

## 1.6.4 Coils power

The power (P) indicated is referred to a temperature of 20°C.  
For DC current it is as follows:

$$P(\text{watt}) = V(\text{Volt}) \times I(\text{Ampere}); \quad P = \frac{v^2 (\text{Volt})}{R (\text{Ohm})}$$

In the case of AC current, the value is referred to the apparent power during inrush (connection moment) and during holding.

$$P(\text{VA}) = V(\text{Volt}) \times I(\text{Ampere})$$

In the case of AC current, voltage and current are not in phase with each other. Phase angle between current and voltage is shown by the angle  $\varphi$  of the resistance triangle (the three sides represent: resistance, reactance and impedance of the circuit).

In the case of AC current the power showed in Watt become:

$$P(\text{watt}) = V(\text{Volt}) \times I(\text{Ampere}) \times \text{power factor } \varphi$$

power factor  $\varphi$  = power factor is always less than 1

The power, or electric input, in a AC current solenoid valve, is higher during inrush while it decreases when the plunger's stroke is complete.

In the DC current solenoid valve, as the power depends from the coil's Ohmic resistance, the power is the same during inrush and also when the plunger's stroke is complete too.