

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Test and Calibration Equipment

with type designation(s)

**JOFRA Reference Temperature Calibrator RTC-156/157,
JOFRA Handheld Pressure Calibrator HPC400/500/502/550Ex/552Ex**

Issued to

**Ametek Denmark A/S
ALLEROD, Denmark**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and 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 **2018-06-30**.

Issued at **Høvik** on **2014-09-22**

DNV GL local station: **Copenhagen**

for **DNV GL**

Approval Engineer: **Ståle Sneen**

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**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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **A-13921**
 File No: **890.90**
 Job Id: **262.1-002398-4**

Product description

JOFRA™ Reference Temperature Calibrators comprising the following models:

Model	Calibration temperature range
RTC-156A/B/C	-30°C* to 155°C
RTC-157A/B/C	-45°C* to 155°C

* Low temperature limit at 23°C ambient temperature.
 The limit depends on environmental temperature, ref. technical specification sheets.

JOFRA™ Handheld Pressure Calibrators comprising the following models:

Model	Pressure range		Pressure range / description
	Port 1	Port 2	
<u>HPC400</u>			<i>Single sensor, single port, high accuracy pressure calibrator series</i>
HPC400	002C	-	Vacuum to 2 bar gauge/compound
HPC400	007C	-	Vacuum to 7 bar gauge/compound
HPC400	020C	-	Vacuum to 20 bar gauge/compound
<u>HPC500</u>			<i>Single sensor, dual port, high accuracy pressure calibrator series</i>
HPC500	25MD	-	±25 mbar differential
HPC500	70MD	-	±70 mbar differential
HPC500	350MD	-	±350 mbar differential
HPC500	001A	-	0 to 1,1 bar absolute
HPC500	001C	-	Vacuum to 1 bar gauge/compound
HPC500	002A	-	0 to 2 bar absolute
HPC500	002C	-	Vacuum to 2 bar gauge/compound
HPC500	007A	-	0 to 7 bar absolute
HPC500	007C	-	Vacuum to 7 bar gauge/compound
HPC500	020A	-	0 to 20 bar absolute
HPC500	020C	-	Vacuum to 20 bar gauge/compound
HPC500	035C	-	Vacuum to 35 bar gauge/compound
HPC500	070G	-	0 to 70 bar gauge
HPC500	200G	-	0 to 200 bar gauge
HPC500	350G	-	0 to 350 bar gauge
HPC500	700G	-	0 to 700 bar gauge
<u>HPC502</u>			<i>Dual sensor, dual port, high accuracy pressure calibrator series</i>
HPC502	001A	001A	0 to 1,1 bar absolute
HPC502	001C	001C	Vacuum to 1 bar gauge/compound
HPC502	002A	002A	0 to 2 bar absolute
HPC502	002C	002C	Vacuum to 2 bar gauge/compound
HPC502	007A	007A	0 to 7 bar absolute
HPC502	007C	007C	Vacuum to 7 bar gauge/compound
HPC502	020A	020A	0 to 20 bar absolute
HPC502	020C	020C	Vacuum to 20 bar gauge/compound
HPC502	035C	035C	Vacuum to 35 bar gauge/compound
HPC502	070G	070G	0 to 70 bar gauge
HPC502	200G	200G	0 to 200 bar gauge
HPC502	350G	350G	0 to 350 bar gauge
HPC502	700G	700G	0 to 700 bar gauge
<u>HPC550 Ex</u>			<i>Single sensor, dual port, high accuracy pressure calibrator series, intrinsically safe</i>
HPC550	25MD	-	±25 mbar differential
HPC550	70MD	-	±70 mbar differential
HPC550	350MD	-	±350 mbar differential
HPC550	001A	-	0 to 1,1 bar absolute
HPC550	001C	-	Vacuum to 1 bar gauge/compound
HPC550	002A	-	0 to 2 bar absolute

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Model	Pressure range		Pressure range / description
	Port 1	Port 2	
HPC550	002C	-	Vacuum to 2 bar gauge/compound
HPC550	007A	-	0 to 7 bar absolute
HPC550	007C	-	Vacuum to 7 bar gauge/compound
HPC550	020A	-	0 to 20 bar absolute
HPC550	020C	-	Vacuum to 20 bar gauge/compound
HPC550	035C	-	Vacuum to 35 bar gauge/compound
HPC550	070G	-	0 to 70 bar gauge
HPC550	200G	-	0 to 200 bar gauge
HPC550	350G	-	0 to 350 bar gauge
HPC550	700G	-	0 to 700 bar gauge
			<i>Dual sensor, dual port, high accuracy pressure calibrator series, intrinsically safe</i>
<u>HPC552 Ex</u>			
HPC552	001A	001A	0 to 1,1 bar absolute
HPC552	001C	001C	Vacuum to 1 bar gauge/compound
HPC552	002A	002A	0 to 2 bar absolute
HPC552	002C	002C	Vacuum to 2 bar gauge/compound
HPC552	007A	007A	0 to 7 bar absolute
HPC552	007C	007C	Vacuum to 7 bar gauge/compound
HPC552	020A	020A	0 to 20 bar absolute
HPC552	020C	020C	Vacuum to 20 bar gauge/compound
HPC552	035C	035C	Vacuum to 35 bar gauge/compound
HPC552	070G	070G	0 to 70 bar gauge
HPC552	200G	200G	0 to 200 bar gauge
HPC552	350G	350G	0 to 350 bar gauge
HPC552	700G	700G	0 to 700 bar gauge

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 is only valid for units with valid calibration certificate(s).

Ex-certification is not covered by this certificate and the following paragraph, which is for information only, is based on information received from the manufacturer, but not verified by DNV.

Information on Ex-Certification received from manufacturer – Not verified by DNV		
Equipment	Certified	Certificate No.
HPC-550 Ex, HPC-552 Ex	⊕ II 2 G Ex ia IIB T3 Gb (Ta = -10 °C to +45 °C)	KEMA 10ATEX0168 X Issue No. 1
HPC-550 Ex, HPC-552 Ex	IECEX Ex ia IIB T3 Gb (Ta = -10 °C to +45 °C)	IECEX CSA 10.0013X Issue No. 0

Type Approval documentation

- Specification sheets: SS-RTC-156/157 Issue 1302,
 SS-HPC400 Issue 1111,
 SS-HPC500 Issue 1111,
 SS-HPC550Ex Issue 1111.
- Reference manuals: Ref. Temp. Calibrator JOFRA RTC-156/157/158/159/250/700 A/B/C (2013-11-18),
 Handheld Pressure Calibrator JOFRA HPC400 (Rev.C 12/13),
 Handheld Pressure Calibrator JOFRA HPC500/HPC502 (Rev.E 12/13).
- Test reports: RTC-156B/RTC-157B dated 2009-12-22,
 HPC502 1 m drop test dated 2009-12-16,
 HPC502 150% pressure test dated 2009-12-16.
- Assessment report: TA periodical assessment report for A-12351, DNV GL Copenhagen 2014-08-07

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Tests carried out

Tests performed by Ametek Denmark AS, witnessed by DNV Copenhagen:

- 24h temperature endurance test for RTC-156 and RTC-157 at 155°C
- For handheld equipment, 1 m drop-test according to IEC 61010 was carried out
- For pressurised equipment, 150% pressure test carried out. The HPC502 700 bar model was tested at 1050 bar.

Marking of product

Each model is marked with 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