

Millstream Software

Valve Sizing and Selection Program

Overview14.doc

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<http://www.millstream.com/>

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Introduction

This program is designed for control valve manufacturers who require a bespoke program to size and select their own range of valves and actuators.

Features include :

- Liquids, gases, cavitation, choking, noise, vapour pressure, velocity, density etc calculated.
- Calculations to European standards.
- Multiple process conditions.
- Fluids properties table for many common fluids.
- Simple calculation summary, but full details available if required.
- User selection of units for all dimensions.
- Stores history of quotations, valves, actuators, calculations, user preferences etc.
- Export an Enquiry to a file and email it to another user of the program to Import.
- Data export to Excel or other spreadsheets via CSV files.
- Excel macro allows user customised specification sheets.
- PDF report of specification sheets straight from the program.
- Built-in transactional fail-safe database prevents data loss.
- All parts and configurations can be controlled via a user-editable spreadsheet.
- Customised for your company with your products, logo etc.

The program works on all versions of Windows from Windows 98SE upwards including Vista and Windows 7. It is deliberately simple to install, backup, restore and uninstall. There are no registry settings, DLLs or complex database components to go wrong. There are no shared components which might cause conflicts with other installed programs. It can be distributed as a single file installer and does not require a hardware dongle, or awkward registration mechanism.

Enquiry Page

Enquiry*	Status	Created	Customer	Sales	Engineer	Total Value	Project Ref	Project Title
a-001-01	New	24/02/2006				0		
RPK-002-00	Open	28/07/2005	G	I	K	0	B	C

The pages are accessed using the tabs along the top : ENQUIRY, Heading, ITEM, Installation, Conditions etc. The tabs have been arranged so that normal access is from left to right.

The Enquiry page shows a list of the quotations/orders you have entered into the database.

The Enquiries can be sorted by clicking a column heading. The asterisk indicates the current sort order.

Users can exchange Enquiries by email without retyping. The button 'Copy to File' puts an Enquiry into a file. The file can be emailed to another user of the program who can click 'Paste from File' to put it into their database.

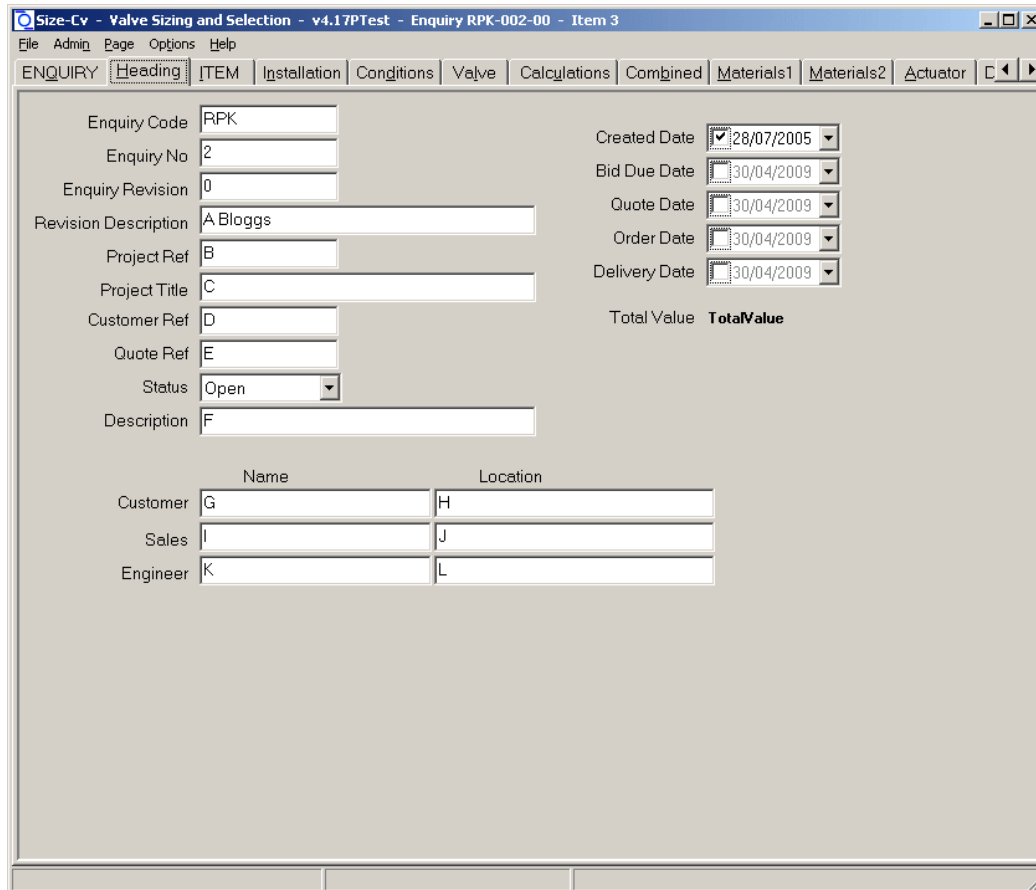
The 'Sheets to Excel' button creates an Excel spreadsheet containing Specification Sheets for all the Items on the chosen Enquiry. You can easily customise the look of your Specification Sheets.

