FORM 85-02
June 1999
Revision 6

AMETEK®
PK II Pneumatic Deadweight Tester

Operating Instructions

AMETEK®
CALIBRATION INSTRUMENTS

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PRODUCT WARRANTY

This instrument is warranted against defects in workmanship, material and design for one (1) year from date of delivery to the extent that AMETEK will, at its sole option, repair or replace the instrument or any part thereof which is defective, provided, however, that this warranty shall not apply to instruments subjected to tampering or abuse, or exposed to highly corrosive condi ions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED AND AMETEK HEREBY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. AMETEK SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, ANY ANTICIPATED OR LOST PROFITS.

This warranty is voidable if the purchaser fails to follow any and all instructions, warnings, and cautions in the instrument's Instruction Manual.

If a manufacturing defect is found, AMETEK will replace or repair the instrument or replace any defective part thereof without charge; however, AMETEK's obligation hereunder does not include the cost of transporta ion which must be borne by the customer. AMETEK assumes no responsibility for damage in transit, and any claims for such damage should be presented to the carrier by the purchaser.

1.0 INTRODUCTION AND PRODUCT OVERVIEW

The AMETEK® PK II Pneumatic Deadweight Tester is a primary standard that produces a pressure by applying force (weight set) over area (the ceramic ball and nozzle). The PK II tester is NIST traceable and accurate to ±0.015% of indicated reading using stainless steel weights cal brated to international standard gravity at 980.665cm/sec^2. The unit is intended for low pressure applications up to 30 PSIG (2 bar). The PK II tester may also be cal brated to the user's local gravity or to inches or centimeters of H_2O at 20°C per ISA recommended practices, or to reference water columns at 60°F per AGA standard practices.

The PK II tester is self-regulating with accuracy independent of the operator. The tester utilizes a frictionless ceramic ball which floats on a layer of air within a stainless steel cylinder.

The PK II tester features a sturdy cast-metal base with integral quick-leveling system for field or laboratory use. The case also contains a tripod fixture allowing the unit to be tripod mounted in the field.

1.1 PRODUCT FEATURES

The key features of the *PK II Pneumatic Deadweight Tester* are:

- Accuracy up to ±0.015% of indicated reading
- Floating ball operation eliminates need to rotate weights during testing
- Self regulating input air flow maintains ball and weights in a float position and compensates for variations in air supply pressure
- Rugged ceramic measuring ball withstands harsh environments and field use
- Monocontaminating fluid eliminates the need to clean instruments after cal bration or before use
- Close cover operation eliminates wind effects in field cal brations
- Multi-position ball valves for both the inlet and outlet connections ensures trouble-free operation
- Certificate of Accuracy and Traceability available with area, mass and intrinsic correction factors
- Rugged aluminum housing offers long life. Top (Front) housing is revers ble.

