

# **MAXIMATOR®**

## **Maximum Pressure.**

High Pressure Technology • Testing Equipment  
Hydraulics • Pneumatics



**Best Practice**  
**Double Block and Bleed Needle Valves**  
**Type: DBBNV & DBBV**

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## Maximum Pressure.

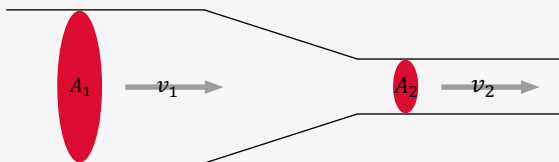
## Double Block and Bleed Needle Valves Information

Double Block and Bleed Needle valves are valves that combine for example two needle valves in one block with a relief valve. This saves space, installation time and reduces leakage possibilities to a minimum. These valves are often called double block and bleed valves and are used, among others, for double shut-off and metering applications.

Changing the geometry within a flow cross-section is an undesirable effect in many applications. For this reason, Maximator GmbH has developed valves with a full nominal size (full bore) in addition to double block and bleed valves with a reduced nominal size. A full nominal size means that the connections as well as the inner bores have the same diameter. It follows that there is no reduction of the flow cross-section inside the valve body. For example, the nominal width of a DBBV with 9/16" connections is 7.9 mm. For a 9/16" DBBNV, it is 2.7 mm. In the following section, the underlying factors are examined in more detail.

### continuity equation of fluid mechanics

In reality, no fluid is truly incompressible, as the density of any real fluid can be changed by pressure. In fluid mechanics, however, we usually treat fluids as incompressible for practical purposes in order to simplify the calculation of flow-relevant parameters.



According to the law of conservation of mass, it is assumed that the mass flow entering a flow cross-section is equal to the mass flow leaving it during a period of time. The mass flow in a period of time comes from the product of the density  $\rho$  and the deviation of time of the volume  $V$ . The change in volume during the time period results out of the product of the flow rate  $v$  and the surface area  $A$ .

By substituting this, the continuity equation of fluid mechanics is obtained.

$A$  = flow cross-section

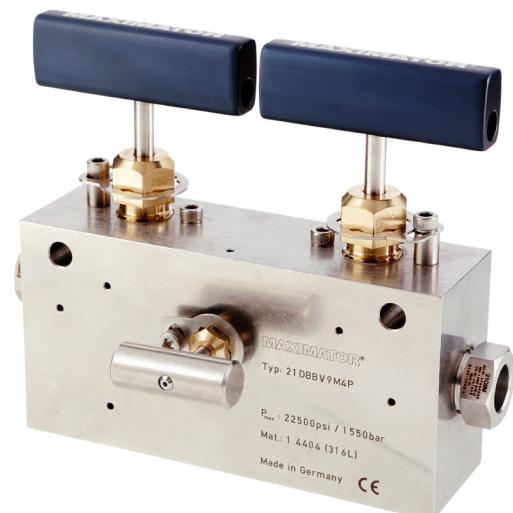
$$\rho_1 \times v_1 \times A_1 = \rho_2 \times v_2 \times A_2$$

Referring to the assumption of incompressible fluids, this results in the following:

$$v_1 \times A_1 = v_2 \times A_2$$

If the cross-section of a pipeline is changed, the flow rate also changes equivalently:

$$v_2 = \frac{v_1 \times A_1}{A_2}$$



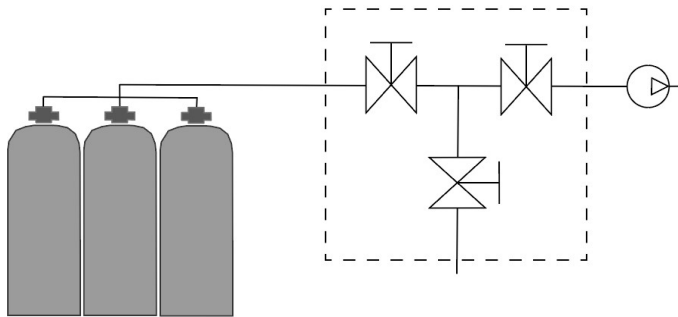
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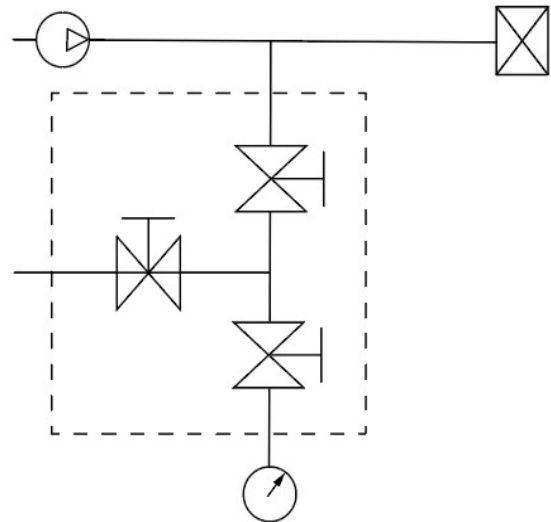
## Maximum Pressure.

