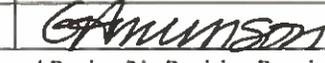


17 - EQUIPMENT CALIBRATION

Title: Equipment Calibration

Doc. No. 2015-MMTS-17

Approval Signatures and Date

Prepared/Reviewed by:		Date:	3/12/15
Approved by:		Date:	3/11/15
Approved by:		Date:	
Approved by:		Date:	3/11/15
<input type="checkbox"/> Initial Release	<input type="checkbox"/> Annual Review/No Revision Required	<input type="checkbox"/> Annual Review/Update (see history below)	

NOTE: This document will be reviewed at least annually to ensure its suitability.

Revision History

Rev. No.	Change description	Author
1	Change description Crosswalk Between NDEP CAPP Review Comments (dated 2014-12-09, 2015-01-30 and 2015-02-26) and Mercury Storage and Transfer Program Document Contents March 10, 2015	Burton Packard and Renee Rodriguez

NOTE: Hard copies of this document may not be the current version. Refer to the "IAmTheKey" to verify the current version.

Reference Documents

Document number	Document title
QP.EMS.HG.0006	Mechanical Integrity Procedure (Tier 1)
MMS-16	Mercury Vapor Monitor System, Mercury Instruments USA
AFA 1000/1 Mk3	Fume Hood Velocity Sensor, TEL-UK Ltd.
Jerome J505	Mercury Vapor Monitor, Arizona Instrument Corp.
5200 Series, Model 5-3305	Large Floor Scale, Arlyn Scales Inc.
PDS-1000	Drum Scale, A and A Scales, LLC
Chapter 10, SOC.OHS.SP.0002	Hot Work Permit
Chapter 12, SOC.OHS.SP.0002	Lockout/Tagout

17.1. PURPOSE

This procedure addresses calibration of the mercury transfer equipment within the MMTS, and is designed to address CAPP requirements as defined by the HWAD Mechanical Integrity Procedure. The purpose of the Mechanical Integrity Procedure is to ensure that critical process equipment associated with the MMTS is designed, installed, maintained, operated and calibrated correctly. That procedure verifies that operations and maintenance activities follow generally accepted sound engineering practices for the purpose of minimizing the risk of unintentional exposures and releases of elemental mercury (Hg).

17.2. SCOPE

This procedure applies to staff and contractors that inspect, test, or maintain the mercury transfer equipment within the MMTS.

17.3. OPERATIONS

17.3.1. Items to be Calibrated

- Facility Manager identifies CAPP-regulated mercury transfer equipment subject to this procedure, and identifies the schedule for conducting inspections and tests based on manufacturer's information or good engineering practices, or more frequently if determined to be necessary by previous experience in operating the equipment.
- Safe work practices, including the HWAD Lockout/Tagout and Hot Work supporting procedures, apply to equipment identified in this procedure.

17.3.2. Calibration Schedule

The items to be calibrated and frequency are listed below and in Table 17.1.

- Automated mercury vapor monitoring system (Mercury Vapor Monitoring System, MMS-16, Mercury Instruments USA))
- Scales (Arlyn 5-3305) and PDS-1000 drum scale
- Fume hood face velocity sensor (Phoenix ZPS 3 10 –STL)

Hand-held mercury monitoring equipment (Jerome J505)

Staff and contractors shall ensure that the required calibrations on CAPP-regulated equipment are performed on the schedule given in this procedure.

17.3.3. Calibration Documentation

Documentation of calibration for the items shown in Table 17.1 is recorded on the appropriate calibration forms (refer to Section 17.6). The completed records include all the information specified on the forms.

If there is a substantial deficiency, staff (or contractor) contacts the Facility Manager, who then authorizes recalibration or replacement.

Table 17.1 Equipment list for calibration of the mercury transfer equipment

Equipment item	Calibration frequency
Mercury vapor monitoring system	Annually or more frequently if specified by vendor or experience
Scales	Annually or more frequently if specified by vendor or experience
Fume hood face velocity sensor	Semi-annually or more frequently if specified by vendor or experience
Jerome mercury vapor monitors	At least annually or more frequently if specified by vendor or experience

17.4. METRICS

Semi-annual and annual (or more frequently if required by vendor or experience) calibrations will be tracked and the results documented. Deficiencies found will be corrected and that information will be used to evaluate the need for more frequent calibrations or equipment replacement.

