

Welding machine verification services from ArcStrike

ArcStrike has partnered with Koomi Consulting to invest in a Calibrator Pro 600 portable load bank for calibration, validation and consistency testing of welding machines.

“Our new Calibrator Pro 600 portable load bank enables us to perform welding machine verification testing according to the new and international EN IEC60974-14: 2018 Standard, which supersedes the old EN 50504 verification standard referenced in ISO 3834 (via ISO 17662),” begins Sean Blake, the technical director of ArcStrike.

In the past, he says, it was typical industry practice simply to measure the welding current and voltage values during welding and compare them to the welding machine settings and meter readings. “This is difficult to do while welding since a live arc produces unstable and inconsistent readings. Values are constantly changing and getting all the necessary readings at the same instant becomes a challenge,” he says.

“The welding machine verification requirement has now been split into three different options: calibration, validation and consistency testing as described in IEC 60974-14, which makes the requirements for new and old welding machines much clearer,” notes Blake.

Calibration, he explains, is for modern welding machines that can measure and display actual welding current (A), voltage (V), and/or wire feed speed (m/minute) while welding. Here, the welding machine display values will be calibrated against a set of real reference values measured during the calibration tests.

As per the requirements of EN IEC 60974-14:2018, five sets of parameters need to be collected, typically at 20%, 40%, 60%, 80% and 100% of the welding machines output range. Alternatively, though, five sets of different values can be chosen across the normal operating range used when welding with the machine.

Validation is for welding machines where absolute values for the welding parameters can be set on the welding machine setting panel. In this case, the current (A), voltage (V) and/or wire feed speed (m/minute) settings are validated against the measurements taken during the test.

The third option, consistency testing, is for older welding machines where the pa-

rameters are set via non-specific dialled increments or units. The consistency test ensures that five discrete positions on the adjustment dials will be accurate and consistently deliver known current, voltage and/or wire-feed rate levels from one test to the next.

Welding machine verification incorporating calibration, validation and consistency testing of welding machines according to EN IEC 60974-14:2018 ensures that all welding machine settings can be effectively used to control the welding process and to ensure weld quality requirements are met, the welding process is repeatable, and that welding procedure specifications (WPSs) can be accurately implemented. “In terms of frequency, the new standard requires that all welding machines be verified at least once a year, and following any changes or repairs to the machine,” Blake adds.

In addition, the requirements are that the test be conducted under a steady electrical load. At the very least, this means that if welding while taking measurements, the welding arc-length must be kept constant. The standard does make provision for welding machine calibration of a TIG power source by creating a stable welding condition with a mechanically held torch.

“Our new Calibrator Pro 600 portable welding load bank enables us to mimic the electrical characteristics of any welding arc, so that more accurate measurements can be recorded quickly and easily,” he explains. The welding machine cables are connected to the calibrator, which creates typical welding load conditions when current passes through. Actual current and voltage readings are automatically recorded and displayed. While this is happening the welding machine values, meter readings or dial positions can also be noted. Wire feed speed, which is an important control parameter for GMAW, FCAW and SAW welding processes, can also be measured and recorded using a tachometer-based system.

Multiple load resistors are built into the Calibrator Pro 600, with resistive loads be-



ArcStrike's new Calibrator Pro 600 portable load bank for calibration, validation or consistency testing of welding machines according to the new and international EN IEC60974-14: 2018 Standard.

ing selected using the front panel switches. Five main load switches can be operated independently, with a sixth fine-step switch giving more precise adjustments of load. This enables over 150 different welding load values to be accurately tested, which allows all MIG/MAG, TIG and MMA power sources – GMAW, FCAW, GTAW, SMAW machines – with welding power ratings of up to 600 A to be tested at or very close to real operating conditions.

“For instance, on a MIG/MAG welding machine required to weld at 300 A, the load can be adjusted to deliver 29 V, while if TIG welding, it might need to be adjusted to give 22 V, and for MMA, 32 V might more accurately match the real welding parameters,” Blake explains.

Calibrator Pro instrument panels use precise, high stability electronics and accuracy levels exceed the highest requirements of IEC60974-14, which allows verification testing to precision grades, where needed.

This makes the system ideal for meeting the needs of all ISO 3834-certified fabricators, along with the demanding precision needs of the nuclear, power, and petrochemical industries.

ArcStrike offers a range of technical and consulting services to improve weld quality and productivity, including welding machine verification.

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