
Instrument Transformers Buyer's Guide





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Product Data Sheets By Type Designation

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JAB-0	750X036XXX	200 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-2
JAD-0	750X020XXX	200 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-16
JAD-0	750X020XXX	200 A - 4,000 A; 600 V/10 kV BIL; Outdoor Current	4-6
JAF-0	750X010XXX	100 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-24
JAG-0	750X010XXX	100 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-30
JAG-0C	750X110XXX	High Relay; 50 A - 5,000 A; 600 V/10 kV BIL; Indoor Current	3-34
JAG-0C	750X110XXX	Standard Relay; 50 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-32
JAH-0	750X014XXX	150 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-14
JAI-0	750X093XXX	Low Burden; 600 V; Indoor Current	3-52
JAK-0	750X033XXX	200 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-4
JAK-0	750X033XXX	200 A - 800 A; 600 V/10 kV BIL; Outdoor Current	4-2
JAM-0	750X021XXX	100 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-48
JAR-0	750X001XXX	Auxiliary; 600 V; Indoor Current	3-54
JAS-0	750X014XXX	150 A - 2,000 A; 600 V/10 kV BIL; Indoor Current	3-12
JAU-0	750X091XXX	Low Burden; 600 V; Indoor Current	3-52
JCB-0	750X011XXX	50 A - 6,000 A; 600 V/10 kV BIL; Indoor Current	3-18
JCB-0C	750X111XXX	50 A - 6,000 A; 600 V/10 kV BIL; Indoor Current	3-20
JCB-3	753X021XXX	600 A - 4,000 A; 5,000 V/60 kV BIL; Indoor Current	3-68
JCB-4	754X021XXX	600 A - 4,000 A; 8,700 V/75 kV BIL; Indoor Current	3-68
JCB-5	755X021XXX	600 A - 4,000 A; 15,000 V/110 kV BIL; Indoor Current	3-68
JCD-0	750X031XXX	1,500 A - 8,000 A; 600 V/10 kV BIL; Indoor Current	3-22
JCD-0	750X031XXX	1,500 A - 8,000 A; 600 V/10 kV BIL; Outdoor Current	4-8
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JCD-4	754X031XXX	1,200 A - 4,000 A; 8,700 V/75 kV BIL; Outdoor Current	4-22
JCD-5	755X031XXX	1,200 A - 4,000 A; 15,000 V/110 kV BIL; Outdoor Current	4-22
JCG-0	750X061XXX	50 A - 10,000 A; 600 V/10 kV BIL; Indoor Current	3-36
JCH-0	750X012XXX	100 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-8
JCH-0C	750X112XXX	50 A - 2,000 A; 600 V/10 kV BIL; Indoor Current	3-10
JCK-3	753X051XXX	5 A - 900 A; 5,000 V/60 kV BIL; Outdoor Current	4-20
JCK-4	754X051XXX	5 A - 900 A; 5,000 V/75 kV BIL; Outdoor Current	4-20
JCK-5	755X052XXX	5 A - 900 A; 15,000 V/110 kV BIL; Outdoor Current	4-28
JCL-0	750X028XXX	1,200 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	4-50
JCM-0	750X025XXX	200 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-42
JCM-2	752X020XXX	1,200 A - 4,000 A; 2,500 V/45 kV BIL; Indoor Current	3-56
JCM-3	753X020XXX	600 A - 4,000 A; 5,000 V/60 kV BIL; Indoor Current	3-64
JCM-4	754X020XXX	600 A - 4,000 A; 8,700 V/75 kV BIL; Indoor Current	3-64
JCM-5	755X020XXX	600 A - 4,000 A; 15,000 V/110 kV BIL; Indoor Current	3-64
JCP-0	750X0150XX	800 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-28
JCP-0	750X0150XX	800 A - 4,000 A; 600 V/10 kV BIL; Outdoor Current	4-10
JCR-0	750X034XXX	100 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-44
JCR-0	750X034XXX	100 A - 400 A; 600 V/10 kV BIL; Outdoor Current	4-14
JCS-0	750X010XXX	50 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-26
JCT-0	750X023XXX	200 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-40
JCW-0	750X032XXX	200 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-38
JCW-0	750X032XXX	200 A - 400 A; 600 V/10 kV BIL; Outdoor Current	4-12
JCW-3	753X030XXX	600 A - 4,000 A; 5,000 V/60 kV BIL; Outdoor Current	4-16
JCW-4	754X030XXX	600 A - 4,000 A; 8,700 V/75 kV BIL; Outdoor Current	4-16
JCW-5	755X030XXX	600 A - 4,000 A; 15,000 V/110 kV BIL; Outdoor Current	4-16



Data subject to change without notice.

Type Designation	Catalog # Series	Description	Page
JE-27	760X090XXX	Dry-Type; 69.4 V - 600 V; Indoor Voltage	1-2
JEP-0C	760X135XXX	69.4 - 600 V/10 kV BIL; Indoor Voltage	1-6
JKC-3	753X002XXX	10 A - 1,200 A; 5,000 V/60 kV BIL; Indoor Current	3-62
JKM-0	750X041XXX	10 A - 1,200 A; 600 V/10 kV BIL; Indoor Current	3-46
JKM-2	752X040XXX	10 A - 1,200 A; 2,500 V/45 kV BIL; Indoor Current	3-58
JKM-3	753X040XXX	5 A - 800 A; 5,000 V/60 kV BIL; Indoor Current	3-66
JKM-4	754X040XXX	10 A - 800 A; 8,700 V/75 kV BIL; Indoor Current	3-70
JKM-5	755X042XXX	5 A - 800 A; 15,000 V/110 kV BIL; Indoor Current	3-76
JKM-5A	755X045XXX	5 A - 800 A; 15,000 V/110 kV BIL; Indoor Current	3-78
JKM-95	755X044XXX	15,000 V/95 kV BIL; Indoor Current	3-74
JKS-3	753X001XXX	15 A - 800 A; 5,000 V/60 kV BIL; Indoor Current	3-60
JKS-5	755X001XXX	15 A - 800 A; 15,000 V/95 kV BIL; Indoor Current	3-72
JKW-3	753X050XXX	5 A - 900 A; 5,000 V/60 kV BIL; Outdoor Current	4-18
JKW-4	754X050XXX	5 A - 900 A; 8,700 V/75 kV BIL; Outdoor Current	4-18
JKW-5	755X053XXX	5 A - 1,200 A; 15,000 V/110 kV BIL; Outdoor Current	4-24
JKW-5A	755X053XXX	5 A - 1,200 A; 15,000 V/110 kV BIL; Outdoor Current	4-26
JKW-6	756X050XXX	5 A - 1,200 A; 25,000 V/150 kV BIL; Outdoor Current	4-34
JKW-6A	756X051XXX	10 A - 1,200 A; 25,000 V/150 kV BIL; Outdoor Current	4-36
JKW-7	757X050XXX	10 A - 800 A; 34,500 V/200 kV BIL; Outdoor Current	4-38
JKW-150	756X030XXX	25 A - 3,000 A; 25,000 V/150 kV BIL; Outdoor Current, Dry	4-30
JKW-200	757X030XXX	25 A - 3,000 A; 34,500 V/200 kV BIL; Outdoor Current, Dry	4-30
JKW-250	758X030XXX	25 A - 3,000 A; 46,000 V/250 kV BIL; Outdoor Current, Dry	4-32
JKW-350	759X030XXX	25 A - 3,000 A; 69,000 V/350 kV BIL; Outdoor Current, Dry	4-32
JVA-0	760X034XXX	120 V - 600 V/10kV BIL; Indoor Voltage	1-4
JVA-0	760X034XXX	120 V - 600 V/10kV BIL; Outdoor Voltage	2-2
JVM-2	762X022XXX	2,400 V/45 kV BIL; Indoor Voltage	1-10
JVM-3	763X021XXX	2,400 V - 4,800 V/60 kV BIL; Indoor Voltage	1-12
JVM-4	764X020XXX	4,200 V - 7,200 V/75 kV BIL; Indoor Voltage	1-14
JVM-4A	764X021XXX	4,200 V - 7,200 V/75kV BIL; Indoor Voltage	1-16
JVM-5	765X021XXX	7,200 V - 14,400 V/110 kV BIL; Indoor Voltage	1-14
JVM-5A	765X023XXX	7,200 V - 14,400 V/110 kV BIL; Indoor Voltage	1-16
JVM-6	766X021XXX	12,000 V - 24,000 V/125 kV BIL; Indoor Voltage	1-20
JVM-95	765X022XXX	7,200 V - 14,400 V/95 kV BIL; Indoor Voltage	1-18
JVP-1	761X020XXX	240 V - 600 V/30kV BIL; Indoor/Outdoor Voltage	1-8
JVP-1	761X020XXX	240 V - 600 V/30kV BIL; Indoor/Outdoor Voltage	2-4
JVS	76XX030XXX	24,000 V - 69,000 V/150 - 350 kV BIL; Outdoor Voltage, Dry	2-20
JVT	76XX030XXX	24,000 V - 69,000 V/150 - 350 kV BIL; Outdoor Voltage, Dry	2-20
JVW-3	763X030XXX	2,400 V - 4,800 V/60 kV BIL; Outdoor Voltage	2-6
JVW-4	764X030XXX	2,400 V - 7,200 V/75 kV BIL; Outdoor Voltage	2-8
JVW-5	765X030XXX	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-8
JVW-4A	764X031XXX	2,400 V - 7,200 V/75 kV BIL; Outdoor Voltage	2-10
JVW-5A	765X031XXX	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-10
JVW-6	766X031XXX	12,000 V - 24,000 V/125 kV BIL; Outdoor Voltage	2-14
JVW-7	767X031XXX	20,125 V - 34,500 V/150 - 200 kV BIL; Outdoor Voltage	2-18
JVW-110	765X031XXX	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-12
JVW-150	766X034XXX	12,000 V - 24,000 V/150 kV BIL; Outdoor Voltage	2-16
YT-1557	760X099001	Three Phase, Auxiliary; Indoor Voltage	1-22



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750X010XXX	JAF-0	100 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-24
750X010XXX	JAG-0	100 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-30
750X010XXX	JCS-0	50 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-26
750X011XXX	JCB-0	50 A - 6,000 A; 600 V/10 kV BIL; Indoor Current	3-18
750X012XXX	JCH-0	100 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-8
750X014XXX	JAH-0	150 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-14
750X014XXX	JAS-0	150 A - 2,000 A; 600 V/10 kV BIL; Indoor Current	3-12
750X015XXX	JCP-0	800 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-28
750X015XXX	JCP-0	800 A - 4,000 A; 600 V/10 kV BIL; Outdoor Current	4-10
750X020XXX	JAD-0	200 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-16
750X020XXX	JAD-0	200 A - 4,000 A; 600 V/10 kV BIL; Outdoor Current	4-6
750X021XXX	JAM-0	100 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-48
750X023XXX	JCT-0	200 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-40
750X025XXX	JCM-0	200 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-42
750X028XXX	JCL-0	1,200 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-50
750X031XXX	JCD-0	1,500 A - 8,000 A; 600 V/10 kV BIL; Indoor Current	3-22
750X031XXX	JCD-0	1,500 A - 8,000 A; 600 V/10 kV BIL; Outdoor Current	4-8
750X032XXX	JCW-0	200 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-38
750X032XXX	JCW-0	200 A - 400 A; 600 V/10 kV BIL; Outdoor Current	4-12
750X033XXX	JAK-0	200 A - 800 A; 600 V/10 kV BIL; Indoor Current	3-4
750X033XXX	JAK-0	200 A - 800 A; 600 V/10 kV BIL; Outdoor Current	4-2
750X034XXX	JCR-0	100 A - 400 A; 600 V/10 kV BIL; Indoor Current	3-44
750X034XXX	JCR-0	100 A - 400 A; 600 V/10 kV BIL; Outdoor Current	4-14
750X036XXX	JAB-0	200 A - 3,000 A; 600 V/10 kV BIL; Indoor Current	3-2
750X041XXX	JKM-0	10 A - 1,200 A; 600 V/10 kV BIL; Indoor Current	3-46
750X061XXX	JCG-0	50 A - 10,000 A; 600 V/10 kV BIL; Indoor Current	3-36
750X091XXX	JAU-0	Low Burden; 600 V; Indoor Current	3-52
750X093XXX	JAI-0	Low Burden; 600 V; Indoor Current	3-52
750X110XXX	JAG-0C	High Relay; 50 A - 5,000 A; 600 V/10 kV BIL; Indoor Current	3-34
750X110XXX	JAG-0C	Standard Relay; 50 A - 4,000 A; 600 V/10 kV BIL; Indoor Current	3-32
750X111XXX	JCB-0C	50 A - 6,000 A; 600 V/10 kV BIL; Indoor Current	3-20
750X112XXX	JCH-0C	50 A - 2,000 A; 600 V/10 kV BIL; Indoor Current	3-10
752X020XXX	JCM-2	1,200 A - 4,000 A; 2,500 V/45 kV BIL; Indoor Current	3-56
752X040XXX	JKM-2	10 A - 1,200 A; 2,500 V/45 kV BIL; Indoor Current	3-58
753X001XXX	JKS-3	15 A - 800 A; 5,000 V/60 kV BIL; Indoor Current	3-60
753X002XXX	JKC-3	10 A - 1,200 A; 5,000 V/60 kV BIL; Indoor Current	3-62
753X020XXX	JCM-3	600 A - 4,000 A; 5,000 V/60 kV BIL; Indoor Current	3-64
753X021XXX	JCB-3	600 A - 4,000 A; 5,000 V/60 kV BIL; Indoor Current	3-68
753X030XXX	JCW-3	600 A - 4,000 A; 5,000 V/60 kV BIL; Outdoor Current	4-16
753X031XXX	JCD-3	1,200 A - 4,000 A; 5,000 V/60 kV BIL; Outdoor Current	4-22
753X040XXX	JKM-3	5 A - 800 A; 5,000 V/60 kV BIL; Indoor Current	3-66
753X050XXX	JKW-3	5 A - 900 A; 5,000 V/60 kV BIL; Outdoor Current	4-18
753X051XXX	JCK-3	5 A - 900 A; 5,000 V/60 kV BIL; Outdoor Current	4-20
754X020XXX	JCM-4	600 A - 4,000 A; 8,700 V/75 kV BIL; Indoor Current	3-64
754X021XXX	JCB-4	600 A - 4,000 A; 8,700 V/75 kV BIL; Indoor Current	3-68
754X030XXX	JCW-4	600 A - 4,000 A; 8,700 V/75 kV BIL; Outdoor Current	4-16
754X031XXX	JCD-4	1,200 A - 4,000 A; 8,700 V/75 kV BIL; Outdoor Current	4-22
754X040XXX	JKM-4	10 A - 800 A; 8,700 V/75 kV BIL; Indoor Current	3-70
754X050XXX	JKW-4	5 A - 900 A; 8,700 V/75 kV BIL; Outdoor Current	4-18
754X051XXX	JCK-4	5 A - 900 A; 8,700 V/75 kV BIL; Outdoor Current	4-20



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Catalog # Series	Type Designation	Description	Page
755X001XXX	JKS-5	15 A - 800 A; 15,000 V/95 kV BIL; Indoor Current	3-72
755X020XXX	JCM-5	600 A - 4,000 A; 15,000 V/110 kV BIL; Indoor Current	3-64
755X021XXX	JCB-5	600 A - 4,000 A; 15,000 V/110 kV BIL; Indoor Current	3-68
755X030XXX	JCW-5	600 A - 4,000 A; 15,000 V/110 kV BIL; Outdoor Current	4-16
755X031XXX	JCD-5	1,200 A - 4,000 A; 15,000 V/110 kV BIL; Outdoor Current	4-22
755X042XXX	JKM-5	5 A - 800 A; 15,000 V/110 kV BIL; Indoor Current	3-76
755X044XXX	JKM-95	15,000 V/95 kV BIL; Indoor Current	3-74
755X045XXX	JKM-5A	5 A - 800 A; 15,000 V/110 kV BIL; Indoor Current	3-78
755X052XXX	JCK-5	5 A - 900 A; 15,000 V/110 kV BIL; Outdoor Current	4-28
755X053XXX	JKW-5	5 A - 1,200 A; 15,000 V/110 kV BIL; Outdoor Current	4-24
755X053XXX	JKW-5A	5 A - 1,200 A; 15,000 V/110 kV BIL; Outdoor Current	4-26
756X030XXX	JKW-150	25 A - 3,000 A; 25,000 V/150 kV BIL; Outdoor Current, Dry	4-30
756X050XXX	JKW-6	5 A - 1,200 A; 25,000 V/150 kV BIL; Outdoor Current	4-34
756X051XXX	JKW-6A	10 A - 1,200 A; 25,000 V/150 kV BIL; Outdoor Current	4-36
757X030XXX	JKW-200	25 A - 3,000 A; 34,500 V/200 kV BIL; Outdoor Current, Dry	4-30
757X050XXX	JKW-7	10 A - 800 A; 34,500 V/200 kV BIL; Outdoor Current	4-38
758X030XXX	JKW-250	25 A - 3,000 A; 46,000 V/250 kV BIL; Outdoor Current, Dry	4-32
759X030XXX	JKW-350	25 A - 3,000 A; 69,000 V/350 kV BIL; Outdoor Current, Dry	4-32
760X034XXX	JVA-0	120 V - 600 V/10 kV BIL; Indoor Voltage	1-4
760X034XXX	JVA-0	120 V - 600 V/10 kV BIL; Outdoor Voltage	2-2
760X099001	YT-1557	Three Phase, Auxiliary; Indoor Voltage	1-22
760X090XXX	JE-27	Dry-Type; 69.4 V - 600 V; Indoor Voltage	1-2
760X135XXX	JEP-0C	69.4 - 600 V/10 kV BIL; Indoor Voltage	1-6
761X020XXX	JVP-1	240 V - 600 V/30 kV BIL; Indoor/Outdoor Voltage	1-8
761X020XXX	JVP-1	240 V - 600 V/30 kV BIL; Indoor/Outdoor Voltage	2-4
762X022XXX	JVM-2	2,400 V/45 kV BIL; Indoor Voltage	1-10
763X021XXX	JVM-3	2,400 V - 4,800 V/60 kV BIL; Indoor Voltage	1-12
763X030XXX	JVW-3	2,400 V - 4,800 V/60 kV BIL; Outdoor Voltage	2-6
764X020XXX	JVM-4	4,200 V - 7,200 V/75 kV BIL; Indoor Voltage	1-14
764X021XXX	JVM-4A	4,200 V - 7,200 V/75 kV BIL; Indoor Voltage	1-16
764X030XXX	JVW-4	2,400 V - 7,200 V/75 kV BIL; Outdoor Voltage	2-8
764X031XXX	JVW-4A	2,400 V - 7,200 V/75 kV BIL; Outdoor Voltage	2-10
765X021XXX	JVM-5	7,200 V - 14,400 V/110 kV BIL; Indoor Voltage	1-14
765X022XXX	JVM-95	7,200 V - 14,400 V/95 kV BIL; Indoor Voltage	1-18
765X023XXX	JVM-5A	7,200 V - 14,400 V/110 kV BIL; Indoor Voltage	1-16
765X030XXX	JVW-5	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-8
765X031XXX	JVW-5A	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-10
765X031XXX	JVW-110	7,200 V - 14,400 V/110 kV BIL; Outdoor Voltage	2-12
766X021XXX	JVM-6	12,000 V - 24,000 V/125 kV BIL; Indoor Voltage	1-20
766X031XXX	JVW-6	12,000 V - 24,000 V/125 kV BIL; Outdoor Voltage	2-14
766X034XXX	JVW-150	12,000 V - 24,000 V/150 kV BIL; Outdoor Voltage	2-16
767X031XXX	JVW-7	20,125 V - 34,500 V/150 - 200 kV BIL; Outdoor Voltage	2-18
76XX030XXX	JVT	24,000 V - 69,000 V/150 - 350 kV BIL; Outdoor Voltage, Dry	2-20
76XX030XXX	JVS	24,000 V - 69,000 V/150 - 350 kV BIL; Outdoor Voltage, Dry	2-20



Instrument Transformer Model Type Designation Breakdown

The figure at right illustrates the breakdown of an Instrument Transformer model number, and the information contained therein. Assigned type numbers are described below.

