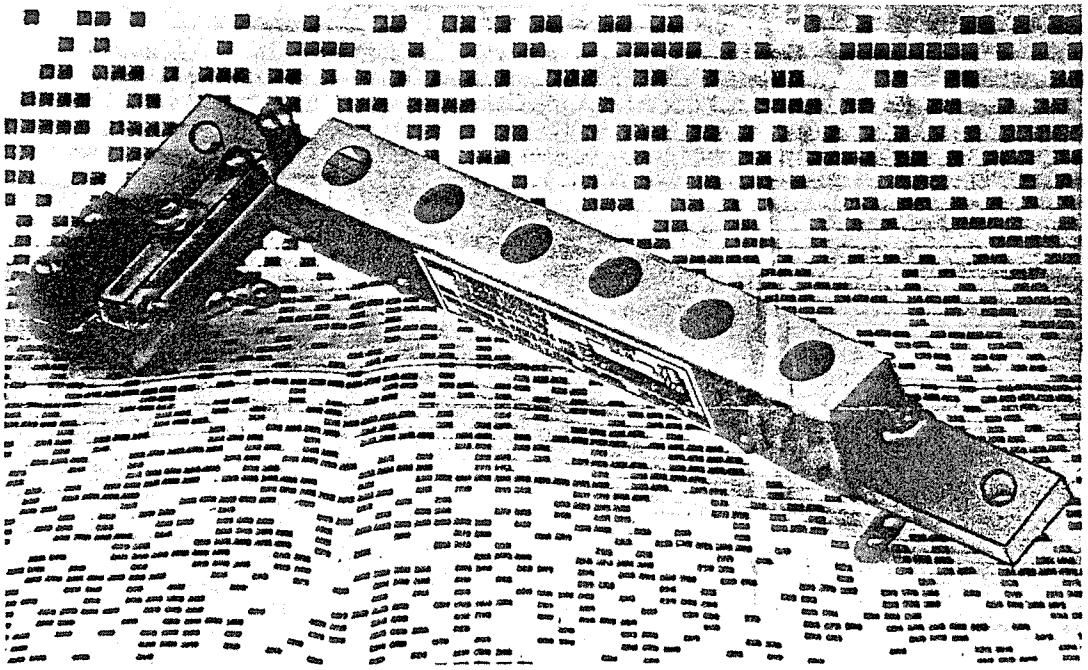
MODEL AD
AIR FLOW DETECTOR
(PAT. 4,152,688)

RANGE: 1 FOOT PER SECOND TO INFINITE AIR VELOCITY



Features:

1. Sensitivity to air flow increases as the air flow velocity diminishes.
2. Immune to shock, vibration, and ambient temperature changes.
3. Built to Military specifications.
4. Will operate with almost any blower.

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MODEL AD AIR FLOW DETECTOR
RANGE: 1 FOOT PER SECOND TO INFINITE AIR VELOCITY

Description:

The Dietz Model AD Air Velocity Detector will indicate air flow in the range of one foot per second to an infinite air velocity. It can be used to detect the lack of air flow in air cooled electronic equipment, such as computers where a common rule of thumb for electronic components is that reliability doubles for each 10° C decrease in component temperature. The use of forced air cooling can reduce temperatures as much as 40° C over natural convection air cooling, thus increasing the reliability 16 times.

However to maintain this higher reliability, it is necessary to safeguard the equipment by using an air flow detector that will sense dirty air filters, accidental blockage of air intakes, and air blower failure.

Devices used in the past for air flow detection, were too large usually to be incorporated into miniaturized equipment, were insensitive to low air flow, and subject to false interruptions from shock and vibration.

The Dietz Model AD Air Velocity Detector is a new invention that overcomes all these limitations and provides a sensitivity to air flow that increases as the air flow diminishes, is immune to shock, vibration, and ambient temperature changes, is low cost, and of small physical size.

Instead of requiring a high air flow velocity for actuation, the Dietz unit uses 5V. D.C. input power to provide over 50% of the energy necessary for actuation.

