
Valve & Actuator Estimating Tool

Operation Guide

2011 - Release 1.103

WHAT IS THE VALVE AND ACTUATOR ESTIMATING TOOL?

The Valve and Actuator Estimating Tool is software program designed to help with efficiently selecting and compiling lists of Honeywell valves and actuators. It is an offline tool that can assist with tasks like:

- obtaining Honeywell valve and actuator model numbers and prices
- assembling a large projects' valve schedule
- capturing criteria and filtering choices to find the most appropriate valve
- calculating a valve's desired target Cv, as well as effective Cv when using pipe size reducers
- refining or adding product selections later as project requirements change

The tool is built on Microsoft Excel, and produces standard spreadsheet style output data, for easy integration into other programs or manual manipulation if needed.

The built in CV calculator will insure the math is done consistently and accurately, avoiding costly errors. Each multipart assembly, for instance consisting of a valve, actuator, and linkage, is organized as a unit to more efficiently track subcomponents.

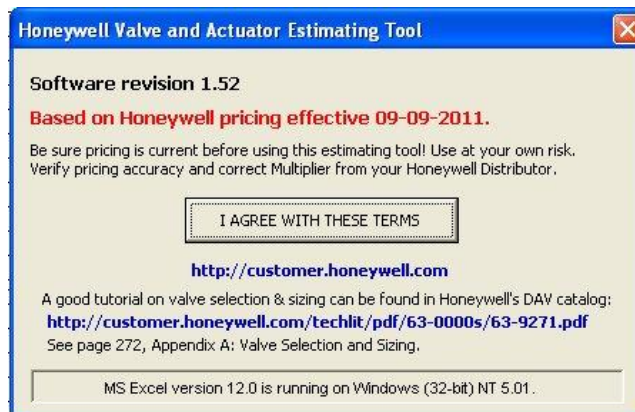
Valve and actuator qualities are clearly defined for each product, and images of the products you select are shown to visually reinforce selection accuracy. Submittal data sheet hyperlinks are included for each product.

GETTING STARTED

Since the tool is an offline program, it does not require an internet connection to operate once you have acquired it. The tool is an excel file with an .xlsm extension, and when clicked it will automatically initiate your Microsoft Excel program. When downloading the tool, save it to your desktop or preferred directory location.

If you are using Excel 2003 or earlier, you may need to download the latest free software updates from Microsoft. Since the tool's file extension is native to Excel 2007 or newer, a file conversion is necessary in Excel 2003 and should happen automatically. If it does not, download the free excel file converter from Microsoft.

The tool uses macros, also called visual basic programming, to power the worksheets. The macros must be enabled to run the program. Depending on your security settings, you may get a 'security warning' notifying you that macros have been disabled for which you must select 'options' then 'enable this content'. Once the macros are properly enabled, an introductory dialog box like the one below will appear.



If you do not get the introductory dialog box, the macros in Excel are not enabled. You may need to locate 'excel options', 'trust center settings', and either change 'macros settings' or add the directory of the tool file to the 'trusted locations'.

IMPORTANT

The introductory dialog box displays the software revision and **the date for which all pricing is based**. Be sure this is the most recent price adjustment date, or download a newer version if available.



You must accept the terms to continue.

SELECTIONS WORKSHEET LIST


Once the introductory dialog box is accepted, you will be presented with the SELECTIONS worksheet. This page will capture and hold all of your selection criteria as well as your product selections. Each of the other worksheets contain a product matrix which will help with the selection process, but **the SELECTIONS worksheet is where everything about our project is stored.**

There are many columns of data that may or may not be populated on this worksheet, depending on your project, so each column can be hidden or visible as you see fit.

Line	Sched	System	Tag	Qty	Media	Flow	▲ P [Inlet]	Cv	Actuator	Honeywell Model #	Net\$ ea(US)	Net\$(US)	Description
1	1.1	B-1 Isolation	V1	1	Water	50	7	18.9	24 VAC	V5011N3046/U	151.5	151.5	Threaded Globe
2	1.2	B-1 Isolation	V1	1						MN7510A2209/U	162.28	162.28	Threaded Globe
3	1.3	B-1 Isolation	V1	1						Q5020A1003/U	112.3	112.3	Single Linkage 1
4	2	Cdw Isolation to Ch-1	V15	1	Water					No Selection			
5	3	Cdw Source Select	V16	1	Water				24 VAC	No Selection			
6	4	AC-1 Heating	V17	1	Water	30.5	2.5	19.3	24 VAC	VBN2EL3P0D/M	196.97	196.97	Ball Valve, 1.5 I
7	5	AC-1 Cooling	V18	1	Water	77.3	2.5	48.9	24 VAC	VBN2EN3P0D/M	197.09	197.09	Ball Valve, 1.5 I

 You can click on any red circle icon  located on any product worksheet to quickly **return to the SELECTIONS** worksheet. Click on the SELECTIONS worksheet instance of the icon and the cursor will go back to the top left to Item 1.

 You can click on the Expanded View icon  located on the SELECTIONS worksheet to toggle the **Full Screen Mode** on or off. This gives increased space to work.

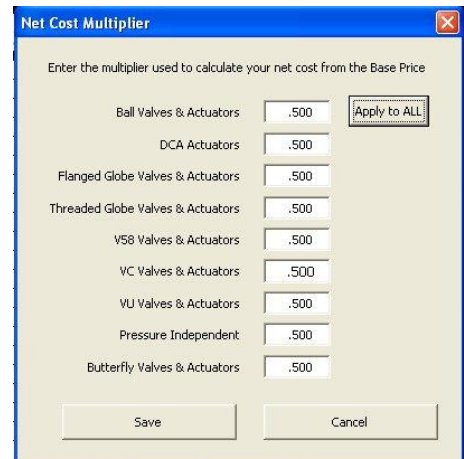
 You can double-click on any cell of any item in the SELECTIONS worksheet to start **Edit Selection** for that item. You can also double-click the next empty item to start **Add New Item**.

IMPORTANT Before we begin selecting any products, the **base price multipliers must be set correctly**. The net cost is transferred to the SELECTIONS worksheet using these multipliers, so it is important to set them **BEFORE** making your selections.

In the SELECTIONS worksheet, click on More Options, then Change Pricing. Choose US or Canadian \$, then Set Multipliers will display the dialog shown to the right →

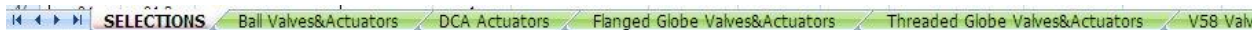
This would also be a good time to enter correct data for Company and Project header Info. See Show/Hide columns if these are not visible.

Save the spreadsheet so the new values will be saved.



The dialog box titled "Net Cost Multiplier" contains a list of product categories with input fields for their respective multipliers. The categories and their values are: Ball Valves & Actuators (.500), DCA Actuators (.500), Flanged Globe Valves & Actuators (.500), Threaded Globe Valves & Actuators (.500), V58 Valves & Actuators (.500), VC Valves & Actuators (.500), VU Valves & Actuators (.500), Pressure Independent (.500), and Butterfly Valves & Actuators (.500). There is an "Apply to ALL" button next to the first entry, and "Save" and "Cancel" buttons at the bottom.

PRODUCT WORKSHEETS



In addition to the SELECTIONS worksheet, there is a dedicated worksheet for each Valve family and one for Direct Coupled Actuators. Your product selections will be made from these worksheets.

- Ball Valves & Actuators
- DCA Actuators
- Flanged Globe Valves & Actuators
- Threaded Globe Valves & Actuators
- V58 Valves & Actuators
- VC Valves & Actuators
- VU Valves & Actuators
- Pressure Independent
- Butterfly Valves & Actuators

Each product worksheet has columns that each define a single characteristic for that product. These columns can be filtered with Excel’s ‘autofilter’ functionality, either automatically using values you define, or manually if desired.

