

Instrument Transformer – Part 2

Burden



STUDY FOR FE

- Burden is defined as the impedance connected to instrument transformer's secondary.
- It includes transformer's own secondary impedance and that of devices and connecting leads.
- IEEE expresses Burden in Ohms. IEC expressed Burden in VA.
- IEEE C57.13 establishes standard burdens for CTs as shown below (applicable @ 5A, 60 Hz only).

Standard Burdens for Current Transformers with 5 A Secondaries *					
Burden Designation +	Resistance (Ω)	Inductance (mH)	Impedance (Ω)	Volt Amperes (at 5 A)	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	0.58	0.5	12.5	0.9
B-0.9	0.81	1.04	0.9	22.5	0.9
B-1.8	1.62	2.08	1.8	45.0	0.9
Relaying Burdens					
B-1	0.50	2.3	1.0	25.0	0.5
B-2	1.00	4.6	2.0	50.0	0.5
B-4	2.00	9.2	4.0	100.0	0.5
B-8	4.00	18.4	8.0	200.0	0.5

- IEEE C57.13 establishes standard burdens for VTs as shown below.
- These burden ratings are expressed at 120V and 69.3V.

Standard Burdens for Voltage Transformers					
	Burden Designation	Volt Amperes	Power Factor	Burden Impedance	
				120 V Burden	69.3 V Burden
Metering Burdens	W	12.5	0.10	1152	384
	X	25	0.70	576	192
	M	35	0.20	411	137
	Y	75	0.85	192	64
	Z	200	0.85	72	24
	ZZ	400	0.85	36	12

$$\text{Burden } (\Omega) = \text{CT secondary resistance } (\Omega) + \text{Wire resistance } (\Omega) + \text{Device impedance } (\Omega)$$