17.5. RECORDS

Calibration records for each piece of regulated equipment are to be maintained for a period of at least five years after the calibration activity.

17.6. FORMS

DZHC 167-E, which is titled “Maximo Preventive Maintenance Form”

Calibration Record

Equipment item	Calibration frequency	Date of calibration	Performed by	Equipment Serial No.	Description of calibration	Results
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Mercury vapor monitoring system	Annually or more frequently if specified by vendor or experience				Mercury vapor readings are correct to within the accuracy of the instrument	
Scales	Annually or more frequently if specified by vendor or experience				Weight reading is correct to within the accuracy of the scale	
Fume hood face velocity sensor	Semi-annually or more frequently if specified by vendor or experience				Velocity reading is correct to within the accuracy of the sensor	
Jerome mercury vapor monitors	At least annually or more frequently if specified by vendor or experience				Mercury vapor readings are correct to within the accuracy of the instrument	

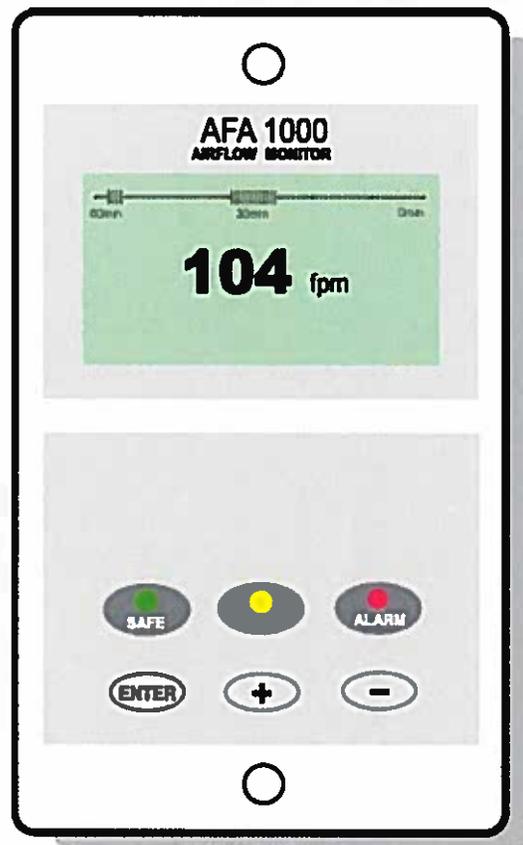
17.7. ATTACHMENTS

- Mercury vapor monitoring system (Attachment 17.1)
- Fume hood velocity sensor (Attachment 17.2)
- Jerome J505 manufacturer's information (Attachment 17.3)
- Digital scales – 5000 pounds and 1000 pounds (Attachments 17.4A and 17.4B)

ATTACHMENT 17.1 Mercury Vapor Monitoring System (MMS-16, Mercury Instruments USA)



Airflow Monitors for the 21st Century



**AFA1000 / 1
Mk 3**



ATTACHMENT 17.3 Jerome J505 Portable Mercury Vapor Analyzer

JEROME®

APPLICATIONS

- Ambient Air Analysis
- Clean Up Compliance
- Detection Compliance
- Disposal & Recycling
- Exhaust Duct Monitoring
- Facility Monitoring
- Fluorescent Lamps
- Gold Mining
- Hazardous Waste Sites
- HVAC/MAV
- Landfill Monitoring
- Leak Detection
- Mercury Exclusion Testing
- Mercury Spill Response
- Monitoring Light bulbs, mercury switches equipment
- Plant Environment
- Quality Control
- Scrubber Efficiency Testing
- Source Surveys
- Worker Safety

CERTIFICATIONS

ISO 9001:2008

MADE IN THE USA



ARIZONA INSTRUMENT LLC
1175 N. Delaware St | Chandler, AZ
www.aizinc.com



JEROME® J505 Atomic Fluorescence Spectroscopy Mercury Vapor Analyzer

The NEW! Jerome® J505 Mercury Vapor Analyzer is a portable fluorescence spectroscopy analyzer, which allows the detection cell to be simpler, smaller, lighter weight and more durable than competing spectroscopy instruments. The highly efficient optical cell requires less flow to purge the system, allowing the J505 to run at a lower flow rate minimizing sample dilution as found in competing spectroscopy instruments.