The 'PDF Report' button outputs the specification sheets into a PDF format file and opens the file to view on-screen in Adobe Acrobat.

Select an Enquiry then continue to the next page to view its details.

Heading Page

The Heading page shows information about the currently selected Enquiry.



Enquiry Code	RPK	Created Date	28/07/2005
Enquiry No	2	Bid Due Date	30/04/2009
Enquiry Revision	0	Quote Date	30/04/2009
Revision Description	A Bloggs	Order Date	30/04/2009
Project Ref	B	Delivery Date	30/04/2009
Project Title	C	Total Value	TotalValue
Customer Ref	D		
Quote Ref	E		
Status	Open		
Description	F		

	Name	Location
Customer	G	H
Sales	I	J
Engineer	K	L

This page can be used to record various reference details about the Enquiry.

All the information you type into the program is automatically stored in the database. This ensures nothing is lost if there is a power failure. You just copy a single directory to save the whole database ready for an easy restore if there is a hard-disk failure.

Item Page

Work Order	Item No*	Quantity	Product Code	Body Size	Body Material	Customer Tag
D	3	1	150	8 ins	A126ClassB	
	10	1	300	2 ins	A126ClassB	

This lists all the Items on the currently selected Enquiry. After selecting an Item the pages to the right - Installation, Conditions, Valve, Actuator etc - display details about the Item.

Sort the Item list by clicking a column heading.

Installation Page

The screenshot shows the 'Installation' page of the 'Size-Cv - Valve Sizing and Selection' software. The window title is 'Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3'. The 'Installation' tab is active, showing the following fields:

- Commercial:**
 - Item No: 3
 - Alternative: [empty]
 - Service Application: Boiler Blowdown
 - Item Revision: 1
 - Hazard Area Class: [empty]
 - Sales Ref: 1234
 - Customer Tag: [empty]
- Pipe Inlet:**
 - Size: 100 mm
 - Material: Carbon Steel
 - Schedule: 40
- Pipe Outlet:**
 - Same as Inlet
 - Size: 100 mm
 - Material: Carbon Steel
 - Schedule: 40
- Insulation:**
 - Pipe: None
 - Valve: None
- Ambient:**
 - Minimum Temperature: -10 C
 - Maximum Temperature: 38 C
 - Atmospheric Pressure: 0 bar(g)

On the Installation page you enter the pipe and insulation details.

The program contains tables of pipe and insulation thicknesses. These are used in the calculation of noise attenuation and of expansion/reduction effects in the pipework.

Conditions Page

Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3

File Admin Page Options Help

ENQUIRY | Heading | ITEM | Installation | **Conditions** | Valve | Calculations | Combined | Materials1 | Materials2 | Actuator

Fluid: Acetylene

Customise this Fluid

Fluid Name: TestFluid

Molecular Mass: 27 kg/kmol

Specific Gravity Liquid: 0.8 Critical Pressure: bar(g)

Warning Levels

Noise (dBA): 85

Maximum Velocity

	Outlet	Pipe	
Gas	150	70	m/s
Liquid	10	7	m/s

Process Units

Temp: C

Pressure: bar(g)

Capacity: Cv

Flow Rate

Mass: kg/h

Volume Gas: Sm³/h

Liquid: m³/h

Design

Temp Minimum: C

Temp Maximum: C

Pressure: bar(g)

Saturated Steam

	Min	Norm	Max	Other
Inlet Temperature C	184.08	22		
Inlet Pressure bar(g)	10	11		
Vapour Pressure bar(g)	210	42.9		
Inlet Fluid State	Gas	Gas		
Outlet Pressure bar(g)	6	9		
Pressure Drop bar	4	2		
Flow Rate Mass kg/h	2000	90		
Volume Gas Sm ³ /h	6641	68.83		
Volume Liquid m ³ /h				
Custom Specific Heat Ratio	2			
Custom Vapour Pressure bar(g)	20			
Custom Kinematic Viscosity m ² /s	3			
Custom Compressibility	4			

On the Conditions page the Fluid is chosen from a table of fluids, warning levels and units are set and the process conditions entered. All units in the program are fully user selectable. Pressures can be entered as Inlet Pressure and Pressure Drop, or as Inlet Pressure and Outlet Pressure. The fluid flow rates can be entered as either Mass or Volume per unit time and the program will automatically convert them to display the figures in both Mass and Volume. The Inlet Vapour Pressure is calculated by the program and from this the Inlet Fluid State of Liquid or Gas.