This method reduces a large quantity of potential products in a clearly defined manner, helping you to locate the best single product item choice. The Reset Filters function will clear all filters on that worksheet.

Valve Size (i)	Cv	Close-off (psid)	Body Type	Pipe Fitting	ANSI Clas	Body Rating	Max Steam Press	Trim	Valve Action	Flow Character
0.5	0.38	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %
0.5	0.38	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %
0.5	0.38	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Stainless Steel	On/Off, Mod	Equal %
0.5	0.38	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Stainless Steel	On/Off, Mod	Equal %
0.5	0.68	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %
0.5	0.68	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %
0.5	0.68	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Stainless Steel	On/Off, Mod	Equal %
0.5	0.68	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Stainless Steel	On/Off, Mod	Equal %
0.5	1.3	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %
0.5	1.3	130	2-way	NPT Female	N/A	360 psi/ 250°F	N/A	Brass	On/Off, Mod	Equal %

Each product worksheet also contains hyperlinks to <http://customer.honeywell.com> for respective product family submittal data sheets. An internet connection is required for this function.

SCHEDULE ITEMS


The tool, in its most basic application use, allows you to go to a product worksheet, make your selection, and add that selected product to the list on the SELECTIONS worksheet. The selected product assembly may consist of more than one component, perhaps a separate valve and an actuator, so those components will make up a single **Schedule Item**. The SELECTIONS worksheet keeps track of assembly components by using a common whole number for all members of the assembly, and a tenth for each component. So if the valve is item 6.1, its actuator would be item 6.2. If the valve is selected without a separate actuator, its schedule item number on the SELECTIONS worksheet would simply be 6 in this example.

In some instances, for example with an actuated butterfly valve, the OS number already includes the valve and the actuator, so it would be a single item. If in doubt, refer to the item description.

Adding an item - directly from a product worksheet

To add a product to the SELECTIONS worksheet list directly from a product worksheet:



- Navigate to the desired product worksheet by clicking the tab at the base of the screen
- Find the desired item in the worksheet
- Double-click any column of the desired product row (or click the blue + (add) icon) 

The Edit Schedule Item dialog box appears. The 'My Selection' section (shown at right) will now display all the information about your selection, including OS number, net price (based on the multipliers entered), a few strategic qualities, a very complete description, and a handy dandy mug shot of the product.

MY SELECTION


Valve* | Actuator* | Linkage* | Combo Y-pack


Valve		Valve Cv	Size Inches	Effective Cv	Actual Delta PSI
OS number	Net\$ ea(US)				
V5011N3046/U	151.19	18.7	1.25	18.7	7.1

Description

Accept Threaded Globe Valve, 1.25 in, cv=18.7, 168 PSI close-off, 2-way, trim=Brass, NPT Female, ANSI 150, On/Off, Mod, Stem up to close (reverse), body=Red Brass, max water=240 psi, max steam=15 psi/249°F, Equal %, stem travel=0.75 in.

Find



 The 'My Selection' area displays tabs for Valve, Actuator, Linkage, and Combo Y-Pack. If a tab contains a separate product which is part of the assembly, an asterisk (*) denotes that the tab is populated. Click on the tab to see the details. You may elect to exclude any individual component by clearing the 'accept' checkbox within its tab.

All values in the VALVE and the ACTUATOR sections are optional and will be recorded on the SELECTIONS worksheet. Typically these values are entered when building a project schedule and are used to automatically set the filters within a product worksheet. See Advanced Use for more details.

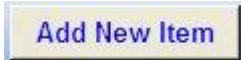
- click the **SAVE** button

If an Item already exists at this Schedule Item location on the SELECTIONS worksheet, you will get a dialog box that asks where you would like to save this Item in the list.

The Item is then added to the Selection worksheet. You may continue to add items from the present product worksheet, or select another product worksheet by clicking on its tab at the bottom, or you may click on the red S to see your item in the list, where the cursor will be pre-placed on the last item you added. Go ahead and check if you don't believe me.

