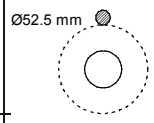
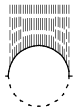
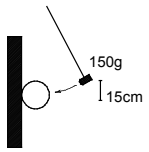
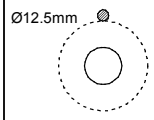
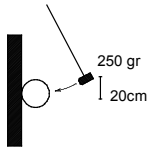
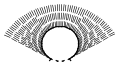
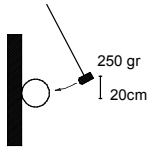
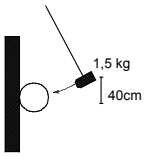
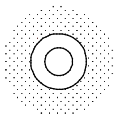
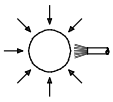
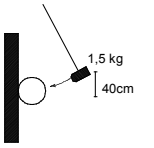
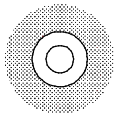
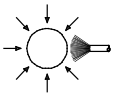
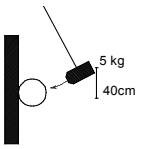
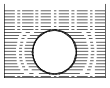
1.6.1 Protection class IP.....

Compliance with the standard DIN 40050 for the electrical protection at 1000 Volt AC and 1500 Volt DC

1st number: protection against solid bodies			2nd number: protection against liquids			3rd number: mechanical protection		
IP	**Testes**	**Description**	**IP**	**Testes**	**Description**	**IP**	**Testes**	**Description**
0		No protection	**0**		No protection	**0**		No protection
1		Protection against solid bodies larger than d.50 mm (ex. involuntary contact by hand)	**1**		Protection against the vertical fall of water drops (condensation)	**1**		Impact energy 0.225 joules
2		Protection against solid bodies larger than d.12mm (ex. finger contact)	**2**		Protection against the fall of water drops up to 15° from the vertical	**2**		Impact energy 0.375 joules
3		Protection against solid bodies larger than d. 2,5mm (ends of tools, wires)	**3**		Protection against the fall of water drops and rain up to 60° from the vertical	**3**		Impact energy 0.500 joules
4		Protection against solid bodies larger than d. 1 mm (ends of tools, thin wires)	**4**		Protection against water jets from all directions	**4**		Impact energy 2.00 joules
5		Protection against dust (no harmful deposits)	**5**		Protection against forced water jets from all directions	**7**		Impact energy 6.00 joules
6		Total protection against dust	**6**		Protection against water similar to waves	**9**		Impact energy 20.00 joules
			7		Protection against water immersion			
In the case of solenoid valves, use only the first two number								

1.6.2 Insulation class according to CEI 15-26

Insulation class	Temperature °C
Y	90
A	105
E	120
B	130
F	155
H	180
200	200
220	220
250	250

The indicated temperature is the effective temperature of the insulation and not the overtemperature.

1.6.3 Service

The coils are normally expected to be used in continuous service (ED100%).
Definition of "Continuous service": when the electrical connection time exceed the thermal constant of the coil by approx. 1/4 .
As a general rule, the continuous service corresponds to an electrical connection time that is equal or higher than 15 minutes.
It's possible, for non-continuous service (e.g. ED50%), either to have coils at powers that are higher than the standard ones, or to use the coils with an ambient temperature higher than the ones indicated.

$$\textbf{ED=} \frac{\text{connection time}}{(\text{connection time} + \text{disconnection time})}$$

$$\text{EXAMPLE=} \frac{5' \text{ (connection time)}}{5'(\text{connection time}) + 5'(\text{disconnection time})} \text{x100= ED50\%}$$

1.6.4 Coils power

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

$$P(Watt) = V(Volt) \times I(Ampere) \;;\; P = \frac{V^2\,(Volt)}{R\,(Ohm)}$$

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

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

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 φ 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:

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

power factor φ = 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.