



Help

Help Software Tutorial

Building a Load Sizing Project with an
NH-EL Humidifier and CSD 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 create a Load Sizing Project with an NH-EL Humidifier and CSD 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 whichever device you choose to access Help with.

There are two types of Projects:

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

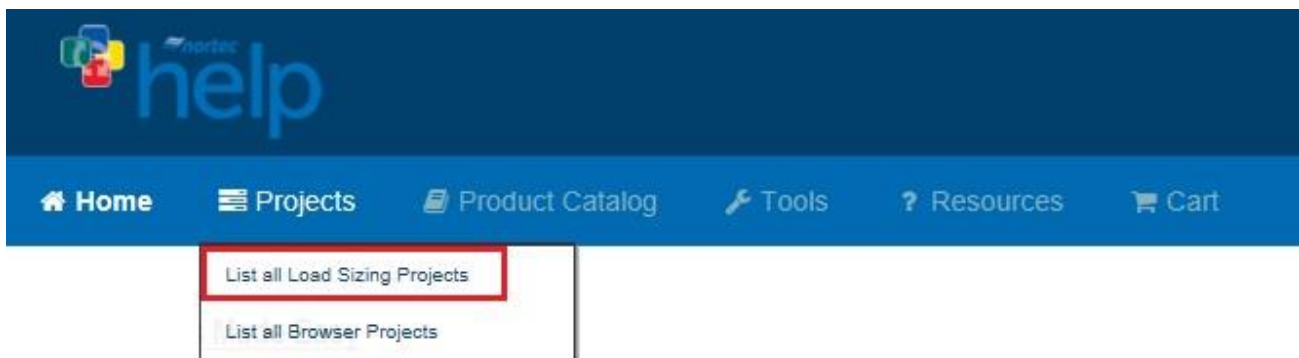


Figure 1: Projects List

Create a New Project

To create a new project, select the **Add** icon shown in Figure 2: Create a New Project to add a load sizing project.

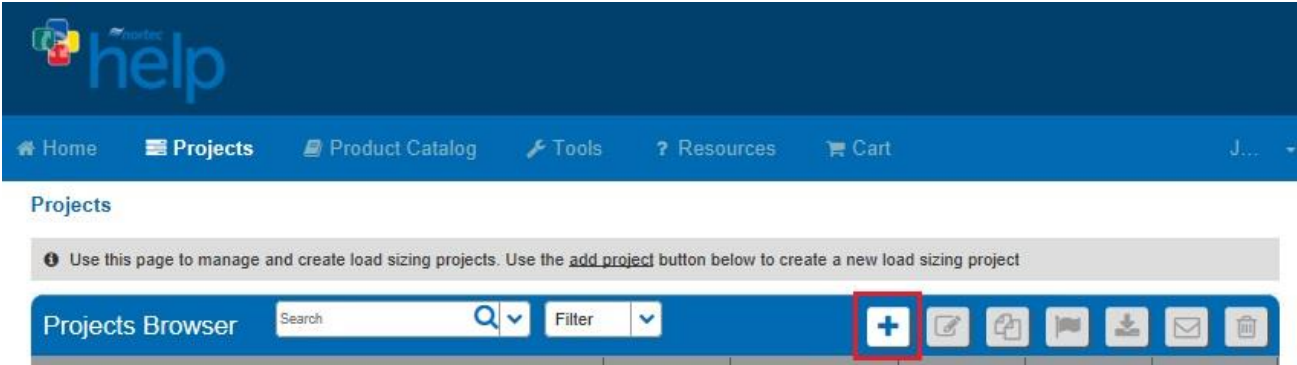


Figure 2: Create a New Project

A dialogue box, as shown below, will appear and request project information. Give the project a name such as “NH-EL 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.

Figure 3: Add Project Dialogue Box

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

Project Home Page

You will be redirected to the Project Home Page, shown below. This is the main page from which your project will be built. Here you can modify the project 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 or sub-area in the project 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 4: Project Home Page

Projects / NH-EL Tutorial







Provide your project details, outside air design parameters, then add a zone using the button in the zone list to begin load sizing and humidifier selection.

Project Information

Configuration | Notes | Project History | Document Center

 Project Information Name: NH-EL Tutorial Project Number: Customer: Created: 2015/08/06 Required Date:	 Customer Address JS Consulting Engineers Ltd. 123 Palm Street Unit 1 Ogdensburg, New York, United States 13669 Customer Contact John Smith user@humidity.com 555-555-5000	 Weather Data Ottawa Macdonald-Cartier Int', Ontario, Canada Altitude: 374.02 ft Dry Bulb Temp: -11.00 °F Relative Humidity: 48.02 % Design Tolerance: 99.60 %
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Zones | Bill Of Materials

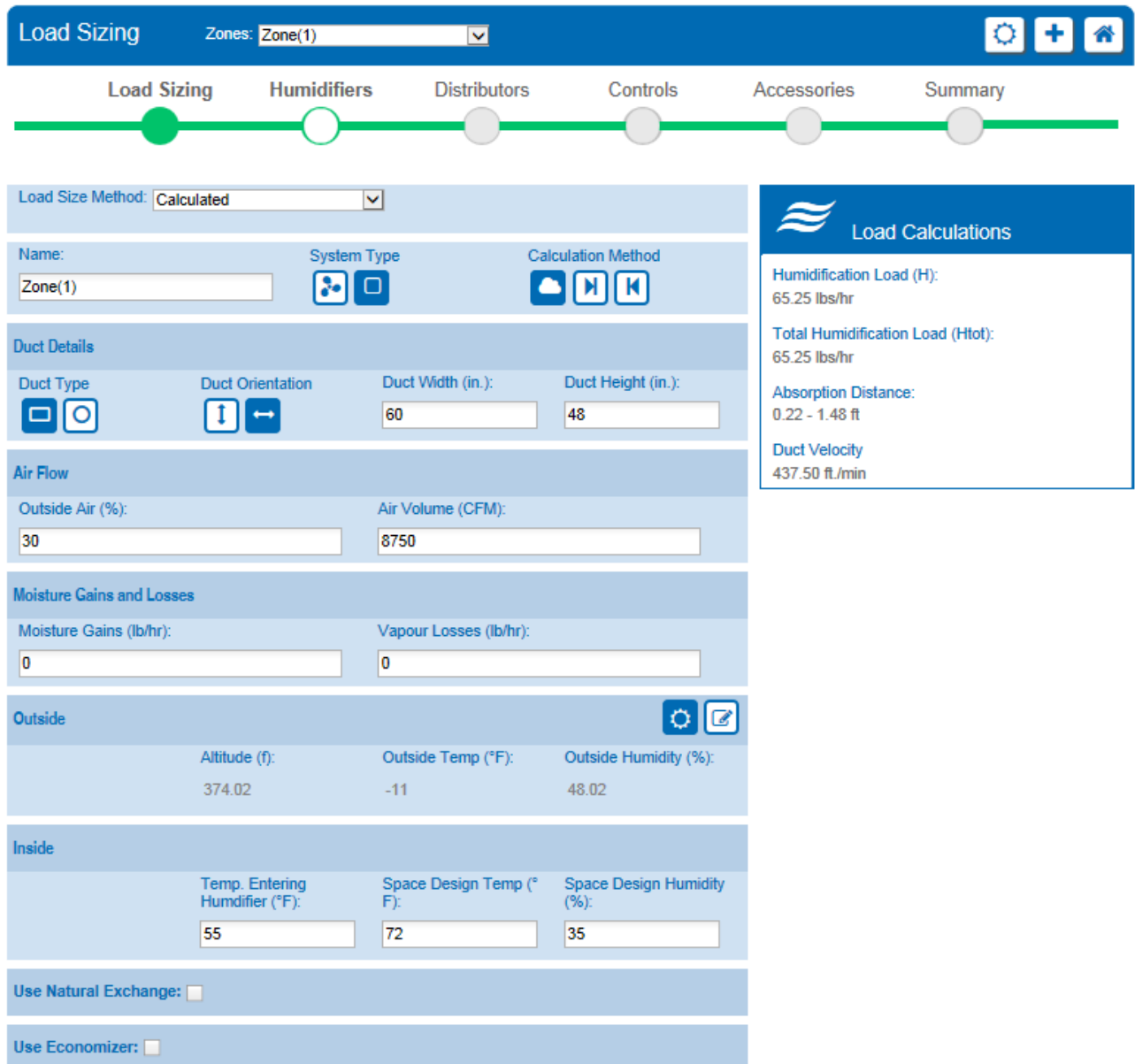
     

Name ↑	Humidifier	Space Temp	Space RH	Air Volume	Temp bH	%Outside Air	Load
Page 1 of 1 20 There are no records to display.							

Figure 4: Project Home Page

Load Sizing Tab

Once you have added a new Zone, you will be redirected to the **Load Sizing** tab as shown in Figure 5: Load Sizing. The Load Sizing tab is where you will enter the specific parameters for your zone.



Load Sizing Zones: **Zone(1)** [Settings] [Add] [Home]

Progress: **Load Sizing** (Active) | Humidifiers | Distributors | Controls | Accessories | Summary

Load Size Method: **Calculated**

Name: **Zone(1)** System Type: [Icons] Calculation Method: [Icons]

Duct Details

Duct Type: [Icons] Duct Orientation: [Icons] Duct Width (in.): **60** Duct Height (in.): **48**

Air Flow

Outside Air (%): **30** Air Volume (CFM): **8750**

Moisture Gains and Losses

Moisture Gains (lb/hr): **0** Vapour Losses (lb/hr): **0**

Outside [Settings] [Edit]

Altitude (ft): **374.02** Outside Temp (°F): **-11** Outside Humidity (%): **48.02**

Inside

Temp. Entering Humidifier (°F): **55** Space Design Temp (°F): **72** Space Design Humidity (%): **35**

Use Natural Exchange:

Use Economizer:

Load Calculations

Humidification Load (H): 65.25 lbs/hr

Total Humidification Load (Htot): 65.25 lbs/hr

Absorption Distance: 0.22 - 1.48 ft

Duct Velocity: 437.50 ft./min

Figure 5: 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. **System Type:** Ensure that *Duct Humidification* is selected

By default Help will select components to distribute steam in duct unless you specify that it will be in-space.

