

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Test and Calibration Equipment

with type designation(s)
JOFRA ETC, MTC, CTC, RTC-159, PTC-125, mAcal

Issued to
Ametek Denmark A/S
Allerød, Denmark

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

The instruments are only approved as portable test instruments.
Traceable calibration certificate is available from the manufacturer.

Issued at **Høvik** on **2019-03-22**

for **DNV GL**

This Certificate is valid until **2022-06-30**.

DNV GL local station: **Copenhagen**

Approval Engineer: **Ståle Sneen**

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Trond Sjøvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-004187-6**
 Certificate No: **TAA00001JX**
 Revision No: **1**

Product description

Calibrators type: JF and JOFRA

Parameter	Type no JF	Type no. JOFRA	Lower cal. setpoint	Upper cal. setpoint
Temperature	JF MTC-140 A	JOFRA MTC-140 A	-30°C to -2°C *	140°C
Temperature	JF MTC-320 A	JOFRA MTC-320 A	10°C to 50°C *	320°C
Temperature	JF MTC-650 A	JOFRA MTC-650 A	10°C to 50°C *	650°C
Temperature		JOFRA MTC-650 A MKII	5°C to 50°C *	650°C
Temperature		JOFRA CTC-155 A/C	-37°C to -7°C	155°C
Temperature		JOFRA CTC-320 B	10°C to 50°C *	320°C
Temperature		JOFRA CTC-350 A/C	5°C to 55°C	350°C
Temperature		JOFRA CTC-650 B	10°C to 50°C *	650°C
Temperature		JOFRA CTC-660 A/C	5°C to 55°C	660°C
Temperature		JOFRA ETC-125 A	-18°C to 6°C *	125°C
Temperature		JOFRA ETC-400A	5°C to 45°C *	400°C
Temperature		JOFRA ETC-400R	5°C to 45°C *	400°C
Temperature		JOFRA PTC-125 A/B/C	-90°C to -73°C *	125°C
Temperature		JOFRA RTC-159 A/B/C	-100°C to -83°C *	155°C
milliamp Calibrator		JOFRA mAcal		

*Depending upon environmental temperature (see technical specification)

Application/Limitation

The Type Approval covers hardware listed under Product description.

Products approved by this certificate are accepted used for calibration on all vessels classed by DNV GL.

Type Approval documentation

The approval is based on the following documentation:

Specification sheets:

SS-CTC issue 1704
 SS-CTC-320/650/1200 issue 1701
 SS-ETC issue 1109
 SS-MACAL issue 1201
 SS-MTC_Marine issue 0515
 SS-PTC-125 issue 1503
 SS-RTC-159 issue 1503

Technical Specifications:

MTC-140 A: 105394 00 dated 2001-10-01
 MTC-320 A: 105395 00 dated 2001-10-01
 MTC-650 A: 105396 00 dated 2001-10-01
 CTC-320 B: 105388 02 dated 2002-08-12
 CTC-650 B: 105389 02 dated 2002-08-12
 ETC-125 A: 124034 01 dated 2003-02-13
 ETC-400 A: 124035 01 dated 2003-02-13
 ETC-400 R: 124501 00 dated 2003-11-19
 mAcal: 103936 00 dated 1997-08-21

User Manuals:

mAcal: 103887 02 dated 2016-08-15
 MTC-140/320/650 A 105337 06 dated 2017-07-31
 CTC-140/320/650 A/B 123199 04 dated 2013-10-10
 ETC-125A/400A/400R: 123943 07 dated 2018-03-15 (User- and Reference Manual)
 PTC-125 A/B/C 128206 06 dated 2018-03-13
 RTC-159 A/B/C 128206 06 dated 2018-03-13

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CTC-155/350/660 A/C 129591 02 dated 2018-11-15

Service Manuals:

mAcal: 105321 00 dated 1999-02-12
CTC-140/320/650 A/B 123200 05 dated 2014-01-24
MTC-140/320/650 A 123200 05 dated 2014-01-24
ETC-125A/400A/400R 124151 00 dated 2003-03-18
PTC-125 A/B/C 127417 02 dated 2018-04-06
RTC-159 A/B/C 127417 02 dated 2018-04-06
CTC-155/350/660 A/C 129586 01 dated 2018-12-11
MTC-650 A MKII 129586 01 dated 2018-12-11

Reference manuals:

CTC-320/650 B 123198 08 dated 2017-08-15
ETC-125A/400A/400R 123943 07 dated 2018-03-15
RTC-159 A/B/C 127139 17 dated 2018-03-22
PTC-125 A/B/C 127915 09 dated 2017-09-19
CTC-155/350/660 A/C 129375 04 dated 2018-11-29
MTC-650 A MKII 130067 00 dated 2018-12-11

Manual calibration procedure: P/N 0600001/2/5

Accept Test Report for Compact Calibrators dated 1999-01-29

DNV survey report dated 1999-05-11

Test report for drop test IPI and CSC200 dated 2005-04-01

Test report for accuracy mAcal dated 2005-03-23

Ametek test report IPI Mk II/APM/CSC/ASC 1 m drop test acc. to IEC 61010-1 8.2.2 dated 2012-11-12

Ametek test report RTC-159-100C dated 2012-12-21

Ametek test report CTC-MTC-RTC dated 2018-12-21

EMC test report B2015138 dated 2015-11-10 – CTC-350 EN 61326-1:2013

EMC test report B2019031-3 dated 2019-02-27 – CTC-155 EN 61326-1:2013

Type approval renewal assessment report for A-13165, DNV GL Copenhagen 2017-12-14

Tests carried out

24 hours endurance test of temp.calibrators at max. setpoint, and at min. setpoint with active cooling.

Pressure test of pressure calibrators to 1.5 times max. pressure.

Drop test of hand held devices.

EMC tests according to IEC 61326-1.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

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Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE