

# NORDCALC™ User Guide

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## NORDCALC™ Introduction

The NORDCALC™ range includes valves, sealants and accessories to fit any need in any application. With the largest lubricated plug valve manufacturing facility in the world, Flowserve is supplying valves and accessories to customers around the world.

The login screen of the NORDCALC™ application is given below:

<b>Login</b>	<a href="#">Terms &amp; Conditions</a>
User Name: <input type="text"/>	<b>Only authorized users allowed</b>
Password : <input type="text"/>	THIS IS A PRIVATE COMPUTER SYSTEM for use authorized by Flowserve Corporation. Users have no explicit or implicit expectation of privacy and users both consent and agree that any use of this system and all data on this system may be intercepted, monitored, authorized, recorded, copied, audited, inspected, and disclosed by Flowserve or its authorized representatives to any law enforcement agency, as well as officials of other agencies, both domestic and foreign.
<input type="checkbox"/> I agree to the Terms & Conditions	By using this system, the user consents to such interception, monitoring, recording, copying, auditing, inspection, and disclosure at the sole discretion of Flowserve Corporation.
<input type="button" value="Login"/>	Unauthorized or improper use of this system may result in disciplinary action up to and including termination, as well as civil and criminal penalties where appropriate.
<a href="#">Register New User</a>   <a href="#">Forgot Password</a>   <a href="#">Contact Us</a>	By continuing to use this system you indicate your awareness of and consent to these terms and conditions of use, as well as the guidelines contained in the Flowserve Code of Business Conduct. LOG OFF IMMEDIATELY if you are not authorized by Flowserve to use this system or do not agree to the conditions stated herein.

## Registration

New users can register by clicking on the **Register New User** link available below the **Login** button.

Register by entering following details

- **User Full Name**
- **Company Name**
- **Designation**
- **Address**
- **Phone**
- **User Email**
- **Login Name**
- **Purpose of Requirement**

Here is an example for registration process.

### Register

User Full Name	:	<input type="text" value="Surinder Raina"/>
Company Name	:	<input type="text" value="Flowserve"/>
Designation	:	<input type="text" value="Sr. Project Engineer"/>
Address	:	<input type="text" value="Flowserve India Controls Pvt Ltd. Plot#4, 1A, Road#8, EPIP, Whitefield, Bangalore - India"/>
Phone Number	:	<input type="text" value="+91 (80) 40146367"/>
User Email	:	<input type="text" value="SRaina@flowserve.com"/>
Login Name	:	<input type="text" value="SRaina"/>
Purpose of Requirement	:	<input type="text" value="To test the application"/>

[Home](#) | [Forgot Password](#) | [Contact Us](#) |

After entering the registration details, click the **Register** button; a message informing you about the setting of default password is displayed. Also, you are prompted to change the password.

You can login by entering registered username and above password generated by System. Also, make sure that you select the **I agree to the Terms & Conditions** check box before you click the **Login** button.

**Login** [Terms & Conditions](#)

User Name:

Password:

I agree to the Terms & Conditions

[Register New User](#) | [Forgot Password](#) | [Contact Us](#)

---

**Only authorized users allowed**

THIS IS A PRIVATE COMPUTER SYSTEM for use authorized by Flowserve Corporation. Users have no explicit or implicit expectation of privacy and users both consent and agree that any use of this system and all data on this system may be intercepted, monitored, authorized, recorded, copied, audited, inspected, and disclosed by Flowserve or its authorized representatives to any law enforcement agency, as well as officials of other agencies, both domestic and foreign.

You can reset your password by following the instructions given on right of the screen shown below.

**Change Password**

User Name : SRaina

User Old Password :

User New Password :

Re Enter User New Password :

**PASSWORD NEEDS TO FOLLOW THE FOLLOWING PASSWORD POLICY**

- AT LEAST 6 CHARACTERS
- AT LEAST 1 UPPER CASE CHARACTER
- AT LEAST 1 LOWER CASE CHARACTER
- AT LEAST 1 NUMBER
- AT LEAST 1 SPECIAL CHARACTER
- NO REPEATING CHARACTERS

After changing the password, login to the NORDCALC™ web application. Once you log in, a disclaimer is displayed. Read the disclaimer carefully and then click **Continue** button; a new web page is displayed. In this web page you can see five tabs. These tabs are used to do different calculations. These tabs are shown in the figure given next.

In-Lb

**NORDCALC™ :: Flow Calculations**

Flow Type :

Calculation Type :

The first tab, **Flow Calculations**, is the default selected tab and is used to calculate the flow rates, pressure drops, valve sizes and flow capacity. You can specify the fluid to be gaseous or liquid. Accordingly, the calculations and parameters will differ.

The second tab, **Torque Calculations & Actuator Mounting Data**, is used to calculate the Top Works (different dimension of Valves) and torques.

The third tab, **Multiport Arrangements**, is used to display arrangement or orientation of different ports based on specified line connections.

The fourth tab, **Sealant Recommendations**, as evident from its name recommends the best possible sealant for a specified set of line material, sealant grade and the lowest and highest possible temperatures.

The last tab, **Blowdown Calculation**, is used to execute the blow-down time and valve riser calculations.

All these tabs are discussed in detail in the following topics.

### **Flow Calculations tab**

This tab is used to execute different flow calculations. These calculations vary depending upon the type of fluid selected (liquid or gas). There are two drop-downs in this tab: **Flow Type** and **Calculation Type**. Depending upon the option selected in the **Flow Type** drop-down, the options in the **Calculation Type** drop-down change. The different calculations that can be executed with the help of this tab:

#### ***Fluid : Gas***

***Possible Calculations: Flow rate, Pressure Drop and Valve Size***

#### ***Fluid : Liquid***

***Possible Calculations: Flow rate, Pressure Drop, Flow Capacity and Valve Size***

The calculations in this document are done with the **Unit System** set to **In-Lb**. As a result, the pressures are measured in **psi**, temperature in **Fahrenheit** and dimensions in **inches**.

You can set the units to metric system by selecting **Metric** in the **Unit System** drop-down. In metric units, the pressures are measured in **kPa**, temperature in **Kelvin** and dimensions in **mm**.

The procedures to do these calculations are discussed in the following sections:

➤ **Calculating the gas flow rate for gaseous medium**

*The input for the flow rate calculation is given below:*

*Valve Figure – FIG 114,*

*Valve Size – 1*

*Gas Type – Methane (Natural Gas)*

*Upstream Pressure – 150*

*Inner diameters of both upstream and downstream pipes - 2*

1. To start with, select **GAS** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **FLOW RATE** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 114** in the **Valve Figure** drop-down and then select **1** in the **Valve Size** drop-down.
4. Similarly, select **Methane (Natural Gas)** in the **Gas Type** drop-down.
5. Next, enter the following values in rest of the editable edit boxes:
 

Pressure Drop ( $\Delta P$ ) = 2	Upstream Pressure (P1) = 150
Upstream Temperature (T1) = 60	ID of Upstream Pipe (D1) = 2
ID of Downstream Pipe (D2) = 2	

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

You can notice that some of the edit boxes are highlighted in yellow. These indicate the values of these edit boxes are set as default values. However, you can change these values as per requirement. Also, note that some of the edit boxes are non-editable or read only. These edit boxes display the properties associated with the gas type selected. In this case, these edit boxes display the properties of Methane.

6. Next, click the **Calculate** button located at the bottom of web page; the flow rate is displayed above the **Calculate** button. The flow rate calculated in this case is **34869 Ft<sup>3</sup>/Hr**. You will also see the value of some entities like critical pressure (Pc), critical temperature (Tc) and acentric factor.

Flow Type : GAS ▼

Calculation Type : FLOW RATE ▼

---

GAS FLOW RATE

---

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please contact us.

Valve Figure : FIG - 114 ▼

Valve Size : 1 ▼

Gas Type : Methane (Natural Gas) ▼

Pressure Drop ( $\Delta P$ ) : 2 (psi)

Upstream Pressure (P1) : 150 (psig)

Upstream Temperature (T1) : 60 (F)

ID Of Upstream Pipe (D1) : 2 (Inch)

ID Of Downstream Pipe (D2) : 2 (Inch)

Specific Gravity (G) : 0.55

Pc = 673 psia | Tc = -117 F |  $\omega$  = 0.011

Compressibility Factor (Z) : 0.98

Flow Coefficient (Cv) : 36

Specific Heat Ratio (K) : 1.31

Valve End ID (d) : 1 (Inch)

FLOW RATE : 34869 FT<sup>3</sup>/HR

Calculate

Now, if you change the values in the drop-downs and edit boxes; the new flow rate will be calculated and displayed above the **Calculate** button. In a similar way, you can calculate the flow rates with different valve sizing parameters.

➤ **Calculating the pressure drop for gaseous medium**

*The input for the pressure drop calculation is given below:*

*Valve Figure – FIG 165,*

*Valve Size – 5*

*Gas Type – Ammonia*

*Upstream Pressure – 200*

*Upstream pressure – 40*

*Inner diameters of upstream pipe – 4*

*Inner diameter of downstream pipe - 2*

*Flow rate – 60000*

1. To start with, select **GAS** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **PRESSURE DROP** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 165** in the **Valve Figure** drop-down and then select **5** in the **Valve Size** drop-down.
4. Similarly, select **Ammonia** in the **Gas Type** drop-down.
5. Next, enter the following values in rest of the editable edit boxes:
 

Upstream Pressure (P1) = 200	Upstream Temperature (T1) = 40
ID of Upstream Pipe (D1) = 4	ID of Downstream Pipe (D2) = 2
Flow rate (q) = 60000	

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit display located below **Flowrate** (q) edit box displays the properties associated with the gas type selected. In this case, these edit boxes display the properties of **Ammonia**.

