



help



LS
SERIES

Help

Help Software Tutorial

Building a Load Sizing Project with a
LiveSteam Humidifier and SAM-e
Distributor

Help Tutorials provide step-by-step examples of complete load sizing projects and browser projects with the various humidifier and distributor technologies.

In this tutorial, you will learn how to build a load sizing project with an LS Humidifier and SAM-e Distributor

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Log In and Projects List

To begin, start by logging into your Help account. Once completed, hover your mouse over the “Projects” tab and then select “List all Load Sizing Projects” as shown in Figure 1: Projects List. The Projects list is where all of your projects are stored. Projects are stored in the cloud and are available from whatever device you access Help with.

There are two types of Projects:

Load Sizing Projects: Allow you to calculate humidification loads and select product step by step through a wizard style approach. Selections can be supplemented by adding product from the Product Browser Catalog.

Browser Projects: Allow you to create your own Bill of Material with product from the Product Browser Catalog.



Figure 1: Projects List

Create a New Project

To create a new project, select “Add” to add a new load sizing project by clicking the button circled in Figure 2: Create a New Project.

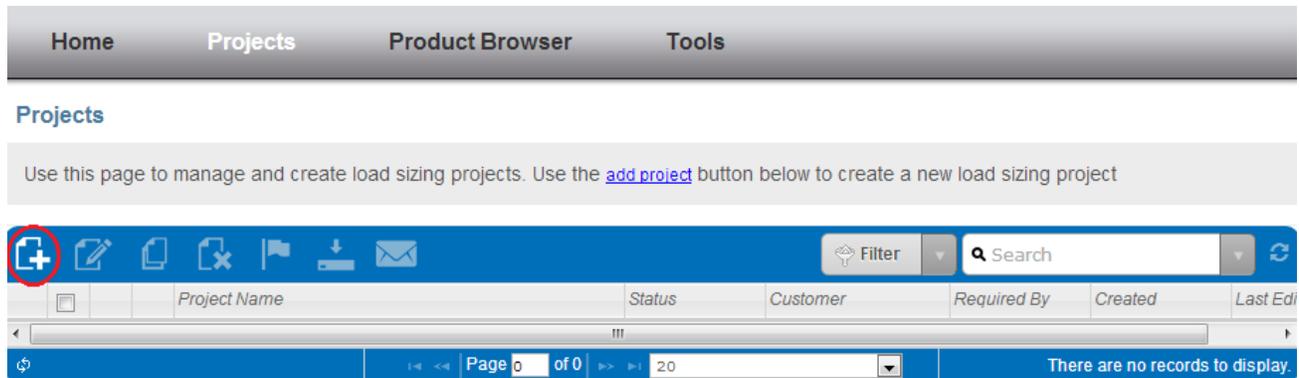


Figure 2: Create a New Project

A popup will appear, asking for project information. Give the project a name such as “LS and SAM-e Tutorial”, set the units to imperial, and set the city to Ottawa Macdonald-Cartier Int’, Ontario, Canada. Help includes weather data for a variety of locations, setting the city allows Help to use appropriate conditions for your region.

Click **Save** at the bottom-right when you have finished editing values.

Project Home Page

You will be taken to the Project Home Page, shown below. This is the main page from which your project will be built. Here you can modify the name, units, dates, weather data and notes, as well as add zones.

All product selections that you will make are grouped together in zones. Zones represent an area being served by a humidification system. Buildings will often contain multiple zones.

Your project must contain at least one zone in order to be complete. To add a zone, click the “Add” button as highlighted in Figure 3: Project Home Page

Projects > LS and SAM-e Tutorial

Project Information

Name : LS and SAM-e Tutorial
Project Number :
Customer :
Created : 2013/05/30
Required Date :
Units Of Measure : Imperial
Chart Type : Psychrometric

Outside Design Conditions

Altitude : 413.00 ft
Location : Ottawa Intl, Ontario, Canada
Dry Bulb Temp : -13.00 °F
Relative Humidity : 49.00 %
Design Tolerance : 99.00 %

Project History

2013/05/30 - Project Created

Notes

Zones Bill Of Materials

Name	Humidifier	Space Temp	Space RH	Air Volume	Temp bH	%Outside Air	Load
There are no records to display.							

