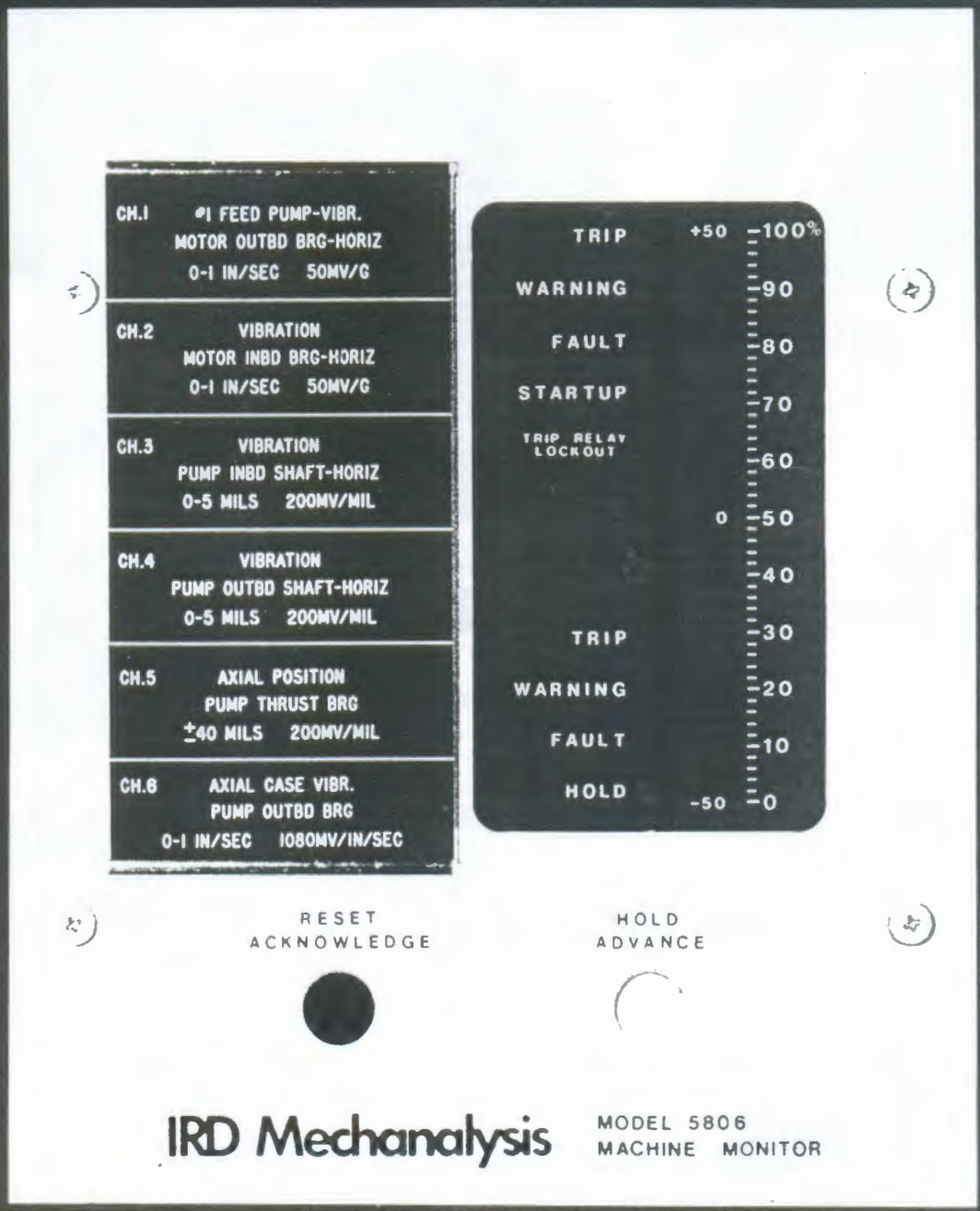
Mechanalysis

Model 5806 Machine Monitor

a revolutionary new monitoring system with available startup-extended warranty service plus on-site operator training



• featuring microprocessor digital circuitry

INSTALLATION–OPERATION
AND
SERVICE
INSTRUCTION MANUAL
FOR
MACHINE MONITOR
MODEL 5806

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MANUAL PART No 54
PRINTED FEB. 1992