6. Next, click the **Calculate** button located at the bottom of the web page; the pressure drop is displayed above the **Calculate** button. The pressure drop calculated in this case is **0.29** psi. You will also see the value of some entities like critical pressure (Pc), critical temperature (Tc) and acentric factor.



Flow Type : GAS ▼

Calculation Type : PRESSURE DROP ▼

---

*GAS PRESSURE DROP*

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please contact us.

Valve Figure : FIG - 165 ▼

Valve Size : 5 ▼

Gas Type : Ammonia ▼

Upstream Pressure (P1) : 200 (psig)

Upstream Temperature (T1) : 40 (F)

ID Of Upstream Pipe (D1) : 4 (Inch)

ID Of Downstream Pipe (D2) : 2 (Inch)

Flowrate (q) : 60000 (ft<sup>3</sup>/Hr)

Specific Gravity (G) : 0.59

Pc = 1657 psia | Tc = 271 F | ω = 0.252

Compressibility Factor (Z) : 0.95

Flow Coefficient (Cv) : 1650

Specific Heat Ratio (K) : 1.31

Valve End ID (d) : 5 (Inch)

PRESSURE DROP : 0.29 psi

Calculate

Now, if you change the values in the drop-downs and edit boxes; the new pressure drop will be calculated and displayed above the **Calculate** button. In a similar way, you can calculate the pressure drops with different valve sizing parameters

➤ **Calculating the valve size for gaseous medium**

*The input for the valve size calculation is given below:*

*Valve Figure – FIG 265*

*Gas Type – Chlorine*

*Min pressure drop – 0.5*

*Max pressure drop – 0.8*

*Upstream Pressure – 200*

*Upstream pressure – 60*

*Inner diameters of upstream pipe – 2*

*Inner diameter of downstream pipe - 2*

*Flow rate – 50000*

1. To start with, select **GAS** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **VALVE SIZE** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 265** in the **Valve Figure** drop-down and then select **Chlorine** in the **Gas Type** drop-down.
4. Next, enter the following values in rest of the editable edit boxes:
 

Min Pressure Drop ( $\Delta P1$ ) = 0.5	Max Pressure Drop ( $\Delta P2$ ) = 0.8
Upstream Pressure (P1) = 200	Upstream Temperature (T1) = 60
ID of Upstream Pipe (D1) = 2	ID of Downstream Pipe (D2) = 2
Flowrate (q) = 50000	

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit boxes located below **Flowrate** (q) edit box displays the properties associated with the type of gas selected. In this case, these edit boxes display the properties of Chlorine.

5. Next, click the **Calculate** button located at the bottom of the web page; the possible valve size(s) along with the corresponding pressure drop(s) are displayed above the **Calculate** button. The two possible valve sizes calculated in this case are **5** and **6**. The corresponding pressure drops calculated in this case are **0.56** psi and **0.62** psi. You will also see the value of some entities like critical pressure (Pc), critical temperature (Tc) and acentric factor.

Flow Type :

Calculation Type :

---

**GAS VALVE SIZE**

*Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please contact us.*

Valve Figure :

Gas Type :

Min Pressure Drop ( $\Delta P1$ ) :  (psi)

Max Pressure Drop ( $\Delta P2$ ) :  (psi)

Upstream Pressure (P1) :  (psig)

Upstream Temperature (T1) :  (F)

ID Of Upstream Pipe (D1) :  (Inch)

ID Of Downstream Pipe (D2) :  (Inch)

Flowrate (q) :  (ft<sup>3</sup>/Hr)

Specific Gravity (G) :

Pc = 1120 psia | Tc = 291 F |  $\omega$  = 0.069

Compressibility Factor (Z) :

Specific Heat Ratio (K) :

Valve Size	Pressure Drop
5	0.56 psi
6	0.62 psi

Now, if you change the values in the drop-downs and edit boxes; the new valve sizes and the corresponding pressure drops will be calculated and displayed above the **Calculate** button. In a similar way, you can calculate the valve sizes with different valve sizing parameters.

➤ **Use of 'Other' option**

The above calculation is based on the standard gases. You can do the same calculation for gases other than the standard, i.e. user defined gases. To do these calculations, you need to select the **Other** option in the **Gas Type** drop-down. On doing so, extra input fields: **Specific Gravity (G)**, **Compressibility Factor (Z)** and **Ratio of Specific Heats (K)** are displayed in the web page, as shown below. To proceed for the calculations, enter the values in these fields.

Specific Gravity (G):	<input type="text"/>
Compressibility Factor (Z):	<input type="text"/>
Ratio Of Specific Heats (K):	<input type="text"/>

This **Other** option is also available for gaseous fluid in **Blowdown** and **Valve & Riser Sizing** calculations. The input fields shown in above image are displayed in the web page if you select this option. As a result, populate these input fields to proceed further.

➤ **Calculating the liquid flow rate for liquid medium**

*The input for the flow rate calculation is given below:*

*Valve Figure – FIG 142,*

*Valve Size – 4*

*Pressure drop - 2*

*Upstream Pressure – 130*

*Inner diameter of upstream pipe – 6*

*Inner diameter of downstream pipe - 4*

*Vapour pressure – 14.7*

*Critical pressure ratio - 0.7*

1. Select **LIQUID** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **FLOW RATE** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 142** in the **Valve Figure** drop-down and then select **4** in the **Valve Size** drop-down.
4. Next, enter the following values in rest of the editable edit boxes:
 

Pressure Drop ( $\Delta P$ ) = 2	Upstream Pressure (P1) = 130
ID of Upstream Pipe (D1) = 6	ID of Downstream Pipe (D2) = 4
Liquid Vapour Pressure (Pv) = 14.696	Liquid Critical Pressure Ratio (Ff) = 0.7

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit boxes in this web page display the properties associated with the working fluid, that is, water.

5. Next, click the **Calculate** button located at the bottom of the web page; the flow rate is displayed. In this case, the flow rate calculated is **388.99** gpm.

Flow Type :

Calculation Type :

---

*LIQUID FLOW RATE*

---

Please note that these calculations apply to current production valves **ONLY**.  
For anything else or to verify information please [contact us](#).

Valve Figure :

Valve Size :

Pressure Drop ( $\Delta P$ ) :  (psi)

Upstream Pressure (P1) :  (psig)

ID Of Upstream Pipe (D1) :  (Inch)

ID Of Downstream Pipe (D2) :  (Inch)

Specific Gravity (G) :

Liquid Vapour Pressure (Pv) :  (psia)

Liquid Critical Pressure Ratio (Ff) :

Flow Coefficient (Cv) : 333

Valve End ID (d) : 4 (Inch)

FLOW RATE : 388.99 gpm

Now, if you change the values in the drop-downs and edit boxes; the flow rate will be calculated and displayed above the **Calculate** button. In a similar way, you can calculate the flow rate of the working fluid.

➤ **Calculating the pressure drop for liquid medium**

*The input for the pressure drop calculation is given below:*

*Valve Figure – FIG 1165*

*Valve Size – 8*

*Upstream Pressure – 190*

*Inner diameter of upstream pipe – 10*

*Inner diameter of downstream pipe - 7*

*Flow rate – 1200*

*Vapour pressure – 10*

*Critical Pressure Ratio – 0.5*

1. To start with, select **LIQUID** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **PRESSURE DROP** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 1165** in the **Valve Figure** drop-down and then select **8** in the **Valve Size** drop-down.
4. Next, enter the following values in rest of the editable edit boxes:

Upstream Pressure (P1) = 190	ID of Upstream Pipe (D1) = 10
ID of Downstream Pipe (D2) = 7	Flow Rate (q) = 1200
Specific Gravity (G) = 1	Liquid Vapour Pressure (Pv) = 10 Liquid
Critical Pressure Ratio (Ff) = 0.5	

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit boxes in this web page display the properties associated with the working fluid, that is, water.

5. Next, click **Calculate**; the pressure drop is calculated and displayed in the web page. In this case, the pressure drop is **1.31** psi.

Flow Type :	<input type="text" value="LIQUID"/>
Calculation Type :	<input type="text" value="PRESSURE DROP"/>
<b>LIQUID PRESSURE DROP</b>	
Please note that these calculations apply to current production valves ONLY. For anything else or to verify information please contact us.	
Valve Figure :	<input type="text" value="FIG - 1165"/>
Valve Size :	<input type="text" value="8"/>
Upstream Pressure (P1) :	<input type="text" value="190"/> (psig)
ID Of Upstream Pipe (D1) :	<input type="text" value="10"/> (Inch)
ID Of Downstream Pipe (D2) :	<input type="text" value="7"/> (Inch)
Flow Rate (Q) :	<input type="text" value="1200"/> (Gpm)
Specific Gravity (G) :	<input type="text" value="1"/>
Liquid Vapour Pressure (Pv) :	<input type="text" value="10"/> (psia)
Liquid Critical Pressure Ratio (Ff) :	<input type="text" value="0.5"/>
Flow Coefficient (Cv) :	1400
Valve End ID (d) :	8 (Inch)
<b>PRESSURE DROP :</b>	<b>1.31 psi</b>
<input type="button" value="Calculate"/>	

Now, if you change the values in the drop-downs and edit boxes; the new pressure drop will be calculated and displayed above the Calculate button. In a similar way, you can calculate the pressure drops with different valve sizing parameters.



