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**vliegwerk *holland***

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## **CARBON MONOXIDE MONITORING SYSTEM**

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### **VCM 01 MANUAL**

**Thank you for purchasing this CO monitoring system.  
To ensure optimum performance of this unit, please read  
this manual thoroughly.**

## TABLE OF CONTENTS

- 1 Basic operation
- 2 **Users guide ( in case of alarm)**
- 3 Symptoms
- 4 Installation procedure
- 5 Wiring diagram
- 6 Specifications
- 7 Test/Calibration

## **1 Basic Operation**

**The design concept of the VCM 01 is to achieve a reliable CO detection unit in your cabin, including basic functions with compact size and low cost.**

**After switching on your master switch, power is applied to the detection unit.**

**After 30 seconds "initial delay" (sensor stabilisation) the unit detects CO concentrations every 10 seconds.**

**Sensor resistance decreases with an increase of CO concentration, based on a logarithmic function.**

**The effective sensor output is obtained every 10 seconds, and will be compared with compensation level (for temperature & humidity), and threshold level.**

**The microcomputer inside calculates the CO concentration and gives a signal to switch on the alarm if CO concentration is above the setting (by calibration) of the threshold.**

**Alarm stays on as long as the concentration is above this threshold, and goes off if concentration is below this threshold.**

## **2 USERS GUIDE**

- 1 Master switch on.
- 2 Press test switch on CO panel for 2 seconds, for checking alarm sound and warning light.

CO Monitoring system is now ready for operation.

### **! IN CASE OF ALARM DURING FLIGHT !**

- 1 Switch off cabin heat (when in use), and close all openings to your engine compartment.
- 2 Ventilate cabin with fresh air.
- 3 Do not smoke.
- 4 Alarm will stop if a safe level of CO concentration is reached.

**! IF ALARM STAYS ACTIVATED AFTER VENTILATION, IF YOU SMELL EXHAUST GASSES, OR IF YOU HAVE ANY SYMPTOMS OF CO POISONING. !**

- 1 Use 100% oxygen if available.
- 2 Land as soon as possible.
- 3 Convince yourself that all CO problems are solved before taking off again.
- 4 check if CO can enter your cabin through defective exhaust system, openings between cabin and engine compartment, or any other cause.

### 3 SYMPTOMS

Once inhaled, CO inhibits the transport of oxygen throughout the body by combining with hemoglobin,- the oxigen carrying pigment in red blood cells- to form a substance known as carboxyhemoglobin (COHB).

The first symptoms of CO poisoning, often a mild headache, appear when blood reaches about 15 % carboxyhemoglobin.

If the air contains CO of a concentration of 100 parts per million (ppm), the average person can breathe it for about 90 minutes before the blood registers a COHB level of 10 %.

At 200-ppm of CO it takes only 35 minutes to reach the 10 % COHB level. At 400-ppm the time limit is 15 minutes.

(cigarette smoking routinely causes a level of about 9 % )

As the poisoning intensifies, the symptoms are serious headache, mental dullness, physical loginess, decreasing of sight.

At 30 % COHB the risk rises of long-term ill effects, including brain damage and, if the victim is pregnant, harm the fetus.

At 45% COHB, most victims are comatose; at 50 % many are dead. Long term exposure to low level concentrations of CO, is as dangerous as short term exposure to high level concentrations.

The alarm level of this CO monitoring system is set to 60 ± 10 ppm concentration of CO conform the  
JOINT TECHNICAL STANDARD ORDER - JTSO-C48a.

**DON'T PANIC IN CASE OF ALARM**, normal circumstances gives you time enough to take your precausions and make a safe landing.

## 4 INSTALLATION PROCEDURE

The CO monitoring system contains :

1 Manual

1CO monitor

p/n: vcm-01

1Text panel

p/n: vcm-01-1

1Fuse holder (in-line 1amp)

p/n: vcm-01-2

1Fuse holder (panel 0.5 amp)

p/n: vcm-01-3

1Warning light assy 12v

p/n: vcm-01-12, or

1Warning light assy 24v

p/n: vcm-01-24

1Contra plug CO monitor AMP

p/n: 1 480318

1Contra plug CO monitor AMP

p/n: 1 480319

2Contact AMP

p/n: 163304 4

2Contact AMP

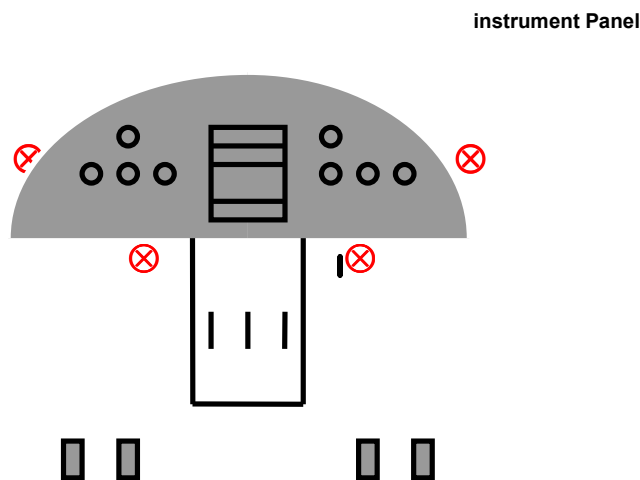
p/n: 163305 4

## 4 INSTALLATION PROCEDURE

Install CO monitor on a place free of obstructions, not on heated elements.

Best where heated air comes in first.

For example ⊗, behind rudder pedals, or behind instrument panel.



Use text panel for locating a good visual spot on the instrument panel.

Make an opening of 5,3 x 2,0 cm

Place text panel in front for making holes to fasten text panel.

Fasten light assy, test button, and fuse holder (vcm-01-3) on text panel.

Connect wiring (aircraft wire an-20) to light assy ,test button, and fuse holder. (see fig 1 wiring diagram)

Install complete panel.

## 4 INSTALLATION PROCEDURE

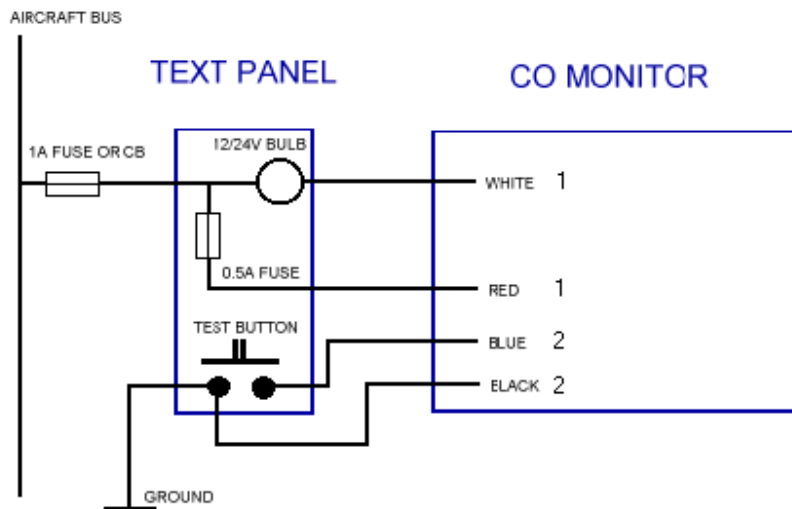
Connect in-line fuse (vcm-01-02) to aircraft bus as close as possible, or install 1 amp circuit breaker.

Connect wiring to CO monitor using AMP connectors and contacts

Connect wiring to in line-fuse or CB , and aircraft ground.

All conform fig 1 wiring diagram.

## 5 WIRING DIAGRAM fig 1





## 6 SPECIFICATIONS

<b>Model VCM-01</b>	<b>Input voltage</b>	<b>9v to 30v DC</b>
	<b>Weight</b>	<b>±210gr</b>
	<b>Power consumption</b>	
	<b>(without alarm) 7sec</b>	<b>25mA</b>
	<b>3sec</b>	<b>50mA</b>
	<b>(with alarm)intermittent</b>	<b>95mA max.</b>
	<b>Operating temperature</b>	<b>-10°C to 60°C</b>
	<b>Storage temperature</b>	<b>-20°C to 70°C</b>
	<b>Altitude test range</b>	
	<b>(non pressurized)</b>	<b>0 to 10.000ft</b>
<b>(pressurized)</b>	<b>0 to 10.000ft</b>	

## **7 TEST / CALIBRATION**

### **TEST**

Functional check can be preformed by holding the opening of a small plastic bag filled with, for example exhaust gas from a petrol car (not diesel), in front of the CO monitor sensor.

Alarm should go on within 1 minute.

### **CALIBRATION**

The CO MONITORING SYSTEM is a safety device, and should not be opened.

**CALIBRATION CAN ONLY BE PREFORMED BY QUALIFIED PERSONEL.**

**PATENT NR NL 1005921 (34485 JAN 98)**

**CALIBRATION PERIOD IS SET TO ONE YEAR.**

**Calibration is low cost,  $\pm$  0.5 hrs labour**

**Warranty period is one year.**

**Pilot in command stays responsible for environmental conditions at all times!**