

Audit Master Pro Training

Water Reports

This tutorial will act as a guide to create and input all data required for the selected water studies.

Audit Master Pro Water Report Training

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Coil Terminal Device Report.....	Page 18
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Boiler Test Report.....	Page 38
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Tower Test Report	Page 77

Click on each report name above to be taken directly to that section.

Audit Master Pro Training

Pump Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

PUMP



Pump Report

COIL



Coil Terminal Device Report

COAH



Coil AHU Mixed Air Report

BOIL



Boiler Test Report

CHIL



Chiller Test Report

TOWR



Tower Test Report

Click "Pump Report"

SYSTEM PUMP TEST REPORT



1

System
System

2

System Design
Design Data

3

Nameplates
Pump & Motor

4

Test
Additional Components

5

Actuals
Actuals

6

Report
Create and print report

Project Name:

System:

Equipment location:

Area served:

Cancel

Next Step →

Enter all System Information

SYSTEM PUMP TEST REPORT

Studies Private Notes Comments Deficiencies Mem of Und C/W Orders Testing Unit Cost



SYSTEM DESIGN

Check box if actual GPM's are known at this point:

Select Type Of System: All GPM's Not Available

Total Coll(s) Design GPM: Not Available

Total System Design GPM: Not Available

Number Of Pumps:

← Previous Step Cancel Next Step →

Enter Design Data

Stand by/Lag (Only Lead Pump(s) are used for calculations)

Short description: Pump 1

Equipment location: Mechanical Room

Area served: HW

Pump type: Secondary

Pump manufacturer: Bell & Gossett

Model number: e-1510

Serial number: 123

Nameplate rated RPM: 1,765.00

Nameplate rated Head/Ft: 50.00

Nameplate rated GPM: 75.00

Nameplate rated pump impeller size (In): 6.250

This Pump's Design Intent GPM: 75.00

Delivery of flow design: Parallel Flow

Pump System Strainer Required/Shown on Plans and Specifications: Yes

Pump System Strainer Installed: Yes

Pump System Strainer Checked and Clean: System couldn't be shut down to check

1 Piping Properly Filled Based on System PRV, Total System Piping Height x .4335 and adding 2 to 3 PSI for fill pressure: Yes

Pump System Piping Properly Vented: Yes

Update

← Previous Step

Cancel

Next Tab →

Enter Nameplate Data

Pump 1 Pmp2

Studies Private Notes Comments Deficiencies Menu of Use C/W Orders Testing Unit Cost

Pump Motor

Nameplate motor manufacturer: Baldor

Motor model number: 123

Nameplate HP: HP 7.5 | KW 5.5927 Nameplate HP unknown

Nameplate RPM: 1,765.00

Nameplate frame category: NEMA Frames

Nameplate frame: 123

Nameplate service factor: 1.15 Not listed *i*

Motor phase: Three phase 2 wire single phase Single phase *i*

ECM (Motor) *i*

System motor operates from a VFD/PWM device?

Motor has electric discharge machining bearing protection installed?

WARNING
Collect only 60 Hz Nameplate Rated Voltage and Amps

Nameplate rated volts: 208.00 230.00 460.00

Nameplate rated amps: 5.52 5.00 10.00

Nameplate efficiency (Eff): 0.940 Power Factor and Efficiency Unknown *i*

Nameplate power factor (PF): 0.747 *i*

Enter Motor Nameplate Data

Select which value reflects actual operating motor Volts and Amps.



Starter/Breaker Mfg

Pump-1



Starter:

Starter mfg: Select Starter Manufacturer.

Starter size:

Quantity of heaters:

Heater stamping:

Heater range rated @:

Incorrect Heaters

Incoming AWG Wire Size supplying power to the starter/panel:

Breaker:

Breaker mfg: Select Breaker Manufacturer.

Breaker model #:

Breaker rated @:

Wrong Breaker was Installed: Too Large Too Small

Additional components:

Enter Starter/ Breaker Information

Note: If on the previous Step you selected that a VFD is controlling the motor, then this section will not populate.



Response required to these questions before continuing

System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.

⚠ WARNING ✕

Ensure everybody is clear of any potential system moving parts, ie motors, fans, pulleys, belts, etc.

⚠ Danger: Arc Flash And Shock Hazard - Appropriate PPE Required. ✕

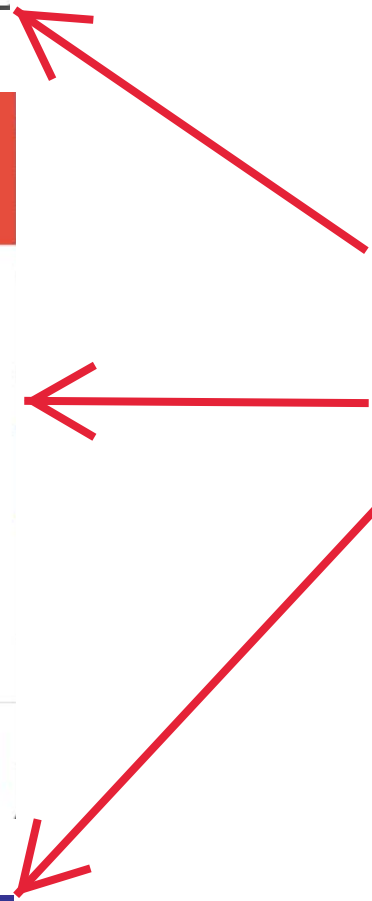
- Do not operate controls or open covers without appropriate Personal Protection Equipment (PPE). Failure to comply may result in Injury or Death.
- Refer to NFPA 70E for minimum PPE Requirements.
- Warning NFPA code requirements may change, always check for current or updated code requirements
- Request a qualified and licensed electrician to collect voltage and Current/Amperage data if not ARC Flash Trained

Warning: Above is understood and will be adhered to.

Is the fan turning in the correct rotation/direction?

These are three of the most common safety warnings that will appear throughout AMPs software.

You will be required to acknowledge each warning individually in order to proceed.



Pump 1

Pump off pressure PSI: Feet water column:

PSI InHg

Pump shut differential:

Actual pump impeller diameter (in): ⓘ

Select Voltage that best represents Actual read:

Nameplate Volts: 208.00V 230.00V 480.00V Voltage Not Listed

Nameplate Amps: 5.52A 5.00A 10.00A

IMPORTANT

1. Single Phase and 3 Phase Voltage are recorded from Phase to Phase, not Phase to Ground.
2. Reading Actual Volts requires a handheld voltmeter rated for VFDs. A typical RMS Voltmeter will not provide accurate readings.
3. Actual Voltage and Amperage associated with the VFD must be recorded on the leaving side of the VFD to the Motor.

Volts read from VFD Screen Volts read with a handheld voltmeter

VFD/PWM Only displays 1 Voltage and 1 Amperage

Motor Actual Volts:

Motor Actual Amps:

PSI InHg

Final running pressures:

Actual pump RPM:

NPSH testing

Pump curve NPSHA (ft):

Pump curve NPSHR (ft): ⓘ

NPSH Pump Inlet water temperature (°F):

NPSHA Inlet Pressure (PSI): ⓘ ⓘ

Design GPM: VFD/PWM set at: % Hz:

Actual GPM: Final %:

System Delta Pressure set-point based on worst case flowing coil/device listed as: ⓘ

Balance valve serving worst case flowing device is: % Open ⓘ

System Delta Pressure set-point:

Enter Actual Pump Data

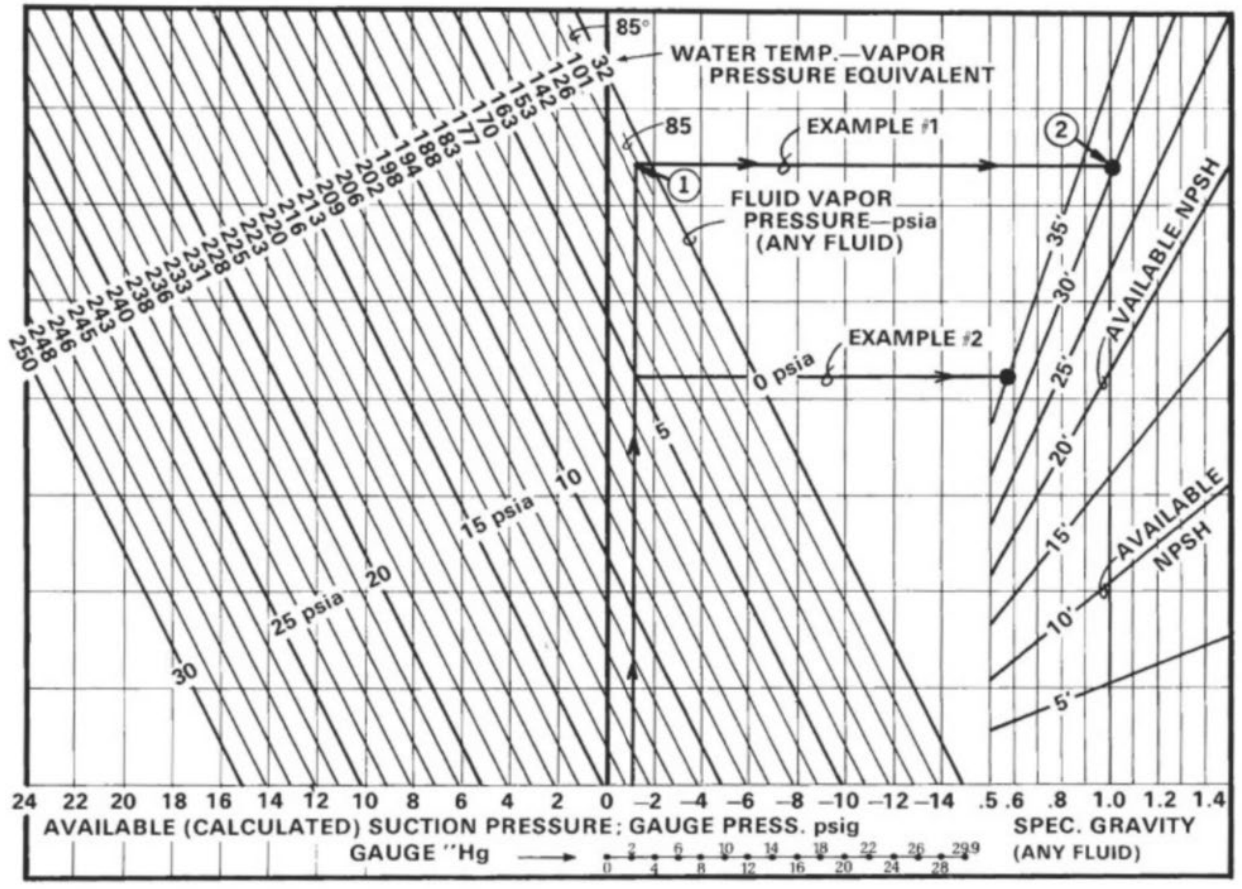
Use actual GPM point and take GPM value until value crosses NPSHR curve or runs parallel, if parallel or curved and between two values, select largest value.



