

Complete System Includes:



- Industrial Harsh Duty Computer**
- Sealed Dust Tight NEMA 4/12
 - AMD K6-2 366 MHz Processor
 - 2.1 GB Hard Drive
 - 64 MB SDRAM
 - 2 MB Video RAM
 - 16 Bit Ethernet, AUI & 10BaseT
 - External Floppy Disk Drive
 - External CDROM Drive
 - NEMA 4 Sealed Miniature Keyboard
 - 800 x 600, 24bit Color LCD Screen, High Brightness, Wide Viewing Angle
 - Analog Resistive Touch Screen
 - Wireless RF Remote Control



- Precision Pipe Traverse System**
- Dustless Dirty Air Probe & Coal Probe Support Fixtures
 - Seal Air/Traverse Rod Fixture
 - Computer Controlled Seal Air System



- Software**
- Windows 98 SE Operating System
 - ACFM Operating Software
 - MS Excel 2000®
 - Winzip® 8.0



- Dirty Air Probe**
- Integrated Thermocouple
 - 10 Point Air Velocity Calibration Curve
 - Static Pressure Calibration
 - Bubble Alignment Level
 - 10' Tube Bundle



- Coal Sampling Probe**
- Choice of ASC or ASME coal sampling probes
 - Bubble Alignment Level
 - 10' Coal Probe Hose



Optional Equipment:



- Swivel Sampler (ISO 9931) Coal Sampling Probe & Software Module
- Quick Disassembly & Shipping
- Additional Dirty Air and Coal Sampling Probes
- Primary Air Relative Humidity Probe & Software Module
- Dirty Air Probe, Coal Probe, and Seal Air Fitting Extension Hoses Extend Probe Reach up to 20'
- S Probe & Software Module for General Duct Traverse

System Parameters

Size: 18" W x 16" D x 52" H
 Weight: 135 Pounds
 Electrical: 120 AC, 5 Amps
 Compressed Air: 90 PSI, 25 CFM
 Environment: 50° to 135° F, Computer & Electrical Enclosure Rated NEMA 12 (Dust Tight)

Measurement Ranges

Air Velocity: 20 ft/sec to 160 ft/sec
 Static Pressure: -30 IWC to +30 IWC
 Temperature: 50° to 225° F
 Coal Sample Size: 100 g to 1500 g
 Capture Efficiency: 99% At 1 µm
 Pipe Diameter: 8" to 36" (Or Greater)

Airflow Sciences

ACFM

ADVANCED COAL FLOW MEASUREMENT



The Advanced Coal Flow Measurement (ACFM) system measures the flow rate of primary air and pulverized coal in pneumatic transport pipes. The system brings a state-of-the-art solution to the problem of performing reliable, efficient, and accurate, primary air and coal flow measurements.

- GREATLY IMPROVED ACCURACY AND REPEATABILITY OF COAL PIPE DATA
- REDUCED PERSONNEL COSTS
- REDUCED DRUDGERY OF COAL PIPE TESTING
- OBTAIN MORE CONSISTENT COAL FINENESS SAMPLES
- GREATLY REDUCE OPERATOR INFLUENCE

Airflow Sciences

Advanced Coal Flow Measurement

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ACFM

Advanced Coal Flow Measurement

Excel® Test Report

AIRFLOW SCIENCES CORPORATION
Advanced Coal Flow Measurement System
Coal Pipe Traversal Results

Software Version 3.0.39

Megawatt Power Company
Unit 3 Baseline Coal Pipe Balance Test
Tuesday, February 6, 2001
09:55:29 - 10:14:35

Atmospheric Pressure (Hgt): 29.03
Ambient Temperature (F): 91.7

WATER VAPOR CORRECTIONS

AMBIENT
Relative Humidity (%): 49.8
Vapor Mass Fraction (lbH₂O / lbWA): 0.01613

COAL PIPE
Relative Humidity (%): 26.2
Dew Point (F): 113.3
Vapor Mass Fraction (lbH₂O / lbWA): 0.0633
True Air Density (lbm/ft³): 0.0596
Air Velocity Correction Factor: 1.021
True Moist Air Flow Rate (lbm/hr): 15,292
True Dry Air Flow Rate (lbm/hr): 14,324
Water Vapor Flow Rate (lbm/hr): 967

MILL
Est. Dry Air Flow Into Mill (lbm/hr): 14,559
Est. Wet Coal Flow Into Mill (lbm/hr): 10,975
Est. Coal Moisture Loss (% Wet Wet): 6.7

Minimum Maximum Average
Velocity (ft/s): 73.9 99.9 93.0
Temperature (F): 162.9 165.5 164.7
Static Pressure (W/C): 1.76 6.48 3.73
Total Pressure (W/C): 3.25 6.88 5.23
Percent Isokinetic: 95.9 103.8 99.9