Construction:

The Model AD Air Flow Velocity Detector is sturdily constructed throughout and is fabricated of fiber glass resin impregnated insulating material, sheet aluminum anodized to MIL-A-8625 Class II. Machine parts made of brass or steel are cadmium plated per QQ-P-416 Type II Class C.

Micro switches can be supplied treated to resist moisture and fungus growth.

Military Specifications:

The Model AD is manufactured to comply with the following Specifications:

- MIL-E-16400B dated 8 Nov. 1961 General Specifications
- MIL-S-901C dated 5 Sept. 1963, Shockproof Equipment, Class HI Shipboard Application
- MIL-STD-167 Type I Vibration Resistant Design

Electrical Specifications:

The Model AD requires an input power of 5V. D.C. (0.15% Reg.) 0.5 amp.. When the correct air velocity causes actuation, an output of 5V. D.C. will be present at the output terminals. Where the customer requires operation on 110 or 220 Volts A.C., we can supply a suitable miniature power supply to furnish the 5V. D.C. power input. Likewise, the 5V. D.C. output can be furnished as S.P.D.T. contacts isolated from the 5V. D.C. input power. Please contact factory for prices and availability of these modifications.

To make the unit field adjustable for an air velocity from 1 foot per second to an infinite air velocity, it is recommended that a 10 ohm potentiometer (3 watts rating) be placed in series with the Model AD (please see Figure 1). Potentiometer is normally customer supplied, but can be purchased from us in small quantities.

Special Specifications:

For extremely low air velocity detection the Model AD can be supplied without its "U" shape aluminum cover to obtain greater sensitivity. Consult factory to obtain this modification.

For extremely high air velocity detection, the orifice holes in the insulating base and the "U" shape aluminum cover can be decreased in size to obtain less sensitivity. Consult factory to obtain this modification.

Mechanical Adjustment:

The Model AD is normally factory set and if the 10 ohm potentiometer is used, no additional mechanical adjustment is required.

However, it is possible to adjust the switch mechanically to achieve a change in the actuating air flow velocity similar to that obtained with the potentiometer. The point of detecting air flow velocity can be adjusted by means of the 2-56 adjustment screw impinging on the actuating plunger of the micro switch. Turning this adjustment screw clockwise, increases the sensitivity to air flow. Turning adjustment screw counter-clockwise, decreases the sensitivity to air flow.

Caution: Adjustments must be made with extreme care, since in most cases the total adjustment is only a fraction of a single turn.

Electrical Adjustment:

There are two ways of electrically adjusting the Model AD to a specific air velocity.

The first is to use a potentiometer in series with the Model AD and a fixed 5V D.C. power input.

The second is to use a variable D.C. power input where the voltage can be varied from 4 volts to 5 volts D.C.

The first adjustment is mechanical and is normally made in the factory when the output voltage is 5V. D.C. or the potentiometer (if used) is set at zero ohms. This adjustment is to adjust the Model AD for least sensitivity to maximum air flow (see above mechanical adjustment).

The next adjustment is electrical and made when there is no air flow. The output is reduced (to approximately 4 volts) or the potentiometer is adjusted to approximately 10 ohms so that the micro switch deactuates. Then carefully increase the output voltage, or turn the potentiometer for less resistance until the switch actuates. This establishes the point where the micro switch has the maximum sensitivity to air flow. The final setting will fall between the setting for maximum air flow and minimum air flow as determined by the customer.

Caution: Do not confuse the time it takes for the blower to come to full speed as a time lag of the air flow detector. The air flow detector is instantaneous in actuation, and will be actuated only when the full air velocity is obtained. This is also true when power is removed from the blower. The air flow detector will not be actuated until the air flow velocity is reduced to the set point.

Installation:

The Model AD should be mounted in such a manner as to allow the air to pass straight through the orifice holes. The best mounting is often that obtained by placing the Model AD directly across the face of the fan. If this method is used, only an additional 3/4" of space is required.

The Model AD will operate in any position and no thought need be given to the effects of gravity, shock, or vibration. The Model AD will operate on either the suction or pressure side of a blower, as flow can be from either direction.

Physical Size:

See Figure 2 for installation dimensions.

