USER'S GUIDE

Installation & Operation
Instructions

Microphone Flow Switch
Model MFS100
Series 6

INDEX

Introduction · · · · · 2
Specifications · · · · · 2
Operating Principle · · · · · 3
Flow Characteristics · · · · · 3
Applications · · · · · 3
Pipe Material · · · · · 3
Pipe Diameter · · · · · 3
Connections and Adjustment · · · · · 4
Sensor Installation · · · · · 5
Enclosure Installation · · · · · 5
Troubleshooting · · · · · 6
Applications Hotline · · · · · 7
Product Return Procedure · · · · · 7
Limited Warranty · · · · · 8

Important Note: This instrument is calibrated to meet product specifications. Please read this manual carefully before installation and operation. Any unauthorized repairs or modifications to this product may result in a suspension of the warranty.

INTRODUCTION - MICROPHONE FLOW SWITCH

The MFS100 Microphone Switch is designed to activate a control relay when flow noise is above a preset, adjustable level. It is ideal to sense flow/no flow conditions from outside a pipe.

The MFS100 includes an encapsulated piezo-electric ceramic crystal, a receiver unit, electronic circuitry to amplify flow noise, and one SPDT control relay.

The remote piezo-electric sensor is housed inside a sealed stainless steel enclosure. A 5 ft (1.5 m) long shielded coaxial cable connects the sensor and electronics. The control relay and electronics are housed in a watertight NEMA4X enclosure.

SPECIFICATIONS

PHYSICAL SPECIFICATIONS

Weight:	2.5 lbs (1.2 kg)
Enclosure:	watertight NEMA4X fiberglass
Sensor:	316 stainless steel, epoxy resin, Buna N gaskets
Cable:	shielded coaxial
Cable length:	5 ft. (1.5 m), 20 ft (6 m) optional

ELECTRICAL SPECIFICATIONS

Power Input:	110VAC 50/60Hz (220VAC 50/60Hz and 24VDC optional)
Connection:	internal terminal board
Relay:	5 ampere SPDT (120/220VAC, 28VDC)

OPERATING ENVIRONMENT

Electronics:	-5 to 140°F (-20 to 60°C)
Sensor:	-20 to 200°F (-30 to 94°C)

GENERAL

Pipe size:	1/4" (6.5mm) OD or larger recommended
Sensor Cable:	Optional length up to 20 ft. (6m)

OPERATING PRINCIPLE

The movement of fluid (or solids) in a pipe generates a broadband of shear noise in the 1 Hz to 100 KHz range. Although pumps and machinery generate noise, it is usually at the low end of the sound frequency spectrum (1-5 KHz). Higher frequency sound at 5-50 KHz (ultrasonic) provides a suitable indication of flow rate. The MFS100 electronic circuits discriminate against low frequencies, monitor high frequencies, and control the relay.

FLOW CHARACTERISTICS

The MFS100 Microphone switch is best suited to noisy or turbulent flow which is generally found close to elbows, valves, couplings etc. Laminar flow, as found in long horizontal pipe runs does not give good results. As a general guideline the MFS100 requires flow with a Reynolds number of 4000 or greater for reliable operation.

APPLICATIONS

The MFS100 Microphone Switch reacts to noise in the pipe caused by flow of liquids or flowable solids. Noise from the flow is detected and amplified to energize the control relay. The absence of noise in no-flow conditions de-energizes the relay.

Because the MFS100 operation relies on detection of *flow* noise, avoid sensor mounting in high noise or high vibration locations.

