



Power Calibration Services

Summit of Accuracy

ISO/IEC17025 Accredited (RvA K164) European Standards Laboratory

Precision Making

BU B8510UA-01E-E

In pursuit of accuracy and precision

The drive for precision, and ever stringent performance targets of R&D projects, is directly influenced by global sustainability goals and as such there is an ever-increasing demand for accurate, precise and stable power measurements. However, no measurement is ever truly ‘correct’ no matter the precision of the measuring instrument, there is always an unknown, finite, non-zero difference between a measured value and the corresponding ‘true’ value.

In pursuit of precision Yokogawa’s ISO/IEC17025 accredited (RvA K164) European Standards Laboratory offers quantifiable confidence in a measurement system and its results. The European Standards Laboratory enables users to get world’s most accurate measurement results. It provides a form of quality assurance and trust which enables engineers to develop the next generation technologies that are environmentally friendly, energy efficient and stand out with leading performance.

Contents

In pursuit of accuracy and precision	2
European Standards Laboratory	4
True quality of measurements	6
It’s in our DNA	8
Ready for the next generation?	10
Request your calibration	12



 **400_v**
SYSTEM AC VOLTAGE

6.3_{kW}
RATED POWER

96.4%
EFFICIENCY

The Yokogawa European Standards Laboratory delivers:

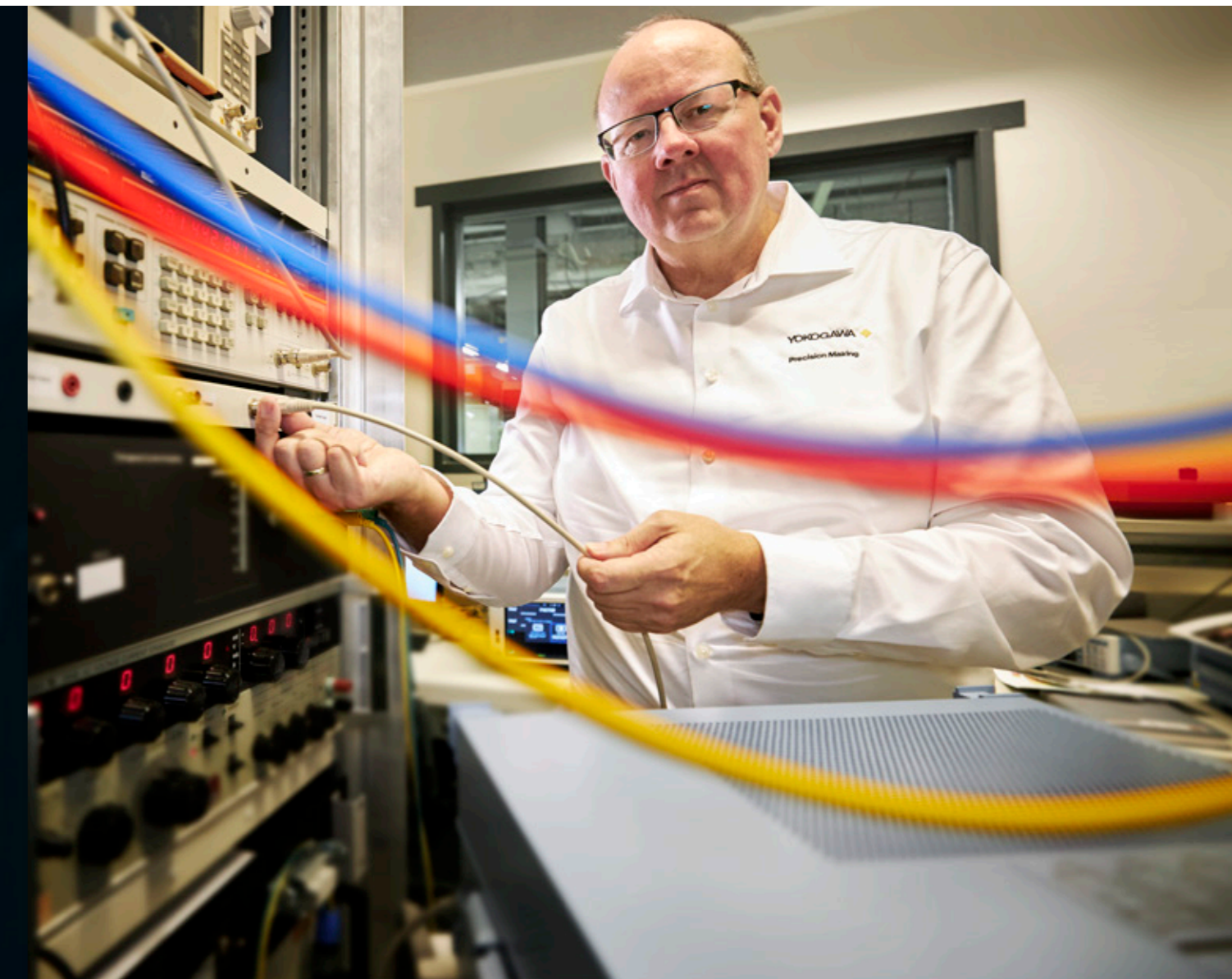
Certainty – With the energy efficiency and miniaturization opportunities afforded by faster switching speeds in modern power electronics, it is no longer enough to calibrate at traditional operating frequencies of 50/60 Hz. Power calibration up to 100 kHz addresses this new requirement and offers a significant increase of measurement certainty at a wider range of frequencies.