Advanced Use – Building Schedule Item criteria

The SELECTIONS worksheet list can be **constructed and edited entirely with the Edit Schedule Item** dialog box, shown below. From the SELECTIONS worksheet, either double-click on the next empty item line, or click



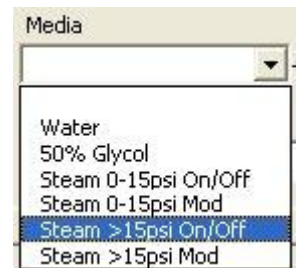
Once the Edit Schedule Item dialog box opens, the **entries will be blank**, ready for you to record the criteria to help select a new item. The Item number in the top left will show the next available number that is being assigned.

Note: **Edit Selection** function behaves the same but rather than empty entry boxes, the entries are copied from all of the selected item's SELECTIONS worksheet column values.

You can also edit an existing item by simply double-clicking the item in the list.


Once the dialog box opens, enter all desired qualities into the VALVE and ACTUATOR sections (also shown on next page). Drop-down boxes are used to speed entry. Be sure to include your desired TAG entry designation such as "V12" if factory labels are desired, currently available and at no cost for VB, VRN, and VFF valves.

You might enter into the System Function something like "AHU1 chilled water", while the Reference entry might contain "Dwg M16.1 section E12". Use these optional fields to best suit your project.



Once the entries are made, you can proceed to select a product using those values, or simply save the item entries and continue building your list. **All entries in the dialog box are optional**, but the more defined the criteria, the smaller the final potential product list you will need to sort through for your final selection.

The image shows two dialog boxes. The top one is titled 'VALVE' and contains the following fields: Tag Label (V1), QTY (1), Body Type (2-way), Flow Type (Equal %), PSI Close-Off (100), Media (Water), Flow GPM (50), DPress PSI (7), Calc Cv (18.9), Pipe Inches (2.5), and Connection (NPT). Below these are System / Function (B-1 Isolation) and Reference. The bottom dialog box is titled 'ACTUATOR' and contains: Supply Voltage (24 VAC), Control Type (On/Off), Fail Action (Stay in Place), NEMA / IP Rating (NEMA2), a Pre-loaded section with checkboxes for 'No filters on search results', 'Search valve = pipe size', and 'Show closest Cv matches', and radio buttons for 'Imperial Units' (selected) and 'Metric (view only)'. A 'Calculator' icon is also present.

If you save your entries without selecting a product, the list will save the OS as 'No Selection'. Products can be selected or changed later. 

If you want to save at this point, before searching for a matching product, click the SAVE button next to the Item number. You will be able to edit the entries or the item at any time. If you are overwriting an existing item, you will be prompted to choose confirm, insert new schedule item, or append to the end of the list.

Before you search for the matching item, let's get more familiar with the calculations that are performed.

CV CALCULATIONS

Once the Media, Flow GPM, and DPress PSI entries are made, the Calculated Cv will automatically populate. Selecting steam as media will alter the entry boxes as well as the calculation results.

Media: Water, Flow GPM: 50, DPress PSI: 7, Calc Cv: 18.9

Media: Steam 0-15psi Mod, Flow lb/hr: 50, Inlet PSI: 7, Calc Cv: 1.8

Once a valve is selected and added to 'MY SELECTIONS', the Effective Cv and Actual Delta PSI will also be calculated automatically. All calculated results are displayed in the Edit Schedule dialog Box only if all required entries are populated.



Although calculations in the Edit Schedule Item dialog box are automatic, a calculator is also available.

Click the icon to start the calculator, which will populate with all of the present values. Changes can be made in the Calculator and saved back to the Edit Schedule form with the **Save to Form** button.



All Calculator icons begin the calculator, but only the Edit Schedule dialog box icon starts the calculator pre-loaded with all current values.



The Water or the Steam calculations tab is automatically chosen based on the 'media' entry. Values can be changed to see potential results of adjustments. Formulas are shown to the right of the results. Changed values in the calculator are only transferred to the dialog box after the **Save to Form** is pressed. The torque tab can be used to calculate required inch pounds for a given damper size, and can be helpful when selecting the appropriate DCA(s).

