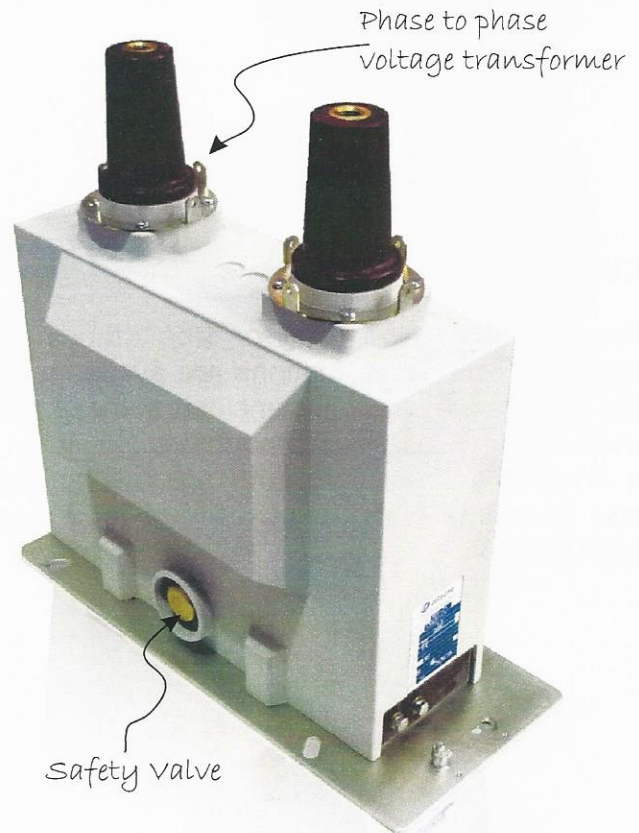


COST EFFECTIVE ALTERNATIVE BMK METERING SOLUTION

For many years the only way of measuring current and voltage values on medium voltage networks has been achieved by using conventional instrument transformers. With the rapid acceptance of modern equipment such as SF6 filled and solid insulation ring main units for example fitted with type C bushings, we can now easily incorporate fully screened solutions which have numerous advantages.

Some of these advantages include:

- Reinforced safety tested designs
- Ease of replacement without having to unbolt any primary connections
- Fully screened design (i.e.) impossible to have any faults between phases
- Tested to latest international specifications
- Much smaller footprints
- Available with phase to phase voltage transformers
- Minimum outage replacement periods



Outdoor type tested metal screen
current transformer

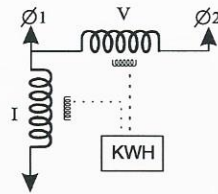
Reinforced Safety Design:

The units are designed, manufactured and available with an unique internal explosion valve that ensures the safety of the operating personnel and reduces the damage and destruction of the equipment in the unlikely event of a failure. These valves can be incorporated in a common exhaust system that ensures release to designated areas. A number of designs are available which are fitted inside the ring main unit cable boxes.



Combo Units:

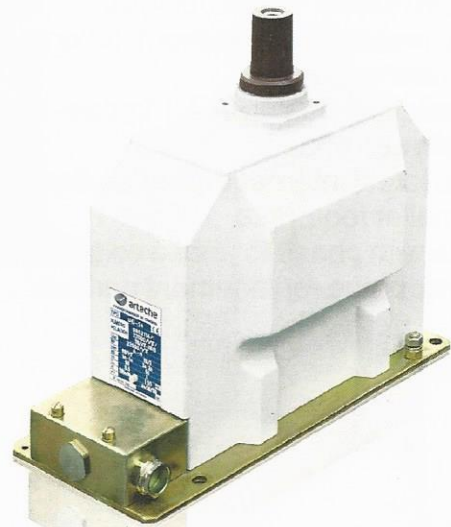
These units have combined current and voltage instrument transformers in relatively small volumes. All primary connections are available in type C bushings. They are available in multiple current ratios making it versatile and ideal for growing loads. All secondary outputs are clearly marked and are available in fully waterproof terminal boxes.



Housings:

Although most users opt for free standing designs without any housings. Options are available where the units are fitted in a metallic enclosure, these enclosures can be wall or free standing mounted.

An array of interlock designs are available between these housings and the associated feeder upstream switch gear.

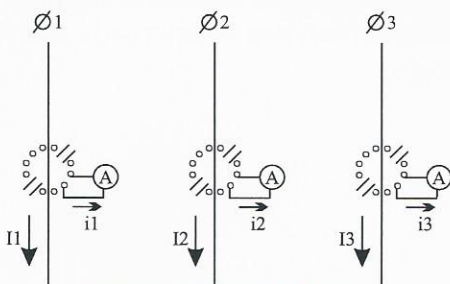


Financial Gains:

In a lot of cases investigated throughout South Africa we found the metering of consumers to be driven from instrument transformers on the secondary of the distribution transformers. This obviously results in the iron losses not being charged by the supplying utility.