1.2 PK II PHYSICAL DIMENSIONS

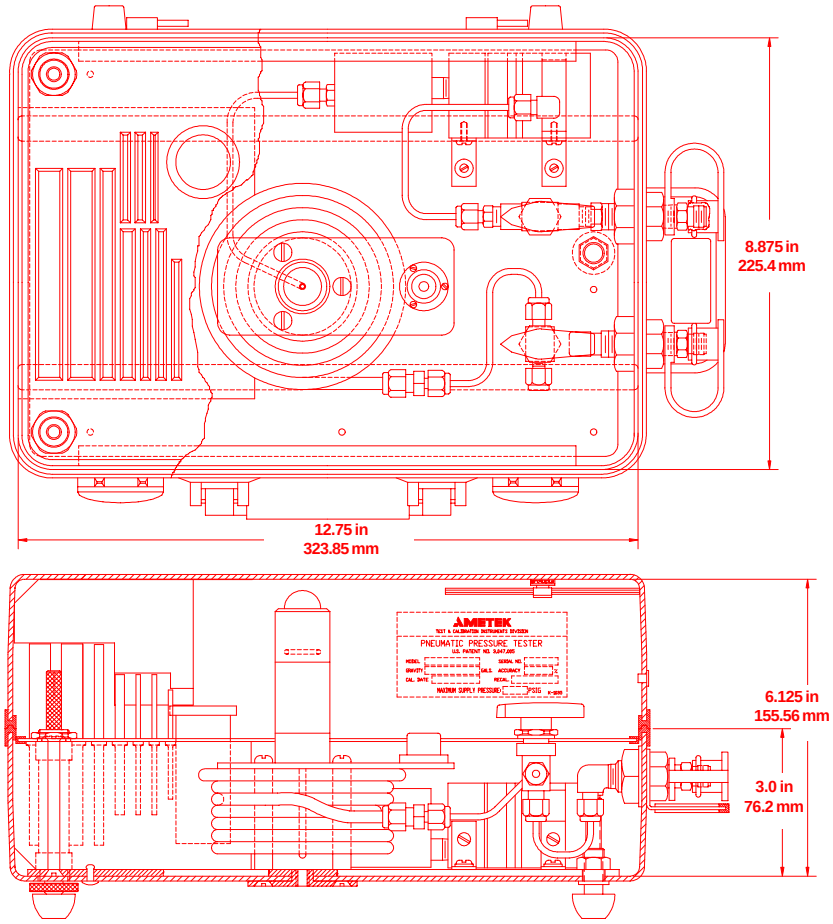


Figure 1.1
PK II Dimensions
(Models 104, 254, 304 and Medical)

1.2 PK II PHYSICAL DIMENSIONS

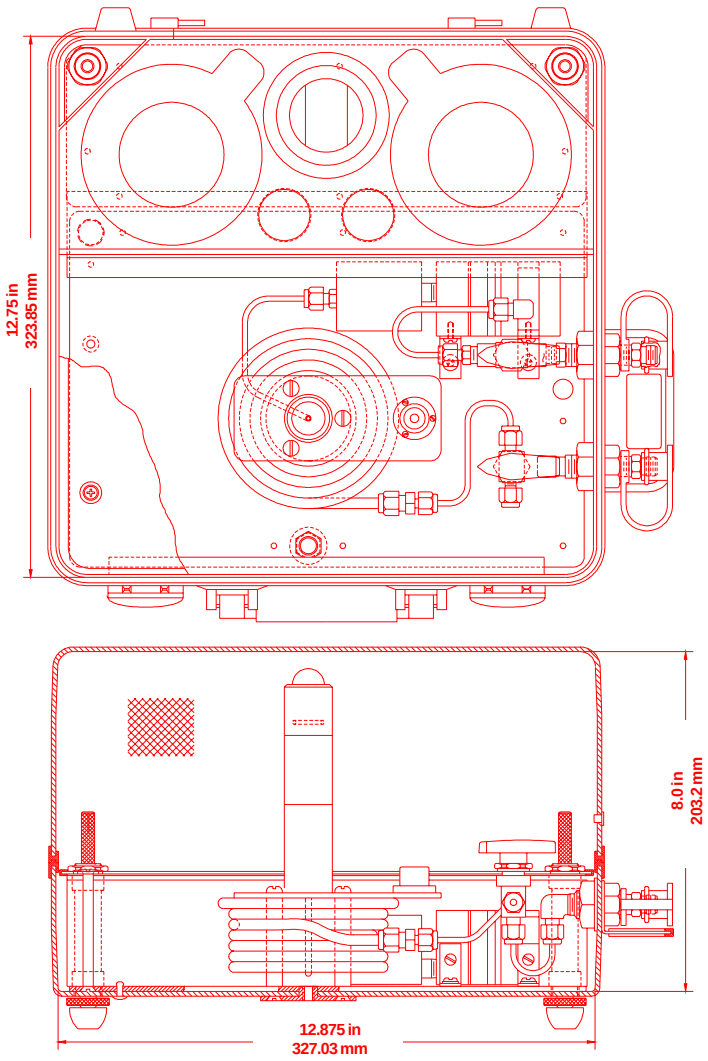


Figure 1.2
PK II Dimensions
(Models 20SS, 30SS, 654, 854, 2000GM, 2010GM
200N, 201N, 500CM, 1000CM, 1500CM, 2000CM, 2B, 2B01)

2.0 CORRECTION FACTORS

An error in pressure determinations may result from any uncertainty of the mass of the loading weights and from the measurement of the effective area of the ball and nozzle. Other sources of error, however, may not be easily recognized. Other sources of error include the air buoyancy of the weights, gravity, thermal expansion and elastic deformation of the ball and nozzle, and the air heads involved. All of these corrections, with the exception of local gravity (except when specified), thermal expansion, and air heads have been corrected for by AMETEK prior to the tester being shipped.