JAB Current, Indoor/Outdoor, molded, window
 JAD Current, Indoor/Outdoor, molded, window
 JAH Current, Indoor, molded, window
 JAI Current, Indoor, window
 JAK Current, Indoor/Outdoor, molded, bar/window
 JAL Current, Underground, molded, window
 JAM Current, Indoor, molded, three-wire
 JAN Current, Indoor, molded, window, US Navy
 JAR Current, Indoor, molded, auxiliary
 JAU Current, Indoor, window

JCA .. Current, Indoor/Outdoor, miniature molded, bar/window
 JCB Current, Indoor, molded, window
 JCC Current, Indoor/Outdoor, molded, custom
 JCD Current, Indoor/Outdoor, molded, window
 JCF Current, Indoor, molded, window, for switchgear
 JCG Current, Indoor, window
 JCH Current, Indoor, molded, window
 JCL Current, Indoor, molded, bar
 JCM Current, Indoor, molded, bar/window
 JCP Current, Indoor/Outdoor, molded, window
 JCR Current, Indoor/Outdoor, with molded window
 JCS Current, Indoor, molded, window, for switchgear
 JCT Current, Indoor, molded, bar/window
 JCU Current, Indoor, window
 JCW Current, Indoor/Outdoor, molded, bar/window
 JCX Current, Indoor, molded, bar/window
 JCZ Current, Indoor, portable, clamp-on window

JKA Current, Outdoor, top connected
 JKB Current, Outdoor, bottom connected
 JKC Current, Indoor, molded, wound primary
 JKD Current, Outdoor, side connected
 JKG Current, Indoor, window for switchgear
 JKM Current, Outdoor, window
 JKL Current, Indoor, bar, no case
 JKM Current, Indoor, molded, wound primary
 JKP Current, Indoor/Outdoor, molded, bar/window
 JKR Current, Indoor, wound primary
 JKS Current, Indoor, molded, wound primary, for switchgear
 JKU Current, Indoor, window
 JKW Current, Outdoor, molded, wound primary
 JKX Current, for oil immersion
 JKY Current, Indoor, molded, window

JNB Current, Indoor, molded, window, US Navy
 JNH Current, Indoor, molded, window, US Navy
 JNM Current, Indoor, molded, bar/window, US Navy

JAK-0

Voltage Class;
Correspond to ANSI Insulation
Classes as follows:

Voltage Class, in kV

- 0 = 0.6
- 1 = 1.2
- 2 = 2.5
- 3 = 5
- 4 = 8.7
- 5 = 15
- 6 = 25
- 7 = 34.5
- 110 = BIL, in kV
- 200 = BIL, in kV
- 250 = BIL, in kV
- 350 = BIL, in kV

Dominant Features;
dependent on second character
M = Indoor
W = Outdoor
S = Single-bushing Voltage Transformer
T = Two-bushing Voltage Transformer

Current Transformer:

- = A
- = C
- = K
- = N = US Navy
- = F, X = Non-US Specification

Voltage Transformer:

- = E
- = V

Instrument Transformer:

- = J

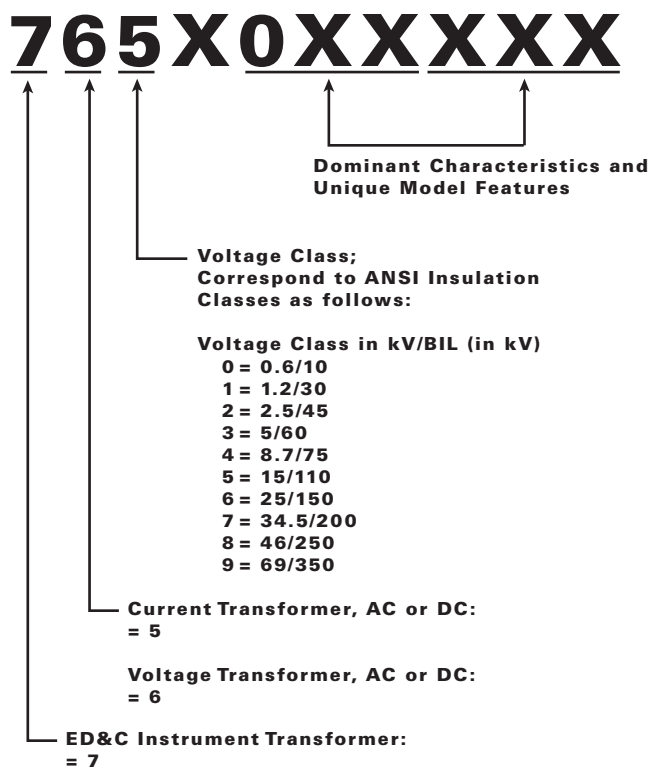
JNP Voltage, Indoor/Outdoor, molded, US Navy
 JNR Current, Indoor, molded, auxiliary, US Navy
 JNS Current, Indoor, molded, window, US Navy

JVA Voltage, Indoor/Outdoor, molded
 JVM Voltage, Indoor, molded
 JVP Voltage, Indoor/Outdoor, molded
 JVS Voltage, Outdoor, molded, single bushing
 JVT Voltage, Outdoor, molded, two bushing
 JVV Voltage, Indoor/Outdoor, molded, custom
 JVW Voltage, Outdoor, molded
 JVX Voltage, for oil immersion
 JVZ Voltage, portable



Data subject to change without notice.

The figure at right illustrates the breakdown of an Instrument Transformer catalog number, and the information contained therein.



Voltage Transformer Type Selection Guide

GE Type	Catalog # Series	Volts	BIL (kV)	0.3 Accuracy @ Rated Volts through Burden	Thermal Rating @30°C	Lbs.	Fuse Option	Page
Accuracy Class 0.3								
JVA-0	760X034XXX	600	10	M(35VA)	500VA	16	Yes	1-4; 2-4
JVP-1	761X020XXX	600	30	Y	750VA	30	Yes	1-8; 2-6
YT-1557	760X099001	600	---	---	300VA	50	No	1-22
JEP-0C	760X135XXX	600	10	W	300VA	12	No	1-6
JE-27	760X090XXX	600	---	1.2X	150VA	9	No	1-2

GE Type	Catalog # Series	Design	Volts	BIL (kV)	0.3 Acc. @ Meter Burden	Thermal VA	Primary		Ave. Lbs.	Creep Inches	Other/Options	Page
							Min.	Max.				
Indoor												
JVM-2	762X022XXX	---	2,400	45	Y	750	---	2,400	30	---	Fuse Option	1-10
JVM-3	763X021XXX	---	4,800	60	Y	750	2,400	4,800	30	---	Fuse Option	1-12
JVM-4	764X020XXX	---	7,200	75	Z	1,500	4,200	7,200	85	---	Fuse Option	1-14
JVM-4A	764X021XXX	---	7,200	75	Z	1,500	4,200	7,200	85	---	Fuse Option	1-16
JVM-5	760X021XXX	---	14,400	95/110	Z	1,500	7,200	14,400	85	---	Fuse Option	1-14
JVM-5A	765X023XXX	---	14,400	95/110	Z	1,500	7,200	14,400	85	---	Fuse Option	1-16
JVM-6	766X021XXX	---	24,000	125	Y	750	12,000	24,000	90	---	No	1-20
Outdoor												
JVW-3	763X030XXX	---	4,800	60	Y	750	2,400	4,800	44	---	2 Bushing	2-6
JVW-4	764X030XXX	---	7,200	75	Z	1,500	2,400	7,200	105	19.6	1-2 Bushing	2-8
JVW-4A	764X031XXX	---	7,200	75	Z	1,500	2,400	7,200	105	19.6	1-2 Bushing	2-10
JVW-5	765X030XXX	---	14,400	110	Z	1,500	7,200	14,400	105	19.6	1-2 Bushing	2-8
JVW-5A	765X031XXX	---	14,400	110	Z	1,500	7,200	14,400	105	19.6	1-2 Bushing	2-10
JVW-110	765X031XXX	---	14,400	110	Y	1,000	7,200	14,400	105	19.6	1-2 Bushing	2-12
JVW-6	766X031XXX	---	14,400	125	Y	750	12,000	---	95	21	1 Bushing	2-14
JVW-6	766X031XXX	---	24,000	125	Y	750	12,000	24,000	95	21	1-2 Bushing	2-14
JVW-150	765X031XXX	---	24,000	150	Y	3,000	12,000	24,000	140	26	2 Bushing	2-16
JVS-150	766X030002	Super-Bute	14,400	150	ZZ	3,000	---	14,000	230	27	1 Bushing	2-20
JVT-150	767X030001	Super-Bute	24,000	150	ZZ	750	---	24,000	225	27	2 Bushing	2-20
JVW-7	767X031XXX	---	34,500	150	Y	750	23,000	34,500	140	26	2 Bushing	2-18
JVW-7	767X031XXX	---	20,125	200	Y	750	---	20,125	140	27	1 Bushing	2-18
JVS-200	767X030002	Super-Bute	20,125	200	ZZ	3,000	---	20,125	240	36	1 Bushing	2-20
JVT-200	767X030001	Super-Bute	34,500	200	ZZ	3,000	27,600	34,500	235	36	2 Bushing	2-20
JVT-200	767X030003	Super-Bute	27,600	200	ZZ	3,000	27,600	34,500	235	36	2 Bushing	2-20
JVS-250	768X030002	Super-Bute	27,600	250	ZZ	5,000	---	27,600	420	50	1 Bushing	2-20
JVT-250	768X030001	Super-Bute	46,000	250	ZZ	4,500	---	46,000	520	52	2 Bushing	2-20
JVS-350	769X030002	Super-Bute	40,250	350	ZZ	5,000	---	40,250	430	64	1 Bushing	2-20
JVT-350	769X030001	Super-Bute	69,000	350	ZZ	4,500	---	69,000	560	66	2 Bushing	2-20

- Notes: 1. Multiply primary amps by rating factor to get maximum amp rating at 30°C.
2. Rating factor can vary with ratio.



Data subject to change without notice.

Current Transformer Type Selection Guide

Type	Catalog # Series	Volts	Primary Amps		400:5 Rating					1500:5 Rating				Other/Options	Page
			Min	Max	Wind. Dia.	R.F.	Burden	Relay Burden	Lbs.	Wind. Dia.	R.F.	Meter Burden	Relay Burden		
Bar Types															
JCT-0	750X023	600	200	800	Bar	2.0	B0.2	---	6	---	---	---	---	---	3-40
JCM-0	750X025	600	200	400	Bar	2.0	B0.5	---	6	---	---	---	---	---	3-42
JKM-0	750X041	600	10	1,200	Bar	1.5	B0.5	T50	15	---	---	---	---	---	3-46
JAM-0	750X021	600	100	400	Bar	1.2	B0.2	---	---	---	---	---	---	For 2W Meter	3-48
JCL-0	750X028	600	1,200	4,000	Bar	---	---	---	---	Bar	1.5	B2	C130	---	3-50
Window Type with Mounting Base															
JCR-0	750X034	600	100	400	2.00	2.0	B0.2	---	3	---	---	---	---	Low or high base	3-44; 4-14
JCW-0	750X032	600	200	400	2.00	2.0	B0.5	---	4	---	---	---	---	Low or high base	3-38; 4-12
JAK-0	750X033	600	200	800	3.00	4.0	B0.5	---	9	---	---	---	---	Dual Ratios	3-4; 4-2
JCP-0	750X015	600	600	4,000	---	---	---	---	28	5.37	2.0	B2	C200	Dual Ratios	3-28; 4-10
JAF-0	750X010	600	100	3,000	4.50	1.3	B0.1	C50	26	5.37	1.3	B2	C100	Dual Ratios	3-24
JCS-0	750X010	600	50	4,000	4.88	2.0	B0.1	C50	28	5.37	1.5	B2	C200	Dual Ratios	3-26
Rectangular Type with Mounting Holes															
JCH-0	750X012	600	100	800	2.50	1.3	.6B0.2	---	4	---	---	---	---	Opt. Mtg. Bkts.	3-8
JCH-0C	750X112	600	50	2,000	1.5/2.5	1.3	.3B0.5	---	3	2.50	1.3	B1.8	---	Opt. Mtg. Bkts.	3-10
JAH-0	750X014	600	150	4,000	4.00	1.3	.6B0.2	---	9	5.75	1.3	B1	C50	---	3-14
JAS-0	750X041	600	150	2,000	4.00	1.3	.6B0.2	C35	8	4.00	1.3	B2	C50	---	3-12
JCB-0	750X011	600	400	6,000	8.12	1.5	.6B0.1	C10	20	8.12	1.5	B1	C100	Mul Ratio	3-18
JCB-0C	750X111	600	50	6,000	7.36	---	---	---	---	---	---	---	---	High Relay	3-20
JAG-0	750X010	600	100	3,000	6.50	4.0	B0.2	C55	25	6.50	2.0	B2	C200	Mul Ratio	3-30
JAG-0C	750X110	600	50	5,000	6.50	3.0	B0.2	C55	21	6.50	2.0	B1.8	C200	Mul Ratio	3-32
JAG-0C	750X110	600	50	4,000	6.50	3.0	B0.5	C100	38	6.50	1.5	B1.8	C400	600&1200:5	3-34
JAD-0	750X020	600	200	4,000	5.75	4.0	B0.2	---	13	5.75	3.0	B1	---	Dual Ratios	3-16
JCD-0	750X031	600	1,500	8,000	---	---	---	---	20	8.12	3.0	B1	---	Dual Ratios	3-22
JAB-0	750X036	600	200	3,000	3.5/4.5	4.0	B0.2	---	7	3.5/4.5	2.0	B1	---	Opt. "Grabbers"	3-2
Auxiliary-Use in Secondary of Main CT To Change Ratio-Many Primary Ratings															
JAR-0	750X001	600	---	---	Wound	1.5	B0.2	---	12	---	---	---	---	---	3-54
Indicating Instrument, Window Types; 1.5% Error at Rated															
JAI-0	750X093	600	50	800	1.75	1.5	2.5VA	---	0.5	---	---	---	---	Term. Screws	3-52
JAU-0	750X091	600	50	800	1.75	1.5	2.5VA	---	0.5	---	---	---	---	With leads	3-52

- Notes:
1. Multiply primary amps by rating factor to get maximum amp rating at 30°C.
 2. Performance and characteristics can vary with ratio/features.
 3. For JAG-0C type only, high ratio is double width.
 4. "-0C" types are case designs (indoor)



Data subject to change without notice.

Current Transformer Type Selection Guide

GE Type	Catalog # Series	Design	Volts	BIL (kV)	0.3 Acc. @ Meter Burden	Most Single Ratio		Primary Amps		Typical 30°C R. F.	Ave. Lbs.	Creep Inches	Other/Options	Page
						Relay Class	Max. Amps at R.F.	Min.	Max.					
Indoor														
JKM-2	752X040XXX	Wound	2,500	45	B0.5	T50	600	10	1,200	1.5	15	---	---	3-58
JCM-2	752X020XXX	Wound	2,500	45	B2	C200	4,000	600	4,000	1.3	35	---	---	3-56
JKC-3	753X002XXX	Wound	5,000	60	B0.5	T50	1,200	10	1,200	1.5	15	---	---	3-62
JKM-3	753X040XXX	Wound	5,000	60	B2	T100	1,000	5	800	1.5	29	---	Tap, Dual Sec.	3-66
JKS-3	753X001XXX	Wound	5,000	60	B0.1/2	T10/100	1,200	15	800	1.5	30	---	Tap, Dual Sec.	3-60
JCM-3	753X020XXX	Bar	5,000	60	B2	C200	4,000	1,200	4,000	1.3	62	---	Tap Sec.	3-64
JCB-3	753X021XXX	5.5" Window	5,000	60	B2	C200/400	5,300	1,200	4,000	1.3	85	---	Tap Sec.	3-68
JCM-4	754X020XXX	Bar	8,700	75	B2	C200	4,000	1,200	4,000	1.3	62	---	Tap Sec.	3-64
JKM-4	754X040XXX	Wound	8,700	75	B2	T100	1,000	10	800	1.5	29	---	---	3-70
JCB-4	754X021XXX	5.5" Window	8,700	75	B2	C200/400	5,300	1,200	4,000	1.3	85	---	Tap Sec.	3-68
JKS-5	755X001XXX	Wound	15,000	95	B0.1/2	T10/200	1,200	15	800	1.5	50	8	Tap, Dual Sec.	3-72
JKM-5	755X042XXX	Wound	15,000	110	B2	T200	1,200	5	800	1.5	47	9	Tap, Dual Sec.	3-76
JCM-5	755X020XXX	Bar	15,000	110	B2	C200	4,000	1,200	4,000	1.3	95	---	Tap Sec.	3-64
JCB-5	755X021XXX	5.5" Window	15,000	110	B2	C200/400	5,300	1,200	4,000	1.3	110	11	Tap Sec.	3-68
Outdoor														
JKW-3	753X050XXX	Wound	5,000	60	B2	T100	1,000	5	800	1.5	38	---	---	4-18
JCD-3	753X031XXX	5.5" Window	5,000	60	B2	C200/400	5,300	1,200	4,000	1.3	110	---	Tap Sec.	4-22
JCW-3	753X030XXX	Bar	5,000	60	B2	C200	4,000	1,200	4,000	1.3	95	---	Tap Sec.	4-16
JCW-4	754X030XXX	Bar	8,700	75	B2	C200	4,000	1,200	4,000	1.3	95	---	Tap Sec.	4-16
JKW-4	754X050XXX	Wound	8,700	75	B2	T100	1,000	10	800	1.5	38	---	---	4-18
JCD-4	754X031XXX	5.5" Window	8,700	75	B2	C200/400	5,300	1,200	4,000	1.3	110	---	Tap Sec.	4-22
JKW-5	755X053XXX	Wound	15,000	110	B2	T100/200	1,200	5	1,200	1.5	60	19	Tap Sec.	4-24
JCD-5	755X031XXX	5.5" Window	15,000	110	B2	C200/400	5,300	1,200	4,000	1.3	135	13.5	Tap Sec.	4-22
JCK-5	755X052XXX	Wound	15,000	110	B0.5	C20	1,200	5	800	1.5/3	35	---	---	4-28
JCW-5	755X030XXX	Bar	15,000	110	B2	C200	4,000	1,200	4,000	1.3	115	15	Tap Sec.	4-16
JKW-6	756X050XXX	Wound	25,000	150	B2	T100/200	1,200	5	1,200	1.5/3	77	24	Tap Sec.	4-34
JKW-150	756X030XXX	Super-Bute	25,000	150	B2	T200/800	4,000	25	3,000	1.5/3	320	25	Tap, Dual Sec.	4-30
JKW-7	757X050XXX	Wound	34,500	200	B0.5	---	1,200	10	800	3	70	26	Tap Sec.	4-38
JKW-200	757X030XXX	Super-Bute	34,500	200	B2	T200/800	4,000	25	3,000	2	345	35	Tap, Dual Sec.	4-30
JKW-250	758X030XXX	Super-Bute	46,000	250	B2	T200/800	4,000	25	3,000	2	540	48	Tap, Dual Sec.	4-30
JKW-350	759X030XXX	Super-Bute	69,000	350	B2	T200/800	4,000	25	3,000	2	590	64	Tap, Dual Sec.	4-30

- Notes: 1. Multiply primary amps by rating factor to get maximum amp rating at 30°C.
 2. Rating factor can vary with ratio.



Data subject to change without notice.

This section provides the descriptive information referenced in each product data sheet in sections 1 - 4 of this volume. Where references are not made to specific item numbers on a product data sheet, please refer to the general item for that category, "Models: All Not Specifically Referenced Otherwise".

1. Construction and Insulation

1.1 Models: JAB-0, JAD-0, JAH-0, JAM-0, JCH-0, JCM-0, JCR-0, JCT-0, JCW-0

These transformers are molded with an electrical grade EPDM that is filled with hydrated alumina for exceptional arc tracking resistance.

1.2 Models: JCB-3, JCB-4, JCB-5, JCD-0, JCD-3, JCD-4, JCD-5, JCK-3, JCK-4, JCK-5, JCL-0, JCM-0, JCM-2, JCM-3, JCM-4, JCM-5, JCP-0, JCW-0, JCW-3, JCW-4, JCW-5, JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JKW-7, JVM-2, JVP-1

Primary coils for voltage transformers and secondary coils for current transformers with wound primaries are cast in epoxy resin prior to being molded in HY-BUTE \nearrow 60 insulation.

1.3 Models: JKW-150, JKW-200, JKW-250, JKW-350, JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

SUPER-BUTE \nearrow 60 transformers use both butyl and epoxy resin to obtain the highest level of quality and performance. The epoxy resin is used for the internal insulation system for winding impregnation and strong mechanical support. HY-BUTE \nearrow 60 insulation is used for the outside shell of the high voltage bushings and as an encasement for the core and winding components. Dry-type insulation also permits indoor installation when required.

1.4 Models: JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A, JVM-6, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

The transformer design is constructed using molded HY-BUTE \nearrow 60 insulation for the transformer body. The primary coil is precast in epoxy resin prior to being molded in HY-BUTE \nearrow 60 insulation.

1.5 Models: JAF-0, JAG-0, JAS-0, JCB-0, JCS-0

The transformer is a window-type, and has no primary winding; the line conductor which is passed through the window serves as the transformer primary. A nylon tube is used for the window, and HY-BUTE \nearrow 60 insulation for the transformer body. The HY-BUTE \nearrow 60 insulation serves both as support and casing. The transformer is offered either with or without a base plate.

Model JAF-0 Only

The transformer is designed to meet the test requirement of the 0.6 kV standard insulation class. The ANSI Standards specify these requirements to be a 4 kV test at 60 Hz and a full-wave impulse test at 10 kV.

1.6 Models: JKM-95, JVM-95

The transformer is of butyl-molded construction with HY-BUTE \nearrow 60 insulation. The complete external surface of the potential transformer, with the exception of the secondary terminal compartment, is coated with a semi-conducting material. This coating provides a ground shield that interfaces with the cables and connectors to provide a continuous ground path to the entire system. The secondary compartment is internally ground-shielded.

The insulation class of the transformer meets the test requirements of the 15L-kV standard insulation class. The ANSI standards specify these requirements to be: full-wave impulse test at 95 kV; one-minute dielectric test, primary to secondary and ground, at 34 kV, 60 Hz; and a one-minute dielectric test, secondary to primary and ground, at 2.5 kV, 60 Hz.

