

INSTRUCTION MANUAL

MODEL 7058

VIBRATION MONITOR





RECEIVING & HANDLING

ACCEPTANCE

Vitec terms of sale, in all instances, are F.O.B. point of origin, freight prepaid. Thoroughly inspect this equipment before accepting shipment from the transportation company. If any of the goods called for in the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt. Request him to make an inspection. Claims for loss or damage in shipment must not be deducted from the Vitec invoice, nor should payment of the Vitec invoice be withheld awaiting adjustment of such claims since the carrier guarantees safe delivery.

If considerable damage has been incurred to your shipment and the situation is urgent, contact the nearest Vitec District Office for assistance.

UNPACKING AND SHORTAGE

Store equipment in a clean, dry area. Do not unpack equipment until ready for use.

PRODUCT WARRANTY

Except as otherwise provided in Vitec's Standard Condition of Sale, all new apparatus sold by the company is warranted to be free from defects in material and workmanship and to conform to any applicable drawings and specifications approved by the company for a period of one year from date of shipment to original user or 18 months from date of shipment by company to buyer, whichever period is shorter.

If within this period the company receives from the buyer written notice of any alleged defect in any such apparatus and if this apparatus is found not to be in conformity with this warranty (the buyer having provided the company a reasonable opportunity to perform any appropriate tests thereon) the company will, at its option and expense, either repair the same or supply a replacement therefore.

The company under either option shall have the right to require the buyer to deliver the apparatus for this purpose to a designated service center and the buyer shall pay all charges for inbound and outbound transportation and for services of any kind, diagnostic or otherwise, excepting only the direct and actual cost of apparatus repair or replacement as provided above.

Apparatus sold but not manufactured by the company will be warranted as to defects in material and workmanship consistent with the warranty policy of the original manufacturer of the apparatus.



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INTRODUCTION

This instruction manual contains descriptive information and functional operating and maintenance instructions for the Vitec Series 7058 Vibration Monitor. In order to obtain maximum usage from the instrument, the contents of this manual should be studied thoroughly. Any repairs or servicing required should be performed only by authorized Vitec personnel.

DESCRIPTION

The Series 7058 Vibration Monitoring System is designed to be installed in a relatively clean environment. It is not designed to be mounted outside or in an area where it will be subject to dirt or dust particles that may enter the case and possibly cause premature failure. The Series 7058 Vibration Monitor is designed to continuously measure, display, and give an alarm indication of vibration of industrial processes and machinery. The 7058 consists of (4) four monitoring channels which receive and process signals from vibration detectors installed on the equipment being monitored. Meter readout is provided for operator viewing of the measured vibration or limit setpoint vibration of the individual channels. Front panel controls include a "Channel Selector" switch, an "alarm set point"/"trip set point" readout switch, a "gap voltage" (applicable only with non-contact probe input)/"reset" switch, a BNC jack for "A.C. signal out". Alarm and trip LED's for each channel are provided to indicate an alarm or trip condition relative to the pre-set "set point" limit for the respective channel. A "signal loss" LED indicates loss of transducer input signal (not applicable with accelerometer input). The "power" LED indicates power has been applied to the unit. "Set Point" potentiometers are accessible through the front panel after removing the cover plate.

CHANNEL SELECTOR SWITCH

This switch selects which channel vibration will be connected to the meter for display. The positions 1,2,3,4 indicate the channels, "HI" will automatically display the channel with the greatest vibration, (highest vibration level). In the "HI" position, to determine which channel is being displayed, turn the switch thru positions 1,2,3, and 4 to locate the corresponding level of vibration. Monitoring functions of all channels are continuous, regardless of the position of this switch.



DESCRIPTION - (Continued)

ALARM SET POINT / TRIP SET POINT

Actuating this momentary switch will display the respective set point limit for the channel indicated by the channel select switch.

GAP / RESET

Actuating this momentary switch to the "Gap" position will display the gap (probe standoff distance) for the channel indicated by the channel select switch. On the right hand scale of the meter, scale is calibrated 0 to 10 with a X 10 factor for a gap of 0 to 100 mils.

NOTE: THIS FUNCTION IS ONLY APPLICABLE TO THOSE UNITS WITH NON-CONTACT PROBE INPUTS. ACTUATING THE SWITCH TO THE "RESET" POSITION WILL RESET ANY LED OR LATCHING RELAY IF THE VIBRATION LEVEL HAS DROPPED BELOW LATCHING THE SET POINT LIMIT.

METER

The meter indicates vibration for individual channels as selected by the "Channel Selector" switch. Actuating the "Alarm Set Point"/"Trip Set Point" switch causes the meter to display the set point vibration for that channel. The meter circuit contains a potentiometer for adjustment of full scale span of the meter. The meter movement is protected against overload.

METER READOUT UNITS

With an accelerometer pickup the instrument meter and limit detection can be in acceleration, velocity or displacement.