FEATURES

- Meets EPA & ATSDR Cleanup Levels
- Flexible Data Handling
- Choice of Two Independently Adjustable High Limit Alarms
- Programmable Auto Sampling Mode
- Choice of 3 Units of Measurement (nanograms, micrograms, milligrams)
- Color Display with Easy to Use Menu System
- Battery Operation for 10+ Hours | Battery Charges in 3 Hours or Less
- A USB Keyboard can be used for Easy Entry of Locations (optional)
- Integrated Data Logging Saves all Test Results (excludes search mode)

SPECIFICATIONS

Resolution	0.01 $\mu\text{g}/\text{m}^3$ (10ng/m ³) in standard test mode
Detection Range	0.05 to 500 $\mu\text{g}/\text{m}^3$
Data Storage Capacity	Up to 10,000 test results, 100 test locations
Operating Environment	5 to 45°C, non-condensing, non-explosive
Accuracy	0.3 $\mu\text{g}/\text{m}^3$ ±15%
	1 $\mu\text{g}/\text{m}^3$ ±10%
	25 $\mu\text{g}/\text{m}^3$ ±10%
	100 $\mu\text{g}/\text{m}^3$ ±10%
Typical Response Time	Search 8 sec. first reading; continuous 1 sec. updates
	Quick 16 sec.
	Standard 28 sec.
Flow Rate	1 liter/minute

JEROME®

Reprints Available
Forms Available
24 Hour Customer Support

Sales Representatives
800.528.7411 | 602.470.1414
sales@azic.com

Extended Warranties and Parts
800.528.7411 | 602.470.1414
sales@azic.com



ARIZONA INSTRUMENT LLC
2375 N Delaware St | Chandler, AZ
www.azic.com

Power Requirements	12VDC power adapter runs on 100-240VAC, 0.8A
Internal Battery Pack	Rechargeable nickel metal hydride (NiMH) with 10+ hours of operation Battery charges in 3 hours or less
Dimensions	12" L x 6.2" W x 8.4" H
Weight	6.5 lb
Output	USB flash drive
Warranty	1 year, factory parts and labor

ACCESSORIES

990-0230	USB Keyboard
990-0244	AC Adapter Power Supply (supply/charger)
990-0246	Soft Handle Grip
990-0247	Soft Carrying Case
Y990-0234	Mercury Spill Kit

PARTS

345-0241	Intake Fritware (pack of 5)
1400 2002	Probe
Z2600 3905	Zero Air Filter

More Information

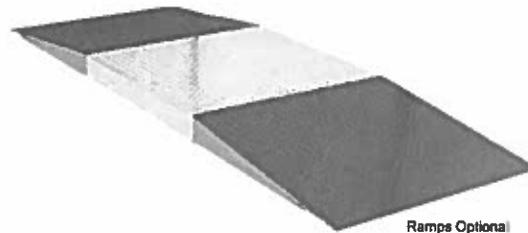
ATTACHMENT 17.4A Digital scale: Arlyn 5200 Series, Large Floor Scale

ARLYN SERIES 5200 LARGE FLOOR SCALES

THE FIRST LARGE PLATFORM SCALE WITH ONE INEXPENSIVE FEATURE- THE PRICE!

Don't be fooled. The new Arlyn Series 5200 all electronic Large Floor Scales boast expensive features. Instead of aluminum or plated steel, there are four heavy duty stainless steel load sensors, for maximum ruggedness. While inexpensive scales use a simple enamel paint, Arlyn applies a 3-part galvanized epoxy coating for maximum protection. Others use a cheap readout. Arlyn provides a water resistant, fully graphical, fully programmable, large LCD display. In fact, the only inexpensive feature you'll find on these scales is the price. But that's perfectly understandable. Because ARLYN electronic scales are shipped to you direct from the factory, and require no dealer services. So instead of paying for a scale and a dealer, you pay only for the scale you need and nothing more.

Weighs in lbs., grams, kg., ounces, troy, grains, etc.



