NVLAP Lab Code 105016-0

FLUKE Calibration

Certificate of Calibration
Fluke Park Laboratory

Description:	Field Metrology Well	**Certificate Number:**	B6423006
Manufacturer:	Fluke	**Date of Calibration:**	23 Apr 2016
Model:	9144	**Date Due:**	
Serial Number:	B64286	**Temperature:**	19.0 to 27.0 °C
Status:	As-Found: New	**Relative Humidity:**	< 60 %RH
	As-Left: In Tolerance	**Pressure:**	95 to 103 kPa
Calibration:	Full	**Issue Date:**	23 Apr 2016
Procedure:	HCT301 - 1		

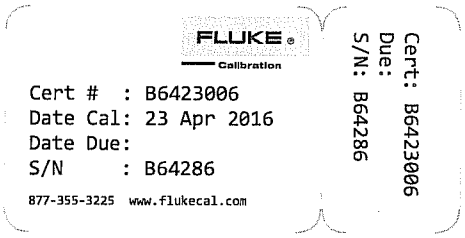
Customer:	FLUKE EUROPE BV EINDHOVEN NL
PO Number:	608031026-FCO-0/IT//CALPO

This calibration is traceable to the SI through recognized national measurement institutes, ratiometric techniques, or natural physical constants and is in compliance with ISO17025:2005 and ANSI/NCSL Z540.1. The calibration has been completed in accordance with the Fluke Calibration Quality System document QSD 111.0. Calibration certificates without signatures are not valid. This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. This certificate shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This calibration certificate may contain data that is not covered by the Scope of Accreditation. The unaccredited test points, where applicable, are indicated by an asterisk (*), or confined to clearly marked sections. Functional tests are not accredited.

Measurement uncertainties at the time of test are given where applicable. They are calculated in accordance with the method described in the ISO Guide to the Expression of Uncertainty in Measurement. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.

Comments:



Electronically signed by
Approved Signatory
Ivars Ikstrums
Metrologist

Certificate Number: B6423006 **Date of Calibration:** 23 Apr 2016

Standards Used

Description	Serial Number	Due-Date
1560 Thermometer, "Black Stack" Base Unit	B14293	NCR
1560 Thermometer, "Black Stack" Base Unit	B14294	NCR
2562-H Precision Digital Thermometer	A53642	09-Nov-2016
2562-H Precision Digital Thermometer	A68764	09-Nov-2016
5628 Platinum Resistance Thermometer	1677	28-Jan-2017
5628 Platinum Resistance Thermometer	2480	18-Jun-2016
Field Metrology Well Test Station	11	NCR

Quality Manuals

This calibration has been completed in accordance with:

- The Fluke Corporate Quality Manual, QSD 111.0, Revision 118, Dated August, 2014 and/or
- The Fluke 17025 Quality Manual, QSD 111.41, Revision 005, Dated Sept. 2014

The instrument described herein was calibrated by direct measurement of generated temperatures using the pertinent reference standards listed in the "Test Equipment" section of this report. The calibration was performed using test insert Model 914x-INST as described in the user manual. This insert is similar to insert "C" but is designed to accommodate the test PRTs and aid in the performance of the axial gradient calibration. The calibration data, internal calibration constants, and uncertainties are shown on the following page(s) of this report. The temperature accuracy test is self-explanatory. The axial differential temperature test is more complex. Due to the nature of the axial differential temperature characteristic and the influence of the test equipment on the test result, this test utilizes tolerances which do not precisely match the instrument specification. However, the unique tolerances used are intended to determine the axial differential temperature tolerance status based on the published specifications. The temperature observations were performed in both increasing and decreasing directions.

The calibration uncertainties are shown at a coverage factor of 2 (k=2). All known significant sources of uncertainty have been considered. Any limitations or remarks pertaining to this instrument and/or calibration are shown below. Additionally, out of tolerance indications, if any, are identified along with the corresponding data on the data pages of this report. Calibration uncertainties have been taken into account in the determination of tolerance status using risk analysis algorithms. When using the instrument in a calibration process, it is recommended that the instrument specifications be used as the contribution of the instrument rather than the calibration uncertainties. The instrument tolerances are shown on the report at a confidence interval of 95%.

NOTE: The instrument referenced herein is known to have an air density dependency related to elevation. This dependency affects axial gradient performance only. The dependency is approximately 0.0003 °C/m. The cumulative result may approach the instrument axial gradient specification when differences in elevation exceed 600 m. The elevation for American Fork, UT is approximately 1400 m and for Everett, WA is approximately 159 m.