There are information icons throughout the study pages should additional understanding be needed.



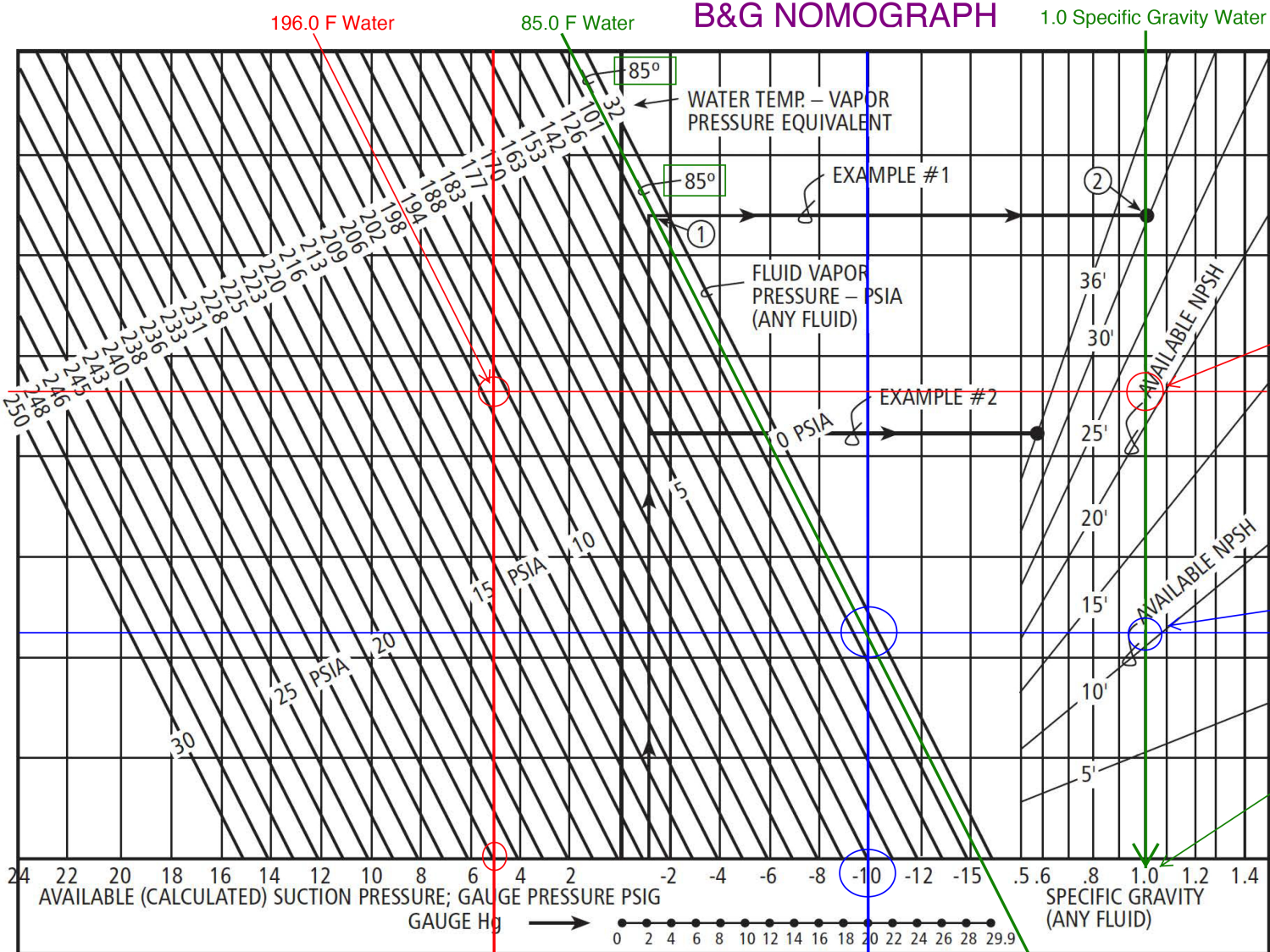
Hz:



NPSHA Chart

Close

B&G NOMOGRAPH



Cross Hairs
NPSHA = 22.5'
+ 5.0 PSIG
196.0 F Water

Cross Hairs
NPSHA = 10.5'
- 10.0 Hg
85.0 F Water

Specific Gravity
of Water = 1.0

NPSHA Chart Example

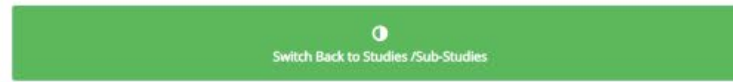
Example to the Right:
2 Suction pressure values were used.
1 @ - 10.0 Hg (Vacuum) @ 85.0 F Water Temperature.
1 @ + 5.0 PSIG @ 196.0 F Water Temperature.
Fluid: Water specific gravity @ 1.0

+ 5.0 PSIG
Water SG @ 1.0
NPSHA = 22.5'
Water Temperature 196.0 F
To avoid pump cavitation
NPSHR Must be less than 22.5'

- 10.0 Hg
Water SG @ 1.0
NPSHA = 10.5'
Water Temperature 85.0 F
To avoid pump cavitation
NPSHR Must be less than 10.5'

Point of 85.0 F Water
Entering Pump Inlet / Suction

SYSTEM PUMP TEST REPORT



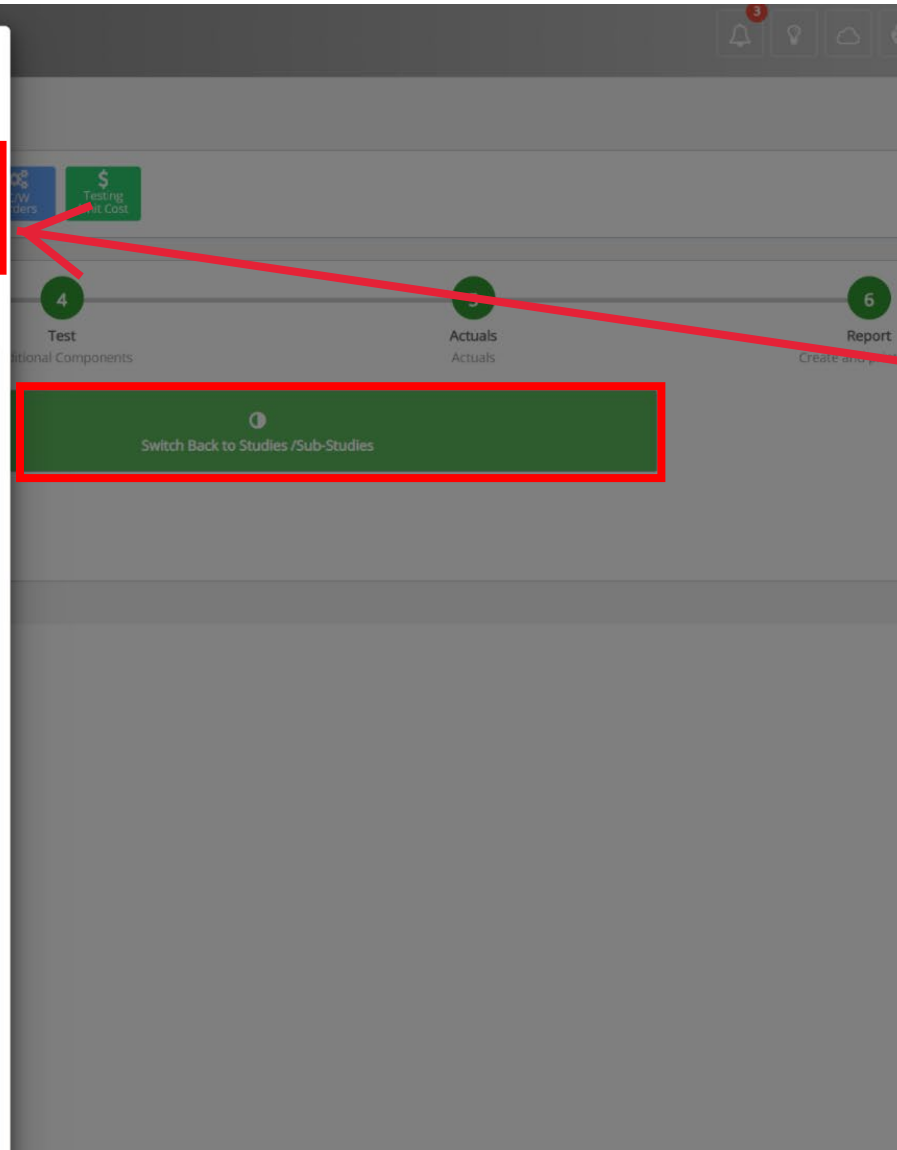
Complete Report/Study

Sub studies

- PROJ-1310 Coil Terminal Device Report (New) →
- PROJ-1311 Coil AHU Mixed Air Report (New) →

Other studies

- AHU 1 - Engineered Fan Report (Working) →
- AHU 1 (COPY) - Engineered Fan Report (New) →
- PROJ-FANA-14971 - Engineered Fan Array Report (New) →
- PROJ-COEA-14972 - Electric Coil AHU Mixed Air Report (New) →
- PROJ-COET-14973 - Electric Coil Terminal Device Report (New) →
- PROJ-STAT-14974 - Static Pressure Report (New) →
- PROJ-PITO-14975 - Pitot Traverse Report (New) →
- PROJ-PITF-14976 - Pitot Fan Report (New) →
- PROJ-OUTM-14977 - Outlet Master Report (New) →
- PROJ-VAVR-14978 - VAV Test Report (New) →
- PROJ-CAVR-14979 - CAV Test Report (New) →
- PROJ-FPBR-14980 - FPB Test Report (New) →
- PROJ-VELG-14981 - Velgrid Report (New) →
- PROJ-MATR-14982 - General Matrix Report (Working) →
- PROJ-RVAR-14983 - Rotating Vane Anem Report (Working) →



Testing Unit Cost

4 Test Additional Components

Actuals Actuals

6 Report Create and...

Switch Back to Studies /Sub-Studies

If you complete a main study before completing the Sub-Study under it, a pop up will show the Sub-Studies that need to be completed.