3. **Calculation Method:** *Isothermal.*

Isothermal is used for steam systems, while the two *adiabatic* options are used for nozzles and evaporative media systems.

4. **Duct Details:**

Duct Type: *Rectangular*

Duct Orientation: *Horizontal*

Duct Width: 60 inches

Duct Height: 48 inches

5. **Air Flow:**

Outside Air %: 30%. *This is the percentage of the air volume that will be outdoor air. The balance will be return air from the space.*

Air Volume: 8750 CFM

6. **Moisture Gains and Losses**

Moisture gains: 0 lb/hr

Moisture Losses: 0 lb/hr

7. **Outside:** Select the *Use Weather Data* icon

8. **Inside:**

Temp. Leaving Humidifier: 55 °F. *This is the temperature of air entering the steam distributor in duct.*

Space Design Temp: 72 °F. *This is the temperature of the space you are humidifying.*

Space Design Humidity: 35% RH. *This is the humidity setpoint of the space you are humidifying.*

9. **Natural Exchange:** Leave unselected

10. **Use Economizer:** Leave unselected

Scroll down and review the schematic drawing shown in Figure 6: 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 at the top right hand corner of the diagrams will export any of these documents as either a PDF or CSV file. Only the Parameters section has the option to export either PDF or CSV. Alternatively, these graphics can be exported from the Project Home Page under the **Document Center** tab.

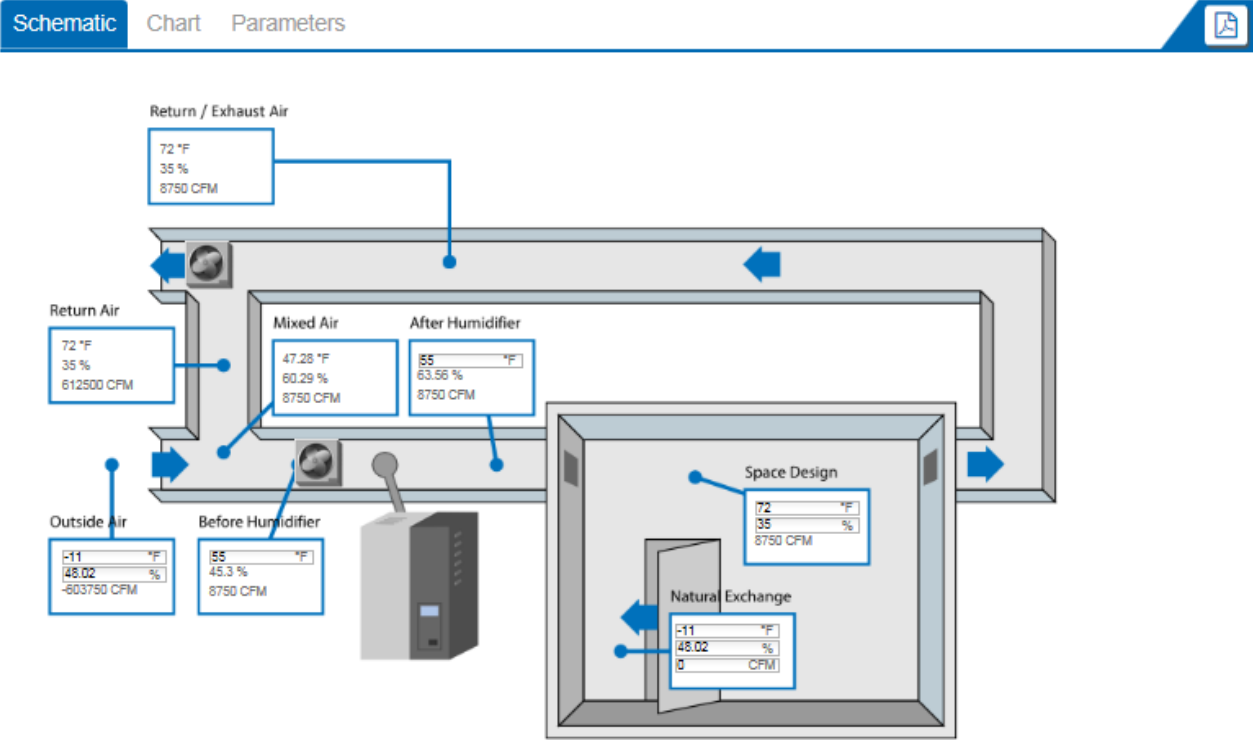


Figure 6: Schematic Drawing

Back at the top of the Load Sizing page, the blue **Load Calculations** box will have a calculated humidification load of 65.25 lbs/hr and a duct velocity of 437.50 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 0.22 and 1.48 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 7: Humidifiers Tab or by selecting the **Next** button below Load Sizing. The humidifiers tab contains a listing of humidifier technologies that match your selections and load from the Load Sizing Tab.

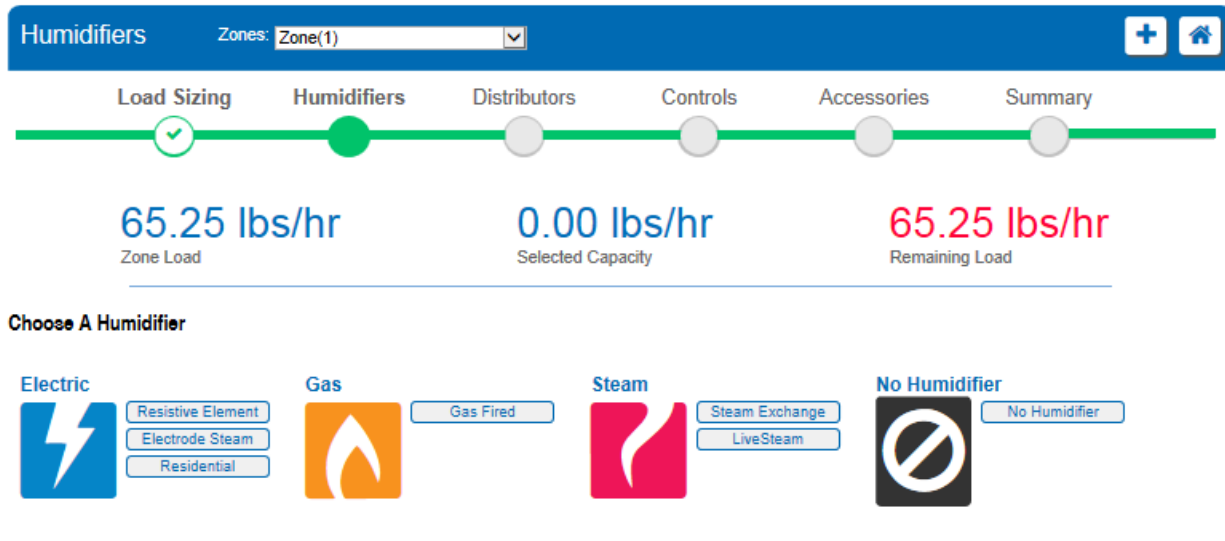


Figure 7: Humidifiers Tab

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

For this tutorial, select **Electrode Steam**. Electrode Steam humidifiers generate steam by passing an electrical current directly through potable water contained in a specially designed cylinder. Water's natural resistance and the induced current cause it to heat to a boil. Electrode steam humidifiers are one of the easiest humidifiers to maintain. As the water boils, minerals that are left behind become collected in the cylinder and periodically, the cylinder will become filled with these minerals. When this occurs, it takes only a few minutes to exchange the cylinder with a fresh one and return the humidifier to service. Electrode steam humidifiers are ideal for many applications and can be applied almost anywhere.

Selecting **Electrode Steam** will activate a configuration window where you can select a model.

There are two available model types:

1. **Indoor Models** are designed to be wall hung indoors. Selecting an Indoor model will result in an NH-EL selection. The NH-EL is a state of the art humidifier featuring an intuitive touchscreen interface, patented auto-adaptive control to extend cylinder life, built-in BACnet protocols, and is even web enabled for remote monitoring through Nortec OnLine.




2. **Outdoor Models** are designed to be mounted outdoors on a curb. Selecting an outdoor model will result in an NHTC Outdoor selection. The NHTC Outdoor models feature an advanced microprocessor controller and are capable of communicating through a building automation system using an optional gateway card.

For this project, select **Indoor**. Help will recommend a specific capacity by making it the default. In this case the *75 lbs/hr* model will be highlighted. Help's recommendation; users are free to select any humidifier model from the list. In this case, follow Help's recommendation and select the **75 lbs/hr** model.

On this page, you can also select the power circuit for the unit. Select a voltage of **220-240/3/60**.

The blue **Add** icon to the right of the electrode steam humidifier tab will allow you to add another electrode steam humidifier. Generally, more than one humidifier in a zone is used for large loads or when redundant units will be used. This tutorial will only require the one humidifier.

Below the configuration window you have access to the product description as well as to other specifications and schematics. This will also give you access to three other icons listed below:

	Information Icon: Redirects to the Nortec product's webpage.
	3D Models: Redirects to Nortec's AutoDesk Seek site, where Revit models, manuals and dwg files can be downloaded.
	Product Document Exporter:Exports a packaging containing this information. Useful for generating product cut sheets and PDFs of relevant info.

Below the additional product information tabs is a list of humidifier specific accessories. They can be added to the humidifier selection by inputting a quantity and selecting the green plus sign to the left of the desired accessory. Clicking the **More Info** button will give you additional information on each accessory.

In this tutorial, two spare cylinders and a foam detection kit will be added to the humidifier shown in Figure 8: Humidifier Options.