A fluid can be 'customised' with a precise Vapour Pressure, Specific Heat Ratio, Viscosity or Compressibility to exactly match a customer's fluid. This is done by selecting the most similar built-in fluid in the Fluid menu then overriding these individual numbers as required per process condition. The calculations will use the precise numbers you have supplied and fall back to the built-in fluid where you have not given a number.

Valve Page

Selected	Recommended	Calculations Summary
Body Model: R-Series	Outlet Pipe Size: 80 mm	Capacity Required: 125
Design Standard: ANSI	Valve Outlet Size: 90 mm	Rated Capacity: 1580 Cv
Body Material: ASTM A 216 WCB	Trim Reduction: 90 mm	Lift Required: 17%
Size: 8 ins		Turndown Process: 200 :1
Rating: 150		Valve Outlet Velocity: 10 m/s
Valve End Type: Double Flanged		Pipe Velocity: 39 m/s
Body Type: SP2P		Noise: 102 dBA
Trim Type: Double-Offset		Warning: Noise ?
Stages: N/A		
Characteristic: Modified Equal Percent		
Trim Reduction: Full		
Trim Size: N/A		
Balancing: N/A		
Seating Type: Metal		
Flow Direction: Preferred		

Warnings

Notes

C-Series Cages			
	Characteristic	Size	Capacity
Cage			N/A
Seat			N/A
Plug			N/A
Outer Cage			N/A

On the left of the Valve page you choose the valve range, material, size etc and a summary of the calculation results for the process conditions are shown on the right. The summary shows the worst velocity, noise or cavitation that will be experienced across all the process conditions. The full details of the calculations can be seen on the next page if necessary. The problems light up in red according to the warning levels set on the Conditions page.

In the middle of this page is a calculation showing the theoretical physical minimum size for the pipe, valve and trim - based on perfect round holes - which could accommodate the required flow. The real valve and pipe sizes you select cannot be smaller than this and will normally be larger.

The menus on the left for choosing the valve are all 'configuration based' with the menus lower down only showing options available within the selections chosen above. For example if Cast Iron is selected as the Body Material and you do not supply Cast Iron valves larger than 4 ins the Size menu will not display these sizes, or alternatively a custom message can be displayed when a larger size is selected. The menus go grey when there is no choice. These menus are controlled by a big spreadsheet of valve sizes, materials, Cvs etc. The spreadsheet can be fully customised to a manufacturer's product range and extended to accommodate new valve ranges when required.

Calculations Page

	Min	Norm	Max	Other
Inlet Temperature	184.08	22		
Inlet Pressure	10	11		
Vapour Pressure	210	42.9		
Inlet Fluid State	Gas	Gas		
Outlet Pressure	6	9		
Pressure Drop	4	2		
Flow Rate - Mass	2000	90		
Volume Gas	6641	68.83		
Volume Liquid				
Custom Specific Heat Ratio	2			
Custom Vapour Pressure	20			
Custom Kinematic Viscosity	3			
Custom Compressibility	4			
Reynolds Number				
Press Vena Contracta	4.46	8.3		
Specific Gravity	0.906	0.906		
Capacity Required	125	0.624		
Percent Lift	17	0.0371		
Choked Drop	5.6	4.89		
Choking				
Noise	102	52.8		
Outlet Velocity	10.2	0.058		
Pipe Velocity	39.2	0.222		
Outlet Mach	0.0114	0.00017		
Pipe Mach	0.0435	0.000649		
Sigma				
SigmaMR				
Warning	Noise	Low Lift		
Power Ratio				

The Calculations page shows detailed calculations for each process condition. The program currently allows up to four process conditions. The units are user-selectable. The calculations are performed according to the EN standards and a 'Calculations Trace' showing great detail of all the individual steps taken during a calculation can be obtained from the program if needed.

