



5533 Probe Driver

Installation Manual



OVERVIEW

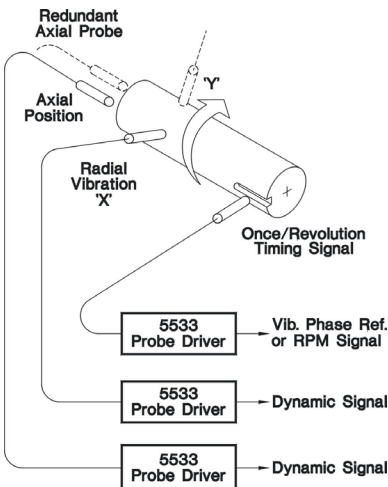
These linear, non-contact sensors measure radial vibration or axial position of machinery shafts. Operating on the eddy current principle, they sense static position or vibration displacement with excellent resolution and stability.

Motions as small as one micron (40 micro-inches) and up to 1.5mm (60 mils) can be measured.

A complete system consists of PP Series probe, extension cable and solid state probe driver assembly. The 5533 Probe Driver, featured here, has a convenient BNC signal jack for local analysis. PP Series probes, cables and driver systems are certified for use in electrically hazardous areas as described in the specifications without additional charge.

FEATURES

- Compatible with most competitive probes and cables
- Fully compliant with API 670 specifications
- 60 mil (1.5mm) displacement range
- BNC connector for local analysis
- Ruggedized cable with integral armor



INSTALLATION

1. The standard probe configurations are shown on page 6. However, other probe configurations can be supplied on special order. For vibration measurements, mount the probe with its axis radial to the shaft, and with its tip approximately 0.050" (1.25 mm) from the surface of the shaft (see Fig. 1). Refer to CALIBRATION for exact gapping procedure. For axial position measurements, mount the probe with its axis parallel to the shaft axis and 0.050" from the end of the shaft. If the center of the shaft is countersunk, the probe should be mounted off center but with its axis no closer to the edge of the shaft than 1.5 X the probe tip diameter. To prevent crossfeed between any two probes mounted in the same vicinity, at least 1" (2.5 cm) spacing between the probe tips should be maintained (see Fig. 2). The probe tip must be provided with sufficient clearance from surrounding metal to prevent an erroneous output. As a minimum, the radial clearance diameter should be twice the probe tip diameter for the full length of the probe tip (see Fig. 1).

2. The probe can be mounted in a simple bracket (P/N 7646), or mounted in a tapped hole in the bearing cap, or by means of the Model 5499 Probe Housing. The latter arrangement provides an easy way to adjust the probe air gap, especially where the target is some distance from the outside surface of the machine. In addition, it provides an explosion proof conduit for the junction of the probe connector and extension cable. When employing the Model 5499 Probe Housing, use the reverse mount probe.

3. When inserting the probe through the machine case or bearing cap, the signal voltage may vary widely before the proper gap is obtained. Therefore, be sure the gap is within 0.1" (2.5 mm) of the target before attempting to set the gap electrically. **CAUTION: If possible, set the probe gap while the machine is shutdown, to avoid possible damage to the probe in the event that it touches the shaft.**

4. Connect the probe to the driver unit, using the coax extension cable. Do not change the length of the extension cable or delete it, as such action will adversely affect the calibration and linearity. If a connector must be replaced, the overall length of the cable can be reduced by 2" without harm. To prevent possible ground loops, the connector junctions between the probe and extension cable should be insulated from grounded metal, using the 8973 insulator supplied, or with heat shrink tubing or tape. For the same reason, it is recommended that the driver unit not be connected to ground. The driver circuit is insulated from ground by its plastic housing. If grounding of the driver is required, a jumper wire can be used to connect the COM terminal to one of the mounting screws. Proper attention must be given to other connections in the circuit to prevent unwanted ground loops which can cause improper operation.

5A. INSTALLATION IN NONHAZARDOUS LOCATIONS

Connect the 24V, SIG, and COM terminals on the driver to the monitor unit or other readout



CAUTION: When attaching field wiring, observe the torque rating of 8 in/lbs, not to exceed 10 in/lbs, to ensure terminal screws are not over-tightened. Over-tightening a terminal screw may cause the terminal to break loose from the device's circuit board and cannot be repaired in the field.

device. Use shielded 3 conductor (AWG #20 or larger) cable, such as Belden #8770 or equivalent (Metrix #93800008). The cable can be up to 1000 feet (300 m) long.



