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# **OPERATING & MAINTENANCE INSTRUCTIONS FOR DUST / FUME EXTRACTION DUCTWORK**

CUSTOMER PROJECT REF:  
DUSTAIR JOB REF. E            / WO.  
PLANT ITEM No.  
SUPPLY DATE:

*Issue 1, March 2011*

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## **BEFORE USING THE EQUIPMENT**

### **General**

The manufacturer does not accept any liability for damage to the product or personal injury caused by non-observance of the safety instructions in this manual, or by negligence during installation (where installation is not performed by Dustair Ltd.), use, maintenance and repair of this product.

Specific working conditions and / or connected equipment may require additional safety instructions. Please contact your supplier or Dustair Ltd if you detect a potential danger when using this product.

**The user of this product is always fully responsible for observing the local safety instructions and regulations.**

**Observe all safety instructions and regulations which apply to machinery or similar connected items.**

### **User Manual**

- All persons using this product must be familiar with the contents of this manual and observe the instructions herein.
- The management should instruct the personnel in accordance with the manual and observe all instructions and directions given.
- Never change the order of the steps to perform.
- Always keep a copy of this manual with the product.
- This product should be used only by authorized, trained personnel.
- This manual is intended to cover a range of units. Therefore some aspects may not apply to your particular unit.

## DUCTWORK - GENERAL DESCRIPTION

Dustair manufacture bespoke ductwork as well as supplying proprietary ductwork components. In addition, a range of wet and dry dust filter units and fans are available for a wide variety of applications.

Light to medium dust and/or pressure duty applications (e.g. general fume, woodwaste, etc.) usually require only light gauge ductwork, typically between 1mm and 2mm wall thickness and constructed using galvanized mild steel. Heavy duty applications (e.g. foundry, sand blasting, recycling plants) normally require heavier gauge ductwork with a wall thickness between 2mm and 6mm typically, which tends to be painted mild steel plate or stainless steel.

Light gauge ductwork may be supplied as 'spiral' wound, clip together, flanged or bespoke. Clip-together type ductwork (available up to 3mm wall thickness) offers the advantage of easy disassembly for cleaning, maintenance or future modification. Heavy gauge ductwork is made to order and is usually flange jointed. Additional requirements for a ductwork system may include wear protection, explosion relief, earth bonding, additional access/cleaning points, etc.

Circular ductwork can withstand higher pressures than rectangular, typically. It is normal for rectangular ductwork to incorporate some means of stiffening on its exterior, usually by way of flat steel sections welded edge on for heavy gauge ducts, or diagonal crease folding of the duct surfaces on lighter gauge ducts.

The dust or fume extraction system will comprise of a suction fan, which may be stand-alone or integral within a filter unit, the ductwork itself and, more often than not, some form of capture hood arrangement.

The ductwork will have been sized according to an in-duct velocity suitable for conveyance of the dust or fume being exhausted. General guideline parameters for the duct systems are:

Fume extraction in-duct velocity: 2,500 feet per minute (12.5 m/s)  
Dust extraction in-duct velocity: 4,000 feet per minute (20 m/s)

Once installed and commissioned, the ductwork system should not be modified in any way without prior consultation of the supplier, as extraction performance of the entire duct system could be compromised as a result.

## HANDLING & INSTALLATION

In normal circumstances the ductwork would be supplied and installed by Dustair Limited. Our engineers are experienced in the mechanical installation of ductwork systems, fans and filtration equipment. However, on some occasions the end user may wish to perform the installation themselves or it may be arranged through an agent.

Care must be exercised when moving or lifting any ductwork, however small. Lengths of duct sections can be in excess of 3m, which could cause injury if not handled correctly. The light gauge ductwork tends to be manageable between two operatives up to approximately 500mm in diameter. Installation engineers must assess the mass of ductwork components prior to attempting any manual lifting. Proprietary lifting equipment is readily available for hire which would assist in this task.

In general, ductwork is normally run horizontally at high level, either supported from cantilever brackets fixed to the adjacent building structure or suspended on rods or similar from the overhead building structure. Circular ductwork normally has a split ring type clamping clip, whilst rectangular ductwork tends to sit upon a flat steel member or similar. The quantity and positions of the ductwork supports will normally have been designed by Dustair to suit the application and type of duct construction. Therefore, this data should not be ignored or modified by the installer.

### ELECTRICAL

All electrical installations must be carried out by qualified electrical engineers and must be in compliance with current legislation. Details of electrical wiring diagrams, loads and specifications of equipment can be provided upon request, where applicable.

Under normal circumstances any associated fans/filter units are fitted with their own separate electrical starters, however, under some circumstances may be interlinked to the equipment being extracted from to ensure that the unit is running prior to commencement of the running of the machinery. Where the units employ their own individual starters the recommendation would be to ensure that the exhaust unit is running correctly prior to energizing any machinery it is exhausting from and this will normally require manual checking of the system.

The standard of associated electrical equipment (e.g. fans, filter units, etc.) should be rated to an IP55 specification however other systems can be supplied to suit site conditions e.g. explosive/ flameproof environments but must be designed and installed by suitably qualified electrical engineers.

### GENERAL OPERATION

As the ductwork is a static piece of equipment, operating instructions tend to be included with the connected fan or filtration equipment. However, there are some points to note, as follows:-

- Once commissioned, do not adjust balancing dampers (not to be confused with shut off dampers, which can be opened or closed to suit operations)
- Avoid damage to any ductwork
- Do not start fan/filtration equipment with all duct branches completely closed – the duct may implode
- Clean / maintain ductwork as specified

## EXPLOSION VENTING

Note should be taken of the installation and maintenance instructions concerning any proprietary ATEX explosion venting panel(s) fitted to the ductwork and/or an associated filter unit. These proprietary items are usually manufactured by FIKE. Where applicable, the appropriate literature is included within this document and forms part of the overall operating and maintenance instructions. Special attention must be paid to the warning in relation to positioning of the explosion panel(s) where personal injury may occur in the event of the panel(s) bursting.

## PRECAUTIONS IN USE

The ductwork systems are used in the extraction of dust and/or fume from a wide range of industrial processes. Some applications may require special precautions in operating and/or maintenance due to the nature of the materials being conveyed within the duct. Any safety procedures or advice given on material-specific COSHH data sheets should be adhered to by the end user. General first aid advice is given here as a supplement to specific requirements for substances in use on site. Consult the substance data sheets for more advice.

### Splashes to the skin

1. Irrigate the affected area thoroughly with copious quantities of running water and continue for at least 10 minutes or until satisfied that no chemical remains in contact with skin. The removal of solvents, solutions and chemicals known to be insoluble in water will be facilitated by the use of soap.
2. Remove all contaminated cloth taking care not to contaminate yourself in the process.
3. Refer for medical advice to the nearest doctor or if warranted arrange transport to hospital. Provide information to accompany the casualty on the type of chemical responsible and brief details of the first aid treatment administered.

### Splashes to the eyes

1. Irrigate the eye thoroughly with copious quantities of gently running water from either a tap or eye wash bottle and continue for at least 10 minutes. If only one eye is affected do not allow contaminated water to flow into the uncontaminated eye.
2. Ensure the water bathes the eyeball by gently opening the eyelid and keeping them apart until treatment is complete.
3. All eye injuries from chemicals require medical advice. Arrange transport to hospital. Provide information to accompany the casualty on the type of chemical responsible and brief details of the first aid treatment administered.

### Ingestion of poisonous chemicals

1. If the chemical has been confined to the mouth then give large quantities of water as a mouth wash. Ensure that the mouth wash is not swallowed.
2. If the chemical has been swallowed then give copious amounts of water or milk to drink to dilute it in the stomach.
3. **DO NOT INDUCE VOMITING!**
4. Arrange for immediate transport to hospital. Provide information to accompany the casualty on the type of chemical ingested with brief details of the first aid treatment administered and if possible an estimate of the quantity and concentration of the chemical consumed.