Combined Page

Size Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3

ENQUIRY | Leading | ITEM | Installation | Conditions | Valve | Calculations | Combined | Materials1 | Materials2 | Actuator | Details | Other | Certificates | Selection

Commercial

Item No. 3 Alternative Service Application Boiler Blowdown Fluid Acetylene View
 Item Rev. 1 Hazard Area Class Customise this Fluid
 Sales Plat. 1234 Customer Tag Fluid Name Test Fluid
 Molecular Mass 27 kg/kmol
 Specific Gravity Liquid 0.8 Critical Press. bar(g)

Warning Levels
 Noise (dBA) 85
 Maximum Velocity
 Outlet 70 m/s
 Pipe 70 m/s
 Liquid 10 7 m/s

Pipe Inlet Pipe Outlet
 Same as Inlet
 Size 100 mm mm
 Material Carbon Steel Carbon Steel
 Schedule 40 40

Process Units
 Temperature C
 Pressure bar(g)
 Capacity Cv

Flow Rate
 Mass kg/h
 Volume Gas Sm³/h
 Liquid m³/h

Design
 Temp Minimum C
 Maximum C
 Pressure bar(g)

Insulation
 Pipe None
 Valve None

Ambient
 Minimum Temperature -10 C
 Maximum Temperature 38 C
 Atmospheric Pressure 0 bar(g)

Selected
 Body Model R-Series
 Design Standard ANSI
 Body Material ASTM A 216 WCB
 Size 8 ins
 Rating 150
 Valve End Type Double Flanged
 Body Type SP2P
 Trim Type Double-Offset
 Stages N/A
 Characteristic Modified Equal Percent
 Trim Reduction Full
 Trim Size N/A
 Balancing N/A
 Seating Type Metal
 Flow Direction Preferred

Recommended
 Outlet Pipe Size 80 mm
 Valve Outlet Size 90 mm
 Trim Reduction 90 mm

Calculations Summary

	Maximum	Minimum
Capacity Required	125	0.62
Rated Capacity	1580	Cv
Lift Required	17%	0.037%
Turndown Process	200	:1
Valve Outlet Vel	10	m/s
Pipe Velocity	39	m/s
Noise	102	dBA
Warning	Noise	?
Caution	Severity	None
	Sigma	0
	SigmaMR	0
	Power Ratio	0

Selected Steam
 Inlet Temperature C 164.00
 Inlet Pressure bar(g) 22
 Vapour Pressure bar(g) 10
 Inlet Fluid State Gas
 Outlet Pressure bar(g) 210
 Pressure Drop bar 42.9
 Flow Rate Mass kg/h 6841
 Volume Gas Sm³/h 68.83
 Volume Liquid m³/h
 Custom Specific Heat Ratio 2
 Custom Vapour Pressure bar(g) 20
 Custom Kinematic Viscosity m²/s 3
 Custom Compressibility 4
 Reynolds Number 4.46
 Press Vena Contracta bar(g) 0.3
 Specific Gravity 0.906
 Capacity Required Cv 0.906
 Percent Lift 125
 Choked Drop bar 17
 Choking 0.0371
 Noise dBA 5.6
 Outlet Velocity m/s 4.89
 Pipe Velocity m/s 102
 Outlet Mach 0.058
 Pipe Mach 0.222
 Pipe Mach 0.0114
 Sigma 0.00017
 SigmaMR 0.0435
 Warning 0.000649
 Power Ratio

	Min	Nom	Max	Other
Inlet Temperature	164.00	22		
Inlet Pressure	10	11		
Vapour Pressure	210	42.9		
Inlet Fluid State	Gas	Gas		
Outlet Pressure	6	9		
Pressure Drop	4	2		
Flow Rate Mass	2800	18		
Volume Gas	6841	68.83		
Volume Liquid				
Custom Specific Heat Ratio	2			
Custom Vapour Pressure	20			
Custom Kinematic Viscosity	3			
Custom Compressibility	4			
Reynolds Number	4.46	0.3		
Press Vena Contracta	0.906	0.906		
Specific Gravity	125	0.624		
Capacity Required	17	0.0371		
Choked Drop	5.6	4.89		
Choking				
Noise	102	52.6		
Outlet Velocity	10.2	0.058		
Pipe Velocity	39.2	0.222		
Outlet Mach	0.0114	0.00017		
Pipe Mach	0.0435	0.000649		
Sigma				
SigmaMR				
Warning	Noise	Low Lift		
Power Ratio				

Notes

The Combined page is for users with large screens who want to see all four previous pages at the same time. It is effectively the Installation page + Conditions page + Valve page + Calculations page all displayed at the same time.

Materials 1 Page

Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3

File Admin Page Options Help

ENQUIRY | Heading | ITEM | Installation | Conditions | Valve | Calculations | Combined | **Materials1** | Materials2 | Actuator

Bonnet Style

Fastener Type

Gland Packing

Pressure Containing Parts

Body

Bonnet

Fasteners

Bonnet Nuts

Seals and Gaskets

Bonnet Gasket

Seat Gasket

Balance Seal

Maximum Safe Pressure

At Process Temperature bar(g)

At Design Temperature bar(g)

Valve Trim

Plug / Disc

Seat

Cage(s)

Plug / Disc Facing

Seat Hard Facing

Connections

Connection Finish

Face To Face Dims

Body Lining Material

Consult for pressure-temperature suitability for BodyMaterial "A216WCB" at rating "150". Material not in table.