5B. INTRINSICALLY SAFE INSTALLATION IN HAZARDOUS LOCATIONS

The Model 5533 Proximity Sensor system is certified by CSA as Intrinsically Safe for Class 1, Division 1, Groups A, B, C, and D hazardous areas when installed per Metrix Installation drawing 8737.

A minimum of ± 18 VDC must be applied to the safety barrier for proper operation. The maximum supply voltage that may be applied to the safety barrier is 35 VDC.

1. This apparatus must be installed such that the terminals are protected to at least IP20
2. The plastic enclosure may create an electrostatic hazard and should not be rubbed or cleaned with a dry cloth.
3. The apparatus must not be installed in an area of high dust-laden air flow.

Consult the manufacturer's safety barrier installation instructions for the specific installation requirements.

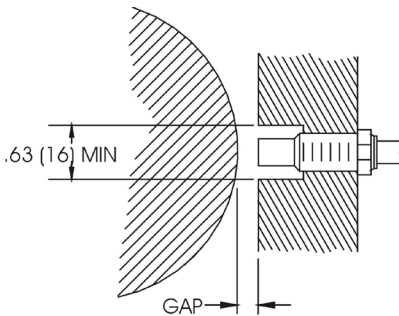


FIGURE 1

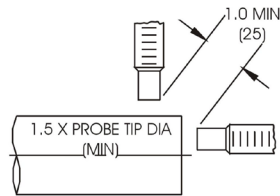


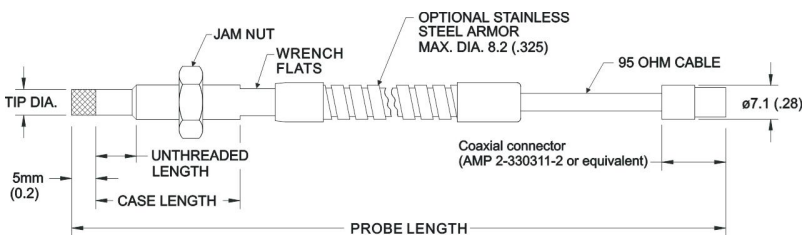
FIGURE 2

CALIBRATION

1. The driver unit has been factory calibrated for 4140 steel target material. Probes can be exchanged without recalibration of the driver with a maximum interchangeability error of 9.5%. The probe gap can be set "electrically" to the center of the measurement range (a gap of 50 mils or 1.25 mm) by observing the output voltage and adjusting the probe gap for a 10.0 VDC output.

2. If the sensitivity (the slope of the response curve) has not been factory calibrated for the intended application, or if system components have been changed and recalibration to restore maximum accuracy is required, the unit can be recalibrated using the following procedure:
 - a. Set the probe gap mechanically to approximately 0.04" (1.0 mm).
 - b. Increase the probe gap by 0.020" (0.50 mm) and observe the change in output voltage measured between SIG and COM on the terminal block or on the BNC. A voltage change of 4 volts/20 mils = 200 mV/mil should be observed. The sensitivity may be increased by a clockwise rotation of the CAL screwdriver adjustment on the driver unit.
 - c. Repeat steps (a) and (b) until the desired sensitivity is obtained.
 - d. Set the probe gap to the center of the measurement range as in (1). The unit is now calibrated and operating in the center of its measurement range.

PROXIMITY PROBES—SERIES 10,000



Probe Pressure Rating:
1380 kPa (200 psig) at probe tip

Probe Tip: polyphenylene sulfide probe tip provides good to excellent chemical resistance to lube oil, phenols, ketones, esters, acids, bases, salts and water.

