

Solenoid

Solenoid Coils (Non-Electronic*)

Except where noted, all ASCO valves are equipped with coils which can be energized continuously without danger of overheating or failure. Standard coils have 18" leads which can be connected to any controlling device. Spade, screw terminal, and DIN-type spade connector coils are also available. For three phase power systems, the two leads can be connected to any two of the three phases.

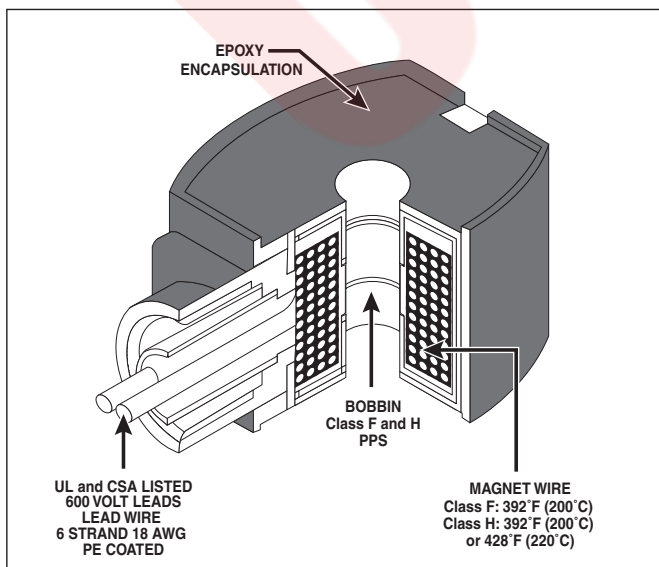
All coils are constructed in accordance with Underwriters Laboratories Inc., NEMA, IEEE, and other industrial standards ASCO Class B, F, and H insulation systems are UL listed in the Recognized Component Index (yellow book) under Guide No. OBJ2.

For AC ambient capabilities, see chart to the right. DC ambient capabilities are 104°F (40°C), or 131°F (55°C) for RedHat II depending on construction. These ambients are based on a minimum available voltage of 85% of nominal. If minimum available voltage is greater, a higher ambient limitation may be possible. Consult factory for details.

* See Pages 469-472 for RedHat Next Generation Electronic coils.

Coil Insulation Systems and Temperature Limitations

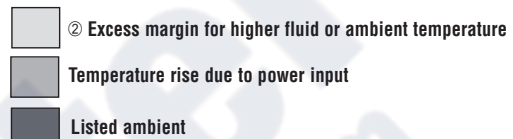
RedHat II Solenoid Class F 311°F (155°C) and Class H 356°F (180°C)



AC Ambient Capabilities

Industrial Temperature Limitations ① ⑤ and Thermal Characteristics of ASCO RedHat II Solenoids and Coils

The typical watt ratings given show the relationship between different classes of coil insulation and the watt ratings to achieve higher temperature capabilities. The information contained in these tables applies only to Non-Explosionproof, AC constructions.④



Notes:

- ① As measured by the "Resistance Method."
- ② Ambient temperatures are directly additive to coil rise — fluid temperature is not.
- ③ For M-6, 50 Hz wattage values, add 2 watts to the indicated values.
- ④ Because of explosionproof codes and surface temperature limitations, the maximum listed ambients for specific valves should not be exceeded. Consult factory concerning explosionproof applications where higher-than-listed ambients are encountered.
- ⑤ Maximum temperatures shown are industrial limits. For UL limits, subtract 27°F (15°C) for Class F coils and 36°F (20°C) for Class H coils.

Final Temperature °C (°F)

Final Temperature °C (°F)	Class "F" Limit		Class "H" Limit	
	FT	FB	HT	HB
200 (356°F)				
180 (311°F)				
160 (284°F)				
155 (284°F)				
140 (266°F)				
130 (266°F)				
120 (212°F)				
100 (194°F)				
90 (140°F)				
80 (125°F)				
60 (125°F)				
51.6 (125°F)				
40				
20				
0				

Coil Class	FT	FB	HT	HB
Typical AC Wattage Rating				
M6 ③	6.1	9.1	6.1	9.1
MXX	10.1	17.1	10.1	17.1
M12	16.1	20.1	16.1	20.1

Coil Operating Voltage Ranges

All coils are designed for industrial operating voltages and can be used on the following voltage ranges:

AC		DC	
Nominal Voltage Rating	Normal Operating Range	Nominal Voltage Rating	Normal Operating Range
24	20-24	6	5.1-6.3
120	102-120	12	10.2-12.6
—	—	24	20-25
240	204-240	120	102-126
480	408-480	240	204-252

Note: Special coils are required for battery charging circuits where wider voltage ranges are typically encountered. For these applications, special continuous duty Class H coils are available that will accommodate a voltage range equivalent to 12% over nominal, 28% under nominal, and a 140°F (60°C) ambient. Standard nominal voltages are 125 and 250 DC, which translate to a voltage range of 90-140 and 180-280, respectively. Add prefix "HC" to the catalog number. "HC" prefix is only applicable to valves with coil classes FT and HT. *Consult factory for other constructions.*

Most ASCO valves, depending upon construction, will operate at 15% under nominal voltage and maximum operating pressure differential, and are capable of operating for short periods at 10% over nominal voltage. For coil classes other than FT and HT, over voltage is not recommended. *For wider voltage ranges than shown here or for operating voltage ranges for specific catalog numbers, please consult your local ASCO sales office.*

Power Consumption

Power consumption can be determined from the ratings shown on individual Series pages. For AC valves, the watts, volt-ampere "inrush" (the high momentary surge occurring at coil energization), and volt-ampere "holding" (the continuous draw following inrush) are given.

The current rating for inrush and holding may be determined by dividing the voltage into the volt-amp rating:

$$\text{Inrush Amps} = \frac{\text{volt-amp inrush}}{\text{voltage}}$$

$$\text{Holding Amps} = \frac{\text{volt-amp holding}}{\text{voltage}}$$

DC valves have no inrush current. The amp rating can be determined by dividing the voltage into the DC watt rating:

$$\text{Amps} = \frac{\text{watts (DC)}}{\text{voltage}}$$

Notes:

1. When a valve has been energized for a long period, the solenoid becomes hot and can be touched by hand for only an instant. This is a perfectly safe operating temperature. Any excessive heating will be indicated by smoke and the odor of burning coil insulation.
2. Valves for AC service can be converted to other AC voltages simply by changing the coil. Similarly, DC valves can be converted to other DC voltages. *When converting from AC to DC, or vice versa, consult your local ASCO sales office for instructions.*

Solenoid Constructions

Internal parts in contact with fluids are of non-magnetic 300 and magnetic 400 series stainless steel. In AC constructions, the shading coil is normally copper, except that silver is mostly used in valves with stainless steel bodies. Other materials are available, when required. In DC constructions, no shading coil is required. Typically, the core tubes are of 300 series stainless steel.