With a velocity pickup the instrument meter and limits can be either velocity or displacement.

With a non-contact displacement pickup the instrument meter and limits are in displacement.

See the deviation sheet for the pickup and instrument detection units for each instrument.



DESCRIPTION - (Continued)

SET POINT ADJUST

To adjust the alarm and trip set points, set channel select switch to desired channel, hold alarm/trip set point switch to desired function, finally turn the set point adjusting pot which corresponds to that channel and function, i.e. channel 3 alarm, channel 2 trip etc. (Note; Screw adjustable set point pots are located behind set point cover located at the lower right hand corner of the front panel).



SPECIFICATIONS FOR A COMPLETE 4-CHANNEL VIBRATION MONITOR MODEL 7058

- a) Four channels available for accelerometer, velocity pickups or non-contact probes.
 - With Accelerometer - read & monitor in acceleration, velocity or displacement.
 - With Velocity Pickup - read & monitor velocity or displacement.
 - With Non-Contact Probe - read & monitor in displacement.
- b) 2 setpoints each channel. (8 in total).
- c) 3 relays, 1 alarm and 1 trip, 1 signal loss operated by any of 4 channels.
- d) 1 LED for power.
- e) 4 LED's for alarm.
- f) 4 LED's for trip.
- g) 1 LED for signal loss.
- h) 1 meter.
- i) 1 4-Channel selector switch to read each channel or highest vibration level.
- j) A buffered A.C. signal output proportional to the input is provided and is available at the front panel BNC jack. Use switch to select 1 or 4 channels.
- k) 1 momentary toggle switch for reset and gap voltage (gap voltage for non-contact probe only).
- l) Available for 110 or 220 VAC - 50 or 60 cycles.
- m) A momentary toggle switch to read alarm setpoints & trip setpoints.
- n) Optional filters for acceleration reading in displacement.
- o) X3 startup attenuation by remote closure by User.
- p) An optional separate analog signal of 0-5 VDC or 4-20 Ma. proportional to full scale is available at terminals on rear connector board for all 4 channels simultaneously.
- q) Relay contacts - Form C (SPDT) 5 amp. non-inductive at 115 V - 60 Hz. De-energized below setpoint is standard.



INSTALLATION

GENERAL

Inspect the instrument and packing case for any evidence of damage or unusual abuse in transit. Check the unit for obvious dents, scratches, and broken fittings. Any damage should be reported to the shipper at once.

VITEC MAKES NO WARRANTY AGAINST EQUIPMENT THAT HAS BEEN SUBJECTED TO IMPROPER HANDLING PROCEDURES. ANY CLAIM AGAINST TRANSPORTATION DAMAGE MUST BE FILED BY THE RECIPIENT WITH THE TRANSPORT SERVICE USED.

The Vibration Monitor is ready for installation upon receipt, requiring only mounting and the connection of power source and vibration pickup input cables. Each instrument is individually tested to listed specifications prior to shipment to ensure satisfactory performance.

MECHANICAL INSTALLATION

The Series 7058 Vibration Monitor is designed for mounting on the customer's vertical panel. A panel cutout must be provided. See Drawing No. 79904-123. The Series 7058 vibration monitor is designed for use as a bench top or a panel mounted device.

To panel mount the Model 7058 the panel mounting rails must first be removed from the case. This is accomplished by removing the (4) outermost screws as viewed from the rear. (Do not confuse these screws with the rear connector mounting screws). After these screws have been removed the panel mounting rails may be slid out of their tracks. At this point the Model 7058 can be placed in a 7.25 X 3.56 panel cutout. (See Drawing 79904-123). The rails may then be replaced along with the retaining screws thereby securing the monitor. (See Fig.1)

The vibration pickups are mounted on the equipment at points designated by the customer. Mounting dimensions and direction of mounting may be particular to the probe. Therefore, detailed installation instructions are not normally included in the monitor manual. Information on a particular probe is available on request.

