SizeMaster™ Mark IV Pressure Relief Valve Engineering Software

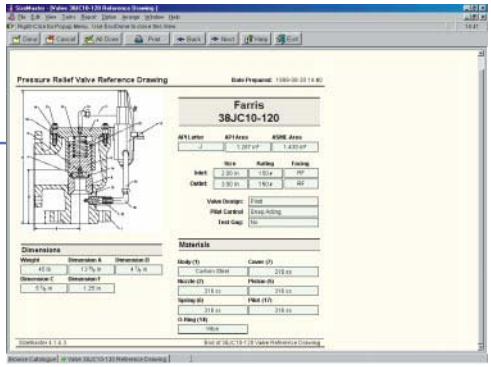
Now you can accurately size and select a pressure relief valve for any combination of process applications with SizeMaster™ Mark IV pressure relief valve engineering software. This program for Windows® 95 and Windows® NT 4.0 brings unprecedented integration of standard engineering practice to the task of sizing and selecting pressure relief valves.

With this software, you can define as few as one or as many as 64 different sizing scenarios including blocked flow, fire, thermal and tube rupture, from a scenario matrix grid. Selection of the valve is automatically based on worst case scenario. Various Wizards make the most complicated task simple.

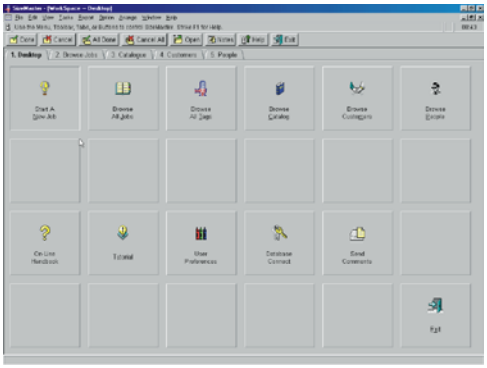
SizeMaster Features:

- Standard Windows user interface functions
- Support of network database access
- Database administration tools
- Interactive product catalog
- Internal client/project database
- Complete revision control with definable database access
- English/Metric units definable by job level
- Import/export capabilities
- All reports in html format
- Online help including a variety of tutorials

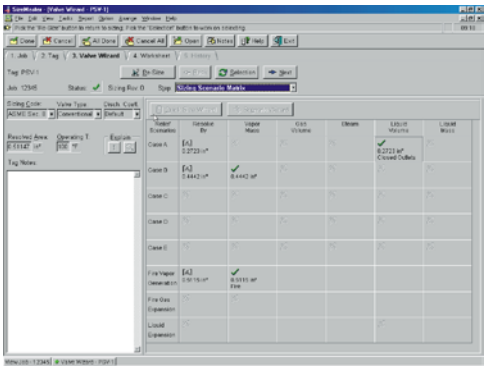
SizeMaster Mark IV pressure relief valve engineering software is available online through Farris Engineering web site at www.cwfc.com



Interactive catalog



SizeMaster workspace



Sizing scenario matrix

Farris Engineering

Division of Curtiss-Wright Flow Control Corporation

10195 Brecksville Road, Brecksville, OH 44141 USA • Telephone: 440/838-7690 • Fax: 440/838-7699 • www.cwfc.com

Facilities: Brecksville, OH USA, E. Farmingdale NY USA, Brantford Ontario Canada, Edmonton Alberta Canada

Offices: worldwide. For a listing of our global sales network, visit out website at www.cwcf.com.

Pressure Relief Valve Scenario Calculations

Date Prepared: 2009-07-27 14:22

General Job Data

Customer	Requisition #	Job #	Job Description
	RFQ003941 / MVCP00025	10090302	2 valves

Prepared By	Checked By	Approved By	Job Status	Revision #
			Sizing/Selecting	0

PSV Identification

Tag #	Tag Description	Tag Status	P / ID	Discharge To	Revision #
PSV-101 / PSV-201	Ventilateurs 1 et 2	Valve Selected			0

Plant #	Drawing #	Index #	Issue For	Service	Inlet Line #	Outlet Line #

Sizing Basis

ASME Code	Sizing Basis	Fluid State	Rupture Disk Coeff.	NACE
Non-code	Fire Gas Expansion	Vapor (Mass)	No Rupture Disk, 1	No

Process Parameters

MAWP	0,49 Bar G	Max. Design T.	32 °C	Min. Design T.	-15 °C
Operating Pressure	0 Bar G	Operating Temp.	15 °C	Constant Back P.	0 Bar G
Set Pressure	0,49 Bar G	Relief Temp.	193,55 °C	Variable Back P.	0 Bar G
Operating to Set %	0 %	Percent Over P.	28,142 %	Over Pressure	0,1379 Bar G
Atmospheric P.	1,0133 Bar Abs	Relief Pressure	1,6412 Bar Abs	Cold Diff. Test P.	0,49 Bar G

Sizing Scenarios

Scenario	Resolve By	Fluid State	Cause of Over P.	Relief Load Capacity	Set P.	Relief T.	Required Area
Fire Gas Expansion	Max	Vapor	Fire	-	0,49 Bar G	193,55 °C	1172,7 mm²

Scenario: Fire Gas Expansion / Vapor Mass -- Fire

Operating Temperature	$T_{operating}$	15 °C
Operating Pressure	$P_{operating}$	0 Bar G
Atmospheric Pressure	P_{atm}	1,0133 Bar Abs
Relief Pressure	P_{relief}	1,6412 Bar Abs
Relief Temperature	T_{relief}	193,55 °C
Max. Wall Temperature	T_{wall}	Carbon Steel Plate, 593,33 °C
Gas Flow Constant	C	315
Discharge Coeff. (0.9 x K_d)	K^{Gas}	0,8577
Environmental Factor	F_{env}	Bare Vessel, 1
Exposed Surface Area	$A_{exposed}$	359,15 ft²
Rupture Disk Coefficient	K_{CCF}	1
Vapor Flow Factor	K_b	0,98303
Vapor Flow Factor	K_v	-

$$T_{relief} = T_{operating} \times \frac{P_{relief}}{P_{operating} + P_{atm}}$$

$$F'_{calc} = \frac{0.1406}{C K^{Gas}} \frac{\left(T_{wall} - T_{relief}\right)^{1.25}}{T_{relief}^{0.6506}}$$

$$F' = \lceil 0.01,\ F'_{calc} \rceil$$

$$A_{conven} = F' \times \frac{F_{env} A_{exposed}}{K_{CCF} K_b \sqrt{P_{relief}}}$$

$$A_{bellow} = F' \times \frac{F_{env} A_{exposed}}{K_{CCF} K_v \sqrt{P_{relief}}}$$

$$A_{pilot} = F' \times \frac{F_{env} A_{exposed}}{K_{CCF} K_b \sqrt{P_{relief}}}$$

Fire Gas Factor	F'	0,024275
Fluid Type (User Defined)		Air + Hydrocarbons
Ratio of Specific Heats	k	1
Discharge Coefficient	K_d	0,953
ASME Area (Actual)		1172,7 mm²