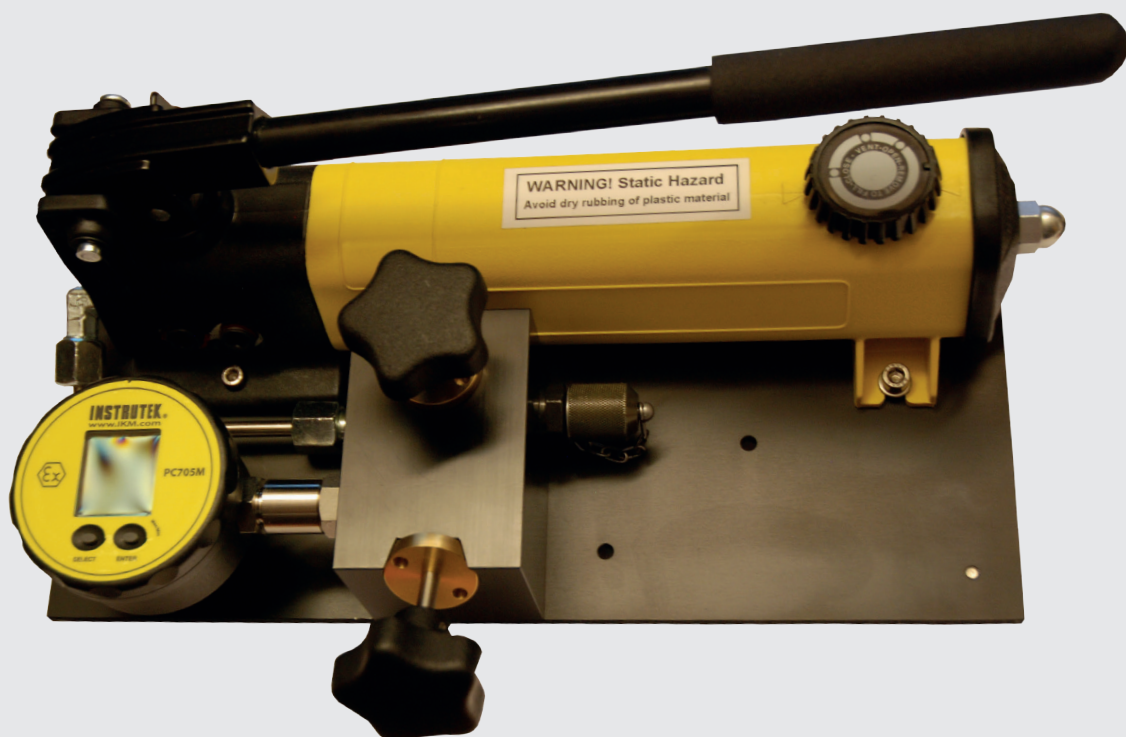


# PC705M Pressure Calibrator



User manual

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The PC705M is designed and manufactured by:

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## Warranty

IKM Instrutek AS standard warranty conditions.

IKM Instrutek AS reserves the right to make improvements or alterations to our products without incurring any responsibility to make the same improvements or alterations to products previously sold.

## All rights reserved

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior permission of IKM Instrutek AS.

All efforts have been made to ensure the accuracy of this handbook. IKM Instrutek is always striving to improve our products and handbooks. We would greatly appreciate being informed of any errors found in our product or in its manual. The above notwithstanding, IKM Instrutek cannot take responsibility for any errors in this handbook or their consequences.

# Symbols used in the user manual



## **WARNING! / CAUTION! Risk of injury!**

This symbol indicates high pressure and dangers that could cause personal injuries or considerable damage to property.



## **CAUTION! Material damage!**

This symbol indicates actions which could lead to possible damage to material or environmental damage.



## **NO DOMESTIC WASTE!**

The device must not be disposed together with domestic waste.