➤ **Calculating the flow capacity for liquid medium**

*The input for the flow capacity calculation is given below:*

*Valve Figure – FIG 525*

*Valve Size – 3*

*Pressure drop – 1*

*Upstream Pressure – 315*

*Inner diameter of upstream pipe – 3*

*Inner diameter of downstream pipe - 3*

*Flow rate – 500*

*Vapor pressure – 13*

*Critical Pressure Ratio – 0.5*

1. To start with, select **LIQUID** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **FLOW CAPACITY** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 525** in the **Valve Figure** drop-down and then select **3** in the **Valve Size** drop-down.
4. Next, enter the following values in rest of the editable edit boxes:
 

Pressure Drop ( $\Delta P$ ) = 1	Upstream Pressure (P1) = 315
ID of Upstream Pipe (D1) = 3	ID of Downstream Pipe (D2) = 3
Flow Rate (q) = 500	Specific Gravity (G) = 1
Liquid Vapour Pressure (Pv) = 13	Liquid Critical Pressure Ration (Ff) = 0.5

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit boxes in this web page display the properties associated with the working fluid, that is, water.

5. Next, click **Calculate**; the flow capacity is calculated and displayed in the web page. In this case, the calculated flow capacity is **500** and the two sizes suggested for the valve with this flow capacity are **3** inch and **4** inch.

Flow Type : LIQUID

Calculation Type : FLOW CAPACITY

---

**LIQUID FLOW CAPACITY**

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please contact us.

Valve Figure : FIG - 525

Valve Size : 3

Pressure Drop ( $\Delta P$ ) : 1 (psi)

Upstream Pressure (P1) : 315 (psig)

ID Of Upstream Pipe (D1) : 3 (Inch)

ID Of Downstream Pipe (D2) : 3 (Inch)

Flow Rate (q) : 500 (Gpm)

Specific Gravity (G) : 1

Liquid Vapour Pressure (Pv) : 13 (psia)

Liquid Critical Pressure Ratio (Ff) : 0.5

Valve End ID (d) : 3 (Inch)

**The flow capacity is : 500**

**The nearest valves are**

Figure	Size	Cv
525	3	560
525	4	590

Calculate

Now, if you change the values in the drop-downs and edit boxes; the flow capacity and the suggested valve sizes for this flow capacity will be calculated and displayed. In a similar way, you can calculate the flow capacities with different valve sizing parameters.

➤ **Calculating the valve size for liquid medium**

*The input for the valve size calculation is given below:*

*Valve Figure – FIG 1165*

*Min pressure drop – 0.5*

*Max pressure drop – 1*

*Upstream Pressure – 150*

*Inner diameters of upstream pipe – 6*

*Inner diameter of downstream pipe - 7*

*Flow rate – 2000*

*Vapour pressure – 12.5*

*Critical pressure ration – 0.75*

1. Select **LIQUID** in the **Flow Type** drop-down, the **Calculation Type** drop-down gets activated.
2. Next, select **VALVE SIZE** in the **Calculation Type** drop-down; different valve sizing parameter fields are displayed in the web page, see the figure.
3. Select **FIG – 1165** in the **Valve Figure** drop-down.
4. Next, enter the following values in rest of the editable edit boxes:
 

Min Pressure Drop ( $\Delta P1$ ) = 0.5	Max Pressure Drop ( $\Delta P2$ ) = 1
Upstream Pressure (P1) = 150	ID of Upstream Pipe (D1) = 6
ID of Downstream Pipe (D2) = 7	Flow Rate (q) = 2000
Specific Gravity (G) = 1	Vapour Pressure (Pv) = 12.5
Liquid Critical Pressure Ratio (Ff) = 0.75	

*Where valve size is measured in inches, pressure drop is measured in psi, pressure is measured in psia, temperature is measured in Fahrenheit and diameters are measured in inches.*

The read only edit boxes in this web page display the properties associated with the working fluid, that is, water.

5. Next, click **Calculate**; the valve size(s) are calculated and displayed in the web page. In this case, the calculated valve sizes are **8** and **12** with the corresponding pressure drops are 0.8795 and 0.5613.

Flow Type : LIQUID

Calculation Type : VALVE SIZE

---

**LIQUID VALVE SIZE**

---

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please contact us.

Valve Figure : FIG - 1165

Min Pressure Drop ( $\Delta P1$ ) : 0.5 (psi)

Max Pressure Drop ( $\Delta P2$ ) : 1 (psi)

Upstream Pressure (P1) : 150 (psig)

ID Of Upstream Pipe (D1) : 6 (Inch)

ID Of Downstream Pipe (D2) : 7 (Inch)

Flow Rate (Q) : 2000 (Gpm)

Specific Gravity (G) : 1

Liquid Vapour Pressure (Pv) : 12.5 (psia)

Liquid Critical Pressure Ratio (Ff) : 0.75

**VALVE SIZE / PRESSURE DROP :** The following valve size matches the range

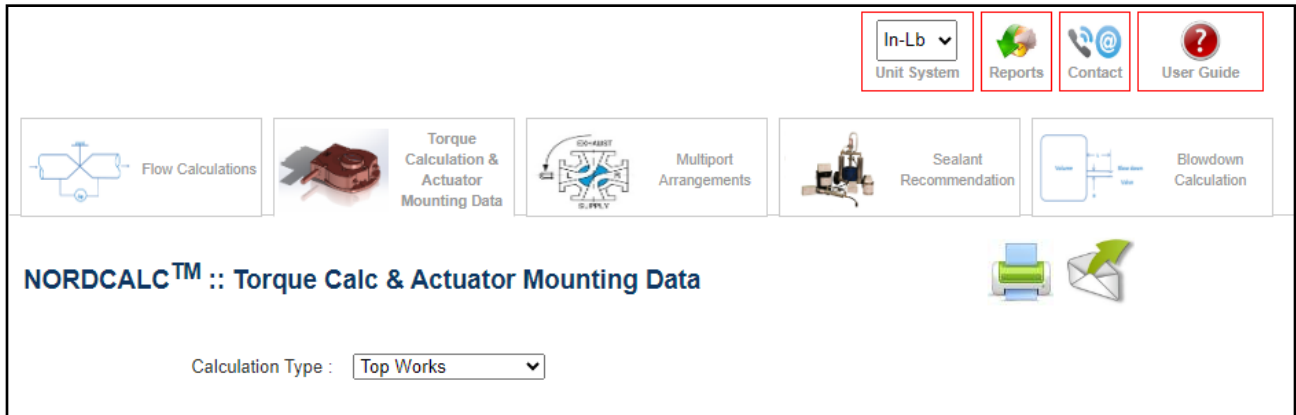
Size	Pressure Drop (psi)
8	0.879521244608739
12	0.561349022119221

Calculate

Now, if you change the values in the drop-downs and edit boxes; the new valve sizes and the corresponding pressure drops will be calculated and displayed above the **Calculate** button. In a similar way, you can calculate the valve sizes with different valve sizing parameters.

### Torque Calculation & Actuator Mounting Data tab

This tab is used to calculate the Top Works (different dimension values) and torque calculations for actuator mountings. The calculation of these data is discussed in the following sections.



#### ➤ Top Works calculation

The input for top works calculation is given below:

Valve Figure – Fig - 2049 Prefix(P)

Valve size – 3

1. Select the **Top Works** option in the **Calculation Type** drop-down.
2. Select **FIG – 2049 Prefix(P)** in the **Valve Figure** drop-down; the options in the **Valve Size** drop-down become available.
3. Select **3** in the **Valve Size** drop-down; the top works details are displayed in the web page.

*(Valve sizes are not available in all prefixes and some sizes are found in multiple prefixes. If you don't see your size, check your prefix.)*

Calculation Type :

---

**TOP WORKS**

---

Valve Figure :

Valve Size :

Design prefixes are issued alphabetically with the later letters being the newer iteration.

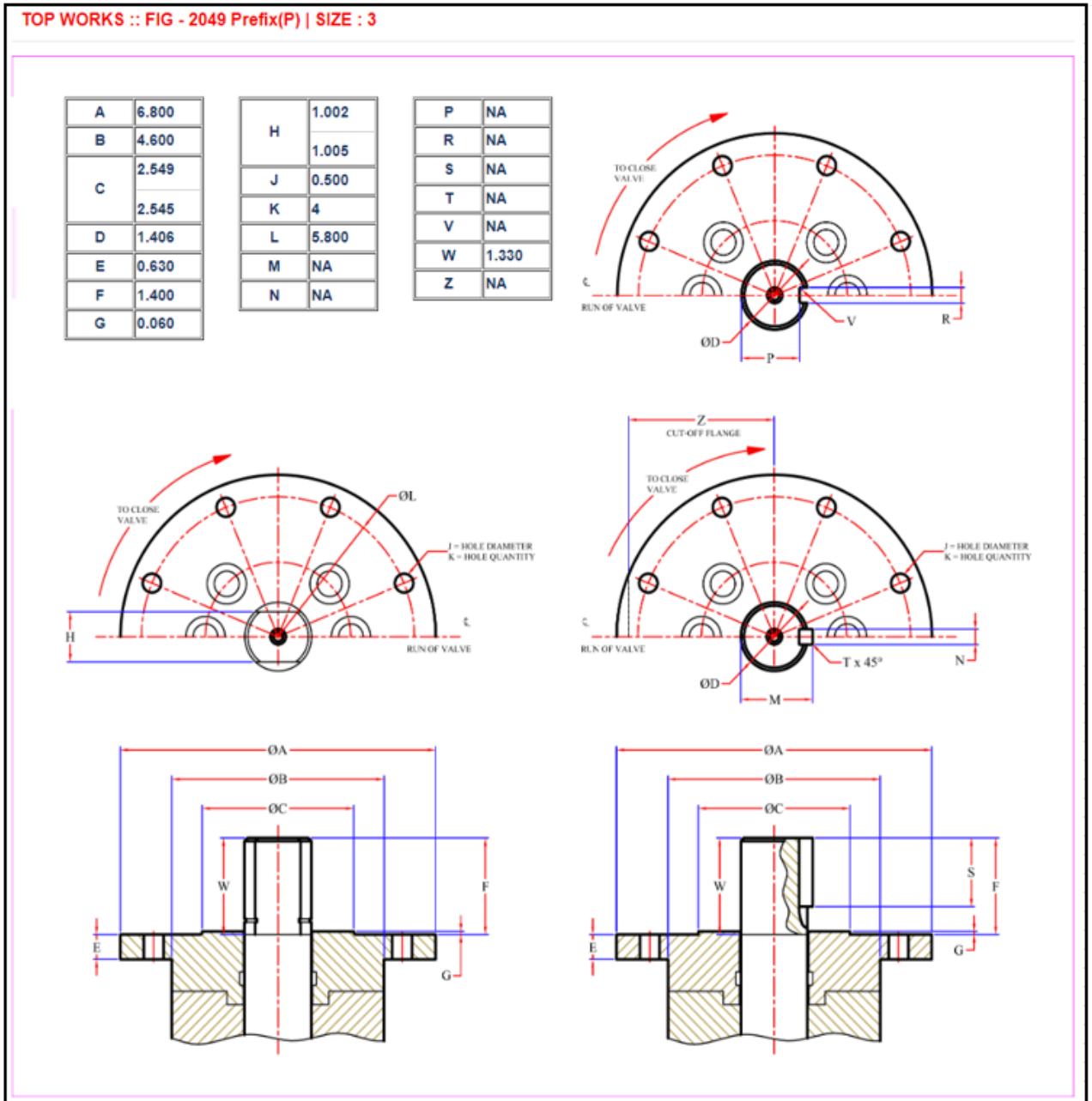
In the below example the same valve sizes are found under two different design prefixes. Design Prefix (J) is newer than Design Prefix (H).

Valve Figure : <input type="text" value="FIG - 2249 Prefix(J)"/>	Valve Figure : <input type="text" value="FIG - 2249 Prefix(H)"/>
Valve Size : <input type="text" value="--SELECT--"/>	Valve Size : <input type="text" value="--SELECT--"/>
<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="12"/>	<input type="text" value="8"/>
	<input type="text" value="10"/>
	<input type="text" value="12"/>

In the below example, Size 4 and smaller are typically Prefix (P) through (S), and size 6 and larger are typically Prefix (G) through (K), some exceptions exist.

Valve Figure : <input type="text" value="FIG - 3049 Prefix(P)"/>	Valve Figure : <input type="text" value="FIG - 3049 Prefix(K)"/>
Valve Size : <input type="text" value="--SELECT--"/>	Valve Size : <input type="text" value="--SELECT--"/>
<input type="text" value="--SELECT--"/>	<input type="text" value="--SELECT--"/>
<input type="text" value="2"/>	<input type="text" value="6"/>
<input type="text" value="3"/>	<input type="text" value="10"/>
<input type="text" value="4"/>	

This page displays the values of the dimensions in tabular form with corresponding letter designations that are displayed on the diagram of the valve.



➤ **Torque Calculation**

The input for torque calculation is given below:  
 Valve Figure – 185  
 Valve size – 5

1. Select the **Torque Calculations** option in the **Calculation Type** drop-down.
2. Select **FIG – 185** in the **Valve Figure** drop-down; the options in the **Valve Size** drop-down become available.
3. Select **5** in the **Valve Size** drop-down and then click the **Calculate** button; the torque calculations are done and the Stem torque is displayed.

In this case the torque value comes equal to **2684** in-lbs, see figure.

Calculation Type :

---

**TORQUE CALCULATIONS**

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please [contact us](#).

Valve Figure :

Valve Size :

**Stem Torque : 2684 in-lbs**

Please Note: Running torque will be lower than this value. Please contact Nordstrom Customer Service for this information.

**DISCLAIMER :** The above torques are calculated based on using Nordstrom sealant in current production valve design . We do not have control over the viscosity of other manufacturer's sealants and therefore cannot supply torques for valves using sealants other than the listed Flowserve sealants. Flowserve will not be responsible for improper sizing of actuators if the conditions vary from what is stated above. Older design valves such as Hypreseals and earlier designs of Nordstrom top entry plug valves both in steel and iron are beyond the scope of this program and Flowserve Sulphur Springs Operations should be contacted for the availability of torque information for those designs.

**TORQUE CALCULATIONS HELP**

Torque Calculations are based on Differential Pressure, Sealant type, Sealant Temperature and Operating Time

**Stem Torque :** Torque required to turn the stem at the conditions specified.

In case of dynamic balanced valves, more inputs need to be provided to do the torque calculations. For example, if you select FIG – 3049 valve figure (dynamic balanced valve), the inputs shown below need to be entered to proceed for torque calculations.

**TORQUE CALCULATIONS**

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please [contact us](#).

Valve Figure :

Valve Size :

Valve Pressure Class :

**Ensure the differential pressure input is within the maximum pressure rating of the valve chosen.**

Differential Pressure (psi) :

Sealant :

Sealant Temperature (F) :

Operation Time (Sec) :

Yield Torque (in-lbs) :



The input for torque calculation of dynamic balanced valves is given below:

Valve Figure – 3049

Valve Size – 2

Differential Pressure – 3705

Sealant – 167

Sealant Temperature – 40

1. Select the **Torque Calculations** option in the **Calculation Type** drop-down.
2. Select **FIG – 3049** in the **Valve Figure** drop-down; the other options (as shown in above image) are displayed.
3. Select **2** in the **Valve Size** drop-down; the **Differential Pressure** edit box gets populated automatically. If required, change the differential pressure as per your requirement.
4. Next, select **167** from the **Sealant** drop-down; the **Sealant Temperature** drop-down becomes available.
5. Select **40** in this drop-down and then enter the operation time if required in the **Operation Time** edit box.
6. Next, click the **Calculate** button; the stem and running torques are displayed in the web page. Also, the factor of safety is displayed.

**TORQUE CALCULATIONS**

Please note that these calculations apply to current production valves ONLY.  
For anything else or to verify information please [contact us](#).

Valve Figure :

Valve Size :

Valve Pressure Class : 1500

Ensure the differential pressure input is within the maximum pressure rating of the valve chosen.

Differential Pressure (psi) :

Sealant :

Sealant Temperature (F) :

Operation Time (Sec) :

Yield Torque (in-lbs): 5795

**Stem Torque : 2866 in-lbs**

**Running Torque : 1286 in-lbs**

Wormshaft Torque : For the valve size selected, please consult customer care.

Torque includes 1.3 safety factor.

### Multiport Arrangements tab

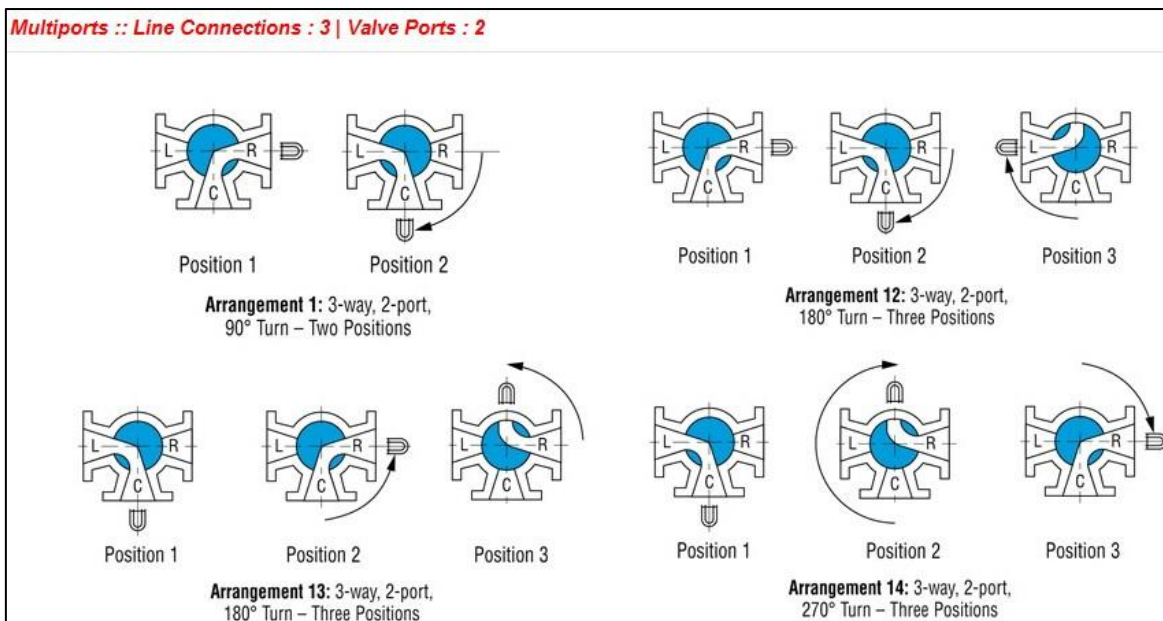
This tab is used to explore the available multiports. The multiport valves have ports arranged so that when the plug is turned from one position to another, the channels previously in connection will be entirely cut off and new channels will open. These valves can be used in place of two, three or four straightway valves arrangements. In exploration of multiports, you need to specify the line connections and the valve ports.