STANDARD PROBE

Model No.	Tip Diam.	Thread	Armor	Unthreaded Length	Case Length	Probe Length	Connector
10001	5 mm	1/4-28	No	Increments of 0.1 in. Minimum = 0.0 in.	Increments of 0.1 in. Minimum = 0.8 in.		
10002	5 mm	1/4-28	Yes	Maximum = case length minus 0.8 in.	Maximum = 9.9 in.		
10003	8 mm	3/8-24	No	Example: 05 = 0.5 in.	Example: 10 = 1.0 in.		
10004	8 mm	3/8-24	Yes	Standard: 00 = 0.0 in.	Standard: 30 = 3.0 in.	05 = 0.5 m ± 0.05 m	00 None
10005	5 mm	M8x1	No	Increments of 10 mm Minimum = 0.0 mm	Increments of 10 mm Minimum = 20 mm	10 = 1.0 m ± 0.1 m	02 Yes
10006	5 mm	M8x1	Yes	Maximum = case length minus 20 mm	Maximum = 250 mm		
10007	8 mm	M10x1	No	Example: 06 = 60 mm	Example: 02 = 20 mm		
10008	8 mm	M10x1	Yes	Standard: 00 = 0.0 mm	Standard: 07 = 70 mm		

Note: Non-standard probe dimensions are available. Consult factory.

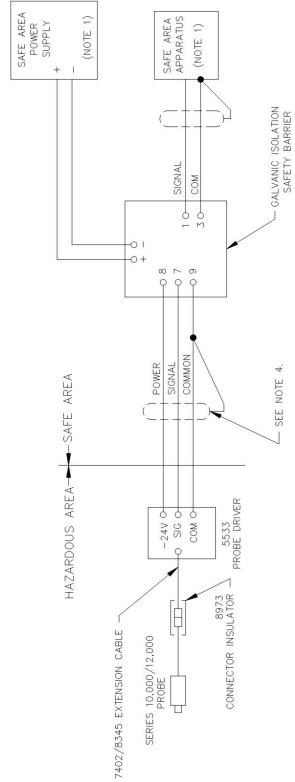
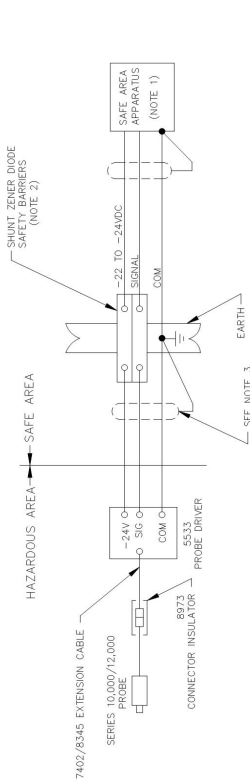


REV	DESCRIPTION	DATE
1	ISSUE	01-15-96
2	7853 RELEASE	01-15-96
3	AW	02-05-96
4	REVISE	

INSTALLATION —
PROXIMITY SENSOR IN HAZARDOUS LOCATION
CANADIAN STANDARDS ASSOCIATION

NOTES:

- SAFE AREA APPARATUS IS NOT SPECIFIED EXCEPT THAT IT MUST NOT BE SUPPLIED FROM A SOURCE OF POTENTIAL WITH RESPECT TO EARTH IN EXCESS OF 250 Vrms OR 250 VDC.
- ENTITY INSTALLATION:
 PROBE DRIVER ENTITY PARAMETERS ARE:
 $V_{max} = 30V$
 $I_{max} = 150mA$
 $C_i = 52nF$
 $L_i = 160uH$
 CHOOSE A CSA CERTIFIED BARRIER WITH ENTITY PARAMETERS THAT SATISFY THE FOLLOWING CONDITIONS:
 $V_{max} \geq V_{oc}$
 $I_{max} \geq I_{sc}$
 $C_i + C \text{ cable} \leq C_a$
 $L_i + L \text{ cable} \leq L_a$
 SUITABLE BARRIERS INCLUDE:
 MTL 7875 (-) AND STAHL 9002/13-280-093-00
 SUITABLE GALVANIC ISOLATION SAFETY BARRIERS INCLUDE:
 STAHL 9307/11-99-10
- INSTALL IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE PART 1 AND PER THE BARRIER INSTRUCTIONS.
- PROBE DRIVER MUST BE INSTALLED IN A SUITABLE ENCLOSURE ACCEPTABLE TO THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.



