

OPERATING INSTRUCTIONS

DYNATROL LEVEL DETECTOR WITH TYPE EC-501A CONTROL UNIT



MOUNTING:

A. DYNATROL DETECTOR

The Dynatrol Detector may be mounted on the vessel with the probe section entering through a 3/4" NPT half coupling (or suitable flange when specified). The location of the probe must be at the desired process level control point, so that it is covered at high level and uncovered at low level. When mounted in the side of a vessel, the outside Detector head should be in the horizontal position, preferably with the conduit hub on the bottom.

The 12" to 14" length of flexible conduit supplied should be connected between the Detector and the EC-501A Control Unit, or to a suitable junction box.

B. CONTROL UNIT TYPE EC-501A

The EC-501A Control Unit is housed in an explosion proof, weather resistant enclosure and may be remotely mounted up to 1,000 feet from the Detector.

WIRING:

Terminals 6-7 and 8-9 are to be served with a 4-conductor #22 AWG shielded pairs cable (Belden #8723) or with two #20 AWG shielded pair cables (Belden #8759) or equal. These two cables should be run together in a single conduit. Do not route in conduit with power wires. The wiring requirements for power terminals 4-5 and control circuit terminals 1-2-3 are conventional and any appropriate size wire can be used here. These wires may be routed in conduit with power wires.

OPERATION:

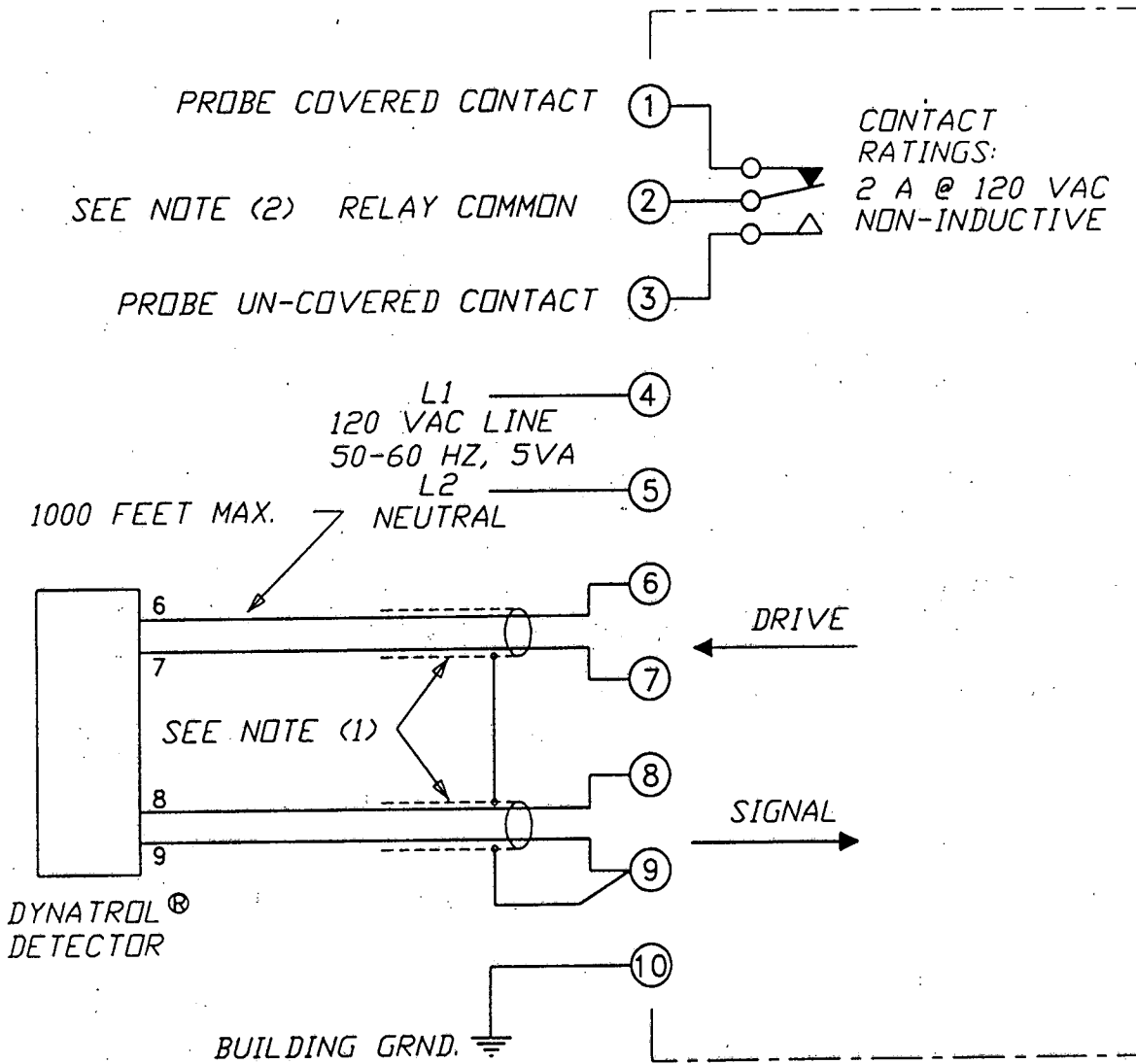
The unit is operational after completion of wiring and application of power. There are no adjustments to be made at either the Detector or at the Control Unit. A properly operating system will provide a contact closure between Control Unit terminals 1 and 2 when the probe is covered by the process media, and will switch to a contact closure between terminals 2 and 3 when the probe is uncovered.