Note: For most items Help has calculated the correct quantity of the option required. The cylinder quantity, however, can be user defined

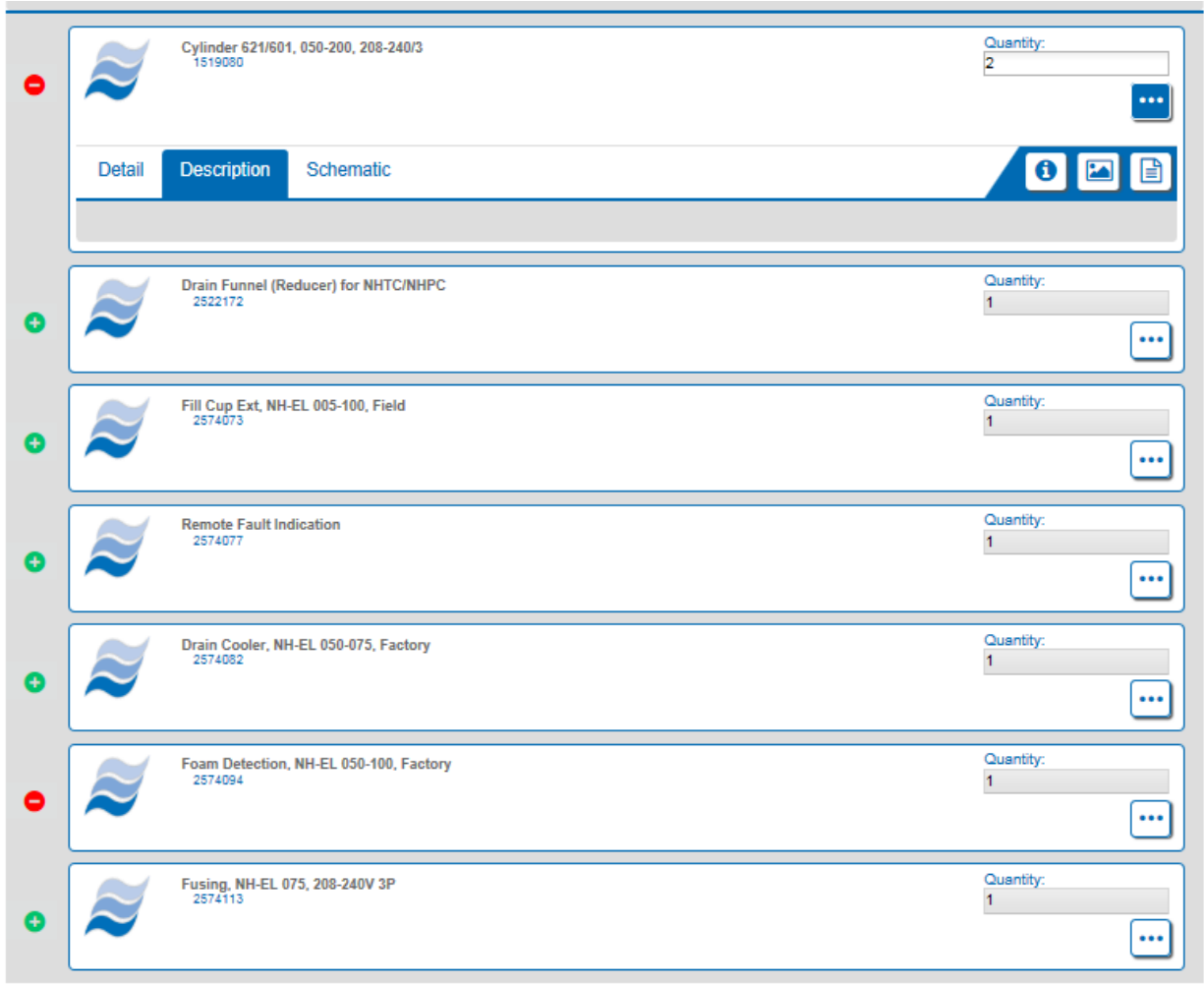


Figure 8: Humidifier Options

The selected humidifier and chosen humidifier accessories will be dynamically added to the humidifier **Bill of Materials** as they are selected. This list is found at the bottom of the page and is shown in Figure 9: Bill of Materials and Options. You may also edit and delete selections here using the highlighted icons.

Parts and Humidifiers List ⋮ 🗑️ 📄

	Part #	Description	Quantity
	2573410	NH-EL 075/220-240/3	1
	1519080	Cylinder 621/601, 050-200, 208-240/3	2
	2574094	Foam Detection, 050-100, NH-EL, Factory	1

Figure 9: Bill of Materials and Options

Click **Next** when you are finished making your humidifier selection.

Distributor Tab

The next step is to add a distributor. Do this by clicking on the **Distributors** tab at the top of the page as shown in Figure 10: Distributors Tab or by selecting the **Next** button at the end of the previous step. Help will present distributor options compatible with your project. Available options will vary with duct geometry, load, and humidifier type specified.