1.7 Models: JVA-0

The transformer design is constructed using molded HY-BUTE \nearrow 60 insulation for the transformer body. The primary and secondary coils are precast in epoxy resin prior to being molded in HY-BUTE \nearrow 60 insulation.

1.8 Models: JAK-0, JAR-0, JCB-3, JCB-4, JCB-5, JCD-0, JCD-3, JCD-4, JCD-5, JCK-3, JCK-4, JCK-5, JCL-0, JCM-2, JCM-3, JCM-4, JCM-5, JCP-0, JCW-0, JCW-3, JCW-4, JCW-5, JKC-3, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JKW-7, JVP-1

The transformer design is constructed using HY-BUTE \nearrow 60 insulation for the transformer body as well as the major portion of the transformer's insulation system. The HY-BUTE \nearrow 60 insulation also serves both as support, bushing, and casing.



1.9 Models: JAG-0C, JCB-0C, JCH-0C

The transformer is a window-type, and has no primary winding; the line conductor which is passed through the window serves as the transformer primary. The case is constructed using Noryl™ plastic.

2. Core Material

2.1 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

The cores are made from high quality silicon steel which is carefully selected, tested, and annealed under rigidly controlled factory conditions. Each core is a shell type of laced construction. They are assembled and supported on flanges that form part of the base structure. The cores are tightly banded in place and protected from weathering by the transformer casing.

2.2 Models: JAB-0, JAD-0, JAH-0, JAK-0, JCB-3, JCB-4, JCB-5, JCD-0, JCD-3, JCD-4, JCD-5, JCG-0, JCH-0, JCH-0C, JCL-0, JCM-0, JCM-2, JCM-3, JCM-4, JCM-5, JCP-0, JCT-0, JCW-3, JCW-4, JCW-5, JKW-7, JKW-150, JKW-200, JKW-250, JKW-350

The core is made from high-quality, grain-oriented, low-loss, high permeability silicon steel which is carefully selected and tested under rigidly controlled factory conditions. The core is wound in the direction of the grain to take advantage of the high permeability.

2.3 Models: JCK-3, JCK-4, JCK-5, JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A

The cores are made from high quality silicon steel which is carefully selected, tested, and annealed under rigidly controlled factory conditions. The core is a shell type.

2.4 Models: JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JVW-7, JVW-150

The core is made of high-permeability, formed, silicon steel strip. The steel is characterized by having highly directional properties, that is, low core losses and high permeability in the direction of rolling. Full advantage is taken of this property of the steel by the shape and construction of the core.

The core has a dispersed-gap construction with interleaved laminations. This type of core provides a construction that will not shift to cause any change in the transformer characteristics. After being assembled into the coils, the core is securely clamped and permanently fastened to

the base plate by a heavy steel strap which encircles the core and is welded to the base.

2.5 Models: JAF-0, JAG-0, JAG-0C, JAS-0, JCB-0, JCB-0C, JCS-0

The core is made of high quality silicon steel which is carefully selected, tested, and annealed under rigidly controlled factory conditions. The steel used is characterized by having highly directional properties; that is, low core losses and high permeability in the direction of rolling. Full advantage is taken of this property of the steel. The core is annealed after being wound in its final shape, thus relieving any stresses that are set up in the winding operation.

2.6 Models: JVM-6, JVW-6

The core is made of high-quality silicon steel which is carefully selected, tested and annealed under rigidly controlled factory conditions. The design is of the dispersed-gap Spirakore construction.

3. Primary and Secondary Coils/Windings

3.1 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

The primary winding consists of the “lattice wound” construction. The construction is divided into either two- or four- coil sections. Each turn within the section is precisely controlled to provide a uniform distribution of turn-to-turn or layer-to-layer stress within the coil. The first turn of the primary winding is a contoured, expanded, metal electrostatic stress shield which, along with the coil configuration, linearly distributes any impulse surges across the complete primary coil rather than allow them to build on the first few turns.

The secondary coils are wound using either insulated wire or copper foil. They have layer-to-layer insulation. Two- bushing Types JVT-150 and JVT-200 have two low voltage windings that can either be used separately or connected in parallel for full thermal capability. The JVT-250 and JVT-350 have one low-voltage winding, while the JVS types have two low-voltage secondaries with taps at approximately 58% of the turns.

3.2 Models: JVM-4, JVM-4A, JVM-5, JVM-5A, JVW-7, JVW-150

The primary winding consists of the “lattice wound” construction. This construction is divided into either two- or four- coil sections. Each turn within the section is precisely controlled to provide a uniform distribution of turn-to-turn or layer-to-layer stress within a coil. The first turn of



the primary winding is a contoured, expanded, metal electrostatic stress shield which, along with the coil configuration, linearly distributes any impulse surges across the complete primary coil rather than allow them to build on the first few

The secondary coils are wound using insulated wire.

3.3 Models: JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A

The primary winding consists of two coils connected in series. Each coil surrounds one leg of the core. This design reduces leakage losses, thus improving the accuracy of the transformer. It also provides a higher mechanical strength than a single coil construction.

The secondary winding consists of two coils connected in parallel. Each coil is located inside the corresponding primary coil and surrounds one leg of the core.

3.4 Models: JCB-3, JCB-4, JCB-5, JCD-3, JCD-4, JCD-5, JCW-3, JCW-4, JCW-5

The primary winding consists of a hollow copper tube (for cable) or a straight-through bar passing through the transformer.

The secondary winding is toroidally wound and is made of enamel-covered copper wire.

3.5 Models: All Not Specifically Referenced Otherwise

The secondary winding is made of heavy enamel-insulated copper wire. It is evenly distributed around the core which reduces the leakage flux and provides the best possible accuracy.

3.6 Models: JKC-3, JKM-0, JKM-2

The primary is wound with heavy copper conductors in a single coil enclosing one side of the core. The secondary coil is positioned inside the primary coil for maximum accuracy. All connections in both windings are brazed for strength and low resistance.

3.7 Models: JCL-0, JCM-2, JCM-3, JCM-4, JCM-5

The primary consists of a ventilated hollow copper tube passing straight through the transformer. The secondary winding is toroidally wound, and is made of heavy enamel-insulated copper wire.

3.8 Models: JVM-3, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A

A formed core of the shell type is used. Enamel insulated wire is used in the primary and

secondary coils. The primary is wound and cast in epoxy resin. The secondary is inside the primary next to the core.

3.9 Models: JAF-0, JAG-0, JAG-0C, JAH-0, JAI-0, JAL-0, JAS-0, JAU-0, JCB-0, JCB-0C, JCG-0, JCH-0, JCH-0C, JCS-0

Primary Winding - This transformer is of the window-type construction, which means that the user can place the cable or bus through the insulated opening in the face of the transformer. This conductor then becomes the primary of the transformer, and no other primary connections are necessary.

3.10 Models: JVS-150, JVS-200, JVS-250, JVS-350

The neutral end of the primary winding is terminated on the butyl head shell with a solid brass threaded sleeve. A grounding strap is used to connect this neutral terminal to the transformer ground pad for normal operation.

3.11 Models: JCK-3, JCK-4, JCK-5, JKW-7

The primary winding consists of strip wound copper in a circular pattern for the lower ratings, and a single-turn configuration for the higher ratings. This type of construction provides good accuracy, along with the highest fault current withstand characteristics.

3.12 Models: JKW-150, JKW-200, JKW-250, JKW-350

Primary Winding - The primary winding is mounted in the high-voltage bushing head shell, which results in a more efficient use of the core properties by permitting a symmetrical distribution of the winding turns. It keeps leakage to a minimum, and makes possible a high level of accuracy with fewer ampere-turns and corresponding improvement in thermal rating.

In transformers rated 300/600:5 A and lower, a multi-turn primary winding is used, consisting of equally distributed copper conductors which encircle the core and secondary winding. In transformers rated 400/800:5 A and above, a single-turn, copper primary bar is used.

3.13 Models: JCB-3, JCB-4, JCB-5, JCD-3, JCD-4, JCD-5

Primary "Pig Tail" Connection - The lead that is connected to the metallic tube in the window is designed for connection to the primary conductor. This connection ensures that the tube is at the same voltage level as the primary conductor. This prevents corona discharges (caused by capacitive voltage distributed between two points) from occurring between an insulated primary conductor and the metallic tube.



Continuous corona discharge could cause deterioration of the primary conductor insulation or be a source of radio interference, but would have no effect on the primary insulation of the instrument transformer.

The connection is not needed when a bare conductor is in direct contact with the through metallic tube, or when a shielded cable is used.

3.14 Models: JAH-0, JAK-0, JCH-0, JCH-0C, JCM-0, JCT-0

Secondary Winding - The secondary winding is made of heavy enamel-insulated copper wire, evenly distributed around the core, reducing leakage flux and providing the best possible accuracy.

3.15 Models: JAD-0, JAF-0, JAG-0, JAG-0C, JCD-0

Secondary Winding - The secondary winding is made of heavy enamel-insulated copper wire, evenly distributed around the core. The double-ratio transformers have a tap in the secondary winding.

3.16 Models: JCB-0, JCB-0C, JCP-0, JCS-0

Secondary Winding - The secondary winding is made of heavy enamel-insulated copper wire, evenly distributed around the core. This construction reduces leakage flux, minimizes the effect of stray fields from adjacent buses, and gives the best possible accuracy. The multi-ratio transformers have multiple taps in the secondary winding.

3.17 Models: JAB-0, JAS-0, JCG-0

Secondary Winding - The secondary winding is made of heavy enamel-insulated copper wire, evenly distributed around the core. This construction reduces leakage flux, minimizes the effect of stray fields from adjacent buses, and gives the best possible accuracy.

3.18 Models: JCK-3, JCK-4, JCK-5, JKW-7

Secondary Winding - The secondary winding is made of enamel-insulated copper wire, evenly distributed around the core. This construction reduces leakage flux and provides the best possible accuracy.

3.19 Models: JKW-150, JKW-200, JKW-250, JKW-350

Secondary Winding - The secondary winding is mounted in the high-voltage bushing head shell, which results in a more efficient use of the core properties by permitting a symmetrical distribution of the winding turns. It keeps leakage to a minimum, and makes possible a high level of accuracy with fewer Ampere-turns and corresponding improvement in thermal rating.

The secondary winding is wound with enamel-insulated copper conductor. All turns are evenly distributed around the core, and suitable compensation is used to obtain very high accuracy performance. This winding is center-tapped to obtain the dual-primary Ampere rating. The secondary leads extend downward through the bushing tube to the secondary terminal block in the transformer base.

3.20 Models: JVM-6, JVW-6

Enamel-insulated wire is used in the primary and secondary coils. The primary is lattice-wound, and cast in epoxy resin. The secondary is inside the primary next to the core.

4. Terminals

4.1 Models: JCM-0, JCT-0

Primary Bars - The primary bars are non-removable. In the 200 A and 400 A ratings, they consist of round copper tubes with the ends formed into flat terminal pads after insertion into the transformer. In the 600 A and 800 A ratings, they consist of round, solid copper bars, with flat terminal pads formed on each end. All terminal pads have a hole and a slot to accommodate different sizes of cable lugs. The pads are tin-plated. The primary bars conform to American National Standard ANSI C12.11.

A solderless, pressure-type potential connector is supplied. It is fastened by a screw through the terminal pad. The connector has a square base which fits into a square hole of similar size in the terminal pad. When tightened, the connector is prevented from turning. The connector can be mounted either above or below the terminal pad or chaged from one terminal pad to the other.

4.2 Models: JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A

Primary Terminals - The primary terminals on the unfused models consist of tapped holes in the center of a flat boss with lock washer and screw. On two fuse models, both terminals are bolts attached directly to the fuse supports, and are provided with lock washers and nuts. On the single fuse models, the line terminal is on the fuse support, and the neutral terminal is a stud protruding from the back, a short distance above the base plate. This stud is insulated from the base plate to permit primary insulation-resistance testing at voltages up to 10,000 volts.

4.3 Models: JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A

Primary Terminals - The primary terminals are flat copper bars, each with one bolt hole and a slot, which facilitates connections to various size



cable lugs. The shape of the insulation next to the primary terminals allows easy and smooth taping of the primary connections. The terminal surfaces are tin-plated to reduce contact resistance.

4.4 Models: JKS-3, JKS-5

Primary Terminals - The primary terminals are flat copper bars, each with two bolt holes. The terminal surfaces are tin-plated to reduce contact resistance.

4.5 Models: JCM-2, JCM-3, JCM-4, JCM-5, JCL-0

Primary Terminals - Flat copper pads welded to the ends of the hollow, ventilated primary tube serve as primary terminals. The terminals are drilled for bolting to a bus. All current ratings in each voltage class have the same distance between bolt holes, facilitating replacement of one transformer with another of a different rating.

4.6 Models: JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

Primary Terminals - The primary terminals are of the solderless type. Made of hardened bronze, the terminal is fitted with a hard-copper collar and bronze pressure screw. The collar is semi-captive and may be turned 90-degrees in either direction for vertical or horizontal connection.

With the collar in the vertical position, the maximum conductor sizes for copper is 250MCM and aluminum is 4/0. With the collar in the horizontal position, the maximum conductor sizes for copper is 3/0 and aluminum is 2/0. In either position, the minimum conductor size is AWG 10.

A clearance hole for a 3/8 inch bolt is provided in the top of the terminal for additional flexibility in making connections. The complete terminal and collar assembly is heavily electroplated with tin so that it is suitable for outdoor use.

Models: JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150 Only:

On single-bushing designs, the H₂ side of the primary winding is insulated for only a 19 kV hipot level, and is connected to an "L" bracket on the baseplate through a removable ground strap. A clamp-type terminal accommodating No. 12 to No. 2 AWG, copper or aluminum, is provided for making the ground connection.

4.7 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

Primary Terminals - The primary terminal consists of a copper or cast bronze, NEMA-approved, flat, two-hole pad. The complete terminals are heavily tin-electroplated for use with either copper or aluminum conductors. This construction can be easily adapted to any type of line termination by use of any of a variety of commercially available connectors.

4.8 Models: JCK-3, JCK-4, JCK-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JKW-7

Primary Terminals - The primary terminals are flat copper bars, each with one bolt hole and a slot, which facilitates connections to various size cable lugs. The terminal surfaces are tin-plated to reduce contact resistance, and to allow connection to either copper or aluminum conductors.

4.9 Models: JCW-3, JCW-4, JCW-5

Primary Terminals - Flat copper pads welded to the ends of the hollow, ventilated primary tube serve as primary terminals. The terminals are drilled for bolting to a bus. All current ratings in each voltage class have the same distance between bolt holes, facilitating replacement of one transformer with another of a different rating. The terminal surfaces are tin-plated to reduce contact resistance.

4.10 Models: JKW-150, JKW-200, JKW-250, JKW-350

Primary Terminals - Transformers rated 300/600:5 Amperes and below have a U-shaped pad for the primary terminals. Transformers rated 400/800:5 Amperes and above use a vertically-oriented, flat copper bar for the primary terminal pads. In both cases, the terminal pads contain four mounting holes with industry standard hole sizes and spacing.

4.11 Models: JAB-0, JCM-0, JCR-0, JCT-0, JCW-0

Secondary Terminals - The secondary terminals are clamp-type, with a 0.275-inch diameter hole, simplifying the connection of large or multiple secondary wires. The terminals are made of bronze for excellent durability and corrosion resistance.

An external secondary terminal block secures a stud in between the two terminals, which is used as a short circuit device, and as a means to attach and secure the secondary cover.



4.12 Models: JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A

Secondary Terminals - The secondary terminals are solderless clamp type. The terminal cover is made of transparent plastic. Provision is made for sealing the cover.

4.13 Models: JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5

Secondary Terminals - The secondary terminals are solderless clamp type. A positive-action, manually operated, short-circuiting switch is provided. The terminal cover is made of transparent plastic. It is reversible and constructed so that it cannot be put in place with meters connected and the short-circuit switch closed. Provision is made for sealing the secondary cover with either a wire or 1/4 inch strip seal.

4.14 Models: JAF-0, JAG-0, JAG-0C, JAS-0, JCB-0, JCB-0C, JCG-0, JCS-0

Secondary Terminals - The terminals are fixed, threaded, bronze sleeves that project approximately 1/8 inch above the casing. Connections to the terminals can be made by means of two 1/4-20 binding head screws, which are supplied.

Because this transformer is used primarily in enclosed switchgear compartments which cannot be opened while the transformer is energized, a secondary protective short-circuiting device is not provided.

4.15 Models: JAH-0, JCH-0, JCH-0C

Secondary Terminals - The secondary terminals are of the screw-type construction. Each end of the secondary winding is brazed to a threaded sleeve which projects up through the top surface of the transformer. The two 3/8 inch long, 10-32 NF-3, slotted, round-head screws furnished with the transformer, are ideally suited for making connections to spade-type terminals or bare conductors.

4.16 Models: JCB-3, JCB-4, JCB-5, JCD-3, JCD-4, JCD-5, JCM-3, JCM-4, JCM-5, JCW-3, JCW-4, JCW-5

Secondary Terminals - The secondary terminals are fixed brass studs with 1/4 inch-28 threads, located on the top of the transformer. Each terminal is supplied with cup washer, lock washer, and nuts.

A fiber piece between the two terminals serves as a mounting block for the short-circuiting device, and as a base for the terminal cover. It also supports the brass sealing stud. The short-

circuiting device is manually operated to give a positive action. The entire secondary terminal structure is designed so that it can be easily removed and reassembled in a reverse position.

Each pair of secondary terminals on the dual-ratio transformers is equipped with a separate cover. The covers are detented to provide ease and accuracy in making secondary wiring connections.

4.17 Models: JCL-0, JCM-2

Secondary Terminals - The secondary terminals are fixed brass studs with 1/4-28 threads, located on the top of the transformer. Each terminal is supplied with cup washer, lock washer, and nuts.

A fiber piece between the two terminals serves as a mounting block for the short-circuiting device, and as a base for the terminal cover. It also supports the brass sealing stud.

4.18 Models: JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

Secondary Terminals - The secondary terminals are located on the insulated surface adjacent to the baseplate. These terminals are clamp-type in fixed, round bronze posts, with excellent durability and corrosion resistance. They have a 0.275-inch diameter cross hole to accommodate large or multiple secondary wires. The secondary terminals are molded in the insulation and held in place internally by a terminal block that prevents their rotation.

4.19 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

Secondary Terminals - The secondary terminals are of the screw-type construction (1/4-20 UNC) with binding heads for making connection to spade-type or bare conductors. Each end of the secondary winding is brazed to a threaded sleeve which projects through the resin to provide a solid brass surface to which a spade-type connection can be made. The secondary terminals are enclosed in a conduit box, secured to the base of the transformer with four 1/4-20 screws.

4.20 Models: JCK-3, JCK-4, JCK-5, JKW-7

Secondary Terminals - The secondary terminals are clamp-type, with a 0.275-inch diameter hole, simplifying the connection of large or multiple secondary wires. The terminals are located on the front of the transformer on the flat butyl surface adjacent to the baseplate. The terminals are made of bronze for excellent durability and corrosion resistance.



An internal secondary terminal block secures the secondary terminals, as well as a stud in between the two terminals, which is used as a short-circuit device pivot.

The short-circuit device is simple, easy to operate, and is made of sturdy bronze parts to give the highest reliability. It features a large contact area, with the short-circuit device and a slot in the terminal having parallel faces to make and extremely good electrical contact. The contact with the terminal is direct, thus eliminating additional joints or connections.

4.21 Models: JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JVW-3

Secondary Terminals - The secondary terminals are in a compartment molded in the side of the transformer. The compartment has a molded phenolic cover held by four brass, nickel-plated, captive thumbscrews, which engage a metal insert molded in the rubber. The thumbscrews are drilled to accommodate a seal wire. The compartment also has two openings for 1 inch conduit connection.

The secondary terminals are the threaded type, each with cup washer, lock washer and nut. A manually operated, secondary short-circuiting switch is located between the secondary terminal studs.

4.22 Models: JKW-150, JKW-200, JKW-250, JKW-350

Secondary Terminals - The secondary terminals are enclosed in a box secured to the base of the transformer with four, ¼-20 screws. Both the box and terminal block can be relocated to any of three sides of the base to fit the particular installation. The terminal box has 1½ inch threaded conduit openings at each end, and a 1½ inch knockout at the bottom. It is also provided with a grounding terminal for the secondary circuit, when required.

4.23 Models: JCK-3, JCK-4, JCK-5, JKW-6, JKW-6A, JKW-7, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

Ground Terminal - A ground terminal is provided in the secondary compartment for making an optional connection to one of the secondary terminals. The ¼-20 round-head ground terminal is welded in the baseplate bracket, and is furnished with a nut, cup washer, flat washer, and lock washer.

4.24 Models: JKW-3, JKW-4, JKW-5, JKW-5A, JVW-3

Ground Terminal - A ground terminal is provided in the secondary compartment for making an optional connection to one of the secondary terminals. The ¼-28 round-head ground terminal is welded in the baseplate bracket, and is furnished with a nut, cup washer, flat washer, and lock washer.