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## **Delivery, unpacking and scope of supply**

All units have been calibrated and carefully checked for their operational reliability before shipment. Upon receipt, please check packaging for damages or any signs of improper handling. Report any possible damages to the forwarder and your product supplier immediately. Damage reported at a later date will not be recognized.

### **Unpacking:**

Carefully unpack the unit to prevent any damage. Check the contents of the delivery based on the delivery note.

### **IMPORTANT!**

Use the labels on the front and back to check if the delivered unit corresponds to your order.



In particular, for devices with electrical components, verify that the correct power supply voltage is supplied.

### **Scope of standard supply:**

- Pressure Calibrator PC705M
- Calibration Certificate
- User manual
- Test hose
- Adapterkit BSP-BSP
- Adapterkit BSP-NPT



EC Declaration of Conformity according  
EN ISO 17050-1:2010 is supplied with the product.

Type approval is performed by DNV-GL.  
It is found to comply with DNV GL rules for classification –  
Ships, offshore units, and high speed and light craft.

# 1 DESCRIPTION OF THE PC705M

The PC705M Pressure Calibrator has been designed as a self-contained, portable pressure calibrator that have been calibrated to precision pressure equipment traceable to national standards.

Each unit is marked with:

- Calibration label, next calibration date
- Serial number
- Production year
- Pressure range.

## 1.1 CALIBRATION LABEL

IKM Instrutek AS certifies that this product meets published specifications at the time of shipment from the factory. IKM Instrutek AS further certifies that its calibration measurements are traceable to accredited international standards. Each pressure calibrator has a calibration label showing the last date of calibration and the date when the next calibration is due. Calibration is scheduled annually, unless you believe the unit to be defective, whereupon the unit will be calibrated after repair and receive a new label showing the date calibrated and the new calibration-due date. Check the calibrated label to ensure the Pressure Calibrator has a valid calibration date before using the unit.

Calibration must be done by IKM Instrutek AS or a certified supplier/service center.

## 1.2 CERTIFICATION

IKM Instrutek AS certifies that the PC705M complies with its published list of specifications at the time it was manufactured. IKM Instrutek AS also certifies that its calibration measurements are traceable to Norwegian Accreditation and to the calibration facilities of other International Standards Organization (ISO) members. IKM Instrutek AS confirms that the PC705M complies with the following standards:



EC Declaration of Conformity in accordance with the following Directive(s):

2004/108/EEC	The Electromagnetic Compatibility Directive
2006/42/EC	Directive on Machinery
94/9/EC	Directive on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)

## 1.3 WARRANTY

This product is guaranteed free from defects in material and workmanship for one (1) year from the date of shipment. During this warranty period, IKM Instrutek AS will, at its option, either repair or replace the PC705M should it prove to be defective. The product must be returned to a service facility designated by IKM Instrutek AS for warranty service or repair.

The foregoing warranty will not apply to defects resulting from improper maintenance by the purchaser, purchaser-supplied software or interfacing, unauthorized modification or misuse, operation exceeding the environmental specifications for the PC705M, or improper site preparation. No other warranty is expressed or implied by IKM Instrutek AS, and IKM Instrutek AS shall not be liable for any direct, indirect, special, incidental or consequential damages, whether based on contract, tort, or any other legal theory.

## 1.4 BATTERY CHANGE / BATTERY LIFE

When the battery starts weakening, a low battery warning (BAT LOW) will appear in the upper left corner of the display. Battery change: Open the instrument (turn the display ring beyond the limit stop). Open the battery compartment and change the battery (type CR2430). Make sure that the O-ring remains embedded in the cover. The battery life is 150 hours in Peak-mode (at continuous operation) and approximately 2000 hours in normal measuring mode.

## 1.5 PC705M NOT OPERATING / FAILED

Repairs must be done by manufacturer or supplier certified for service/repair. Replacement parts must be obtained from the manufacturer.