The following technique is suggested to compute the corrected tester output pressure readings:

Gravity

Local gravity values differ depending upon geographic locations. Pressure is defined as "force per unit area", so that mass values must be converted to force values. To accomplish this, the acceleration of gravity must be used. The acceleration of local gravity may be determined by having a gravitational survey made of the local area with a gravimeter or by contacting various governing bodies such as the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. Once the local value of gravity is known, the pressure may be corrected using the following formula:

$$P_G = \frac{G}{G_W} \times P_N$$

Where:

P_G = tester output pressure corrected only for gravity

G = local gravity

G_W = gravity value for which the tester is calibrated

P_N = pressure value of weights applied

Temperature

If the coefficient of expansion of the ball and nozzle is positive, the effective area will increase with increasing temperature resulting in a corresponding decrease in pressure. Corrections can be made using the following formula:

$$P_T = \frac{P_G}{1 + 1.67 \times 10^{-5} (T - 23°C)}$$

Where:

P_G = tester output pressure corrected only for gravity

P_T = tester output pressure corrected for gravity and temperature

T = ambient temperature (°C)

Air Head

When pressurized, a correction is required only when the gauge height or reference plane of the unit being calibrated is either higher or lower than that of the pneumatic tester. The reference plane of the tester is at the top of the nozzle. Heights above the reference plane are negative, while heights below the reference plane are positive. Corrections can be made using the following formula:

$$P_A = P_T (1 + H \times 2.84 \times 10^{-6})$$

Where:

H = air head (Inches)

P_T = tester output pressure corrected for gravity and temperature

P_A = tester output pressure corrected for gravity, temperature and air head

3.0 CALIBRATION AND RECERTIFICATION

The accuracy of measurements can only be ensured through calibration against reference standards of a known and well characterized measurement uncertainty; reference standards that are ultimately traceable through a national standards laboratory to the International Bureau of Weights and Measures (BIPM), to a natural physical constant, or to consensus standards.

All AMETEK pressure calibrations are traceable in the United States of America to reference masters calibrated by the National Institute of Standards and Technology (NIST).

Measurement performance is affected by the frequency and severity of use, the environment, test conditions, and by other factors. AMETEK recommends calibration on a prescr bed interval/frequency in order to ensure optimal measurement performance and reliability.

Two types of calibration services are offered:

- Calibration with a Certificate of Conformance/Certificate of Compliance
  A statement of conformity which documents that the listed device(s) conforms to published specifications, or the terms of the order/contract. It can provide, in addition, a statement of traceability to NIST.

- Calibration with a Cal bration Report/Certificate
  A report that outlines detailed information about the calibration process. This includes actual calibration data, traceability information, test conditions, and other factors as may be applicable to the type of device being calibrated.

3.1 RECOMMENDED CALIBRATION FREQUENCY

As a general rule, AMETEK *pneumatic testers should be tested and recertified every 12 months.* Testers used on a more frequent basis should be tested more frequently.

3.2 MATERIALS NECESSARY FOR RECERTIFICATION

Both the tester assembly and weight set should be returned to AMETEK in order to allow for calibration of the tester as a “system”. Pressure is a derived parameter requiring determinations of both effective area and force (weight-mass). Instruments not sent to AMETEK as a “system” can only be provided with certifications on the parameter calibrated, e.g. effective area or mass.

All materials should be securely packaged to prevent damage during transportation and handling. Testers should be returned in their case. The ball/nozzle assembly should be wrapped with adequate padding material and well secured to avoid shifting, movement and to protect them from shock during transportation.

4.0 SPECIFICATIONS

The PK II Pneumatic Deadweight Testers are self-regulating, primary standards with a pressure capacity of 104- 254-, 304- and 854-inches H_2O. These instruments operate on the deadweight principle using only fundamental units of force and area. Pressure equals the weight force divided by the effective area of the ball.