Consult for pressure-temperature suitability for BodyMaterial "A216WCB" at rating "150". Material not in table.

The Materials1 page is 'configuration based' and controlled by the same spreadsheet as the menus on the Valve page. This allows detailed materials to be automatically chosen based on top-level choices, or alternatively opens the choice of individual component materials if required. The grey menus in this screen-shot have been chosen for the user based on the top-level choices such as Body Material.

The materials are checked against pressure-temperature curves and any problems are highlighted in red.

Materials 2 Page

The screenshot shows a software window titled "Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3". The window has a menu bar with "File", "Admin", "Page", "Options", and "Help". Below the menu bar is a tabbed interface with the following tabs: "ENQUIRY", "Heading", "ITEM", "Installation", "Conditions", "Valve", "Calculations", "Combined", "Materials1", "Materials2", and "Actuator". The "Materials2" tab is currently selected.

The main content area is divided into several sections, each containing dropdown menus for material selection:

- Stem Shaft**: dropdown menu
- Shaft Pins**: dropdown menu
- Seat Gkt Retainer**: dropdown menu
- Bearings**: dropdown menu
- Thrust Rings**: dropdown menu
- Internal Bolting**: dropdown menu
- Mounting Plate**: dropdown menu
- Mounting Plate Paint**: section containing:
 - Paint**: dropdown menu
 - Top Colour**: dropdown menu
 - Colour Code**: dropdown menu
- End Cover**: section containing:
 - End Cover**: dropdown menu
 - Fastener**: dropdown menu
 - Gasket**: dropdown menu
- Body Paint**: section containing:
 - Paint**: dropdown menu
 - Top Colour**: dropdown menu
 - Colour Code**: dropdown menu
- Gland**: section containing:
 - Follower**: dropdown menu
 - Seal**: dropdown menu
 - Bolting**: dropdown menu

At the bottom of the window, there are two large, empty rectangular areas with vertical scrollbars, likely intended for displaying a list of materials or a detailed configuration summary.

The Materials2 page is also 'configuration based' and provides extra menus of component materials.

Actuator Page

The screenshot shows a software window titled "Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3". The "Actuator" tab is selected. The form contains the following fields and values:

Shut-off Class	IV	Maximum Inlet Pressure	11 bar(g)	<input type="radio"/> Max Inlet Pressure
Power	Pneumatic	Maximum Process Drop	4 bar	<input type="radio"/> Max Process Drop
Actuator Series	EL5600	Actuator Sizing Pressure	bar(g)	<input checked="" type="radio"/> User Entered
Power Fail Action	NO FAIL MODE	Safety Factor	%	
Actuator Size	EL5600	Maximum Advised Pressure	bar(g)	
Spring Range	N/A	Actuator Thrust Used	%	
Voltage	N/A	Thrust Required	N	
Hand Wheel	Yes	Thrust Available	N	
Volume Tank	No			
Operation	Modulating Control			
System Air Supply	6 bar(g)			
Maximum Air Supply	bar(g)			
Actuator Stroke	mm			
Valve Stroke	mm			
Actuator Area	mm ²			
Actuator Model				
Actuator Part No				

A red error message is displayed in a scrollable area on the right side of the form:

Actuator model not found. The actuator menu selections have not produced an actuator model which fits the valve. Try a different actuator Size or Series.

The Actuator page calculates and compares the valve forces from fluid pressures, stem and seal friction and pinch against the thrusts that can be produced by the chosen actuator and highlights any problems in red.

Full details and a 'Calculations Trace' can be obtained on the next page if required.

Actuator Details Page

Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3

File Admin Page Options Help

Conditions Valve Calculations Combined Materials1 Materials2 Actuator Details Other Certificates Selection

Seat Diameter	<input type="text"/>	mm
Stem Diameter	<input type="text"/>	mm
Seal Diameter	<input type="text"/>	mm
Motion	Linear	
Signal Fail Action	STANDARD	
Orientation	Standard	
Angle Range	<input type="text"/>	
Body Material	<input type="text"/>	
Cylinder Material	<input type="text"/>	
Fire Protection	<input type="text"/>	
Actuator Paint		
Paint	Standard	
Top Colour	<input type="text"/>	
Colour Code	<input type="text"/>	

Actuator Trying To Close Valve

	Force Needed	Actuator Thrust	Power Fail Thrust	
Open	<input type="text"/>	<input type="text"/>	<input type="text"/>	N
Closed	<input type="text"/>	<input type="text"/>	<input type="text"/>	N
Closed and Seat	<input type="text"/>	N		
Shut-off Test	<input type="text"/>	N		
Friction Included	<input type="text"/>	N		

(Positive forces oppose closing. Positive thrusts assist closing.)