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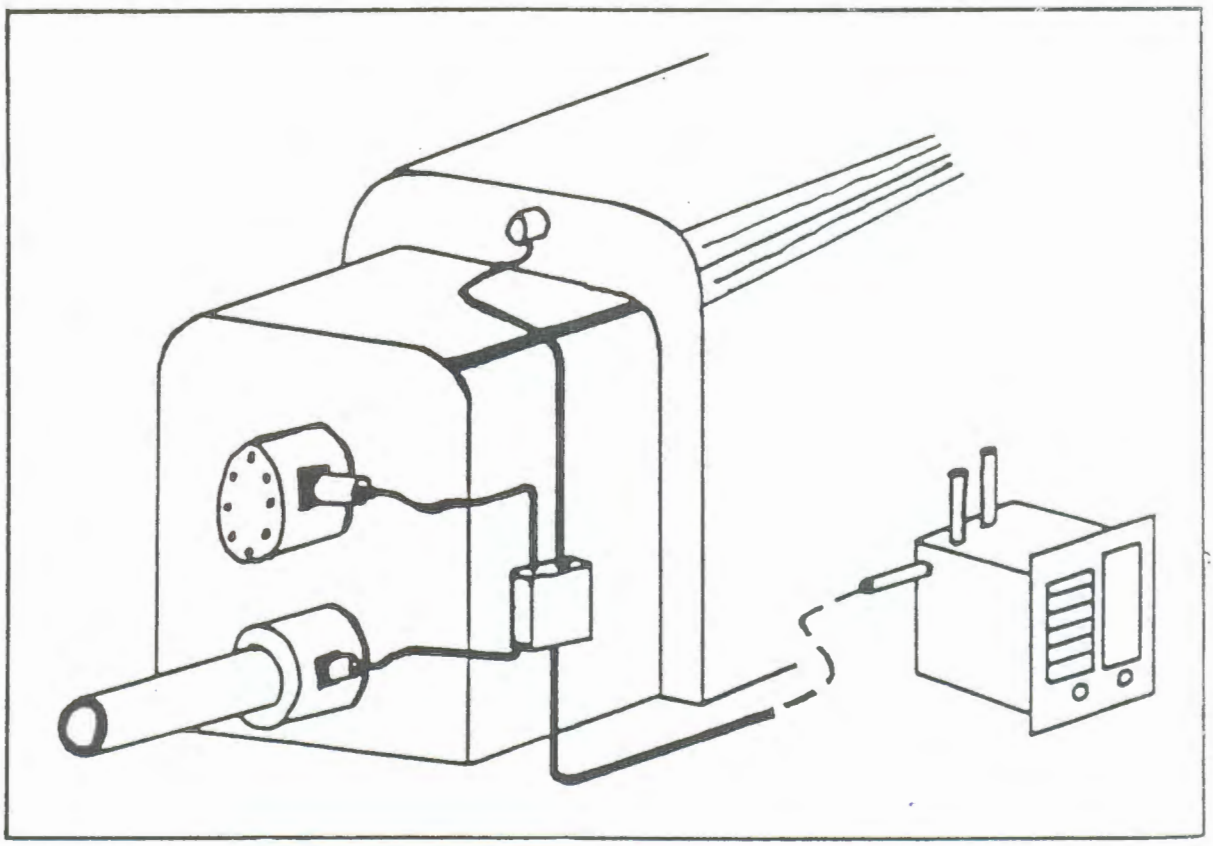
SYSTEM DESCRIPTION

The concept of machinery monitoring is quite simple. During normal operation, the machine's "vital signs" remain within relatively narrow ranges. If a mechanical problem develops, it will be reflected as a change in one or more of these vital signs. This change will be sensed by the monitor instrument and cause an alarm.

The monitor system consists of a number of TRANSDUCERS connected to the MONITOR. Transducers installed on the machine convert the "vital signs"- various mechanical parameters such as vibration, temperature, axial movement, and others - to electrical signals that are transmitted to the monitor instrument.

The monitor is usually installed in the control room with other machine instrumentation. It receives signals from the transducers, processes and measures the signals, and closes electrical relay contacts if one of the signals increases too much. The relays can be connected to annunciators or to automatic machine controls.

The monitor also provides signal-proportional electrical outputs that can be used with strip chart recorders, data loggers, or computers.



TRANSDUCERS

The effectiveness of the monitor system will depend on the selection of proper transducers and their location on the machine.

The transducers supplied with this monitor are those specified by the purchaser. The installation section of this manual covers the details of proper transducer mounting and wiring. Because of the great variety of machine configurations, the manual does not attempt to instruct the installer as to exact placement of the transducers. IRD engineers will be pleased to offer advice and recommendations relative to the selection and/or installation of transducers, upon request.

(In most cases, the transducers have been selected by system engineers to guard against the most commonly encountered failure modes of the machine. It is important to recognize that some machine faults can occur that would not result in a significant change in the monitored parameters, therefore would not cause an alarm.)