Figure 3: Project Home Page

Load Sizing Tab

Once you've clicked add, you will be redirected to the Load Sizing tab as shown in Figure 4: Load Sizing. The Load Sizing tab is where you will enter the specific parameters for your zone.

Zones : Zone(1) ▼
Projects > LS and SAM-e Tutorial > Zone(1)

Provide zone design parameters to calculate a load, then proceed to select humidifiers, distributors, controls, and accessories.

<p>Name : <input type="text" value="Zone(1)"/></p> <p>Load Size Method : Calculated ▼</p> <p>Calculation Method : Isothermal ▼</p> <p>In Space Humidification: <input type="checkbox"/></p>	<p>Air Volume (CFM) : <input type="text" value="20000"/></p> <p>Duct Width (in.) : <input type="text" value="72"/></p> <p>Duct Height (in.) : <input type="text" value="72"/></p> <p>Duct Orientation : Horizontal ▼</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2">Load Calculations</th> </tr> </thead> <tbody> <tr> <td>Humidification Load (H):</td> <td>162.30 lbs/hr</td> </tr> <tr> <td>Natural Exchange Load (H):</td> <td>0.00 lbs/hr</td> </tr> <tr> <td>Water Vapour Absorption Losses (L):</td> <td>0.00 lbs/hr</td> </tr> <tr> <td>Internal Moisture Gains (S):</td> <td>0.00 lbs/hr</td> </tr> <tr> <td>Total Humidification Load (Htot):</td> <td>162.30 lbs/hr</td> </tr> <tr> <td>Low Absorption Distance:</td> <td>0.38 ft</td> </tr> <tr> <td>High Absorption Distance:</td> <td>2.34 ft</td> </tr> <tr> <td>Duct Velocity</td> <td>555.56 ft/min</td> </tr> </tbody> </table>	Load Calculations		Humidification Load (H):	162.30 lbs/hr	Natural Exchange Load (H):	0.00 lbs/hr	Water Vapour Absorption Losses (L):	0.00 lbs/hr	Internal Moisture Gains (S):	0.00 lbs/hr	Total Humidification Load (Htot):	162.30 lbs/hr	Low Absorption Distance:	0.38 ft	High Absorption Distance:	2.34 ft	Duct Velocity	555.56 ft/min
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High Absorption Distance:	2.34 ft																			
Duct Velocity	555.56 ft/min																			

Calculation Values

Outside Temp (°F) : <input type="text"/>	Outside Humidity (%) : <input type="text"/>	Outside Air (%) : <input type="text" value="25"/>	Override Outside Design Conditions: <input type="checkbox"/>
Space Design Temp (°F) : <input type="text" value="75"/>	Space Design Humidity (%) : <input type="text" value="40"/>	Temp Before Humidity (°F) : <input type="text" value="55"/>	Naturally Vented: <input type="checkbox"/>
Natural Exchange Temp (°F) : <input type="text"/>	Natural Exchange Humidity (%) : <input type="text"/>	Natural Exchange Volume (CFM) : <input type="text" value="0"/>	Use Natural Exchange: <input type="checkbox"/>
Moisture Gains (lb/hr) : <input type="text" value="0"/>	Vapour Losses (lb/hr) : <input type="text" value="0"/>		Use Economizer: <input type="checkbox"/>

Figure 4: Load Sizing

For this exercise, the following settings will be used:

1. **Load Size Method:** *Calculated*. This permits you to enter in air flow and conditions to calculate a load. The alternative, *Manual*, allows users to specify a load directly.
2. **Calculation Mode:** *Isothermal*. *Isothermal* is used for steam systems, while the two *adiabatic* options are used for nozzles and evaporative media systems.
3. Ensure that **In Space Humidification** is unchecked. By default Help will select components to distribute steam in duct unless you specify that it will be in-space.
4. Enter the following values:
Air Volume: 20000 CFM
Duct Width: 72 inches
Duct Height: 72 inches
Duct Orientation: *Horizontal*
5. Under the Calculation values heading, set the following conditions:
Outside Air %: 25%. This is the percentage of the air volume that will be outdoor air. The balance will be return air from the space.
Space Design Temp: 75 °F. This is the temperature of the space you are humidifying.
Space Design Humidity: 40% RH. This is the humidity setpoint of the space you are humidifying.
Temp Before Humidity: 55 °F. This is the temperature of air entering the steam distributor in the duct.