## 2 CONTROLS AND INDICATORS

PC705M Digital Pressure Calibrator



## 2.1 DISPLAY, CONTROLS AND CONNECTIONS

The PC705M has two operating keys. The left key (SELECT) serves to select the functions and the pressure units. The right key (ENTER) activates the selected function or pressure unit. The right key is also used to switch between the MAX.- and MIN.-value in both the Mano- and Peak-mode.

**Turn-on:**

Pressing the SELECT key turns the instrument on.

The instrument subsequently displays the software version (year/week), the full-scale pressure range, the actual pressure (top display) and the last measured MAX.-value (bottom display).

**The instrument has the following functions:**

RESET: Max./Min.-value and Peak-value are set to the actual pressure

OFF: Turns off the instrument

MANO: Releases the following functions:

PEAK off: Normal measuring mode with 2 measurements per second

PEAK on: Fast measuring mode with 5000 measurements per second

ZERO SET: Sets a new Zero reference

ZERO rES: Sets the Zero to factory setting

CONT on: Deactivates the automatic turn-off function

CONT off: Activates the automatic turn-off function (the instrument turns off 15 minutes after the last key function) followed by the unit selection.

PM205: bar, mbar, hPa, kPa, MPa, PSI, kp/cm<sup>2</sup>

PC705M: bar, mbar, hPa, kPa, MPa, PSI, kp/cm<sup>2</sup>, cm-H<sub>2</sub>O, mH<sub>2</sub>O, inH<sub>2</sub>, ftH<sub>2</sub>O, mmHg, inHg

**Example: Setting a new Zero Reference:**

--> Turn on the instrument by shortly pressing the SELECT-key.

--> Wait for the instrument's measuring mode (approx. 3 seconds).

--> Press the SELECT-key 3 times: MANO appears.

--> Press ENTER: PEAK on or PEAK off appears.

--> Press SELECT: ZERO SET appears.

--> Press ENTER: The new Zero reference is set. The instrument returns to the measuring mode.

**Example: Setting new pressure unit (mbar).**

--> Turn on the instrument by shortly pressing SELECT.

--> Wait for the instrument's measuring mode ( $\approx 3$  s).

--> Press the SELECT-key 3 times: MANO appears.

--> Press ENTER: ZERO SET appears.

--> Press SELECT: ZERO rES appears.

--> Press SELECT: CONT on or CONT off appears.

--> Press SELECT: bar appears.

--> Press SELECT: mbar appears.

--> Press ENTER: The new pressure unit (mbar) is set.

The instrument returns to the measuring mode.

**Display of the Minimum Pressure Value**

When in the measuring mode (Display: Actual Pressure and Max.- value), you may display the Min.-value for 5 seconds by shortly pressing the ENTER-key.

**Notes:**

1) The functions and units can also be called up by keeping the SELECT-key depressed.

Releasing the key enables the displayed function or unit to be activated with the ENTER-key.

2) If the selected function or unit is not activated within 5 seconds with the ENTER-key, PC705M returns to the measuring mode without changing any settings.

3) Turning PC705M on and off does not influence any of the previous settings.

4) If the PEAK on or CONT on function is activated, it is indicated with a flashing sign on the display.

5) If a pressure can not be represented on the display, OFL (overflow) or UFL (underflow) appears on the display.

6) If the actual pressure goes beyond the measuring range, the last valid pressure value starts flashing on the display.

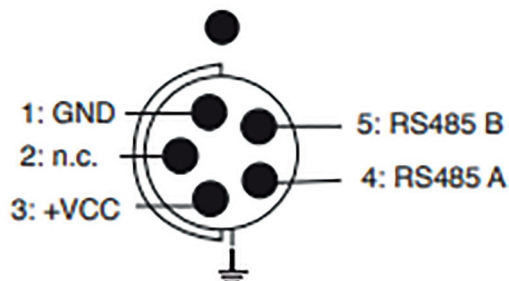
## 2.2 COMMUNICATION PC705M

### Interface (RS485)

The interface converter K-103A (RS232) or K-114A (USB) can be connected at the back of the manometer (Fischer plug Series 103), allowing the data transfer to the PC.