4.25 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

Ground Pad - The clamp-type ground connector is for use with No. 2 solid to 500 MCM copper or aluminum grounding cable.

5. Baseplate and Mounting

5.1 Models: JVM-2, JVP-1

The base is made of heavy stainless-steel plate and is provided with holes and slots adapting it for mounting by either bolts or pipe clamps.

5.2 Models: JKW-150, JKW-200, JKW-250, JKW-350, JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

SUPER-BUTE 60 voltage transformers and current transformers can be mounted in any position from upright to inverted, providing the centerline of current transformers through the primary terminals is parallel with the ground surface.

Loading by lines or busswork on either VT's or CT's should be kept to a maximum to avoid placing appreciable strain upon the transformer bushings and terminals. For CT's, the maximum recommended loading from all sources should not be greater than the equivalent of a 200-pound external force applied at the axis of the primary terminals.

5.3 Models: JCK-3, JCK-4, JCK-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JKW-7, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

The base is made of stainless-steel. A stainless-steel grounding lug is welded to the baseplate and provides a hole for attaching the grounding connector.

Mounting holes or slots are located in each corner of the baseplate. Mounting hardware is supplied with the transformer.



The transformer can be mounted with the primary terminals in any position—up, down, or horizontal. It can be bolted directly to a crossarm attached by “U” bolts or suspension hooks, or mounted on double crossarms, using channel brackets. Refer to the Accessories Listing on the transformer data sheet for Catalog Numbers.

5.4 Models: All Not Specifically Referenced Otherwise

Versatile mounting is a feature of these transformers. The transformers are furnished with mounting feet assembled to the bottom edge. These mounting feet may be reassembled in 90 degree steps around the edge as needed. The transformers may also be supported on the primary bar, and the bodies of the transformers may be rotated and locked in two positions separated 90 degrees to insure easy access to the secondary terminals.

5.5 Models: JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JVM-3

The base is made of heavy steel plate and is provided with holes and slots adapting it for mounting by either bolts or pipe clamps.

5.6 Models: JVM-4, JVM-4A, JVM-5, JVM-5A

The base is made of heavy steel plate and is provided with holes and slots adapting it for mounting by either bolts or pipe clamps. All exposed metallic surfaces are protected with two coats of baked enamel.

5.7 Models: JCR-0, JCW-0

This transformer can be mounted in any position. When used indoors, it can be mounted on any flat surface or suspended on the primary bus or cable. It is especially suitable for use in small boxes, and transformers can be mounted close together because the nameplate and secondary terminals are on top.

When used outdoors, it can be installed either with our without any base. It can be mounted on a pole without the use of crossarms or enclosing boxes.

The transformer has four mounting holes arranged on a 1½ inch square so that the transformer can be attached to corresponding holes in transformer mounting brackets. Three optional bases are available for mounting the transformers. The mounting dimensions of the transformers conform to ANSI C12.11.

The low base is made of stainless steel. The high base is made of formed mild steel. Both are removable and are held in place by four stainless

steel screws. Removing the screws permits the transformer to be rotated with respect to the base in 90° increments. The high base increases the transformer height by 1¹³/₁₆ inches.

An extra wide base of stainless steel is available to match the mounting dimensions of the intermediate size JAK-0 current transformer.

5.8 Models: JCM-0, JCT-0

The transformer can be mounted in any position. It can be mounted on any flat surface or suspended by the primary bar from the bus or cable. It is especially suitable for use in small boxes. Transformers can be mounted close together because the terminals are on top.

Two base constructions are available for the transformer. Both bases are made from heavy steel, finished with a coat of black paint. The bases are removable and are held in place by four No. 8-32 machine screws.

The low base is furnished with a 7/₁₆ inch wide mounting slot in each corner of the base.

The high base increases the transformer height by 2 inches, and meets the required dimensions of Specification ANSI C12.11. A large mounting slot is furnished in each corner of the high base.

5.9 Models: JKW-150, JKW-200, JKW-250, JKW-350

A fabricated metal base is the supporting structure for the transformer. It is provided with four 1³/₁₆ inch mounting holes and two lifting eye-bolts. Adjacent to the nameplate is a standard two-bolt ground connector.

5.10 Models: JCL-0, JCM-2, JCM-3, JCM-4, JCM-5

The transformer is furnished with mounting feet assembled to the bottom edge. These mounting feet may be reassembled in 90-degree steps around the edge as needed. The transformers may also be supported on the primary bar, and the bodies of the transformers may be rotated and locked in two positions separated by 90 degrees to insure easy access to the secondary terminals.

5.11 Models: JCB-3, JCB-4, JCB-5, JCD-3, JCD-4, JCD-5

The transformer is furnished with stainless steel mounting feet assembled to the bottom edge. These mounting feet may be reassembled in 90-degree steps around the edge as needed. The transformer may be mounted in any position.



5.12 Models: JAF-0, JCS-0

The base plate is made of heavy steel plate. It is attached by two bolts to the body of the transformer.

The transformer may be easily mounted on any flat surface by means of the open-end slots on each of the four corners of the base plate. If the base plate is not used, mounting is by means of two 3/8 inch-16 tapped holes in the transformer's bottom surface.

5.13 Models: JCW-3, JCW-4, JCW-5

The transformer is furnished with stainless steel mounting feet assembled to the bottom edge. These mounting feet may be reassembled in 90-degree steps around the edge as needed. The transformers may also be supported on the primary bar, and the bodies of the transformers may be rotated and locked in two positions separated by 90 degrees to insure easy access to the secondary terminals.

5.14 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

The base assembly for the 25 kV and 34.5 kV models is made of fabricated steel, and is copper-plated. In the higher voltages, the assembly is cast aluminum. All exposed metallic surfaces are protected with two coats of baked enamel. The base framework supports the core and windings, and contains a grounding pad and provision for mounting the detachable secondary terminal box.

5.15 Model: JCK-3, JCK-4, JKW-3, JKW-4, JVW-3, JVW-4, JVW-5, JVW-110

The transformer can be mounted with the primary terminals in any position – up, down, or horizontal. It can be bolted directly to a cross-arm, attached by “U” bolts or suspension hooks, or mounted on double crossarms using channel brackets. Please refer to the Accessories Listing for Catalog Numbers, and to the Applications Information Section of this volume.

5.16 Model: JCB-0, JCB-0C

Stainless steel mounting brackets are available for mounting. Refer to the Accessories Listing on the transformer data sheet for Catalog Numbers. The bracket for the 50:5 ratio transformer is 6" wide to match the 50:5 ratio transformer. The bracket for all other ratios is 3" wide to match the other transformers.

6. Nameplates

6.1 Models: JCD-3, JCD-4, JCD-5, JCW-3, JCW-4, JCW-5, JKW-3, JKW-4, JKW-5, JKW-5A, JKW-6, JKW-6A, JVA-0, JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

The nameplate is made of stainless-steel. It carries all the information prescribed by the ANSI Standards in easy-to-read form. The information contained on the plate is either etched or stamped into the metal to provide a permanent record that is not easily obliterated. Provision and space are provided on the nameplate for attaching the user's identifying tag.

6.2 Models: JCK-3, JCK-4, JCK-5, JKW-7, JKW-150, JKW-200, JKW-250, JKW-350, JVW-6, JVW-7, JVW-150

The nameplate is made of stainless-steel and located on the base of the transformer. It contains all the information designated by the ANSI Standards in easy-to-read form.

6.3 Models: JAB-0, JAM-0, JAR-0, JCB-3, JCB-4, JCB-5, JCL-0, JCM-0, JCM-2, JCM-3, JCM-4, JCM-5, JCT-0, JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5

The nameplate is of lithographed aluminum. It is mounted on the top of the transformer. Provision is made for attaching the user's identifying tag.

6.4 Models: JAD-0, JAK-0, JCD-0, JCP-0, JCR-0, JCW-0, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-110

The nameplate is made of etched corrosive-free aluminum alloy. Provision is made for attaching the customer's identifying tag. This material meets all the environmental requirements for outdoor use.

6.5 Models: JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A

The nameplate is of lithographed aluminum. It is mounted on the base of the transformer. Provision is made for attaching the user's identifying tag.

6.6 Models: JAF-0, JAG-0, JAG-0C, JAS-0, JCB-0, JCB-0C, JCS-0,

The nameplate is molded in the top surface of the transformer, and is a permanent, integral part of the transformer.



General Product Information

6.7 Models: JAH-0, JCH-0, JCH-0C

The nameplate is molded in a recessed section on the face of the transformer, and is a permanent, integral part of the transformer.

6.8 Models: JKM-95, JVM-95

The nameplate is made of anodized aluminum. It is located just above the secondary terminal compartment and carries all the information prescribed by the ANSI standards in easy-to-read form. Provision is made for attaching a customer's number tag.

6.9 Models: JVP-1, JVM-2

An aluminum nameplate with slotted tabs for attaching user's serial number is located on the front of the transformer. The nameplate has the ratio printed on it in large numerals.

6.10 Models: JE-27

The nameplate is mounted on the top of the transformer.

7. Polarity

7.1 Models: JAB-0, JAD-0, JAH-0, JAI-0, JAK-0, JAM-0, JAR-0, JAU-0, JCD-0, JCH-0, JCH-0C, JCK-3, JCK-4, JCK-5, JCM-0, JCR-0, JCT-0, JCW-0, JKW-6, JKW-6A, JKW-7, JKW-150, JKW-200, JKW-250, JKW-350, JVA-0, JVM-2, JVM-6, JVP-1, JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350, JVW-6, JVW-7, JVW-150

The permanently molded primary polarity markings H_1 and H_2 and the secondary polarity markings X_1 and X_2 are situated adjacent to their respective terminals. The polarity terminal is designated by use of the subscript 1, and the mark is painted white for better visibility.

7.2 Models: JCB-3, JCB-4, JCB-5, JCD-3, JCD-4, JCD-5, JCL-0, JCM-2, JCM-3, JCM-4, JCM-5, JCW-3, JCW-4, JCW-5, JKC-3, JKM-0, JKM-2, JKM-3, JKM-4, JKM-5, JKM-5A, JKS-3, JKS-5, JKW-3, JKW-4, JKW-5, JKW-5A, JVM-3, JVM-4, JVM-4A, JVM-5, JVM-5A, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-110

The primary and secondary polarity markers are molded in the insulation. They are thus permanent and integral parts of the transformer and cannot readily be obliterated. The polarity is subtractive.

7.3 Models: JAF-0, JAG-0, JAG-0C, JAS-0, JCB-0, JCB-0C, JCG-0, JCP-0, JCS-0

The primary and secondary polarity markers are molded in the casing. They are permanent, integral parts of the transformer, and cannot be obliterated.

7.4 Models: JKM-95, JVM-95

Primary and secondary terminals are marked H_1 , H_2 , and X_1 , X_2 , respectively. These markings are permanently molded into the butyl rubber in recessed letters, directly adjacent to the terminal location. The H_1 and X_1 markings are filled with weather-resistant white paint. The polarity is subtractive.

8. Bushings

8.1 Models: JKW-150, JKW-200, JKW-250, JKW-350, JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

Since the bushings are an integral part of the transformer, standards normally pertaining to porcelain bushing tests do not apply. However, characteristics equal to, or better than, those required for porcelain are provided.

9. Tests

9.1 Models: JKW-150, JKW-200, JKW-250, JKW-350

Each transformer is tested in accordance with the ANSI Standards. Refer to the section entitled Tests on Molded and Other Dry-Type Instrument Transformers, page 39, for specific information.

10. Maintenance *(also see pages 24 through 27)*

10.1 Models: All not Specifically Referenced Otherwise

These transformers require no maintenance other than an occasional cleaning if installed in an area where air contamination is severe.

11. Maximum Lead Length for Metering Accuracy

11.1 Models: JAK-0, JCK-3, JCK-4, JCK-5, JCR-0, JKW-6, JKW-6A, JKW-7

Maximum distance in feet between CT and meter to meet 0.3 ANSI accuracy classification, for the more common metering applications using one or two General Electric meters and where the line power factor is 0.8 or higher.



Maximum Secondary Lead Length	
AWG Copper Wire Size	Maximum Distance (Feet)
14	19
12	31
10	49
8	79
6	126

Table 11.1-1 corresponds to all CT's rated 0.3 B-0.2.

11.2 Models: JAK-0, JKW-7

Maximum Secondary Lead Length	
0.3 ANSI Accuracy Classification; ≥0.8 PF	
AWG Copper Wire Size	Maximum Distance (Feet)
14	75
12	120
10	190
8	305
6	485

Table 11.1-2 corresponds to all CT's rated 0.3 B-0.5.

11.3 Models: JCK-3, JCK-4, JCK-5, JKW-6, JKW-6A

Maximum Secondary Lead Length	
0.3 ANSI Accuracy Classification; ≥0.8 PF	
AWG Copper Wire Size	Maximum Distance (Feet)
14	330
12	500
10	800
8	1,200
6	1,900

Table 11.1-3 corresponds to CT's rated 0.3 B-2.0.

12. Secondary Conduit Box

12.1 Models: JKW-5, JKW-5A, JKW-6, JKW-6A, JKW-7, JVW-3, JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

A detachable secondary conduit box, Catalog Number 9689897001, is provided with the transformer. This die-cast aluminum conduit box is furnished attached to the transformer. Its use permits easy changeout of transformers without dismantling rigid conduit structures.

The box is provided with two 1 inch threaded conduit hubs on the sides and a 1 inch conduit knockout in the bottom. Each box is furnished

complete with aluminum cover, gasket, four sealable cover screws, seal wire, four mounting screws with lock washers, and plastic pipe plugs.

12.2 Models: JCD-3, JCD-4, JCD-5, JCW-3, JCW-4, JCW-5

The secondary conduit box is made from black anodized aluminum. Two 1 inch conduit hubs are provided. The aluminum cover is gasketed and secured to the conduit box with four sealable thumb screws. The conduit box is attached to the body of the transformer with four screws, and its position may be rotated in 90-degree steps for wiring convenience.

12.3 Models: JVS-150, JVS-200, JVS-250, JVS-350, JVT-150, JVT-200, JVT-250, JVT-350

The terminal box has 1½ inch threaded conduit openings at each end, and a 1½ inch knockout at the bottom. It is also provided with a secondary-circuit grounding terminal.

12.4 Models: JAD-0, JCD-0

A secondary conduit box is available for both single-ratio and dual-ratio transformers. The box is not furnished assembled to the transformer. It is designed to be easily assembled on the transformer in place of the secondary terminal block. Two boxes are required for dual-ratio transformers. The conduit box, including cover, is made of aluminum with a black painted finish. It is furnished with the necessary gasket, four wing screws and two pipe plugs. To accommodate the conduit box, transformers having provisions for conduit box must be specified on the order.

13. Rating Identification

13.1 Models: JVW-4, JVW-4A, JVW-5, JVW-5A, JVW-6, JVW-7, JVW-110, JVW-150

The high-voltage rating is identified by large orange digits located on the insulation surface near the top of the transformer. This provides permanent identification that is clearly visible from a distance, and is resistant to fading and abrasion.

13.2 Models: JCK-3, JCK-4, JCK-5, JKW-5, JKW-6, JKW-6A, JKW-7

The primary current rating is identified by large orange digits located on two sides of the transformer. This provides permanent identification that is clearly visible from a distance, and is resistant to fading and abrasion.



INTRODUCTION

These instructions apply to indoor and outdoor instrument transformers of molded and other dry-type constructions. For information on the installation and care of transformers with unusual ratings of frequency, voltage or current, or on installations where unusual conditions exist (refer to Requirements for Instrument Transformers, IEEE Standard C57.13-1993, Section 4), consult the nearest sales office of the General Electric Company. When special information is requested, give the complete nameplate data to identify the transformer.

BEFORE INSTALLATION

INSPECTION

Before installation, transformers should be inspected for physical damage that may have occurred during shipment or handling. During shipping, transformers usually are supported only by the base or mounting supports, except that certain molded types may be shipped from the factory supported by insulation surfaces. Transformers should be dry and the surface of the bushings should be clean. All insulation surfaces should be considered the same as the surface of a porcelain bushing in regard to cleanliness and dryness.

DRYING OUT

Molded transformers, particularly designs for outdoor use, are relatively impervious to moisture. If, due to unusual circumstances, insulation tests indicate the possibility of the entrance of moisture into a molded transformer, refer to the nearest GE Sales Office for detailed information on proper procedure.

Wet asphalt-impregnated or varnish-impregnated transformers may be dried by self-heating. Refer to the nearest GE Sales Office for detailed information on proper procedure.

TESTING

General

Tests should be made in accordance with C57.13-1993, Section 8, NOT Section 4.5 (table 2). Note that 8.8.2 states, in part: "It is recommended that field tests of insulation should not be in excess of 75 percent of the factory test voltage; that for old apparatus rebuilt in the field, tests should not be in excess of 75 percent of the factory test voltage; and that periodic insulation tests in the field should not be in excess of 65 percent of the factory test voltage. Tests made by the user for design approval may be made at 100 percent. These recommendations relate to dielectric tests applied between windings and ground and to induced voltage tests."

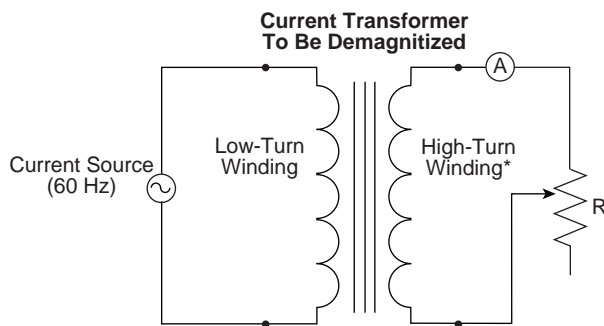
All other test methods are described in ANSI C57.13 and the Handbook for Electricity Metering.

Demagnetizing

Current transformer cores may become magnetized as a result of the application of direct current to a winding (for example, while measuring winding resistance or checking continuity) or in other ways. If a current transformer becomes magnetized, it should be demagnetized before being used for precision work. Current transformers should always be demagnetized before accuracy test.

One method of demagnetizing is shown in Figure 1. Connect the transformer in the test circuit as shown, with a low resistance across the high-turn winding. Pass rated current through the low-turn winding (usually $H_1 - H_2$). Increase the resistance (R) in the high-turn winding (usually $X_1 - X_2$) circuit until the transformer core is saturated; then, slowly reduce resistance to zero and disconnect the current source. Saturation of the core is indicated by a reduction of current in the high-turn winding circuit.

WARNING: A CONTINUOUSLY VARIABLE RESISTANCE MUST BE USED TO AVOID OPENING THE HIGH-TURN WINDING CIRCUIT WHEN RESISTANCE VALUES ARE CHANGED. AS THE RESISTANCE IS INCREASED, THE VOLTAGE ACROSS THE RESISTANCE WILL APPROACH OPEN-CIRCUIT VALUE.



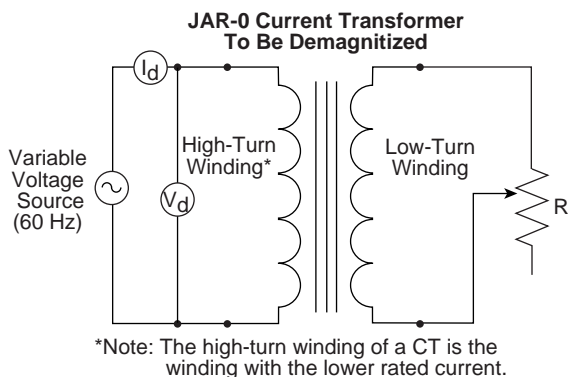
*Note: The high-turn winding of a CT is the winding with the lower rated current.

Figure 1. Circuit for Demagnetizing Current Transformers

Demagnetizing JAR-0 Auxiliary Transformers

Due to the wide range of current ratios available in the Type JAR-0 current transformer, the following method is necessary to prevent voltages which are damaging to the transformer. See Figure 2.





I_d = ammeter for reading demagnetizing current
 V_d = voltmeter for reading demagnetizing voltage

I_d reading must not exceed:

$$\frac{\text{Rated current of the winding energized}}{50}$$

V_d reading must not exceed:

$$\frac{160}{\text{Rated current of the winding energized}}$$

Figure 2. Circuit for Demagnetizing JAR-0 Current Transformers

For example, for demagnetizing by energizing any 5-Ampere JAR-0 winding, do not exceed 32 volts and 0.1 ampere. The core will be adequately demagnetized when either the voltage or the current is increased to over 80 percent of the maximum value shown in the applicable formula (see above), and then gradually reduced to zero.

WARNING: ONE OR MORE WINDINGS ARE OPEN-CIRCUITED DURING THIS OPERATION. THESE WINDINGS MAY DEVELOP VOLTAGES WHICH ARE HAZARDOUS TO PERSONNEL. OBSERVE SAFETY PRECAUTIONS.

Insulated-neutral and Grounded-neutral Terminal-type Voltage Transformers

Certain voltage transformers are designed with one fully insulated primary terminal, with the neutral end of the primary winding insulated for a lower level or connected to the case, frame, or base. In some designs, this connection to the case, etc., can be removed for primary-applied potential testing. In such General Electric designs, the customer should consider the required factory primary-applied potential test level to be 19 kV on outdoor types and 10 kV on indoor types. These levels correspond to C57.13-1978 requirements for insulated-neutral terminal types.