With these designs the units can easily be integrated on the medium voltage network without compromising any of the parameters. The value of the iron losses could easily offset the cost of these units and reduce the payback period considerably (i.e.) on a 500 Kva unit the

Note All ring type CT's are available in split core type



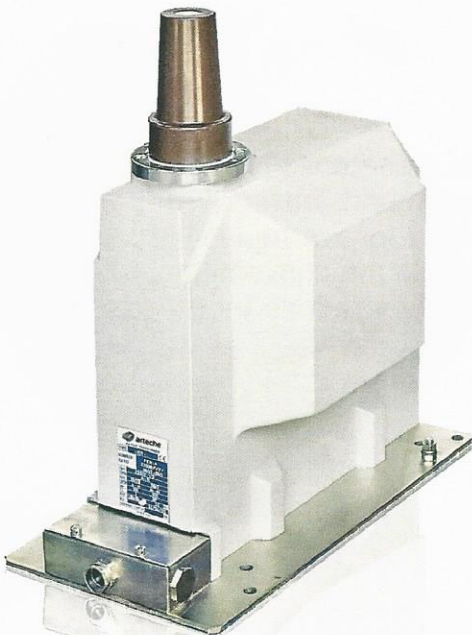
Protection Options:

Instead of the traditional method of protection which uses the high rupturing fuse links in series with the respective windings, these designs are available with fast acting devices fitted on the main body which can be incorporated into the upstream protection scheme. This innovative solution reduces/stops all existing insulation and mechanical weaknesses such as faulty springs, misalignment of phase spouts and partial discharge on the fuse compartment.



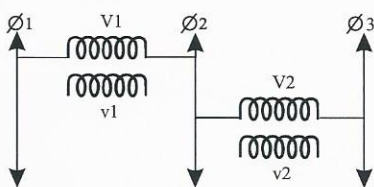
Primary Winding Applications:

The primary windings are available in a phase to earth as well as a phase to phase arrangement. Both have their uses and applications depending on the network where they are commissioned, but recently there has been a trend especially on networks with substantial number of voltage transformers connected on a common cable network to specify phase to phase units instead of phase to earth. This permits the testing of the system in the event of a cable fault without having to individually remove each unit from the network. This can save up to “hours” of driving around and isolating.



3 Phase units versus 1 Phase units:

This again depends on the Engineer’s personal preference but the cost and time required to upgrade or replace a unit is obviously in favour of the plug in single phase units. Often in the case of failure only the affected faulty phase unit needs to be replaced still allowing the system to partly “give us” some voltage readings. The current design used and specified in South Africa is also unique and is not installed elsewhere in any substantial volumes as most cases consists of a 3 phase unit with a floating neutral.



Note

No earthing issues

Partial Discharge Implications:

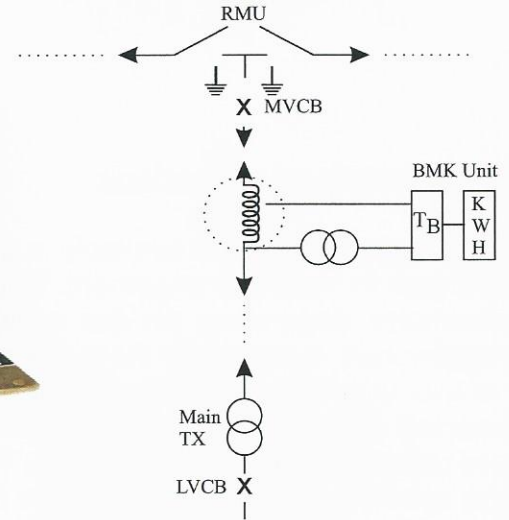
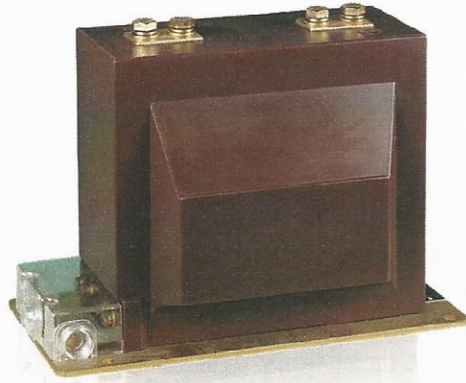
As we should all be aware partial discharge is responsible directly and indirectly for almost 80% of failures in medium voltage networks. Conventional designs that are not individually screened can develop from a series type fault into a shunt type fault such as phase to phase faults with catastrophic results. Type testing requirements have been continually reviewed and updated to ensure trouble free operation of these units in service. Even in the harshest conditions and it is imperative that all units purchased meet the latest requirements of the specification number IEC-61869. Amongst the whole list of tests the partial discharge requirements are:

For 1 pole (phase to earth) VT: <50pC at U_m ; <20pC at $1.2 U_m/v3$

For 2 poles (phase to phase) VT: <20pC at $1.2 U_m$



Indoor/Outdoor
Phase to Phase
Metering Unit
(Bottom Entry)



Various Applications:

The simple modular design of screened instrument transformer permits these units to be installed in various applications may it be upright, upside down, overhead, underground, basically anywhere. Recently a number of units have been supplied complete with surge arrestors for overhead applications. These units are a lot lighter and do not present any fire risks as for example the conventional oil filled units. The other main advantage is that being commissioned well high they reduce the vandal and interference factor substantially



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