AGENCY APPROVED PRODUCT
DO NOT DEVIATE FROM
DOCUMENTED CONSTRUCTION
OR LISTED PARTS

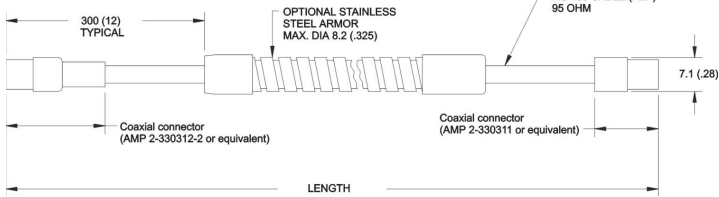
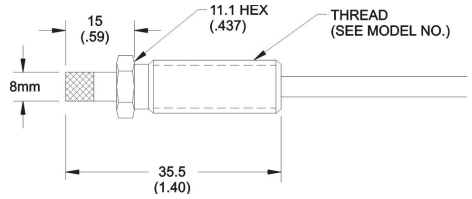
STANDARD	TYPE	DATE	ISSUED	U.S.A.
1000	1000	10-23-96	10-23-96	10-23-96
THIS DOCUMENT AND ALL INFORMATION HEREON IS THE PROPERTY OF METRIX INSTRUMENT CO. NO REPRODUCTION OR INFORMATION DISSEMINATION IS PERMITTED WITHOUT THE WRITTEN PERMISSION OF METRIX INSTRUMENT CO. THIS DOCUMENT MUST BE RETURNED UPON REQUEST.				
FRACTIONS: DECIMALS 1/8" = .125 1/4" = .25 3/8" = .375 1/2" = .50 5/8" = .625 3/4" = .75 7/8" = .875 SURFACE FINISH .001" .002" .005" .010"				
METRIX INSTRUMENT CO. 5633 COMMERCIAL IN THAZAROUS LOCATION U.S.A.				
METRIX INSTRUMENT CO. 8757-8758-8759-8760-8761-8762-8763-8764-8765-8766-8767-8768-8769-8770-8771-8772-8773-8774-8775-8776-8777-8778-8779-8780-8781-8782-8783-8784-8785-8786-8787-8788-8789-8790-8791-8792-8793-8794-8795-8796-8797-8798-8799-8800-8801-8802-8803-8804-8805-8806-8807-8808-8809-8810-8811-8812-8813-8814-8815-8816-8817-8818-8819-8820-8821-8822-8823-8824-8825-8826-8827-8828-8829-8830-8831-8832-8833-8834-8835-8836-8837-8838-8839-8840-8841-8842-8843-8844-8845-8846-8847-8848-8849-8850-8851-8852-8853-8854-8855-8856-8857-8858-8859-8860-8861-8862-8863-8864-8865-8866-8867-8868-8869-8870-8871-8872-8873-8874-8875-8876-8877-8878-8879-8880-8881-8882-8883-8884-8885-8886-8887-8888-8889-8890-8891-8892-8893-8894-8895-8896-8897-8898-8899-8900-8901-8902-8903-8904-8905-8906-8907-8908-8909-8910-8911-8912-8913-8914-8915-8916-8917-8918-8919-8920-8921-8922-8923-8924-8925-8926-8927-8928-8929-8930-8931-8932-8933-8934-8935-8936-8937-8938-8939-8940-8941-8942-8943-8944-8945-8946-8947-8948-8949-8950-8951-8952-8953-8954-8955-8956-8957-8958-8959-8960-8961-8962-8963-8964-8965-8966-8967-8968-8969-8970-8971-8972-8973-8974-8975-8976-8977-8978-8979-8980-8981-8982-8983-8984-8985-8986-8987-8988-8989-8990-8991-8992-8993-8994-8995-8996-8997-8998-8999-9000-9001-9002-9003-9004-9005-9006-9007-9008-9009-9010-9011-9012-9013-9014-9015-9016-9017-9018-9019-9020-9021-9022-9023-9024-9025-9026-9027-9028-9029-9030-9031-9032-9033-9034-9035-9036-9037-9038-9039-9040-9041-9042-9043-9044-9045-9046-9047-9048-9049-9050-9051-9052-9053-9054-9055-9056-9057-9058-9059-9060-9061-9062-9063-9064-9065-9066-9067-9068-9069-9070-9071-9072-9073-9074-9075-9076-9077-9078-9079-9080-9081-9082-9083-9084-9085-9086-9087-9088-9089-9090-9091-9092-9093-9094-9095-9096-9097-9098-9099-9100-9101-9102-9103-9104-9105-9106-9107-9108-9109-9110-9111-9112-9113-9114-9115-9116-9117-9118-9119-9120-9121-9122-9123-9124-9125-9126-9127-9128-9129-9130-9131-9132-9133-9134-9135-9136-9137-9138-9139-9140-9141-9142-9143-9144-9145-9146-9147-9148-9149-9150-9151-9152-9153-9154-9155-9156-9157-9158-9159-9160-9161-9162-9163-9164-9165-9166-9167-9168-9169-9170-9171-9172-9173-9174-9175-9176-9177-9178-9179-9180-9181-9182-9183-9184-9185-9186-9187-9188-9189-9190-9191-9192-9193-9194-9195-9196-9197-9198-9199-9200-9201-9202-9203-9204-9205-9206-9207-9208-9209-9210-9211-9212-9213-9214-9215-9216-9217-9218-9219-9220-9221-9222-9223-9224-9225-9226-9227-9228-9229-9230-9231-9232-9233-9234-9235-9236-9237-9238-9239-9240-9241-9242-9243-9244-9245-9246-9247-9248-9249-9250-9251-9252-9253-9254-9255-9256-9257-9258-9259-9260-9261-9262-9263-9264-9265-9266-9267-9268-9269-9270-9271-9272-9273-9274-9275-9276-9277-9278-9279-9280-9281-9282-9283-9284-9285-9286-9287-9288-9289-9290-9291-9292-9293-9294-9295-9296-9297-9298-9299-9300-9301-9302-9303-9304-9305-9306-9307-