EXPENSIVE SCALE FEATURES (Features found on scales costing 3 to 5 times as much as Series 5200)

- HIGH ACCURACY** - High weight resolution to 0.5 lbs.
 - Internal resolution to 1 part in 500,000
- EXTREMELY DURABLE** - Rugged heavy-duty construction
 - Stainless steel "ArlynLOAD" cell system
 - Large diamond plate low profile platform
 - 3-part galvanized epoxy platform coating
 - Adjustable large diameter leveling legs
 - Remote mount water resistant display

- ELIMINATES MAINTENANCE** - No moving parts
- EASY OPERATION** - Pushbutton functions for automatic and keyboard tare, tare functions with memory, net/gross
 - Unit conversion with mode indicators
 - Movable display head for easy viewing
- NO SET UP OR DEALER SERVICES** -
 - Automatic calibration functions

All other models also available in ss (stainless steel construction)

Model number	5-3305	5-4404	5-4405	5-4405ss	5-5510
Capacity	5000 lb. 2200 kg	2500 lb. 1150 kg	5000 lb. 2200 kg	5000 lb. 2200 kg	10000 lb. 4400 kg
Readability	1 lbs. .5 kg	.5 lb. .2 kg	1 lb. .5 kg	1 lb. .5 kg	2 lb. 1 kg
Internal Res.	1 part in 500,000				
Platform Dimensions	3' x 3'	4' x 4'	4' x 4'	4' x 4'	5' x 5'

Most other sizes and capacities are available, up to 8' x 10' and up to 30,000 lbs. CALL!

ADDITIONAL SPECIFICATIONS

POWER REQUIREMENTS-
AC-117 VAC, 50/60 Hz. (220VAC Optional)
DC-Rechargeable Battery approx. 20 hours use, 4 hour recharge
ACCURACY- 0.1% of full scale
DIMENSIONS- 4' x 4' x 2.8"
350 lb. shipping weight
TARE, ZERO RANGE- 100% of full scale
OPERATING TEMP.- 14°F to 104°F
DISPLAY- 1" high, easy-to-read Graphics LCD Display with status annunciators
DISPLAY SPEED- 0.4 seconds, adjustable

OVERLOAD CONDITION- Display warning message at 102% of scale capacity.
ELECTRONICS-
32-bit microcomputer circuitry, self test feature. All electronics on 1-plug-in board for easy service.
WEIGHING FEATURES- Adjustable filter constants, adjustable display update, automatic calibration
OPTIONS-
USB Computer port
RS-232 Computer port, adjustable rates
Time and Date output
4-20 ma or 0-5vdc analog output
Label, page and ticket printers
Automatic Setpoints - Battery Pack
Post for display
Aluminum platform
Stainless steel platform



ARLYN SCALES www.arlynscales.com
CALL TOLL FREE 1-800-645-4301. Fax# 516-693-4607
59 2ND St., E. Rockaway, NY 11518 (in NY 516-693-4465)

ATTACHMENT 17.4B Digital scale: PDS 1000 Drum Scale

FWI Drum Scale

http://www.scaleline.com/fwi_drum_scale.htm

PDS-1000 Drum Scale

[\[Home \]](#) [\[Up \]](#)

A and A Scales LLC

Phone 800-481-4114 or 973-800-3965

Open 7 days a week

No sales tax for customers outside New Jersey

We will not be undersold!



E-MAIL

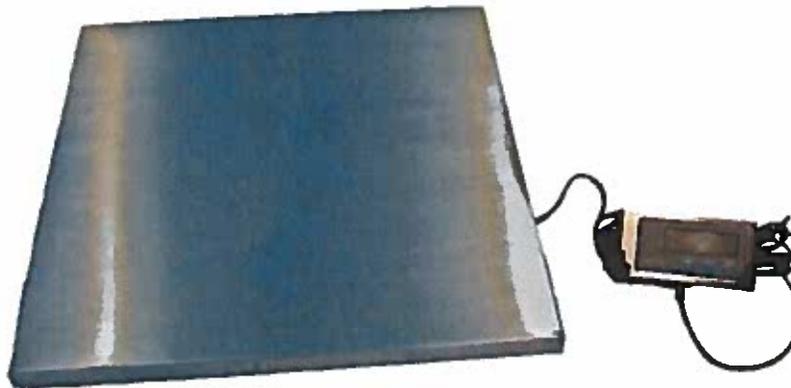
PDS-1000 Drum Scale

1000 lb x 0.5 lb

Price: \$499

Free shipping

[Buy ▶](#)



- * 24" x 24" - 1000 lb capacity platform
- * Stainless Steel cover, painted steel substructure
- * Digital Display is battery / Electric powered
- * Low profile scale platform
- * Easy to read LCD display
- * Digital Display comes standard with wall mounting bracket
- * 15 ft cable from platform to display