Audit Master Pro Training

Coil Terminal Device Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

 PUMP Pump Report	 COIL Coil Terminal Device Report
 COAH Coil AHU Mixed Air Report	 BOIL Boiler Test Report
 CHIL Chiller Test Report	 TOWR Tower Test Report

← Click “Coil Terminal Device Report”

COIL TERMINAL DEVICE REPORT | 1ST TO 5TH FLOOR



1

Step 1

System configuration

2

Step 2

Coil data configuration

3

Step 3

Data capture and report

4

Step 4

Report

Project Name Test Project

System 1st to 5th Floor

Description

Add All Coil Flows to Pump System Total

Add All Coil Flows to Pump Coil Total

Add Total BTU/H to System Total

Automatically Fill Next Row & Item

Add Device PDW PSI column

Add Device PDW Feet' column

Add Device Cv/Coefficient column

System Contains Glycol

Design Glycol Type Ethylene Glycol

Design Glycol % by Volume 30

Design Glycol Freeze Protection Value °F + 0

Note: It is recommended the airflow flowing through the coil(s) listed below be balanced with known flows available prior to recording heat transfer data.

Airflow(s) that effect the coils was balanced with "known flows/values" prior to performing detailed Coil Heat Transfer Performance Recordings:

Yes

Cancel

Next Step →

Enter system information and select the data to be collected.

COIL TERMINAL DEVICE REPORT | 1ST TO 5TH FLOOR

Navigation icons: Studies, Private Notes, Comments, Deficiencies, Mem of Und, C/W Orders, Testing Unit Cost



Export and Conversion icons

Hydronic Heat Transfer Performance Data

Add All

- Add DESIGN ΔT °F Water Temperature Column
- Add ACTUAL ΔT °F Water Temperature Column
- Add DESIGN Coil Δ PSI Water Column
- Add ACTUAL Coil Δ PSI Water Column
- Add DESIGN Coil BTU/H Sensible
- Add ACTUAL Coil BTU/H Sensible

Airflow Heat Transfer Performance Data

Add All

- Add DESIGN Airflow - ΔT °F DB Column (Sensible)
- Add ACTUAL Airflow - ΔT °F DB Column (Sensible)
- Add DESIGN Airflow - Coil Δ SP In/WC Column
- Add ACTUAL Airflow - Coil Δ SP In/WC Column
- Add DESIGN Airflow - % RH, WB, DP Column
- Add ACTUAL Airflow - % RH, WB, DP Column
- Add DESIGN Coil Airflow
- Add ACTUAL Coil Airflow

← Previous Step | Cancel | Next Step →

Select Coil Data to be collected

Response required to these questions before continuing

System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.



System Contains Glycol

I know the % Glycol Solution i I know the Freeze Protection Value i

Glycol Type: Ethylene Glycol Glycol % by Volume: 30 Glycol Freeze Protection Value °F: 0 Glycol Specific Gravity: 1.04 Glycol Protection % of Design: 100%

i HEAT TRANSFER CONTROL VALVE 1.456.08

Coil Configuration

#	System, Room, or Area Served	Number of Feeds/Circuits	Throttled Device Set @	Fins per In	Rows	Design H2O PDW Feet	Device Actual PDW PSI	Coil Width	Coil Length	Design GPM	% of Design	Actual GPM	Auto Min/Max
1	1st Floor	1	Auto	8	0	2,000		48,000	30,000	40,000	96.75%	38,700	36.0/44.0
Totals										40,000	96.75%	38,700	36.0/44.0

1 i +

Item: 1

Device Mfg: <input type="text"/> Missing <input type="checkbox"/> Extra <input type="checkbox"/> Device Model: <input type="text"/> Manual <input type="checkbox"/> Auto-Flow <input type="checkbox"/>	Design Airflow - ΔT °F DB (Plans/Print) Design Coil Air Temperature ΔT °F DB: <input type="text"/> Actual Airflow - ΔT °F DB Up Stream Coil Air Temperature Dry Bulb °F: <input type="text"/> ΔT °F DB: <input type="text"/> Down Stream Coil Air Temperature Dry Bulb °F: <input type="text"/>
Design Airflow Coil BTU/h Total (Plans/Print) Design Total Coil BTU/h: <input type="text"/>	Actual Airflow CFM (Plans/Print) Design Airflow CFM: <input type="text"/> Actual Airflow CFM: <input type="text"/> % Design: <input type="text"/>
Design ΔT °F Water Temperature (Plans/Print) Design Coil Water ΔT °F: <input type="text"/>	Design Pipe Information (Plans/Print) Design Pipe Size In: <input type="text"/> (Plans/Print) Design Pipe Fluid Velocity Fps: 0.000
Actual ΔT °F Water Temperature Entering Coil Water Temperature °F: <input type="text"/> ΔT °F: 0.00 Leaving Coil Water Temperature °F: <input type="text"/>	Actual Pipe Information Dimensions are for the full flow of the Coil, not the bypass if present

Calibrated Balance Device(s)
 This Coil has Calibrated Balance Devices: Use Ultrasonic Meter:

Enter Actual Coil Data

Device Model

Manual Auto-Flow

Design Airflow Coil BTU/h Total

(Plans/Print) Design Total Coil BTU/H

Design ΔT °F Water Temperature

(Plans/Print) Design Coil Water ΔT °F

Actual ΔT °F Water Temperature

Entering Coil Water Temperature °F

ΔT °F 0.00

Leaving Coil Water Temperature °F

Calibrated Balance Device(s)

This Coil has Calibrated Balance Devices: Use Ultrasonic Meter:

Ultrasonic Meter / Doppler

Ultrasonic/Doppler Meter Mfg

Transducers Used

Transducers Spacing Set Inches

Actual Airflow - ΔT °F DB

Up Stream Coil Air Temperature Dry Bulb °F

ΔT °F DB

Down Stream Coil Air Temperature Dry Bulb °F

Actual Airflow CFM

(Plans/Print) Design Airflow CFM

Actual Airflow CFM

% Design

Design Pipe Information

(Plans/Print) Design Pipe Size In

(Plans/Print) Design Pipe Fluid Velocity Ft/s 0.000

Actual Pipe Information
Dimensions are for the full flow of the Coil, not the bypass if present

Piping Type

Actual Installed Pipe Size OD In

Actual Pipe Wall Thickness In

Actual Installed Pipe Size ID In

Installed Pipe Material Type

Actual Fluid Velocity Ft/s

Actual Pipe Smallest Segment Information
Smallest Pipe Dimension in this circuit's section

Smallest Segment Installed Pipe Size OD In

Smallest Segment Pipe Wall Thickness In

Smallest Segment Installed Pipe Size ID In

Smallest Segment Fluid Velocity Ft/s

Exec

Conversion

Update Cancel

← Previous Step Next Step →

Enter Actual Coil Data Continued

Note:

You can copy any coil along with its design data by clicking the "BLUE" Copy Icon.

Enter additional coils by clicking the "GREEN" + Icon.

COIL TERMINAL DEVICE REPORT | 1ST TO 5TH FLOOR

Studies
Private Notes
Comments
Deficiencies
Menu of Unit
CHW Orders
Testing Unit Cost

Print
Convert

1
 Step 1
 System configuration

2
 Step 2
 Coil data configuration

3
 Step 3
 Data capture and report

4
 Step 4
 Report

System Contains Glycol

I know the % Glycol Solution i

I know the Freeze Protection Value i

i HEAT TRANSFER CONTROL VALUE
1,456.08

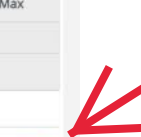
Coil Configuration

#	System, Room, or Area Served	i Number of Feeds/Circuits	Throttled Device Set @	Fins per In	i Rows	Design H2O Flow Feet	Device Actual PDW PSI	Coil Width	Coil Length	Design GPM	% of Design	Actual GPM	Auto Min/Max
1					0			In	In				
Totals										0.000	%	0.000	0.0/0.0

1

Item: 1

Device Mfg	Design Airflow - ΔT °F DB
Missing <input type="checkbox"/> Extra <input type="checkbox"/>	(Plans/Print) Design Coil Air Temperature ΔT °F DB <input type="text"/>
Device Model	Actual Airflow - ΔT °F DB
Manual <input type="checkbox"/> Auto-Flow <input type="checkbox"/>	Up Stream Coil Air Temperature Dry Bulb °F <input type="text"/>





 Complete Sub-study

 Switch to Main Study

[← Previous Step](#) [Cancel](#)

Complete Sub-Study

1

Confirmation

CONFIRMATION

This will complete this Study and **NO ADDITIONAL CHANGES WILL BE ALLOWED UNLESS YOU REOPEN REPORT STUDY.** Are you certain you want to finalize your test?

Accept

Cancel

Accept Confirmation

Audit Master Pro Training

Coil AHU Mixed Air Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

PUMP



Pump Report

COIL



Coil Terminal Device Report

COAH



Coil AHU Mixed Air Report

BOIL



Boiler Test Report

CHIL



Chiller Test Report

TOWR



Tower Test Report

Click "Coil AHU Mixed Air Report"



1

Step 1

System configuration

2

Step 2

Coil data configuration

3

Step 3

Data capture and report

4

Step 4

Report

Project Name

System

Room/Area Served

Description

Automatically Fill Next Row & Item

Add Device PDW PSI column

Add Device PDW Feet' column

Add Device Cv/Coefficient column

System Contains Glycol

Note: It is recommended the airflow flowing through the coil(s) listed below be balanced with known flows available prior to recording heat transfer data.