Coal L/D Correction Factor (C): 1.0000
Total Air Mass Flow (lbm/hr): 15,334
Coal Sample Weight (g): 334.1
Total Coal Mass Flow (lbm/hr): 10,242
Air/Coal Ratio: 1.55

Air Velocity Profiles

Port	Point	Temp (deg F)	Total P (W/C rel)	Static P (W/C rel)	Density (lbm/ft ³)	Air Velocity (ft/sec)	Air Mass Flow (lbm/hr)	Probe Detach (W/C)	Coal Samp Wt (g)	Coal Samp Time (s)	Percent Isokinetic	Air/Coal Ratio	R (inches)	Theta (degrees)
1	1	164.2	6.16	4.71	0.0624	88.0	597	1.606	NA	NA	101.3	NA	-5.76	0.0
1	2	164.4	6.38	4.97	0.0624	86.9	590	1.555	NA	NA	102.2	NA	-5.26	0.0
1	3	164.5	4.53	3.07	0.0622	88.8	599	1.621	NA	NA	99.7	NA	-4.71	0.0
1	4	164.7	4.46	2.85	0.0621	93.1	629	1.789	NA	NA	103.2	NA	-4.08	0.0
1	5	164.9	4.31	2.70	0.0621	93.3	630	1.796	NA	NA	99.3	NA	-3.33	0.0
1	6	164.9	4.08	2.53	0.0620	91.4	617	1.723	NA	NA	101.5	NA	-2.35	0.0
1	7	165.2	3.91	2.24	0.0619	92.0	619	1.740	NA	NA	98.7	NA	0.00	180.0
1	8	164.9	3.65	2.10	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
1	9	164.9	3.38	1.94	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
1	10	164.9	3.30	1.85	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
1	11	164.0	3.34	1.81	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
1	12	162.8	3.25	1.76	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
1	13	164.9	3.30	1.85	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	1	165.3	6.95	5.12	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	2	166.3	6.64	4.90	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	3	165.4	6.25	4.51	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	4	165.5	6.41	4.65	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	5	165.4	6.71	5.00	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	6	165.5	6.88	5.06	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	7	165.2	6.91	5.24	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	8	166.4	6.72	5.32	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	9	165.4	6.76	5.45	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	10	165.2	6.43	5.24	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	11	164.3	6.28	4.97	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	12	162.9	6.73	5.39	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0
2	13	165.2	6.43	5.24	0.0619	91.4	616	1.720	NA	NA	99.6	NA	2.35	180.0

Site: Megawatt Power Company
Unit 3 Baseline Coal Pipe Balance Test
Pipe: 2
Probe Used: DA 007
Project Code: Baseline

Test # 1
Pipe Diameter (inches): 12.0
Number of Test Ports: 2
Number of Traverse Points: 12
Air Sampling Period (s): 3
Coal Sampling Period (s): 15
Coal Sampling Frequency: 100.0
Upstream Bend Dist. (inches): 0.0

Probe Used: DA 007
Demo Mode
Use Load Cell
Use RH Probe And Calculations
Air Flow Only Test
Use RobotProbe For Coal Sampling

Reprobe Nozzle Tip Settings: 2.12" 3.00" 3.64" 5.83"

LOW SAVE EXIT

THE ACFM MEASURES:

- Primary Air Mass Flow Rate
- Primary Air Velocity Profile
- Primary Air Temperature
- Primary Air Static & Total Pressure
- Pulverized Coal Flow Rate
- Primary Air/Coal Ratio
- Atmospheric Pressure
- Obtains Coal Fineness Sample

FEATURES:

- Uses existing test ports; 1"-1.5" NPT nipple & full port ball valve.
- Easy to use system relieves operator of all peripheral/secondary tasks. Operator stays focused on moving the probe, pushing a button, and moving on to the next pipe.
- Complete data reduction and report generation in MS Excel® at the completion of each pipe.
- Small, mobile system fits into tight spaces, can be moved easily up and down steps and can reach the most inaccessible test ports.
 - Requires only one person to perform test.
 - Rugged system is completely sealed against dust and operates in ambient temperatures up to 135° F.
 - Insulated and heat traced sample train prevents condensation and pluggage.
 - Automatic dirty air probe purge system prevents probe pluggage and speeds test.
 - Precision pipe traversing system can be quickly set up for any pipe diameter.
 - Comprehensive user's manual.

ACFM Program Test Setup Screen

Swivel Sampler (ISO 9931) Coal Sampling Probe

ASC Coal Sampling Probe



ASME Coal Sampling Probe



Structured computer program ensures that each test is performed using the same procedure every time.