INSTALLATION

SAFETY PRECAUTIONS

1. Always consider an instrument transformer as part of the circuit to which it is connected, and do not touch the leads and terminals or other parts of the transformer unless they are known to be adequately grounded.

2. The insulation surface of molded transformers should be considered the same as the surface of a porcelain bushing, since a voltage stress exists across the entire insulation surface from terminals to grounded metal parts.

3. Always ground the metallic cases, frames, bases, etc., of instrument transformers. The secondaries should be grounded close to the transformers. However, when secondaries of transformers are interconnected, there should be only one grounded point in this circuit to prevent accidental paralleling with system grounding wires.

4. Do not open the secondary circuit of a current transformer while the transformer is energized and do not energize while the secondary circuit is open. Current transformers may develop open-circuit secondary voltages which may be hazardous to personnel or damaging to the transformer or equipment connected in the secondary circuit.

5. The applications of power fuses in the primary circuits of voltage transformers is recognized and recommended operating practice on power systems. To provide the maximum protection practical against damage to other equipment or injury to personnel in the event of a voltage transformer failure, it is usually necessary to use the smallest fuse ampere rating which will not result in nuisance blowing. Increasing the fuse ampere rating to reduce nuisance blowing is usually accompanied by slower clearing and increased possibility of damage to other equipment or injury to personnel.

6. Never short-circuit the secondary terminals of a voltage transformer. A secondary short circuit will cause the unit to overheat and fail in a very short period of time.

MOUNTING

Instrument transformers should be mounted so that connections can be made to the power or distribution lines in such a manner as to avoid placing appreciable strains upon the terminals of the transformers.

For high-current transformer ratings, 2000 amperes and above, there may be some interference from the electric field of the return bus unless the bus centers are kept at a minimum distance of 15 inches apart; for ratings above 5000 amperes, this distance should be not less



than 24 inches. If this type transformer is used with more than one primary turn, the loop should be at least 24 inches in diameter. Make sure that the secondary leads are twisted closely together and carried out without passing through the field of the primary conductors. It is not necessary that the bus exactly fill the window, but the bus or buses should be centralized. For ratings of 1000 amperes or less, these precautions are generally unnecessary.

CONNECTIONS

SECONDARY CONNECTIONS

The resistance of all primary and secondary connections should be kept as low as possible to prevent overheating at the terminals, and to prevent an increase in the secondary burden.

The resistance of the secondary leads should be included in calculating the secondary burden carried by current transformers. The total burden should be kept within limits suited to the transformers used. The voltage drop in the primary and secondary leads of voltage transformers will reduce the voltage at the measuring device.

Short-Circuiting of Current Transformers

Many current transformers are provided with a device for short-circuiting the secondary terminals, and are normally shipped from the factory with this device in the short-circuiting position. Check the position of the shorting device. The secondary terminals should be short-circuited by the shorting device, or equivalent, until a suitable burden (such as an ammeter, wattmeter, watt-hour meter, relay, etc.) has been connected to the secondary terminals.

Tapped-secondary current transformers, including multi-ratio current transformers with more than one secondary tap, are adequately short-circuited when the short is across at least 50 percent of the secondary turns. When a suitable secondary burden has been connected

to two terminals of a tapped-secondary current transformer, and normal operation is desired, all unused terminals must be left open to avoid short-circuiting a portion of the secondary winding and producing large errors. Only one ratio can be used at a time.

On double-secondary or multiple-secondary current transformers, that is, transformers with two or more separate secondary windings (each having an independent core), all secondary windings not connected to a suitable burden must be shorted.

Before a burden is disconnected from a current transformer, the secondary terminals should be short-circuited.

POLARITY

When wiring instrument transformer circuits, it is necessary to maintain the correct polarity relationship between the line and the devices connected to the secondaries. For this reason, the relative instantaneous polarity of each winding of a transformer is indicated by a marker H_1 (or a white spot) on or near one primary terminal, and a marker X_1 (or a white spot) near one secondary terminal. Refer to Figure 3.

Where taps are present, all terminals are marked in order. The primary terminals are H_1, H_2, H_3 , etc.; the secondary terminals X_1, X_2, X_3 , etc. (and Y_1, Y_2, Y_3 , etc., if another secondary is used). The marker H_1 always indicates the same instantaneous polarity as X_1 and Y_1 .

When connection is made to secondary terminal having a polarity marking similar to a given primary terminal, the polarity will be the same as if the primary service conductor itself were detached from the transformer and connected directly to the secondary conductor. In other words, at the instant when the current is flowing toward the transformer in a primary lead of a certain polarity, current will flow away from the transformer in the secondary lead of similar polarity during most of each half cycle.

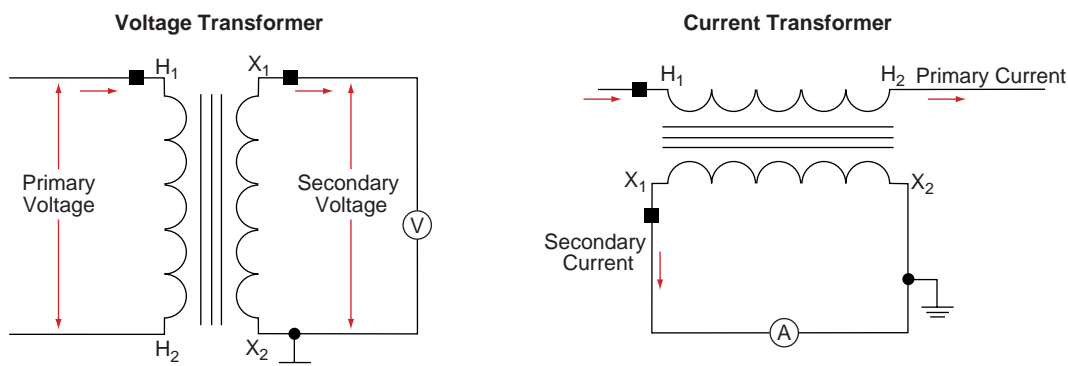


Figure 3. Elementary Connections of Instrument Transformers



Data subject to change without notice.

When connecting instrument transformers with meters or instruments, refer to the instructions furnished with the meters or instruments involved.

When the secondary of an instrument transformer is connected to an instrument (such as a voltmeter or ammeter) which measures only the magnitude of the primary voltage or current, polarity is not significant.

PRIMARY FUSES FOR VT'S

The function of voltage transformer primary fuses is to protect the power system by de-energizing failed voltage transformers. (Although the function of the fuses is not to protect the voltage transformer, the fuses selected will often protect the voltage transformer promptly in the event of a short in the external secondary circuitry, if the short is electrically close to the secondary terminals.)

To provide the maximum protection practical against damage to other equipment or injury to personnel in event of a voltage transformer failure, it is usually necessary to use the smallest fuse current rating which will not result in nuisance blowing. Fuses are rarely available which will fully protect voltage transformer from overloads, or immediately clear the system of a failed voltage transformer. Increasing the fuse ampere rating to reduce nuisance blowing is usually accompanied by slower clearing and increased possibility of other damage.

The use of a fuse in the connection of a voltage transformer terminal to ground is not recommended. For grounded wye connections, it is preferred practice to connect one primary lead from each voltage transformer directly to the grounded neutral, using a fuse only in the line side of the primary. With this connection, a transformer can never be "alive" from the line side with a blown fuse on the grounded side.

The fuses on certain molded transformers for system voltages of 2400 volts or less are provided with molded fuse holders. The fuses and holders are secured to the transformer by the spring action of the fuse clips. When replacing the fuse and holder, be sure that the plastic insulating piece, which is fastened under the transformer fuse clip, is inserted between the end of the fuse and the open end of the fuse holder. Then press the holder firmly onto the transformer to seat the fuse in both clips.

WARNING: THE HOLDERS SHOULD NOT BE USED TO CONNECT OR DISCONNECT FUSES WHILE THE PRIMARY CIRCUIT IS ENERGIZED.

The fuses of some older dry-type transformers for system voltages of 2400 volts or less, are supported by a hinged

ceramic cover. If it is necessary to replace a fuse while the transformer is connected to an operating circuit, the cover should be opened by use of an insulating hook of sufficient length to prevent the operator from being injured in case an abnormality exists in the transformer or the connected circuits.

In testing fuses for continuity of circuit, not more than 0.25 ampere should be used.

APPLICATION OF GE TYPE EJ FUSES

System maximum operating line-to-line voltage should be in the range 70 to 100 percent of the rated voltage of the fuse. This range of application voltage is recommended because the current-limiting action of the fuse is characterized by the generation of transient recovery voltages above normal circuit voltages values. The magnitude of these over-voltages increases nonlinearly as available short-circuit current increases. The maximum voltage permitted at rated interrupting current is specified in ANSI C37.46-1998.

Therefore, it is important that the voltage rating of high-voltage fuses be coordinated with the voltage levels of the associated system equipment to avoid inducing destructive voltages during fuse operation.

One permissible exception to the general rules above is the use of the 2400-volt, Size A, Type EJ-1 fuse, on 2400/4160-volt solidly grounded wye systems.

In selecting primary-fuse ampere ratings for use with voltage transformers, the objective is to use the smallest ampere rating that will not result in nuisance blowing during normal energization of the voltage transformer. When delayed clearing of a failed voltage transformer may result in damage to other equipment or injury to personnel, "Class II" connection (where a fuse must pass the magnetizing inrush current of two transformers) should be avoided if this connection requires a higher fuse ampere rating than the "Class I" connection (where a fuse passes the inrush current of one transformer).

MAINTENANCE

After instrument transformers for indoor use have been installed, they should need no care other than keeping them clean and dry. Transformers for outdoor installations should receive the same care in operation as power transformers of similar design and of similar voltage rating.

CLEANING

Molded transformers may be cleaned by scrubbing the insulation surface with detergent and a stiff brush to remove accumulated dirt or oil film. Remove the detergent by washing with clean water. Then, apply a light grade of silicone oil to the surface if restoration of original surface appearance is desired.



Terminology

Extracts from American National Standards Institute (ANSI) for Instrument Transformers, IEEE C57.13–1993

All definitions, except as specifically covered in this standard, shall be in accordance with IEEE Standard 100-1992, Dictionary of Electrical and Electronics Terms.

Bar-type current transformer

One that has a fixed, insulated straight conductor in the form of a bar, rod, or tube that is a single primary turn passing through the magnetic circuit and that is assembled to the secondary core and winding.

Burden of an instrument transformer

That property of the circuit connected to the secondary winding that determines the active and reactive power at the secondary terminals. The burden is expressed either as total ohms impedance with the effective resistance and reactance components, or as the total volt-amperes and power factor at the specified value of current or voltage, and frequency.

Bushing-type current transformer

One that has an annular core and a secondary winding insulated from, and permanently assembled on the core but has no primary winding or insulation for a primary winding. This type of current transformer is for use with a fully insulated conductor as the primary winding. A bushing-type current transformer usually is used in equipment where the primary conductor is a component part of other apparatus.

Continuous-thermal-current rating factor (RF)

The number by which the rated primary current of a current transformer can be multiplied to obtain the maximum primary current that can be carried continuously without exceeding the limiting temperature rise from 30°C ambient air temperature. The RF of tapped-secondary or multi-ratio transformers applies to the highest ratio, unless otherwise stated. (When current transformers are incorporated internally as parts of larger transformers or power circuit breakers, they shall meet allowable average winding and hot spot temperatures under the specific conditions and requirements of the large apparatus).

Current transformer (CT)

An instrument transformer intended to have its primary winding connected in series with the conductor carrying the current to be measured or controlled. (In window type current transformers, the primary winding is provided by the line conductor and is not an integral part of the transformer.)

Double-secondary current transformer

One that has two secondary windings each on a separate magnetic circuit with both magnetic circuits excited by the same primary winding.

Double-secondary voltage transformer

One that has two secondary windings on the same magnetic circuit with the secondary windings insulated from each other and the primary.

Excitation losses for an instrument transformer

The power (usually expressed in watts) required to supply the energy necessary to excite the transformer, which include the dielectric watts, the core watts, and the watts in the excited winding due to this excitation current.

Fused-type voltage transformer

One that is provided with means for mounting one or more fuses as integral parts of the transformer in series with the primary winding.

Grounded-neutral terminal type voltage transformer

A voltage transformer that has the neutral end of the high-voltage winding connected to the case or mounting base in a manner not intended to facilitate disconnection.

Instrument transformer

One that is intended to reproduce in its secondary circuit, in a definite and known proportion, the current or voltage of its primary circuit with the phase relations substantially preserved.

Insulated-neutral terminal type voltage transformer

One that has the neutral end of the high-voltage winding insulated from the case or base and connected to a terminal that provides insulation for a lower voltage than required for the line terminal. (The neutral may be connected to the case or mounting base in a manner intended to facilitate temporary disconnection for dielectric testing.)

Marked ratio

The ratio of the rated primary value to the rated secondary value as stated on the nameplate.

Multiple-secondary current transformer

One that has three or more secondary coils each on a separate magnetic circuit with all magnetic circuits excited by the same primary winding.

Percent ratio

The true ratio expressed in percent of the marked ratio.



Percent ratio correction of an instrument transformer

The difference between the ratio correction factor and unity expressed in percent.

NOTE: The percent ratio correction is positive if the ratio correction factor is greater than unity. If the percent ratio correction is positive, the measured secondary current or voltage will be less than the primary value divided by the marked ratio.

Phase angle correction factor (PACF)

The ratio of the true power factor to the measured power factor. It is a function of both the phase angles of the instrument transformer and the power factor of the primary circuit being measured.

NOTE: The phase angle correction factor is the factor that corrects for the phase displacement of the secondary current or voltage, or both, due to the instrument transformer phase angles.

The measured watts or watthours in the secondary circuits of instrument transformers must be multiplied by the phase angle correction factor and the true ratio to obtain the true primary watts or watthours.

Phase angle of an instrument transformer (PA)

The phase displacement, in minutes, between the primary and secondary values.

The phase angle of a current transformer is designated by the Greek letter beta (β) and is positive when the current leaving the identified secondary terminal leads the current entering the identified primary terminal.

The phase angle of a voltage transformer is designated by the Greek letter gamma (γ) and is positive when the secondary voltage from the identified to the unidentified terminals leads the corresponding primary voltage.

Polarity

The relative instantaneous directions of the currents entering the primary terminals and leaving the secondary terminals during most of each half cycle.

NOTE: Primary and secondary terminals are said to have the same polarity when, at a given instant during most of each half cycle, the current enters the identified, similarly marked primary lead and leaves the identified, similarly marked secondary terminal in the same direction as though the two terminals formed a continuous circuit.

Rated current

The primary current upon which the basis of performance specifications are based.

Rated secondary current

The rated current divided by the marked ratio.

Rated secondary voltage

The rated voltage divided by the marked ratio.

Rated voltage of a voltage transformer

The primary voltage upon which the performance specifications of a voltage transformer are based.

Ratio correction factor (RCF)

The ratio of the true ratio to the marked ratio. The primary current or voltage is equal to the secondary current or voltage multiplied by the marked ratio times the ratio correction factor.

Secondary winding

The winding intended for connection to the measuring, protection or control devices.

Thermal burden rating of a voltage transformer

The volt-ampere output that the transformer will supply continuously at rated secondary voltage without exceeding the specified temperature limitations.

Three-wire type current transformer

One that has two primary windings, each completely insulated for the rated insulation level of the transformer. This type of current transformer is for use on a three wire, single-phase service.

NOTE: The primary windings and secondary windings are permanently assembled on the core as an integral structure. The secondary current is proportional to the phasor sum of the primary currents.

Transformer correction factor (TCF)

The ratio of true watts or watthours to the measured watts or watthours, divided by the marked ratio.

NOTE: The transformer correction factor for a current or voltage transformer is the ratio correction factor multiplied by the phase angle correction factor for a specified primary circuit power factor.

The true primary watts or watthours are equal to the watts or watthours measured, multiplied by the transformer correction factor and the marked ratio.

The true primary watts or watthours, when measured using both current and voltage transformers, are equal to the current transformer correction factor times the voltage transformer correction factor multiplied by the product of the marked ratios of the current and voltage transformers multiplied by the observed watts or watthours.



True ratio

The ratio of the root-mean-square (rms) primary value to the rms secondary value under specified conditions.

Turns ratio of a current transformer

The ratio of the secondary winding turns to the primary winding turns.

Turns ratio of a voltage transformer

The ratio of the primary winding turns to the secondary winding turns.

Voltage transformer (VT)

An instrument transformer intended to have its primary winding connected in shunt with the voltage to be measured or controlled.

Window-type current transformer

One that has a secondary winding insulated from and permanently assembled on the core, but has no primary winding as an integral part of the structure. Complete insulation is provided for a primary winding in the window through which one turn of the line conductor can be passed to provide the primary winding.

Wound-type current transformer

One that has a primary winding consisting of one or more turns mechanically encircling the core or cores. The primary and secondary windings are insulated from each other and from the core(s) and are assembled as an integral structure.

Accuracy

In the application of voltage transformers and current transformers for the operation of metering and control devices, it is necessary that the characteristics of the transformers be given careful consideration. Different applications often require different characteristics in the transformers. For example, a straight metering application will require the highest possible accuracy at normal current conditions; that is, up to the continuous thermal rating of the transformers; a relay application may be such that the characteristics of the transformer with normal current are not important, but the characteristics at some over-current condition, such as 20 times normal current, must be considered. It is, therefore, desirable to have some convenient means of classifying instrument transformer performance in order to facilitate the selection of proper transformers for any particular application.

The use of high-grade materials and superior methods of manufacture have reduced the errors in modern-design instrument transformers to a negligible value for many conditions. However, all transformers have

some errors, and in order to classify these errors a system of instrument transformer accuracy classification has been devised.

The IEEE Standard C57.13, issued in 1993, contains a system for classifying the performance of voltage and current transformers. This IEEE accuracy classification system makes use of a set of standard secondary burdens and a set of accuracy classes. Each accuracy class has definite limits of "Ratio Correction Factor," "Transformer Correction Factor," and "Line Power Factor".

For voltage transformers a set of burdens is used covering the usual range of metering and relay applications. One set of accuracy classes is used.

For current transformers a set of burdens is used covering the usual range of metering and relay applications. Two sets of accuracy classes are used, one for metering applications covering a current range up to the continuous thermal rating and one for relay applications covering a range up to 2000 percent of rated secondary current.

IEEE Accuracy Standards for Voltage Transformers

The method of classifying voltage transformers as to accuracy is as follows:

Since the accuracy is dependent on the burden, standard burdens have been designated, and these are the burdens at which the accuracy is to be classified.

The standard burdens have been chosen to cover the range normally encountered in service and are identified by the letters W, X, M, Y, Z, and ZZ as given in Table 1.

ANSI Standard Burdens for Voltage Transformers at 60 Hz		
Burden	Volt-Amperes at 120 or 69.3 Secondary Volts	Burden Power Factor
W	12.5	0.10
X	25.0	0.70
M	35.0	0.20
Y	75.0	0.85
Z	200.0	0.85
ZZ	400.0	0.85

Table 1. ANSI Standard Burdens for Voltage Transformers at 60 Hz

It should be pointed out that the burden of any specific meter or instrument may approximate, but seldom is the same as, any one of the standard burdens. The



standard burden serves merely as a standardized reference point at which the accuracy of the transformer may be stated.

It should also be noted that each standard burden has the same VA at 120 or 69.3 secondary volts, and therefore has different impedances at the two voltages.

The accuracy classes with their limits of ratio correction factor and transformer correction factor are given in Table 2.

ANSI Accuracy Classes for Voltage Transformers		
Accuracy Class	Limits of Ratio Correction Factor and Transformer Correction Factor	Limits of Power Factor (Lagging) of Metered Power Load
1.2	1.012 - 0.988	0.6 - 1.0
0.6	1.006 - 0.994	0.6 - 1.0
0.3	1.003 - 0.997	0.6 - 1.0

① The limits given for each accuracy class apply from 10 percent above rated voltage to 10 percent below rated voltage, at rated frequency, and from no burden on the potential transformer to the specified burden, maintaining the power factor of the specified burden.

Table 2. ANSI Accuracy Classes for Voltage Transformers

The *Ratio Correction Factor* (RCF) has been defined as the factor by which the marked ratio must be multiplied in order to obtain the true ratio.

The *Transformer Correction Factor* (TCF) represents a method of setting down in one number, the combined effect of the ratio error and the phase-angle error on wattmeter or similar measurements where the change in power factor from primary to secondary circuits enters the measurement. TCF is designed as the factor by which a wattmeter reading must be multiplied to correct for the combined effect of the instrument transformer ratio correction factor and phase angle. The limits of TCF, as indicated in Table 2, have been set up by ANSI for the range of load power factor set forth in the table. If the power factor of the primary circuit is outside this range, the TCF of the transformer also may be outside the limits specified, even though the transformer is correctly listed as one which will meet a certain accuracy class.