Airflow(s) that effect the coils was balanced with "known flows/values" prior to performing detailed Coil Heat Transfer Performance Recordings:

Select Airflow Response

Cancel

Enter System Information

Studies
Private Notes
Comments
Deficiencies
Mem of Use
C/W Orders
Testing Unit Cost



Ermo
Converse

Hydronic Heat Transfer Performance Data

Add All

- Add **DESIGN** ΔT °F Water Temperature Column
- Add **ACTUAL** ΔT °F Water Temperature Column
- Add **DESIGN** Coil Δ PSI Water Column
- Add **ACTUAL** Coil Δ PSI Water Column
- Add **DESIGN** Coil BTU/H Sensible
- Add **ACTUAL** Coil BTU/H Sensible

Airflow Heat Transfer Performance Data

Add All

- Add **DESIGN** Airflow - ΔT °F DB Column (Sensible)
- Add **ACTUAL** Airflow - ΔT °F DB Column (Sensible)
- Add **DESIGN** Airflow - Coil Δ SP In/WC Column
- Add **ACTUAL** Airflow - Coil Δ SP In/WC Column
- Add **DESIGN** Airflow - % RH, WB, DP Column
- Add **ACTUAL** Airflow - % RH, WB, DP Column

When collecting Airflow Transfer Data use: Relative Humidity Wet bulb F Dew Point

← Previous Step
Cancel
Next Step →

Select Coil data to be collected

Response required to these questions before continuing

System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.

1

Step 1
System configuration

2

Step 2
Coil data configuration

3

Step 3
Data capture and report

4

Step 4
Report

Coil Configuration

#	Number of Feeds/Circuits	Throttled Device Set @	Fins per In	Rows	Design H2O PDW Feet	Device Actual PDW PSI	Coil Width	Coil Length	Design GPM	% of Design	Actual GPM	Auto Min/Max
1	1	20	8	2	4.000	2.000	48.000	24.000	25.000	99.20%	24.800	22.5/27.5
Totals									25.000	99.20%	24.800	22.5/27.5

Actual System Total Combined BTU/H 496,694.400

1

Item: 1

Device Mfg	Unit
Missing <input type="checkbox"/>	Extra <input type="checkbox"/>
Device Model	123
Manual <input type="checkbox"/>	Auto-Flow <input type="checkbox"/>
Design Total Hydronic Coil BTU/H	
(Plans/Print) Design Coil BTU/H Total	500,000.000
Actual Total Hydronic Coil BTU/H	
Actual Total Coil BTU/H	496,694.40
% of Design	99.34%
Design ΔT °F Water Temperature	
(Plans/Print) Design Coil Water ΔT °F	10.000

Design Hydronic/Water Coil Δ PSI Water

(Plans/Print) Design Coil Water Δ PSI 1.734

Actual (As Found) Hydronic/Water Coil Δ PSI Water

Entering Water PSI 20.000

Δ PSI 2.00

Leaving Water PSI 18.000

Actual (Coil Valvs wide open) Hydronic/Water Coil Δ PSI Water

Entering Water PSI 18.000

Δ PSI 2.00

Leaving Water PSI 20.000

Actual (As Left/Balanced) Hydronic/Water Coil Δ PSI Water

Enter Actual Coil Data

If a calibrated balancing device is selected, this box will appear.

% of Design 99.34%

Design ΔT °F Water Temperature (Plans/Print) Design Coil Water ΔT °F 10.000

Actual ΔT °F Water Temperature

Entering Coil Water Temperature °F 180.000

ΔT °F 40.000

Leaving Coil Water Temperature °F 140.000

Calibrated Balance Device(s)

This Coil has Calibrated Balance Devices: Use Ultrasonic Meter:

Indicate the number of Balance Setter Devices:

Balance Setter Device		1
	GPM Design	25.000
	Device Size In	6.500
	GPM Actual	24.800
As Found-Data	<i>i</i>	
	Entering Water PSI	22.000
	Leaving Water PSI	20.000
	Water Δ PSI	2.00
Wide-Open-Data	<i>i</i>	
	Entering Water PSI	46.000
	Leaving Water PSI	42.000
	Water Δ PSI	4.00
As Left/Balanced-Data	<i>i</i>	
	Entering Water PSI	64.000
	Leaving Water PSI	57.000

Δ PSI 2.00

Leaving Water PSI 20.000

Actual (As Left/Balanced) Hydronic/Water Coil Δ PSI Water

Entering Water PSI

Δ PSI 0.00

Leaving Water PSI

Design Airflow - ΔT °F DB

(Plans/Print) Design Coil Air Temperature ΔT °F DB 50.000

Actual Airflow - ΔT °F DB

Up Stream Coil Air Temperature Dry Bulb °F 173.000

ΔT °F DB 153.000

Down Stream Coil Air Temperature Dry Bulb °F 20.000

Design Airflow - Coil Δ SP In/WC

(Plans/Print) Design Coil Δ SP In/WC 20.000

Actual Airflow - Coil Δ SP In/WC

Up Stream Coil SP In/WC 20.000

Δ SP In/WC 0.00

Down Stream Coil SP In/WC 20.000

Actual Airflow CFM

(Plans/Print) Design Airflow CFM 500.000

Actual Airflow CFM 492.000

% Design 98.40%

Design Pipe Information

Enter Actual Coil Data Continued

Wide-Open-Data		<i>i</i>
Entering Water PSI	46.000	
Leaving Water PSI	42.000	
Water Δ PSI	4.00	
As Left/Balanced-Data		<i>i</i>
Entering Water PSI	64.000	
Leaving Water PSI	57.000	
Water Δ PSI	7.00	
Water Temperature		
Entering T °F	180	
Leaving T °F	140	
Δ T °F	-40	
BTU/H	496,694.40	
Key Circuit	<input type="radio"/>	
Combined GPM:	24.80	Total BTU/H: 496,694.40

Down Stream Coil SP In/WC: 20.000

Actual Airflow CFM

(Plans/Print) Design Airflow CFM	500.000
Actual Airflow CFM	492.000
% Design	98.40%

Design Pipe Information

(Plans/Print) Design Pipe Size In	6.500
(Plans/Print) Design Pipe Fluid Velocity Ft/s	0.596

Actual Pipe Information

Dimensions are for the full flow of the Coil, not the bypass if present

Piping Type	Select Coil Pipe Type
Actual Installed Pipe Size OD In	6.500
Actual Pipe Wall Thickness In	0.237
Actual Installed Pipe Size ID In	6.03
Installed Pipe Material Type	Carbon Steel
Actual Fluid Velocity Ft/s	DATA WILL BE AVAILABLE WHEN PAYMENT IS RECEIVED

Actual Pipe Smallest Segment Information


Smallest Pipe Dimension in this circuit's section

Smallest Segment Installed Pipe Size OD In	6.500
Smallest Segment Pipe Wall Thickness In	0.237
Smallest Segment Installed Pipe Size ID In	6.03
Smallest Segment Fluid Velocity Ft/s	DATA WILL BE AVAILABLE WHEN PAYMENT IS RECEIVED

Enter Actual Coil Data Continued




Complete Report/Study


Switch Back to Studies

← Previous Step **Cancel**

Complete Report/Study

Complete Study



1

Confirmation

CONFIRMATION

This will complete this Study and **NO ADDITIONAL CHANGES WILL BE ALLOWED UNLESS YOU REOPEN REPORT STUDY.** Are you certain you want to finalize your test?

Accept

Cancel

Accept Confirmation

Audit Master Pro Training

Boiler Test Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

PUMP



Pump Report

COIL



Coil Terminal Device Report

COAH



Coil AHU Mixed Air Report

BOIL



Boiler Test Report

CHIL



Chiller Test Report

TOWR



Tower Test Report

Select "Boiler Test Report"



BOILER TEST REPORT



1

Step 1
System

2

Step 2
Boiler Design Data

3

Step 3
Boiler Nameplate Data

4

Step 4
Boiler Flue Gas Combustion Efficiency Test

5

Step 5
Report



Project name:

System:

Equipment location:

Condition of test:

Enter Boiler System Information

BOILER TEST REPORT



BOILER DESIGN DATA

Design/Rated GPM Total:	<input type="text" value="75.000"/>	
Design Manufacturer:	<input type="text" value="Lochinvar"/>	
Design Model #:	<input type="text" value="123"/>	
Design/Rated (Return/Cool) EWT (°F):	<input type="text" value="120.000"/>	EWT
Design/Rated (Supply/Hot) LWT (°F):	<input type="text" value="180.000"/>	LWT
Design/Rated Boiler Water Delta T (°F):	<input type="text" value="60.000"/>	ΔT
Design Rated BTU/H:	<input type="text" value="2,250,000.000"/>	
Design/Rated MBH:	<input type="text" value="2,250.000"/>	
Design/Rated Boiler Efficiency:	<input type="text" value="0.960"/>	
Design/Rated Tube Bundle Δ PSI:	<input type="text" value="7.000"/>	Δ PSI
Number of Circulating Pumps Serving this Boiler:	<input type="text" value="1"/>	
Number of Primary Pumps Serving this Boiler:	<input type="text" value="1"/>	

There are information icons on this page to assist with identifying each pump.



Enter Boiler Design Data



BOILER NAMEPLATE DATA

Manufacturer:

Model #:

Serial #:

Series #:

Minimum Relief Valve Capacity (PSI):

Mfg Date:

Fuel/Utility Source:

Fuel Utility Supplier Caloric Energy Value: Unit (GPH, BTU/H, etc.)

BTU/H:

MBH:

Efficiency:

Minimum BTU/H Fuel Input:

Maximum BTU/H Fuel Input:

Minimum BTU/H Output:

Maximum BTU/H Output:

Boiler horsepower:

Square Feet of Heating Surface:

Gross E.D.R.:

Maximum Water Temperature (°F):

Maximum Working Pressure (PSI):

Minimum Input USGPH:

Steam





Enter Boiler Nameplate Data

Note: Ideal testing procedures is to run the boiler at full load for 30 minutes under steady state.