Calculator (Water | Steam | Torque)

Buttons: Save to Form, Clear, Close

Water / Glycol Calculations

Enter Flow: 50 GPM

Specific Gravity of Media: 1.0 (water=1, 50% Glycol = 1.04)

Desired Pressure Drop: 5 PSI (11.53329373 Ft/Head)

Calculated CV: 22.4 = Flow / (SG * SQRT (PDrop))

Enter Actual CV: 26 (CV listed for selected valve)

Pipe - Valve Size Reduction Adjustment

None | Ball 2Way | Ball 3Way | Btrfly Mod | Btrfly OnOff

Pipe Size Inches: 2 Inches

Valve Body Size Inches: 1 Inches

Effective CV: 20.0 = Actual CV with adjustment

Calculated Pressure Drop: 6.3 = (Flow / ActualCV) exp 2

Calculator (Water | Steam | Torque)

Buttons: Save to Form, Clear, Close

Steam Calculations

Control: Modulating | On/Off

Inlet Pressure: 0 - 15 PSI | > 15 PSI

Flowrate: 5400 LB/HR (5184 MBH)

Inlet Steam Pressure: 6 PSI

Downstream Pressure: 1.2 Psig

Pressure Drop: 4.8 Psig

Pressure at Inlet: 6.0 Psig

Pressure at Outlet: 15.9 Psig

Cv Required: 206.0

NOTES ABOUT EFFECTIVE CV:

Ball valves and butterfly valves data sheets list actual Cv values based on using equal diameter to pipe size. When using valve sizes that are less than pipe size, the reduction creates a pipe geometry that lowers the effective resultant Cv value. Other style valves are not significantly affected. Although most butterfly valves are sized to be equal to the connecting pipe, ball valves are often used at reduced sizes, as small as half the size of the pipe. Reasons to use a smaller ball valve include obtaining a Cv value unavailable in larger sizes, or as a cost savings measure. This Cv reduction should be accounted for to make a proper selection. The ball valve effective Cvs in the tool are calculated using sizing charts published in the Honeywell data sheets.

NOTES ABOUT BUTTERFLY VALVE CV:

Butterfly valves have separate Cv values for 60 degrees and for 90 degrees of valve position. The 60 degree value is used with modulating applications, and the 90 degree value is used for on-off applications. By default the modulating Cv is used, but if the ACTUATOR 'Control Type' entry selection is On/Off, the 90 degree value is automatically used for the Actual Cv value and the calculations.

SEARCH USING CRITERIA



You can use the entries in the Schedule Item Edit dialog box to help you pick a product. You can also use the top menu bar (shown above) to navigate quickly between worksheets.

Use the 'Click_to_Select_Search→' drop-down box arrow to expose the drop-down product worksheet choices, and click on a product family (see above right). You will be taken to that product worksheet **with its filters set to match your criteria** field entries. If the number of resultant matches is large, fill in any blank entries. If there are no matches, reduce your criteria. You can add, delete, or change your entries and re-select the product worksheet.



TIP: After adjusting entries to vary filter criteria, you can simply double-click the previously selected product worksheet name (which will be on top in the search box) to quickly re-filter for fresh results.

No filters on search results
 Search valve = pipe size
 Show closest Cv matches

Pipe size entry is used to filter searching for valve size. Valve sizes equal to pipe size through valves sizes half of pipe size are included in the search. If no pipe size is entered, every valve size will match.

Pipe Inches
1.25

If the 'search size=pipe size' is checked, the search will be limited as stated.

Calc Cv
18.9

Calculated Cv value is used for searching valve Cvs. **Any valve Cv within +-20% of the calc Cv will match** unless the 'Show closest Cv matches' box is checked. In that case the **closest Cv below** and the **closest Cv above** will match, no matter how far away the values. This can help when a search yields no matches.