The input for displaying Multiports is given below:

Line Connections – 3

Valve Ports – 2

1. To start with, select **3** in the **Line Connections** drop-down.
2. Next, select **2** in the **Valve Ports** drop-down; the possible arrangements of the specified line connections and valve ports are displayed in the web page.



Similarly, you can explore the other arrangements by selecting different line connections and valve port options.

### Sealant Recommendation tab

This tab is used to get the best possible sealant recommendations for a set of specified line material, sealant grade and the lowest and highest possible temperatures. The line material can be selected from the **Line Material** drop-down and the grade(s) can be specified from the **Sealant Grade Available** check boxes. The lowest and highest possible temperature edit boxes are both set to 60 degree Fahrenheit and are highlighted in yellow. However, you can change these value based on your requirement. After you specify all options in this tab, you need to click **Show** to view the recommended sealant. The figure given below shows the options in the **Sealant Recommendation** tab.

SEALANT RECOMMENDATION	SEALANT TYPES HELP
<p>Line Material : --SELECT--</p> <p>Sealant Grade Available :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> BULK</li> <li><input type="checkbox"/> CARTRIDGE</li> <li><input type="checkbox"/> GUN PAK</li> <li><input type="checkbox"/> J AND K</li> <li><input type="checkbox"/> SS BULK</li> <li><input type="checkbox"/> STICK</li> <li><input type="checkbox"/> TUBE</li> </ul> <p>Lowest Possible Temperature (F) : 60</p> <p>Highest Possible Temperature (F) : 60</p> <p style="text-align: center;"><input type="button" value="Show"/></p>	<p><b>Bulk</b> Nordstrom bulk sealants are normally 400-D hand gun and Hypregun sealant injectors. e 5-quart can is specifically designed for use in Hyprigun and must always be used with the canshield installed.</p> <p><b>Cartridge</b> Bulk sealants, except sealant 234 are also available in cardboard cartridges designed to fit the 401-D and 401-DE handguns.</p> <p><b>SS bulk</b> Super Soft (SS) bulk sealants is available in 950, 555 and 167 formulations. SS bulk sealant has an improved 'Pumpability' characteristics.</p> <p><b>Stick</b> Nordstrom stick sealants are high viscosity sealants that are used with combination button head fittings and in the 400-A and 400-D hand guns. The sealant is a consistency that maintains its extruded shape and diameter. Contact your customer service.</p> <p><b>Tube</b> Plastic tubes are standard packaging only for sealant 234</p>

Based on the line material, sealant grade(s) and temperatures, the NORDCALC™ application will recommend different sealants. Given below are the examples that illustrate the use of this tab for sealant recommendation.

➤ **Example 1**

*The input for Example 1 is given below:*

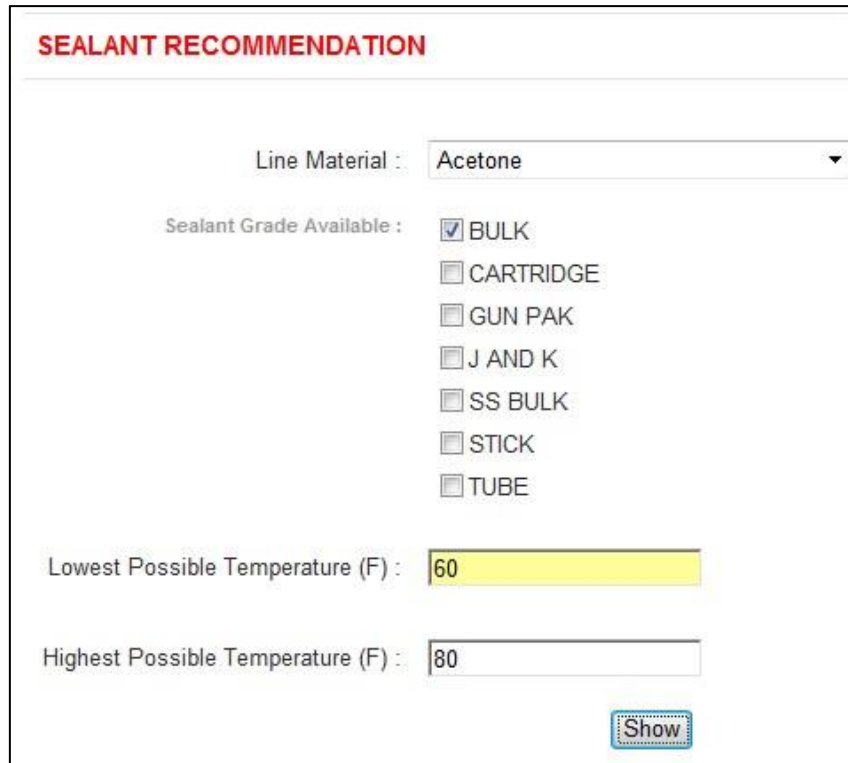
*Line material – Acetone,*

*Sealant grade – BULK*

*Lowest temperature – 60*

*Highest temperature - 80*

1. To start with, select **Acetone** in the **Line Material** drop-down.
2. Select the **BULK** check box in the **Sealant Grade Available** area.
3. Enter **60** and **80** in the **Lowest Possible Temperature (F)** and **Highest Possible Temperature (F)** edit boxes, respectively, see the figure.



The screenshot shows a web form titled "SEALANT RECOMMENDATION". It contains the following fields and options:

- Line Material :** A dropdown menu with "Acetone" selected.
- Sealant Grade Available :** A list of checkboxes with "BULK" checked. Other options include CARTRIDGE, GUN PAK, J AND K, SS BULK, STICK, and TUBE.
- Lowest Possible Temperature (F) :** A text input field containing "60".
- Highest Possible Temperature (F) :** A text input field containing "80".
- Show :** A button located at the bottom right of the form.

4. Next, click the **Show** button; the sealants recommended by the NORDCALC™ application are displayed at the bottom of the same page. In addition to the sealants recommended, this application displays other information about the sealant, such as grades available, color, principle services they best suit for and the services they do not suit, see figure. This figure will also inform you about the matching capability of the recommended sealants with the specified criteria.

Following sealants match the given criteria 100%	
Sealant Number :	421
Grades Available :	BULK (0F to 300F)
Color :	Cream
Principle Services :	Acids, alkalies, alcohols, amines, asphalt, aqueous solutions, fats, glycerine, glycols, soap, water steam. Food and pharmaceutical applications as determined suitable by the user.
Unsuitable For :	Hydrocarbon solvents.
Sealant Number :	234
Grades Available :	BULK (-40F to 400F)
Color :	White
Principle Services :	A silicone sealant for hot air, hot water, steam, high vacuum, acetic acid, acetic anhydride, ethyl alcohol below 250 degrees F., natural gas compressor discharge, food and pharmaceutical applications as determined suitable by the user.
Unsuitable For :	Gasoline and light liquid hydrocarbons, strong mineral acids, aromatic and chlorinated solvents.

If you change the options in this tab, the recommended sealants will also vary.

➤ **Example 2**

The input for Example 2 is given below:

Line material – Asphalt

Sealant grade – BULK, GUN PAK, J AND K and TUBE

Lowest temperature – 65

Highest temperature - 100

1. To start with, select **Asphalt** in the **Line Material** drop-down.
2. Select the **BULK, GUN PAK, J AND K** and **TUBE** check boxes in the **Sealant Grade Available** area.
3. Enter **65** and **100** in the **Lowest Possible Temperature (F)** and **Highest Possible Temperature (F)** edit boxes, respectively, see the figure.

SEALANT RECOMMENDATION

Line Material :

Sealant Grade Available :

- BULK
- CARTRIDGE
- GUN PAK
- J AND K
- SS BULK
- STICK
- TUBE

Lowest Possible Temperature (F) :

Highest Possible Temperature (F) :

4. Next, click the **Show** button; the sealants recommended by the NORDCALC™ application are displayed at the bottom of the same page along with the some more information about the sealant, such as grades available, color, principle services they best suit for and the services they do not suit, see figure.

