

Frontline Ballistic Barriers

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Demorest, GA



Addison Energy Technologies, LLC

45 Cannon Road

Toccoa, GA

February 10, 2016



INSTRUMENT CALIBRATION REPORT

INSTRUMENT	APPLICATION	SERIAL NO.	CALIBRATION TEST DATE
Cooper SH66A-E Temperature Meter; w/ Probes	Water / Temperature Meter	061011054-SH66A-E	6/5/2015
Amprobe / Digital Psychrometer	Dry Bulb / Wet Bulb & Relative Humidity Dew Point	100202417	6/5/2015
Dwyer Digital Water Meter	Water	N/A	3/12/2015
Digital Thermometer	Temperature	N/A	3/11/2015
PLT-200 Laser Tachometer	RPM	1847198	6/4/2015
Amprobe AC75B	Volts-Amps	09070083	6/5/2015
Fluke 30 V/A/O	Volts-Amps-Ohms	N/A	3/26/2015
ADM-860C Airdata Multimeter	Air Volume	M14607	1/25/2016
ADM-870C Airdata Multimeter	Air Volume	M13629	11/13/2015
Shortridge HDM-250 Hydrodata Multimeter	Hydronics	W11013	12/22/2015
Shortridge HDM-250 Hydrodata Multimeter	Hydronics	W13043	2/25/2015
Digital Sound Level Meter	Sound Volume	M:407768 S/N:H175576	2/1/2016
Rotating Vane Anemometer RVA801	Air Volume	A01624	2/1/2016

Note: Not all instruments may be used for this project.



ABBREVIATIONS

#	Number
%	Percentage
Δ	Delta or Difference
°F	Degrees Fahrenheit
APD	Air Pressure Drop
BHP	Brake Horsepower
CFH	Cubic Feet per Hour
CFM	Cubic Feet per Minute
CHW	Chilled Water
Cv	Coefficient of Velocity
dB	Decibels
DB	Dry Bulb
DIA	Diameter
DIFF	Differential
EFF	Efficiency
ENT	Entering
EOF / E.O.F.	Eye Of Fan
FL	Full Load
FPM	Feet per Minute
FT	Feet
GPM	Gallons per Minute
HP	Horsepower
HW	Hot Water / Heating Water
HZ	Hertz
IMP	Impeller
IN	Inches
KW	Kilowatts
LVG	Leaving
MAX	Maximum
MIN	Minimum
MVD	Manual Volume Damper
N/A	Not Applicable
NA	Not Accessible
NIS	Not In Scope
NPSH	Net Positive Suction Head
OBD	Opposed Blade Damper
OD / O.D.	Outside Diameter
OSA	Outside Air
P	Pressure
PF	Power Factor
PSI	Pounds per Square Inch
QTY	Quantity
R.L.A.	Running Load Amps
REQ	Required
RPM	Revolutions Per Minute
SEC	Section
SF	Service Factor
SQFT	Square Feet
TEMP	Temperature
W	Watts
WB	Wet Bulb
W.C. / WC	Water Column
W.G. / WG	Water Gauge



PROJECT SUMMARY

JOB NAME: FRONTLINE BALLISTIC BARRIERS

THE DATA PRESENTED IN THIS REPORT IS A RECORD OF SYSTEM MEASUREMENTS AND FINAL ADJUSTMENTS THAT HAVE BEEN OBTAINED IN ACCORDANCE WITH THE CURRENT EDITION OF AABC'S **NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE**. ANY VARIANCES FROM DESIGN QUANTITIES, WHICH EXCEED AABC'S TOLERANCES, ARE NOTED ON THIS PROJECT SUMMARY.

ON 2/4/2016, AET TESTED THE LOUVER TO DETERMINE IF THERE WAS ANY RESTRICTION IN AIRFLOW. WE SET THE MCGILL DUCT LEAKAGE TEST MACHINE TO A CONSTANT 400 CFM WITH NO DUCT ATTACHED. AT 400 CFM, WE HAD AN ORIFICE DIFFERENTIAL PRESSURE OF 7.75". WE PROCEEDED BY ATTACHING A 3 FOOT PIECE OF 6" FLEX TO THE DUCT / LOUVER. OUR ORIFICE DIFFERENTIAL PRESSURE WAS 7.20", WHICH EQUATES TO 385.4 CFM THROUGH THE LOUVER. THIS REFLECTS A 15 CFM DIFFERENCE. WE HAVE ATTACHED PICTURES TO SHOW THE SET UP AND A FLOW CHART FOR OUR DUCT LEAKAGE TEST MACHINE.





OMADA
PEDA

WORLD

FMP

LIVLO



300 WLN MAG
1800 S401

2800 FPS

The table and graph below are to be used only for Tube No: 5317-5

This chart is for: **Forward Flow**

Instructions: Record the pressure drop across the orifice. Find the pressure drop in the table below and note the corresponding leakage rate.

Pressure Drop Across Orifice (in. wg.)	Leakage Rate (cfm)	Pressure Drop Across Orifice (in. wg.)	Leakage Rate (cfm)	Pressure Drop Across Orifice (in. wg.)	Leakage Rate (cfm)
0.0	0.0	3.5	269.5	7.0	380.0
0.1	46.2	3.6	273.3	7.1	382.7
0.2	65.2	3.7	277.0	7.2	385.4
0.3	72.7	3.8	280.7	7.3	388.0
0.4	81.8	3.9	284.4	7.4	390.7
0.5	91.7	4.0	287.9	7.5	393.3
0.6	102.4	4.1	291.5	7.6	395.9
0.7	113.1	4.2	295.0	7.7	398.4
0.8	123.6	4.3	298.5	7.8	401.0
0.9	137.4	4.4	301.9	7.9	403.5
1.0	144.8	4.5	305.3	8.0	406.1
1.1	151.8	4.6	308.6	8.1	408.6
1.2	158.5	4.7	311.9	8.2	411.1
1.3	164.9	4.8	315.2	8.3	413.6
1.4	171.1	4.9	318.4	8.4	416.0
1.5	177.0	5.0	321.6	8.5	418.5
1.6	182.8	5.1	324.8	8.6	420.9
1.7	188.7	5.2	328.0	8.7	423.3
1.8	193.8	5.3	331.1	8.8	425.7
1.9	199.1	5.4	334.2	8.9	428.1
2.0	204.2	5.5	337.2	9.0	430.5
2.1	209.2	5.6	340.2	9.1	432.9
2.2	214.1	5.7	343.2	9.2	435.2
2.3	218.8	5.8	346.2	9.3	437.6
2.4	223.5	5.9	349.2	9.4	439.9
2.5	228.1	6.0	352.1	9.5	442.2
2.6	232.6	6.1	355.0	9.6	444.5
2.7	237.0	6.2	357.9	9.7	446.8
2.8	241.3	6.3	360.7	9.8	449.1
2.9	245.5	6.4	363.5	9.9	451.3
3.0	249.7	6.5	366.3	10.0	453.6
3.1	253.8	6.6	369.1	10.1	455.8
3.2	257.8	6.7	371.9	10.2	458.1
3.3	261.7	6.8	374.6	10.3	460.3
3.4	265.7	6.9	377.3	10.4	462.5

Leakage rate may also be calculated using $CFM = A(\text{orifice pressure drop})^B$

where $A = 144.791$ and $B = 0.4959$

If using a calculator, you will need one that has a x^y button on it.