Scroll down and review the schematic drawing shown in Figure 5: Schematic Drawing. The schematic drawing, Psychrometric Chart, and Parameter table can all be viewed by clicking on their respective tabs. They provide a graphical representation of the parameters entered above.

Clicking the Export Icon () will export any of these documents as either a PDF or CSV file. Alternatively these graphics can be exported from the Project Home Page.

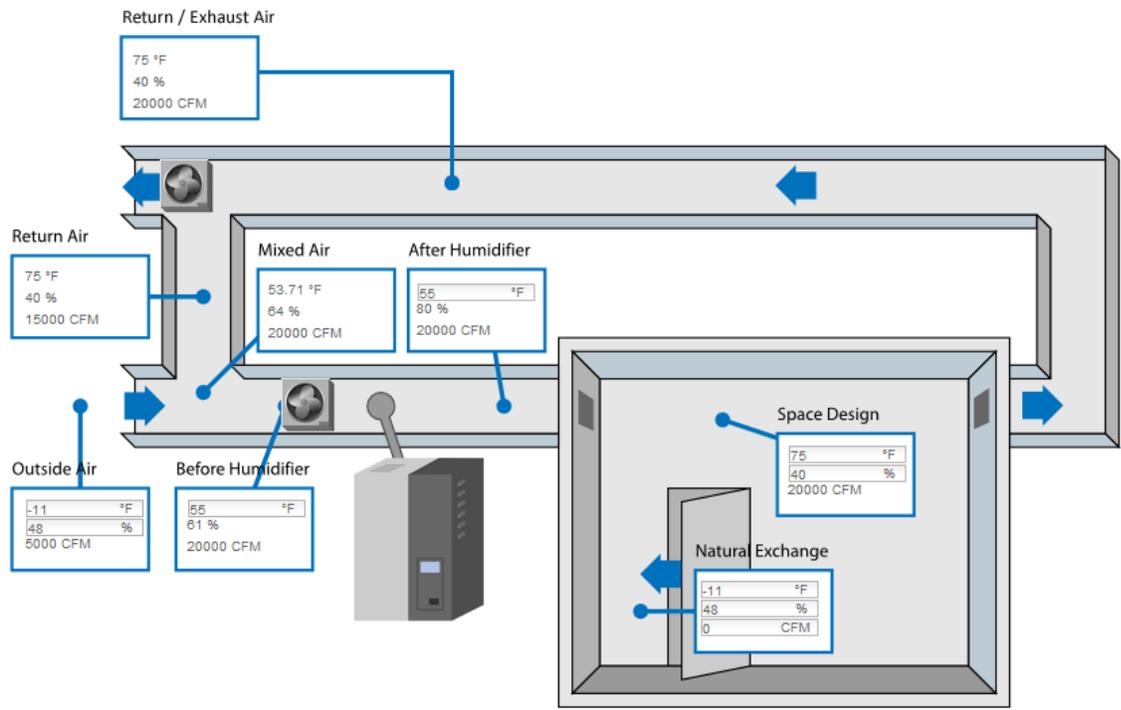


Figure 5: Schematic Drawing

Back at the top of the Load Sizing page, the grey **Load Calculations** box will have calculated a Humidification load of 162.30 lbs/hr and a duct velocity of 555.56 feet per minute. This box updates automatically as you type values and click other fields on the page. The **Absorption Distance** will also show values between 0.38 and 2.34 ft. These values are presented as a range since the specific distributor used will be configured in a later step.

Humidifiers Tab

The next step is to select a humidifier. Do this by clicking on the **Humidifiers** tab as shown in Figure 6: Humidifiers Tab.