Select "Fuel/Utility Source"

BOILER TYPE: NATURAL GAS

 E=mc²
 Conversions


Maximum Hydronic Pressure PSI:

MBH Rating:

Gas Minimum Inlet Pressure In/WC: 

Gas Maximum Inlet Pressure In/WC:

Gas Manifold Pressure In/WC: 

NOx Emission Level PPM: 

START TEST

Update

Cancel

← Previous Step

Enter Fuel/Utility Source Data

Important ✕

Before performing Test. Ensure system has been running for 30 minutes and is under full load and Steady State.

Accept

Cancel

Recommended run time and steady state confirmation pop-up.

Response required to these questions before continuing

System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.

1

Step 1
System

2

Step 2
Boiler Design Data

3

Step 3
Boiler Nameplate Data

4

Step 4
Boiler Flue Gas Combustion Efficiency Test

5

Step 5
Report

Actual Gas Inlet Pressure (PSI):	<input type="text" value="2.000"/>
Actual Gas Manifold Pressure (PSI):	<input type="text" value="3.450"/>
Actual GPM Total:	<input type="text" value="74.500"/>
Actual (Return/Cool) EWT (°F):	<input type="text" value="118.000"/>
Actual (Supply/Hot) LWT (°F):	<input type="text" value="181.000"/>
Actual Boiler Inlet/Returning (Cold) PSI:	<input type="text" value="14.000"/>
Actual Boiler Discharge/Leaving (Hot) PSI:	<input type="text" value="14.000"/>
Actual Tube Bundle Δ PSI as Tested:	<input type="text" value="2.000"/>
Total Tube Bundle ΔT as Tested:	<input type="text" value="63.000"/>
Total BTU/H as Tested:	<input type="text" value="2,350,035.450"/>
Total MBH as Tested:	<input type="text" value="2,350.035"/>
Actual Water/Hydraulic kW:	<input type="text" value="688.756"/>

END TEST

Update

Cancel

← Previous Step

Enter Boiler Performance Test Data

Warning: Confirm all data is correct. You can not make any changes after this data is finalized.

Important



This will complete your Boiler test report and **NO ADDITIONAL CHANGES WILL BE ALLOWED.**
Are you certain you want to finalize this test?

Accept

Cancel

Accept Entered Data

Studies Notes Comments Deficiencies Und Orders Unit Cost



Complete Report/Study

Switch Back to Studies /Sub-Studies

← Previous Step Cancel

Complete Report/Study

Complete Study X

1 ————— 2
Validate Incomplete Studies Confirmation

VALIDATE INCOMPLETE STUDIES

This Project has non-completed studies.
Completing this Project will close and register non-completed studies as Incomplete
WARNING: NO ADDITIONAL CHANGES WILL BE ALLOWED.

Are you certain you want to continue?

[View Incomplete Studies](#)

[Cancel](#) [Next Step →](#)

When entering boiler data, if you selected that a pump serves this boiler and is a part of the test, a Sub-Study will automatically be created for that pump.

The Sub-Study must be completed, otherwise it will show up as incomplete for the Boiler Study.

Sub studies

PROJ--827 Pump Report (New) →

PROJ--828 Pump Report (New) →

Close

Begin Sub-Study

Audit Master Pro Training

Chiller Test Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

PUMP



Pump Report

COIL



Coil Terminal Device Report

COAH



Coil AHU Mixed Air Report

BOIL



Boiler Test Report

CHIL



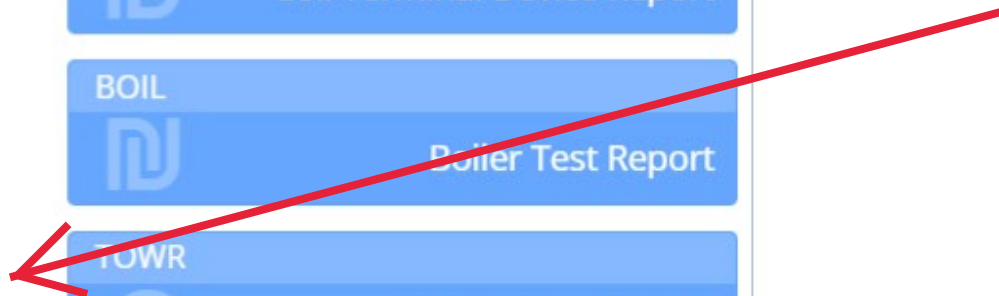
Chiller Test Report

TOWR

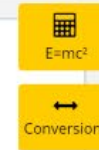


Tower Test Report

Select "Chiller Report"



CHILLER TEST REPORT



Project Name

System(s) Served

Quantity of Chillers

Quantity of Towers

Location

Cancel

Update

Next Step →

Enter Chiller System Information

Studies
Private Notes
Comments
Deficiencies
Map of Unit
L/W Orders
Testing Unit Cost



Energy
Conversions

Operated from approximately (Date) to

"Estimated" Daily Operating Hours Mon - Fri Hrs / Per day

"Estimated" Daily Operating Hours Saturday Hrs / Per day

"Estimated" Daily Operating Hours Sunday Hrs / Per day

"Estimated" Annual Operating Hours Hrs / Per year

"Estimated" Annual Operating Days Days / Per year

Number of Evaporator pumps in this System

Number of Evaporator pumps to be tested

Number of Tower/Condenser pumps in this System

Number of Tower/Condenser pumps to be tested

Evaporator Section

Condenser Section

Design/Rated GPM Total

Design/Rated GPM Total

Design/Rated (Warm) EWT

Design/Rated (Warm) EWT

Design/Rated (Cold) LWT

Design/Rated (Cold) LWT

Evaporator Design ΔT (°F)

Condenser Design ΔT (°F)

Evaporator Design BTU/H

Condenser Design BTU/H

← Previous Step
Update
Next Step →
Cancel

Enter Operating and Design Data

Step 1 System Information | Step 2 General Information | Step 3 Nameplates | Studies | Power Meters | Comments | Deficiencies | Main Unit | CMV Orders | Test: Unit Cost | Step 6 Energy Source Test | Step 7 Energy Combined/Averaged | Step 8 Report

Operated from approximately (Date) to

Estimated Daily Operating Hours Mon - Fri Hrs / Per day

Estimated Daily Operating Hours Saturday Hrs / Per day

Estimated Daily Operating Hours Sunday Hrs / Per day

Estimated Annual Operating Hours Hrs / Per year

Estimated Annual Operating Days Days / Per year

Number of Evaporator pumps in this System

Number of Evaporator pumps to be tested

Number of Tower/Condenser pumps in this System

Number of Tower/Condenser pumps to be tested

Evaporator Section		Condenser Section	
Design/Rated GPM Total	<input type="text" value="250.000"/>	Design/Rated GPM Total	<input type="text" value="375.000"/>
Design/Rated (Warm) EWT	<input type="text" value="52.000"/>	Design/Rated (Warm) EWT	<input type="text" value="83.000"/>
Design/Rated (Cold) LWT	<input type="text" value="40.000"/>	Design/Rated (Cold) LWT	<input type="text" value="93.000"/>
Evaporator Design ΔT (°F)	<input type="text" value="12.000"/>	Condenser Design ΔT (°F)	<input type="text" value="910.000"/>
Evaporator Design BTU/H	<input type="text" value="1,502,100.000"/>	Condenser Design BTU/H	<input type="text" value="170,883,875.000"/>

WARNING
 Your values entered are not within industry standard range. Your ratio of Heat of Absorption to the calculated Heat of Rejection is 11375 %. Ideal is 125.00 %.
 Review the design data you've entered for the Evaporator and Condenser regarding flows and temperatures.

Warning: This message will appear if data entered exceeds industry standards.

This warning will be removed once the data has been corrected.

Condenser Section

Design/Rated GPM Total 375.000

Design/Rated (Warm) EWT 83.000

Design/Rated (Cold) LWT 93.000

Condenser Design ΔT ($^{\circ}F$) 10.000

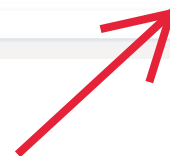
Condenser Design BTU/H 1,877,625.000

← Previous Step

Update

Next Step →

Cancel



Warning has been cleared

Information



Prior to performance testing this cell: Confirm the system is fully loaded/challenged and has been operating for a minimum of 30 minutes and is at steady state. Testing ideally to be performed when the prevailing wind speed is 15.0 MPH or less when testing Cooling Towers.

Accept

Cancel

A pop up box will appear to explain ideal testing conditions.



Evaporator/Condenser Nameplate Data

Chiller 1

Chiller Manufacturer:

Model #:

Serial #:

Refrigerant Class: hfc cfc

Refrigerant Type:

Nameplate Rated Full-Load Capacity (Tons):

Nameplate Rated Full-Load Efficiency (kW/ton):

Options Code:

Additional Information:

Compressors/Circuits

1 +

Nameplate Compressor Manufacturer:

Nameplate HP: Nameplate HP unknown

Motor phase: three phase 2 wire single phase

Nameplate Rated Volts:

Nameplate Rated Amps:

Nameplate efficiency (EFF): Power Factor and Efficiency Unknown

Nameplate power factor (PF):

Nameplate Rated Hz: 50 Hz 60 Hz

Enter Chiller Nameplate Data

Compressors/Circuits



1 +

Nameplate Compressor Manufacturer: Emerson

Nameplate HP: HP 40 | KW 29.828

Nameplate HP unknown

Motor phase: Three phase 2 wire single phase

Nameplate Rated Volts: 460.00 000.00 V 000.00 V
Nameplate Rated Amps: 230.00 000.00 A 000.00 A

Add Remove

Nameplate efficiency (Eff): 0.95_ Power Factor and Efficiency Unknown i

Nameplate power factor (PF): 0.171 i

Nameplate Rated Hz: 50 Hz 60 Hz

← Previous Step Update Next Step →
Cancel

Enter Compressor Nameplate Data



Tower/Condenser Nameplate Data

EMcalc
Conversions

Tower 1

Tower Manufacturer

Model #

Serial #

Date Manufactured

Nameplate Tonnage

Nameplate Rated Capacity (BTU/H)

Tower Total CFM

Design Entering Air WB


Design Ambient Air DB

Fan/Motors

1 +

Nameplate Motor Manufacturer:

Enter Tower/Condenser Nameplate Data

1 

Nameplate Motor Manufacturer:


Serial number:


Nameplate HP: Nameplate HP unknown:

Nameplate RPM:

Nameplate frame category:

Nameplate frame:

Nameplate service factor: Not listed: 


ECM (Motor) 


System motor operates from a VFD/PWM device?