All PK II Testers are shipped with tester and weight contained within a carrying case. The instrument is available with accuracies of ±0.015%, ±0.025% or ±0.05% of indicated reading with stainless steel weights.

MODEL	RANGE	MINIMUM INCREMENT	WEIGHT SET
PK2-20SS	1-20 PSIG	1 PSIG	Table 2a
PK2-30SS	1-30 PSIG	1 PSIG	Table 2a
PK2-104WC-SS	4-100" H_2O	1" H_2O	Table 2b
PK2-254WC-SS	4-254" H_2O	1" H_2O	Table 2b
PK2-304WC-SS	4-304" H_2O	1" H_2O	Table 2b
PK2-654WC-SS	4-654" H_2O	1" H_2O	Table 2b
PK2-854WC-SS	4-854" H_2O	1" H_2O	Table 2b
PK2-2000GM-SS	25 - 2000 gm/cm^2	25 gm/cm^2	Table 2c
PK2-2010GM-SS	10 - 2000 gm/cm^2	5 gm/cm^2	Table 2c
PK2-200N-SS	2-200 KPa	2 KPa	Table 2d
PK2-201N-SS	1 - 200 KPa	0.5 KPa	Table 2d
PK2-500CM-SS	10 - 500 cm H_2O	10cm H_2O	Table 2e
PK2-100CM-SS	10 - 1000 cm H_2O	10 cm H_2O	Table 2e
PK2-1500CM-SS	10-1500 cm H_2O	10 cm H_2O	Table 2e
PK2-2000CM-SS	10 - 2000 cm H_2O	10 cm H_2O	Table 2e
PK2-2B-SS	0.02 - 2 bar	0.02 bar	Table 2f
PK2-SB .01-SS	0.01 - 2 bar	0.005 bar	Table 2f
PK2-MEDICAL	10 - 325 mm Hg	5 mm Hg	Table 2g

Table 2a
Pressure in PSIG

MODEL	WEIGHT CARRIER AND BALL (PSIG)	Weights Furnished per Pressure Increment 1 PSI	2 PSI	3 PSI	5 PSI
PK2-20SS	1	2	1		3
PK2-30SS	1	2	1		5
Part Number	K-2000 (PK2-20, PK2-30)	K-2011	K-2012	K-2013	K-2013-5

Table 2b
Pressure in Inches of Water @ 20°C

MODEL	WEIGHT CARRIER AND BALL (in H_2O)	Weights Furnished per Pressure Increment						
		1" H_2O	2" H_2O	5" H_2O	10" H_2O	20" H_2O	50" H_2O	100" H_2O
PK2-104WC-SS	4" H_2O	1	4		9			1[1]
PK2-254WC-SS	4" H_2O	1	2	1	2	1	2	1
PK2-304WC-SS	4" H_2O	1	2	1	2	1	1	2
PK2-654WC-SS	4" and 10" H_2O	1	2	1	2	1	2	5
PK2-854WC-SS	4" and 10" H_2O	1	2	1	2	1	2	7
Part Number	K-1279 (4" H_2O)							
	K-1265-1 (10" H_2O)	K-1277	K-1278	K-2047-1	K-1294	K-2046-16	K-2030	K-2031

NOTE: [1] Weight insert accepts optional 100" H_2O weight.

Table 2c
Pressure in Grams per Square Centimeter (g/cm^2)

MODEL	WEIGHT CARRIER AND BALL (g/cm^2)	Weights Furnished per Pressure Increment						
		5g/cm^2	10g/cm^2	25g/cm^2	50g/cm^2	100g/cm^2	200g/cm^2	500g/cm^2
PK2-2000GM-SS	25g/cm^2			1	1	2	1	3
PK2-2010GM-SS	25 and 10g/cm^2	1	2	1	1	2	1	3
Part Number	K-1279-4 (10g/cm^2)							
	K-1265-13 (25g/cm^2)	K-2047-33	K-2047-32	K-2046-30	K-2046-19	K-2030-5	K-2039-14	K-2039-11