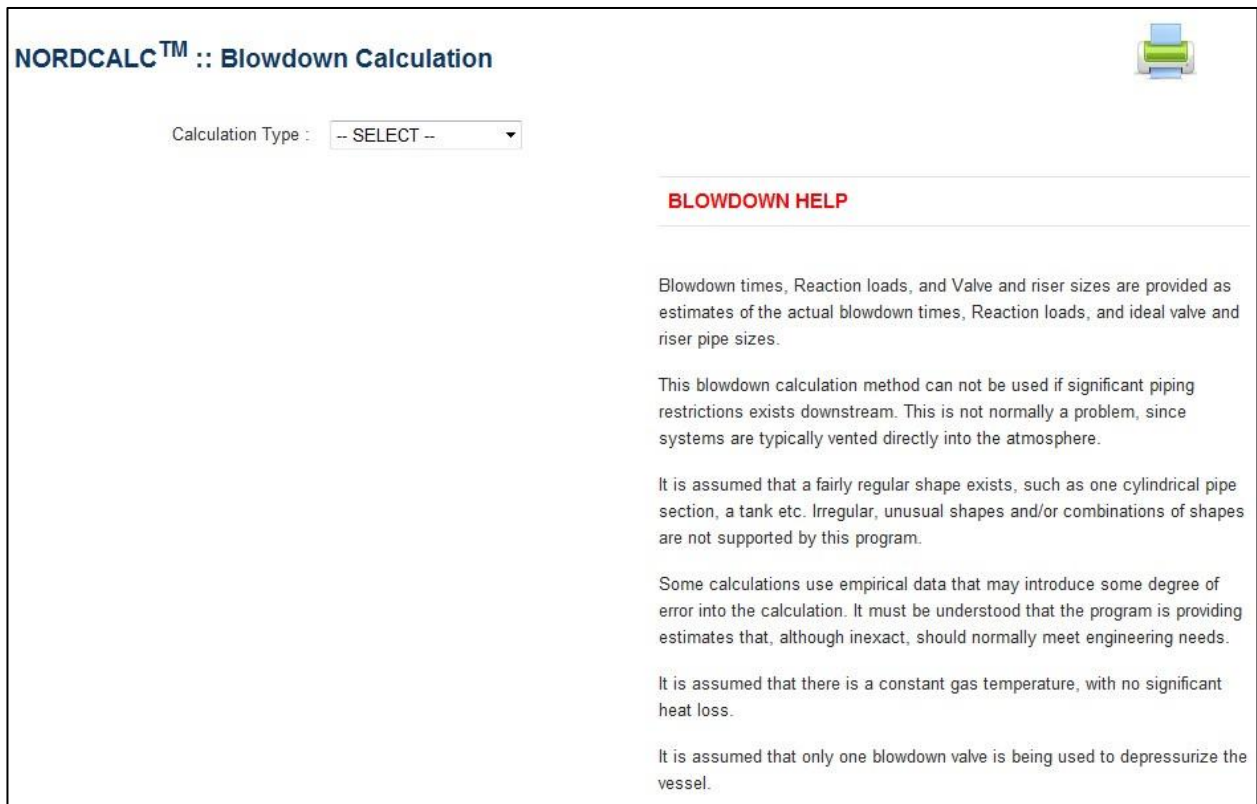
Below listed sealants match <b>partially</b> to the given criteria	
<p>Sealant Number : 1033</p> <p>Grades Available : BULK (-40F to 500F) GUN PAK (-40F to 500F) J AND K (-20F to 500F)</p> <p>Color : Green</p> <p>Principle Services : General purpose sealant for liquid and gaseous aliphatic hydrocarbon service suitable for gasoline, kerosene, fuel oils, crude distillates, aviation and jet fuel, natural gas.</p> <p>Unsuitable For : Aromatic solvents, strong acids and alkalies, steam.</p>	
<p>Sealant Number : 950</p> <p>Grades Available : BULK (-10F to 350F) GUN PAK (-10F to 350F) J AND K (10F to 350F)</p> <p>Color : Cream</p> <p>Principle Services : Excellent dual resistance to petroleum products and water. Particularly recommended for regular, premium and high octane gasoline, kerosene, aviation and jet fuels, fuel blending ingredients, such as alkylate and platformate, fuel and lubricating oils, mixtures of these products and water in all proportions. Useable to 400 degrees F. in non-oxidizing atmospheres. Approved under specification MIL-G-6032D "Grease Plug Valve, Gasoline and Oil Resistant."</p> <p>Unsuitable For : Strong acids and alkalies.</p>	
<p>Sealant Number : 654</p> <p>Grades Available : BULK (0F to 500F) GUN PAK (0F to 500F) J AND K (50F to 500F)</p> <p>Color : Brown</p> <p>Principle Services : Solvent treating of lubricating oils, hot hydrocarbon vapors and gases, general hot oil service, asphalt.</p> <p>Unsuitable For : Liquid light hydrocarbons, aromatic solvents, strong acids and chemicals.</p>	

If you change the options in this tab, the recommended sealant will also vary.

### Blowdown Calculation tab

This tab is used to calculate the blowdown time and reaction load of the valve. This tab can also be used to get the valve size and its riser details. Blowdown time is the time that a valve takes to blowdown or release a given volume. The blowdown may be necessary for safety reasons or venting out the residual fluid from the equipment before filling a new fluid in it. The valve and riser calculations are used to calculate valve sizes and the corresponding riser dimensions.

The following figure shows the blowdown calculation page of the NORDCALC™ application. In this page, you need to use the **Calculation Type** drop-down to proceed with blowdown time or valve and riser sizing calculations.





The following section illustrates the usage of **Blowdown Calculation** tab for the calculation of blowdown time and the valve and riser sizes.

➤ **Blowdown time calculation**

*The input for blowdown time calculation is given below:*

*Valve Figure – 2045*

*Valve size – 3*

*Gas – Methane (Natural Gas)*

*Initial pressure – 50*

*Final pressure – 28*

*Temperature – 35*

*Gas volume - 5000*

1. To start with, retain the default selection (**Blowdown Time**) in the **Calculation Type** drop-down.
2. Select **FIG – 2045** in the **Valve Figure** drop-down; the options in the **Valve Size** drop-down become available.
3. Select **3** in the **Valve Size** drop-down. Note that in the **Gas Type** drop-down, only **Methane (Natural Gas)** option will be selected and available.
4. Next, enter **3** in both the **Riser Pipe ID (d)** and **Riser Pipe Length (L)** edit boxes.
5. Enter **50** and **28** in the **Initial Gas Pressure (Pi)** and **Final Pressure (Pf)** edit boxes.
6. Next, enter **35** and **5000** in the **Gas Temperature (T)** and **Gas Volume (Vo)** edit boxes.

Alternatively, you can enter main pipe data instead of gas volume. To do so, select the **OR (Input Main Pipe Data)** check box; the **Gas Volume (Vo)** edit box becomes hidden. Instead, the **Main Pipe Inside dia** and **Main Pipe Length** edit boxes become available. Enter the inside diameter and pipe length in these edit boxes.

*In this case, we have not used the **OR (Input Main Pipe Check)** option. So there is no need to input data in **Main Pipe Inside dia** and **Main Pipe Length** edit boxes.*

7. Click the **Calculate** button; the blowdown time is calculated and displayed in the web page, see figure. In this case, the blowdown time is calculated as **2.59188 minutes**. Also, some other coefficients and parameters related to choked and subsonic conditions are displayed in the web page.

Calculation Type : Blowdown Time

---

**BLOWDOWN TIME**

---

Valve Figure : FIG - 2045

Valve Size : 3

Gas Type : Methane (Natural Gas)

Riser Pipe ID (d) : 3 (Inch)

Riser Pipe Length (L) : 3 (ft)

Initial Gas Pressure (Pi) : 50 (psig)

Gas Temperature (T) : 35 (F)

Gas Volume (Vo) : 5000 (cu.ft.)

OR (Input Main Pipe Data)

Final Pressure (Pf) : 28 (psig)

Molecular Weight (Mw) : 16.04

---

**Choked :**

$ce = 0.11941$  |  $Ac = 1412.72727$  |  $M_u = 10.90972$

$Z = 0.98951$  |  $t_{choked} = 1.09390$  min

---

**Subsonic :**

$ce = 0.11919$  |  $Ac = 1411.61446$  |  $M_u = 10.93457$

$Z = 0.98851$  |  $t_{subsonic} = 1.49798$  min

---

**BLOWDOWN TIME : 2.59188 min**

Calculate

The following section illustrates the usage of **Blowdown Calculation** tab for determining the valve size, blowdown time and the maximum reaction loads. These calculations are done taking into consideration the riser dimensions. Riser is a pipe or an apparatus connecting the pipe line and the valve inlet. It is used as path for blowdown process in case of sub-merged pipelines.

➤ **Valve & Riser Sizing calculation**

*The input for valve and riser size calculation is given below:*

*Gas used – Nitrogen*

*Riser pipe length – 5*

*Initial pressure – 30*

*Final pressure – 10*

*Temperature – -200*

*Main pipe inside diameter – 5*

*Main pipe length – 0.25*

*Blowdown time – 5*

*In this calculation, we will use the **OR (Input Main Pipe Data)** option.*

1. To start with, select **Valve & Riser Sizing** in the **Calculation Type** drop-down. Note that in the **Gas Type** drop-down, only **Methane (Natural Gas)** option will be selected and available.
2. Enter **5** in the **Riser Pipe Length (L)** edit box.
3. Next, enter **30** and **10** in the **Initial Gas Pressure (Pi)** and **Final Pressure (Pf)** edit boxes respectively.
4. Enter **-200** in the **Gas Temperature** edit box and then select the **OR (Input Main Pipe Data)** check box; the **Gas Volume (Vo)** edit box gets hidden. Instead, the **Main Pipe Inside dia** and **Main Pipe Length** edit boxes become available.
5. Enter **5** and **0.25** in **Main Pipe Inside dia** and **Main Pipe Length** edit boxes, respectively.
6. Next, enter **5** in the **Blowdown Time** edit box and click **Calculate**; the valve size, valve figures and blowdown times are calculated and displayed in the web page.