MECHANICAL INSTALLATION

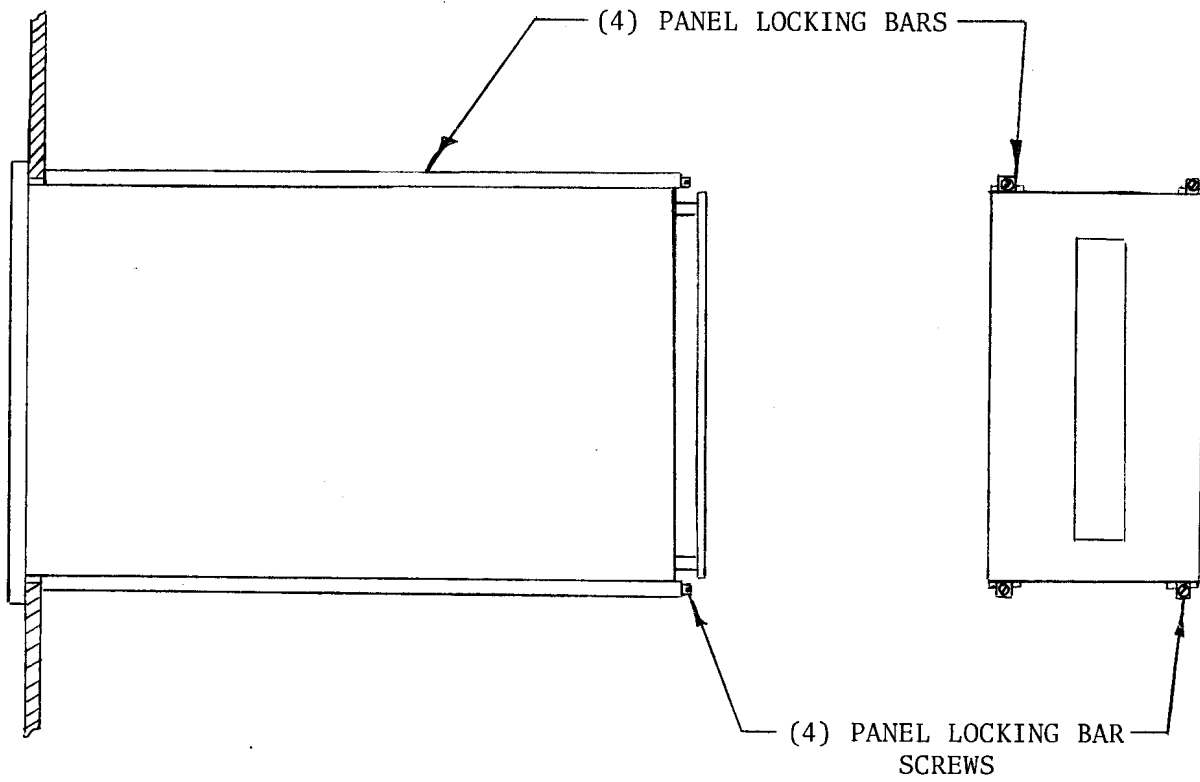


FIG.1



INSTALLATION - (Continued)

ELECTRICAL INSTALLATION

All electrical connections are made to the terminal strips mounted on the rear of the housing. See Drawing No. 412530-__ (see deviation sheet for dash number).

The monitor is functional with power connected to terminals TB2-17, 18 and 19 and the vibration pickup and relay connections completed.

REMOTE RESET

TB1-1 and TB1-2 may be used for connecting a remote, normally open, reset switch.

START-UP LIMIT

TB2-15 and TB2-16 may be used for connecting a normally open switch, closing this switch decreases the input signal by a factor of 3 as long as the switch is closed. Decreasing the input signal allows high vibration levels to be read, and eliminates alarms and trips, during startup.

ANALOG OUTPUTS

TB1-3 through TB1-10 makes available separate analog signals for each of the (4) channels. The analog output is proportional to full scale.

CAUTION: SHUT OFF INPUT POWER FOR MONITOR BEFORE CONNECTING OR

DISCONNECTING WIRING TO TERMINALS.

BE SURE TO CONNECT TB2-19 TO A GOOD EARTH GROUND.



GROUND CONNECTION

WARNING: SEVERE, POSSIBLE FATAL ELECTRICAL SHOCK CAN RESULT FROM CONTACT WITH AN INADEQUATELY GROUNDED VIBRATION MONITORING SYSTEM. TO ENSURE SAFETY OF OPERATING PERSONNEL ... AN INSULATED GROUNDING WIRE OF AT LEAST 14 AWG SHOULD BE CONNECTED FROM MONITOR TERMINAL TB2-19 TO A SUITABLE EARTH GROUND. REFER TO NATIONAL ELECTRIC CODE REGULATIONS FOR YOUR AREA FOR SPECIFIC REQUIREMENTS.



OPERATION

PREPARATION FOR USE

Before operating the equipment

- a) Check all interconnecting wiring for strict conformance to wiring diagrams. Make sure all connections are tight.
- b) Visually inspect monitor and vibration pickup wiring for loose or broken connections or damaged wires.
- c) Check for loose or damaged components.
- d) See that proper input power is available.

OPERATION OF VIBRATION MONITOR

- a) Connect input power. Monitor "PWR" indicator will light.

NOTE: THE MONITORING FUNCTION WILL COMMENCE FOR ALL CHANNELS
AS SOON AS POWER IS APPLIED TO THE UNIT.

- b) Turn the CHANNEL selector switch to the desired positions. The panel meter will immediately display the vibration for the selected channel. Similarly select other channels for visual readout of vibration.
- c) The present vibration limit setpoint for a particular channel may be observed by activating the "ALARM SET POINT"/"TRIP SET POINT" switch. The monitor panel meter will display the set point, then return to the vibration reading for that channel when the switch is released.
- d) The vibration monitoring function of all channels is continuous while the unit is in operation.