Since published data on voltage transformer characteristics, as well as the data given on transformer calibration certificates, are usually given in the form of ratio correction factor and phase-angle error, it is necessary to have a means of interpreting these data in terms of the accuracy classification given in the table. This is done as follows:

For any known RCF of a given voltage transformer, the positive and negative limiting values of the phase-angle error (γ) in minutes may be adequately expressed as follows:

$$\gamma = 2600(\text{TCF} - \text{RCF})^*$$

*The formula above and the parallelograms of Figure 1 below derived from it are approximate only. The correct formula is:

$$\cos(53.13^\circ + \gamma) = 0.6 \frac{\text{RCF}}{\text{TCF}}$$

However, the approximate formula introduces very little error into the calculation and is entirely adequate for normal purposes.

In using this formula, TCF is taken in turn as the maximum and minimum values of transformer correction factor specified in the table, and RCF is the ratio correction factor of the voltage transformer under the conditions that are being checked.

These limits of RCF, together with the corresponding limits of phase angle, keep the TCF within the specified limits for all values of power factor (lagging) of the metered load between 0.6 and 1.0.

If the values of γ in minutes are determined by the above formula for each maximum and minimum value of RCF and these values of γ and RCF are plotted, a series of parallelograms will be obtained such as are shown in Figure 1. The characteristics of any voltage transformer, given as RCF and phase angle, can then be located on this graph, and the accuracy classification will be the smallest parallelogram within which the transformer characteristics lie.

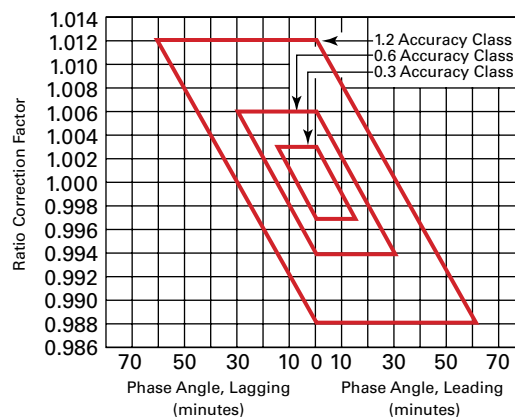


Figure 1. Parallelograms for ANSI Accuracy Classes 0.3, 0.6, and 1.2 for Voltage Transformers



Accuracy Standards Information

By means of this ANSI system, the accuracy of a voltage transformer may be described by listing the best accuracy class which it meets for each burden.

Thus, a voltage transformer may be accurate enough to be rated:

0.3 W, 0.3 X, 0.3 Y and 0.3 Z while another may be:

0.3 W, 0.3 X, 0.6 Y and 1.2 Z or still another:

0.3 W, 0.6 X and 1.2 Y.

In the last example, the omission of any reference to accuracy at the Z burden indicates that the error is greater than that specified for the poorest accuracy class at this high burden and, thus, no figure can be given.

It should be noted that the foregoing system provides a method of classifying transformers as to accuracy, but it does not give the specified error for any given transformer beyond the fact that it is within a certain range. Thus, for accurate measurements, the actual error of the transformer must be known and taken into account in the measurement. For high accuracy measurements, this information may be obtained from a calibration certificate or other calibration result on the particular transformer in question. A reasonable approximation of the accuracy may be obtained also from the characteristic accuracy curves listed in the descriptive literature for most types of voltage transformers.

ANSI Accuracy Standards for Metering Current Transformers at 60 Hz

The method of classifying current transformers as to accuracy is as follows:

Since the accuracy is dependent upon the burden, standard burdens have been designated. These are the burdens at which the accuracies are to be classified.

The standard burdens have been chosen to cover the range normally encountered in service and are designated as B0.1, B-0.2, etc. as given in Table 3.

It should be pointed out that the burden of any specific meter or instrument may approximate, but seldom is the same as, any one of the standard burdens. The standard burden serves merely as a standardized reference point at which the accuracy of the transformer may be stated.

Standard Burdens for Current Transformers with 5A Secondaries ①					
Burden Designation ②	Resistance (Ω)	Inductance (Ω)	Impedance (Ω)	Volt-Amperes (at 5A)	Power Factor
Metering Burdens					
B-0.1	0.09	0.116	0.1	2.5	0.9
B-0.2	0.18	0.232	0.2	5.0	0.9
B-0.5	0.45	0.580	0.5	12.5	0.9
B-0.9	0.81	1.040	0.9	22.5	0.9
B-1.8	1.62	2.080	1.8	45.0	0.9
Relaying Burdens					
B-1	0.5	2.3	1.0	25	0.5
B-2	1.0	4.6	2.0	50	0.5
B-4	2.0	9.2	4.0	100	0.5
B-8	4.0	18.4	8.0	200	0.5

① If a current transformer is rated at other than 5A, Ohmic burdens for specification and rating may be derived by multiplying the resistance and inductance of the table by [5/(ampere rating)], the VA at rated current and the power factor remaining the same.

② These standard burden designations have no significance at frequencies other than 60 Hz.

Table 3.
Standard Burdens for Current Transformers with 5A Secondaries.

The accuracy classes with their limits of ratio correction factor and transformer correction factor are given in Table 4.

ANSI Accuracy Classes for Metering Current Transformers					
Accuracy Class	Limits of Ratio Correction Factor and Transformer Correction Factor				Limits of Power Factor (Lagging) of Metered Power Load
	100% Rated Current ①		10% Rated Current		
	Min.	Max.	Min.	Max.	
1.2	0.988	1.012	0.976	1.024	0.6-1.0
0.6	0.944	1.006	0.988	1.012	0.6-1.0
0.3	0.997	1.003	0.944	1.006	0.6-1.0

① These limits also apply at the maximum continuous-thermal current, which is the product of rated current and the continuous-thermal-current rating factor.

Table 4.
ANSI Accuracy Classes for Metering Current Transformers.

The *Ratio Correction Factor* (RCF) has been defined as the factor by which the marked ratio must be multiplied in order to obtain the true ratio.

The *Transformer Correction Factor* (TCF) takes into account the combined effect of the ratio error and phase-angle error on watt-hour meters or similar measurement devices. It is defined as the factor by



which a wattmeter reading must be multiplied to correct for the effect of instrument transformer RCF and phase-angle. The limits of TCF, as indicated in Table 4, have been established by ANSI with the requirement that the power factor of the load being measured must be within the limits set forth in this table. If the power factor of the primary circuit is outside this range, the TCF of the transformer also may be outside the range specified, even though the transformer is correctly listed as one which will meet a certain accuracy class.

Since published data on current-transformer characteristics, as well as the data given on transformer-calibration certificates, are usually given in the form of RCF and phase-angle β , it is necessary to have a means of interpreting these data in terms of the accuracy classes given in Table 4. This is done as follows:

For any known RCF of a specific current transformer, the positive and negative limiting values of the phase-angle error (β) in minutes may be adequately expressed as follows:

$$\beta = 2600(RCF - TCF) *$$

TCF is taken in turn as the maximum and minimum values of transformer correction factor specified in the table, and RCF is the ratio correction factor of the current transformer under the conditions being checked.

*The formula above and the parallelograms of figures 2 and 3 which are derived from it are approximate only. The correct formula is:

$$\text{Cos}(53.13^\circ - \beta) = 0.6 \frac{RCF}{TCF}$$

However, the approximate formula introduces very little error into the calculation, and it is entirely adequate for normal purposes.

These limits of RCF, together with the corresponding limits of phase angle, keep the TCF within the specified limits for all values of power factor (lagging) of the metered load between 0.6 and 1.0.

If the values of β in minutes are determined by the above formula for each maximum and minimum value of RCF and these values of β and RCF are plotted, a series of parallelograms will be obtained such as are shown in Figures 2 and 3. Each accuracy class has two parallelograms, one for 100 percent rated current and one for 10 percent rated current.

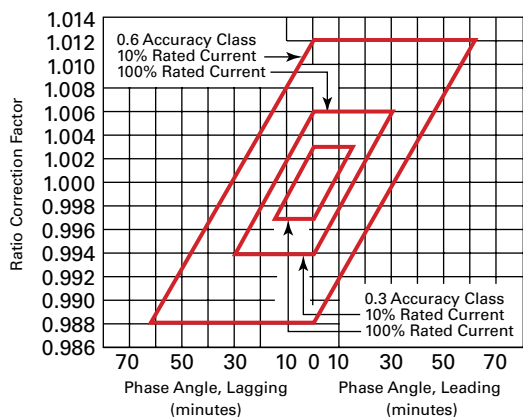


Figure 2. Parallelograms for ANSI Accuracy Classes 0.3 and 0.6 for Current Transformers for Metering Service

The characteristics of any current transformer given as RCF and phase angle can then be located on these graphs, and the accuracy classification of the current transformer will be the smallest pair of parallelograms within which the transformer characteristics lie.

By means of this ANSI system, the accuracy of a current transformer may be described by listing the best accuracy class which it meets for each burden.

Thus, a current transformer may be accurate enough to be rated:

0.3 B-0.1, 0.3 B-0.2, 0.3 B-0.5, and 0.3 B-1.8.

For another transformer the error may be such that it can only be classified as:

0.3 B-0.1, 0.3 B-0.2, 0.6 B-0.5, and 1.2 B-1.8.

or even . . .

0.6 B-0.1, 0.6 B-0.2, and 1.2 B-0.3.

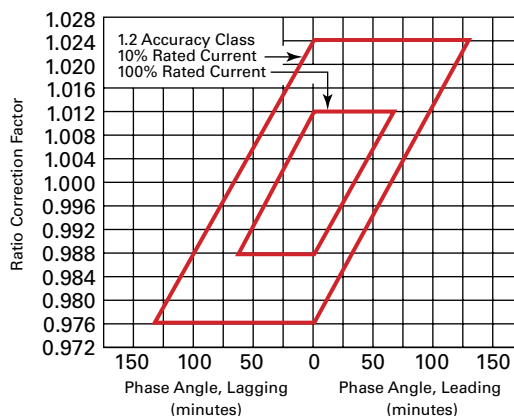


Figure 3. Parallelograms for ANSI Accuracy Class 1.2 for Current Transformers for Metering Service



In the third example, the omission of any reference to accuracy of B-1.8 indicates that the error is greater than that specified for the poorest accuracy class at this high burden, hence no figure can be given.

It should be noted that the foregoing system provides a method of classifying transformers as to accuracy, but it does not give the specific error for any given transformer beyond the fact that it is within a certain range. Thus, for accurate measurements, the actual error of the transformer must be known and taken into account in the measurement. For high accuracy measurements, this information may be obtained from a calibration certificate or other calibration result on the particular transformer in question. A reasonable approximation of the accuracy may be obtained also from the characteristic accuracy curves listed in the description literature for most types of current transformers.

ANSI Accuracy Standards for Relaying Current Transformers at 60 Hz

Current transformers that are used to operate relays must have a certain accuracy under overcurrent conditions where relay operation is expected to occur. The transformer must be able not only to withstand the high currents involved, but it must also transform the current to a lower value suitable for application to the relay terminals, and do this with a measurable accuracy.

The Institute of Electrical and Electronic Engineers has standardized on the accuracy classes and the conditions under which the standard accuracy will apply. These ratings are on the basis of the standard secondary terminal voltage a transformer will deliver at 20 times rated secondary amperes without exceeding 10 percent ratio error. Thus, transformers may be classified as (for example) C100 or T200.

In these classifications, “C” indicates that the relay accuracy can be calculated with adequate accuracy, a condition which typically occurs when leakage flux in the transformer core is negligible. The letter “T” indicates that there is appreciable leakage flux and the

relay accuracy must be determined by test. Letters “C” and “T” define the manner in which the rating is established and do not define different performance requirements to be met. The performance requirements for “C200” and “T200” are identical.

The number following the “C” or “T” is the secondary terminal voltage which the transformer will deliver to a standard burden (see Table 3, page 32) at 20 times rated secondary current without exceeding 10 percent ratio error. The standard output voltage ratings (at 20 times rated secondary current), for transformers with a rated secondary current of five amperes are thus:

10, 20, 50, 100, 200, 400, and 800.

Furthermore, the ratio error must not exceed 10 percent at any current from 1 to 20 times rated current (5 to 100 secondary amperes) at any lesser burden ohms.

Figure 4 illustrates the performance requirements of the various relay accuracy classes.

The ratio error shall not exceed 10 percent whenever the secondary terminal voltage falls within the designated class area defined by the sloped line, two vertical lines, and base. The sloped lines also indicate the limiting burden impedances for the current range of 5 to 100 amperes.

Accuracy classes shown cover only the 50, 100, 200, 400, and 800 classes.

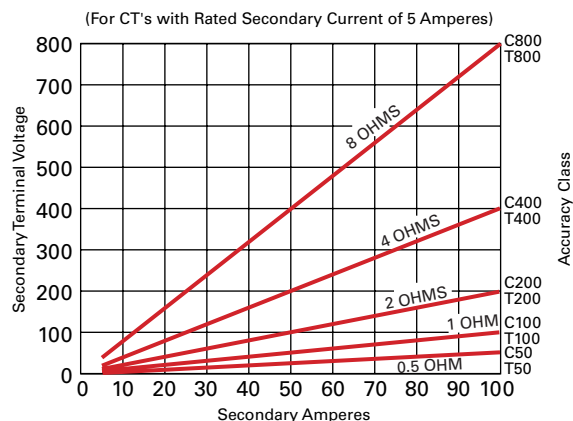


Figure 4. Standard Relay Accuracy Limits



Table 5

Transformer Correction Factors for Voltage Transformers

The following table provides a ready means of determining the transformer correction factor (TCF) of a voltage transformer when the ratio correction factor (RCF) and phase angle of the transformer and also the line power factor are known.

The range covered in these tables is sufficient to meet the requirements of most high-accuracy metering applications. Interpolation between the points, shown in this table, can be made for intermediate values of RCF, phase angle, or line power factor.

RCF	γ	Transformer Correction Factor (TCF)					
		Power factor of Metered Load-Lagging					
		0.6	0.7	0.8	0.9	1.0	
0.995	-15'	0.9892	0.9905	0.9917	0.9929	0.9950	
	-10'	0.9911	0.9920	0.9928	0.9936	0.9950	
	-5'	0.9931	0.9935	0.9939	0.9943	0.9950	
	-2'	0.9942	0.9944	0.9946	0.9947	0.9950	
	0'	0.9950	0.9950	0.9950	0.9950	0.9950	
	+2'	0.9958	0.9956	0.9954	0.9953	0.9950	
	+5'	0.9969	0.9965	0.9961	0.9957	0.9950	
	+10'	0.9989	0.9980	0.9972	0.9964	0.9950	
	+15'	1.0008	0.9994	0.9983	0.9971	0.9950	
	+20'	1.0027	1.0009	0.9993	0.9978	0.9950	
	+30'	1.0065	1.0039	1.0015	0.9992	0.9950	
	0.996	-15'	0.9902	0.9915	0.9927	0.9939	0.9960
-10'		0.9921	0.9930	0.9938	0.9946	0.9960	
-5'		0.9941	0.9945	0.9949	0.9953	0.9960	
-2'		0.9952	0.9954	0.9956	0.9957	0.9960	
0'		0.9960	0.9960	0.9960	0.9960	0.9960	
+2'		0.9968	0.9966	0.9964	0.9963	0.9960	
+5'		0.9979	0.9975	0.9971	0.9967	0.9960	
+10'		0.9999	0.9990	0.9982	0.9974	0.9960	
+15'		1.0018	1.0004	0.9993	0.9981	0.9960	
+20'		1.0037	1.0019	1.0003	0.9988	0.9960	
+30'		1.0076	1.0049	1.0025	1.0002	0.9960	
0.997		-15'	0.9912	0.9925	0.9937	0.9949	0.9970
	-10'	0.9931	0.9940	0.9948	0.9956	0.9970	
	-5'	0.9951	0.9955	0.9959	0.9963	0.9970	
	-2'	0.9962	0.9964	0.9966	0.9967	0.9970	
	0'	0.9970	0.9970	0.9970	0.9970	0.9970	
	+2'	0.9978	0.9976	0.9974	0.9973	0.9970	
	+5'	0.9989	0.9985	0.9981	0.9977	0.9970	
	+10'	1.0009	1.0000	0.9992	0.9984	0.9970	
	+15'	1.0028	1.0014	1.0003	0.9991	0.9970	
	+20'	1.0047	1.0029	1.0013	0.9998	0.9970	
	+30'	1.0086	1.0059	1.0035	1.0012	0.9970	
	0.998	-15'	0.9922	0.9935	0.9947	0.9959	0.9980
-10'		0.9941	0.9950	0.9958	0.9966	0.9980	
-5'		0.9961	0.9965	0.9969	0.9973	0.9980	
-2'		0.9972	0.9974	0.9976	0.9977	0.9980	
0'		0.9980	0.9980	0.9980	0.9980	0.9980	
+2'		0.9988	0.9986	0.9984	0.9983	0.9980	
+5'		0.9999	0.9995	0.9991	0.9987	0.9980	
+10'		1.0019	1.0010	1.0002	0.9994	0.9980	
+15'		1.0038	1.0024	1.0013	1.0001	0.9980	
+20'		1.0057	1.0039	1.0023	1.0008	0.9980	
+30'		1.0096	1.0069	1.0045	1.0022	0.9980	
0.999		-15'	0.9932	0.9945	0.9957	0.9969	0.9990
	-10'	0.9951	0.9960	0.9968	0.9976	0.9990	
	-5'	0.9971	0.9975	0.9979	0.9986	0.9990	
	-2'	0.9982	0.9984	0.9986	0.9987	0.9990	
	0'	0.9990	0.9990	0.9990	0.9990	0.9990	
	+2'	0.9998	0.9996	0.9994	0.9993	0.9990	
	+5'	1.0009	1.0005	1.0001	0.9997	0.9990	
	+10'	1.0029	1.0020	1.0012	1.0004	0.9990	
	+15'	1.0048	1.0034	1.0023	1.0011	0.9990	
	+20'	1.0067	1.0049	1.0033	1.0018	0.9990	
	+30'	1.0106	1.0079	1.0055	1.0032	0.9990	
	1.000	-15'	0.9942	0.9955	0.9967	0.9979	1.0000
-10'		0.9961	0.9970	0.9978	0.9986	1.0000	
-5'		0.9981	0.9985	0.9989	0.9993	1.0000	
-2'		0.9992	0.9994	0.9996	0.9997	1.0000	
0'		1.0000	1.0000	1.0000	1.0000	1.0000	
+2'		1.0008	1.0006	1.0004	1.0003	1.0000	
1.000 con't	+5'	1.0019	1.0015	1.0011	1.0007	1.0000	
	+10'	1.0039	1.0030	1.0022	1.0014	1.0000	
	+15'	1.0058	1.0044	1.0033	1.0021	1.0000	
	+20'	1.0077	1.0059	1.0043	1.0028	1.0000	
	+30'	1.0116	1.0089	1.0065	1.0042	1.0000	
	1.001	-15'	0.9952	0.9965	0.9977	0.9989	1.0010
		-10'	0.9971	0.9980	0.9988	0.9996	1.0010
		-5'	0.9991	0.9995	0.9999	1.0003	1.0010
		-2'	1.0002	1.0004	1.0006	1.0007	1.0010
		0'	1.0010	1.0010	1.0010	1.0010	1.0010
		+2'	1.0018	1.0016	1.0014	1.0013	1.0010
		+5'	1.0029	1.0025	1.0021	1.0017	1.0010
+10'		1.0049	1.0040	1.0032	1.0024	1.0010	
+15'		1.0068	1.0054	1.0043	1.0031	1.0010	
+20'		1.0087	1.0069	1.0053	1.0038	1.0010	
+30'		1.0126	1.0099	1.0075	1.0052	1.0010	
1.002		-15'	0.9962	0.9975	0.9987	0.9999	1.0020
	-10'	0.9981	0.9990	0.9998	1.0006	1.0020	
	-5'	1.0001	1.0005	1.0009	1.0013	1.0020	
	-2'	1.0012	1.0014	1.0016	1.0017	1.0020	
	0'	1.0020	1.0020	1.0020	1.0020	1.0020	
	+2'	1.0028	1.0026	1.0024	1.0023	1.0020	
	+5'	1.0039	1.0035	1.0031	1.0027	1.0020	
	+10'	1.0059	1.0050	1.0042	1.0034	1.0020	
	+15'	1.0078	1.0064	1.0053	1.0041	1.0020	
	+20'	1.0097	1.0079	1.0063	1.0048	1.0020	
	+30'	1.0136	1.0109	1.0085	1.0062	1.0020	
	1.003	-15'	0.9972	0.9985	0.9997	1.0009	1.0030
-10'		0.9991	1.0000	1.0008	1.0016	1.0030	
-5'		1.0011	1.0015	1.0019	1.0023	1.0030	
-2'		1.0022	1.0024	1.0026	1.0027	1.0030	
0'		1.0030	1.0030	1.0030	1.0030	1.0030	
+2'		1.0038	1.0036	1.0034	1.0033	1.0030	
+5'		1.0049	1.0045	1.0041	1.0037	1.0030	
+10'		1.0069	1.0060	1.0052	1.0044	1.0030	
+15'		1.0088	1.0074	1.0063	1.0051	1.0030	
+20'		1.0107	1.0089	1.0073	1.0058	1.0030	
+30'		1.0146	1.0119	1.0095	1.0072	1.0030	
1.004		-15'	0.9982	0.9995	1.0007	1.0019	1.0040
	-10'	1.0001	1.0010	1.0018	1.0026	1.0040	
	-5'	1.0021	1.0025	1.0029	1.0033	1.0040	
	-2'	1.0032	1.0034	1.0036	1.0037	1.0040	
	0'	1.0040	1.0040	1.0040	1.0040	1.0040	
	+2'	1.0048	1.0046	1.0044	1.0043	1.0040	
	+5'	1.0059	1.0055	1.0051	1.0047	1.0040	
	+10'	1.0079	1.0070	1.0062	1.0054	1.0040	
	+15'	1.0098	1.0084	1.0073	1.0061	1.0040	
	+20'	1.0117	1.0099	1.0083	1.0068	1.0040	
	+30'	1.0156	1.0129	1.0105	1.0082	1.0040	
	1.005	-15'	0.9992	1.0005	1.0017	1.0029	1.0050
-10'		1.0011	1.0020	1.0028	1.0036	1.0050	
-5'		1.0031	1.0035	1.0039	1.0043	1.0050	
-2'		1.0042	1.0044	1.0046	1.0047	1.0050	
0'		1.0050	1.0050	1.0050	1.0050	1.0050	
+2'		1.0058	1.0056	1.0054	1.0053	1.0050	
+5'		1.0069	1.0065	1.0061	1.0057	1.0050	
+10'		1.0089	1.0080	1.0072	1.0064	1.0050	
+15'		1.0108	1.0094	1.0083	1.0071	1.0050	
+20'		1.0127	1.0109	1.0093	1.0078	1.0050	
+30'		1.0167	1.0139	1.0115	1.0092	1.0050	



Data subject to change without notice.

