

Application Note

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**Save 'Size' and 'Cost', with a right selection
of 'VA burden of your Current Transformer'**





Cost Effectiveness-Need of the hour

In the current COVID-19 situation, our productivity has suffered due to measures like lockdowns and loss of manpower due to health and other related issues. In addition to that, there has been an increase in prices of commodities like metals and plastics. All of these factors have affected costing. Therefore, it becomes imperative for us to look at cost-effective solutions without compromising on quality by focusing on a selection of products.

Higher VA demand from customers

- LT Metering Current Transformers are widely used in the industry & it has been seen that the customers usually ask for a VA rating which is much higher than the actual requirement.
- Customers usually ask for 5VA, 10VA, 15VA CT's even if the ratings or requirement is lesser.
- Higher VA burden unnecessarily affects cost, accuracy, and size, three most important aspects in product selection.

Let us understand...

Actual need and calculations

Analog Panel Meters hardly consume 0.5 VA & the wires used for connection hardly consume 0.7 VA (Considering 5A, 2.5 sq. mm copper wire, 2-meter length), combined together, the maximum VA requirement is 1.2VA, even if we use 1.5 or 2 or 2.5 VA CT – which fulfils the requirement. Digital Panel Meter or Multifunction Meter or Digital Energy Meter hardly consume 0.3VA & the wires used for connection hardly consume 0.7 VA (Considering 5A, 2.5 sq. Mm copper wire, 2-meter length), combined together, the maximum VA requirement is 1VA, even if we use 1.25 or 1.5 or 2 VA CT – which again fulfils the requirement.

VA burden- core size – accuracy relation

As VA increases, so does the core size & as a result, cost increases too. In the current situation, it becomes imperative to look at cost-effectiveness & selecting the VA as per system requirement. As per the IEC standard, the CT's are to be tested at full VA as well as quarter VA @ 1 & 120% input (in case of class S accuracy) or 5 & 120% input (in case of normal class accuracy).

We have tried to understand the impact on accuracy at full VA & quarter VA, it has been observed that the accuracy at full VA is much better than quarter VA.

RATED BURDEN		% OF RATED	SPECIFIED RATIO	OBSERVED RATIO
VA	P.F.	PRI.CURRENT	ERROR (+/-) IN %	ERROR (+/-) IN %
5	0.8	120	1.00	0.111
		5	3.00	-0.188
1.25	1.0	120	1.00	0.458
		5	3.00	0.382

Hence, it becomes clear that even from a system accuracy point of view, it is better to select CT's in line with the system VA requirement.



Primary to Secondary phase angle difference

The IEC standard also talks about primary to secondary phase angle difference, the limits are defined under this standard. We must ask the supplier to submit a test report which will have test results of the phase angle difference too, otherwise, the energy & power readings may differ from the actual readings.

<i>SPECIFIED PHASE ERROR (+/-) IN MIN</i>	<i>OBSERVED PHASE ERROR (+/-) IN MIN</i>
60	1.145
180	11.930
60	5.948
180	12.590



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