THEORY OF OPERATION:

When the probe of the Detector is uncovered by the process media, an electro-mechanical oscillator is formed consisting of the Detector and an amplifier in the Control Unit. The probe is driven by a coil located in the Detector and connected to terminals 6 and 7 of the Control Unit. A second coil located in the Detector monitors the mechanical vibration of the Detector probe and feeds an AC signal voltage back to the Control Unit on lines 8-9. This feedback signal voltage is amplified by the Control Unit and reapplied out terminals 6-7 to the Detector drive coil to sustain the mechanical vibration of the probe. As long as the probe is uncovered it will continue to vibrate.

When the probe is covered by the process media, a dampening of the probe vibration occurs. This causes the feedback signal and drive voltages to collapse to zero and oscillations cease.

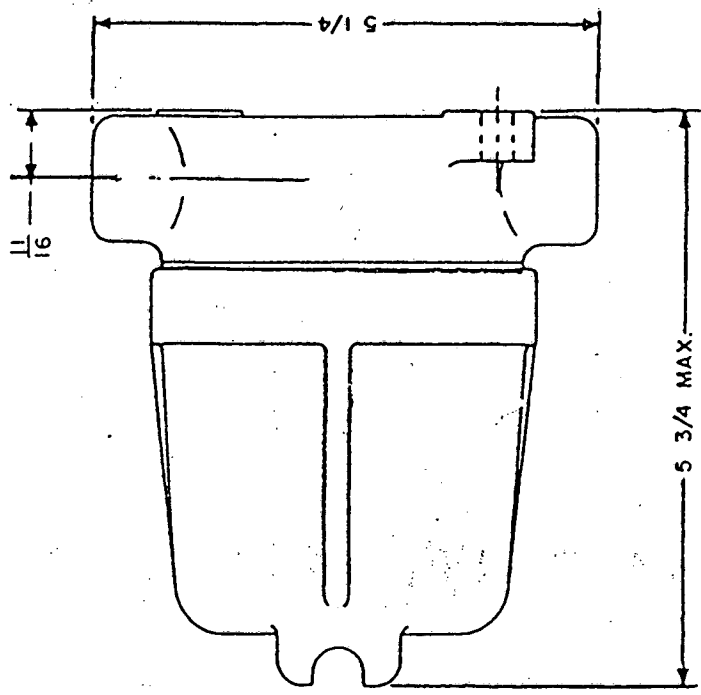
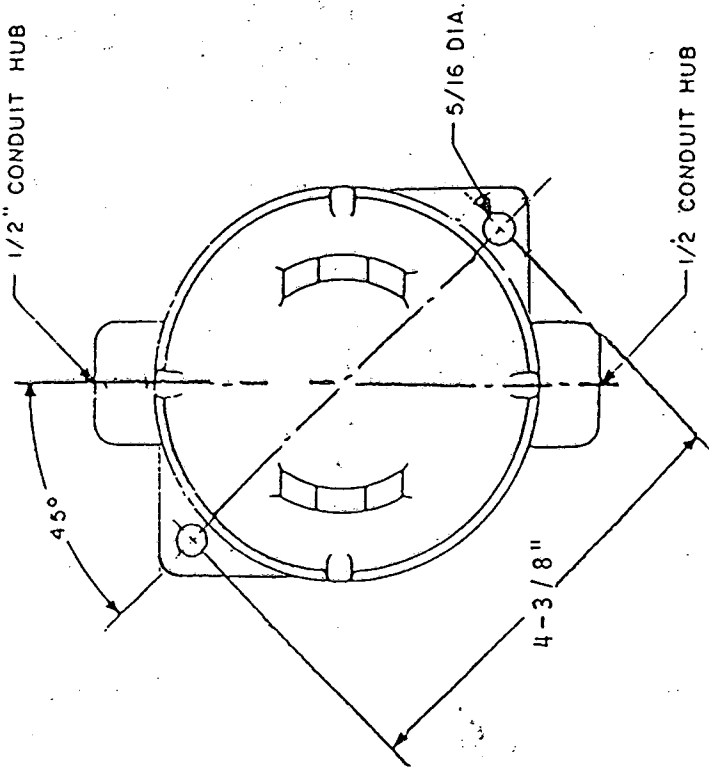
A relay located in the Control Unit is energized when the probe is uncovered and gives contact closure between terminals 2-3. The relay is de-energized when the probe is covered and the contact closure switches to terminals 1-2.