Actuator Trying To Open Valve

	Force Needed	Actuator Thrust	Power Fail Thrust	
Open	<input type="text"/>	<input type="text"/>	<input type="text"/>	N
Closed	<input type="text"/>	<input type="text"/>	<input type="text"/>	N
Closed and Seat	<input type="text"/>	N		
Shut-off Test	<input type="text"/>	N		

(Positive forces oppose opening. Positive thrusts assist opening.)

This shows the underlying actuator calculations for engineering and audit purposes. More details are available in the 'Calculations Trace' if required.

Other Page

The screenshot displays the 'Other' page of the 'Size-Cv - Valve Sizing and Selection' software. The window title is 'Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3'. The interface includes a menu bar (File, Admin, Page, Options, Help) and a tabbed navigation system with tabs for Conditions, Valve, Calculations, Combined, Materials1, Materials2, Actuator, Details, Other (selected), Certificates, and Selection.

The 'Other' page is divided into several sections:

- Positioner:** Includes dropdown menus for Group, Manufacturer, Model (EP5 [Other]), Protocol, Control Signal (None [Other]), Signal Range (None [Other]), Action (Single [Other]), Enclosure, Case Material, and Rating.
- Switch:** Features radio buttons for Limit (selected) and Proximity. It includes dropdowns for Type, Position, Manufacturer, Model (None [Other]), To Indicate (None [Other]), Hazard. Area, Rating (None [Other]), Voltage (None [Other]), and Power. A checkbox for 'Switch Box' is also present.
- Solenoid Valve:** Contains dropdowns for Model (D363CVP [Other]), Operate (None [Other]), Hazard. Area, Connections, Body Material, Rating (None [Other]), Voltage (None [Other]), Power, Type (None [Other]), Action, and Manual Op.
- Instrument Air Connections:** Includes dropdowns for Tube (COPPER [Other]), Fittings (None [Other]), Gauges, Gauge Units (bar [Other]), and Gauge Material (None [Other]).
- Other Accessories:** Features dropdowns for Filter Reg. (MPC2 [Other]), F.R. Gauge, Position Trans., Booster (None [Other]), Quick Exhaust (None [Other]), Lockup Valves (None [Other]), Speed Restrict., Relief Valve, Partial Str. Sys., and Closed Loop Br.

At the bottom of the page, there is an 'Other' text input field and two large empty rectangular areas with scrollbars.

The Other Page provides menus of positioners, switches and accessories.

Certificates Page

The screenshot shows the 'Certificates' page in the 'Size-Cv - Valve Sizing and Selection' software. The window title is 'Size-Cv - Valve Sizing and Selection - v4.17PTest - Enquiry RPK-002-00 - Item 3'. The menu bar includes 'File', 'Admin', 'Page', 'Options', and 'Help'. The main window has a tabbed interface with the following tabs: 'Conditions', 'Valve', 'Calculations', 'Combined', 'Materials1', 'Materials2', 'Actuator', 'Details', 'Other', 'Certificates', and 'Selection'. The 'Certificates' tab is active.

The 'Certificates' page is organized into several sections:

- Material Certification:** Includes dropdown menus for 'Body Bonnet' (3.1 [Other]), 'Bonnet Bolting' (3.1 [Other]), 'Trim' (3.1 [Other]), 'Body Disc Shaft', 'End Cover', 'End Cover Bolts', and 'Other Wetted Parts'.
- Design and Testing:** Includes dropdown menus for 'Design Codes', 'Testing Codes', 'PED Certification', 'NACE' (F [Other]), 'Disc Strength Test', 'Cryogenic Test', 'Seat Leak Test' (F [Other]), 'Hydrostatic Test' (F [Other]), 'HP Gas Test', 'LP Seat Leak Test', and 'Emissions Test'. It also features checkboxes for 'Control Loop Hysteresis', 'Control Loop Dead Band', 'Paint Thickness Test', 'Flow Test', 'Seismic Test', 'ATEX', 'Functional Test', and 'Positioner Calibration'.
- Drawings:** Includes checkboxes for 'Drawing Outline', 'Drawing GA', and 'Drawing Hook Up'.
- Supplementary Material Testing:** Includes dropdown menus for 'Radiography', 'Dye Penetrant', 'Magnetic Particle', 'Ultrasonic Test', 'Charpy Impacts', 'Pickling', 'Microstructure', 'G48 Corrosion', 'Ferrite Content', '100% Visual', 'Huey Test', 'Pentathylene Test', 'Carbon Content', and 'Feroxyl Test'.