The corresponding PC software can be found on our web site.

Note: The RS485 interface may only be used outside the zone with a potentially explosive atmosphere!



The connection at the rear for the RS485 interface may only be used outside the zone with a potentially explosive atmosphere.

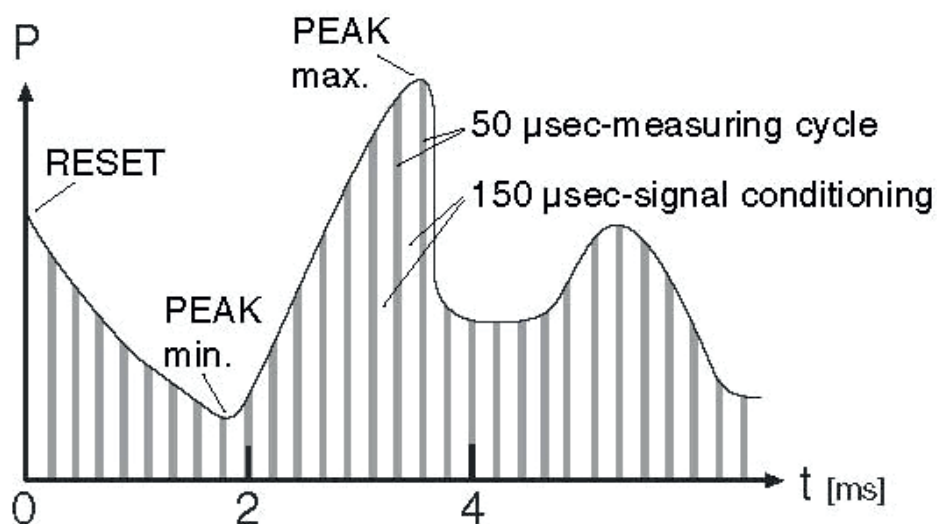
Due to the internal capacitances only a safe maximum voltage of  $U_m = 6,3 \text{ V}$  may be applied and the power of  $0,9 \text{ W}$  may not be exceeded.

This guarantees that the capacitance limit for the basic voltage level is not exceeded on reintroducing the equipment to the hazardous zone. The battery may be changed inside the zone with a potentially explosive atmosphere.

The following battery type must be used in explosive atmospheres: Renata CR2430 or CR2430MFR

Do not conduct such processes in close proximity, which generate charged particles (air ioniser, high-voltage electrodes, etc.)