Table 2d
Pressure in Kilopascals (KPa)

MODEL	WEIGHT CARRIER AND BALL (KPa)	Weights Furnished per Pressure Increment						
		0.5 KPa	1 KPa	2 KPa	4 KPa	10 KPa	20 KPa	50 KPa
PK2-200N-SS	2 KPa			2	1	2	1	3
PK2-201N-SS	2 KPa & 1 KPa	1	1	2	1	2	1	3
Part Number	K-1279-2 (1KPa)							
	K-1265-12 (2 KPa)	K-2047-17	K-2047-18	K-1294-2	K-2046-29	K-2030-1	K-2031-3	K-2039-12

Table 2e
Pressure in Centimeters of Water @ 20°C

MODEL	WEIGHT CARRIER AND BALL (cm H_2O)	Weights Furnished per Pressure Increment					
		10cm H_2O	20cm H_2O	50cm H_2O	100cm H_2O	200cm H_2O	500cm H_2O
PK2-500CM-SS	10 cm H_2O	1	2	1	2	1	
PK2-1000CM-SS	10 cm H_2O	1	2	1	2	1	1
PK2-1500CM-SS	10 and 25 cm H_2O	1	2	1	2	1	2
PK2-2000CM-SS	10 and 25 cm H_2O	1	2	1	2	1	3
Part Number		K-2047-24	K-2045-10	K-2046-24	K-2031-18	K-2031-19	K-2031-20

Table 2f
Pressure in Bar

MODEL	WEIGHT CARRIER AND BALL (Bar)	Weights Furnished per Pressure Increment						
		0.005 bar	0.01 Bar	0.02 Bar	0.04 Bar	0.1 Bar	0.2 Bar	0.5 Bar
PK2-2B-SS	0.02 Bar			2	1	2	1	3
PK2-.01-SS	0.01 and 0.02 Bar	1	1	2	1	2	1	3
Part Number		K-2047-17	K-2047-18	K-1294-2	K-2046-29	K-2030-1	K-2031-3	K-2039-12

Table 2g
Pressure in Millimeters of Mercury (Hg)

MODEL	WEIGHT CARRIER AND BALL (mm Hg)	Weights Furnished per Pressure Increment				
		5 mm Hg	10 mm Hg	20 mm Hg	50 mm Hg	100 mm Hg
PK2-MED	10 mm Hg	1	2	2	1	2
Part Number		K-2047-23	K-2047-22	K-2046-25	K-2046-21	K-2012-1

5.0 ASSEMBLY AND SETUP

5.1 BALL AND NOZZLE

You should routinely check the ceramic ball and the nozzle for cleanliness. Never scrape the nozzle or its associated parts with a hard object or anything that is abrasive or that may remove material from the parts. AMETEK recommends that the ceramic ball and nozzle be kept in place at all times, except when cleaning is required. This will prevent dirt from entering the ball and nozzle assembly.

5.1.1 Removing Ceramic Ball

Cup one hand over the top (beveled end) of the nozzle and push from the bottom of the nozzle to remove the ball. If the ball tends to stick when being removed, DO NOT FORCE IT. Forcing the ball may cause serious damage to the nozzle.

Carefully, lift the ceramic ball from the nozzle assembly and store in a secure location.

5.1.2 Removing the Nozzle

Carefully remove the nozzle by pulling the nozzle upward while twisting to overcome the friction of the O-ring seal.

Grasp the nozzle firmly and pull upward with a slight twisting motion.

5.1.3 Cleaning Ball and Nozzle

AMETEK recommends cleaning the ceramic ball and nozzle with a residue-free solvent.

Using a cottom swab or soft cloth with a solvent such as alcohol, wipe the inside of the nozzle.

Dampen a clean cloth with alcohol or other residue-resistant solvent, and clean the ceramic ball by rotating it within the cloth.

5.1.4 Ball & Nozzle Cleanliness Check

The ball should pass smoothly through the nozzle bore without any restriction or friction. If resistance is felt, reclean the ceramic ball and nozzle and repeat cleanliness check.

After the ball and nozzle have been cleaned, slide the ball through the nozzle. The ball should pass through the nozzle with no resistance.