PIPE MATERIAL

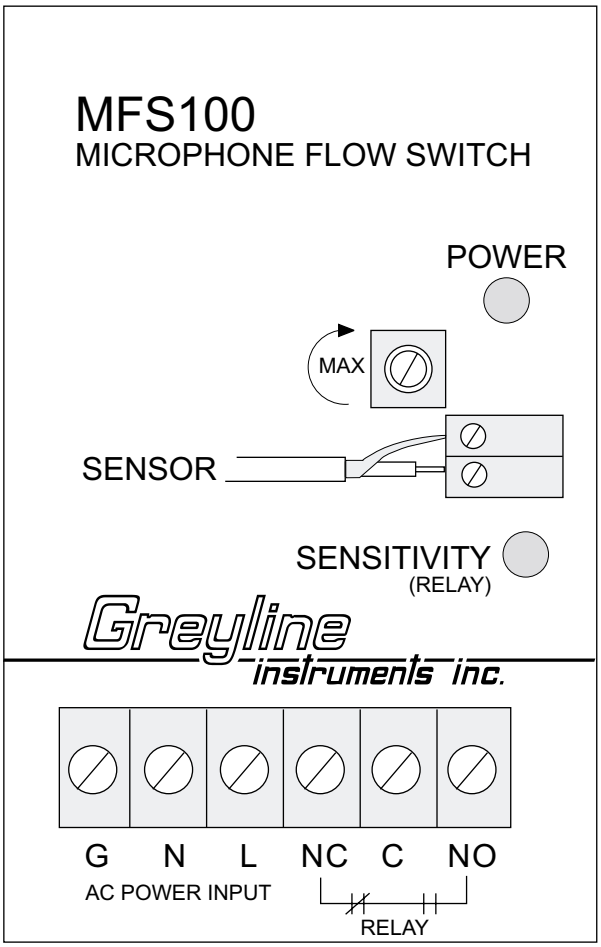
The MFS100 is ideal for use on most metal and rigid plastic pipes. In small diameter flexible hose or tubing transmission of flow noise will be minimal.

PIPE DIAMETER

The Microphone Switch sensor can be installed on pipes of any size from 1/8" inside diameter or larger, or on feed chutes, hoppers etc. Low flow noise from slow velocity fluids in very small pipes or tubes may restrict use of the MFS100.

CONNECTIONS AND ADJUSTMENT

Connect 120VAC 50/60Hz (220VAC optional) power input and Sensor as shown below. The relay operating point is adjusted using a sensitivity potentiometer. With fluid flowing in the pipe, adjust the potentiometer clockwise until the relay just energizes (SENSITIVITY indicator light 'ON'). Check that the RELAY "drops out" when flow STOPS (SENSITIVITY indicator light 'OFF').



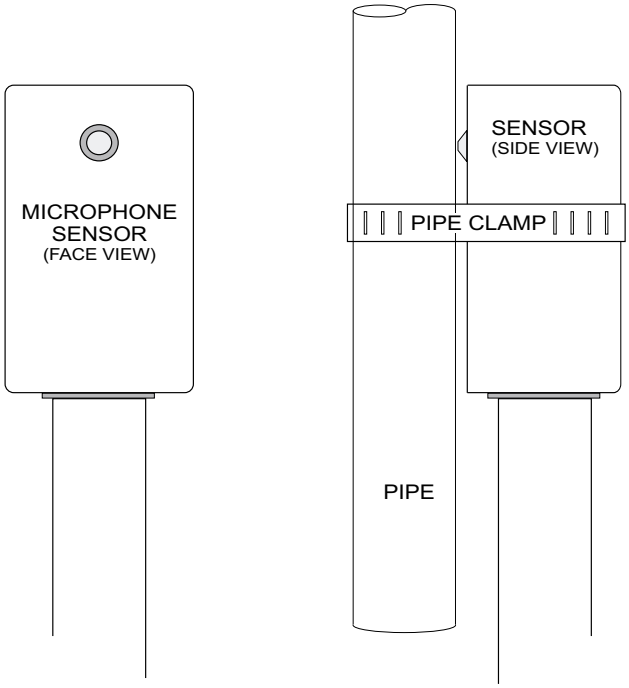
SENSOR INSTALLATION

The sensor should be mounted in the bottom or side of the pipe and attached using a pipe clamp or strapping. Wherever possible mount the sensor on a vertical run of pipe. It is essential that the microphone sensor in the centre of the transducer makes good contact with the pipe.

Mount the sensor as far away as possible from pumps, large motors or machinery which may produce excessive noise or vibration.

IMPORTANT: Microphone sensor must be in contact with pipe. Tighten only to secure from movement.

Do not over tighten or sensor may be damaged.



ENCLOSURE INSTALLATION

Locate the enclosure with 5 ft. (1.5 m) of the sensor. It can be wall-mounted with four mounting screws (#8 recommended). Avoid mounting the enclosure in direct sunlight to protect the electronics from damage due to overheating.

