

# MCM , CT & VT requirements

1. To monitor Low Voltage (<500V) and Line/Soft Starter/ VYE-Delta/DOL driven motor, MCM & 3 low voltage CTs are required.
2. To monitor Medium / High Voltage (>500V) and Line / Soft Starter / VYE – Delta/ DOL driven motor, MCM & 3 medium voltage CTs & 3 medium voltage VTs are required.
  - If motor supply cables are insulated it's possible to use low voltage CTs instead of medium voltage CTs
3. To monitor Low Voltage (<500V) and Frequency Converter driven motor 3 low voltage current sensors (CSs) & 1 power supply (PSU) unit are required.
4. To monitor Medium/High Voltage (>500V) and Frequency Converter driven motor 3 medium/high voltage CSs & 3 medium voltage VTs & 1 power supply (PSU) unit are required.

## Information that effect CT selection for MCM

1. Is it possible to use existing CTs? \* *Recommended for Medium & High voltage applications*
2. Line Drive (CT) or Inverter (Hall Effect CS) has to be used.
3. Ratio = (Motor Current) : 5, use **next** highest available
4. Motor lead wire size fits through CT opening
5. Physical dimensions fit in MCC cabinet
6. Mounting arrangements fit in MCC cabinet
7. If motor cable is insulated, possible to use Low voltage CTs instead of Medium/High Voltage CTs

## Low Voltage

### Low Voltage CT

Class : 0,5  
Secondary : 0 – 5 A  
Burden Rate : 10 VA



It's possible to use **Low Voltage CTs** with **insulated** motor cables.

*\* Please check the possible CTs from Artesis Price List(there is a limited stock)*

### Low Voltage Current Sensors

Frequency Band : DC – 200 kHz  
Secondary : 0 – 50 / 100 mA  
Accuracy:  $\pm 0.45\%$  VA



It's possible to use **Low Voltage CSs** with **insulated** motor cables.

*\* Please check the possible CSs from Artesis Price List(there is a limited stock)*

## Medium Voltage

### Medium Voltage CT

Class : 0,5  
Secondary : 0 – 5 A  
Burden Rate : 10 VA  
Bar / Wound Type  
Appx. 18 kg  
Delivery in 5 weeks



### Medium Voltage VT

Secondary 0 – 100V/ 120V  
Class : 0.5  
Burden Rate : 10VA  
Appx. 16 - 24 kg  
Delivery in 5 weeks



• **Medium Voltage CTs are not in Artesis price list**

## 1. Line driven systems

Line driven applications : Direct on line, star – delta or soft starter. Sensors should be selected such that the nominal motor values for current and voltage are around 70% of the corresponding sensor rating. Alternatively, for current transformers, the secondary current at nominal motor current should be between 3.5 – 4.5A. Failure to do so will result in a loss of sensitivity and the ability of MCM to detect motor degradation or change. Current transformer which is suitable for MCM usage specifications are given in following table.

Current Transformers				
Upper Voltage [kV]	Class	Secondary output range [A]	Standards	
			IEC	ANSI
0,72	0,5	0 – 5	60044 – 1	57.13
7,2	0,5	0 – 5	1851987	CS71978
12				
17,5				
24				

**MCM has ability to detect correct phase order and relative polarity automatically. No connection change needed.**

# Current Sensor Selection for MCM

Class (% Accuracy)

- 0.5 Recommended, Class 1 or 2 Usually OK

Rated Output Current

- **5A** – most common, MCM default
- **1A** – seen rarely, requires special MCM

Protection or Measurement CT?

- “Protection CT” **will not saturate** if overcurrent – DO NOT USE. MCM may be damaged due to high input current
- “Measurement CT” **will saturate** – **use this type** for best protection of MCM

Burden rate is power consumption on cables between MCM & CTs and in MCM internal measuring circuitry (resistance. MCM has a very low resistive circuitry inside 6.8mOhm and the cable resistance depends on the length and thickness of the cable but it will be very small as well.

MCM  $I_{xy}$  input resistance  $R = 6.8$  milli-Ohms

**MCM load on CT must be < CT rating (VA)**

Example: CT rating is 10VA, Cable length is 20 meters and total cable resistance is 0.1 Ohm

$$\text{Power} = V \cdot A$$

$$\text{Power} = I^2 R = 5 \cdot 5 \cdot (0.1 + 0.0068) = 5 \cdot 5 \cdot 0.1068 = \mathbf{2.67VA \text{ OK!}}$$

**If the cable you are using is less than 20 meters, 5VA will be enough which is the case in most application**