### GENERAL MAINTENANCE

#### **IMPORTANT NOTE!**

**At all times when carrying out maintenance and inspection of the duct systems, the fan and any associated units must be electrically isolated and a minimum of three minutes must be allowed from the stopping of the fan before opening any access doors. This ensures that any rotating or mechanical parts and air flow will have come fully to rest before attempting inspection or maintenance.**

#### Daily

- (i) Inspect the local exhaust ventilation system to ensure that there are no blockages or accumulation of material within the system. This includes inspection adjacent to any bends, flexible joints or within hood connections, as blockages will prevent the correct operation of the equipment. Accumulation in horizontal ducts can cause failure of supports due to the weight of material, with possible catastrophic results.
- (ii) Inspect the mechanical integrity of the dust extraction system to ensure that there are no perforations, breaks or wear holes within the equipment. This would include the inspection of any flexible hoses to ensure that these are not perforated, as again any air leakage will reduce the efficiency of the exhaust system.

#### Monthly

Visually inspect the ductwork and associated extraction components for signs of fatigue, wear or other faults. This is of particular importance in systems conveying abrasive dusts or large particulate where constant abrading of surfaces may occur. In such instances it is wise to perform these checks more frequently.

### Six Monthly

- (i) The impellor of any connected fan should be inspected with the aid of a torch for any signs of material build up on its blades. This can be done by electrically isolating the fan motor, then removing the bolted access panel on the outside of the curved fan casing. If desired, the impeller can be removed externally by unbolting of the motor mounting plate. By suitably supporting the motor, the impellor, shaft and motor can be removed as one complete unit. It is recommended that the customer contact Dustair engineers before attempting removal of the motor or fan impeller assembly. It is inevitable that, over time, some build up of material will occur on the blades of the fan impellor. During normal operation a noisy or vibrating fan is indicative of this and Dustair should be contacted in such a situation. **DO NOT ALLOW THIS TO GO UNCHECKED – IT WILL GET WORSE!**

### Annually

In addition to the foregoing, it is a requirement of Health and Safety / C.O.S.H.H. that an extraction system be tested for correct and safe operation every fourteen months or less.

During such tests pressure and flow rate readings are taken at various points on the ductwork system in order to ascertain correct and efficient operation. Differential pressure readings are also taken on any connected filter unit to assess its condition and operational efficiency.

Dustair Limited can provide engineers and equipment to carry out any of the above operations, with prices available upon request.



## Appendix I

### FAN OPERATION & MAINTENANCE INSTRUCTIONS

See fan manufacturer's Instruction Manual

## Appendix II

### PROPRIETARY EQUIPMENT OPERATING & MAINTENANCE INSTRUCTIONS

See also any individual instruction manuals



# INSTALLATION AND MAINTENANCE INSTRUCTIONS

## Explosion Vents CV, CV-S, CV-CF, CV-H

### General

An explosion vent is a pressure relief device, designed to give an instantaneous opening at a predetermined pressure to a closed system. Its purpose is to protect this system from excessive pressures caused by dust or gas explosions.

**Warning:** Do not locate the vent assembly where people are exposed to the vent itself or to the area above or in front of the vent as they may be injured by the escaping pressure, fire, noise, chemicals, and/or fragmenting particles. The location of the explosion vent must be such that the discharge cannot be the ignition source of secondary explosions. Interfacing equipment and/or machinery must also be protected.

### Installation

Rectangular explosion vents are mounted into lightweight angular frames. Circular explosion vents are also available for mounting in the lightweight angular frames or weldneck flanges in accordance with DIN or ANSI standards. Explosion vent frames can be supplied by Fike or can be constructed by customer, in which case Fike will supply construction drawings. Frames are available in different configurations and can be bolted or welded to the system.

**Important:** When explosion vents are installed horizontally, the use of drainage holes in the holddown frame are required. When installing CV vents support/safety bars placed across the vessel opening flush with the mounting flange, is to be considered to prevent the risk of persons falling through the opening and increase the service life of the vent.

**Warning:** Provisions have to be taken to prevent that personnel can stand or walk on explosion vents. Furthermore it must be prevented that goods or products can be left on top of explosion vents.

**Installation:** Use base of explosion vent frame as template to indicate placement of explosion vent on vessel to be protected. After cutting relief area and drilling mounting holes, bolt the base into place. If using studs, be sure the threads are clean and are not damaged. Place the vent carefully on the base; position holddown frame on vent.

Fit nuts or fit bolts and nuts. Studs and nuts should be free running and coated with high temperature light oil or grease. Torque to values specified on the explosion vent tagplate (fig.1/2). The explosion vent tagplate should always be placed to the atmospheric side. If the explosion vent is equipped with a vacuum support, the bulged side is the atmospheric side. When the system operates at other than atmospheric pressure, it is recommended that sealant material (gasket) or other means be used to prevent leakage. The gasket should be dimensioned so that it is flush with the inside edge of the frame.

The recommended gasket material is to be selected in accordance with the process requirements and should have similar compression characteristics as provided by non-asbestos material (type IT, DIN 2690-2691).

**Welded installation:** Similar to above except base is welded to vessel.

**Caution:** Handle explosion vent with extreme care. Do not bend, poke or in any way distort the vent membrane.

### Insulation

Fike explosion vents can be supplied with 2 optional types of insulation (Armaflex or ceramic fibre). If ceramic fibre, please consult additional installation instructions 8.8350.00.

<b>CE-0035</b>		<b>DANGER</b>		EN ISO 4126-2
Upon Venting Release of Pressure May Cause Injury				
VENT DESIGNED TO RUPTURE IN THIS DIRECTION				
Model	<input type="text"/>	Material	<input type="text"/>	
Size	<input type="text"/>	Area	<input type="text"/>	m <sup>2</sup>
Bolts	<input type="text"/>	Torque	<input type="text"/>	Nm
Burst pressure	<input type="text"/>	at	<input type="text"/>	
		at	<input type="text"/>	
Lot N°	<input type="text"/>	Tag N°	<input type="text"/>	
FIKE EUROPE BVBA B 2200 Herentals Belgium				

Figure 1



Figure 2

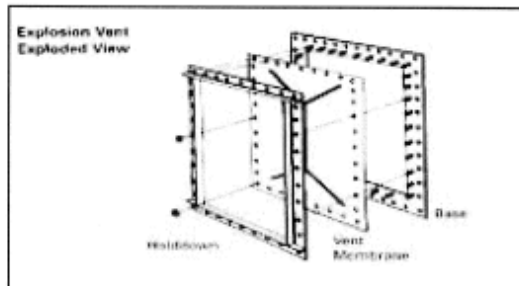


Figure 3

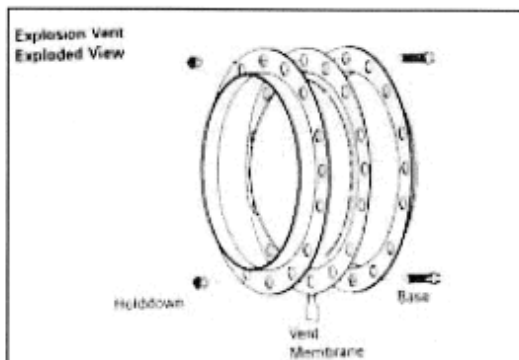


Figure 4

## Burst indicator

The Fike explosion vents can have as an option an integrated electric burst indicator designed for intrinsically safe service. Alternatively Fike can supply a magnetic reed switch burst indicator.

**Caution:** Unacceptably high voltage or currents will permanently damage the electrical system and the use of a non approved intrinsically safe power supply may even be the eventual ignition source of a dust or gas explosion. All burst indicators must be installed in an intrinsically safe circuit which conforms to the applicable national standard.

**Warning:** Do not bend the electrical cable at any angle at a distance of less than 20cm from the mechanical bracing part and do not lift the explosion vent by the electrical cable, as this may damage the electrical circuit.

**Warning:** The maximum torque values as mentioned on the nameplate must not be exceeded as this will permanently damage the electrical circuit.

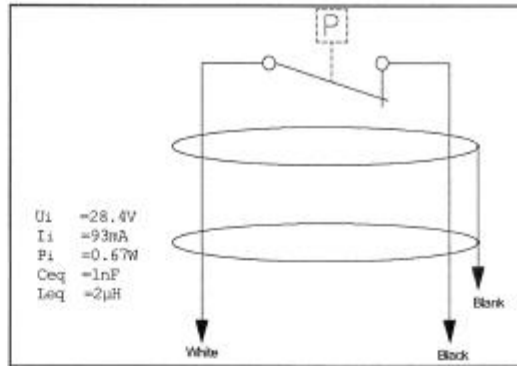


Figure 5

## Replacement of explosion vents

Inspect the explosion vent carefully. Check that the tag number and data on the tagplate (fig.1/2) correspond with location and system specifications. Place the new vent carefully on the base, replace the holddown frame on vent. Fit nuts to studs or fit bolts and nuts. Torque to values specified on the explosion vent tagplate (fig.1/2). When using a gasket or sealant material, it should be placed between the vent and the base. All torque values are based on new free running studs coated with light oil. Torque should be applied crosswise and in at least two steps. It is recommended that after initial start-up and system is brought to working pressure and temperature, the studs are retorqued to the values shown. Care must be taken during installation that flange or frame faces are brought down at an equal rate and that faces are parallel.

**Caution:** The maximum torque values should not be exceeded as this may possibly affect the burst pressure.

When reordering explosion vents always indicate vent lot number (see tagplate fig.1/2).

## Maintenance

The explosion vent assembly is maintenance-free due to its basic design and concept. Maintenance could consist of periodic visual inspections, consistent with the operating parameters and severity of service.

**Note:** Severe service is defined as rapid changes in pressure, high pressure, high temperature, or corrosive process. Explosion vents should be replaced if they appear damaged, corroded, or leaking.

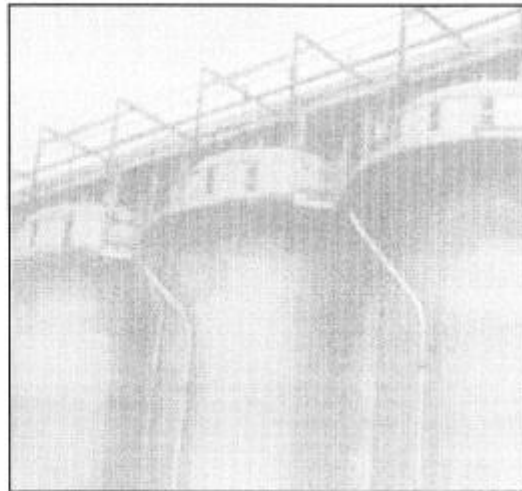


Figure 6

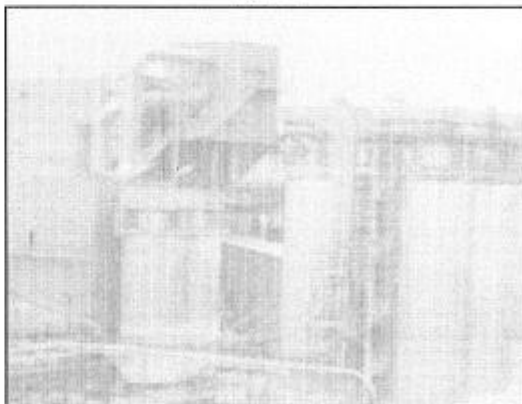


Figure 7

All above data are subject to change without notice. They must not be used unless confirmed in writing.