9308-9309-9310-9311-9312-9313-9314-9315-9316-9317-9318-9319-9320-9321-9322-9323-9324-9325-9326-9327-9328-9329-9330-9331-9332-9333-9334-9335-9336-9337-9338-9339-9340-9341-9342-9343-9344-9345-9346-9347-9348-9349-9350-9351-9352-9353-9354-9355-9356-9357-9358-9359-9360-9361-9362-9363-9364-9365-9366-9367-9368-9369-9370-9371-9372-9373-9374-9375-9376-9377-9378-9379-9380-9381-9382-9383-9384-9385-9386-9387-9388-9389-9390-9391-9392-9393-9394-9395-9396-9397-9398-9399-9400-9401-9402-9403-9404-9405-9406-9407-9408-9409-9410-9411-9412-9413-9414-9415-9416-9417-9418-9419-9420-9421-9422-9423-9424-9425-9426-9427-9428-9429-9430-9431-9432-9433-9434-9435-9436-9437-9438-9439-9440-9441-9442-9443-9444-9445-9446-9447-9448-9449-9450-9451-9452-9453-9454-9455-9456-9457-9458-9459-9460-9461-9462-9463-9464-9465-9466-9467-9468-9469-9470-9471-9472-9473-9474-9475-9476-9477-9478-9479-9480-9481-9482-9483-9484-9485-9486-9487-9488-9489-9490-9491-9492-9493-9494-9495-9496-9497-9498-9499-9500-9501-9502-9503-9504-9505-9506-9507-9508-9509-9510-9511-9512-9513-9514-9515-9516-9517-9518-9519-9520-9521-9522-9523-9524-9525-9526-9527-9528-9529-9530-9531-9532-9533-9534-9535-9536-9537-9538-9539-9540-9541-9542-9543-9544-9545-9546-9547-9548-9549-9550-9551-9552-9553-9554-9555-9556-9557-9558-9559-9560-9561-9562-9563-9564-9565-9566-9567-9568-9569-9570-9571-9572-9573-9574-9575-9576-9577-9578-9579-9580-9581-9582-9583-9584-9585-9586-9587-9588-9589-9590-9591-9592-9593-9594-9595-9596-9597-9598-9599-9600-9601-9602-9603-9604-9605-9606-9607-9608-9609-9610-9611-9612-9613-9614-9615-9616-9617-9618-9619-9620-9621-9622-9623-9624-9625-9626-9627-9628-9629-9630-9631-9632-9633-9634-9635-9636-9637-9638-9639-9640-9641-9642-9643-9644-9645-9646-9647-9648-9649-9650-9651-9652-9653-9654-9655-9656-9657-9658-9659-9660-9661-9662-9663-9664-9665-9666-9667-9668-9669-9670-9671-9672-9673-9674-9675-9676-9677-9678-9679-9680-9681-9682-9683-9684-9685-9686-9687-9688-9689-9690-9691-9692-9693-9694-9695-9696-9697-9698-9699-9700-9701-9702-9703-9704-9705-9706-9707-9708-9709-9710-9711-9712-9713-9714-9715-9716-9717-9718-9719-9720-9721-9722-9723-9724-9725-9726-9727-9728-9729-9730-9731-9732-9733-9734-9735-9736-9737-9738-9739-9740-9741-9742-9743-9744-9745-9746-9747-9748-9749-9750-9751-9752-9753-9754-9755-9756-9757-9758-9759-9760-9761-9762-9763-9764-9765-9766-9767-9768-9769-9770-9771-9772-9773-9774-9775-9776-9777-9778-9779-9780-9781-9782-9783-9784-9785-9786-9787-9788-9789-9790-9791-9792-9793-9794-9795-9796-9797-9798-9799-9800-9801-9802-9803-9804-9805-9806-9807-9808-9809-9810-9811-9812-9813-9814-9815-9816-9817-9818-9819-9820-9821-9822-9823-9824-9825-9826-9827-9828-9829-9830-9831-9832-9833-9834-9835-9836-9837-9838-9839-9840-9841-9842-9843-9844-9845-9846-9847-9848-9849-9850-9851-9852-9853-9854-9855-9856-9857-9858-9859-9860-9861-9862-9863-9864-9865-9866-9867-9868-9869-9870-9871-9872-9873-9874-9875-9876-9877-9878-9879-9880-9881-9882-9883-9884-9885-9886-9887-9888-9889-9890-9891-9892-9893-9894-9895-9896-9897-9898-9899-9900-9901-9902-9903-9904-9905-9906-9907-9908-9909-9910-9911-9912-9913-9914-9915-9916-9917-9918-9919-9920-9921-9922-9923-9924-9925-9926-9927-9928-9929-9930-9931-9932-9933-9934-9935-9936-9937-9938-9939-9940-9941-9942-9943-9944-9945-9946-9947-9948-9949-9950-9951-9952-9953-9954-9955-9956-9957-9958-9959-9960-9961-9962-9963-9964-9965-9966-9967-9968-9969-9970-9971-9972-9973-9974-9975-9976-9977-9978-9979-9980-9981-9982-9983-9984-9985-9986-9987-9988-9989-9990-9991-9992-9993-9994-9995-9996-9997-9998-9999-10000				