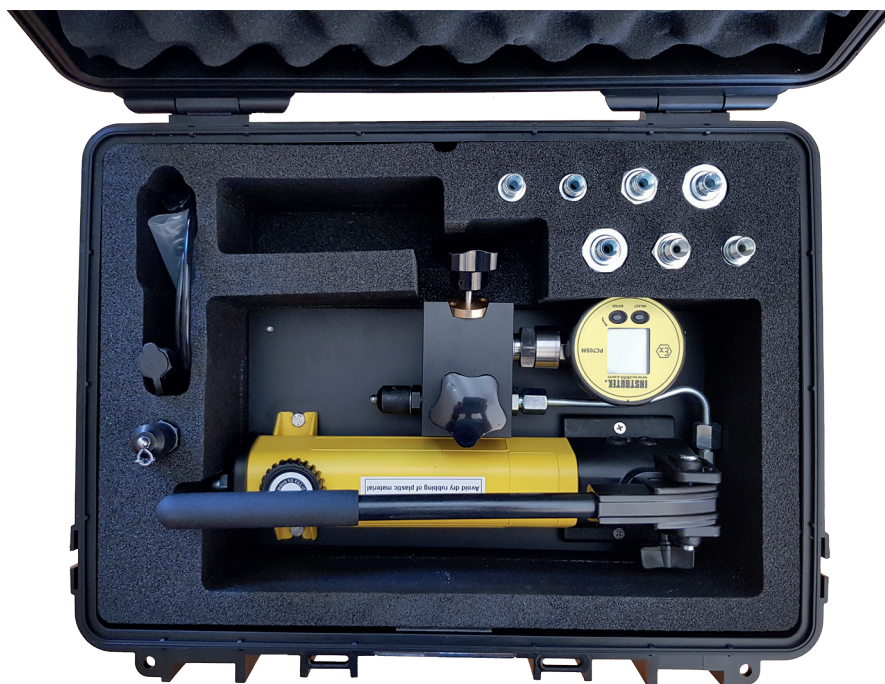
## 2.3 MEASURING PROCEDURE OF THE PEAK-MODE





### 3 SPECIFICATIONS OF PC705M

Range	0 to 700 bar
Resolution	200 mbar
Overpressure	700 bar
Reading per second	5000 (PEAK mode)
Zero function	Yes
Peak function	Max. or Min.
Auto power off	15 min.
Power supply	Battery
Battery life	2000 hours continuous operation MANO-Mode 150 hours of continuous operation in PEAK-Mode
Litium battery	3.0V size CR2430
Display	LCD
Selectable read out	PC705M: bar, mbar, hPa, kPa, MPa, PSI, kp/cm <sup>2</sup> , cm-H <sub>2</sub> O, mH <sub>2</sub> O, inH <sub>2</sub> , ftH <sub>2</sub> O, mmHg, inHg
Standard process coupling	¼" BSP MALE, Swivel
Protection class (EN 60529)	IP65
PC705M:	
Dimensions	345 x 160 x 180mm
Weight	7,5kg
Accuracy RT (room temperature)	PC705M: < 0,05% FS
Total Error Band (0 to 50 °C)	< 0,2 % FS
Storage-/Operating Temperature	PC705M: -10 to 60 °C
Compensated Temperature Range	0 to 50 °C





## 4 ACCESSORIES

### 4.1 ADAPTERS FOR THE ITEM UNDER TEST

IKM Instrutek part no. **INADAPTERKIT1**

Adapter kit1, 1/4-inch BSP to NPT Female, Carbon Steel

Content:

1/4" BSP male – 1/8" NPT female

1/4" BSP male – 1/4" NPT female

1/4" BSP male – 3/8" NPT female

1/4" BSP male – 1/2" NPT female



IKM Instrutek part no. **INADAPTERKIT2**

Adapter kit 2, 1/4-inch BSP to BSP Female, Carbon Steel

Content:

1/4" BSP male – 1/8" BSP female

1/4" BSP male – 3/8" BSP female

1/4" BSP male – 1/2" BSP female



IKM Instrutek part no. **INP00408**

Test hose kit 700 bar

Content:

Test hose 1m

Test connector M16x1.5mm to 1/4" BSP male

Adapter 1/4" BSP female



## 5 PC705M HYDRAULIC PRESSURE CALIBRATOR

Provides hydraulic pressure of 0 to 700 bar.