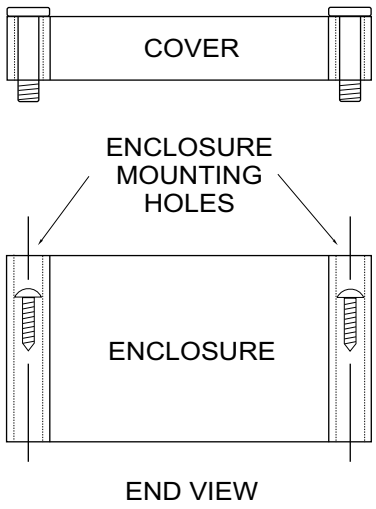
NEMA4X (IP67) FIBERGLASS WITH CLEAR COVER

1. Remove cover.

2. Insert #8 screws through the four enclosure mounting holes to secure the enclosure to wall or mounting stand.

3. Close cover.

Additional conduit holes can be cut in the fiberglass enclosure when required. Use a hole saw or Greenle-type hole cutter.



TROUBLESHOOTING

Relay Operates (Energizes) Or Chatters With No Flow

Possible Cause: Noise in pipe due to vibration
Solution: Reduce sensitivity and/or relocate sensor

Possible Cause: Noise in pipe due to leaking valves
Solution: Check valve operation or relocate sensor

Possible Cause: Noise in pipe due to pumps or machinery
Solution: Reduce sensitivity and/or relocate sensor

Erratic Operation Or Relay Chatters With Flow

Possible Cause: Flow noise fluctuates
Solution: Increase sensitivity

Possible Cause: External, intermittent noise
Solution: Relocate sensor

Relay Does Not Operate

Possible Cause: Power interruption or improper power input
Solution: Check power light. Check input circuit

Possible Cause: Improper installation of the sensor
Solution: Review installation procedure

Possible Cause: Sensitivity set too low
Solution: Increase sensitivity

Possible Cause: Low flow noise
Solution: Relocate sensor close to flow obstruction such as elbow, tee or venturi

APPLICATIONS HOTLINE

For applications assistance, advice or information on any Greyline Instrument contact your Sales Representative, write to Greyline or phone the Applications Hotline below:

United States:	Tel: 315-788-9500	Fax: 315-764-0419
Canada:	Tel: 613-938-8956	Fax: 613-938-4857
Toll Free:	888-473-9546	
Email:	info@greyline.com	
Web Site:	http://www.greyline.com	

Greyline Instruments Inc.

Canada
16456 Sixsmith Drive
Long Sault, Ont. K0C 1P0

USA:
407 County Route 46
Massena, NY 13662

PRODUCT RETURN PROCEDURE

Instruments may be returned to Greyline for service or warranty repair. Before shipping a product to the factory please contact Greyline by telephone or Fax to obtain an RMA number (Returned Merchandise Authorization). This ensures fast service and correct billing or credit.

When you contact Greyline please have the following information available:

1. Model number / Software Version
2. Serial number
3. Date of Purchase
4. Reason for return (description of fault or modification required)
5. Your name, company name, address and phone number

After obtaining an RMA number please ship the product to the appropriate address below:

Canadian and International Customers:

Greyline Instruments Inc.
16456 Sixsmith Drive
Long Sault, Ont. K0C 1P0

RMA#

USA Customers:

Greyline Instruments Inc.
407 County Route 46
Massena, NY 13662

RMA#

LIMITED WARRANTY

Greyline Instruments warrants, to the original purchaser, its products to be free from defects in material and workmanship for a period of one year from date of invoice. Greyline will replace or repair, free of charge, any Greyline product if it has been proven to be defective within the warranty period. This warranty does not cover any expenses incurred in the removal and re-installation of the product.

If a product manufactured by Greyline should prove defective within the first year, return it freight prepaid to Greyline Instruments along with a copy of your invoice.

This warranty does not cover damages due to improper installation or handling, acts of nature, or unauthorized service. Modifications to or tampering with any part shall void this warranty. This warranty does not cover any equipment used in connection with the product or consequential damages due to a defect in the product.

All implied warranties are limited to the duration of this warranty. This is the complete warranty by Greyline and no other warranty is valid against Greyline. Some states do not allow limitations on how long an implied warranty lasts or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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