## Double Block and Bleed Needle Valves Applications

Application examples for DBBV (full nominal size)



Application examples for DBBNV (reduced nominal size)



DBBV, Double Block and Bleed Valves with full nominal size can be used directly in the process without influencing its parameters. Among others, they have the task of double shut-off with the option to measure leakage of the valve seats.

DBBNV, i.e. Double Block and Bleed Valves with reduced nominal size are often used in a branch line of the process for measuring applications.



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## Maximum Pressure.

## Double Block and Bleed Needle Valves Applications

### Application examples for DBBV (full nominal size)

- A - Pressure gauge
- B - Outlet
- C - Inlet
- D - Drain into container

- » Valve has the task of double shut-off
- » Fluid flows from C to B
- » S3 is closed, S1 and S2 are open
- » Process is completed and S1 and S2 are closed
- » S3 is opened
- » Remaining fluid can flow off via D
- » Space between S1 and S2 is relieved

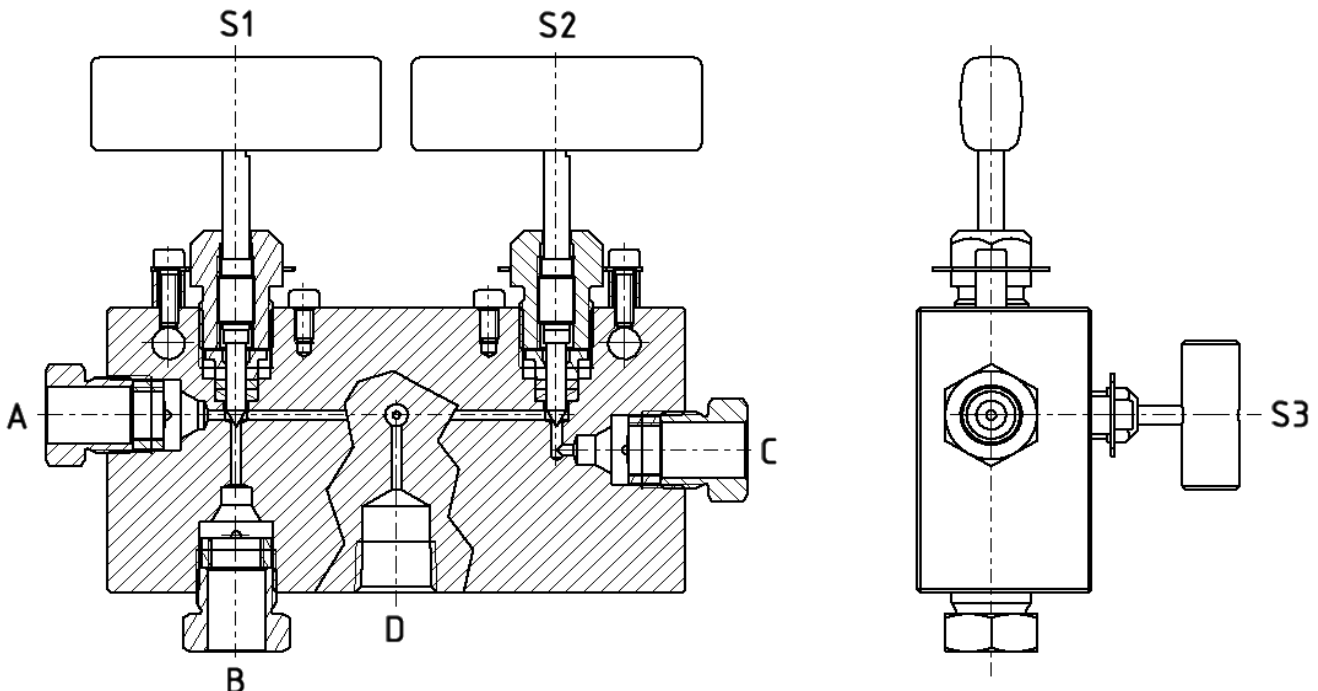
**Advantage:** When S1, S2 and S3 are closed, the leakage of the valve seat of S2 can be monitored via A and the valve body can be checked for complete relief.