Performance – Specifications of measurement equipment are often limited by the standards and specific conditions of the manufacturers test facility and are valid for up to a year. Accredited calibration offers demonstrable proof of an instrument's true performance under more relevant or customer specified conditions often at much lower uncertainties than specified. It also gives engineers a better insight of an instruments long term reliability.

Accreditation – Yokogawa is the first industrial (i.e. non-government or national) organization in the world to offer accredited power calibration at frequencies up to 100 kHz. Being the authority in power measurement Yokogawa's ISO/IEC17025 accreditation (RvA K164) demonstrates the international mastery and competence of the laboratory.

'Several years ago we started the lab with an ambition to become the best commercial power calibration lab in Europe. Today we are proud to provide worldwide leading power calibration in frequencies up to 100 kHz, of unmatched uncertainty.'

Erik Kroon
Yokogawa Calibration Laboratory Manager



Calibration defines true quality of measurements

Scientists and engineers often need to capture the smallest of deviations on increasingly finer scales, particularly in system and compliance testing. It is vital therefore to have a reliable view of the ever-present uncertainty in the difference between the measured value and true value of a parameter. Calibration is a non-invasive method for gaining quantifiable confidence in a measurement system by comparing the instrument's performance to a standard with a known uncertainty. Regular calibration by a laboratory, which can provide very low measurement uncertainties at the specific measurement points applicable to individual users, enables instrument makers and their customers to have full confidence in their test results. Calibration isn't a matter of "fine-tuning" your measurement instruments. Rather, it ensures you can reliably use instruments to get the accurate test results you require to gain a complete insight into the power usage of your design, devices and systems. If you measure once and are very close to the known standard you are accurate, if you can do it repeatedly to the same closeness over a period of time your instrument is precise. It is only when a measurement system is considered both accurate and precise that it is valid and fit for applications where low uncertainty and quality measurements are required.



Confidence over time

Over time there is a tendency for measurement results and accuracy to 'drift'. Calibration can show whether an instrument has drifted outside its specifications. This can be caused by excessive inputs, environmental conditions, poor usage or the quality of the instrument itself. To be confident in the results being measured there is an ongoing need to maintain the calibration of equipment throughout its lifetime for reliable, accurate and repeatable measurements. Moreover, when a measurement instrument has been proven stable over time by regular calibrations, it also allows one to estimate its behavior in the future.

Improved specifications

A calibration certificate can even be used to improve the uncertainty of the measurement. The specifications of measurement instruments are often limited by the test capabilities present at the manufacturer production line. As the test instruments specifications need to be guaranteed over a complete production series this means that the actual performance of an individual instrument will differ within the specifications and often is better than specified. In these cases, calibration provides quantifiable confidence and clear insight in the actual accuracy of an individual instrument.

Reduced risk

Calibration can prevent working with an instrument that is providing unreliable data, which not only is a loss of time but also has impact on the business in the form of compliancy issues or faulty products.

'By proving the measurement accuracy and providing a high level of quality assurance, accredited power calibration plays a vital role in effective risk management.'



1960

Yokogawa's APR-2 Power Standard sets 'the standard' with 0.1% accuracy, and is used globally in national standards laboratories all over the world.

today

Yokogawa keeps leading the way in calibration standards. The latest generation of high compliance bench top AC and DC calibrators are found in analogue meter laboratories and on production lines around the world.



1915

The first power measuring instrument was a portable analog-type wattmeter for switch boards.



today

The award winning WT5000 Precision Power Analyzer is the world's most accurate power analyzer.



It's in our DNA

Over 100 years of precision making

Yokogawa was founded in 1915, a time when the world was witnessing the 2nd industrial revolution as the heavy industry moved away from steam to electricity for its energy needs. The sudden rise of heavy industries consumed much of that new energy.

At first, Yokogawa developed the watt-hour meters which were used to measure the consumed power for manufacturing, and soon became internationally recognized for mass produced precision power meters as well as developing highly precise power standards for calibration of those power meters.

To this day, Yokogawa continues its leadership in power measurement, offering not only the world's most accurate power analyzers that enable the development of next generation electronics, but also a leading calibration facility that enables users to get the most accurate test results.

We are known for being 'precision makers' and by that we mean we are committed to making the most reliable instruments that operate with the highest level of certainty in the readings taken over their lifetime.

Ready to develop the next generation Power Conversion Technologies?

To have trust in the measurements results of a power analyzer the instrument needs to be calibrated according to the application requirements. This does not only mean that the capabilities of the calibration laboratory must cover small currents for manufacturers of home and office appliances, but also higher voltages and currents at different phase angles for industrial applications such as inverters, electric motors and renewable energy.