TABLE 6

Transformer Correction Factors for Current Transformers

The following table provides a ready means of determining the transformer correction factor (TCF) of a current transformer when the ratio correction factor (RCF) and phase angle of the transformer and also the line power factor are known.

The range covered in these tables is sufficient to meet the requirements of most high-accuracy metering applications. Interpolation between the points, shown in this table, can be made for intermediate values of RCF, phase angle, or line power factor.

RCF	γ	Transformer Correction Factor (TCF)				
		Power factor of Metered Load-Lagging				
		0.6	0.7	0.8	0.9	1.0
0.995	-15'	1.0008	0.9994	0.9983	0.9971	0.9950
	-10'	0.9989	0.9980	0.9972	0.9964	0.9950
	-5'	0.9969	0.9965	0.9961	0.9957	0.9950
	-2'	0.9958	0.9956	0.9954	0.9953	0.9950
	0'	0.9950	0.9950	0.9950	0.9950	0.9950
	+2'	0.9942	0.9944	0.9946	0.9947	0.9950
	+5'	0.9931	0.9935	0.9939	0.9943	0.9950
	+10'	0.9911	0.9920	0.9928	0.9936	0.9950
	+15'	0.9892	0.9905	0.9917	0.9929	0.9950
	+20'	0.9872	0.9890	0.9906	0.9922	0.9950
	+30'	0.9834	0.9861	0.9884	0.9907	0.9950
0.996	-15'	1.0018	1.0004	0.9993	0.9981	0.9960
	-10'	0.9999	0.9990	0.9982	0.9974	0.9960
	-5'	0.9979	0.9975	0.9971	0.9967	0.9960
	-2'	0.9968	0.9966	0.9964	0.9963	0.9960
	0'	0.9960	0.9960	0.9960	0.9960	0.9960
	+2'	0.9952	0.9954	0.9956	0.9957	0.9960
	+5'	0.9941	0.9945	0.9949	0.9953	0.9960
	+10'	0.9921	0.9930	0.9938	0.9946	0.9960
	+15'	0.9902	0.9915	0.9927	0.9939	0.9960
	+20'	0.9882	0.9900	0.9916	0.9932	0.9960
	+30'	0.9843	0.9871	0.9894	0.9917	0.9960
0.997	-15'	1.0028	1.0014	1.0003	0.9991	0.9970
	-10'	1.0009	1.0000	0.9992	0.9984	0.9970
	-5'	0.9989	0.9985	0.9981	0.9977	0.9970
	-2'	0.9978	0.9976	0.9974	0.9973	0.9970
	0'	0.9970	0.9970	0.9970	0.9970	0.9970
	+2'	0.9962	0.9964	0.9966	0.9967	0.9970
	+5'	0.9951	0.9955	0.9959	0.9963	0.9970
	+10'	0.9931	0.9940	0.9948	0.9956	0.9970
	+15'	0.9912	0.9925	0.9937	0.9949	0.9970
	+20'	0.9892	0.9910	0.9926	0.9942	0.9970
	+30'	0.9853	0.9881	0.9904	0.9927	0.9970
0.998	-15'	1.0038	1.0024	1.0013	1.0001	0.9980
	-10'	1.0019	1.0010	1.0002	0.9994	0.9980
	-5'	0.9999	0.9995	0.9991	0.9987	0.9980
	-2'	0.9988	0.9986	0.9984	0.9983	0.9980
	0'	0.9980	0.9980	0.9980	0.9980	0.9980
	+2'	0.9972	0.9974	0.9976	0.9977	0.9980
	+5'	0.9961	0.9965	0.9969	0.9973	0.9980
	+10'	0.9941	0.9950	0.9958	0.9966	0.9980
	+15'	0.9922	0.9935	0.9947	0.9959	0.9980
	+20'	0.9902	0.9920	0.9936	0.9952	0.9980
	+30'	0.9863	0.9891	0.9914	0.9937	0.9980
0.999	-15'	1.0048	1.0034	1.0023	1.0011	0.9990
	-10'	1.0029	1.0020	1.0012	1.0004	0.9990
	-5'	1.0009	1.0005	1.0001	0.9997	0.9990
	-2'	0.9998	0.9996	0.9994	0.9993	0.9990
	0'	0.9990	0.9990	0.9990	0.9990	0.9990
	+2'	0.9982	0.9984	0.9986	0.9987	0.9990
	+5'	0.9971	0.9975	0.9979	0.9983	0.9990
	+10'	0.9951	0.9960	0.9968	0.9976	0.9990
	+15'	0.9932	0.9945	0.9957	0.9969	0.9990
	+20'	0.9912	0.9930	0.9946	0.9962	0.9990
	+30'	0.9873	0.9901	0.9924	0.9947	0.9990
1.000	-15'	1.0058	1.0044	1.0033	1.0021	1.0000
	-10'	1.0039	1.0030	1.0022	1.0014	1.0000
	-5'	1.0019	1.0015	1.0011	1.0007	1.0000
	-2'	1.0008	1.0006	1.0004	1.0003	1.0000
	0'	1.0000	1.0000	1.0000	1.0000	1.0000
	+2'	0.9992	0.9994	0.9996	0.9997	1.0000

RCF	γ	Transformer Correction Factor (TCF)				
		Power factor of Metered Load-Lagging				
		0.6	0.7	0.8	0.9	1.0
1.000 con't	+5'	0.9981	0.9985	0.9989	0.9993	1.0000
	+10'	0.9961	0.9970	0.9978	0.9986	1.0000
	+15'	0.9942	0.9955	0.9967	0.9979	1.0000
	+20'	0.9922	0.9940	0.9956	0.9972	1.0000
	+30'	0.9883	0.9911	0.9934	0.9957	1.0000
1.001	-15'	1.0068	1.0054	1.0043	1.0031	1.0010
	-10'	1.0049	1.0040	1.0032	1.0024	1.0010
	-5'	1.0029	1.0025	1.0021	1.0017	1.0010
	-2'	1.0018	1.0016	1.0014	1.0013	1.0010
	0'	1.0010	1.0010	1.0010	1.0010	1.0010
	+2'	1.0002	1.0004	1.0006	1.0007	1.0010
	+5'	0.9991	0.9995	0.9999	1.0003	1.0010
1.002	+10'	0.9971	0.9980	0.9988	0.9996	1.0010
	+15'	0.9952	0.9965	0.9977	0.9989	1.0010
	+20'	0.9932	0.9950	0.9966	0.9982	1.0010
	+30'	0.9893	0.9921	0.9944	0.9967	1.0010
	-15'	1.0078	1.0064	1.0053	1.0041	1.0020
	-10'	1.0059	1.0050	1.0042	1.0034	1.0020
	-5'	1.0039	1.0035	1.0031	1.0027	1.0020
1.003	-2'	1.0028	1.0026	1.0024	1.0023	1.0020
	0'	1.0020	1.0020	1.0020	1.0020	1.0020
	+2'	1.0012	1.0014	1.0016	1.0017	1.0020
	+5'	1.0001	1.0005	1.0009	1.0013	1.0020
	+10'	0.9981	0.9990	0.9998	1.0006	1.0020
	+15'	0.9962	0.9975	0.9987	0.9999	1.0020
	+20'	0.9942	0.9960	0.9976	0.9992	1.0020
1.004	+30'	0.9903	0.9931	0.9954	0.9977	1.0020
	-15'	1.0088	1.0074	1.0063	1.0051	1.0030
	-10'	1.0069	1.0060	1.0052	1.0044	1.0030
	-5'	1.0049	1.0045	1.0041	1.0037	1.0030
	-2'	1.0038	1.0036	1.0034	1.0033	1.0030
	0'	1.0030	1.0030	1.0030	1.0030	1.0030
	+2'	1.0022	1.0024	1.0026	1.0027	1.0030
1.005	+5'	1.0011	1.0015	1.0019	1.0023	1.0030
	+10'	0.9991	1.0000	1.0008	1.0016	1.0030
	+15'	0.9972	0.9985	0.9997	1.0009	1.0030
	+20'	0.9952	0.9970	0.9986	1.0002	1.0030
	+30'	0.9913	0.9941	0.9964	0.9987	1.0030
	-15'	1.0098	1.0084	1.0073	1.0061	1.0040
	-10'	1.0079	1.0070	1.0062	1.0054	1.0040
1.006	-5'	1.0059	1.0055	1.0051	1.0047	1.0040
	-2'	1.0048	1.0046	1.0044	1.0043	1.0040
	0'	1.0040	1.0040	1.0040	1.0040	1.0040
	+2'	1.0032	1.0034	1.0036	1.0037	1.0040
	+5'	1.0021	1.0025	1.0029	1.0033	1.0040
	+10'	1.0001	1.0010	1.0018	1.0026	1.0040
	+15'	0.9982	0.9995	1.0007	1.0019	1.0040
1.007	+20'	0.9962	0.9980	0.9996	1.0012	1.0040
	+30'	0.9923	0.9951	0.9974	0.9997	1.0040
	-15'	1.0108	1.0094	1.0083	1.0071	1.0050
	-10'	1.0089	1.0080	1.0072	1.0064	1.0050
	-5'	1.0069	1.0065	1.0061	1.0057	1.0050
	-2'	1.0058	1.0056	1.0054	1.0053	1.0050
	0'	1.0050	1.0050	1.0050	1.0050	1.0050
1.008	+2'	1.0042	1.0044	1.0046	1.0047	1.0050
	+5'	1.0031	1.0035	1.0039	1.0043	1.0050
	+10'	1.0011	1.0020	1.0028	1.0036	1.0050
	+15'	0.9992	1.0005	1.0017	1.0029	1.0050
	+20'	0.9972	0.9990	1.0006	1.0022	1.0050
	+30'	0.9932	0.9961	0.9984	1.0007	1.0050



Get the Best Accuracy Available in the Industry With GE's Certified 0.15% Performance

A New Standard in Performance

GE's enhanced Accubute accuracy standard specifies that the ratio and phase error of each Accubute instrument transformer will be no greater than $\pm 0.15\%$ of rated current and voltage, even down to 5% of its rated range, which is **better than the best** ANSI standard accuracy class in existence today! This state-of-the-art performance improves energy measurement accuracy, translating directly into more equitable revenue metering.

Figure 1 compares the conventional ANSI C57.13 accuracy classes to the new 0.15 class for GE Accubute instrument transformers. As you can see, GE's new Accubute instrument transformer accuracy class offers a **two-fold** performance improvement over the best ANSI accuracy class, and a **four-fold** improvement versus the ANSI 0.6 class! For current transformers in particular, this 4:1 improvement provides a significant improvement in your overall energy metering resolution. Why? Because GE's Accubute transformers not only maintain their certified $\pm 0.15\%$ accuracy at reduced load currents where the ANSI specification allows accuracy performance of 0.6, but continue to maintain their $\pm 0.15\%$ accuracy all the way down to 5% of rated load, where there are no ANSI performance requirements at all. Figure 2 depicts the Accubute current transformer accuracy over the extended load current range.

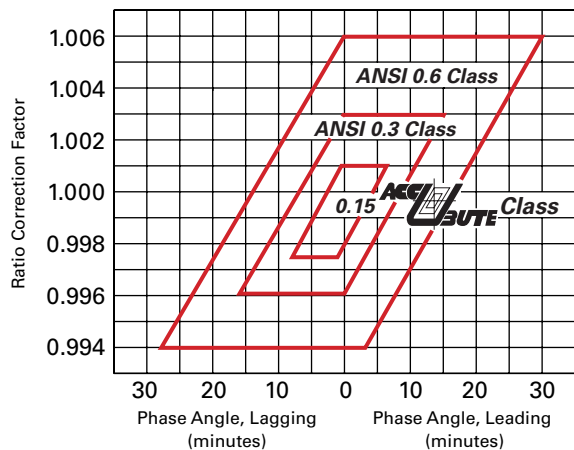


Figure 1. Accuracy Class Comparison

Extended Operating Range...Building Blocks for the Future

Accubute instrument transformers are the ideal match for today's electronic energy meters. Solid-state energy meters feature significantly better long-term accuracy over a wider dynamic operating range than their electromechanical counterparts. This increased meter accuracy creates a need for current transformers with improved accuracy over wider dynamic operating ranges. That need is met with GE's Accubute instrument transformers.

Pays for Itself, And Then Some...

Each 0.1% improvement in metering accuracy can have a significant impact on revenues. Consider the following example of a typical metering installation, where the resulting increase in revenue is over \$700 per year.

CT Load: 50% of rated current for 16 hours per day, 5 days per week
5% of rated current for the balance of the time

System: 4-wire, 3-phase,
15 kV 200:5 Amperes CT rating
0.9 line power factor

Energy Price: \$0.07/kwhr.

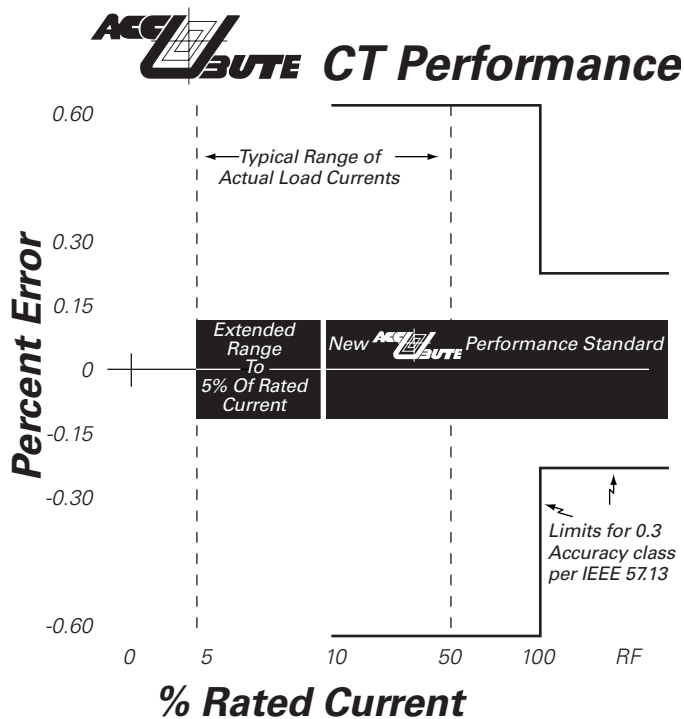


Figure 2. Accubute Extended Operating Range



Data subject to change without notice.

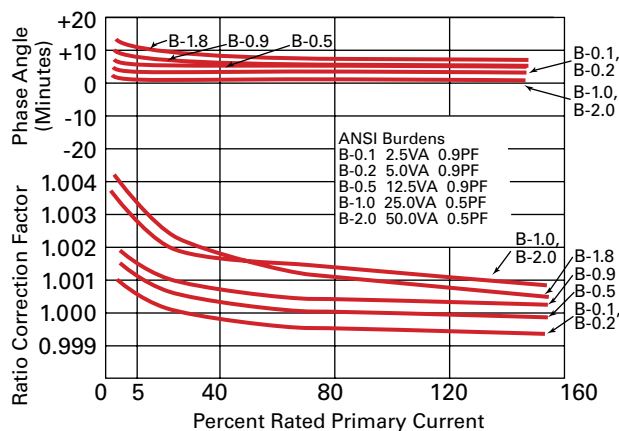


Figure 3. Accubute Characteristic Ratio and Phase Angle Curve

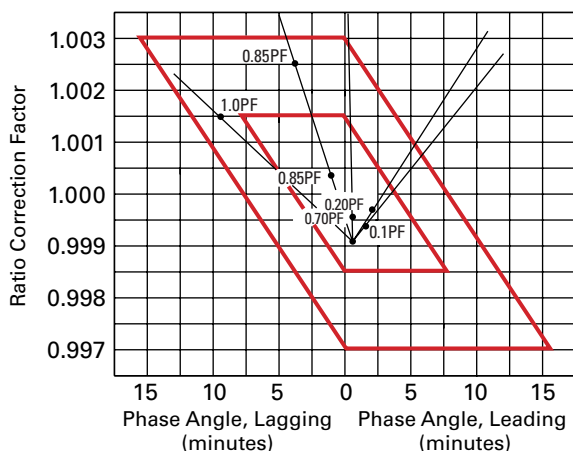


Figure 4. Accubute Characteristic Fan Curve

The difference in energy metered for $\pm 0.1\%$ CT error: 872.809 kwhr/month; 10,473,708 kwhr/year.
 Energy cost for $\pm 0.1\%$ improvement in resolution is \$61.09/month, \$733.08 per year.

If the CT rating were 800:5 instead of 200:5, the increased revenue would have \$2,932.32 per year.

With similar revenue increases across an entire system, it is easy to see that using Accubute instrument transformers can more than justify their cost in no time at all.

Typical Accubute Instrument Transformer Performance

Figure 3 depicts the typical Accuracy curves, for the Accubute instrument transformers. Figure 4 depicts the Characteristic Fan Curve for the Accubute instrument transformers.

GE Instrument Transformers with Accubute Performance															
Voltage Transformers								Current Transformers							
Indoor				Outdoor				Indoor				Outdoor			
BIL (kV)	NSV (kV)	Type	Page	BIL (kV)	NSV (kV)	Type	Page	BIL (kV)	NSV (kV)	Type	Page	BIL (kV)	NSV (kV)	Type	Page
75	8.7	JVM-4A	1-16	75	8.7	JVW-4A	2-10	10	0.6	JAB-0A	3-2*	60	5	JCW-3A	4-16*
110	15	JVM-5A	1-16	110	15	JVW-5A	2-10	60	5	JCB-3A	3-68*	60	5	JCD-3A	4-22*
				125	12 to 25	JVW-6A	2-14*	60	5	JCM-3A	3-64*	60	5	JKM-3A	3-66*
				150	25	JVW-7A	2-18*	75	8.7	JCB-4A	3-68*	60	5	JKW-3A	4-18*
								75	8.7	JCM-4A	3-64*	75	8.7	JCW-4A	4-16*
								110	15	JKM-5A	3-78	75	8.7	JCD-4A	4-22*
								110	15	JCB-5A	3-68*	75	8.7	JKM-4A	3-70*
								110	15	JCM-5A	3-64*	75	8.7	JKW-4A	4-18*
												110	15	JKW-5A	4-26
												110	15	JCW-5A	4-16*
												110	15	JCD-5A	4-22*
												125	25	JKW-6A	4-36
												200	34.5	JKW-200	4-30*

* Similar to this type number except with Accubute performance. Many ratios are available.

Table 1. Accubute Instrument Transformers



Data subject to change without notice.

TESTS ON MOLDED AND OTHER DRY-TYPE INSTRUMENT TRANSFORMERS

Instrument Transformers—Tests

Tests Performed at Factory BIL 10—125 kV

A certificate of factory test is supplied with each transformer. This attached certificate (a 3 x 5 in. tag) is a true record of the actual test data obtained on the transformer at 60 Hz with stated conditions. Certified copies of this test data will be supplied at no charge when requested on the requisition.

Additional ratio and phase-angle test (which supplement the test data normally furnished) can be made on any instrument transformer and a test certificate supplied, showing the accuracy of the transformer at the burdens specified. The measurements will be correct within one tenth of one percent in ratio and three minutes in phase angle.

VOLTAGE TRANSFORMERS

Standard Accuracy Tests—Ratio and phase-angle tests are made at three test points: (1) zero VA at rated voltage, (2) zero VA at 10% above rated voltage, and (3) with one standard burden, typically the maximum standard burden for which the transformer is rated at its best accuracy.

The accuracy of a voltage transformer at other burdens can be readily established from the data provided. The method of calculation is covered in IEEE C57.13.

Special Ratio and Phase-angle Tests— All special ratio and phase-angle tests on voltage transformers are made with three secondary voltages: (1) at rated voltage, (2) at approximately 10 percent above rated voltage, and (3) at approximately 10 percent below rated voltage. Therefore, if the rated secondary voltage is 115 volts, tests are made at 105, 115, and 125 volts; if the rated secondary voltage is 120 volts, tests are made at 108, 120, and 132 volts.