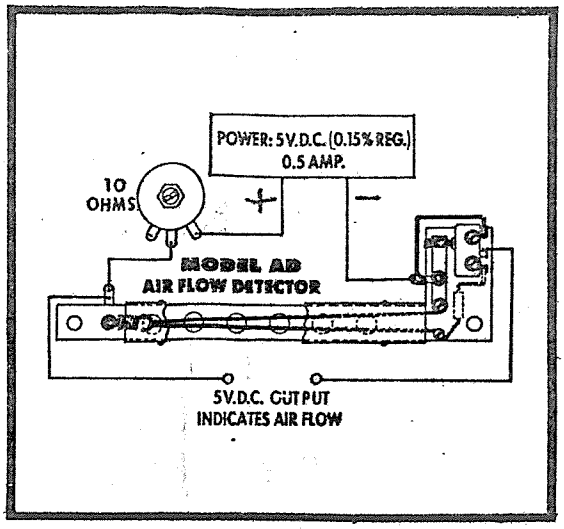

Figure 1

Application:

The Model AD Air Flow Detector can be used to provide a direct logic output for interfacing to computers. Where necessary it can be furnished with S.P.D.T. contacts.

The small size and extreme sensitivity to low air flow makes it possible to now employ air flow interlock protection in applications that would have been impossible before this invention. The Dietz Air Velocity Detector can be used in airborne and Military equipment with low output blower for air flow detection to safeguard air cooled equipment from dirty filters and blower failure.

In air conditioning, low air velocity for maximum creature comfort can now be detected and controlled.

Machine vibration and shock will not cause false interruptions to the Dietz Air Velocity Detectors when sensing extremely low air flow velocity and, therefore, they are acceptable for use in heavy-duty industrial use.

Ordering Specifications:

The standard Model AD will operate, with practically any blower or air stream if the variable power input or 10 ohm potentiometer is used. If units are to be used factory set without the variable power input or potentiometer, it is best to provide the factory with complete information on the blower characteristics or an actual sample of the blower it is to be used with.

The air velocity of a small blower is very difficult to determine, as the air velocity of fan type blowers varies across the face of the blower and it is difficult, if not impossible, to specify it accurately.

type of photographic process has several advantages. It's clean and dry, and requires no addition of liquids, toners or other materials to develop the image. Light and heat are the only requirements. In addition, the photographic process offers a very high image quality, and a more faithful reproduction of your display than that offered by other processes.

With that understanding, let's look at several factors which contribute to copy quality, and steps you can take to optimize your hard copies.

Adjusting for Optimum Copies

Within the hard copy unit, three elements influencing copy quality are crt beam intensity, development temperature, and crt beam focus. Factors outside the copier are the level of the hard copy scan on your 4050 Series display and how you treat and handle the hard copy paper.

Getting the Best Contrast

The hard copy crt beam intensity and the development temperature govern the background/image contrast.

Adjusting Crt Intensity. The LIGHT-DARK control on the front panel adjusts the gain (intensity) of the writing beam inside the hard copy unit; the beam that exposes the paper to the image. If the beam level is too low, the image may appear faint or even show gaps within letters or lines. If the crt beam intensity is too high, alphanumerics may bleed together. Start with the control set about mid-point and experiment until you obtain optimum character contrast.

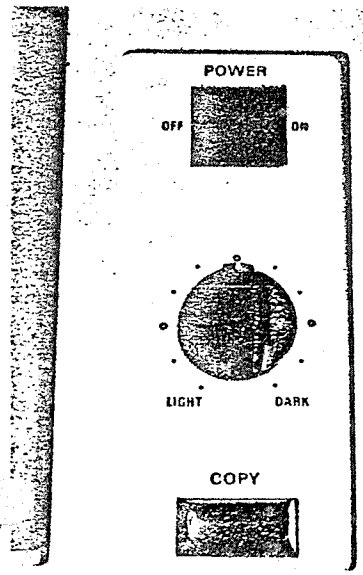

Fig. 2. 4631 Control panel.

Adjusting Development Temperature. The processor temperature controls the development of the exposed paper, and governs the contrast of the developed image. The paper should be developed with the processor as warm as possible while maintaining proper background/image contrast.

