

## OPERATING INSTRUCTIONS Automatic Flashback Arrestor W-66 S

in brass according to DIN EN ISO 5175-1, DIN EN ISO 5175-2 for fuel gas and oxygen. BAM certified Certification-No.: BAM/ZBF/009/12 See overleaf.

### Operating and fundamental safety recommendations

The safety device has a manufacturers label which indicates any special requirements.

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#### Foreword

These operating instructions should serve to make the correct operation and safe use of the safety device possible. Attention to the instructions aids danger to be avoided, downtime reduced and operational life and certification to be increased.

The operating instructions should be kept in an accessible place within reach at all times. All persons working with the safety device should read and observe the operating instructions. If in doubt contact the manufacturer. In addition to the specific instructions there may be mandatory regulations or codes of practice regarding the installations or use of the equipment. Any such regulations should be complied with.

All particulars marked  $\Delta$  must be regarded as important safety recommendations.

The safety device meets the requirements of DIN EN ISO 5175-1 and is tested before despatch for safe function.

### 1 Description

The safety device consists of a combination various separate safety elements whose functions are described.

#### 1.1 Non-return valve [NV]

Prevents the gas flowing in the reverse direction to the normal flow.

#### 1.2 Dirt filter

Protects the safety device from dirt particles.

#### 1.3 Flame arrestor [FA]

Prevents the transmission of a flame or flashback from the blowpipe passing through the safety device into the equipment connected upstream.

#### 1.4 Cut-off of gas without flashback [PV]

This is caused by extreme back pressure of upstream pressure when equipment is shut off. The symptom is a warning that operating procedures and/or equipment should be checked.

#### 1.5 Temperature sensitive cut-off valve [TV]

Cuts off gas supply when the safety device is overheated due to an external flame or a flame returning from downstream.

#### 1.6 Explosion relief valve [RV]

Discharges to the atmosphere products of combustion and pressure produced by a flashback.

Opening pressure for fuel gas 7.5-8 bar and for Oxygen and Compressed air 13-14 bar.

### 2 Operating and fundamental safety recommendations

#### 2.1 Authorised operation

The safety device determines the safety level of an outlet point in a pipeline or a single cylinder system.

$\Delta$  A safety device which has been used with compressed air may not be subsequently installed in oxygen equipment.

$\Delta$  A single piece of equipment may be connected to a single safety device.

Check that the safety device has the correct flow capacity for the application.

#### 2.2 Unauthorised operation (examples)

Inappropriate handling and unauthorised operation could result in risk of injury to the operator and other persons as well as damage to the equipment. Some examples:

The safety device may not be used with

gases in the liquid phase and are not certified for use in temperatures below minus 20 °C and above 70 °C.

$\Delta$  A single piece of equipment may be connected to a single safety device.

$\Delta$  A safety device which has been used with compressed air may not be subsequently installed in oxygen equipment.

$\Delta$  The explosion relief is not a safety relief valve to protect the equipment from unpermitted pressure increases in the pipeline system.

$\Delta$  Risk of fire or injury by an escaping flame at the relief valve.

$\Delta$  Risk by noise exposure as a result of a released shock wave at the relief valve.

$\Delta$  Risk by escaping gas at the relief valve in case of a possible malfunction from pressure reducer.

$\Delta$  Modification and dismantling of the safety device is not permitted.

### 3 Marking

The safety device has a manufacturers label which indicates any special requirements!

### 4 Recommendations for operation, maintenance and repair

#### 4.1 Installation

$\Delta$  All components coming into contact with oxygen must be oil and fat free to avoid the risk of explosion.

$\Delta$  Marking of the safety device eg. part number or date of purchase, must not be done with punches or any other method requiring force.

$\Delta$  Check that all connecting threads and seating surfaces are clean and without damage.

The safety device may only be fitted to clean and tested pipelines.

After repairing a pipeline it must be blown through and re-tested before safety devices can be re-fitted.

An isolation valve should be fitted to the pipeline before each safety device.

Hoses DIN EN ISO 3821 should be fitted with suitable hose clips EN 560.

$\Delta$  The fitting of the safety device is unconnected with the type of blowpipe in use.

$\Delta$  The connection of two or several working devices (burners) is not allowable.

The safety device fitted to a pipeline supplied from an acetylene generator may only be used together with an approved gas purifier. A dirt filter in the inlet of the safety device is sufficient in pipelines supplied by acetylene cylinders.

If there is any risk of condensation in a pipeline a moisture separator must be installed.

Wet and dry safety devices should not be installed in the same pipeline wherever possible.

When this is impossible to avoid the safety device should be installed in separate parts of the pipeline protected from the entry water.

The safety device is to install at the end of the pipeline - at the beginning of the hose.

With equipment that is built in or connected permanently to the pipeline the safety device should be fitted into the pipeline as close as possible to the blowpipe (avoid the possibility of overheating).

$\Delta$  After installations all connections should be tested under pressure for leak tightness to atmosphere. Suitable leak protection fluids should be used. Leak protection should not be carried out with a naked flame.

### 4.2 Commissioning

Pay attention to the operation instructions for the equipment to be connected.

### 4.3 Breakdowns

#### 4.3.1 No gas flow

Test the isolation valve before the safety device is open.

#### 4.3.2 Red signal lever opens

If the red signal level is open, the pressure cut-off valve is closed and the gasflow is stopped.

The closing of the pressure cut-off valve could have several reasons.

$\Delta$  The reason is to examine and to eliminate. The lever is not to block !

a) Back feeding of gas due to a faulty blowpipe.

b) Flashback due to insufficient gas flow, check that safety device with sufficient flow has been chosen.

Please check, if a flashback arrestor with an enough high flow is used for the application.

Okay, the flashback arrestor could be plugged by dirt from the distribution pipe or by carbon caused of several flashbacks.

Also water can block the flame arrestor.

The safety device is to repair by the manufacturer.

c) A leak between the ball valve before the flashback arrestor and the non-return valve of the flashback arrestor.

The pressure disappears over the leak in the atmosphere if the ball valve before and behind the flashback arrestor is closed and system was under pressure .

The pressure cut-off valve closes at a pressure difference of max. 1.2 bar between the pressure before the flashback arrestor and the pressure behind the non-return valve. This could be caused by a leak between the ball valve and the flashback arrestor.

$\Delta$  The flashback arrestor is to release of the pressure and the leak is to eliminate before

the flashback arrestor is resetted.

If it is not possible to reset the flashback arrestor, the temperature activated cut-off valve has melted. In that case the flashback arrestor must be replaced.

d) The temperature activated cut-off valve and the gas flow cut-off has operated. If so the Flashback arrestor has served its purpose and will have to be deposed off.

There is nothing to indicate that the temperature activated cut-off valve has operated. Backburn has stabilised internally or the ambient temperature is to high.

### 4.4 De-commissioning

In the event of an outlet point not being used for a long time carefully close the isolation valve before the safety device. At the outlet connection fit a threaded blanking plug.

### 4.5 Maintenance

Annual testing of the non-return valve, leak tightness and flow capacity is recommended.

The test may be carried out by the operator and must be documented. See overleaf.

### 4.6 Repair

$\Delta$  Repairs may be only carried out by the manufacturer.

Model	Gases max. working pressure [bar]	
W-66 S	Acetylene (A)	1.5
	LPG (P) Natural gas (M) Hydrogen (H) Town gas (C)*	5.0
	Oxygen (O)	10.0

\* No BAM certification

pressure [bar]	W-66 S	Q [Nm³/h] for air (20 °C)
0.1	1.4	
0.9	12.8	
1.5	19.5	
10.0	108.0	

### Flow rate RV at dual max. operating pressure

Model	Gases	m³/h
W-66 S	Oxygen O <sub>2</sub>	51.0
	Fuel Gas	18.7

Conversion factors:

Acetylene	x 1.04
Natural Gas	x 1.25
Methane	x 1.33
Propane	x 0.80
Oxygen	x 0.95
Town gas	x 1.54
Hydrogen	x 3.75

**Maintenance guidelines for Unitor Flash Back Arrestors S-55, W-66 and 85-10**

The manufacturing date of the Flash Back Arrestors S-55, W-66 and 85-10 is engraved in a code on their cylindrical sides. It is also stated as MM/YY on the outer packaging.

**Maintenance guidelines for Unitor Flashback Arrestors S-55, W-66 and 85-10**

- Unitor flashback arrestors do not require specific maintenance unless the operator suspects malfunctioning or improper operation.
- Regular maintenance checks of Unitor flashback arrestors can include inlet filter cleaning and checking of the functioning of the non-return valve (checking for back flow by applying dry Nitrogen).
- It is advised to routinely check the inlet filter.
- Flashback arrestors should be replaced every 5 years because the internal condition of the flame arrestor is difficult to judge (also refer to OCIMF SIRE VIQ 7 for Tankers and related vessel).

**Annual verification guidelines for Unitor Flashback Arrestors S-55, W-66 and 85-10**

S-55, W-66 and 85-10 arrestors' Instruction Manuals recommend annual Functionality Test (leak test, back pressure test, and flow test). These are our recommendations, please observe these steps:

- Leak tightness of S-55, W-66 and 85-10 body is normally done together with either the AC-OX fixed system annual leakage test, or as a test of the standard assembly including R-510 regulator. Working pressure is applied. Soapy water is applied externally.
- Back Pressure function is verified by applying 1-2 Bar compressed Nitrogen in the reverse direction.
- Flow Test normally requires dedicated and regularly Certified verification equipment, and it is physically impossible to implement Flow Test within on-board conditions.

Immediate replacement reasons for Unitor AC and OX Flash Back Arrestors is required when :

- Flashback arrestor body does not pass leak tightness test or back pressure test at the working pressure.
- It is faulty, it is older than 5 years, or it is corroded.
- The Flashback Arrestors and Welding Gas Regulators must be replaced every 5 years interval (also refer to OCIMF SIRE VIQ 7 requirements for Tankers and related vessel).

Template for registration of the annual inspection of flashback arrestors:

Flashback Arrestor	Location / Application	Gas Type	Manufacturing Date	Inspected By	Inspection Date	Sign	Remarks

**SAFETY PRECAUTIONS FOR GAS REGULATING EQUIPMENT VERIFICATION ON- BOARD:**

The use of compressed air (probably with oil traces), for testing and/or for cleaning is a source of problems, because later compressed pure oxygen will react violently with these minor amounts of oil. Other safety risks are the use of copper adaptors for acetylene, non-approved secondary pressure hoses, use of faulty pressure regulators, or even not using a pressure regulator and thinking that throttling the pressure by a shut-off valve is possible. Even properly organized guidelines and documentation is not a guarantee against "the human factor" influence. Always follow the instructions of the manufacturers/suppliers in detail, as they have experience in handling these products.



**DECLARATION OF CONFORMITY**

WILHELMSSEN SHIPS SERVICE AS.  
Strandveien 20  
NO-1366 LYSAKER  
Norway

WILHELMSSEN SHIPS SERVICE AS. Herewith declare that the below mentioned products are manufactured conforming to the standards mentioned and meeting all the requirements as below:

Product Number	Product Description	Applicable Standards
1 610 – 5853721	FLASHBACK ARRESTOR AC 8510	EN 730 DIN EN ISO 5175
2 610 – 6824271	FLASHBACK ARRESTOR OX 8510	
3 171 – 183970	FLASHBACK ARRESTOR W-66S ACETYLENE	
4 171 – 302976	FLASHBACK ARRESTOR W-66S OXYGEN	
5 171 – 708537	FLASHBACK ARRESTOR S55 AC	
6 171 – 708545	FLASHBACK ARRESTOR S55 OX	

For WILHELMSSEN SHIPS SERVICE AS.,



Chris Teoh  
Global Product Marketing Manager – Welding & Tools Solutions  
Marine Product, Wilhelmsen Ships Service



**Safety devices**

Certificate N°: BAM/ZBF/009/12  
5<sup>th</sup> Revised version

Hereby it is confirmed by the BAM Certification Body that the

Safety devices  
with the designations and terms of application  
listed in the Annex to this Certificate

of the certificate holder

Wilhelmsen Ships Service AS  
Strandvn 20, Lysaker  
NO 1324 LYSAKER  
NORWAY

meet the requirements of those paragraphs named in the annex to this certificate of the following standards:

- |                 |  |
|-----------------|--|
| ISO 5175-1:2017 | Gas welding equipment – Safety devices – Part 1: Devices incorporating a flame (flashback) arrester                                      |
| ISO 5175-2:2017 | Gas welding equipment – Safety devices – Part 2: Devices not incorporating a flame (flashback) arrester                                  |
| DIN EN 561:2002 | Gas welding equipment - Quick-action coupling with shut-off valves for welding, cutting and allied processes; German version EN 561:2002 |

The contract No. **BAM-ZBF-0008-2012-UNITOR** forms the basis for this certification. The terms and conditions for monitoring of the products are also stipulated in this contract. The products certified by BAM may be labelled with the BAM certification mark „BAM Geprüft und überwacht“ and/or “BAM Certified and under surveillance” together with the certificate number.

The certificate is valid until 23<sup>rd</sup> May, 2024.

for Bundesanstalt für Materialforschung und -prüfung (BAM)  
Unter den Eichen 87,12205 Berlin, 2019-09-30



Dr. R. Schmidt  
BAM Certification Body

Distribution list: 1<sup>st</sup> Certificate holder 2<sup>nd</sup> BAM Certification Body

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CERTIFICATE

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