8.8300.00.6

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## Appendix III

### CERTIFICATION

Engineers in  
Dust ~ Fume  
and Ventilation  
systems

Tel: 044 + (0) 1384 76662 / 77716  
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# Dustair Ltd

REGISTERED No. 925805 ENGLAND

REGISTERED OFFICE  
UNIT 13-PEDMORE IND. EST.-PEDMORE RD-BRIERLEY HILL  
WEST MIDLANDS DY5 1TJ

## E.C. DECLARATION OF CONFORMITY

THE MANUFACTURER / DISTRIBUTOR:-

**Dustair Limited**  
Unit 13, Pedmore Industrial Estate,  
Pedmore Rd, Brierley Hill,  
West Midlands, DY5 1TJ, UK.

Herewith declares that the product described below complies with the relevant Health and Safety requirements of the U.K. Supply of Machinery ( Safety )Regulations 1992 as amended by the Supply of Machinery (Safety Amendment ) Regulations 1994 and EEC. Directive 89/392 EEC as amended by Directive 91/368 EEC , 93/44/EEC, 93/68 EEC and 98/37/EC.

The product has been identified, labeled and assembled with C.E. Mark in compliance with the above directives.

### Product Description.

**DESCRIPTION:** Wet Dust Scrubber

**MODEL (If Applicable):** 500 cfm Pip (De) Judge

**SERIAL/CONTRACT No.:** E11562 / WO 6350

Applicable Transposed Harmonised Standard:- N/A.

National Standards: For Fans: BS5304 & BS3042.  
N/A for other equipment.

Signed on behalf of Dustair Ltd.

  
-----  
Director

I MARSHALL  
Name

28.4.08  
Date:

DIRECTORS: M G Marshall, I C Marshall  
F:\DOCUMENTS\MANUALS\E11562-DEC\_CONF.doc



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## Declaration of Conformity Explosion Vents

### CUSTOMER INFORMATION

Customer: DUSTAIR LTD	Sales Order#: 321030 S2 1,000
Customer P.O.#: 5031	

### PRODUCT SPECIFICATIONS

Product Type: CV	Code Requirement: CE + EN ISO 4126-2
Nominal Size: 400X500 MM	Flange Rating: LAF
Material: 304 FEP	
Spec. Temperature: 22,00° C	
Spec. Burst Pressure: 100,00 MBAR	

### TESTING/MARKING INFORMATION

MFG. Lot#: **0814251** Lot Size: **6**

Marked Pressures: MBAR @ *Ambient	Spec: 100,00	
Burst Tolerance: MBAR @ *Ambient	Min: 75,00	Max: 125,00
Burst Tests: MBAR @ *Ambient		
99,00      95,00		

\*Ambient temperature is defined as 59° - 86° F (15° - 30° C). Explosion Vents are manufactured at ambient temperature to tolerance values derived from Fike Temperature Compensation data unless actual temperature tests are performed.

### MATERIALS OF CONSTRUCTION

Component	Material	Cert. Nr.
Top	1.4301	084515
Top Side Gasket		N/A
Seal	FEP	N/A
Bottom	1.4301	084515

### PED CERTIFICATION INFORMATION

Notified Body (NB): TÜV SÜD Industrie Service GmbH		
(NB) Address: Westendstrasse 199, D-80686 München		
(NB) Registration No.: 0035	EU Directives: PED 97/23/EC	
Harmonized Standards: EN ISO 4126-2	Year Built: 2008	
Conformity Assessment Proc: Module H1	Examination of the Design: B000351/FE1	

### ATEX CERTIFICATION INFORMATION

Notified Body (NB): IBExU Institut für Sicherheitstechnik GmbH		
(NB) Address: Freiberg - Deutschland		
(NB) Registration No.: 0637	EU Directives: ATEX 94/9/EC	
Harmonized Standards: EN 1127-1/EN 13463-1	Year Built: 2008	
Conformity Assessment Proc: Annex IV	Type-test: IBEXU03ATEX2056 X	

### SPECIAL NOTES

MBAR signifies millibar gauge.

We certify these components meet applicable specifications, drawings, and requirements of your purchase order. Evidence of compliance is maintained on file in our records and is available for review upon request.

PETER DE HAES  
 Authorized Quality Representative

17/04/08  
 Date: (DMY)