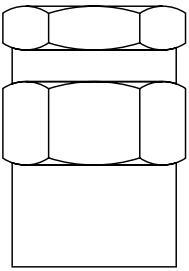
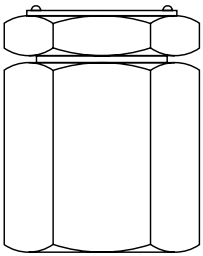
IM-P019-05
ST Issue 2

VB14 and VB21
Vacuum Breakers
Installation and Maintenance Instructions



VB14



VB21

1. General safety information

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

Isolation

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

Pressure

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

2. General product information

2.1 General description

The **VB14** is a small purpose designed vacuum breaker manufactured in brass for general purpose applications on condensing vapour (steam) or liquid systems on pressures up to 14 bar g (203 psi g).

The **VB21** is a small purpose designed vacuum breaker manufactured in stainless steel for general purpose applications on condensing vapour (steam) or liquid systems for pressures up to 21 barg (304 psi g).

Note: For further information see the following Technical Information Sheet, TI-P019-02.

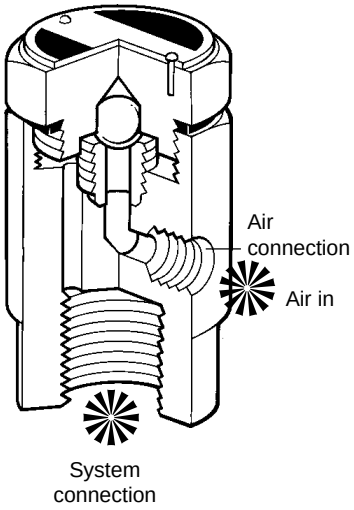


Fig. 1 VB14

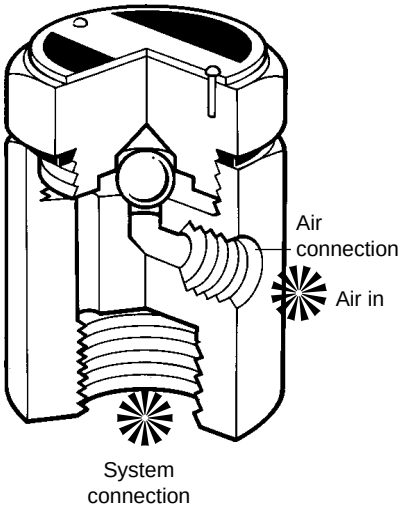


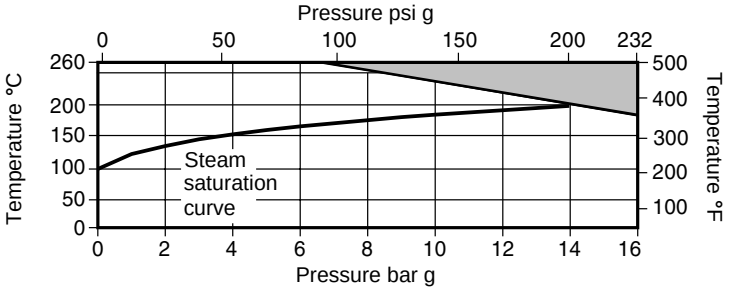
Fig. 2 VB21

2.2 Sizes and pipe connections

VB14 and VB21	**½"** (system connection) screwed BSP or NPT
	⅛" (air inlet connection) screwed BSP or NPT

2.3 Pressure / temperature limits

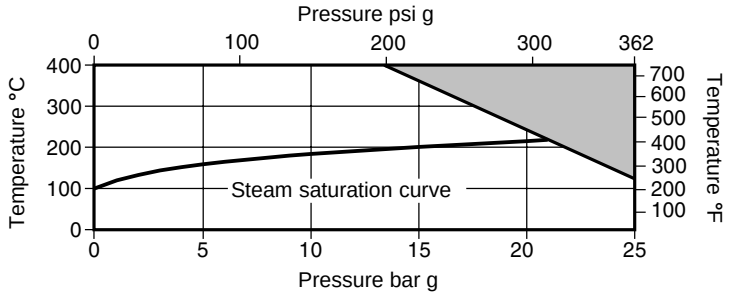
VB14



The product **must not** be used in this region.

Body design conditions		PN16	
PMA	Maximum allowable pressure	16 bar g @ 180°C	(232 psi g @ 356°F)
TMA	Maximum allowable temperature	260°C @ 7 bar g	(500°F @ 101 psi g)
Minimum allowable temperature		-196°C	(-321°F)
PMO	Maximum operating pressure for saturated steam service	14 bar g	(203 psi g)
TMO	maximum operating temperature	260°C @ 7 bar g	(500°F @ 101 psi g)
Minimum operating temperature		0°C	(32°F)
Designed for a maximum cold hydraulic test pressure of:		24 bar g	(348 psi g)

VB21



The product **must not** be used in this region.

