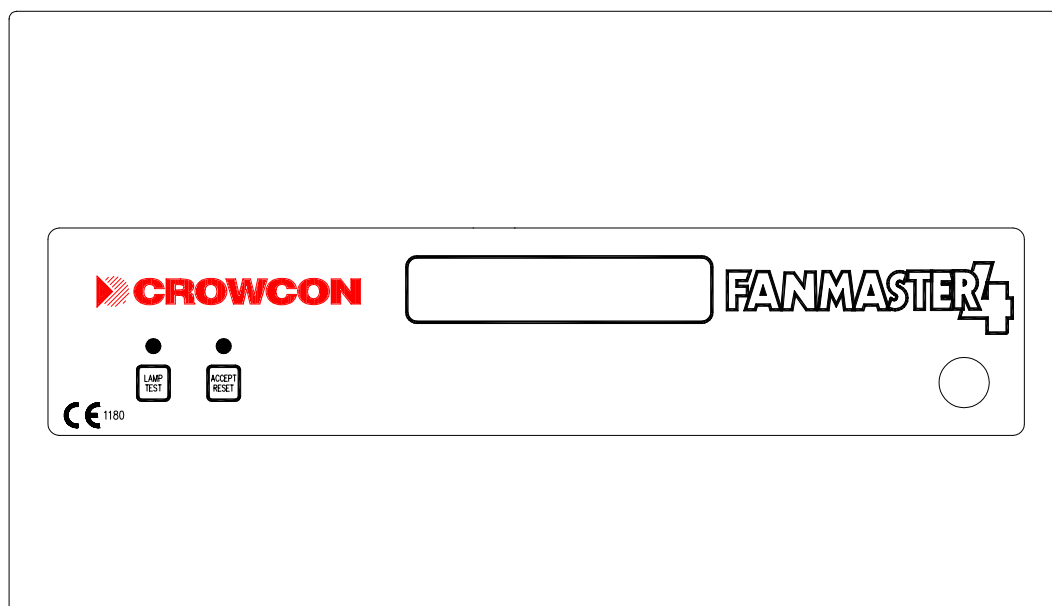


FANMASTER & 87ESU MANUAL
(to be read in conjunction with Gasmaster Manual)

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1. FANMASTER INSTALLATION AND OPERATING INSTRUCTIONS



Description

The Crowcon Fanmaster has been designed to provide monitored current for up to 4 Environmental Sampling Units (87ESU). It can operate from mains voltage or external 12V DC and has a battery back-up to maintain correct operation of the fans in the event of mains failure.

The alarm function detects fan failure by monitoring the fan current, which should remain within a pre-set window. Should the current fall outside this window (either above or below) an alarm LED will light, the sounder is energised and an alarm relay operate. Each of the 4 channels are independently monitored.

Installation

Refer to section 1 of the Gasmaster manual for mounting details, and 'diagram 2' on page 8 for Fanmaster to ESU wiring details.

Ensure that the fuses fitted on the fan input cards are rated for 250mA and are of the High Rupture Current type. If replacement or spare fuses are required, these must be obtained from Crowcon due to the safety certification of the 87ESU. The part number and description are shown below:

Part No. E01307 Description: Fuse 250mA 20mm HRC

Operation

As soon as power is supplied to the Fanmaster, any 87ESU modules connected to it will automatically be powered up. If the fan is rotating properly, the current should lie within a pre-set band, which is set using the low and high alarm potentiometers on the input channel alarm card. These two thresholds have been factory set and should not need adjustment.

With the unit operating correctly, the power LED indication should be illuminated, showing that the system is powered up, the mains is healthy and that each channel's fan is drawing the correct current.

If the mains power supply should fail, the power LED will extinguish, and the battery LED will flash. The internal 12V battery keeps the controller running for at least 3 hours.

If any of the fans within the 87ESU modules should slow, the relevant channel's red 'LOW' LED will light, the sounder will be energised and the relevant alarm relay will operate. If any of the fans should stop, the relevant channel's red 'HIGH' LED will light, the sounder will be energised and the relevant alarm relay will operate. If a fan becomes disconnected, the relevant channel's yellow 'FAULT' LED will light, and the common fault relay will de-energise.

The sounder can be silenced by pressing the button marked 'ALARM ACKNOWLEDGE'. The alarm relays are normally energised so as to work in fail-safe mode. If any of the fans should fail, or if the internal voltage-rail fails, relevant relay(s) will become de-energised.

2. 87ESU ENVIRONMENTAL SAMPLING UNIT

The 87ESU Environmental Sampling Unit is designed to make it easier to monitor gases such as chlorine and sulphur dioxide which, because they have a high density and are readily absorbed into many materials, are difficult to detect using conventional point detectors. The explosion proof version may be used for monitoring heavy flammable gas such as LPG. The 87ESU uses a sampling chamber technique in which gas is sampled using an electric fan. This is installed in the outlet from the chamber and thus draws samples through the system via pipe-work connected to the chamber.

The sampling chamber, which is made from high impact ABS, houses a gas detector with its junction box on the outside of the sampling chamber. Connection points for the electrical supply to the fan are also made externally to the sampling chamber via a second junction box.

The standard arrangement is for the sampling chamber to be fitted with 3 metres of PVC pipe on either side of a tee piece at the gas entry point to the chamber. It is possible to extend this to 6 metres, or put the chamber at one end of a 12 metre length of sampling pipe. (The attached chart shows that with 12 metres of pipe, the minimum flow rate is 0.4 metres/sec which ensures detector response in 60 seconds at most. Any extra bends or T pieces count as 2 metres of pipe). Other options are available, for example the pipe-work can be closed at both ends with a series of small inlet holes along its length, or it can be mounted vertically with a series of sampling holes along its length but with the bottom open for immersing in liquid of varying depth. The sampling chamber should always be mounted above the surface of any liquids to avoid ingress of water.

If the gas to be monitored is potentially explosive, for example heavy hydrocarbon gases which can accumulate in drains, the version certified as electrically safe (Eex m IIC T4) by BASEEFA must be used.

It is important to note the conditions for connecting and use of the 87ESU to ensure compliance with the hazardous area certification.

- a. Electrical supply to the fan at 12V DC must be fused at the power supply at 250 mA (fuse to have a breaking capacity of 4000A). This is accomplished preferably by using the Crowcon Fanmaster which provides fan failure alarm and standby power.

- b. Electrical supply to the fan must be via cable suitable for hazardous areas, such as steel wire armoured type 6942X terminated via an Ex 'e' gland in the junction box.
- c. The sampling chamber must be mounted so as to be protected from receiving any direct impact.
- d. Detecting head to be cabled in accordance with instructions in the appropriate fixed system instruction manual.

Care must be exercised to connect the 12V DC electrical supply and the sensor output signal at the appropriate junction boxes.

WARNING: Connecting the 12V fan supply to the sensor could cause irreparable damage.

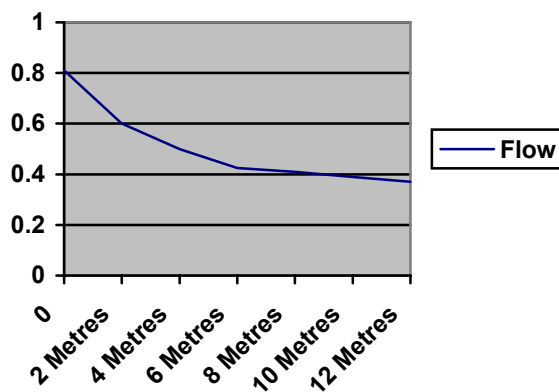
<u>Specification for Fan</u>		110V type	12V type
	Certified type C01 135	(uncertified) C01 352	(uncertified) C01 369
Supplying voltage to fan	12V DC	110VAC	12V DC
Consumption	100mA	20mA	100mA

Approval codes (certified type only): EEx m IIC T4
 Ⓜ II 2G
 Certificate Number: Baseefa 03 ATEX 0033X

Commissioning Checks

After installation it is recommended that a flow check is carried out. This can be done simply by holding a strand of wool or cotton by one end across the open end of the outlet pipe it should be seen to flutter in the air stream.

Typical Air Flow Rates

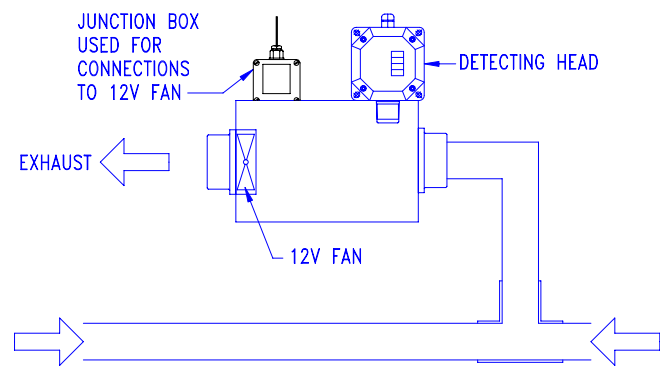


Note: the x axis represents the sample pipe length, the y axis represents flow rate (metres per second).