### Application examples for DBBNV (reduced nominal size)

- A - Output test item
- B - Pressure gauge
- C - Inlet
- D - Discharge test item

- » S1 + S2 open, S3 closed, a pressure gauge for test monitoring is connected to B
- » Test fluid flows from C via A into the test item
- » Test item is put under test pressure, S2 is closed
- » Test takes place
- » S3 is opened; test fluid can escape via D
- » Test item can be dismantled

**Advantage:** If the pressure gauge needs to be replaced, this can be done by shutting off S1 in the unloaded stage. The process does not have to be interrupted.



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# **MAXIMATOR<sup>®</sup>**

## **Maximum Pressure.**

### **Double Block and Bleed Needle Valves**

### **Applications**

**Oil & Gas Industry (Christmas Tree Injection)**

**Measuring applications with pressure relief**

**Hydrogen Technology**

**Chemical Injection Technology**



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### Double Block and Bleed Needle Valves

#### Overview

Catalogue number	Nominal size	Connection size	Orifice in. (mm)	Relief connection sizes	Pressure
21DBBNV4M	full	4M	0,11 (2,74)	4P 6P 8P 9P 4M 6M	1550 bar (22.500 psi)
21DBBNV6M	reduced	6M	0,11 (2,74)		
21DBBV6M	full	6M	0,201 (5,1)		
21DBBNV9M	reduced	9M	0,11 (2,74)		
21DBBV9M	full	9M	0,307 (7,8)		
21DBBNV9H	reduced	9H	0,11 (2,74)		
21DBBV12M	full	12M	0,438 (11,1)		
21DBBV16M	full	16M	0,562 (14,3)		

\* The relief connection must not be selected larger than the process connection.



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## Maximum Pressure.

## Double Block and Bleed Needle Valves

Full control at any moment

### Advantages of the DBB...-series

- » Proven high pressure technology
- » Non-rotating stem
- » Application-oriented material selection
- » Huge selection of connection sizes
- » Full and reduced nominal size
- » Metal-seated valve seats

### Your benefits



#### Compact Design

Reduced size by combining components in one block



#### Increased Availability

Reduced leakage due to less connection points



#### Application-orientation

Full or reduced nominal size as required



#### Reliability

Due to metal-sealing connections



#### Flexibility

Connection sizes from 1/4" to 1"

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## On your side everywhere

Maximator is one of the leading companies providing high pressure equipment up to 25,000 bar. The standard air driven Maximator boosters have been used in hydrogen applications for over 20 years.

Maximator GmbH, with its company headquarter in Nordhausen, has been extremely successful worldwide for more than five decades.

With our products and innovative system solutions, we are the long-standing partner of companies of repute in the automotive and supplier industry, as well as the life science, chemical and mechanical engineering, energy, oil and gas industry sectors.

With our international partner companies, experienced experts in high-pressure technology are always ready to assist you. We have compiled detailed contact information for our international partners which you can find on our website at:

[www.maximator.de/worldwide+distribution](http://www.maximator.de/worldwide+distribution)

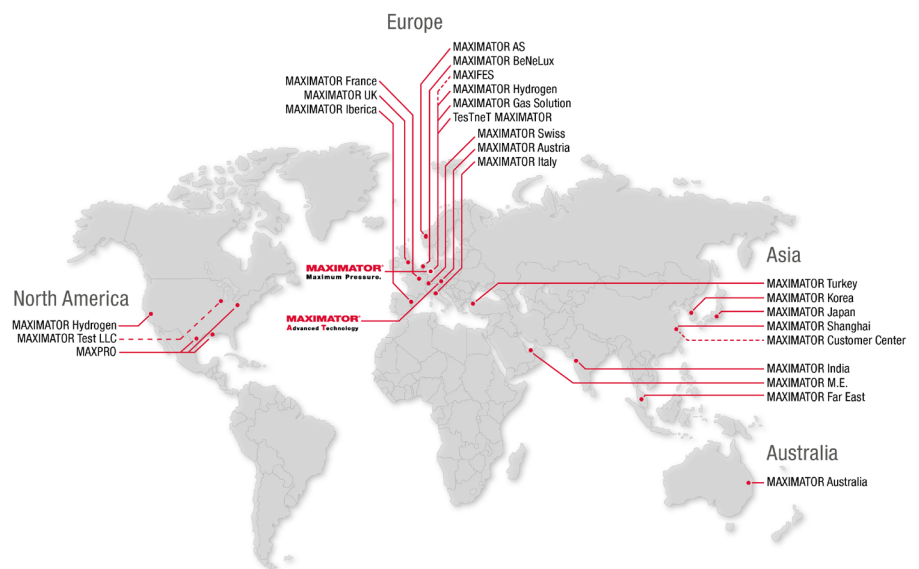
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