NOTE: The term "pickup" is commonly used interchanageably with the term "transducer".

The chart below summarizes the various types of pickups used with Model 5806 Monitor.

MEASURED PARAMETER	PICKUP TYPE(S)	IRD PICKUP MODEL NUMBER(S)	MONITOR READOUT IN TERMS OF ---
Vibration	Velocity	544B, 544M 544R, 540	Velocity (in/s or mm/s) Displacement (mils or µM)
	Accelerometer	960M, 910M	Acceleration (g) or Velocity (in/s or mm/s)
	Non-Contact	403	Displacement (mils or µM)
Axial Position (Thrust)	Non-Contact	403	Displacement (mils or mm)
Temperature	Thermocouple	*Type J,K,T	Temperature (°F or °C)
	RTD	*100 ohm Pt	Temperature (°F or °C)
Spike Energy	Accelerometer	960M	Spike Energy (gSE)
Speed	Non-Contact	403	Speed (Rev/min)

*Not supplied by IRD

INSTALLATION

SELECTING A LOCATION FOR THE MONITOR

The monitor is designed for panel mounting in a control room for ready access by operating personnel. If it is necessary to install the monitor outdoors, a NEMA-3 Weatherproof Enclosure must be used to prevent rain from entering the monitor. If the anticipated minimum temperature is below 32°F (0°C) the enclosure must be equipped with a heater. Shade from direct sunlight must be provided to prevent excessive heat buildup in the enclosure (which could result in an equipment failure). Maximum temperature for the monitor unit is 140°F.

When selecting a location for the monitor, keep in mind that it is a complex electronic device. It is designed and manufactured to withstand quite severe environmental conditions BUT ---- as with any electronic instrument it will give the longest, trouble-free service if treated with some care. In general, any location that is comfortable for people is best.

The selected panel location should not subject the monitor to dripping water from above, or to heat from equipment installed beneath it.

HAZARDOUS LOCATIONS

Due to the proximity of some control rooms to process machinery, the control room interior may be designated as a hazardous area within the definition of Article 500 of the (U.S.) National Electrical Code, or similar codes in other countries.

If the control room is classified as a Division 2 area (N.E.C.), present interpretation of the code usually permits the operation of electrical equipment if two conditions are met during normal operation:

(1) Arcing or sparking contacts must not be exposed, and
(2) No surface temperature may exceed 80% of the ignition temperature (in °C) of the hazardous gas or vapor.

The Model 5806 Monitor meets the first requirement since all relay contacts are hermetically sealed. The second requirement is met if ignition temperature of the hazardous gas or vapor is above 200°C.

CAUTION

BEFORE INSTALLING OR OPERATING THIS MONITOR IN A HAZARDOUS LOCATION, OBTAIN SPECIFIC APPROVAL TO DO SO FROM THE LOCAL APPROVING AUTHORITY.

PURGING

Some airborne gases (such as chlorine) are so corrosive that over an extended period of time even the best protected instrument will be damaged. If this situation exists in the proposed monitor location, consideration should first be given to selecting another location! If that is not possible, the NEMA-3 Enclosure should be used, with a continuous flow of clean instrument air to exclude the corrosive gas.

NOTE: Purging in this manner is NOT recommended in explosion-hazardous areas, such as discussed in the preceeding paragraph

GROUNDING AND SHIELDING

Electrical signals from the transducers are quite small, and therefore susceptible to interference from electrical "noise". Noise can be generated by power cables near the transducers or wiring, by walkie-talkies, by electrical static discharges or lightning, or by large electrical equipment (motors, transformers, controllers) in the vicinity.

To minimize the possibility of interference- which can cause erroneous monitor readings and false alarms - it is essential to follow the recommendations on these pages with respect to grounding and shielding.

Radio-frequency interference (RFI) can result from open wiring. If walkie-talkies are used in the plant, it is strongly recommended that ALL wiring be run in thin-wall metallic electrical tubing (conduit). Conduit, fittings, and junction boxes should be electrically bonded to a good earth ground.

INSTALLATION DETAIL DRAWINGS

The following several pages show installation details, dimensional data, and wiring instructions for:

(1) Indoor panel mounting of 5806 Monitor
(2) Outdoor panel mounting in NEMA-3 Enclosure
(3) Wiring to 5806 Monitor Terminals (4 pages)
(4) Velocity Pickups
(5) Non-Contact Pickups
(6) Accelerometer Pickups

CAUTION

DO NOT APPLY POWER TO THE MONITOR UNTIL ALL WIRING HAS BEEN CAREFULLY CHECKED.