5.1.4 Ball & Nozzle Reassembly

After ensuring that both the ceramic ball and nozzle are clean, reassembly by first placing the nozzle back into proper position and alignment. Always make sure that the serial number on the nozzle is directly above the serial number of the nozzle body.

CORRECT ALIGNMENT- The serial number for the nozzle (top) aligns with the serial number of the nozzle body (bottom).

INCORRECT ALIGNMENT- The serial numbers DO NOT align and may lead to inaccurate readings.

5.2 LEVELING THE TESTER

For proper operation, the PK II tester should be placed on a support that is solid and free from vibration.

5.2.1 Coarse Leveling

Both coarse and fine leveling are supported by the PK II tester. Coarse leveling to raise the tester is achieved by pushing the knurled rod (located inside the case on either side of the weight insert) and rotating the knurled nut until it contacts the bottom of the case.

For coarse adjustment, use the knurled rod located on the top.

5.2.2 Fine Leveling

Fine leveling is obtained by rotating the knurled rod clockwise to raise and counter-clockwise to lower the tester.

A third adjustable foot is located under the PK II case between the inlet and outlet valves.

A bull's-eye level is located on the cover plate for sighting level accuracy.

For fine adjustment, hold the bottom foot and rotate the knurled knob at the top.

5.3 CONNECTION

Connect a supply of clean, dry and oil-free air or nitrogen to the connection below the valve marked "INLET".

CAUTION
The use of other gases will result in an incorrect reading.
Always use clean, dry and oil-free air or nitrogen.

When using the tester thru full range, regulate the supply pressure at 30 PSIG minimum, however take care NOT TO REGULATE THE SUPPLY PRESSURE OVER 100 PSIG.

WARNING
Do not regulate the supply pressure over 100 PSIG.

Connect clean, dry and oil-free air or nitrogen to the INLET valve.

Connect instrument to be tested to the OUTLET valve.

Connect the instrument to be tested to the valve marked "OUTLET". The tester's input and output connections are 1/4-inch male tube fittings.

The accuracy of the tester is seriously undermined by leaks in the output connections and/or the instrument being calibrated. To check for leaks, load the tester so as to apply a pressure indicating instrument and then turn off the tester output valve. If the pressure indicated by the instrument being calibrated holds, it is safe to assume their are no leaks. If, however, the pressure decreases, there is l kely a leak in the calibration system. You must locate and fix the leak before calibration can take place.

Under no circumstances should mercury or corrosive fluids be permitted into the tester. When the tester is used in connection with an instrument or pressure system that contains a liquid, a suitable safeguard such as a trap or float-type manometer check valve should be installed in the tester output line to prevent fouling of tester components.

6.0 OPERATING INSTRUCTIONS

The following steps are provided to guide the user through a typical calibration using the PK II tester.

Slide the weight carrier over the ball and nozzle assembly.

Step 1

Slip the weight carrier over the ceramic ball.

Open the INLET valve and supply pressure to the tester.

Step 2

Admit the supply pressure to the tester by turning on the valve marked “INLET”.

WARNING
NEVER connect the PK II tester to a high pressure source.
Applying high pressure may result in personal injury and damage to the tester.
NEVER apply a pressure greater than 100 PSIG.

Add the required weights by sliding the weights over the carrier. Apply the heavier weights first. Always store the weights in the compartment provided in the PK II tester case.

Step 3

Add weights as required. Exercise caution when handling the weights. Handle only one weight at a time to avoid damaging the weights.

6.0 OPERATING INSTRUCTIONS (Cont'd.)

Slowly rotate the weights to ensure that there are no restrictions and that the weights float freely.

Step 4

Weights may be given a slow rotary motion to ensure that the weights rotate freely without abrupt stopping. *(See Section 6.1 to correct for poor weight rotation).*

Note: It is not necessary to excessively spin the weights of the pneumatic deadweight tester to overcome friction. Excessive rotation may affect accuracy.

WARNING

Do NOT spin the weights unless the ceramic ball is floating.

Open the OUTLET valve to calibrate the instrument. Once the calibration is completed, you may vent the pressure by rotating the OUTLET knob to the VENT position.

