Spot Weld Set-Up Sheet

To set-up a spot welder for welding two pieces of equal thickness materials the following recommended guidelines are suggested.

1. After studying the table for the material type and size thickness to be welded, the following machine settings can be preset as follows:

    a. Select and pre-set Tip Dia. for upper & lower electrode, from proper material & thickness to be welded chart.
    b. Select weld time from weld chart.
    c. Select weld force from chart.

Knowing the weld force depending on the machine being used, select the proper air pressure to provide this weld force. On press type machines, this can be determined by the pressure ratio from the air cylinder. (Force = P x A) Force = Sq. in. area x PSI.

On rocker arm type machines, the leverage of the air cylinder to the pivot point and the pivot point to the weld tips, should be determined and the weld force calculated from the air cylinder, sq. in. area x PSI (X leverage) to provide the actual tip force. (A tip force gauge is very useful in this case & can be used directly between the tips to determine the weld force. It is highly recommended for both rocker arm and press type machine set-up).

    d. Adjusting Weld Current

Adjusting the weld current is the only variable from the above settings which is now un-determined. We suggest starting (low) on Tap no. 1 of the welder and using a low percent current of 75% heat, now gradually increase the current by moving to tap 2 and making weld samples to determine the proper tap setting for your gauge material.

After the proper approx. Weld current is provided, now the percent heat dial can be moved up or down to provide a fine adjustment and a final setting of weld current can be obtained. Thus, setting the % heat in the range of 75% to 80% allows moving up or down to provide the proper current. Also, it is recommended to use the percent current in the higher ranges as high as 95% but always allow some extra adjustment for increasing or decreasing weld current for any general set-up.

The next step would be making peel tests to determine the weld nugget size & pull strength if a tensile tester machine is used. Also verifying the appearance of the welds to meet your general requirements is important at this time. After a proper setting is determined, logging each setting into a data sheet is important for future reference and also to help provide fine adjustments in any particular setting to provide the best quality or appearance weld.

The above outline should serve as a basic guide in assisting the set-up of a spot welder on a new application.

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Definition Of Accessories Available

Two-stage foot switch operation – provides for energizing of SVCR on first stage; and completion of cycle when second stage is reached. Low voltage (24volt) single position pilot is available on all timers by means of a separate transformer providing 24volt initiation.

AC Forge Delay – provides means of timing and energizing of a forging pressure system; timing from beginning of weld time.
Machine Control Relay – designed to energize a relay, for machine operations, at the end of hold time.
Dual Pressure – provides for the selection of either of two preset pressures.
Dual Schedule – provides for the selection of either of two preset weld times, heats and pressures (dual weld, dual heat, dual pressure).
Triple Weld – provides for the selection of either of three preset weld times.
Dual Weld Interval – provides for the selection of either of two preset weld interval times.
Water Control – designed to energize water valve solenoid coil at the beginning of the sequence and de-energizing the valve two minutes after the end of the weld sequence.
Phase Shift Heat Control – provides stepless single dial adjustment of weld current (heat) from 20-100% of rms value.
Dual Heat (or #2 heat) – provides for the selection of either of two preset heat or current levels.
Triple Heat (or #3 heat) – provides for the selection of either of three preset heat or current levels.
Up Slope – provides a means of controlling the initial and maximum weld heat current levels and timing the rate of current change.
Up-Down Slope – provides up slope as well as means to control the final heat level and time during which the welding current decreases from the end of weld heat time.
Quench-Temper – provides for an adjustable (quench) from the end of weld time to the beginning of post weld current time (temper). Weld and Temper heat control provided.
Weld Compensator – (Heat control – Current regulator) – device to maintain the rms current constant.
Weld/Slope/Compensator – device to provide Up Slope and Weld regulation.
Voltage Regulator – device to maintain the voltage on the primary of a resistance welder transformer constant.
Dual Gun Interlock – device to prevent simultaneous use of two guns when used with one control and single welder transformer.
Triple Gun Interlock – device to prevent simultaneous use of three guns when used with one control and single welder transformer.