REVERSED MOUNT PROBE

1 0 0 2 6 - 0 2 - 1 2 - [] - []

Total Length	Connector
0 5 = 0.5 m ± 0.05 m	0 0 None
1 0 = 1.0 m ± 0.1 m	0 2 Yes



EXTENSION CABLE

7 4 0 2 - [] - []

System Length	Probe Length	Cable Length	Armor
5 m	1.0 m	0 4 0 = 4.0 m ± 0.4 m	
5 m	0.5 m	0 4 5 = 4.5 m ± 0.4 m	0 0 None
9 m	1.0 m	0 8 0 = 8.0 m ± 0.8 m	0 1 Yes
9 m	0.5 m	0 8 5 = 8.5 m ± 0.8 m	

ENVIRONMENTAL INFORMATION



This electronic equipment was manufactured according to high quality standards to ensure safe and reliable operation when used as intended. Due to its nature, this equipment may contain small quantities of substances known to be hazardous to the environment or to human health if released into the environment. For this reason, Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the public waste stream. The “Crossed-Out Waste Bin” label affixed to this product is a reminder to dispose of this product in accordance with local WEEE regulations. If you have questions about the disposal process, please contact Metrix Customer Services.

info@metrixvibration.com

www.metrixvibration.com

8824 Fallbrook Dr. Houston, TX 77064, USA

Tel: 1.281.940.1802 • Fax: 1.713.559.9421

After Hours (CST) Technical Assistance: 1.713.452.9703