Step 5

Open the tester "OUTLET" valve and calibrate the instrument. Once calibration is complete, the downstream pressure may be vented by turning the outlet valve to the "VENT" position.

CAUTION

The ceramic ball, weight carrier and weights comprise a "system" for your PK II calibrator and should be used together to ensure a correct calibration. Accuracy will be affected if the ceramic ball, weight carrier and weights are interchanged.

7.0 MAINTENANCE

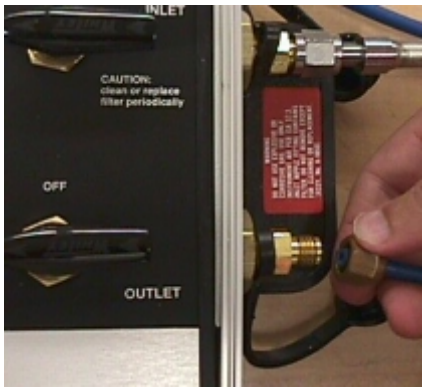
7.1 OUTPUT SYSTEM

The PK II tester features an output tank that may be cleaned. If any contamination is evident in the output system, it may be easily removed using the following procedure:

Step 1
Remove the weights and weight carrier from the tester leaving the ceramic ball in place.

Step 2
Connect an air supply to the tester.

Step 3
Disconnect the output line.



Step 4
Fully open both the INLET and OUTLET valves.

Step 5
While holding the ceramic ball (to ensure that the ball does not fall out), tilt the tester so that the output connection is pointing downward.

Step 6
Pressure the ball into its socket to provide an output pressure sufficient to purge the system.

Step 7
After completing Steps 1 - 6, disconnect the air supply from the INLET and connect the air supply to the OUTLET. DO NOT APPLY PRESSURE AT THIS TIME.

Step 8
Using a screw driver, remove the ceramic ball and restriction tube. The restriction tube is located under the ceramic ball.

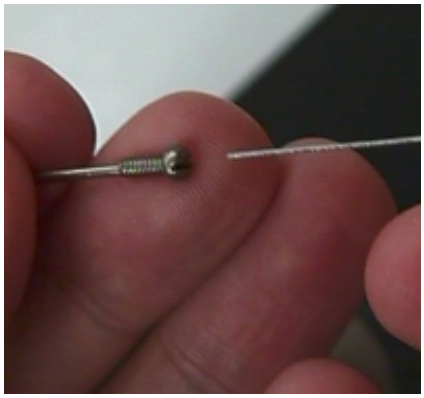
Step 9
Remove the nozzle.

Step 10
Place a cloth or absorbent material over the nozzle body.

Step 11
Apply 15 to 30 PSI to the OUTLET for a few seconds or until the material on the nozzle body is clean and dry when removed. Mild solvents may be applied to the outlet fitting and flushed out when applying pressure. If a solvent is used, it should not leave any film or residue once dried.

Step 12
Clean the output restriction using a 1/32" drill or piece of 22 gauge wire to clean out any obstructions.

Step 13
Clean the ceramic ball, nozzle and body thoroughly.



7.2 INPUT SYSTEM

The PK II tester features an input filter located within the 1/4” male tube fitting on the outside of the PK II tester case. As this filter becomes dirty, the tester may react by not supporting the weights. To correct, remove the filter and examine the NPT opening for any contamination.

CLEANING THE INPUT FILTER

Remove the input filter fitting and clean it by backflushing from the downstream end with clean compressed air. If an ultrasonic cleaner is available, AMETEK recommends that the filter fitting be cleaned using the ultrasonic cleaner for 10 to 15 minutes in a residue-free solvent.

CAUTION
Do NOT attempt to remove the filter element from the fitting.

Filters should be replaced periodically.

8.0 TROUBLESHOOTING

The following represent common troubleshooting tips for the PK II tester.

8.1 CORRECTING FOR POOR WEIGHT ROTATION

If weights do not rotate freely as described in Section 6.0, Step 4, perform the following:

Step 1
Check the cleanliness of the ceramic ball and nozzle.

Step 2
Make sure the tester is level by checking the bull's eye.

Step 3
Isolate tester from environmental vibrations or relocate tester.

