

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Test and Calibration Equipment**

with type designation(s)

Temperature Calibrators ETC600, MTC 350/650, 350H/650H Pressure Calibrators MPCE Series, MPC Series, PPC Series

Issued to

**Nagman Instruments & Electronics (P) Ltd
Chennai, Tamil Nadu, India**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships and High Speed and Light Craft
Det Norske Veritas' Offshore Standards****Application :****The instruments are only approved as portable test instruments.****Traceable calibration certificates are available from the manufacturer.**This Certificate is valid until **2018-12-31**.Issued at **Høvik** on **2015-01-22**DNV GL local station: **Chennai**Approval Engineer: **Ståle Sneen**for **DNV GL**

Digitally Signed By: Nesvåg, Odd Magne

Location: DNV GL Høvik, Norway

Signing Date: 2015-01-27

**Odd Magne Nesvåg
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.

Certificate No: **A-14134**
 File No: **890.90**
 Job Id: **262.1-010655-2**

Product description

The ETC600 is an Economy Medium Temperature Dry Block Calibrator with an accuracy of $\pm 0.15\%$ FS. The MTC350/650 is a Microprocessor based Low Temperature Calibrator with accuracy $\pm 0.4^\circ\text{C}/\pm 0.6^\circ\text{C}$ with serial interface and software included. The 350H/650H is a Low/Medium Temperature Dry Block Calibrator with an accuracy of $\pm 1^\circ\text{C}/\pm 1.5^\circ\text{C}$.

The MPC-E Series are Pneumatic / Hydraulic Pressure Calibrators Microprocessor with an accuracy of $\pm 0.1\%$ FS.

The MPC Series are Microprocessor based High Accuracy ($\pm 0.05\%$ FS) & Very High Accuracy ($\pm 0.025\%$ FS) Pressure Calibrators

The PPC Series are Pneumatic/Hydraulic Portable Pressure Calibrators with In-built / Integrated Pump & Vernier assembly with an accuracy of $\pm 0.05\%$ FS (PPC Series) & $\pm 0.025\%$ FS (PPC+ Series).

Model	Range	Power Supply
Temperature calibrators		
ETC600	50°C to 600°C	230 VAC / 50 Hz / 1200 W
MTC350/650	50°C to 350°C and 650°C	220 VAC / 50 Hz / 1200 W
350H	10°C above ambient to 350°C	230 VAC /50 Hz & 115 VAC /60 Hz
650H	20°C above ambient to 650°C	230 VAC /50 Hz & 115 VAC /60 Hz
Pressure calibrators		
MPC-E Series	Ultra Low Pressure: +/- 2000/5000/8000 mmWC Pneumatic: -0.85 to 2/10/20/35/40 Bar Hydraulic: 0 to 70/100/200/350/600/700 Bar	9 VDC Battery
MPC Series	Pneumatic: -0.85 to 2/10/25/40 Bar Hydraulic: 0 to 70/100/200/350/700 Bar	Rechargeable Battery and Charger
PPC Series	PPC-P: -0.85 to 2/10/20 Bar (Pneumatic) PPC-H: 0 to 200/400 Bar (Hydraulic) PPC-D: -0.85 to 20 Bar (Pneumatic) 0 to 400 Bar (Hydraulic)	Rechargeable Battery and Charger

Application/Limitation

The Type Approval covers hardware listed under product description. The instruments are only approved for use as portable test instruments. The Type Approval of temperature and pressure calibrators are only valid for units with a valid calibration certificate.

Type Approval documentation

- [I-1] ETC600 Datasheet no.: NIE/TS/ETC600/7.3, 01/00
- [I-2] ETC600 El. Drawing no.: NIE/ELECT/ETC600/001, rev.0
- [I-3] ETC600 Mechanical drawing no.: NIE/MECH/ETC600/001, rev.0
- [I-4] ETC600 Instruction Manual no.: NIE/MAN/ETC600/8.2.4
- [I-5] ETC600 Reports for Environmental testing
- [I-6] 350H Datasheet no.: NIE/TS/350H/H2/7.3, 01/00
- [I-7] 650H Datasheet no.: NIE/TS/650H/H2/7.3, 01/00
- [I-8] 350H/650H El. drawing no.: NIE/MECH/350H/650H/013B, rev.0
- [I-9] 650H - General Assembly Mech. Drawing no.: NIE/MECH/650H/001A, rev.0
- [I-10] 350H/H2-650H/H2 Instruction Manual no.: NIE/MAN/350H/650H/8.2.4
- [I-11] 650H Reports for Environmental testing
- [I-12] MTC350-650 Data sheet no.: NIE/TS/MTC650/350/7.3, 01/00
- [I-13] MTC350-650 El. drawing no.: NIE/ELECT/MTC350/650/020, rev.0
- [I-14] MTC350-650 Mech. drawing no.: NIE/MECH/MTC350/650/001, rev.0
- [I-15] MTC 650/350 Instruction Manual no.: NIE/MAN/MTC350/650/8.2.4
- [I-16] MTC 650/350 Reports for Environmental testing
- [I-17] MPC-E Datasheet no.: NIE/TS/MPC-E/7.3, 01/00
- [I-18] MPC-E Wiring diagram no.: NIE/ELECT/MPCE/001, rev.00
- [I-19] MPCE General assembly no.: NIE/MECH/MPCE/001, rev.00

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[I-20] MPC-E Instruction Manual no.: NIE/MAN1/MPC-E/8.2.4, 01/00
[I-21] MPCE Reports for Environmental testing
[I-22] MPC Datasheet no.: NIE/TS/MPC/7.3, 01/00
[I-23] PPC/MPC Wiring diagram no.: NIE/ELECT/PPC/MPC/001, rev.0
[I-24] MPC Series Mech. drawing no.: NIE/MECH/MPC/001, rev.0
[I-25] MPC Series Instruction Manual no.: NIE/MAN/MPC/8.2.4
[I-26] MPC Series Reports for Environmental testing
[I-27] PPC Series datasheet no.: NIE/TS/PPC/7.3, rev.01/00
[I-28] PPC/MPC Schematic Wiring diagram no.: NIE/ELECT/PPC/MPC/001, rev.0
[I-29] PPC General assembly no.: NIE/MECH/PPC-P/001, rev.0
[I-30] PPC Series Instruction Manual no.: NIE/MAN/PPC/8.2.4
[I-31] PPC Reports for Environmental testing
[I-32] 24h Temperature Endurance Test at maximum temperature (temperature calibrators) dated 2010-11-09
[I-33] Pressure test at 150% of design pressure (pressure gauges/pumps/hoses) dated 2010-11-09
Type approval assessment report for A-12066, DNV GL Chennai dated 2015-01-06.

Tests carried out

Environmental tests according to DNV Standard for Certification No. 2.4, April 2006.
24h Temperature Endurance Test at maximum temperature for Temperature Calibrators.
Pressure test at 150% of design pressure (pressure gauges/pumps/hoses).

Marking of product

Each model is marked with manufacturer name, model name and serial number.

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE