	<b>Pressure and vacuum vent 937-P 50/1x0,9 Instructions for operating and maintenance</b>	<b>REV 1.0</b>
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For the pressure and vacuum vent type 937-P 50/1x0,9 dimension sheet and pressure drop/volume flow diagram are available.

## 1. Use

Pressure and vacuum valve 937-50/2x0,5/1x0.9 complies with standards

EN ISO 16852:2016	Flame Arresters – Performance requirements, test methods and limits for use
DIN EN 13463 Part 1:2009-07	Non-electrical equipment for potentially explosive atmospheres Basics methods and requirements
DIN EN 13463 Part 5:2004-03	Non-electrical equipment for potentially explosive atmospheres Protection by constructional safety "c"

The general suitability as a deflagration and endurance burn end of line flame arrester when used with inflammable gas/air mixtures and vapour/air mixtures of inflammable liquids of explosion group IIA (standard gap width > 0.9 mm) had been verified by tests executed at the Institute for Safety Technology IBExU GmbH Freiberg and the results were confirmed by the issued EC prototype test certificate **IBExU18ATEX2036 X**.

On principle, for all cases of use the placement conditions, especially the following limits for the operating pressure and temperature have to be considered:

- permissible operating pressure : atmospheric (0,8bar (absolute) to 1,1bar (absolute))
- permissible operating temperature : -20°C to 60°C  
(Surface temperature max. 80% of ignition point)

The following valve insert settings are possible:

- Set-pressure for pressure: 2,5 to 50 mbar \*) \*) factory pre-set default
- Set-pressure for vacuum: 3,0 to 50 mbar \*)

On delivery of the devices the technical parameter of the flame arrester with stating the EC prototype test certificate number are documented in the works test certificate according to EN 10204. In the declaration of compliance it is referred to the accordance with the harmonized standard EN ISO 16852. The maintenance of the basic safety requirements according to directive 2014/34/EU has been confirmed

## 2. Construction

The vent 937-P consists of a cast iron housing (1), equipped with pressure (6) and vacuum valve inserts (9) and a flame arrester elements (2 and 3).

The flame arrester above the pressure valve is sure against endurance burning.

It consists of a covering flange, a grid cage, a star and two metal foil elements.

The foil elements have different directions of winding in its gaps. The gap width amounts 0.5 mm.

For protection against effects of the weather the flame arrester is equipped with a metal sheet cover (14).

In case of endurance burning a clamp of acryl glass (19) will burn down..The metal cover will be opened by torsion springs. That is why an unhindered burning down of the inflammable mixture will be possible.


The vacuum valve is located on a valve seat wich is pressed in an intermediate ring (11).

This intermediate ring is clamped by deflagration flame arrester (3), stud screws (24) and cap nuts (25).

The flame arrester (3) consists of a covering flange and a metal foil element with a gap width amounts 0.9 mm.

Both valve inserts are pre-set for the customer's specific set-up pressure via weight discs at the manufacturer's end. They can either be equipped with FEP foil or a metal surface.

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<b>Approved By:</b>	<b>VO'Hara</b>	<b>Date: 21.03.18</b>	

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### 3. Marking

The information for marking the vent is arranged on the nameplate and an additional hazard sign (page 5/5). The following data are indicated:

#### Nameplate

- name and address of the manufacturer
- type (including version number)
- serial number and year of production
- Number of the certificate (EC prototype certificate-no.)
- EN number
- specific mark for prevention of explosions in connection with the mark indicating the group of devices II, and the letter "G" (for areas where explosive gas, vapour, air mixtures are available)
- explosion group
- CE mark with the number of the indicated inspection authority, which act during production
- set-up pressure for pressure and vacuum valve
- opening pressure for pressure and vacuum valve
- volume flow at opening pressure

#### Hazard sign

- **Warning**            **Flame arresters have installation and application limits**  
**Type designation in accordance with ISO 16852**
- sign for type of flame arrester:            **DEF**    (deflagration)
- ratio  $L_w/D$  (distance to ignition source):        ---    (not applicable)
- burn rate „BC“:                                    **a**        (endurance burning)
- burn time  $t_{BT}$  (only for „BC“ b):                ---    (not applicable)
- explosion group:                                    **IIA**
- operational temperature  $T_0$ :                    **60°C**
- maximum operational pressure  $p_0$ :            **atm.**    (atmospheric)

Warning note:                                    Note: This flame arrester is safe for endurance burning! The use is restricted to pure hydrocarbons! Refer to operating and maintenance instructions!

The metal foil is marked at the outermost wound element, as follows:

- name of the manufacturer
- gap width
- material number
- direction of winding

Example: BSB – 0.5 – 1.4571 – R


### 4. Installation

The arrangement and the installation of the vent into the plant shall be done under observance of the rules applicable to the relevant range of use. Especially the instructions for accident prevention have to be observed. A vertical installation position of the vent has to be kept under any circumstances.

A minimum distance of outlet to external devices has to be adhered, to avoid reduction of volume flow resp. to avoid damage due to flame causing by endurance burning.

This minimum distance depends on local circumstances and has to be specified by operator. Flame arrester for endurance burning must not be equipped with heat insulation.

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The vent is equipped with a flange adapter DN50 PN16 Form C or ANSI 150 RF. While flanging be careful that the sealing face is not damaged and that there is no foreign matter or grease between the flanges for no gap to the atmosphere can occur.

The valve has to be included in the equipotential bonding of the vessel or plant.

**To prevent transportation damage, the valve inserts have been secured with transportation safeguards, which must be removed as follows:**

- Opening cover (14) by loosening the wing screws (20)
- Loosening hexagon nut (23) and lift out flame arrester (2)
- Remove transportation safeguard (corrugated card board) of the bottom valve insert (6)
- Lift out top valve insert
- Remove transportation safeguard (corrugated card board) of the lower valve insert (9)
- Check the bottom valve insert (9) for easy mobility and proper location on the guide bolt at lower flame arrester (3)
- Place the top valve insert (6) upon the top valve seat (5)
- Install flame arrester (2) and pull hexagon nuts (23) tight
- When placing the flame arrester, make sure that the guiding socket is guided properly across the guiding bolt of the top valve insert.
- Swivel in cover (14) and screw in wing bolt (20) in clamp (19)

## 5. Maintenance

The maintenance includes a periodic visual control of the valve and the flame arrester element with regard to contamination and appearance. The intervals for the maintenance works depend on the operating conditions and the kind how the individual media tend to contamination.

### Flame arrester element 2x0.5 and pressure valve:

- Opening cover (14) by loosening the wing screws (20)
- Loosening hexagon nut (23) and lift out flame arrester (2)
- Cleaning as stated below
- Lift out top valve insert (6)
- Check top valve seat (5) and valve insert (6) as stated below
- Place the top valve insert (6), flame arrester (2) and cover (14) as described in 4.

### Flame arrester element 1x0.9 and vacuum valve:

- Loosening cap nuts (25) and take down flame arrester element (3)
- Cleaning as stated below
- Pull out the intermediate ring (11) with valve seat and valve insert (9)
- Check top valve seat and valve insert as stated below
- Check O-ring (12), substitute if necessary
- Mounting of valve insert, intermediate ring and flame arrester element in reverse order
- Pay attention, that guiding bolt of flame arrester correctly fit in guiding socket of valve insert.
- As well metal foil element of flame arrester has correctly fitted into the housing (1), that no gap formed between housing and flange of flame arrester.

### Cleaning of flame arrester elements:

For purposes of cleaning, the flame arrester element must be uninstalled as described above:

In case of minor contamination the flame arrester element shall be blown up with compressed air or hot vapour. In case of major contamination a flushing with a cleaning agent can be carried out. After cleaning all parts which had been wetted by a cleaning agent; shall be blown dry.

During the cleaning works no mechanical modifications may be done on the flame arrester element or on the housing parts of the flame arrester.

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On principle, the flame arrester element has to be replaced by a new one, if:

- a fire occurred at the flame arrester element;
- loosening or distortions in the structure of the metal foil elements can be recognized;
- corrosion damages at the metal foil elements have been detected;
- in case of strongly contaminated metal foil elements, even after cleaning, a residual contamination of more than 30 % of the free flow cross-section remained.

All works in connection with repair and replacement of components shall be executed only by trained and authorized skilled personnel.

#### **Cleaning / inspection of valve seats and valve inserts:**

During maintenance work, valve seats and valve discs have to be checked for contamination and damages as well. Uninstalling and re-installing are to be performed as described under 4.

The valve seat must be examined in particular for intactness of the sealing surface. Damages to the valve seat are to be eliminated by expert grinding and smoothing.

Depending on the sealing system in use on the valve inserts, make sure that either the FEP-seal or the metallic sealing surface are not damaged. Damaged valve discs or seals must be replaced by new ones.

It is recommended to hold spare flame arrester elements and the respective seals ready for each vent.

In case of replacement of structural units only original BS&B spare parts listed in the spare parts list may be installed to ensure the required safety.

## **6. Spare part list**

Table : Spare parts 937-E 50/1x0,9

<b>Item No.</b>	<b>Designation</b>	<b>No.</b>	<b>Material</b>	<b>Order-No.</b>
2	Flame arrester element 2x0,5; incl. cover, mounted	1	NSt	FET15415210
3	Flame arrester element 1x0,9; mounted	14	NSt	FET15415212
6	Pressure valve insert with FEP-sealing *)	1	NSt/FEP	FET15415216
	- " - with metal seal face *)	1	NSt	FET15415226
9	Vacuum valve insert with FEP-sealing *)	1	NSt/FEP	FET15415217
	- " - with metal seal face *)	1	NSt	FET15415227
12	O-ring	1	NBR	802006600
	O-ring	1	FPM	792041100
	O-ring	1	EPDM	792066100
	O-ring	1	FPM/FEP	792065300
19	Clamp (acryl glass)	1	K	FET999941000
26	Condensate outlet device	1	NSt	FET992766000

\* Valve inserts without added weights

#### Material marks

St ... steel	LM ... light metal	FPM ... Viton	FEP .. Fluoride plastic
NSt ... stainless steel	K ... plastic	NBR ... Perbunan(N)	PTFE .. Fluoride plastic

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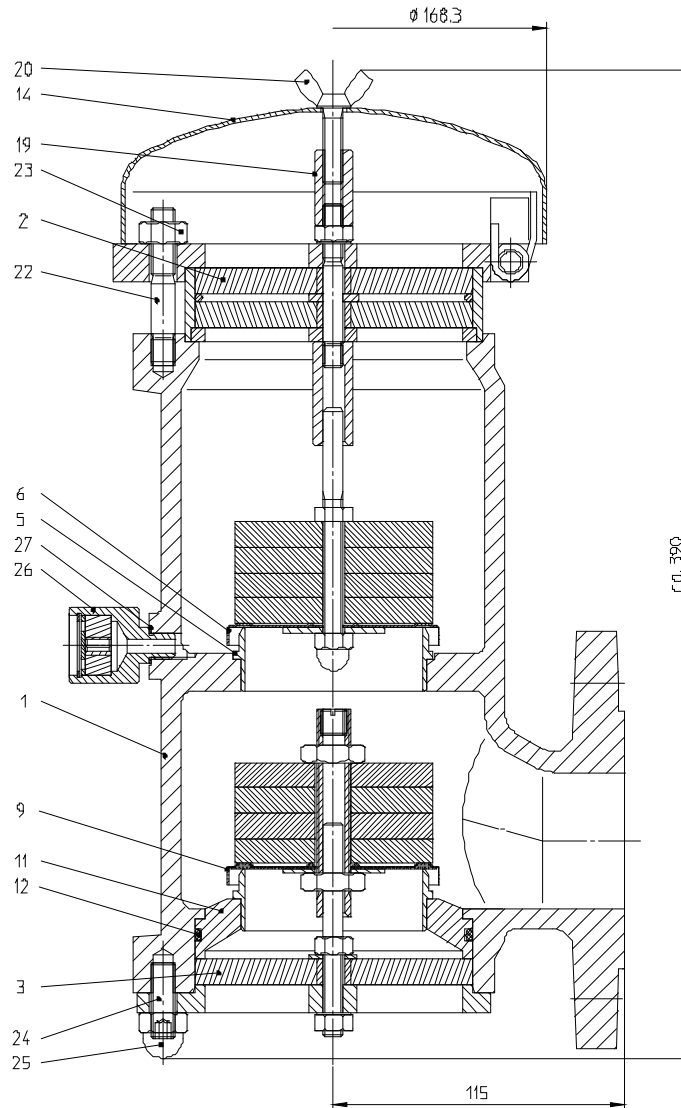


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**Assembly drawing**



**Nameplate**

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Raheen Business Park, Limerick, Ireland.			
<b>Flame Arrester ISO 16852</b>		Ex G IIA	
Type	937-P 50/1x0.9		
Cert. No.	IBExU18ATEX2036 X		
Ser. No.	xxxxxx / xxxxxx	DN	50
	Set Pressure	Opening Pressure	Volume Flow Rate*
Vacuum	-xx	+xx	xxxx
Pressure	-xx	+xx	xxxx
	mbar		m <sup>3</sup> /h
	mbar		m <sup>3</sup> /h
* Air in standard conditions at opening pressure			

**Hazard sign**

Warning	Flame arrester have installation and application limits. Type design in accordance with ISO 16852		
DEF	L <sub>q</sub> /D = ---	BC: a	t <sub>BT</sub> = --- min
	Ex G IIA	T <sub>0</sub> = 60 °C	p <sub>0</sub> = atm.

**Warning note**

Note: This flame arrester is safe for endurance burning! The use is restricted to pure hydrocarbons! Refer to operating and maintenance instructions!

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