Motor phase: Three phase 2 wire single phase



Nameplate Rated Volts:

Nameplate Rated Amps:

Nameplate efficiency (Eff): Power Factor and Efficiency Unknown 

Nameplate power factor (PF): 

Nameplate Rated Hz: 50 Hz 60 Hz

Enter Tower Motor Nameplate Data

Response required to these questions before continuing


System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.



ion

3
Step 3
Nameplates

4
Step 4
Actuals

5
Step 5
Sound Pressure Test

6
Step 6
Energy Source Test

Energy

START TEST

← Previous Step Cancel

Start Test

WARNING

Ensure everybody is clear of any potential system moving parts, ie motors, fans, pulleys, belts, etc.

ACCEPT

Cancel

⚠ Danger: Arc Flash And Shock Hazard - Appropriate PPE Required.

- Do not operate controls or open covers without appropriate Personal Protection Equipment (PPE). Failure to comply may result in Injury or Death.
- Refer to NFPA 70E for minimum PPE Requirements.
- Warning NFPA code requirements may change, always check for current or updated code requirements
- Request a qualified and licensed electrician to collect voltage and Current/Amperage data if not ARC Flash Trained

Warning: Above is understood and will be adhered to.

ACCEPT

Cancel

These are two of the most common safety warnings that will appear throughout AMPs software.

You will be required to acknowledge each warning individually in order to proceed.

Enter Actual Chiller Data



Chiller Actuals

Record Chilled water supply and return temperature readings.
Compare data to digital readout on chiller control panel.

Actual Chilled Water Delivery GPM

Actual Chiller/Cooler Refrigerant Sump Temp °F

Need Chiller Refrigerant Pressures

Chiller 1

	Actual (°F)	Display (°F)	Δ Comparison	Design Δ °F	Actual Δ °F	Δ °F % of Design
Chilled Water Supply Temp (°F)	0.00	0.00	0.00	12.00	0.00	0.00
Chilled Water Return Temp (°F)	0.00	0.00	0.00			

Compressors/Circuits

Comp-1

Compressor Number

Compressor Type

Select Voltage that best represents Actual Value: Voltage Not Listed

Nameplate Volts: 460V V V

Nameplate Amps: 230A A A

Compressor Actual Volts: L1 -L2 L1 -L3 L2 -L3

Compressor Actual Amps:

Chiller Results

Actual BTU/H	Actual kW	Kw/Ton	C.O.P.
0.00	0.00	0.00	0.00

Switch for required recording of refrigerant pressures.

Recording Pressures Agreement



I acknowledge I will follow all EPA, Federal, State, and Local codes when recording pressures internal to the DX System

I acknowledge

2nd Confirmation check box confirming all rules and regulations will be followed.

CHILLER TEST REPORT

Studies
Private Notes
Comments
Deficiencies
Mem of Lind
CW Orders
Testing Unit Cost



Print
Conversions

Chiller Actuals

Record Chilled water supply and return temperature readings.
Compare data to digital readout on chiller control panel.

Actual Chilled Water Delivery GPM:
 Actual Chiller/Cooler Refrigerant Sump Temp °F:
Need Chiller Refrigerant Pressures

Chiller 1

	Actual (°F)	Display (°F)	Δ Comparison	Design Δ °F	Actual Δ °F	Δ °F % of Design
Chilled Water Supply Temp (°F)	40.20	40.10	0.10	12.00	10.60	88.33
Chilled Water Return Temp (°F)	50.80	50.70	0.10			

Compressors/Circuits

Comp-1

Compressor Number:

Compressor Type:

Low Side Suction Pressure PSI:

High Side Discharge Pressure PSI:

Select Voltage that best represents Actual Value: Voltage Not Listed

Nameplate Volts: 460V V V

Nameplate Amps: 230A A A

Compressor Actual Volts: L1-L2: L1-L3: L2-L3:

Compressor Actual Amps:

Chiller Results

Actual BTU/H	Actual kW	Kw/Ton	C.O.P.
1,316,240.16	1.33	0.01	291.03

Enter Actual Chiller Data

Compressor Actual Amps: 100.00

- Studies
- Private Notes
- Comments
- Deficiencies
- Mem of Und
- C/W Orders
- Testing Unit Cost

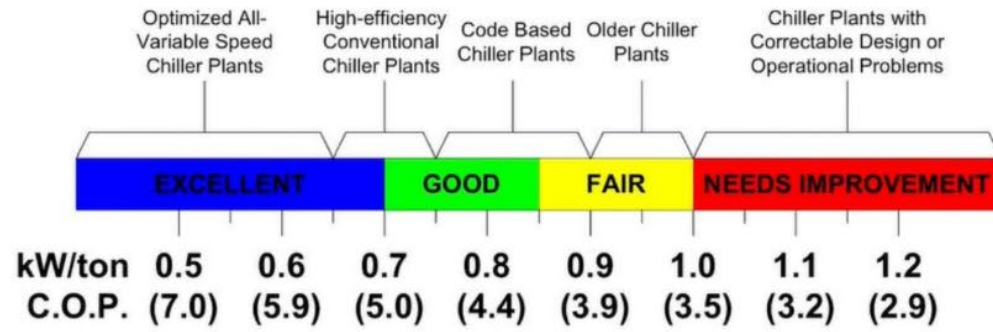
Chiller Results

Actual BTU/H	Actual kW	Kw/Ton
1,316,240.16	1.33	0.01

C.O.P. EVALUATION RESULT:

EXCELLENT

Chiller Plant Energy Use Spectrum



AVERAGE ANNUAL CHILLER PLANT EFFICIENCY IN KW/TON (C.O.P.)
(Input energy includes chillers, condenser pumps, tower fans and chilled water pumping)

*Based on electrically driven centrifugal chiller plants in comfort conditioning applications with 42F (5.6C) nominal chilled water supply temperature and open cooling towers sized for 85F (29.4C) maximum entering condenser water temperature.
 Local Climate adjustment for North American climates is +/- 0.05 kW/ton*

- ← Previous Step
- Update
- Next Step →
- Cancel

Chiller Results:

An evaluation of your chiller will be shown based on actual BTU/h, kW, kW per ton, and COP.

This chart will indicate ideal performance.



Condenser/Tower Actuals

Record Condenser water supply and return temperature readings.

Compare data to digital readout on chiller control panel.

Actual **Condenser** Water Delivery GPM Actual Entering Air WB Temp °F Actua

Tow/Cond 1

	Actual (°F)	Display (°F)	Δ Comparison	Design Δ °F	Range / Δ T
Condenser Water Supply Temp (°F)	0.00	0.00	0.00	10.00	0.00
Condenser Water Return Temp (°F)	0.00	0.00	0.00		

Ambient WB Temperature at Condenser/Tower	Condenser/Tower Approach	% Cooling Tower Efficiency	Cooling Tower BTU/H
0.00	0.00	0.00	0.00

Fan Motors

FnMt-1

Fan Motor Number

VFD Operating Hertz

VFD Operating % Speed

i If VFD has a display screen - Collect Operating Voltage and Current/Amperage directly from this display if available.
 If the screen only displays a single averaged Voltage and Current/Amperage, enter its value in each data input box.
 If using a standard Volt/Amp meter not rated to read VFD or PWM voltage output, the meter won't work when recording VFD / PWM "Output Voltage". This meter will work when collecting Amperage(s). Collecting actual VFD / PWM "Output Voltage" can be done with the meters designed and available

Select Voltage that best represents Actual Value: Voltage Not Listed

Nameplate Volts: 460V V V

Nameplate Amps: 60A A A

Enter Actual Tower and Motor Data

Fan Motors

FnMT-1

Fan Motor Number	<input type="text" value="0"/>
VFD Operating Hertz	<input type="text" value="0.00"/>
VFD Operating % Speed	<input type="text" value="0.00"/>

i If VFD has a display screen - Collect Operating Voltage and Current/Amperage directly from this display if available. If the screen only displays a single averaged Voltage and Current/Amperage, enter its value in each data input box. If using a standard Volt/Amp meter not rated to read VFD or PWM voltage output, the meter won't work when recording VFD / PWM "Output Voltage". This meter will work when collecting Amperage(s). Collecting actual VFD / PWM "Output Voltage" can be done with the meters designed and available to do this task.

Select Voltage that best represents Actual Value: Voltage Not Listed

Nameplate Volts:	460V	V	V	
Nameplate Amps:	60A	A	A	

WARNING

1. Single Phase and 3 Phase Voltages are recorded from Phase to Phase, not Phase to Ground.
2. Reading Actual Volts requires a handheld voltmeter rated for VFDs. A typical RMS Voltmeter will not provide accurate readings.
3. Actual Voltage and Amperage associated with the VFD must be recorded on the leaving side of the VFD to the Motor.

Volts read from VFD Screen Volts read with a handheld voltmeter

VFD/PWM Only displays 1 Voltage and 1 Amperage

	L1 -L2	L1 -L3	L2 -L3
Fan Motor Actual Volts:	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>
Fan Motor Actual Amps:	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>

Enter Actual Fan Motor Data



Condenser/Tower Actuals

Record Condenser water supply and return temperature readings.

Compare data to digital readout on chiller control panel.