Good contrast and sharp lines are gained by setting the processor temperature correctly. If your processor temperature is set too high, the background (white) area of the copy might look grey, perhaps even a little brown. On the other hand, if the processor temperature is set too low, lines will be poorly defined, fuzzy, or grey instead of black.

To adjust the processor temperature, first open the hard copy unit cover and latch it into the upright position. The temperature adjustment is located on the right side of the unit, about halfway back, as shown in Fig. 3. Use a small screwdriver to turn the control: clockwise cools the processor, while counterclockwise warms it.

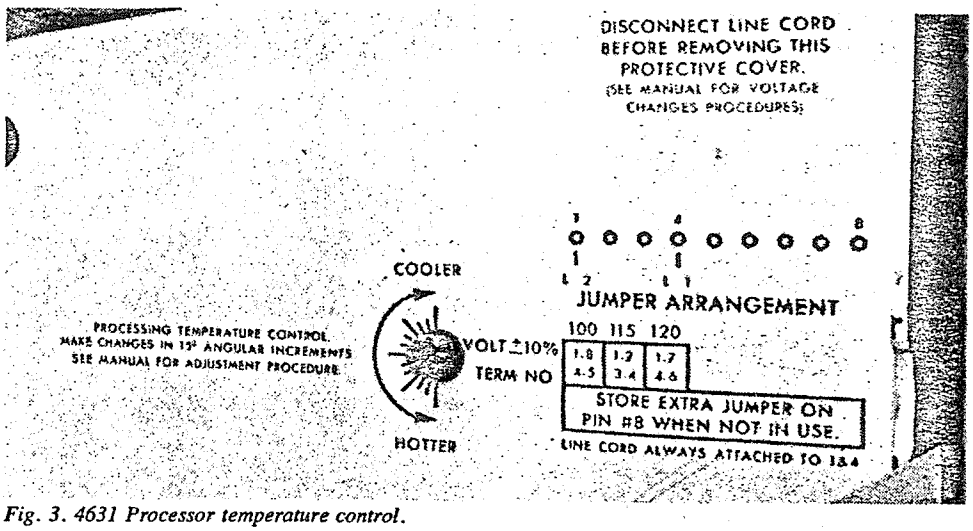

Fig. 3. 4631 Processor temperature control.

Use small steps for adjustment, about 20 degree turns for each step. Then allow time for the processor to adjust to the new setting, and check your copy quality. (The wait time depends on whether your 4631 is already warmed up, or starting cold. If the unit has been warmed up, the processor takes from one to five minutes to change temperatures, depending on the magnitude of the change.

Keep in mind that whenever the cover has been opened, or paper has just been loaded into your unit, the first few inches of paper have been exposed to light. Therefore, when the first copy is run through, that portion of paper exposed to room lighting should be developed to a deep black; if it's grey, the processor is still too cool. For additional checks, you can simply copy a display and check the lines and characters to make certain they're black, and that the background is white.

If the background looks grey when you copy a display, the processor may be too hot. You may need two or three passes at

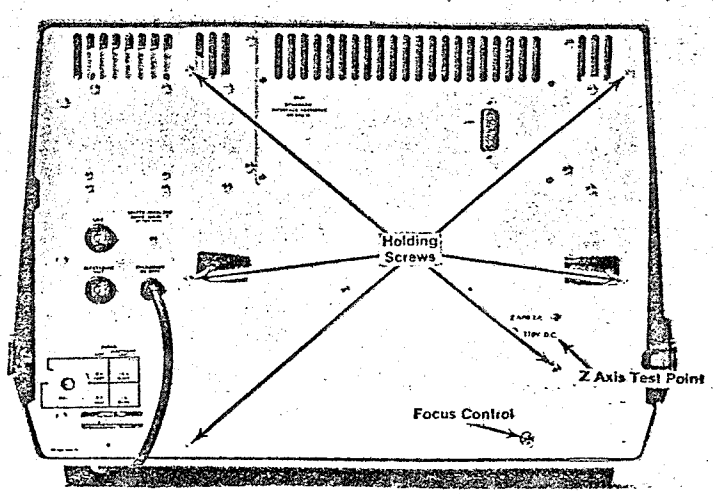

Fig. 4. Focus control on 4631.