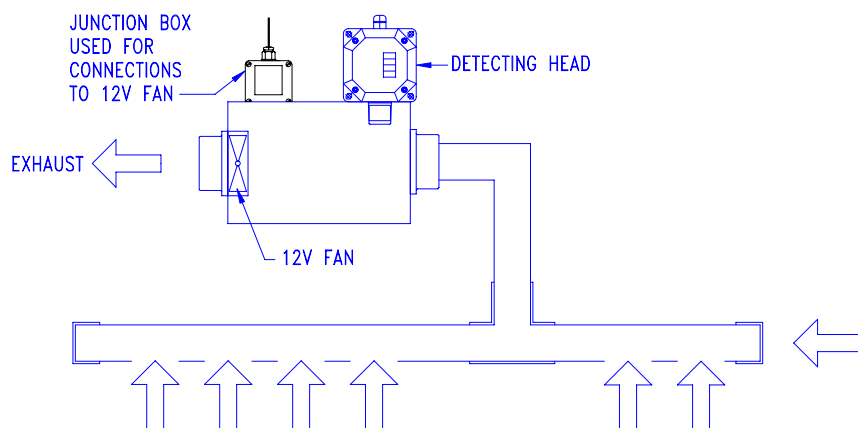
Typical 87ESU installation layouts are shown on the following page.

DRG. No. **87ESU-1415-A3**
 USED ON _____
 STOCK No. _____

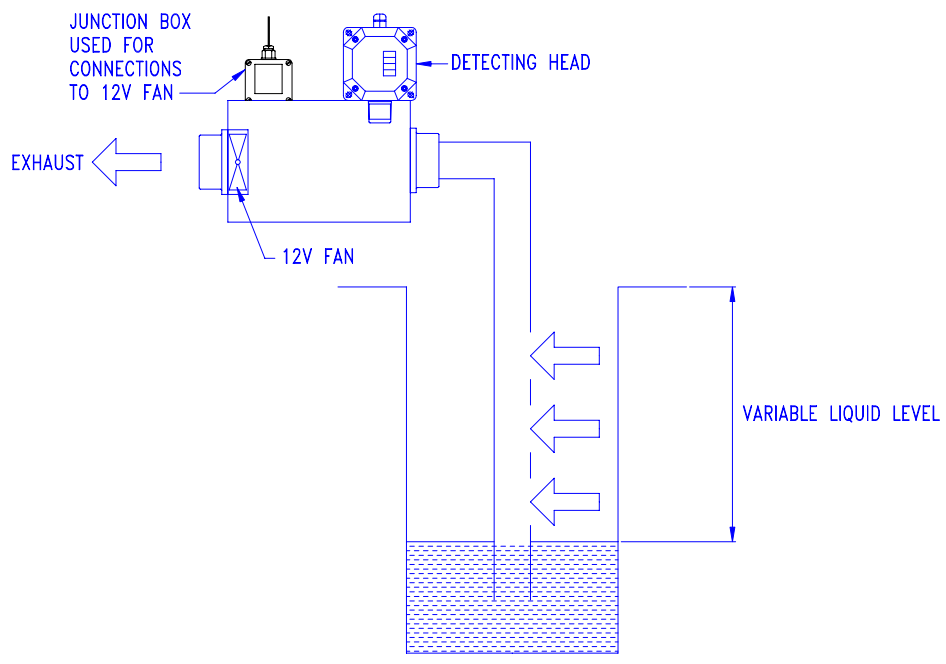
ISSUE	D.C.I. No.	DATE
2	495D 2/93	12/09/90
1	—	—



OPTION 1 :- SAMPLE TUBE OPEN AT ENDS



OPTION 2 :- SAMPLE TUBE SEALED AT ENDS
 SAMPLE INLETS ALONG LENGTH



OPTION 3 :- SAMPLING ABOVE VARIABLE LIQUID LEVEL

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DO NOT SCALE DRAWING
 IF IN DOUBT ASK
 DRAWN TO B.S. 308/3939
 SURFACE FINISH: _____

MATERIAL: _____
 FINISH: _____
 DRI: JRC
 CHKD: _____
 APPR: _____

TOLERANCES:
 2 DEC PLACES = _____
 1 DEC PLACE = _____
 OTHER = _____
 ANGULAR = _____
 DIMS: _____

SCALE: N.T.S.

TITLE: **87ESU-VARIOUS INSTALLATION OPTIONS**
 DRG. No. **87ESU-1415-A3**

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