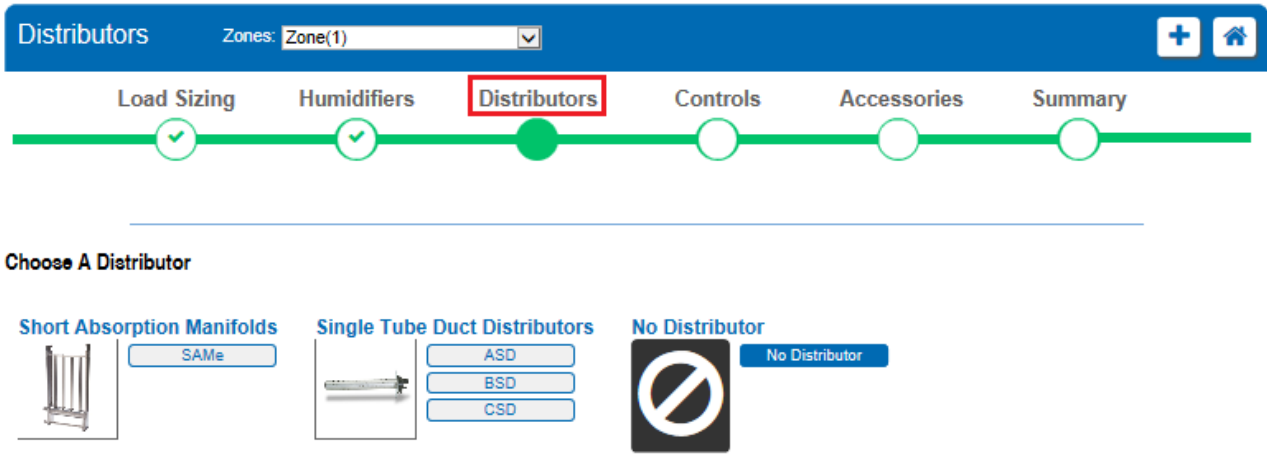


Figure 10: Distributors Tab

For this project the single tube distributors; ASD, BSD, and CSD are available as is the SAM-e Short Absorption Manifold. For the purposes of this tutorial, it is assumed that the distributor will be installed in a section of ductwork with a maximum absorption distance of 3 feet. To minimize costs only a single distributor will be used.

Select each of the ASD, BSD, and CSD buttons. Help will tell identify the minimum number of tubes needed to serve the load, the maximum number of tubes that will fit the duct, as well as the absorption distance for each combination. You will want to select the distributor that allows the minimum number of tubes to be 1, as shown in Figure 11: Distributor Selection. Fewer tubes reduces heat losses at the same time as reducing costs.

In this example, the **CSD** single tube distributor will provide the desired specifications.

Select the following options for the CSD:

1. **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.
2. **Quantity: 1.**

Choose Distributor

Steam Distributor

Minimum Number of Tubes: 1

Maximum Number of Tubes: 4

Absorption Distance: 0.64 - 1.48 ft.

Number of Tubes	Absorption Distance
1	1.48 ft.
2	0.98 ft.
3	0.77 ft.
4	0.64 ft.

Select distributor based on: Zone Load

* Quantity: 1

SAVE CANCEL

Figure 11: Distributor Selection

Click **Save** to finish the selection and add the distributor to bill of materials shown below.

Parts and Distributors List

Part #	Description	Quantity
CSD		
2553750	Steam Distributor CSD 60in	1

Distributor Configuration

Duct Width: 60.00 in. Absorption: 1.48 ft

Duct Height: 48.00 in. Distance to Bend: 1.48 ft

Duct Orientation: Horizontal Distance to Submicron: 4.44 ft

Distance to Humidity Sensor: 7.40 ft

Figure 12: Distributor Bill of Materials

Since the humidifier will be installed only a few feet from the distributor, steam hose will be used for the entire steam line run. To minimize plumbing effort, condensate from the distributor will be returned to the humidifier.

Select the **Edit Options** button, shown in Figure 12: Distributor Bill of Materials, to activate the options selection window. Under the **Steam and Condensate Hoses** tab check the boxes next to Steam Supply Hose 1³/₄ ID and Condensate Hose 3/8 ID. For each enter a quantity of **10** feet. Select **Save** to proceed.

The distributor bill of materials will now update to include these new parts.

Select **Next** when you are finished.

Controls Tab

You will now be directed to the Controls tab. Clicking on the **Controls** tab at the top of the page will also bring you here. 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:

1. **Controls by Nortec** configures a complete control package provided by Nortec.
2. **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, the humidifier will be configured to accept a **0 – 10 VDC** demand control signal provided by a BACnet IP building automation system. The unit will also be configured for 2 way communication with the automation system so that various control points can be monitored and changed from a central terminal. The humidifier will include an air proving switch and high limit humidistat to protect against excessive moisture in the duct.

Begin configuration by selecting **Controls by Others**, indicating that the primary control signal will come from a third party automation system.

Next select the following options as shown in Figure 13: Control Dialogue:

1. **Signal Type: Demand.**
Demand signals instruct the humidifier to operate at certain percentages of its capacity. Alternatively, transducer signals report the relative humidity in the space to the humidifier. The humidifier uses an internal proportional – integral (PI) loop to determine the output.
2. **Channels: Single.**
Select whether you will have one or two modulating control signals controlling the humidifier. If two signals are selected the humidifier will operate until the first signal has been satisfied before becoming idle.
3. **Signal Type: 0 – 10 VDC.**
Select the primary control signal type to control the humidifier.
4. **Include Air Proving Switch: Check Box.**
This on/off safety device prevents humidifier operation unless air is flowing in the duct.
5. **Include On/Off High Limit Switch: Check Box.**
This on/off safety device prevents condensation in the duct by stopping humidification if the duct humidity levels exceed a certain level.

6. Building Automation System Gateway: BACnet IP/Modbus.

The NH-EL includes built-in BACnet IP, BACnet MS/TP, and Modbus as a standard feature. If a BTL certified BACnet protocols or LonWorks is required, select one of these options to include an optional gateway card configured for the respective protocol.