NOTE:

- (1) TERMINALS 6-7 & 8-9 TO BE SERVED WITH #20 AWG OR #22 AWG SHIELDED PAIRS
- (2) FUSE FOR A MAXIMUM OF 10A

REVISIONS				AUTOMATION PRODUCTS INC.	
NO.	DATE	DRN BY	CHK BY	HOUSTON, TEXAS	
				WIRING DIAGRAM FOR EC-501A 120 VOLT AC	
				DRAWING NO. EC-501-29	
				SCALE N.T.S.	DRAWN BY L.A.P.
				DATE 5-29-98	CHECKED BY G.D.

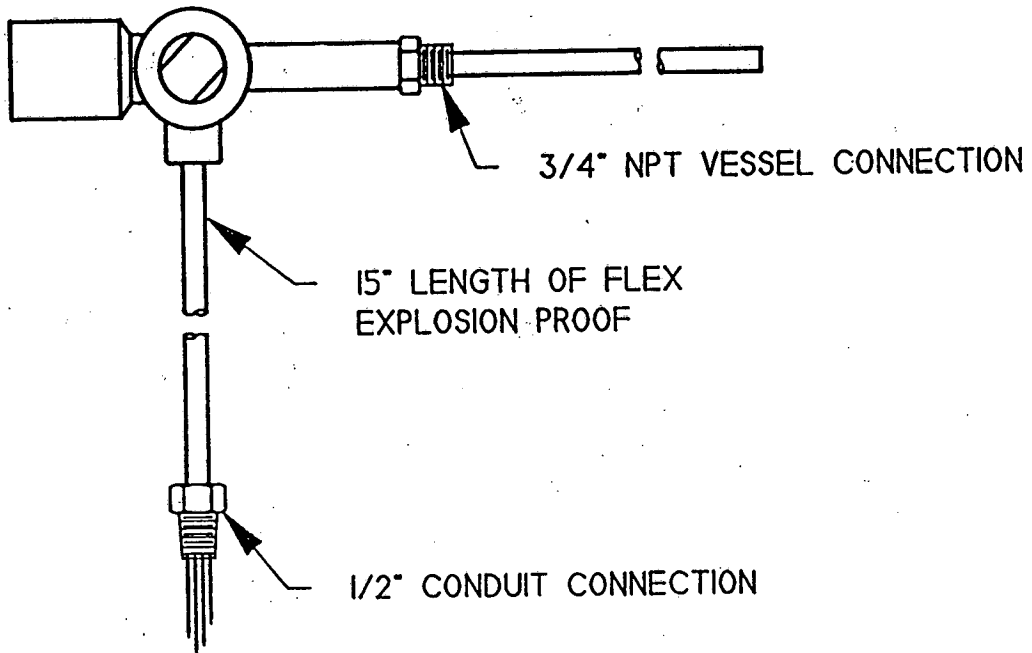
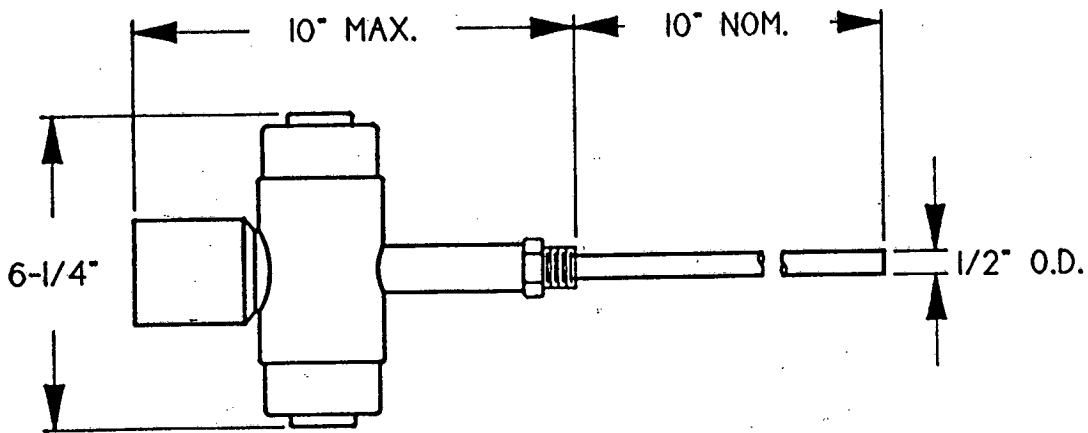