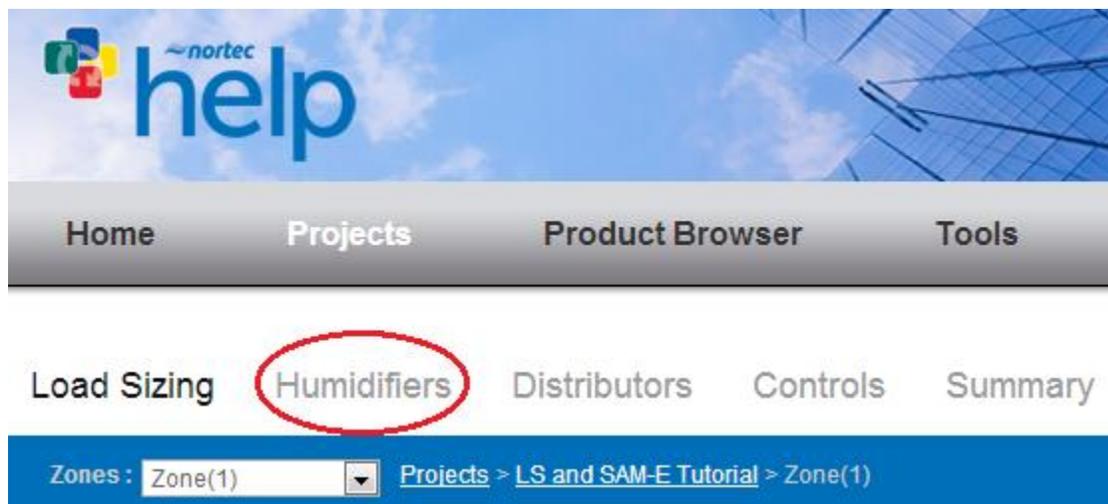


Figure 6: Humidifiers Table

The humidifiers tab contains a listing of humidifier technologies that match your selections and load from the Load Sizing Tab.

For this tutorial, select **LiveSteam**. LiveSteam humidifiers distribute steam from a central facility boiler into your building ventilation system.

A popup will appear asking for you to enter the **Steam Pressure** in PSI. Values between 5 and 50 psi are acceptable, however for this project enter **10 psi**. Click elsewhere on the window to commit the value.

Next, change the **Type** to *Stainless Steel* and click **Get Valve Recommendations** and Help will calculate the capacities of the available steam control valves. Help will also highlight a recommended valve. The recommended valve is the first one that exceeds the load calculated in the previous step. In this case the CV=6.20 valve should be highlighted with a capacity of 201.16 lbs/hr. Click the radio button for this valve.

The popup window will extend, allowing you to configure options for this valve. Select the following values:

Quantity: 1. The quantity field allows you to use multiple smaller valves or redundant valves.

Actuator: *Electric, 0 -10 VDC.* You can specify various types of actuators to meet the needs of different projects.

Wye Strainer: *Stainless Steel.* A wye strainer filters debris and corrosion from the steam prior to the steam valve. All strainers have stainless steel filter screens, however, you can specify a stainless body, bronze body, or to provide a strainer from your own source.

Primary Trap: *Stainless Steel, Bucket.* The primary trap removes condensate from humidifier. You can specify various types of straps or to provide your own. For stainless steel based project such as this one; the bucket trap is the most economical.

Click **Save** when you are done and Help will begin building a Bill of Materials as shown in Figure 7: Humidifier Bill of Materials.

Load Sizing **Humidifiers** Distributors Controls Summary

Zones: Projects > LS and SAM-e Tutorial > Zone(1) > Humidifiers  

Please select a humidifier for this zone. If you are unsure of what type to use, click "More Info" to view detailed product information. Note: Link opens in a new browser window.  cost analysis tool.

Your load size is:	162.30 lbs/hr
Your total selected humidifier capacity:	201.16 lbs/hr
Remaining load:	0.00 lbs/hr



Add Another Humidifier
Use multiple units to serve a load or add redundant units by clicking here.

The currently selected humidifier and option part numbers are listed below.

Zone	Part Number	Description	Humidifier	Quantity	
Zone(1)	1594223	Valve, St. St. 3/4 CV=6.20		1	
Zone(1)	1507549	Actuator 0-10Vdc 1/2-2in (1/2-3/4in SS)	1594223	1	
Zone(1)	1599616	Trap Inv Bucket SS up to 75 psig	1594223	1	
Zone(1)	1599632	Wye Strainer, Stainless Steel, 1.0 nominal diameter	1594223	1	

Figure 7: Humidifier Bill of Materials

Distributors Tab

The next step is to add a distributor. Do this by clicking on the **Distributors** tab at the top of the page. Help will present distributor options compatible with your project. Available options will vary with duct geometry, load, and humidifier type selected.