Controls Zones: **Zone(1)** + 🏠

Load Sizing Humidifiers Distributors **Controls** Accessories Summary

4.1 Choose Selection Type

Please select Manual or Assisted selection to configure controls for this zone.

Manual Selection Assisted Selection None

4.2 Choose Controls

Controls by Nortec Controls by Others

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

Signal Type: **Demand** Channels: **Single**

Other Single Channel Demand

Signal Type:	0-10 VDC
Include Air Proving Switch:	<input checked="" type="checkbox"/>
Include On/Off High Limit Switch:	<input checked="" type="checkbox"/>
Building Automation System Gateway: More Info...	BACnet IP, Modbus

GENERATE

Figure 13: Control Dialogue

Selecting **Generate** will update the Controls Bill of Materials found below.

Parts and Controls List ⋮

Part #	Description	Quantity
1329203	SP Switch Air Proving, Duct, mtd.	1
2548732	Humidistat, On/Off, High Limit,Dig. Duct	1
2523066	DEMAND signal acceptance,0-10 VDC single	1

Figure 14: Controls Selection Results

Click **Next** to complete the selection.

Accessories Tab

The next step allows you to add accessories to the current Zone. Selecting the **Next** button on the previous page will bring you to this step or you can choose the **Accessories** Tab for the navigation Bar at the top of the page.



















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.

For this tutorial, a water filter will be installed upstream of the humidifier. To include this item, click on the Accessories button, select one “In-Line Water Filter c/w 5 micron filter” and click Save as shown in Figure 15: Accessories. You will now be directed to the **Summary** Tab. Clicking on the Summary tab in the Navigation Bar at the top of the page will also bring you here.




Here you will see a complete bill of materials for the entire Zone shown in Figure 16: Zone Summary

5. Choose Accessories

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

	 Double Check Valve for Water Inlet line 1458807	Quantity: <input type="text" value="1"/>	
	 Drain Water Cooler, Electric 1710020	Quantity: <input type="text" value="1"/>	
	 Drain Water Cooler, Self-Actuated 1710010	Quantity: <input type="text" value="1"/>	
	 Drain Water Sump Pump, high flow 2524504	Quantity: <input type="text" value="1"/>	
	 Drain Water Sump Pump, medium flow 1429527	Quantity: <input type="text" value="1"/>	
	 In-Line Water filter c/w 5 micron filter 1329505	Quantity: <input type="text" value="1"/>	

Detail | Description | Shop Drawing 1

In-Line Water Filter, c/w a 5 micron disposable cartridge. 3/4" threaded inlet and outlet. Pressure relief vent and easy open design.