MAINTENANCE

GENERAL

Vitec Series 7058 Vibration Monitors are manufactured of high reliability components and under normal operating conditions will give long, trouble-free service. In the event a component should fail, requiring replacement, it may become necessary to return the instrument to the manufacturer for re-calibration if it does not operate satisfactorily following repair.

REPAIR PROCEDURES

The application of solid-state circuitry yields a rugged and reliable instrument during normal operation. In the event of a suspected failure and before any repairs are attempted:

- a) Read the WARRANTY on the front of this manual.
- b) Make sure that the applied input is of sufficient amplitude and within specified range.
- c) Verify proper positioning of operating controls.
- d) Visually inspect unit for loose or broken wiring connections and defective components.

If a valid malfunction is encountered, follow these general instructions:

- a) NEVER remove or replace a component while the power cord is connected.

CAUTION: EXERCISE EXTREME CARE WHEN SERVICING THIS EQUIPMENT WHILE POWER IS CONNECTED. A SHOCK HAZARD DOES EXIST! REPAIRS SHOULD BE MADE BY QUALIFIED PERSONNEL ONLY.

- b) Properly ground all test equipment.
- c) Use only a grounded, transformer-coupled, thermostatically controlled soldering iron.
- d) Never use acid-core type solder on wiring or electronic component connections.



MAINTENANCE - (Continued)

TROUBLE ANALYSIS

Whenever trouble occurs systematically, check fuses, primary power lines, external circuit elements and related wiring before trouble shooting the instrument. Failures and malfunctions often can be traced to simple causes such as supply-load connections or fuse failure. The fuse for this unit is located on the rear printed circuit board. Replace defective fuse with a 1 AMP plug-in microfuse Vitec P/N: 412725-22C or equivalent.

Use the electrical schematic diagrams as an aid to locating trouble causes. These diagrams contain various circuit voltages using the conditions for measurement specified on the schematic diagram. Use measuring probes for measurement specified on the schematic diagram. Use measuring probes carefully to avoid causing short circuits and damaging circuit components.

CHECKING TRANSISTORS AND CAPACITORS

Check transistors with an instrument that has a highly limited current capability. Observe proper polarity to avoid error in measurement. The transistor forward resistance is LOW, but never zero; backward resistance is always higher than the forward resistance.

For GOOD transistors, the forward resistance for any junction is always greater than zero.

NOTE: DO NOT ASSUME CIRCUIT TROUBLE IS ELIMINATED WITH THE REPLACEMENT OF ONE FAULTY COMPONENT. THIS IS ESPECIALLY TRUE WHEN ONE TRANSISTOR, FAILS, CAUSING OTHER TRANSISTORS TO FAIL. REPLACING ONLY ONE TRANSISTOR, THEN TURNING POWER ON BEFORE CHECKING FOR ADDITIONAL DEFECTIVE COMPONENTS, COULD DAMAGE THE REPLACEMENT PART.

When soldering semi-conductor devices, wherever possible, hold the lead being soldered with a pair of long-nose pliers placed between the component and the solder joint...this will usually provide an effective heat sink.

Note: The leakage resistance obtained from a simple resistance check of a capacitor is not always an indication of a faulty capacitor. In some cases a capacitor is shunted with resistances, some of which have low values. Normally, a dead short is a true indication of a shorted capacitor.



MAINTENANCE - (Continued)

PRINTED CIRCUIT BOARD MAINTENANCE

- 1) If circuit foil is intact, but not covered with solder, it is a good foil. DO NOT ATTEMPT TO COVER WITH SOLDER.
- 2) Voltage measurements can be made from either side of the board. Use a needlepoint probe to penetrate to the wiring whenever a protective coating is used on the wiring. A brass probe can be soldered to an alligator clip adapted to the measuring instrument.
- 3) Wherever possible, use a heat sink when soldering transistors.
- 4) Broken or damaged printed wiring is usually the result of an undetected imperfection, strain, or careless soldering. To repair small circuit breaks, select a short piece of hook-up wire to bridge the break, and holding the wire in place, flow solder along the length of wire so that it becomes part of the circuitry.
- 5) When unsoldering components from the board, never attempt to pry or force loose the part; unsolder the component, using a suitable solder removal tool for removing excess solder.



TECHNICAL INFORMATION

MAIN PRINTED CIRCUIT BOARD (LOGIC BOARD) P/N 53221 is connected to the signal conditioner printed circuit board through the rear mother board. The main board contains the +5, \pm 12 volt power supplies, multiplexer, A/D converter, analog output circuitry, LED's and related circuitry, relays, and channel select switch.