CURRENT TRANSFORMERS

Standard Accuracy Tests— Ratio and phase-angle tests are made at 10% and 100% rated current with one IEEE standard burden.

Special Ratio and Phase-angle Tests— All special ratio and phase-angle tests on current transformers will be made at secondary points 0.5, 1, 2, 3, and 5 amperes. For transformers with tapped secondaries, tests will be made on both connections. For double-secondary transformers, tests will be made on each secondary.

VOLTAGE-TRANSFORMER STANDARD BURDENS

Some users require ratio and phase angle data at burdens different from that provided on test tag. The table below lists the standard burdens at which data can be provided at extra cost. Contact the factory for special burdens and prices.

1. Zero burden.
2. Burden W (12.5 VA at 10% PF).
3. Burden X (25 VA at 70% PF).
4. Burden M (35 VA at 20% PF).
5. Burden Y (75 VA at 85% PF).
6. Burden Z (200 VA at 85% PF).
7. Burden ZZ (400 VA at 85% PF).
8. Burden of Leeds and Northrup voltage transformer test set and voltmeter.

DIELECTRIC TESTS

Each voltage transformer receives both an applied voltage test and an induced voltage test at the factory. No charge is made for these tests. A certified report of either test can be supplied.

IMPULSE TESTS

Impulse tests of voltage transformers are made only when requested.

CURRENT-TRANSFORMER STANDARD BURDENS

Some users require ratio and phase angle data at burdens different from that provided on test tag. The table below lists the standard burdens at which data can be provided at extra cost. Contact the factory for special burdens and prices.

1. Burden B-0.1 (2.5 VA at 90% PF).
2. Burden B-0.2 (5.0 VA at 90% PF).
3. Burden B-0.5 (12.5 VA at 90% PF).
4. Burden B-0.9 (22.5 VA at 90% PF).
5. Burden B-1.0 (25.0 VA at 50% PF).
6. Burden B-1.8 (45.0 VA at 90% PF).
7. Burden B-2.0 (50.0 VA at 50% PF).
8. Burden B-4.0 (100.0 VA at 50% PF).
9. Burden B-8.0 (200.0 VA at 50% PF).
10. Burden of Silsbee current transformer test set and ammeter.

DIELECTRIC TESTS

Each current transformer receives applied voltage tests and (where required by IEEE C57.13) an induced voltage test at the factory. No charge is made for these tests. A certified report of either test can be supplied.

IMPULSE TESTS

Impulse tests of current transformers are made only when requested.



TESTS ON SUPERBUTE INSTRUMENT TRANSFORMERS

Instrument Transformers—Tests

Tests Performed at Factory BIL 150—350 kV, Dry-type

A certificate of factory test is supplied with each transformer. Current transformers designed for OEM or Relay applications do not have Certified Test Data Tags. Multi Ratio transformers are tested at 10% and 100% at rated burden on each tap winding. Certified Test Tags not normally provided. This attached certificate (a 3" x 5" tag) is a true record of the actual test data obtained on the transformer at 60 Hz with stated conditions. Certified copies of this test data will be supplied at no charge when requested on the requisition.

Additional ratio and phase-angle tests (which supplement the test data normally furnished) can be made on any instrument transformer and a test certificate supplied, showing the accuracy of the transformer at the burdens specified. The measurements will be correct within one tenth of one percent in ratio and three minutes in phase angle.

VOLTAGE TRANSFORMERS

Standard Accuracy Tests—Ratio and phase-angle tests are made at three test points: (1) zero VA at rated voltage, (2) zero VA at 10% above rated voltage, and (3) with one standard burden, typically the maximum standard burden for which the transformer is rated at its best accuracy.

The accuracy of a voltage transformer at other burdens can be readily established from the data provided. The method of calculation is covered in IEEE C57.13.

Special Ratio and Phase-angle Tests— All special ratio and phase-angle tests on voltage transformers are made with three secondary voltages: (1) at rated voltage, (2) at approximately 10 percent above rated voltage, and (3) at approximately 10 percent below rated voltage. Therefore, if the rated secondary voltage is 115 volts, tests are made at 105, 115, and 125 volts; if the rated secondary voltage is 120 volts, tests are made at 108, 120, and 132 volts.

CURRENT TRANSFORMERS

Standard Accuracy Tests—Ratio and phase-angle tests are made at 10% and 100% rated current with one IEEE standard burden, typically the maximum standard burden for which the transformer is rated at its best accuracy.

Special Ratio and Phase-angle Tests— All special ratio and phase-angle tests on current transformers will be made at secondary points 0.5, 1, 2, 3, and 5 amperes. For transformers with tapped secondaries, tests will be made on both connections. For double-secondary

transformers, tests will be made on each secondary.

VOLTAGE TRANSFORMER STANDARD BURDENS

Some users require ratio and phase angle data at burdens different from that provided on test tag. The table below lists the standard burdens at which data can be provided at extra cost. Contact the factory for special burdens and prices.

1. Zero burden.
2. Burden W (12.5 VA at 10% PF).
3. Burden X (25 VA at 70% PF).
4. Burden M (35 VA at 20% PF).
5. Burden Y (75 VA at 85% PF).
6. Burden Z (200 VA at 85% PF).
7. Burden ZZ (400 VA at 85% PF).
8. Burden of Leeds and Northrup voltage transformer test set and voltmeter.

DIELECTRIC TESTS

Each voltage transformer receives either an applied voltage test or induced voltage test at the factory. No charge is made for these tests. A certified report of either test can be supplied.

IMPULSE TESTS

Impulse tests of voltage transformers are performed at the factory. No charge is made for these tests. A certified report of this test can be supplied.

CURRENT TRANSFORMER STANDARD BURDENS

Some users require ratio and phase angle data at burdens different from that provided on test tag. The table below lists the standard burdens at which data can be provided at extra cost. Contact the factory for special burdens and prices.

1. Burden B-0.1 (2.5 VA at 90% PF).
2. Burden B-0.2 (5.0 VA at 90% PF).
3. Burden B-0.5 (12.5 VA at 90% PF).
4. Burden B-0.9 (22.5 VA at 90% PF).
5. Burden B-1.0 (25.0 VA at 50% PF).
6. Burden B-1.8 (45.0 VA at 90% PF).
7. Burden B-2.0 (50.0 VA at 50% PF).
8. Burden B-4.0 (100.0 VA at 50% PF).
9. Burden B-8.0 (200.0 VA at 50% PF).
10. Burden of Silsbee current transformer test set and ammeter.

DIELECTRIC TESTS

Each current transformer receives applied voltage tests and (where required by IEEE C57.13) an induced voltage test at the factory. No charge is made for these tests. A certified report of either test can be supplied.

IMPULSE TESTS

Impulse tests of current transformers are performed at the factory. No charge is made for these tests. A certified report of this test can be supplied.



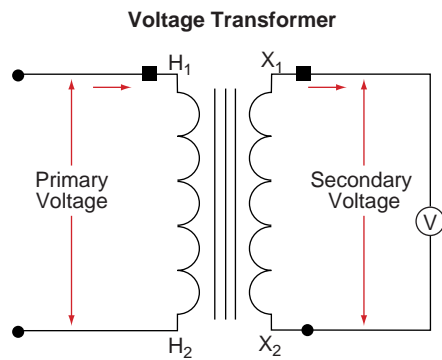


Figure 1. Elementary Connections of Voltage Transformers

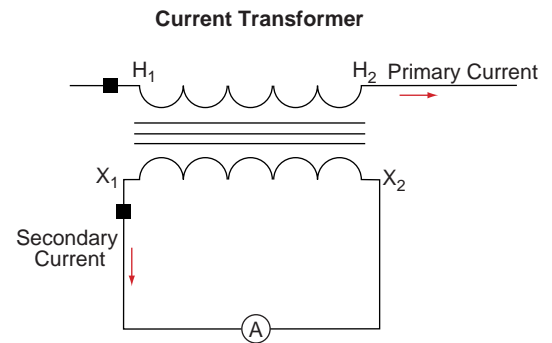


Figure 2. Elementary Connections of Current Transformers

Current Transformers

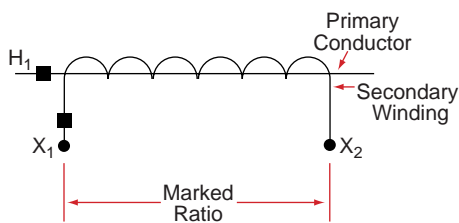


Figure 3. Typical Window or Bar Type Current Transformer with Two Secondary Terminals

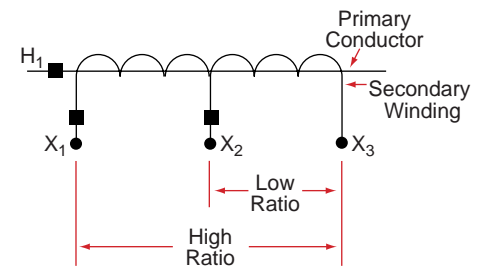


Figure 3a. Typical Window or Bar-type Current Transformer with Tapped Secondary and Three Secondary Terminals

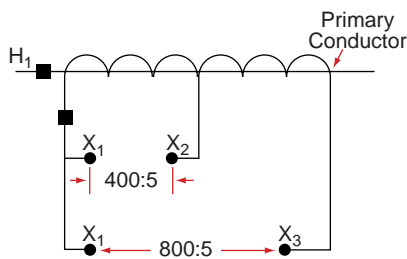


Figure 3b. Typical Window or Bar Type Current Transformer with Four Secondary Terminals

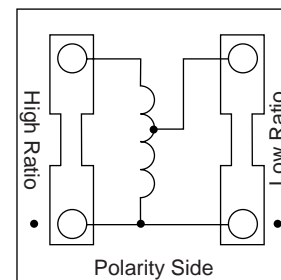


Figure 3b1. Secondary Terminal Connection for Dual Ratio Current Transformers



Current Transformers

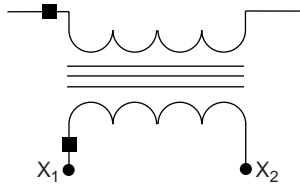


Figure 4.
Typical Wound Type Primary
Current Transformer with
a Single Secondary and
Two Secondary Terminals

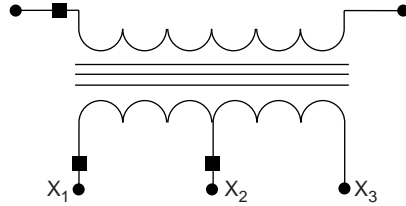


Figure 4a.
Typical Wound or Bar-Type Current
Transformer with Tapped Secondary
and Three Secondary Terminals

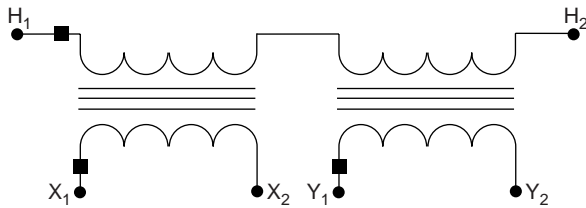


Figure 4b.
Typical Wound Type Primary
Current Transformer with
Two Independent Secondaries

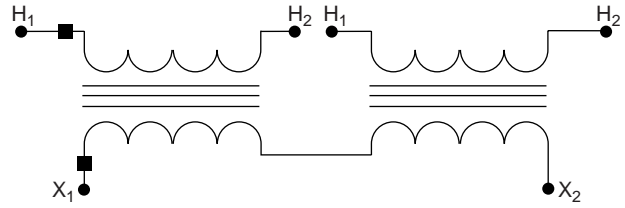


Figure 4c.
Typical Wound Primary Type or Bar-Type
Current Transformer with Two Independent
Primaries and Two Secondaries connected
in series for 3-Wire Applications

Voltage Transformers

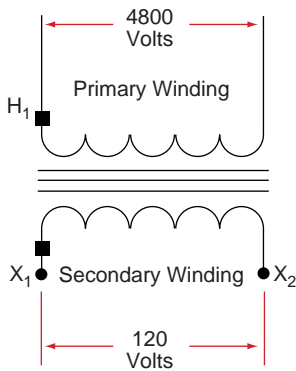


Figure 5.
Typical Voltage Transformer with
Single Secondary

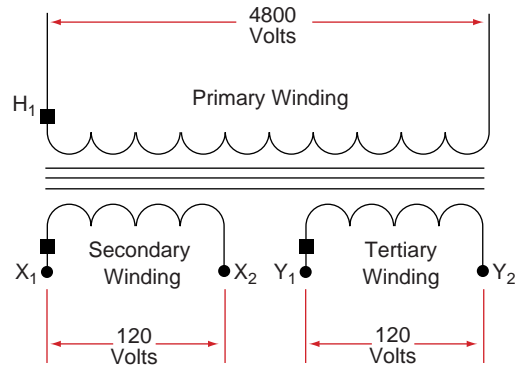


Figure 6.
Typical Voltage Transformer
with Two Secondaries



Voltage Transformers

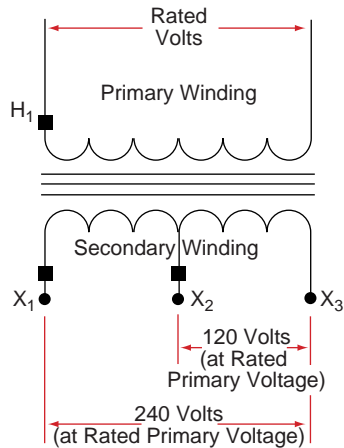


Figure 7.
Typical Voltage Transformer with Mid-Tapped Secondary

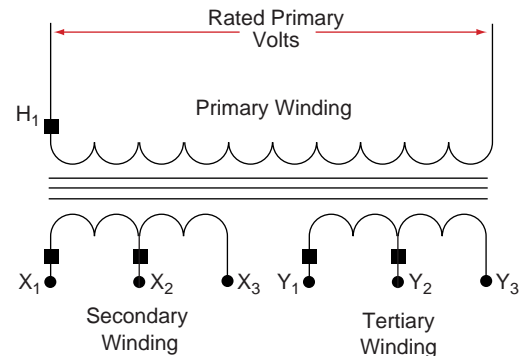


Figure 8.
Typical Voltage Transformer with Two Secondaries, Both Tapped

Nominal 3-Phase Systems

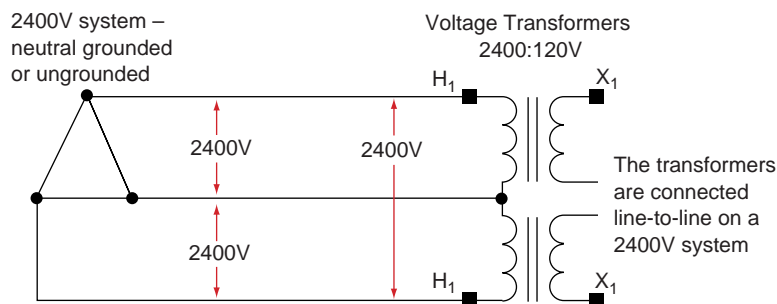


Figure 9.
Typical Voltage Transformer with Two High Voltage Terminals Connected in a Delta Circuit

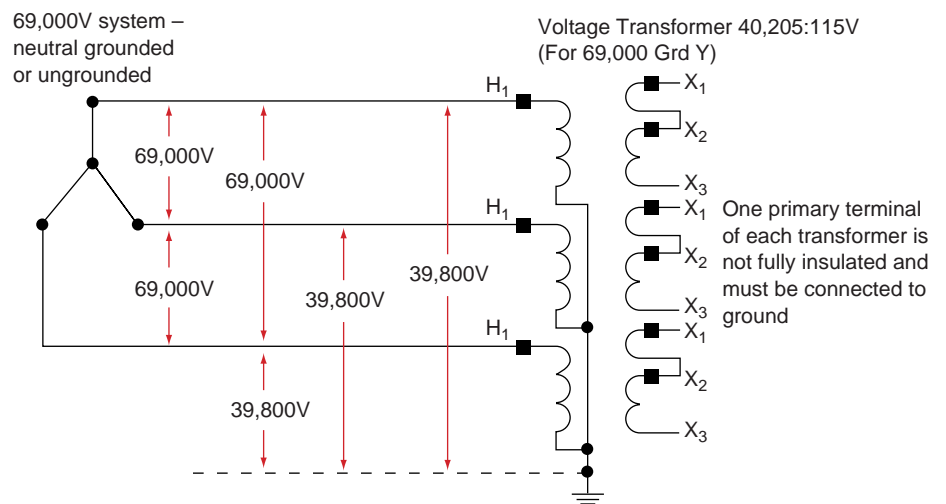


Figure 10.
Typical Voltage Transformer with One High Voltage Terminal Connected in a Wye Circuit



Current Transformers

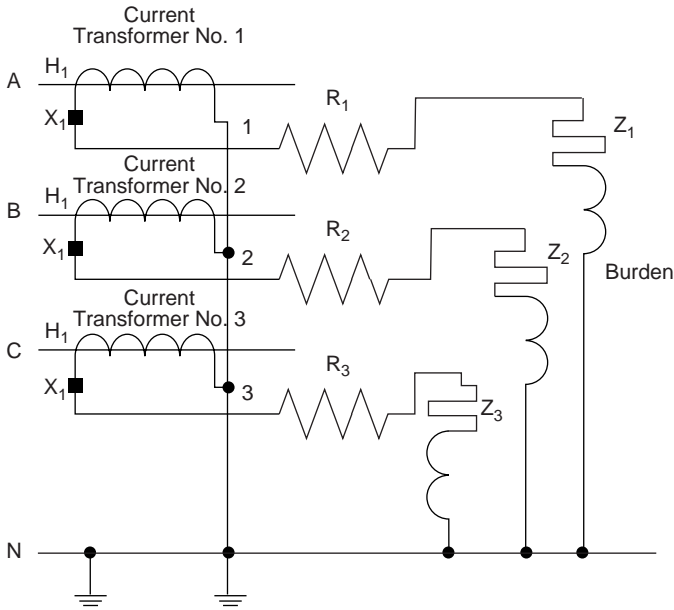


Figure 11.
Typical Wye Interconnection
of Current Transformer Secondaries

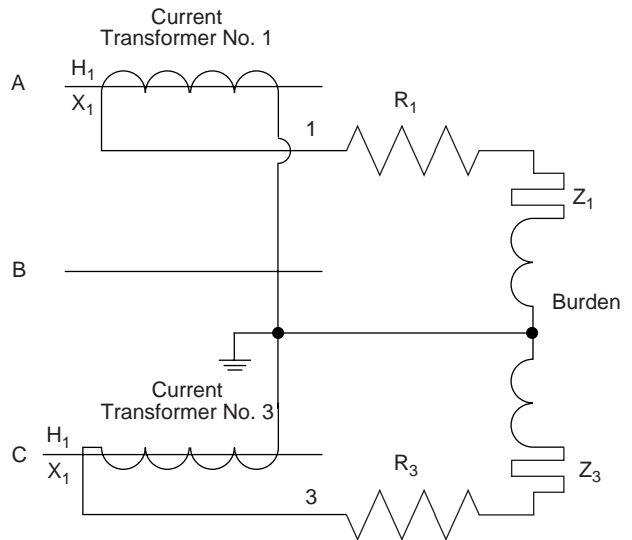


Figure 12.
Typical Open-Delta Interconnection
of Current Transformer Secondaries



Current Transformer

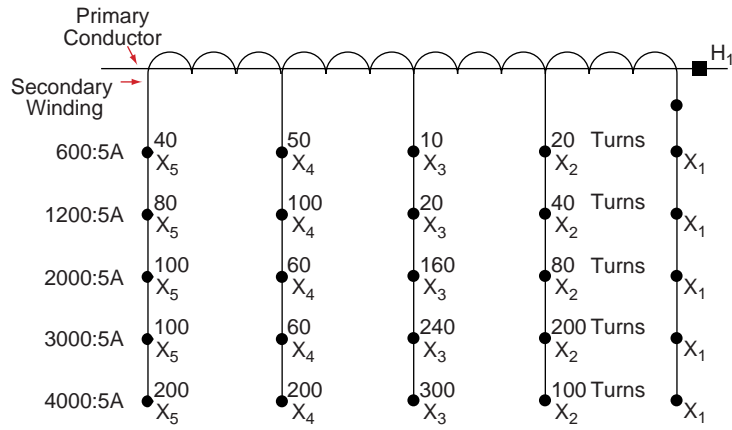


Figure 13.
Typical JAG-0C Multiple-Ratio
Transformers

Voltage Transformer

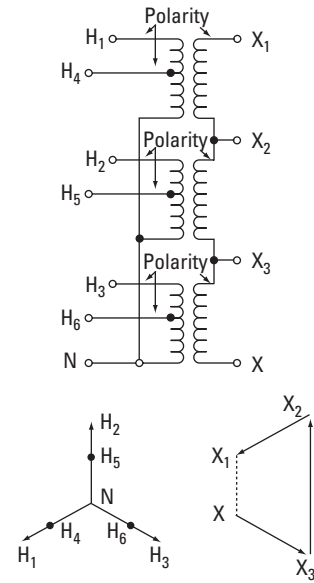


Figure 14.
YT-1557 Transformer