REVISIONS		
NO.	DATE	DRN. CKD. BY
1	97	

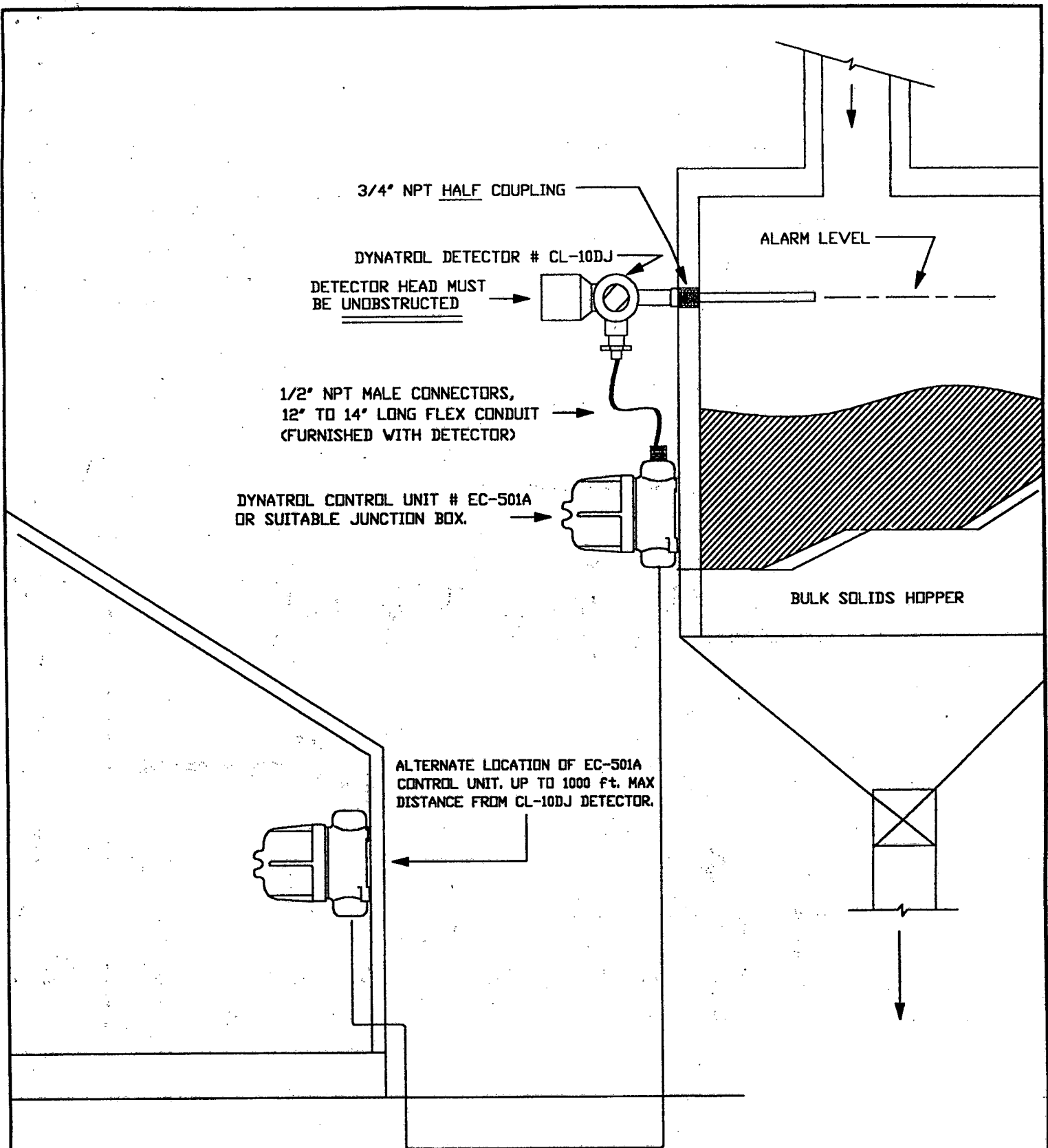
AUTOMATION PRODUCTS, INC.
HOUSTON, TEXAS

EC-501A CONTROL UNIT
INSTALLATION DIMENSIONS

DRAWING NO EC-501-14
SCALE NONE
DRAWN BY JEW
CHECKED BY WBS



REVISIONS				AUTOMATION PRODUCTS INC. HOUSTON, TEXAS	
NO.	DATE	DRN BY	CHK BY	TYPE CL-10DJ DYNATROL LEVEL DETECTOR OUTLINE DIMENSIONS	
				DRAWING NO. DJ-45	
				SCALE N.T.S.	DRAWN BY L.A.P.
				REDRAWN 4-20-92	CHECKED BY
				DATE 4-20-92	



3/4" NPT HALF COUPLING

DYNATROL DETECTOR # CL-10DJ

DETECTOR HEAD MUST BE UNOBSTRUCTED

ALARM LEVEL

1/2" NPT MALE CONNECTORS,
12" TO 14" LONG FLEX CONDUIT
(FURNISHED WITH DETECTOR)

DYNATROL CONTROL UNIT # EC-501A
OR SUITABLE JUNCTION BOX.

BULK SOLIDS HOPPER

ALTERNATE LOCATION OF EC-501A
CONTROL UNIT, UP TO 1000 ft. MAX
DISTANCE FROM CL-10DJ DETECTOR.

NOTE

DETECTOR PROBE MUST NOT BE LOCATED IN RECESS WHERE MATERIAL CAN PACK AROUND PROBE

REVISIONS				AUTOMATION PRODUCTS INC. HOUSTON, TEXAS	
NO.	DATE	DRN BY	CHK. BY	TYPICAL INSTALLATION OF DYNATROL DETECTOR TYPE CL-10DJ	
				DRAWING NO. DJ-12B	
				SCALE N.T.S.	DRAWN BY LK
				DATE 1/6/00	CHECKED BY WB

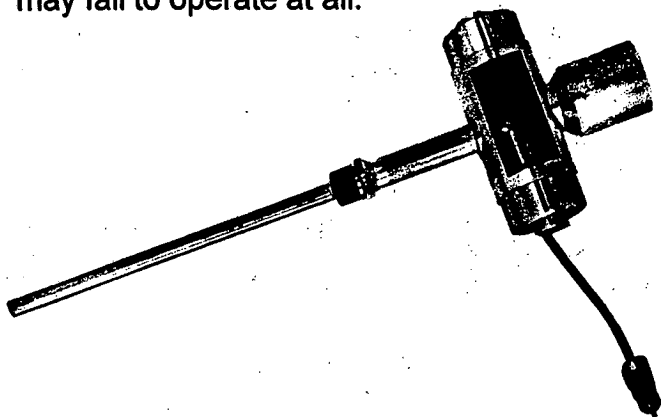
Dynatrol[®]

LEVEL SWITCH

FOR BULK SOLIDS

GENERAL:

The Type CL-10DJ Dynatrol[®] Detector is designed for application to either high or low point level detection of bulk solids. Reliable operation can be achieved with this control in problem applications where other types of controls may fail to operate at all.



PRINCIPLE OF OPERATION:

The Dynatrol[®] Detector consists of a rod which is installed through the wall of the bin or duct at the point of desired level detection. When the probe is uncovered, the drive coil drives the rod into self-sustained mechanical oscillations at the natural resonant frequency of the rod. The pick-up coil, located opposite to the drive coil, is excited by these mechanical oscillations and produces an a-c signal voltage. This signal voltage indicates the rod is uncovered - that a low level exists.

When the process media covers the rod, a dampening of the rod oscillations occurs. Consequently, the magnitude of the rod oscillations are greatly reduced and the output from the pick-up coil drops to a very low value, indicating that the rod is covered - that a high level exists.

The On/Off signal from the Dynatrol[®] Detector operates a SPDT relay in the EC-501A Control Unit. The contacts of this relay can be used to actuate alarms, indicator lights or process control equipment.

ADVANTAGES:

Versatile

This control is applicable to the level detection of a wide range of bulk solid materials. Various models are available in order to operate successfully in products ranging from low density flakes and powders to heavy granulars and pellets. Models are also available for detection of the interface level between liquids and bulk solids materials.

No Adjustment Required

All components have been constructed for long operating-life and require no field adjustments.

SPECIFICATIONS:

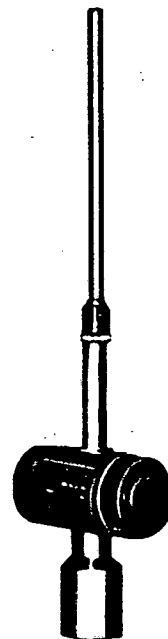
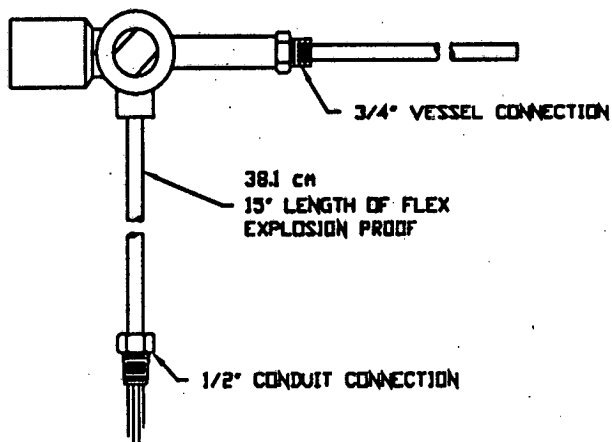
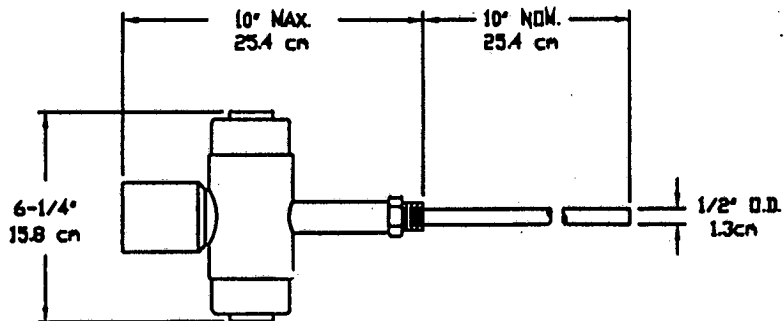
DYNATROL[®] DETECTOR, Type CL-10DJ