The sequence of operation begins with the multiplexer scanning to the signal level, the signal is then converted to an 8-bit digital signal by the A/D converter and is stored in an 8-bit latch. Next, the multiplexer scans to the alarm pot. This voltage is also converted to a digital signal by the A/D converter. The value in the latch is then compared to the value in the A/D converter (signal vs. alarm setting), if the signal is greater than the pot setting the comparator output becomes high (Logic 1). The result is then stored in a latch, through a time delay and finally to the LED's and relay. The same sequence is followed for the trip setting and is typical of all four channels.



TECHNICAL INFORMATION

NON-CONTACT PROBE SIGNAL CONDITIONING PRINTED CIRCUIT BOARD P/N 53224

The non-contact probe signal conditioning printed circuit board is for use with API-670 probes and drivers. This board supplies the required -24 VDC to each driver, and each supply is individually regulated and current limited. A continuous short on the output will neither damage the monitor nor cause the other channels to malfunction.

This signal conditioner is a 4-channel unit which displays the vibration level in mils peak-to-peak. This unit also performs the functions of scaling, absolute value full wave rectification, A.C. out, startup attenuation, open pickup detection, along with supplying power to the non-contact probe drivers. The full scale range is shown on the deviation sheet in this manual.

This board also supplies a buffered A.C. signal output proportional to the input and is available at the front panel BNC jack and controlled by the channel select switch.



VELOCITY TRANSDUCER (4033)

SIGNAL CONDITIONER

This unit is a 4-channel signal conditioner configured to measure peak velocity (in/sec) or displacement in mils peak-to-peak.

The unit performs the functions of scaling, integration, absolute value full wave rectification, and open pickup detection. The full scale range is shown on the deviation sheet.

Open pickup protection actuates a normally de-energized relay and at the same time inhibits the channel from actuating the alarm or trip relay. A signal loss LED, located on the front panel, indicates an open pickup condition. Locating the channel with the open pickup is accomplished by rotating the channel selector switch through the channels. The channel that reads zero will have the open pickup.

This unit also supplies an A.C. signal output proportional to the input. This signal is available at the front panel BNC jack. The output signal is from the channel indicated by the channel selector switch.



ACCELEROMETER TRANSDUCER (4068)

SIGNAL CONDITIONER

This unit is a 4-Channel signal conditioner configured to measure peak acceleration (G's), peak velocity (in/sec) or displacement (mils pk to pk).

The unit performs the function of scaling, no integration, single integration or double integration, and absolute value rectification. The full scale range is shown on the deviation sheet.

Optional multistage filters either low pass, high pass or band pass can be provided with 12db or 24db attenuation. The filter circuit can be configured to be a Butterworth or Chebychev depending upon filter characteristics required.

This unit also supplies an A.C. signal output proportional to the input. This signal is available at the front panel BNC jack. The output signal is from the channel indicated by the channel selector switch.

This unit does not have open pickup protection.



ACCELEROMETER TRANSDUCER (4070)

SIGNAL CONDITIONER

This unit is a 4-Channel signal conditioner configured to measure peak acceleration (G's), peak velocity (in/sec) or displacement (mils peak-to-peak).

The unit performs the function of scaling, no integration, single integration or double integration, and absolute value rectification. The full scale range is shown on the deviation sheet.

Optional multistage filters either low pass, high pass or band pass can be provided with 12db or 24db attenuation. The filter circuit can be configured to be a Butterworth or Chebychev depending upon filter characteristics required.

This unit also supplies an A.C. signal output proportional to the input. This signal is available at the front panel BNC jack. The output signal is from the channel indicated by the channel selector switch.

This unit does not have open pickup protection.



(8) RELAY OPTION

The (8) Relay Option provides an alarm and a trip Relay for each input channel. The relays are located on the Rear Auxilliary Terminal Board and each has (1) form C contact (SPDT) rated for 10 Amps at 24VDC or 115VAC.

The (8) Relay Logic P.C.B., (X4), is mounted piggyback on the main P.C.B., (X1), and recieves input logic signals via a ribbon cable from U5 on X1 to J2 on X4. The output signals which control the relays are connected to the (8) Relay Auxillary Terminal Board (X5) via a ribbon cable from J1 on X4 to J1 on X5.

The (8) Relay Auxillary Term Board, (X5), contains terminal blocks for the relay contacts user connections, Relay Driver I.C.'s & switches S1 & S2 for programming the swich modes as shown in the table below:

Trip Relays K5,6,7,8

S1-1; Closed-Energized below Setpoint
Open-De-Energized below Setpoint

S1-2; Closed-Latching
Open-Non-Latching

Alarm Relays K1,2,3,4

S2-1; Closed-Energized below Setpoint
Open-De-Energized below Setpoint

S2-2; Closed-Latching
Open-Non-Latching

NOTE:

The (8) Relay Auxillary Terminal Board is mounted directly over the rear connectoer P.C.B., (X2), using (2) hinged and (2) straight standoffs. Access to X2 is attained by removing the two (2) hold down screws on the right hand side (as viewed from the rear) of X5, disconnecting the ribbon cable connector J1 and swinging X5 to the left. See Fig. 1

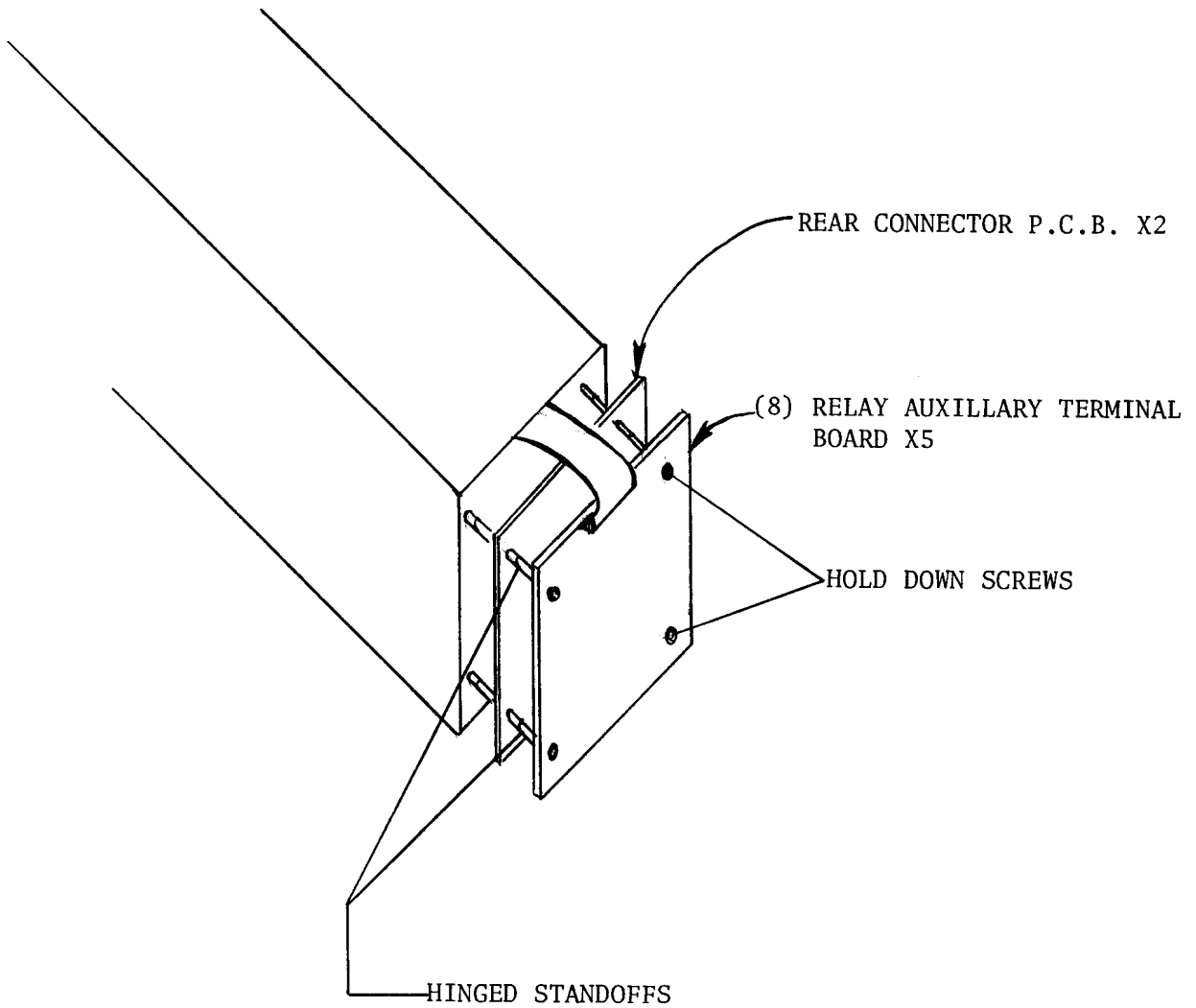


Fig. 1



Instruction Manual No. 412537-137 Sh. 15
Rev. Ltr. A Date 2/2/95 By: BLS