Calculation Type : Valve & Riser Sizing ▾

---

**VALVE & RISER SIZING**

---

Gas Type : Methane (Natural Gas) ▾

Riser Pipe Length (L) :  (ft)

Initial Gas Pressure (Pi) :  (psig)

Gas Temperature (T) :  (F)

OR (Input Main Pipe Data)

Main Pipe Inside dia :  (inch)

Main Pipe Length :  (miles)

Blowdown Time (t) :  (min)

Final Pressure (Pf) :  (psig)

Molecular Weight (Mw) : 16.04

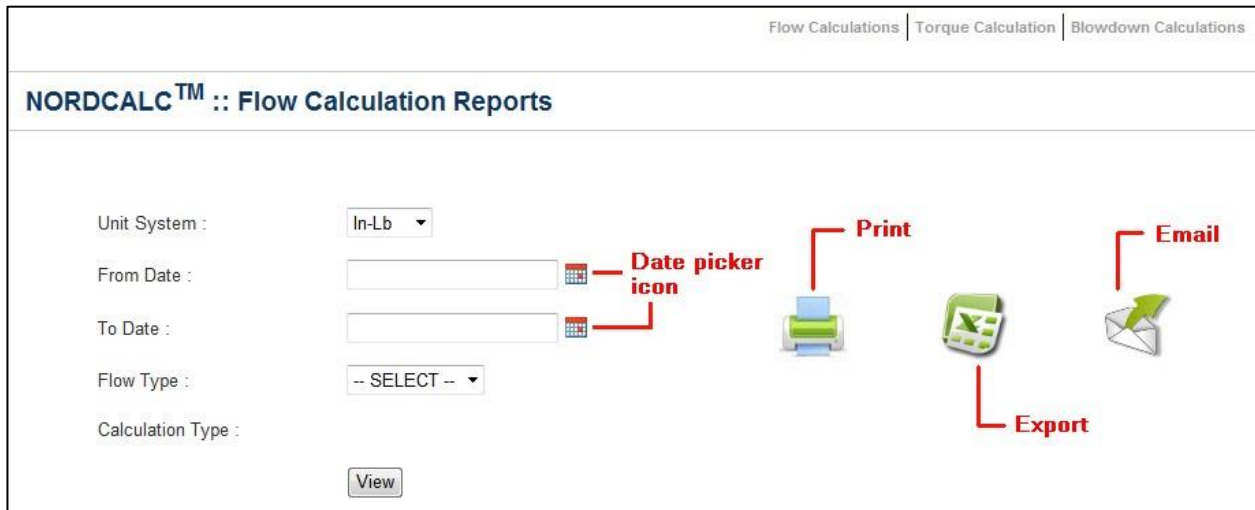
	Valve Size	Valve Figure	Blowdown Time
A	1 in	2245	4.05 min
B	0.75 in	3044	4.05 min
C	1 in	3044	4.05 min

Calculate

In this case, three valve sizes **0.5 inch**, **0.75 inch** and **1 inch** and their corresponding valve figures and blowdown times are calculated and displayed in the web page.

## Reports

After doing all calculation, there may be a need to view the reports of these calculations. Reports help in analyzing, testing and validating the results given by an application. In NORDCALC™ application, the **Reports** option is used to create the reports. This option is available on right of the **Unit System** drop-down in the home page (after user has logged in). Once generated, the reports can be printed, exported or sent as an email. The following image shows the reports page of NORDCALC™ application.



In this page, you can see two **Date picker icons** on right of the **From Date** and **To Date** fields. These icons are used to specify the start and end dates. In addition to these icons, you can see three more buttons. The first button, **Print**, is used to print the flow calculation report. The second button, **Export**, is used to export the report in the form of an excel sheet at the required location on your system. The third button, **Email**, is used to send the report to the required email address. These buttons are common for all the report pages.

### ➤ Generating the flow calculation reports

The **Flow Calculations Reports** page is used to generate the report of flow calculations done. This page is displayed as the default page if you click **Reports** option in the Home page of NORDCALC™ web page. The following example illustrates the generation of flow calculations report.

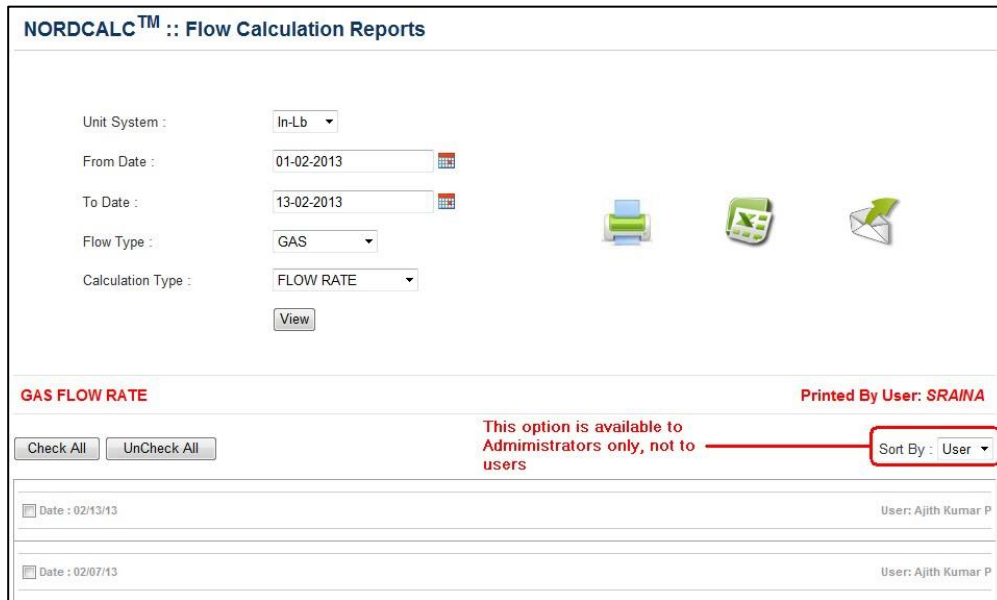
*The inputs for generating a flow calculation report are given below:*

*Units – In-Lb*

*Flow Type – Gas*

*Calculation Type – Flow Rate*

1. To start with, select **In-Lb** option in the **Unit System** drop-down. If you have done calculations in metric units, select **Metric** in this drop-down.
2. Next, specify the start date for the report in the **From Date** field.
3. Similarly, specify the end date of the report in the **To Date** field.
4. Select **GAS** in the **Calculation Type** drop-down.
5. Next, select **Flow Rate** in the **Calculation Type** drop-down and then click the **View** button; a list of gas flow rate report(s) is displayed in the web page.



**NORDCALC™ :: Flow Calculation Reports**

Unit System : In-Lb

From Date : 01-02-2013

To Date : 13-02-2013

Flow Type : GAS

Calculation Type : FLOW RATE

**View**

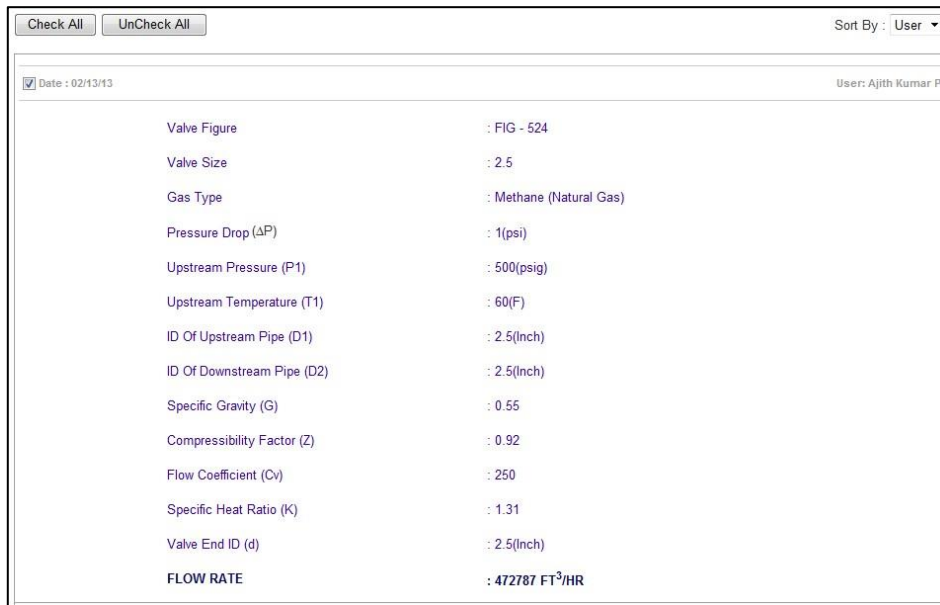
**GAS FLOW RATE** Printed By User: SRAINA

Check All UnCheck All Sort By : User

This option is available to Administrators only, not to users

<input type="checkbox"/> Date : 02/13/13	User: Ajith Kumar P
<input type="checkbox"/> Date : 02/07/13	User: Ajith Kumar P

6. Select the check box of the desired report or just click on the report to view its details, see figure.



<input checked="" type="checkbox"/> Date : 02/13/13	User: Ajith Kumar P
Valve Figure	: FIG - 524
Valve Size	: 2.5
Gas Type	: Methane (Natural Gas)
Pressure Drop ( $\Delta P$ )	: 1(psi)
Upstream Pressure (P1)	: 500(psig)
Upstream Temperature (T1)	: 60(F)
ID Of Upstream Pipe (D1)	: 2.5(Inch)
ID Of Downstream Pipe (D2)	: 2.5(Inch)
Specific Gravity (G)	: 0.55
Compressibility Factor (Z)	: 0.92
Flow Coefficient (Cv)	: 250
Specific Heat Ratio (K)	: 1.31
Valve End ID (d)	: 2.5(Inch)
<b>FLOW RATE</b>	<b>: 472787 FT<sup>3</sup>/HR</b>

The report list may contain more than one report based on the number of flow rate calculations done in the specified period. You can view a single, multiple or all calculated reports. Viewing a single report is discussed already. To view multiple reports, select the check boxes of the required reports. To view all reports, click the **Check All** button available above the report list. You can clear the selection by clicking the **UnCheck All** button.