For this tutorial, select a **SAM-e Short Absorption Manifold**. The SAM-e short absorption manifolds are designed to fit a variety of duct sizes and offer the shortest absorption distances. Clicking SAM-e will cause a popup window to appear.

This window allows you to configure your SAM-e. Select the following options:

Select Distributor Based On: *Zone Load*. The capacity will be matched to the humidification load. Alternatively, the distributor capacity can be matched to the humidifier capacity. In this case, the humidifier is a valve.

Tube Spacing: *12 inches*. It is best practice to select the widest spacing that meets your available absorption distances. Wider tube spacing will result in fewer tubes minimizing both costs and heat losses.

Tube Material: *304 Stainless Steel*. Either 304 or 409 stainless can be selected for tubes. 409 is a more economical material, but may discolor with time. 304 stainless is a higher grade stainless that will maintain its appearance for the life of the product.

Support Frame: *Galvanized Steel*. Support frames allow the manifold assembly to be easily secured to the duct ceiling. Frames are available in Galvanized or Stainless Steel and are optional for horizontal flow ducts, but are required for vertical flow ducts.

Separator: *SAM-e Header*. The SAM-e header can be used as a condensate separator to remove any condensate traveling with the boiler steam prior to it entering the distributor tubes. Alternatively an external separator can be used.

Distributor Trap: *Cast Iron, F&T*. Select the steam trap that will remove condensate from the distributor. You can select various materials or to provide one from your own source.

Insulation: *CHECK*. Insulation covers both the header and steam tubes minimizing heat transfer and improving system efficiency.

Inlet Adapter: *Automatically Select*. Help will automatically match an inlet adapter to your selected humidifier. Alternatively, you may prefer to specify your own inlet adapter.

Click **Save** when you are done and Help will generate a Bill of Materials. Scrolling further down the page, the Distributor Configuration section provides information about the distributor as well as a drawing of the SAM-e.

Clicking the PDF icon () will export this drawing to a PDF file. Alternatively, the distributor drawings can be accessed from the Project Home Page.

Controls Tab

Next click the **Controls** tab at the top of the page. The controls tab allows you configure controls for your project. Controls are optional, so this step can be skipped if controls will not be provided.

There are two options; **Controls by Nortec** configures a complete control package provided by Nortec. **Controls by Others** configures a control package with the primary control signal coming from another source such as a building automation system. In either case safety switches and building automation gateways can be included.

For this tutorial, click on **Controls by Nortec**. In this example, a controls package will be configured with a modulating demand control signal, modulating high limit, and air proving switch.

Make the following selections as illustrated in Figure 8: Controls Configuration.

Signal Type: *Demand*. Demand signals send the humidifier a signal telling it the percentage at which it should operate as opposed to reporting a setpoint (transducer signal). LiveSteam humidifiers are only compatible with Demand signals and it is the only option available.

Channels: *Dual*. Select whether you will have one or 2 modulating control signals controlling the humidifier. The humidifier will operate until the first signal has been satisfied before becoming idle. Dual modulation is commonly used in cases where the humidifier will be used with a modulating high limit control.

Channel 1 Location: *Wall*. Select whether you would like the humidistat to be a wall mounted or duct mounted model. For this example, the primary humidistat will be located on the wall in the conditioned space.

Outdoor Temperature Sensor: *None*. The outdoor temperature sensor connects to a humidistat. It will allow the humidistat to reduce the space humidity level in response to cold outdoor temperatures minimizing the risk of condensation on windows.

Channel 2 Location: *Duct*. The second channel will be the duct mounted modulating high limit stat.

Include Air Proving Switch: *CHECK*. This on/off safety device prevents humidifier operation unless air is flowing in the duct.

Include On/Off High Limit Switch: *Unchecked*. This on/off safety device prevents condensation in the duct by stopping humidification if the duct humidity levels exceed a certain level. In this example, this is redundant as a modulating high limit is being used instead.

Choose Controls ✕

Please select the controls you require based on the signal type and channel.

Signal Type:	Demand
Channels:	Dual

Nortec Dual Channel Demand

Channel 1 Location:	Wall
Outdoor Temperature Sensor:	None
Channel 2 Location:	Duct
Include Air Proving Switch:	<input checked="" type="checkbox"/>
Include On/Off High Limit Switch:	<input type="checkbox"/>

Save Cancel

Figure 8: Controls Configuration

Click **Save** to complete the selection. The bill of materials will update to reflect the selected controls package.