Certificate of Calibration

Model: 9144
Serial No.: B64286
Certificate No: B6423006

As Found Data

No As Found Data Required

As Left Data

Data ID: B6113135700800

Calibration Constants

TEMP 1	**-1.219**
TEMP 2	**-2.059**
TEMP 3	**-2.564**
GRAD 1	**-0.110**
GRAD 2	**-0.033**
GRAD 3	**-0.025**
GRAD 4	**-0.045**
GRAD 5	**-0.082**

Control Constants

TEMP PB	**18.0**
TEMP INT	**90.0**
TEMP DER	**30.0**

Temperature Accuracy

Set-point °C	Actual °C	Error °C	Tolerance °C	Uncertainty	Pass/Fail
50.000	**50.011**	**0.011**	**±0.350**	**±0.065**	**P**
200.000	**199.962**	**-0.038**	**±0.350**	**±0.070**	**P**
420.000	**419.950**	**-0.050**	**±0.350**	**±0.080**	**P**
550.000	**550.002**	**0.002**	**±0.420**	**±0.10**	**P**
660.000	**659.889**	**-0.111**	**±0.500**	**±0.13**	**P**

Temperature Stability

Set-point °C	Observed °C (2 Sigma)	Tolerance °C	Uncertainty	Pass/Fail
50.000	**0.004**	**±0.030**	**±0.0045**	**P**
420.000	**0.017**	**±0.050**	**±0.0090**	**P**
660.000	**0.036**	**±0.050**	**±0.012**	**P**

Axial Differential Temperature

Set-point °C	Target °C	Actual °C	Error °C	Tolerance °C	Uncertainty	Pass/Fail
50.000	**0.000**	**0.013**	**0.013**	**±0.040**	**±0.045**	**P**
200.000	**0.047**	**0.055**	**0.008**	**±0.140**	**±0.080**	**P**
420.000	**0.148**	**0.140**	**-0.008**	**±0.280**	**±0.11**	**P**
550.000	**0.196**	**0.173**	**-0.023**	**±0.340**	**±0.13**	**P**
660.000	**0.290**	**0.318**	**0.028**	**±0.400**	**±0.14**	**P**

1 Affected Manual Revision

1.1 This addendum applies to revision 840701-EN of the 914X Series Field Metrology Well User's Guide.

1.2 Additionally, this addendum applies to revision 842102-EN of the 914x Series Field Metrology Well Technical Guide.

2 Updates

2.1 Replace Table 2, Base Unit Specifications for the 9143 and 9144, (page 14) as follows:

Base Unit Specifications			
	9142	9143	9144
Weight	8.16 kg (18 lbs)	7.3 kg (16 lbs)	7.7 kg (17 lbs)
Power Requirements	100V to 115 V (± 10%) 50/60 Hz, 635 W 230 V (± 10%) 50/60 Hz, 575 W	100 V to 115 V (± 10%), 50/60 Hz, 1400 W 230 V (± 10%), 50/60 Hz, 1800 W	
System Fuse/Circuit Breaker Ratings	115 V: 6.3 A T 250 V 230 V: 3.15 A T 250 V	15 A 240 V Thermal Circuit Breaker	
4-20 mA Fuse (-P model only)	50 mA F 250V		
Computer Interface	RS-232 and 9930 Interface-it control software included		
Safety	EN 61010-1:2001, CAN/CSA C22.2 No. 61010.1-04		

2.2 Replace Section 3.2.3 – Power Panel, Fuses (4) (page 22) as follows:

Remove: "For the 9143 and 9144, the fuses are separate from the power connector (Figure 6 on opposite page).

Insert:

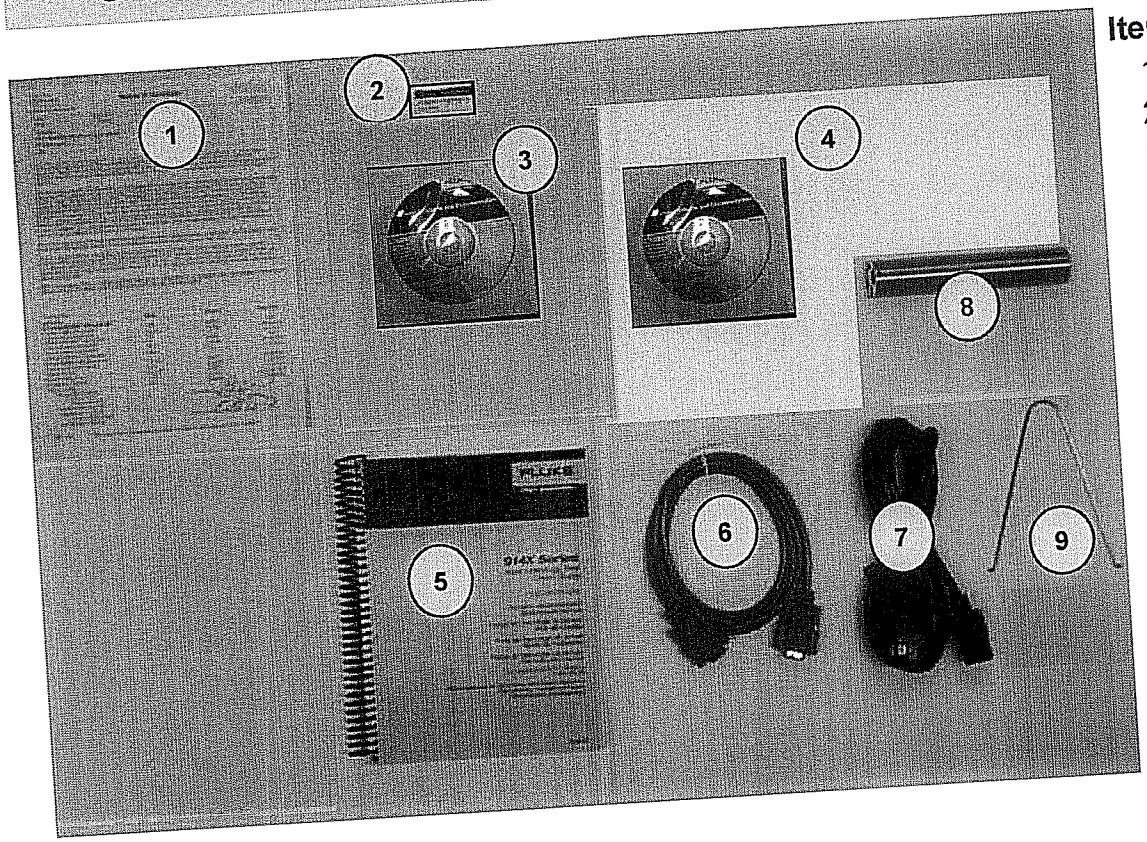
Thermal Circuit Breakers (5)
For the 9143 and 9144, the thermal circuit breakers are separate from the power connector (Figure 6 on opposite page). Circuit breakers can be reset by depressing the R-Button (white button on front of circuit breaker).