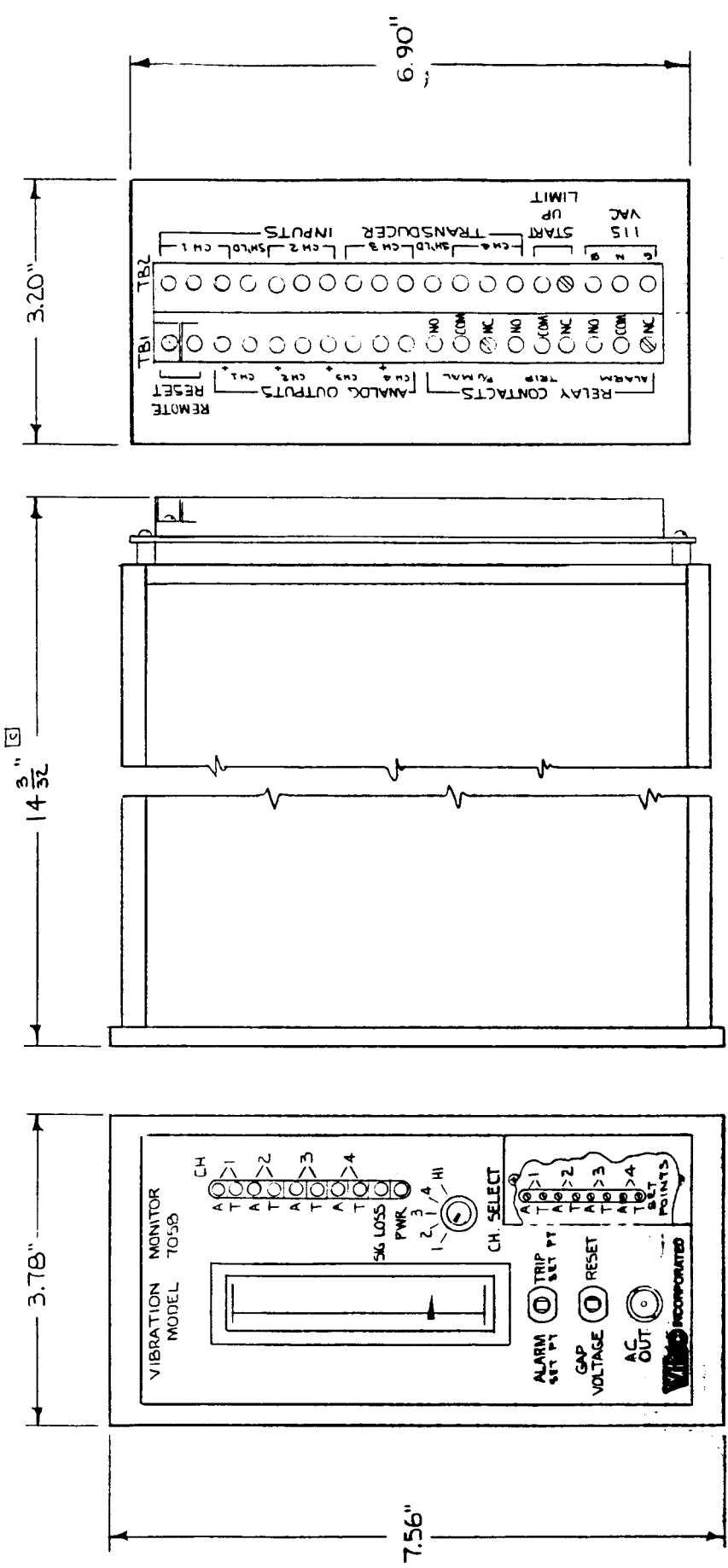
SUPPLEMENTAL DRAWINGS FOR M 7058

<u>DESCRIPTION</u>	<u>DRAWING NUMBER</u>
Model 7058 Case Dimensions....	79904-123 Sheet 1 & 3
Model 7058 Rear Conn. Wiring...	412530-*

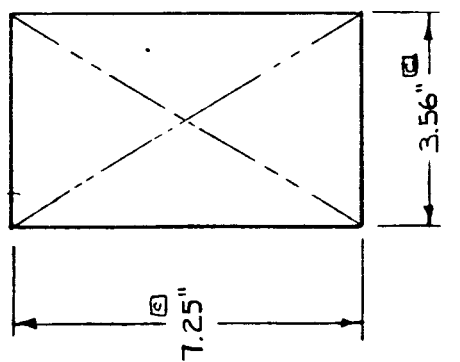
*See deviation sheet for complete part number

1 2 3 4

REVISIONS		DATE	APPROVED
ZONE	LTR	DESCRIPTION	
B		REDESIGNED	5-12-91 MT J SIMMS
C		OA LENGTH WAS 13.65; PANEL CUTOUT WAS 7.52 X 3.62	6-10-91 MT J.S.MKO
D		ADDED SETPOINT COVER	6-25-91 MT J.S.MKO