- CSA/NRTL/C Rated Explosion Proof: Class 1, Group D, Division 1
- Temperature Rating: 300°F (Standard) (High Temperature Construction Available)
- Pressure Rating: 1000 PSIG @ 100°F
- Pressure Connection: 3/4" NPT
- Conduit Connection: 1/2" NPT
- Material: Stainless steel

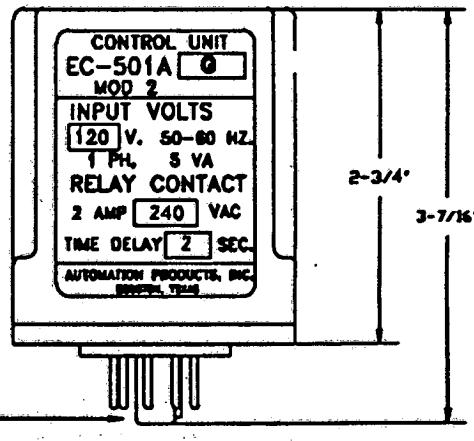
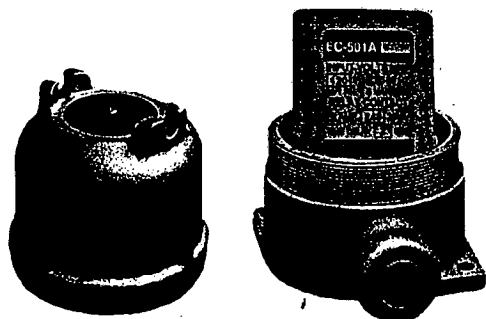
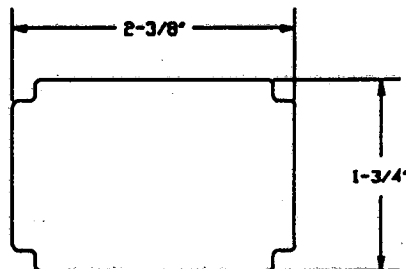
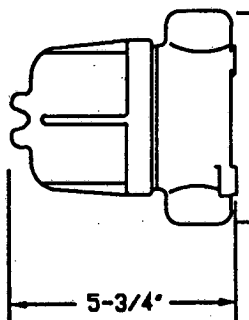
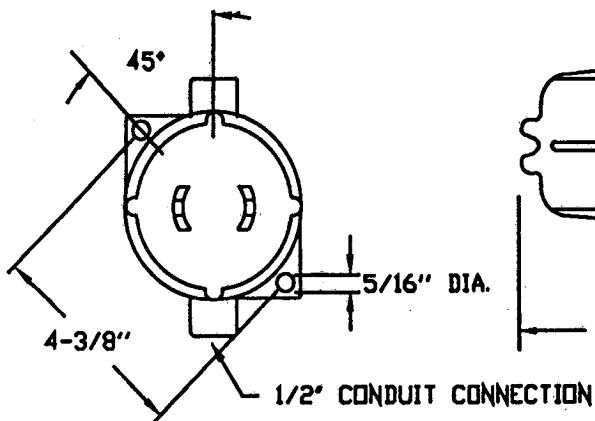
EC-501A CONTROL UNIT

- Solid State Circuitry
- Explosion Proof: CSA NRTL/C approved for Class 1, Group D, Division 1
- Voltage Supply (Nominal): 120 volts - 50-60Hz
- Power Consumption: 5 VA
- Temperature Rating: 125°F Maximum
- Contacts: SPDT 2A @ 120 VAC (Non-Inductive)
- Also Available in 240 VAC and 24 VDC

DYNATROL® LEVEL DETECTOR



EC-501 A CONTROL UNIT



AUTOMATION PRODUCTS, INC.

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