Typically, calibration laboratories use pure sine waves at 50 Hz as a reference to calibrate instruments. The reason for this is that sine waves are the best known and described waveforms and are fairly easy to reproduce. As power conversion technologies are increasingly switching at higher speeds, harmonic content is introduced at much higher frequencies. The voltage and current signals in any of these

applications are distorted by the inverter, which mean higher frequency components must be analyzed.

These applications require a calibration of the measuring instrument on both DC and AC power on all frequency components that the signals contain. Calibration over a wide frequency range not only gives traceability on power measurements with distorted waveforms, it also proves the performance of a power analyzer. A power analyzer can be found well within specifications on 50/60 Hz while it can have an offset on higher frequencies. This offset is not detected when calibrating only on mains frequency. To ensure their power analyzers are calibrated for the application requirements of their customers, Yokogawa has developed a 100 kHz power calibration system, which is ISO/IEC17025 accredited (RvA K164) and calibrates electrical power at DC and AC from 10 Hz to 100 kHz.



ISO/IEC17025 Accreditation (RvA K164)

Quality systems such as ISO9001 aim at confirming the compliance of the management system to an international standard, but does not specifically evaluate the technical competence of a laboratory.

Laboratories that are accredited to ISO/IEC17025, like the Yokogawa European Standards Laboratory, have demonstrated that they are technically competent and able to produce precise and accurate calibration measurements that are globally recognized.



ILAC MRA: "Accredited once, accepted everywhere".

ILAC Mutual Recognition Arrangement enhances the acceptance of products across national borders, removing so the need for additional calibration in import countries. In this way the ILAC MRA promotes international trade and the free-trade goal of "accredited once, accepted everywhere" can be realized.

RvA is participant in ILAC MRA, assuring in this way compliance with relevant international accreditation standards. Other participants are DakkS (Germany), UKAS (UK), SAS (Switzerland), COFRAC (France), Accredia (Italy) and other altogether 90 accredited signatories worldwide.



Phone
+31 (0) 88 464 1000

Website
tmi.yokogawa.com/eu/support/calibration

Email
tmi@nl.yokogawa.com



"Precision is all around us. In everything we see, everything we touch. It means the difference between success and failure, safe and unsafe, sustainable and unsustainable. But precision doesn't just happen. It's made. **We are the Precision Makers.**"

**Send us your
Power Calibration inquiry**

**When your power application
demands high accuracy and
precision, go for certainty,
performance and ISO17025
accredited calibration!**

Headquarters

Yokogawa Europe B.V.
Test & Measurement
Euroweg 2
3825 HD Amersfoort
The Netherlands
Tel. +31 88 464 1429
tmi@nl.yokogawa.com

Local sales offices

Benelux
 Yokogawa Europe Solutions B.V.
 Test & Measurement
 Euroweg 2
 3825 HD Amersfoort
 The Netherlands
 Tel. +31 88 464 1429

Italy
 Yokogawa Italia S.r.l.
 Via Assunta 61
 20834 Nova Milanese - MB
 Italy
 Tel. +39 02 66 055 1

United Kingdom
 Yokogawa UK Ltd
 Measurement Technologies Division
 Stuart Road, Manor Park
 Runcorn, Cheshire WA7 1TR
 United Kingdom
 Tel. +44 1928 597200

Germany
 Yokogawa Deutschland GmbH
 Gewerbestrasse 17
 D-82211 Herrsching
 Germany
 Tel. +49 815293 100

Distribution network

Yokogawa Test & Measurement has an extensive distribution network in Europe. To find the representative in your country or close to you, go to: tmi.yokogawa.com/ea or call +31 (0) 88 464 1000 or email to tmi@nl.yokogawa.com

**International offices**

Global Sales: YOKOGAWA TEST & MEASUREMENT CORPORATION Phone: +81-422-52-6237 E-mail: tm@cs.jp.yokogawa.com
North America: YOKOGAWA CORPORATION OF AMERICA Email: tmi@us.yokogawa.com
China: YOKOGAWA SHANGHAI TRADING CO., LTD. Phone: (86)-21-6239-6363 Email: tech@ysh.com.cn
Korea: YOKOGAWA ELECTRIC KOREA CO., LTD. Phone: (82)-2-2628-3810 Email: TMI@kr.yokogawa.com
South East Asia: YOKOGAWA ENGINEERING ASIA PTE. LTD. Phone: (65)-62419933 Email: TMI@sg.yokogawa.com
India: YOKOGAWA INDIA LTD. Phone: (91)-80-4158-6396 Email: tmi@in.yokogawa.com
Russia: YOKOGAWA ELECTRIC CIS LTD. Phone: (7)-495-737-78-68 Email: info@ru.yokogawa.com
South America: YOKOGAWA AMERICA DO SUL LTDA. Phone: (55)-11-5681-2400
Middle East & Africa: YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c) Phone: (973)-17-358100 Email: help.ymatmi@bh.yokogawa.com

Subject to change without notice.
 Product and service overview. Copyright ©Yokogawa 2020.
 Printed in The Netherlands 2020.