REAR VIEW



PANEL CUTOUT

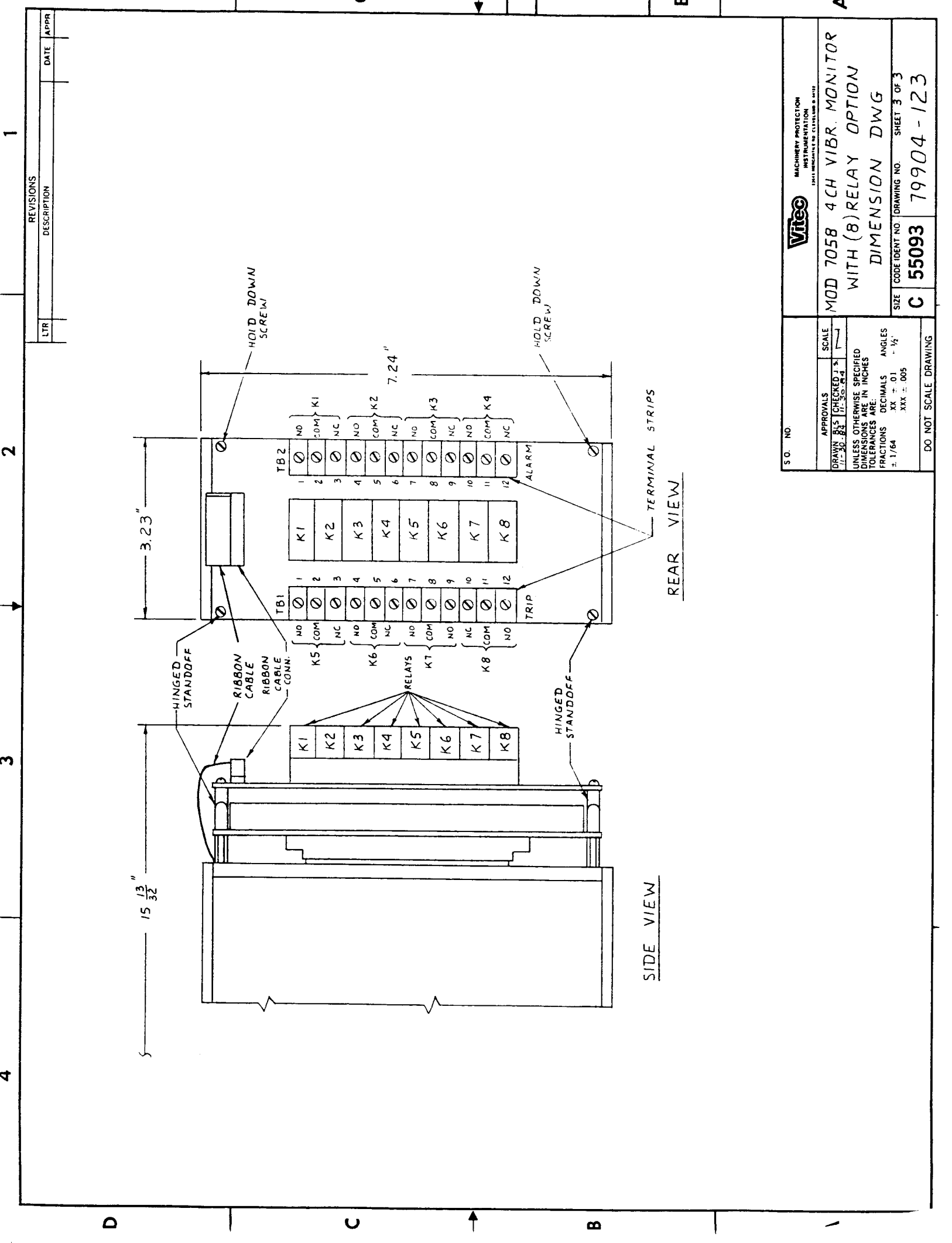
QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.	
FRACTIONS	DECIMALS	APPROVALS	DATE
± 1/64	XX ± 01 ± 1/2	DRAWN TROYAN	5-12-91
	XXX ± .005	CHECKED J.S.MKO	5-14-91
MATERIAL			
FINISH			
APPLICATION			
NEXT ASSY	USED ON		
DO NOT SCALE DRAWING			
SIZE	CODE IDENT NO.	DRAWING NO.	
C	55093	79904-123	
SCALE	1-1	SHEET	1 OF 3



MODEL 7058 VIBRATION MONITOR DIMENSION DWG

MACHINERY PROTECTION INSTRUMENTATION

30001 WINDYBROOK DR. ST. LOUIS, MO 63114



REVISIONS	DESCRIPTION	DATE	APPR
LTR			

Vitec MACHINERY PROTECTION INSTRUMENTATION
19411 WILSON BLVD. • CLEVELAND 8, OHIO

MOD 7058 4CH VIBR. MONITOR
 WITH (8) RELAY OPTION
 DIMENSION DWG

S.O. NO. _____

APPROVALS _____ SCALE _____
 DRAWN BY: CHECKED BY: _____
 11-30-64 11-30-64

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ARE:
 FRACTIONS DECIMALS ANGLES
 ± 1/64 ± .01 ± 1/2°
 XXX ± .005

SIZE CODE IDENT NO. DRAWING NO. SHEET 3 OF 3
C 55093 79904-123

DO NOT SCALE DRAWING