If you want to search a product worksheet without any filters, regardless of your entries in the dialog box, check the 'No filters on search results' box.

Once you achieve a reasonable number of potential products in the product worksheet, use the rollup feature of the dialog box to minimize its footprint via the up-down red button arrow. You can work 'behind' the dialog box to find the best selection on the product worksheet. Use the autofilter buttons to assist, or simply navigate manually to make your choice.



+ Once found, simply **double-click your selection** to add it to the 'My Selections' section of Edit Schedule dialog box. Alternatively, click on your selection row, then click any blue (+) icon.

If you are happy with your choices, click the **SAVE** button to write the values to the SELECTIONS worksheet. If you prefer to keep searching for a different product for this item, locate the new desired product on the product worksheet and double-click. You could alternatively use the blue (+) Add icon instead of the double-click action.

Anytime you save to an Item number already existing on the SELECTIONS worksheet, you will get a dialog box that asks where you would like to save this Item in the list. This allows you to copy an item by opening it with edit, make whatever changes, and when you save you choose not to overwrite but to append to the end of the list. If you need many copies, see the Replicate function.

USING THE MENU BAR TO NAVIGATE



The menu bar on the Edit Schedule dialog box shows the currently selected item number. Use the up and down arrows to load the corresponding item from the SELECTIONS worksheet. Items with multiple components are automatically compensated for.

An alternative method is to double-click on any item in the SELECTIONS worksheet. It is not necessary to close the dialog box first.

Changing the item number with the arrows here will also place the cursor on the respective item in SELECTIONS.

The dialog box always stays in front of the Z-order. If it is closed, any unsaved data changes in the dialog box will be lost.

If you need to locate the product worksheet and row of a valve you previously saved, click the 'Find' button next to the valve description in the My Selection section. It will take you straight to the first instance of that valve OS number. If the valve is an assembly with a separate actuator or linkage component, you will need to locate the correct row manually. This function can be helpful to re-load net pricing, although one product at a time.

WORKSHEET SAVING AND PROTECTION

The product worksheets are protected to guard against accidental value changes.

The SELECTIONS worksheet is protected to a lesser extent to prevent adding or deleting columns which must remain fixed. The summary files do not have any protections. If you need to alter formatting on the SELECTIONS worksheet, the unprotect password is a space. The worksheets will re-protect themselves automatically.

When building a project, **it is recommended that you first save a copy from the blank master file**, and label it with a clear project name. You must use the full tool rather than the file summary if you wish to be able to add or edit values later using the benefit of the tool's programming.

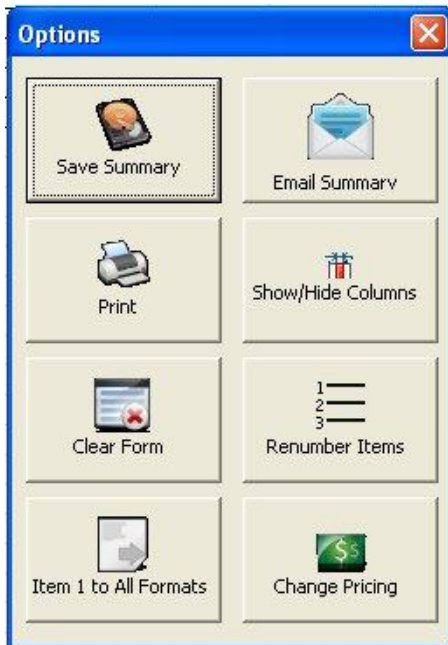
REPLICATE BUTTON

The Replicate function copies a single SELECTIONS worksheet item multiple times, appending a consecutive suffix to each successive copy's tag labels. It is limited to 100 copies at a time.

If the source item has multiple components they will all be replicated. All entered values from the original item are copied.