Summary Tab

Click the **Summary** tab at the top of the page to proceed to the project summary. Here you have the option to add any common accessories such as water filters and condensate pumps, as well as view the bill of materials for the zone.

In this example, a drain water cooler will be selected to comply with local plumbing regulations. To do this, click on the **Accessories** button, select one “Drain Water Cooler, Self-Actuated” and click **Save** as shown in Figure 9: Accessories.

Choose Accessories ✕

Please select any common options you would like for this zone. You may edit the quantity where applicable.

Option	Quantity	Part Number	Description
<input type="checkbox"/>	1	1458807	Backflow Preventer, 3/8 in NPT
<input type="checkbox"/>	1	1710020	Drain Water Cooler, Electric
<input checked="" type="checkbox"/>	1	1710010	Drain Water Cooler, Self-Actuated
<input type="checkbox"/>	1	2524504	Drain Water Sump Pump, high flow
<input type="checkbox"/>	1	1429527	Drain Water Sump Pump, medium flow
<input type="checkbox"/>	1	2533363	Humidity Alarm Package, Duct High limit
<input type="checkbox"/>	1	2533365	Humidity Alarm Package, Duct Low limit
<input type="checkbox"/>	1	2533364	Humidity Alarm Package, Wall High limit
<input type="checkbox"/>	1	2533366	Humidity Alarm Package, Wall Low limit
<input type="checkbox"/>	1	1329505	In-Line Water filter c/w 5 micron filter
<input type="checkbox"/>	1	1469595	Pocket Hygro-Thermometer digital display
<input type="checkbox"/>	1	1603032	Transformer, Plug In, 120 VAC to 24 VAC
<input type="checkbox"/>	1	1329561	Water Filter Cartridge 1 micron
<input type="checkbox"/>	1	1329506	Water Filter Cartridge 5 micron (x2)

Figure 9: Accessories

The product selection for this zone has now been completed.

Select the Project Home button () to return to the Project Home Page as shown in Figure 10: Zone Summary.

Load Sizing Humidifiers Distributors Controls Summary

Zones: Projects > [LS and SAM-e Tutorial](#) > [Zone\(1\)](#) > Summary  

Below is the list of materials for this zone. You can add another zone or go back to the project home page to view your bill of materials and generate documents.



Accessories
 Drain water coolers, sump pumps, water filters and more. Add accessories to your humidification system here.

The currently selected control and monitoring part numbers are listed below. Click the Controls button above to reconfigured your selections.

Zone	Part Number	Description	Humidifier	Quantity
Zone(1)	1594223	Valve, St. St. 3/4 CV=6.20		1
Zone(1)	1507549	Actuator 0-10Vdc 1/2-2in (1/2-3/4in SS)	1594223	1
Zone(1)	1599632	Wye Strainer, Stainless Steel, 1.0 nominal diameter	1594223	1
Zone(1)	1599616	Trap Inv Bucket SS up to 75 psig	1594223	1
Zone(1)	1599601	Trap F&T up to 15 psig	1594223	1
Zone(1)	1503419	Steam Tube, SAM-e, 60 in Type B, 304SS	1594223	6
Zone(1)	2538853	Tube Insulation, SAM-e 60 (Covers 1 Tube)	1594223	6
Zone(1)	2538919	Header Insulation, SAM-e 72	1594223	1
Zone(1)	1506800	Header SAM-e 72, 12 centers	1594223	1
Zone(1)	1503471	Mounting Frame, SAM-e 51 - 99 in	1594223	1
Zone(1)	1503474	Inlet adapter, SAM-e, Pressure Steam 3/4 npt	1594223	1
Zone(1)	1329203	Switch Air Proving (duct airflow safety interlock)	1594223	1
Zone(1)	1510142	Control, 0-10V Digital Wall Humidistat	1594223	1
Zone(1)	2520266	Control, 0-10V Digital Duct Humidistat	1594223	1
Zone(1)	2558776	Dual Demand Controller for NHRS, RH2, and LS	1594223	1
Zone(1)	1710010	Drain Water Cooler, Self-Actuated	1594223	1

Figure 10: Zone Summary

Project Submittals and Requesting a Quotation

On the project at the project home page, you can **Export** a submittal package as well as other useful information. You can also **Request Pricing** from your local Nortec agent.