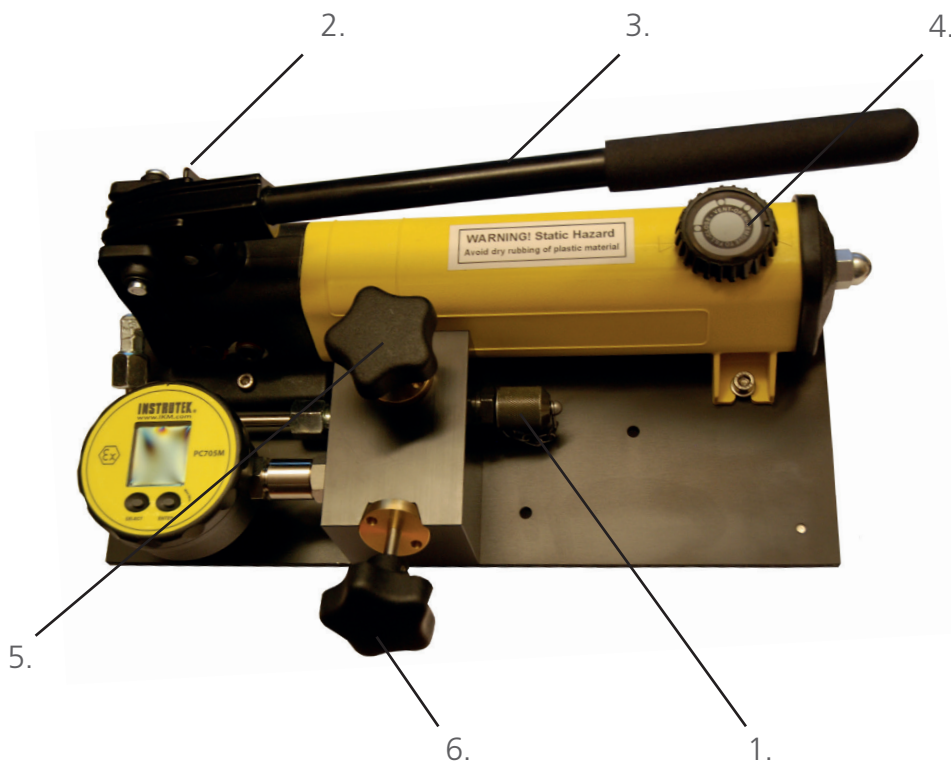
Always release the internal pressure at the connectors before disconnecting. Uncontrolled release of high pressure can result in personal injury and damage to equipment.

Reservoir fluid level: If the fluid level in the reservoir falls considerably during use, a partial vacuum may be created in the reservoir that can affect the pump performance of the pump.

To avoid this, simply allow air to enter the reservoir by partly unscrewing the filling plug.

Seal replacement: Depending on the frequency of use, the main piston seal (and others) may need replacing.

### 5.1 CONTROLS AND ORIENTATION



Drawing key:

1. Pressure port: M16 X 1,5 mm quick connector for flexible hose to adapters and item under test
2. Pressure release valve
3. Pump handle
4. Filling cap
5. Main pressure valve
6. Fine adjustment valve

## 5.2 OPERATION

Refer to the orientation drawing to locate the controls.

1. Lift the pump handle 3. remove the filling plug 4. and fill the reservoir to 6mm level with the recommended fluid.  
Replace the filling plug.
2. Connect the instrument under test to the flexible hose/gauge adapter and attach it to the pump via the quick-fit connection 1.
3. Adjust the main-pressure valve 5. and fine-adjustment valve 6. to mind-travel.
4. Ensure that the pressure-release valve 2. fully clockwise.
5. Operate the pump handle 3. several times to expel air from the pump.
6. Close the pressure-release valve 2. fully clockwise.
7. Prime the system by pumping the handle to allow the oil to enter the pump cylinder.  
Repeat as necessary until the system is fully primed and low pressure is indicated on either the master or the test instrument.
8. Close the main-pressure valve 5.
9. Adjust the pressure to the required value using the fine-adjustment valve 6.  
Note: The pressure will fall slightly, immediately after pressure generation due to the thermodynamic effect but will stabilize after a short time.



DO NOT EXCEED the maximum operating pressure indicated on the pump label!

10. To totally release pressure from the system, turn the pressure-release valve 2. and the main-pressure 5. one turn counterclockwise (the pump handle 3. can be operated without pressure resistance). Note: Careful use of the release valve 2., main-pressure valve 5. and fine-adjustment valve 6. enables a controlled release of pressure, essential for calibration purposes.
11. End of operation procedure.

## 6 CERTIFICATES

Please contact us for copies of EEx/Is certification.

PC705M  
Ex II 2G Ex ia IIC T6 Gb  
PTB 05 ATEX 2012x and,  
1ECEX PTB 13.0028x



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