2.3 Technical Guide Only: Add to Table 18, troubleshooting, problems, causes and solutions (page 105) the following:

Problem.	Causes and Solutions
The instrument does not power up	Check if the circuit breaker R-Button has been activated. Depress to reset the R-Button. If the circuit breaker activates repeatedly, it is caused by failure of a component part.

9144 Non-Reference Shipping List

FLUKE®
Hart Scientific®



Item	Part #	Description
1.		Report of Calibtrion
2.		Re-Calibration Sticker
3.	3750689	914X Manual CD
4.	3751278	Software and Documentation CD
5.	3720986	914X Users Guide Manual
6.	2090854	Serial 9PF-9PF Cbl w/ 9-25 Adpatr
7.	3733375	Detach Pwr Cord Assy
8.	As ordered	Block Sleeve (Al-Bronze)
9.	2123363	Insert Removal Tongs
10.	9144	9144 Metrology Well

型号或产品系列名称：

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下表列出了本产品的零部件名称，以及包含的超过中国标准 SJ/T 11363-2006 规定限量的有毒、有害物质。

本产品所含的有害物质或元素

零部件名称 Part Name	有毒和有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr+6)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
硬质/软质手提箱 Hard/Soft Carry Case	O	O	O	O	O	O
塑料外壳 Plastic Enclosure	O	O	O	O	O	O
其它塑料零件 Other Plastic Parts	O	O	O	O	O	O
防护套 Holster	O	O	O	O	O	O
按键 Keypad	O	O	O	O	O	O
显示组件 Display Assembly	X	O	O	O	O	O
变压器和电源适配器 Transformers & Power Adaptors	X	O	O	O	O	O
电路板组件 Printed Circuit Assembly	X	O	O	O	O	O
电线和电缆 Wire & Cable	X	O	O	O	O	O
金属（底座，面板，分总成，罩壳等） Metal (chassis, panels, subassemblies, shields)	O	O	O	O	O	O
紧固件 Fasteners	O	O	O	O	O	O
电池（单电池，电池组） Battery (cells, packs)	X	O	O	O	O	O
输入/输出接口器件 I/O Interface Devices	O	O	O	O	O	O
组合驱动单元 Modular Drive Units	O	O	O	O	O	O
传感器（探测器） Sensor (detector)	X	O	O	O	O	O
光学器件 Optics	O	O	O	O	O	O
其它附件（电线电缆，探针，连接器） Other Accessories (cables, probes, connectors)	X	O	O	O	O	O
液体处理装置 Fluid Handling Components	O	O	O	O	O	O

X = 在该零部件至少一种均质材料中，该有毒有害物质的含量超过了 SJ/T 11363-2006 规定的限量要求。
X = Toxic and hazardous substances in at least one homogeneous material of the part exceeds the concentration limit requirement described in SJ/T 11363-2006.
O =在该零部件至少一种均质材料中，该有毒有害物质的含量或者符合 SJ/T 11363-2006 规定的限量要求，或者表示产品中未使用此零件。
O = Toxic and hazardous substances in all the homogeneous materials of the part is either below the concentration limit requirement described in SJ/T 11363-2006 is not applicable because the part is not used.
当非可充电电池的电量用完时，请取出或更换电池。
Remove or replace primary (non-rechargeable) batteries when exhausted.

表示产品含有中国 RoHS 禁止的物质；数字表示所涉及产品和零件的“环保使用期限”。
Product contains China RoHS banned substances; the number indicates "Environmentally Friendly Use Period" (EFUP) for all enclosed products and their parts.

表示所涉及产品和零件不含有中国 RoHS 禁止的物质。
Product or parts contains no China RoHS banned substances.