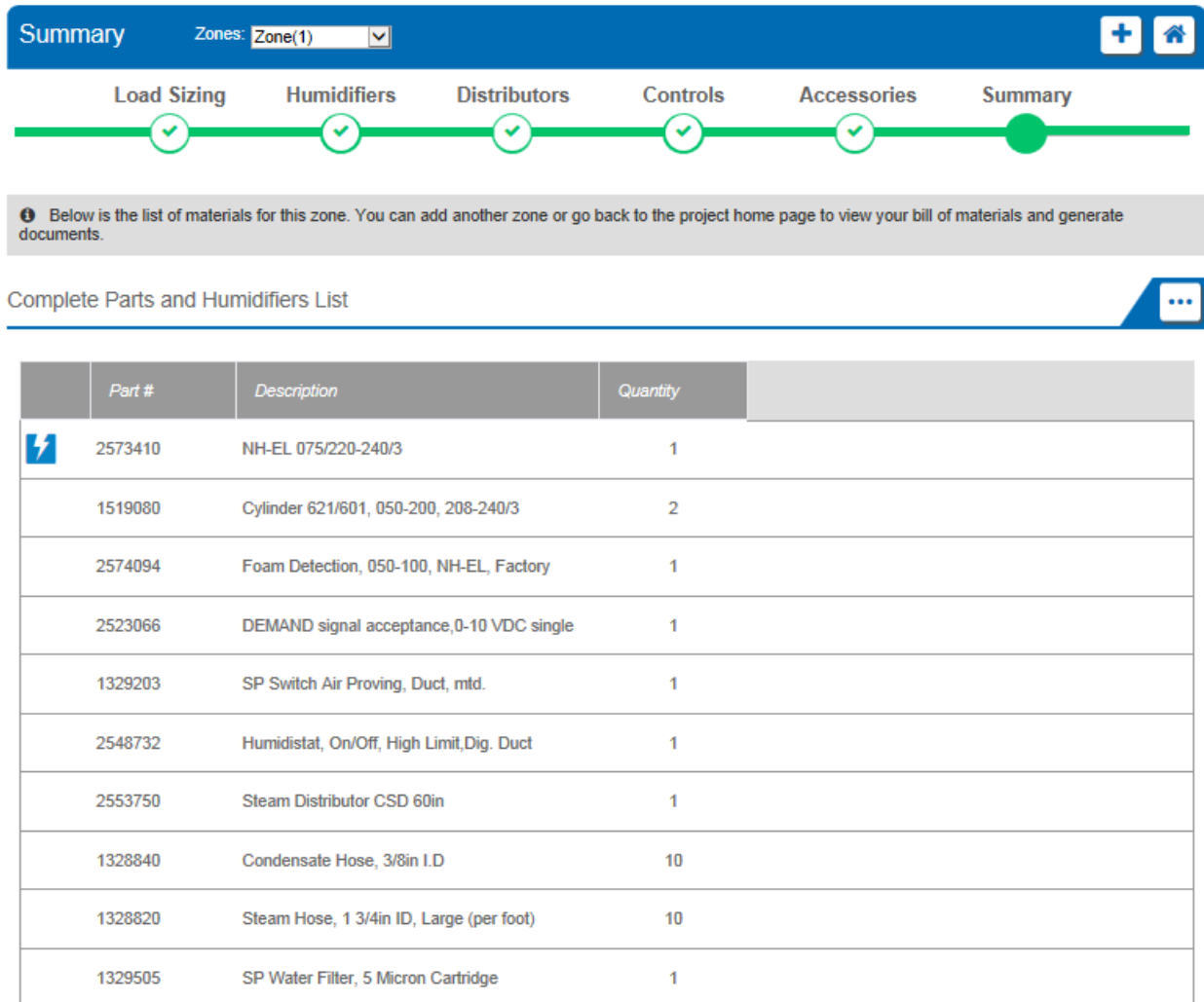
Figure 15: Accessories

Select **Next** once you have finished adding any desired accessories.

Summary Tab

You will now be directed to the **Summary** Tab. Clicking on the Summary tab in the Navigation Bar at the top of the page will also bring you here.

Here you will see a complete bill of materials for the entire Zone shown in Figure 16: Zone Summary



The screenshot shows the 'Summary' tab selected in a navigation bar. Below the navigation bar is a progress indicator with six steps: Load Sizing, Humidifiers, Distributors, Controls, Accessories, and Summary. The 'Summary' step is currently active. Below the progress bar is an information message: '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.' Below this is the title 'Complete Parts and Humidifiers List' and a table of parts.


	Part #	Description	Quantity
	2573410	NH-EL 075/220-240/3	1
	1519080	Cylinder 621/601, 050-200, 208-240/3	2
	2574094	Foam Detection, 050-100, NH-EL, Factory	1
	2523066	DEMAND signal acceptance, 0-10 VDC single	1
	1329203	SP Switch Air Proving, Duct, mtd.	1
	2548732	Humidistat, On/Off, High Limit, Dig. Duct	1
	2553750	Steam Distributor CSD 60in	1
	1328840	Condensate Hose, 3/8in I.D	10
	1328820	Steam Hose, 1 3/4in ID, Large (per foot)	10
	1329505	SP Water Filter, 5 Micron Cartridge	1

Figure 16: Zone Summary

The product selection for this zone has now been completed.

Select the **Done** button to return to the Project Home Page.

Project Submittals and Requesting a Quotation

On the project home page under the **Document Center** tab shown below, you can export a submittal package as well as other useful information. You can also request a quote from your local Nortec agent.

Projects / NH-EL Tutorial

Provide your project details, outside air design parameters, then add a zone using the button in the zone list to begin load sizing and humidifier selection.

Project Information

Configuration | Notes | Project History | Document Center

Project Information

Name: NH-EL Tutorial
 Project Number:
 Customer:
 Created: 2015/08/06
 Required Date:

Customer Address

JS Consulting Engineers Ltd.
 123 Palm Street Unit 1
 Ogdensburg, New York, United States
 13669

Customer Contact

John Smith
 user@humidity.com
 555-555-5000

Weather Data

Ottawa Macdonald-Cartier Int', Ontario, Canada

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

Zones

Bill Of Materials

Name	Humidifier	Space Temp	Space RH	Air Volume	Temp bH	%Outside Air	Load
1 <input type="checkbox"/> Zone(1)	Electrode Steam	72	35	8750	55	30	65.25

Page 1 of 1 | 20 | View 1 - 1 of 1

Figure 17: Document Center

Selecting **Project Exports** will bring up a dialogue box as shown in Figure 18: Export Center.

Export Centre ✕

Select the reports you would like to download.

Project Exports

Document Title	Downloads		
Bill of Material	rtf	pdf	csv
Humidifier Schedule	rtf	pdf	csv
Specification	rtf	pdf	
Submittal Package	rtf	pdf	
Zone Table	rtf	pdf	csv

Zone Exports

Zone	Schematic Diagram	Psychrometric Chart	Zone Parameters
Zone(1)	pdf	pdf	csv

Custom Exports

[Custom Submittal Report](#) | [Custom Specification Report](#) | [Dynamic Drawings](#)

Ok | Cancel

Figure 18: Export Center

Help can generate the following documents:

Bill of Material: A listing of the entire product selected, broken down by zone.

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

Specification: An engineering specification for incorporation into a larger mechanical specification. Help dynamically builds the specification based on selected product 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 to create Submittals, Specifications, and Distributor Drawings containing only zones you specify for multi-zone projects.

Selecting **Request Quote** will bring up a dialogue box allowing you to enter any comments or and notes and to confirm your contact information. Selecting the **Request** button will send a pricing request to the agent along with a copy of the project. Your local representative will contact you shortly regarding pricing and further information.

Congratulations, you have successfully completed this tutorial!

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