

limit. Moreover, the maximum current which can be drawn from a power source at given a duty cycle depends upon size of winding wire, type of insulation and cooling system of the power source. In general, large diameter cable wire, high temperature resistant insulation and force cooling system allow high welding current drawn from the welding source at a given duty cycle.

10.4 Class of Insulation

The duty cycle of a power source for a given current setting is primarily governed by the maximum allowable temperature of various components (primary and secondary coils, cables, connectors etc.), which in turn depends on the quality and type of insulation and materials of coils used for manufacturing of power source. The insulation is classified as A, E, B, F & G in increase order of their maximum allowable temperature 60, 75, 80, 100 & 125 °C respectively.

10.5 High Frequency Unit

Some power sources need high frequency unit to start the arc like in TIG and plasma arc welding. High frequency unit is introduced in the welding circuit. Filters are used between the control circuit and HF unit to avoid damage of control circuit. High frequency unit is a device which supplies pulses of high voltage of the order of few KV and low current at high frequency (of few kHz). The high voltage pulse supplied by HF unit ionizes the gaseous medium between electrode and workpiece/nozzle to produce starting pilot arc which ultimately leads to the ignitions of the main arc. Although high voltage can be fatal for operator but at high frequencies current passes through the skin and does not enter the body. This is called skin effect i.e. current passes through the skin without any damage to the operator.

10.6 Feed drives for constant arc length

Two types of feed systems are generally used for maintaining the arc length a) constant speed feed drive and b) variable speed feed drive. In constant speed feed drives, feed rollers rotating at fixed speed are used for pushing/pulling wire to feed into the weld so as to maintain the arc length during welding (Fig. 10.4 a). This type drive is normally used with constant voltage power sources in conjunction with small diameter electrodes where self regulating arc helps to