Body design conditions		PN25	
PMA	Maximum allowable pressure	25 bar g @ 120°C	(362 psi g @ 248°F)
TMA	Maximum allowable temperature	400°C @ 13 bar g	752°F @ 188 psi g)
Minimum allowable temperature		-48°C	(-54°F)
PMO	Maximum operating pressure for saturated steam service	21 bar g	(304 psi g)
TMO	maximum operating temperature	400°C @ 13 bar g	(752°F @ 188 psi g)
Minimum operating temperature		0°C	(32°F)
Designed for a maximum cold hydraulic test pressure of:		38 bar g	(551 psi g)

3. Installation

Note: Before actioning any installation observe the 'Safety information' in Section 1.

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

3.1 Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.

3.2 Determine the correct installation situation and the direction of fluid flow.

3.3 Remove protective covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

3.4 Always install in a vertical position with the system connection of the bottom.

Note: As the equipment is to discharge to atmosphere ensure it is to a safe place, the discharging fluid may be at a temperature of 100°C (212°F).

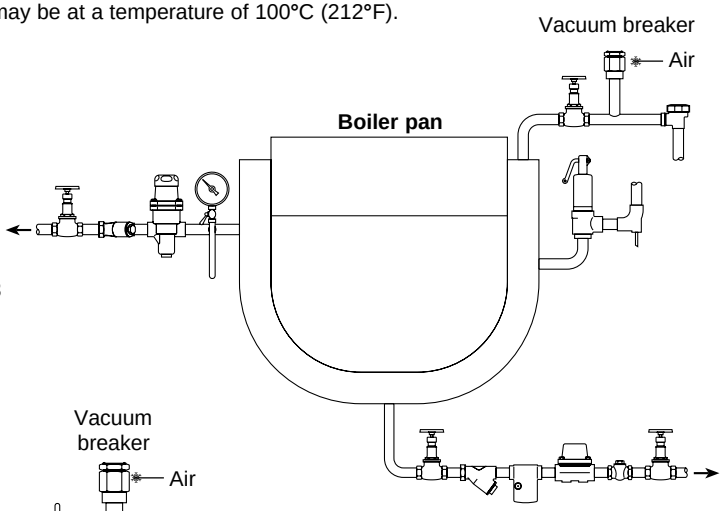


Fig. 3

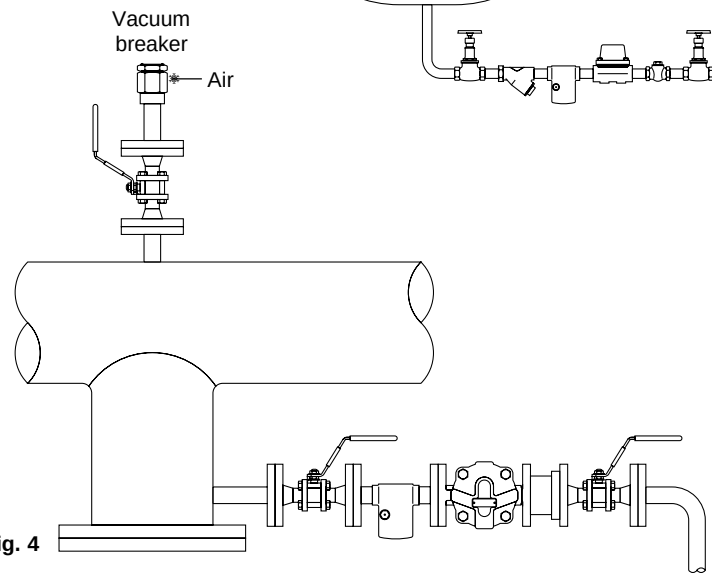


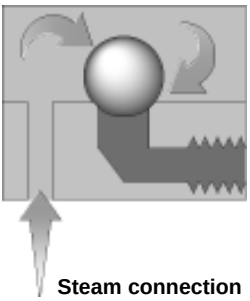
Fig. 4

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

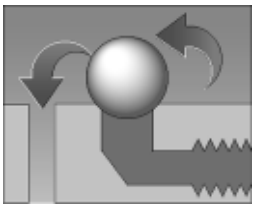
5. Operation

The VB14 and VB21 protect steam plant and process equipment against vacuum and at the same time allow condensate to drain effectively from pipework and storage vessels. The valves have a K_V of 0.52 and require a differential pressure of 4.6 mm Hg to open.



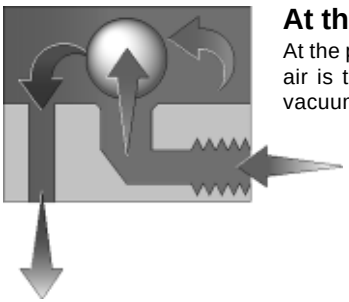
Normal operation

The precision ground stainless steel valve is held firmly on its seat during normal operating conditions ensuring a tight shut-off.



Cooling

During cooling, steam begins to condense resulting in a reduction of pressure. The valve remains on its upper seat until the pressure in the upper chamber falls below the air inlet pressure (usually atmospheric pressure).



At the point of vacuum

At the point of vacuum, the valve will instantly lift of its seat. The air is then drawn in through the upper chamber preventing a vacuum being formed.

6. Maintenance

Note: Before actioning any maintenance program observe the 'Safety information' in Section 1.

The VB14 and VB21 are non-maintainable products. In the event of failure the complete unit should be replaced.

7. Spare parts

There are no spare parts available.

How to order a new product

Example: 1 off Spirax Sarco ½" VB14 vacuum breaker having screwed BSP connections.