Actual Condenser Water Delivery GPM: Actual Entering Air WB Temp °F: Actual Ambient Air DB Temp °F:

Low/Cond 1

	Actual (°F)	Display (°F)	Δ Comparison	Design Δ °F	Range / Δ T	Δ °F % of Design
Condenser Water Supply Temp (°F)	83.00	83.20	0.20	10.00	10.20	102.00
Condenser Water Return Temp (°F)	93.20	92.90	0.30			

Ambient WB Temperature at Condenser/Tower	Condenser/Tower Approach	% Cooling Tower Efficiency	Cooling Tower BTU/H	Tower Total kW
83.00	8.20	-510.00	1,950,927.48	15.32

Fan Motors

FmM-1

Fan Motor Number:
 VFD Operating Hertz:
 VFD Operating % Speed:

i If VFD has a display screen - Collect Operating Voltage and Current/Amperage directly from this display if available. If the screen only displays a single averaged Voltage and Current/Amperage, enter its value in each data input box. If using a standard Volt/Amp meter not rated to read VFD or PWM voltage output, the meter won't work when recording VFD / PWM "Output Voltage". This meter will work when collecting Amperage(s). Collecting actual VFD / PWM "Output Voltage" can be done with the meters designed and available to do this task.

Select Voltage that best represents Actual Value: 450V V V Voltage Not Listed
 Nameplate Volts: 450V V V
 Nameplate Amps: 60A A A

WARNING
 1. Single Phase and 3 Phase Voltages are recorded from Phase to Phase, not Phase to Ground.
 2. Reading Actual Volts requires a handheld voltmeter rated for VFDs. A typical RMS Voltmeter will not provide accurate readings.
 3. Actual Voltage and Amperage associated with the VFD must be recorded on the leaving side of the VFD to the Motor.

Volts read from VFD Screen Volts read with a handheld voltmeter
 VFD/PWM Only displays 1 Voltage and 1 Amperage
 L1 - L2 L1 - L3 L2 - L3
 Fan Motor Actual Volts:
 Fan Motor Actual Amps:

This is the full page view of Step 4.

- 1
Step 1
System Information
- 2
Step 2
General Information
- 3
Step 3
Nameplates
- 4
Step 4
Actuals
- 5
Step 5
Sound Pressure Test
- 6
Step 6
Energy Source Test
- 7
Step 7
Energy Combined/Averaged
- 8
Step 8
Report

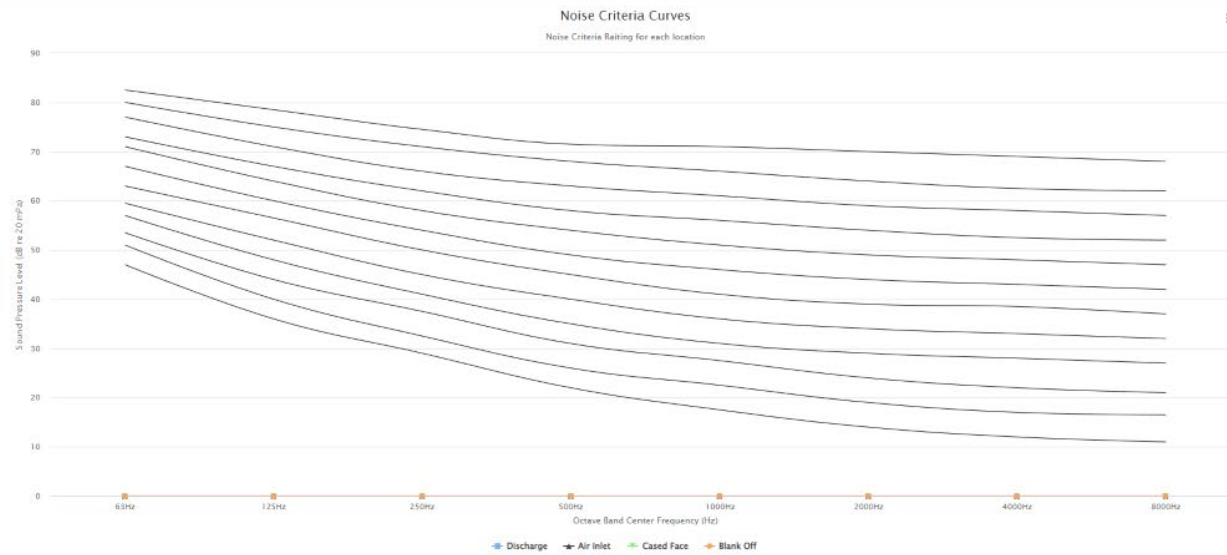
Condenser / Tower Sound Pressure Testing

1 +

Sound Level: Maximum sound pressure levels (dB) measured from the cooling tower operating at full fan speed.

Location	Distance from Tower (Feet)	Taken at (N, S, E, W)	Octave Frequency Bands								Noise Criteria Curves	i Weighted Test	Actions	
			63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8KHz				
Discharge	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊘
Air Inlet	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊘
Cased Face	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊘
Blank Off	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊕ ⊘

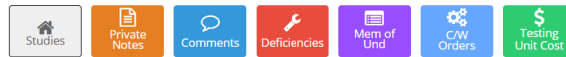
The locations above are recommended by the Software. You can update, delete, or add new locations at any time.



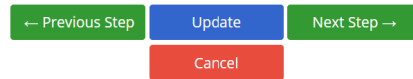
← Previous Step
Update
Next Step →
Cancel

Enter Sound Pressure Test Data

CHILLER TEST REPORT



Energy Source Subtracted/Isolated:



WARNING ✕

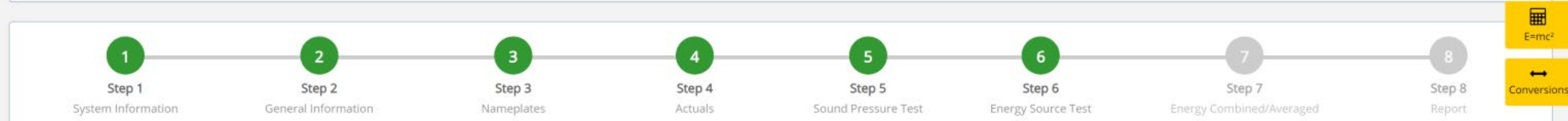
For SUBTRACTING background noise-testing purposes, this procedure should be used only when the total noise exceeds the background noise by 3 dB or more.

Accept

Warning: This is a recommendation indicating when step (6) should be performed.

Enter Energy Source Test Data

CHILLER TEST REPORT



E=mc²

Energy Source Subtracted/Isolated: ← Isolating background noise from subject target.

1 +

#	Source	Tested Source On	Tested Source Off	Tested Source dB	Add
1	Tower	90	88	85.67	

Recommend All Sources On/Off and add Description.

CHILLER TEST REPORT

Studies
Private Notes
Comments
Deficiencies
Map of Use
Chp Clusters
Taxing Unit Cost

1 Step 1 System Information
2 Step 2 General Information
3 Step 3 Nameplates
4 Step 4 Actuals
5 Step 5 Sound Pressure Test
6 Step 6 Energy Source Test
7 Step 7 Energy Combined/Averaged
8 Step 8 Report

Energy Combined/Averaged: Adding Energy Sources Together.

1 +

Energy Combined		Source #1	Add +
Description		Tower	
Combined DB	85.671		

Combined DB 85.671

Energy Average		Source #1	Add +
Description		Tower	
Average DB	85.671		

Averaged DB 85.671

Previous Step
Update
Next Step
Cancel

Energy Combined and Energy Averaged Data is entered here.


Fill out all of the information you would want to see on your final combined Energy Source Test.

For example, suppose you ran five sound pressure tests on five different cooling towers, three of which were the same larger size. For a cooling load degree day, only the three largest towers would be used. You would now only include the three larger cooling towers in the Energy Source Test because that is all that would be used on a cooling load degree day.

CHILLER TEST REPORT



 Complete Report/Study

 Switch Back to Studies /Sub-Studies

← Previous Step Cancel

Complete Report/Study

Audit Master Pro Training

Tower Test Report

This tutorial will act as a guide to create and input all data required for the selected study.

Select the type of report

WATER REPORT TEMPLATES

PUMP



Pump Report

COAH



Coil AHU Mixed Air Report

CHIL



Chiller Test Report

COIL



Coil Terminal Device Report

BOIL



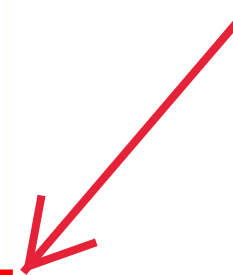
Boiler Test Report

TOWR



Tower Test Report

Click "Tower Test Report"



TOWER TEST REPORT



System Information

Project Name

System(s) Served

CT System

Number of Towers

System Design Data

Operated from approximately (Date) to

Estimated Daily Operating Hours Mon - Fri Hrs

Estimated Daily Operating Hours Saturday Hrs

Estimated Daily Operating Hours Sunday Hrs

Estimated Annual Operating Hours Hrs

Estimated Annual Operating Days Days

Number of Cells

Enter System Operating Information

"Estimated" Annual Operating Days Days

Number of Cells 

Cooling Tower Design

Design/Rated Ambient Air Temp (Wb)

Design/Rated GPM Total

Design/Rated (Warm) EWT (°F)

Design/Rated (Cold) LWT (°F)

Condenser Design ΔT (°F)

Condenser Design BTU/H

Number of Cells "on Line" to be Tested

Number of Condenser pumps providing flow to this tower

Number of condenser pumps to be tested

Cancel

Update

Next Step →

Enter Cooling Tower
Design Data

TOWER TEST REPORT



Tower/Condenser Nameplate Data

Tower 1

Tower Manufacturer	<input type="text"/>
Model #	<input type="text"/>
Serial #	<input type="text"/>
Date Manufactured	<input type="text"/>
Nameplate Tonnage	<input type="text" value="0.00"/>
Nameplate Rated Capacity (BTU/H)	<input type="text" value="0.00"/>
Tower Total CFM	<input type="text" value="0.00"/>
Design Entering Air WB	<input type="text" value="0.00"/>
Design Ambient Air DB	<input type="text" value="0.00"/>

Fan/Motors

Enter Cooling Tower Nameplate Data

Nameplate Motor Manufacturer:

Serial number:

Nameplate HP: Nameplate HP unknown

Nameplate RPM:

Nameplate frame category:

Nameplate frame:

Nameplate service factor: Not listed:

ECM (Motor)

System motor operates from a VFD/PWM device?

