Monitor and Checker Calibration

INTRODUCTION

The growing need to meet tighter manufacturing tolerances and eliminate errors makes accurate calibration and maintenance of monitors and checkers essential. AMADA WELD TECH, the leading manufacturer of resistance welding monitors and checkers, has developed a complete, single source program for the calibration, repair and maintenance of its current and voltage instruments.

Calibration verifies (a.) that the current, voltage and time measurement capabilities of a monitor or checker are within stated specifications, and that (b.) the instrument performs as specified when compared to a standard of known precision. The objective of calibration is to detect and eliminate inaccuracies. When companies meet these objectives, production downtime and rejected material can be reduced thus saving time and reducing costs.

This Connection will present information regarding calibration as it pertains to resistance welding monitors and checkers.

CALIBRATING RESISTANCE WELD MONITORS AND CHECKERS

Most companies understand the need to calibrate instruments and have incorporated calibration into their corporate quality statements. Conformance with ANSI, ISO and MIL-STD's (three of the primary guidelines used in industry today) is critical.

Q 9001 Section 4.11.1 and 4.11.2 section C defines the user requirements with regard to calibration: "The supplier shall establish and maintain documented procedures to control, calibrate, and maintain inspection, measuring, and test equipment (including test software) used by the supplier to demonstrate the conformance of product to the specified requirements. Inspection, measuring, and test equipment shall be used in a manner which ensures that the measurement uncertainty is known and is consistent with the required measurement capability."

It is important, therefore, to periodically calibrate resistance weld monitors and checkers to:

- Establish a known standard for measurement or testing.
- Minimize measurement uncertainty

Most users want to establish a "known standard" within their facilities. Many AC weld controls derive their current output by utilizing the triggering signal of the incoming voltage and calculating the measurement based on internal algorithms or look-up tables. Furthermore, they measure the primary current. AMADA WELD TECH checkers and monitors accurately measure the secondary current used in the process which is the actual current used to make the weld.

Factors in the manufacturing environment which may contribute to inaccurate measurements or readings, thus increasing the level of uncertainty, include: product damage or abuse, aging of electronic components (component drift) and human intervention. Resistance weld controls, monitors and checkers are not self calibrating, and, therefore, require periodic re-calibration to maintain accuracy. Manufacturers who do not provide periodic re-calibration of their equipment may experience production problems which are extremely difficult to detect because the process appears to be in tolerance.

AMADA WELD TECH monitors and checkers are often used as the standard by which resistance welding processes are evaluated. It is important, therefore, that these instruments are of known compliance with product specifications.

WHEN SHOULD CALIBRATION BE PERFORMED?

The frequency with which calibration is performed is based on a number of factors which may include one or more of the following:

- Internal quality standards
- Obvious damage to the instruments
- Questions that may have arisen with regards to accuracy

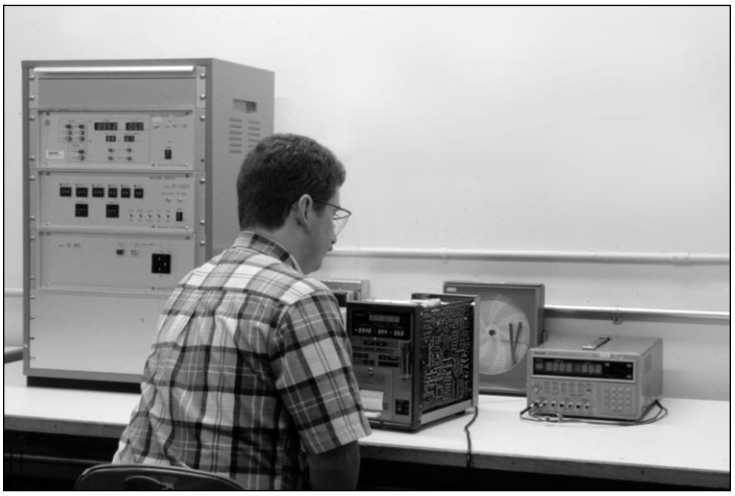


Figure 2 MX-24 Standard w/checker and coil

AMADA WELD TECH does not make specific recommendations regarding scheduling of calibration; historical information, however, has shown that a frequency of once every 6 – 12 months is beneficial. Specific attention should be given to equipment that has been dropped or damaged (e.g., impact to toroidal coils), and it is always a good practice to send the instrument in for re-calibration should accuracy concerns arise.

At AMADA WELD TECH, we calibrate all resistance weld monitors, checkers, and Toroidal Coils manufactured by AMADA WELD TECH to the original specifications.

AMADA WELD TECH CALIBRATION SERVICES

As with all free-market products, the market place provides a number of independent calibration service contractors. AMADA WELD TECH, however, is the only company that specializes in the resistance welding market. AMADA WELD TECH has developed a number of methods and calibration principles specific to AMADA WELD TECH products:

1. Calibration equipment utilized is specifically designed for AMADA WELD TECH resistance weld monitors, checkers and coils.