MORE OPTIONS BUTTON

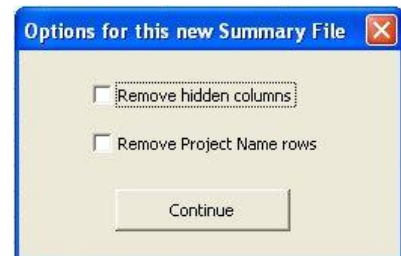


SAVE SUMMARY

Saves a copy of the SELECTIONS worksheet in xls format.

No images or macros are saved. The filename and location can be changed. Hidden columns can be removed, as can the Project and Company info.

The output file can easily be imported into programs like Visio or AutoCad.



EMAIL SUMMARY

Opens your Mail service and starts a new email with the summary file attached. Great for sending a PO to your distributor or maybe just kiss up to the boss because it looks like you worked really hard on this.

PRINT

This function opens a Print Preview, allowing you to alter the page fit before printing. Press the Print once ready. The Show/Hide function may be helpful to eliminate unused columns.

SHOW/HIDE COLUMNS

Each column on the SELECTIONS worksheet can be set to visible or hidden. Show what you want, hide the rest. A PO Format button will show only information necessary for a purchase order.

The Wrap Text option will allow the lengthy descriptions to run out onto additional rows. Otherwise the descriptions are only as long as you make the description column wide.

CLEAR FORM

This function clears all items in the SELECTIONS sheet. There is no undo function so a confirmation appears.

RENUMBER ITEMS

This function repairs non-consecutive line item numbering and schedule item numbering. Helpful when copying and pasting item rows manually from an outside source.

ITEM 1 TO ALL FORMATS

The first Item's format is automatically used when adding any new items. This option will apply the format from Item 1 to all other items.

This is useful for changing fonts, sizes, colors, borders, etc. Just change the first row and use this function.

Item	Checked
Show Company and Proj Name	<input type="checkbox"/>
Wrap Text	<input type="checkbox"/>
Show or Hide Columns	
Show Line Item No.	<input checked="" type="checkbox"/>
Show Sched Item No.	<input checked="" type="checkbox"/>
Show System / Function	<input checked="" type="checkbox"/>
Show Tag	<input checked="" type="checkbox"/>
Show Qty	<input checked="" type="checkbox"/>
Show Media Type	<input checked="" type="checkbox"/>
Show Flow	<input checked="" type="checkbox"/>
Show Delta Pressure	<input checked="" type="checkbox"/>
Show CV (calc)	<input checked="" type="checkbox"/>
Show Actuator Ctrl Type	<input type="checkbox"/>
Show Actuator NEMA rating	<input type="checkbox"/>
Show Actuator Fail Mode	<input type="checkbox"/>
Show Actual CV	<input type="checkbox"/>
Show Valve Body Size	<input type="checkbox"/>
Show Effective CV	<input type="checkbox"/>
Show Actual Valve Delta Press	<input type="checkbox"/>
Show Coil Delta Press	<input type="checkbox"/>
Show Reference	<input type="checkbox"/>
Show Model Number	<input checked="" type="checkbox"/>
Show Net Ea Price	<input checked="" type="checkbox"/>
Show Net Price	<input checked="" type="checkbox"/>
Show Model Description	<input checked="" type="checkbox"/>
Show Actuator Sply Volts	<input checked="" type="checkbox"/>
Show Body Type	<input type="checkbox"/>
Show Connection Type	<input type="checkbox"/>
Show Pipe Size	<input type="checkbox"/>
Show Flow Char	<input type="checkbox"/>
Show Close-Off	<input type="checkbox"/>

CHANGE PRICING

Choose US or Canadian currency. All prices say (US) or (CAN) to avoid confusion. Canadian currency does not appear in the individual product worksheets, but in all other places.

The multipliers are also set here. Please be sure to use accurate multipliers **before** building your project!

Do not change currency or multipliers with existing items in SELECTIONS or incorrect net\$ will result for those items. You must re-select products to insure correct net prices in the list!

~~ Thank you for choosing Honeywell products ~~

END OF OPERATION GUIDE

Please send any comments or improvement ideas about this tool to your local Honeywell Sales Rep. Thank you!
November 2011