Motor phase: Three phase 2 wire single phase

Nameplate Rated Volts:	<input type="text" value="000.00 V"/>	<input type="text" value="000.00 V"/>	<input type="text" value="000.00 V"/>
Nameplate Rated Amps:	<input type="text" value="000.00 A"/>	<input type="text" value="000.00 A"/>	<input type="text" value="000.00 A"/>

Nameplate efficiency (Eff): Power Factor and Efficiency Unknown

Nameplate power factor (PF):

Nameplate Rated Hz: 50 Hz 60 Hz

Enter Tower Motor Nameplate Data

Response required to these questions before continuing

System at steady state for this test Yes No

System steady state will be monitored and maintained for this test Yes No

"Steady State" Defined as a system that is maintaining constant flow and/or temperature based on the testing being performed.

Throughout the AMP software you will be required to verify that the system being tested is at steady state.

Steady state is critical to testing as it ensures that any readings or calibrations are repeatable.

WARNING

Ensure everybody is clear of any potential system moving parts, ie motors, fans, pulleys, belts, etc.

ACCEPT

Cancel

⚠ Danger: Arc Flash And Shock Hazard - Appropriate PPE Required.

- Do not operate controls or open covers without appropriate Personal Protection Equipment (PPE). Failure to comply may result in Injury or Death.
- Refer to NFPA 70E for minimum PPE Requirements.
- Warning NFPA code requirements may change, always check for current or updated code requirements
- Request a qualified and licensed electrician to collect voltage and Current/Amperage data if not ARC Flash Trained

Warning: Above is understood and will be adhered to.

ACCEPT

Cancel

These are two of the most common safety warnings that will appear throughout AMPs software.

You will be required to acknowledge each warning individually in order to proceed.



Condenser/Tower Actuals

Record Condenser water supply and return temperature readings.

Compare data to digital readout on system control panel.

Actual Condenser Water Delivery GPM: Actual Entering Air WB Temp °F: Actual Ambient Air DB Temp °F:

Tow/Cond 1

	Actual (°F)	Display (°F)	Δ Comparison	Design Δ °F	Range / Δ T	Δ °F % of Design	
Condenser Water Supply Temp (°F)	1.00	1.00	0.00	8.00	0.00	0.00	
Condenser Water Return Temp (°F)	1.00	1.00	0.00				
Ambient WB Temperature at Condenser/Tower	1.00			Condenser/Tower Approach	% Cooling Tower Efficiency	Cooling Tower BTU/H	Tower Total kW
				0.00	0.00	0.00	30.53

Fan Motors

FanM-1

Fan Motor Number:

VFD Operating Hertz:

VFD Operating % Speed:

i If VFD has a display screen - Collect Operating Voltage and Current/Ampere directly from this display if available. If the screen only displays a single averaged Voltage and Current/Ampere, enter its value in each data input box. If using a standard Volt/Amp meter not rated to read VFD or PWM voltage output, the meter won't work when recording VFD / PWM "Output Voltage". This meter will work when collecting Amperage(s). Collecting actual VFD /PWM "Output Voltage" can be done with the meters designed and available to do this task.

Select Voltage that best represents Actual Value: 480V V V Voltage Not Listed

Nameplate Volts: 480V A A

Nameplate Amps: 125A A A

WARNING

1. Single Phase and 3 Phase Voltages are recorded from Phase to Phase, not Phase to Ground.
2. Reading Actual Volts requires a handheld voltmeter rated for VFDs. A typical RMS Voltmeter will not provide accurate readings.
3. Actual Voltage and Amperage associated with the VFD must be recorded on the leaving side of the VFD to the Motor.

Volts read from VFD Screen Volts read with a handheld voltmeter

VFD/PWM Only displays 1 Voltage and 1 Amperage

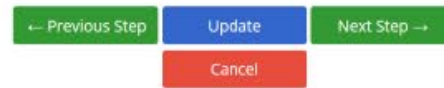
	L1 -L2	L1 -L3	L2 -L3
Fan Motor Actual Volts:	<input type="text" value="480.00"/>	<input type="text" value="480.00"/>	<input type="text" value="480.00"/>
Fan Motor Actual Amps:	<input type="text" value="114.00"/>	<input type="text" value="119.00"/>	<input type="text" value="119.00"/>

Enter Actual Tower and Motor Data

TOWER TEST REPORT



Cooling Tower Sound Pressure Testing



Select switch if Sound Pressure Testing is required.

- 1
Step 1
System Design
- 2
Step 2
Nameplates
- 3
Step 3
Actuals
- 4
Step 4
Sound Pressure Test
- 5
Step 5
Energy Source Test
- 6
Step 6
Energy Combined/Averaged
- 7
Step 7
Report

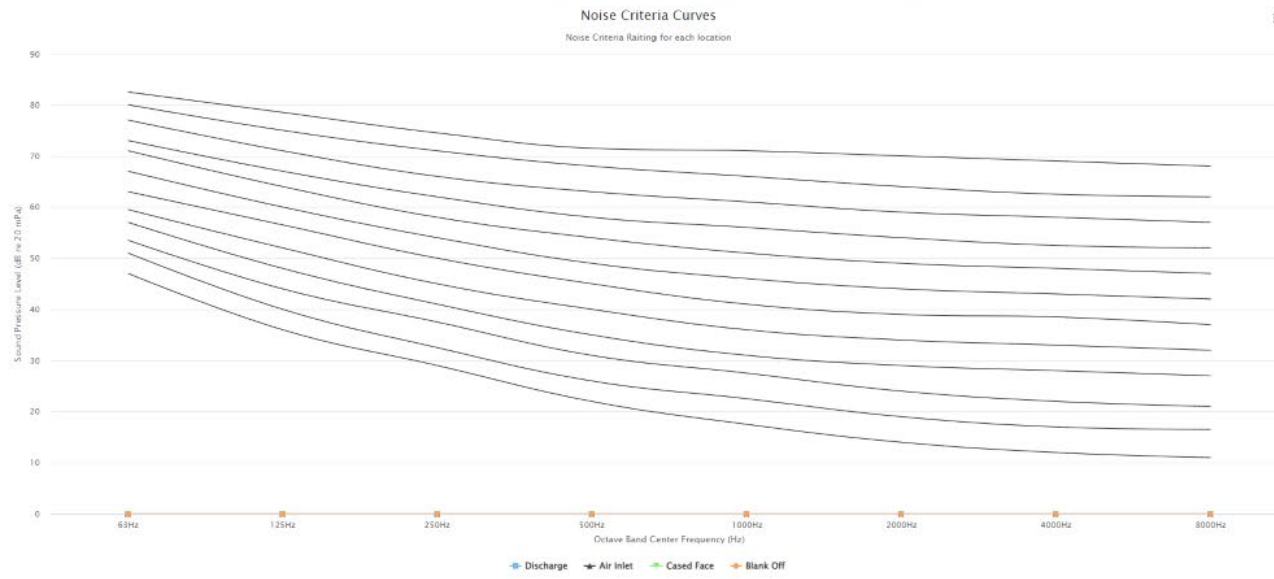
Cooling Tower Sound Pressure Testing

1 +

Sound Level: Maximum sound pressure levels (dB) measured 50 ft from the cooling tower operating at full fan speed.

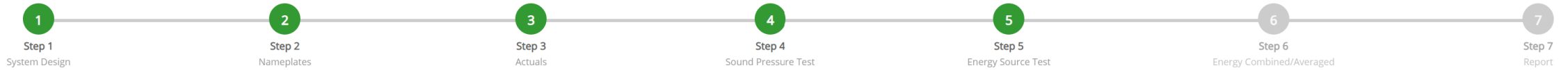
Location	Distance from Tower (Feet)	Taken at (N, S, E, W)	Octave Frequency Bands								Noise Criteria Curves	i Weighted Test	Actions	
			63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8KHz				
Discharge	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊖
Air inlet	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊖
Cased Face	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊖
Blank Off	0	▼	0	0	0	0	0	0	0	0	0	▼	▼	⊕ ⊖

The locations above are recommended by the Software. You can update, delete, or add new locations at any time.



← Previous Step
Update
Next Step →

Enter Sound Pressure Test Data



Energy Source Subtracted/Isolated:

← Previous Step Update Next Step →

Cancel

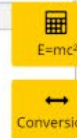
WARNING ✕

For SUBTRACTING background noise-testing purposes, this procedure should be used only when the total noise exceeds the background noise by 3 dB or more.

Accept

Warning: This is a recommendation indicating when step (5) should be performed.

TOWER TEST REPORT



Energy Source Subtracted/Isolated: ← Isolating background noise from subject target.

1 +

#	Source	Tested Source On	Tested Source Off	Tested Source dB	Add
1		0	0	0.00	

Recommend All Sources On/Off and add Description.



Enter Energy Source Test Data

TOWER TEST REPORT

Studies
Private Notes
Comments
Deficiencies
Map of Unit
CW Orders
Testing Unit Cost

1 Step 1 System Design
 2 Step 2 Nameplates
 3 Step 3 Actuals
 4 Step 4 Sound Pressure Test
 5 Step 5 Energy Source Test
 6 Step 6 Energy Combined/Averaged
 7 Step 7 Report

Energy Combined/Averaged: -- Adding Energy Sources Together.

1 +

Energy Combined		Source #1	Add
Description	Enter description		
Combined DB	0		
Combined DB		0	

Energy Average		Source #1	Add
Description	Enter description		
Average DB	0		
Averaged DB		0	

← Previous Step
Update
Next Step →

Cancel


Energy Combined and Energy Averaged Data is entered here.

Fill out all of the information you would want to see on your final combined Energy Source Test.

For example, suppose you ran five sound pressure tests on five different cooling towers, three of which were the same larger size. For a cooling load degree day, only the three largest towers would be used. You would now only include the three larger cooling towers in the Energy Source Test because that is all that would be used on a cooling load degree day.



 Complete Report/Study

 Switch Back to Studies /Sub-Studies

← Previous Step Cancel

Complete Report/Study

Complete Study X

1 ————— 2
Validate Incomplete Studies Confirmation

VALIDATE INCOMPLETE STUDIES

This Project has non-completed studies.
Completing this Project will close and register non-completed studies as Incomplete
WARNING: NO ADDITIONAL CHANGES WILL BE ALLOWED.

Are you certain you want to continue?

[View Incomplete Studies](#)

[Cancel](#) [Next Step →](#)

To complete the main study, all Sub-Studies must be completed.