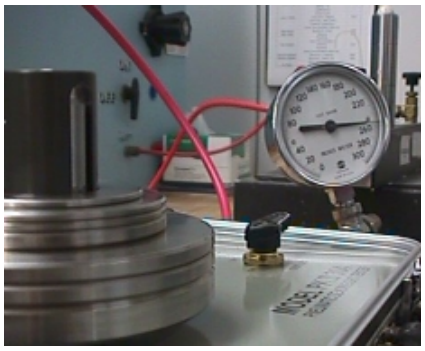
Step 4
Check for adequate air supply.

8.2 OUTPUT AND INTERNAL LEAKAGE

The accuracy of the tester is seriously undermined by leaks in the output connections and/or instrument being calibrated. The following procedures are recommended to isolate and correct for leakage.

8.2.1 Output Connection Leaks

Load the tester so as to apply a pressure to the instrument being calibrated. Close (turn OFF) the OUTLET valve. If the pressure indicated by the instrument being calibrated remains constant (holds at the indicated pressure), it is safe to assume there are no leaks in the output system (between the tester and the instrument).



8.2.2 Internal Leaks

You can perform a check for internal leaks with the input pressure applied and with the cover plate off.

Step 1
Place full range of weights onto tester.

Step 2
Turn OFF (Close) the OUTPUT valve.

Step 3
Apply liquid leak detector to all internal fittings from the input connection to the output valve.

Step 4
Check for leaks by the presence of bubbles on joints.

Step 5
If a leak is found, the PK II Tester must be returned to AMETEK for repair.

WARNING
Leak checks should be done in the order described above, otherwise the source of the leak may not be accurately identified.

CAUTION
DO NOT ATTEMPT TO REPAIR INTERNAL LEAKS.
Return the PK II tester to AMETEK for internal leak repairs.
Failure to do so may void product warranty.

8.3 REPLACING THE NOZZLE AND O-RING

Remove the ball and nozzle and the nozzle O-ring (10-90013). The replacement O-ring should be wiped clean with a lint-free cloth and placed within the groove in the nozzle body. DO NOT LUBRICATE THE O-RING WITH ANY FORM OF OIL OR GREASE.

Clean the ball and nozzle as described in Section 5.1.3.- Cleaning the Ball and Nozzle, and reassemble.

9.0 PARTS LIST

PART NUMBER	DESCRIPTION
K-1035	Nameplate
K-1048	Nozzle Body Restriction Screw
K-1050/ETCH	Nozzle
10-90013	Nozzle O-Ring
K-1051	Ceramic Ball
K-1182	Spring
K-1193	Retainer
K-1209	Regulator Nozzle Block
K-1212	Disc, Clip and Diaphragm Assembly
K-1216	Regulator Ratio Disc Diaphragm (Stem Side)
K-1217	Regulator Ratio Disc Diaphragm (Flat)
K-1223	Gasket
K-1224	Regulator Assembly Screw
K-1246	Bulls-Eye Level
K-1273	Label (Inlet, Outlet, Caution)
K-1297	Capacity Tank Assembly
K-1303	Nozzle Body Restriction Assembly
K-1831	Tripod Mounting Plate
K-1832	Level Adjust Stud
K-1833	Level Retainer Stud
K-1834	Leveling Foot
K-1835	Leveling Foot Assembly
K-1836	Aluminum Adjusting Nut (3/8”-24)
K-1839	Nut (5/8-18 x 1/8”)
K-1840	Regulator Assembly
K-1850	Filter Assembly
K-1868/ASSY	Internal Cover Assembly (Small Case)
K-1896/ASSY	Internal Cover Assembly (Large Case)
K-1880	Regulator Bracket
K-1882	Weight Retainer Block
03-90020	Screw (2-56 x 5/16)
04-90047	Nut (7/16-20)
06-90040	Brass Washer (0.74” OD)
12-90040	1/8” NPT x 1/8” Tube Straight Connector
11-90062	Bulkhead Fitting
13-90003	Outlet Valve
13-90022	Inlet Valve

AMETEK®
CALIBRATION INSTRUMENTS

ISO 9001
Manufacturer

Printed in U.S.A.