**Note: The Sort By drop-down is unavailable to the end-users. It is available to the administrators only and is used to sort or arrange the reports according to the user name or the date. This sorting is done by selecting the User or the Date option in this drop-down.**


➤ **Generating the torque calculation reports**


The **Torque Calculations Reports** page is used to generate the report of torque calculations done. This page is displayed if you click **Torque Calculations** option in the reports page. The following example illustrates the generation of torque calculations report. In this page, you need to specify the unit system and the calculation date only.




1. To start with, select **In-Lb** option in the **Unit System** drop-down. If you have done calculations in metric units, select **Metric** in this drop-down.
2. Specify the start date for the report in the **From Date** field.
3. Similarly, specify the end date of the report in the **To Date** field.
4. Next, click the **View** button; a list of torque calculation report(s) is displayed in the web page.

**NORDCALC™ :: Torque Calculation Reports**

Unit System :

From Date :  

To Date :  

---

**Torque Calculation** **Printed By User: SRAINA**

Sort By :

<input type="checkbox"/>	Date : 02/11/13	User: Ajith Kumar P
<input type="checkbox"/>	Date : 02/11/13	User: Ajith Kumar P

5. Select the check box of the desired report or just click on the report to view its details, see figure.

<input type="button" value="Check All"/> <input type="button" value="UnCheck All"/> <span style="float: right;">Sort By : User ▾</span>	
<input checked="" type="checkbox"/>	Date : 02/11/13 <span style="float: right;">User: Ajith Kumar P</span>
Valve Figure :	1949
Valve Size :	4
Differential Pressure (psi) :	41.3357570107257
Sealant :	862
Sealant Temperature (F) :	244.26111111111111
Operation Time (Sec) :	15
Yield Torque (in-lbs):	1112.448665718
Stem Torque :	224 Nm
Wormshaft Torque :	20 Nm
Torque includes 1.3 safety factor.	

This report contains information about the valve figure, valve size, pressures, sealant, and torques and so on.

### ➤ **Generating the blowdown calculation reports**

The **Blowdown Calculations Reports** page is used to generate the report of the Blowdown Time and the Valve & Riser Sizing calculations done. This page is displayed if you click **Blowdown Calculations** option in the reports page. The generation of both these reports is discussed next.

#### **1. Blowdown time report**

The following example illustrates the generation of Blowdown Time calculation report. In this page, you need to specify the unit system, calculation date and type of calculation.

1. To start with, select **In-Lb** option in the **Unit System** drop-down. If you have done calculations in metric units, select **Metric** in this drop-down.
2. Specify the start date of the report in the **From Date** field.
3. Similarly, specify the end date of the report in the **To Date** field.
4. Select the **Blowdown Time** option in the **Calculation Type** drop-down.
5. Next, click the **View** button; a list of blowdown time calculation report(s) is displayed in the web page.



- Select the check box of the desired report or just click on the report to view its details, see figure.

**NORDCALC™ :: Blowdown Calculation Reports**

Unit System : In-Lb

From Date : 13-02-2013

To Date : 20-02-2013

Calculation Type : Blowdown Time

**BLOWDOWN TIME** Printed By User: SRAINA

Sort By : User

<input type="checkbox"/> Date : 02/20/13	User: Ajith Kumar P
<input type="checkbox"/> Date : 02/13/13	User: Ajith Kumar P

Sort By : User

<input checked="" type="checkbox"/> Date : 02/06/13	User: Ajith Kumar P
---	---------------------

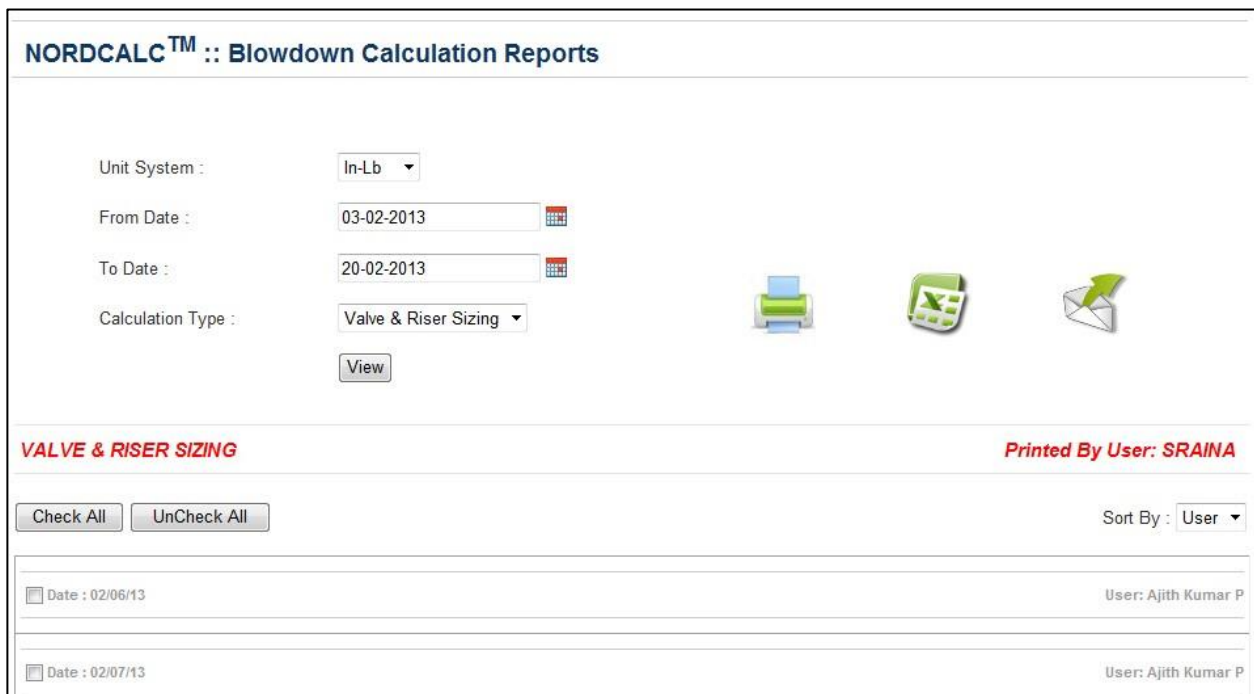
Valve Figure :	2249
Valve Size :	6
Gas Type :	Methane (Natural Gas)
Riser Pipe ID (d) :	6 (Inch)
Riser Pipe Length (L) :	6 (ft)
Initial Gas Pressure (Pi) :	1500 (psig)
Gas Temperature (T) :	600 (F)
Gas Volume (Vo) :	500 (cu.ft.)
Main Pipe Inside dia :	NA (inch)
Main Pipe Length :	NA (miles)
Final Pressure (Pf) :	30 (psig)
Molecular Weight (Mw) :	16.04
Specific Heat Ratio (k) :	NA
Compressibility Factor (Z) :	1.00
Specific Gravity (G) :	NA
Blowdown Coefficient :	1
Isentropic Comp. Exp. :	1.48054892
<b>BLOWDOWN TIME :</b>	<b>0.19992 min</b>

This report contains information about the valve figure, valve size, type of fluid, dimension, pressures, temperatures, blowdown time and so on.

## 2. Valve & riser sizing calculation reports

The following example illustrates the generation of Valve & Riser Sizing calculation report. In this page, you need to specify the unit system, calculation date and type of calculation.

1. To start with, select **In-Lb** option in the **Unit System** drop-down. If you have done calculations in metric units, select **Metric** in this drop-down.
2. Specify the start date of the report in the **From Date** field.
3. Similarly, specify the end date of the report in the **To Date** field.
4. Select the **Valve & Riser Sizing** option in the **Calculation Type** drop-down.
5. Next, click the **View** button; a list of valve and riser sizing calculation report(s) is displayed in the web page.



**NORDCALC™ :: Blowdown Calculation Reports**

Unit System :

From Date :

To Date :

Calculation Type :

**VALVE & RISER SIZING** *Printed By User: SRAINA*

Sort By :

<input type="checkbox"/>	Date : 02/06/13	User: Ajith Kumar P
<input type="checkbox"/>	Date : 02/07/13	User: Ajith Kumar P

6. Select the check box of the desired report or just click on the report to view its details, see figure.

Check All    UnCheck All
Sort By : User ▾

---

Date : 02/20/13
User: Ajith Kumar P

Gas Type : Methane (Natural Gas)

Riser Pipe Length (L) : 20 (ft)

Initial Gas Pressure (Pi) : 500 (psig)

Gas Temperature (T) : 60 (F)

Gas Volume (Vo) : 500 (cu.ft.)

Main Pipe Inside dia : NA (inch)

Main Pipe Length : NA (miles)

Blowdown Time (t) : 3.57 (min)

Final Pressure (Pf) : 30 (psig)

Molecular Weight (Mw) : 16.04

Specific Heat Ratio (k) : NA

Compressibility Factor (Z) : 0.99

Specific Gravity (G) : NA

Isentropic Comp. Exp. (Γ) : 1.35929912

	Valve Size	Valve Figure	Blowdown Time
A	2 in	20545	3.56 min
B	2 in	20549	3.56 min
C	2.06 in	76505	3.56 min

This report contains information about the type of fluid, riser dimensions, pressures, temperatures, blowdown time and so on.

**For more information about NORDCALC™ application, please contact:**

Flowserve Sulphur Springs Operations  
 1511, Jefferson Street,  
 Sulphur Springs, TX 75482  
 E-mail: [nordstromquotes@flowserve.com](mailto:nordstromquotes@flowserve.com)  
 Phone: 1-800-225-6989  
 Fax: 903-439-3411