At the bottom of the page, there is an 'Other' text input field with a scrollable area below it.

Certification and testing requirements are recorded on the Certificates page. These menus are also 'configuration based' and can be loaded with whatever text you require.

Selection Page

Size-Cv - Valve Sizing and Selection - v4.27PTest - Enquiry a-001-01 - Item 2

File Admin Page Options Help

Valve Calculations Combined Materials1 Materials2 Actuator Details Other Certificates Selection Prices

Valve Product Code PN 25

Actuator Model PL1M

Valve Part No

Actuator Part No Unknown

Serial No 1234

Work Order

Positioner Model P10

Filter Regulator FR10

Availability [Other]

Notes

Note Text

Special delivery instructions ...

Extra information ...

Insert Delete Move Up Move Down

The Selection page displays the valve and actuator product codes and part numbers. It can also hold as many lines of notes as you want.

Prices Page

Size-Cv - Valve Sizing and Selection - v4.27PTest - Enquiry a-001-01 - Item 2

File Admin Page Options Help

Valve Calculations Combined Materials1 Materials2 Actuator Details Other Certificates Selection Prices

Prices		Revisions		
Description	Price	Revision*	Date	Description
Materials	550.00	1	02/02/2009	Original.
Actuator	900.00	2	26/07/2009	Paint details added.

Insert Delete Move Up Move Down

Quantity

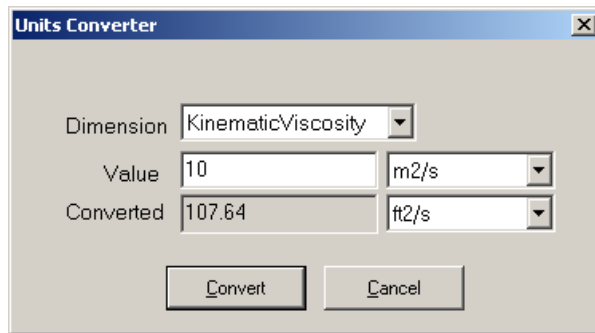
Unit Price

Total Price

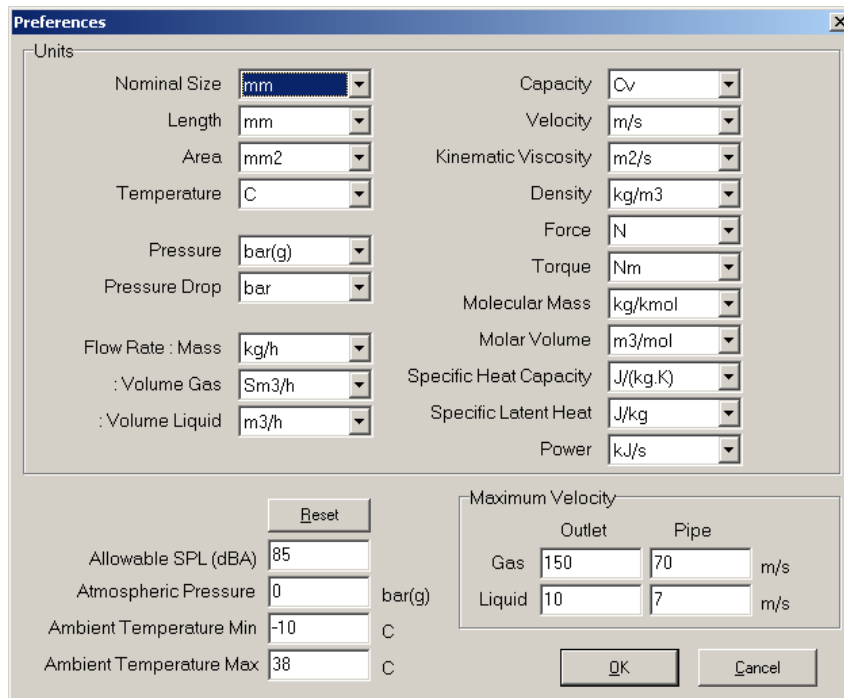
Insert Delete

You can type prices and details of revisions into this page as required.

Miscellaneous Features



A units converter is included for ad hoc calculations of all dimensions and units available in the program.



The Preferences Page sets the defaults for all the units and warning levels. These are automatically copied onto a new Item when it is created and can then be changed individually on the Item if required.