2. Calibration equipment is traceable to NIST standards

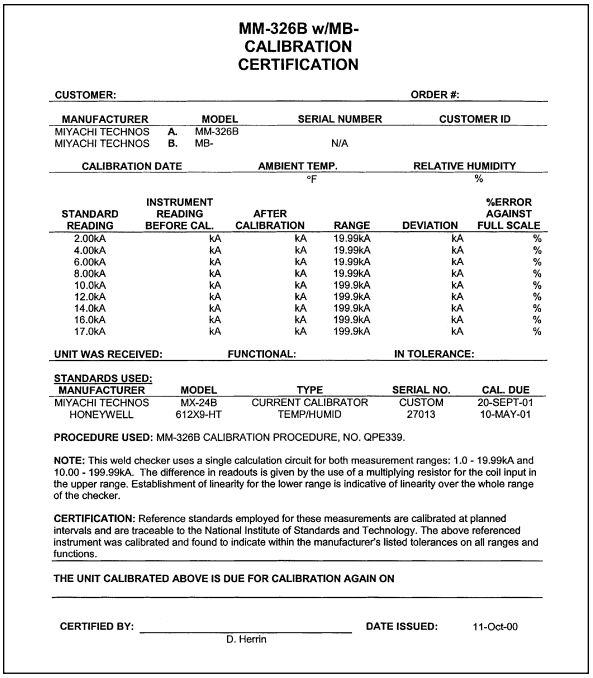
3. Personnel are trained in both calibration and repair of AMADA WELD TECH products.

4. Written procedures are designed specifically for AMADA WELD TECH equipment.

5. Most material required for repair is kept in stock for quick delivery.

6. We use only genuine AMADA WELD TECH parts.

7. All service is guaranteed.



MM-326B w/MB-CALIBRATION CERTIFICATION

CUSTOMER: ORDER #:

MANUFACTURER		MODEL	SERIAL NUMBER	CUSTOMER ID
MIYACHI TECHNOS	A.	MM-326B		
MIYACHI TECHNOS	B.	MB-	N/A	

CALIBRATION DATE	AMBIENT TEMP. °F	RELATIVE HUMIDITY %

STANDARD READING	INSTRUMENT READING BEFORE CAL.	AFTER CALIBRATION	RANGE	DEVIATION	%ERROR AGAINST FULL SCALE
2.00kA	kA	kA	19.99kA	kA	%
4.00kA	kA	kA	19.99kA	kA	%
6.00kA	kA	kA	19.99kA	kA	%
8.00kA	kA	kA	19.99kA	kA	%
10.0kA	kA	kA	199.9kA	kA	%
12.0kA	kA	kA	199.9kA	kA	%
14.0kA	kA	kA	199.9kA	kA	%
16.0kA	kA	kA	199.9kA	kA	%
17.0kA	kA	kA	199.9kA	kA	%

UNIT WAS RECEIVED: FUNCTIONAL: IN TOLERANCE:

STANDARDS USED:

MANUFACTURER	MODEL	TYPE	SERIAL NO.	CAL. DUE
MIYACHI TECHNOS	MX-24B	CURRENT CALIBRATOR	CUSTOM	20-SEPT-01
HONEYWELL	612X9-HT	TEMP/HUMID	27013	10-MAY-01

PROCEDURE USED: MM-326B CALIBRATION PROCEDURE, NO. QPE339.

NOTE: This weld checker uses a single calculation circuit for both measurement ranges: 1.0 - 19.99kA and 10.00 - 199.99kA. The difference in readouts is given by the use of a multiplying resistor for the coil input in the upper range. Establishment of linearity for the lower range is indicative of linearity over the whole range of the checker.

CERTIFICATION: Reference standards employed for these measurements are calibrated at planned intervals and are traceable to the National Institute of Standards and Technology. The above referenced instrument was calibrated and found to indicate within the manufacturer's listed tolerances on all ranges and functions.

THE UNIT CALIBRATED ABOVE IS DUE FOR CALIBRATION AGAIN ON

CERTIFIED BY: D. Herrin DATE ISSUED: 11-Oct-00

Figure 3 – Certificate

AMADA WELD TECH's calibration process quickly assesses and addresses customers' needs and requirements. By phoning our customer service department, users are able to receive an immediate quote and a return material authorization (RMA) number which facilitates the tracking of material sent to AMADA WELD TECH. The standard delivery after receipt of the equipment is 14 days. AMADA WELD TECH recommends that the coil used with the instrument also be returned so that a system calibration can be performed, ensuring the highest degree of accuracy. When complete, the user will be provided with a calibration certificate and a sticker which identifies the calibration date, who performed the calibration, and the date calibration will again be required. Additionally, a complete datasheet, shown at right, is included with every calibration at no additional cost.

SUMMARY

Proper calibration of resistance weld controls, monitors, and checkers, minimizes measurement uncertainty, establishes standards within a facility, and saves the manufacturer both time and money by reducing plant down-time due to process control fluctuations. The implementation of standard monitors and checkers within a manufacturing facility is a key element in the reduction of process uncertainty.

Contact AMADA WELD TECH Customer Service at (626) 303-5676 to discuss how our calibration services can benefit your company.

2024 991-458