Submittal packages, project drawings, and various other information can be exported from the Export Manager by clicking on the Export Button (📄). This will bring up a popup window as shown in Figure 11: Export Center.

Help can generate the following documents:

Bill of Material: A listing of all of the products selected, broken down by zone.

Humidifier Schedule: An engineering schedule for the humidifiers included on the project. Can be incorporated into larger mechanical schedules.

Specification: An engineering specification for incorporation into a larger mechanical specification. Help dynamically builds the specification based on selected products to save time and reduce editing.

Submittal Package: A detailed package containing relevant information, drawing, wiring diagrams, and a bill of materials for your project.

Zone Table: A summary of each zone along with its key design conditions.

Zone Exports: Allows you to export the schematic diagram, psychrometric chart, or zone parameters that appear on the Load Sizing tab of each zone.

Custom Exports: Allow you create Submittals, Specifications, and Distributor Drawings containing only zones you specify for multi-zone projects.

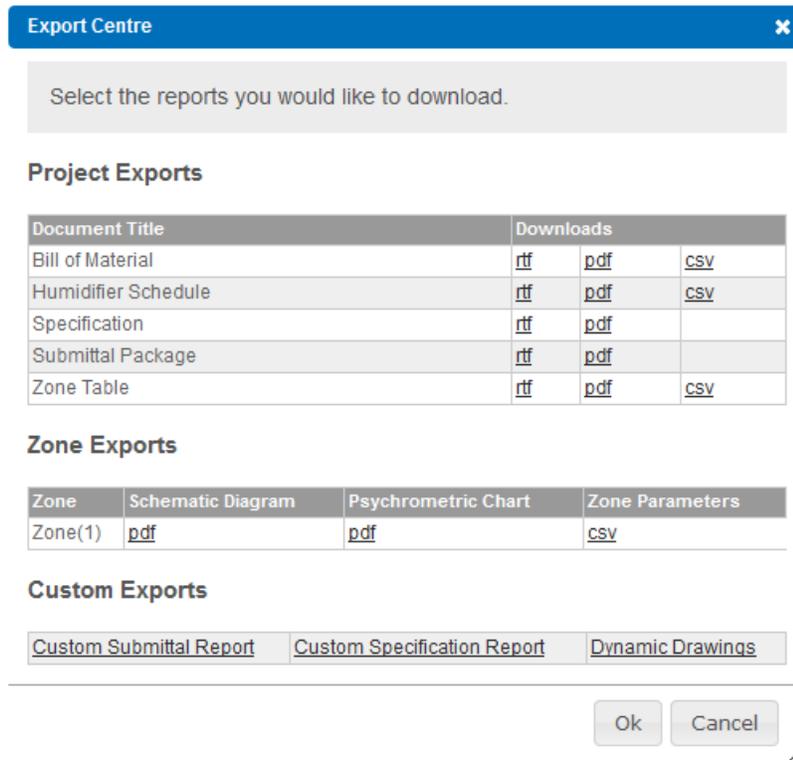


Figure 11: Export Center

Help also allows you to request pricing from your local Nortec representative.

To do this, click the Request Pricing () button. A popup will appear allowing you enter any comments or notes and allowing you to confirm your contact information. A pricing request will be sent to the agent along with a copy of your project. Your local representative will contact you shortly with pricing and further information.

Projects > LS and SAM-e Tutorial
 

Project Information

Name : LS and SAM-e Tutorial
 Project Number :
 Customer :
 Created : 2013/11/05
 Required Date :
 Units Of Measure : Imperial
 Chart Type : Psychrometric

Outside Design Conditions

Altitude : 374.02 ft
 Dry Bulb Temp : -11.00 °F
 Relative Humidity : 48.02 %
 Design Tolerance : 99.60 %

Location
 Ottawa Macdonald-Cartier Int', Ontario, Canada

Project History

- 2013/11/05 - Created
- 2013/11/05 - Edited

Notes

Zones Bill Of Materials

     								
	Name	Humidifier	Space Temp	Space RH	Air Volume	Temp bH	%Outside Air	Load
1	Zone(1)	LiveSteam	75	40	20000	55	25	162.3

Page 1 of 1
View 1 - 1 of 1

Congratulations, you have successfully completed this tutorial!

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