View Fluid ✕

Media Name

Media Type

Specific Heat Ratio STP

Molecular Mass

Specific Gravity Liquid

Specific Gravity Gas STP

Density Gas STP

Density Liquid

Critical Temperature

Critical Pressure

Triple Temperature

Triple Pressure

Kinematic Viscosity Gas STP

Kinematic Viscosity Liquid STP

Specific Heat Capacity Cp STP

Specific Heat Capacity Cv STP

Degrees Of Freedom

Molar Critical Volume

Specific Latent Heat Vapour

Antoines

Units

Antoine A

Antoine B

Antoine C

Beattie-Bridgeman Coefficients

A0

A

B0

B

C

Specific Heat Coefficients

A0

B

C

D

The fluid factors from the built-in table of fluids can be seen by clicking the 'View' button on the Conditions page. Various common fluids are already available, but any number of extra fluids can be put in the table when the database is initially loaded.

It is also possible to 'customise' one of the built-in fluids. This lets the user create a new fluid similar to an existing one without having to obtain all the complex fluid factors, just by supplying the name of the new fluid and one or two known factors which the program can then overlay onto an existing similar fluid.

Spec Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2							C SERIES CONTROL VALVE DATA SHEET					Sheet No	1	of	1	
3																
4	Enquiry Reference		RPK-02			Rev 0										
5	Date	28/07/2005	Item No.	3		Quantity	1									
6	Customer Reference										Sales Name					
7	Sales Reference										Sale Location					
8	Project Title										Customer Name					
9	Project Reference										Customer Location					
10	Description										Engineer					
11											Engineer Location					
12	Product Model Number										Product Unit Contact					
13																
14	Process Data Relevant to Control Valve Selection										ACTUATOR					
15	1	Service Application									63	Model				0
16	2	Hazard area class									64	Type	Pneumatic			
17	3	Min Instrument air supply				6	bar(g)				65	Operation	Air to Open			
18	4	Ambient Air temp				-10	C min	38	C max		66	Travel	0	mm		
19	5	Site Allowable SPL				85	dB(A)	@	1m		67	Fail safe	Power fail close			
20	6	Valve Design Press				19.6	bar(g)	@	38	C	68	Spring range	1.0-2.0	bar		
21	7	Max Safe Working Press				0	bar(g)	@	0	C	69	Hand wheel	No			
22	8	Pipe material				Carbon	Steel				70	Volume tank	No			
23	9	Pipe size Inlet Dia				100	mm	Sch	40		POSITIONER					
24	10	Pipe size Outlet Dia				100	mm	Sch	40		71	Model	None			
25	11	Pipe connection				Flange	Raised Face				72	Control Signal	None			
26	12	Pipe Insulation				None					73	Signal Range	None			
27	13	Valve Insulation				None					74	Action	None			
28	Process Data										Limit Switches					
29	14	Process Fluid				Steam					75	Model	None			
30	15	Upstream phase									76	To Indicate	None			
31	16	Process Conditions				Minimum	Normal	Maximum	Units		77	Voltage	None			
32	17	Flow Rate							kg/h		78	Rating	None			
33	18	Inlet press P1							bar(g)		Proximity Switches					
34	19	Outlet press P2							bar(g)		79	Model	None			
35	20	Inlet temp T1							C		80	To Indicate	None			
36	21	Max Shut off Differential							bar		81	Voltage	None			
37	22	Flowing Differential							bar		82	Rating	None			
38	23	Fluid SG							Ratio		Solenoid Valve					
39	24	Mass Flow Rate							kg/h		83	Model	None			
40	25	Vapour press Pv							bar(g)		84	Operate	None			
41	26	Critical press Pc							bar		85	Rating	None			
42	27	Viscosity							m2/s		86	Voltage	None			
43	28	Specific Heat Ratio							Ratio		87	Type	None			
44	29	Compressibility Z1							Factor		Instrument Air Connections					
45	Calculated Values										Instrument Air Connections					
46	30					Minimum	Normal	Maximum	Units		88	Tube	None			
47	31	Required Capacity							Cv		89	Fittings	None			
48	32	Percent Open							%		90	Gauges	bar			
49	33	Noise dBA							dB(A)@1m		91	Gauge Material	None			
50	34	Sigma									Other Accessories					
											92	Filter Reg	None			

The Spec spreadsheet and embedded macro can produce Specification sheets in Excel for printing or emailing to customers. All the information about an Enquiry is output by the program into a text file which the Excel macro reformats with one or more 'layout' worksheets. These worksheets are easily customised to produce different layouts for different purposes e.g. Specification, Sizing, Assembly and Test etc.

Bill Spreadsheet

A set of inter-linked tables in the Bill spreadsheet provide the raw data for the configuration based menus and parts. This information is entered in a simple tabular format. The tables are fully customisable to any level and complexity required. Macros are provided to get the information into the database and if required to produce a spreadsheet which can calculate the same configurations in Excel.