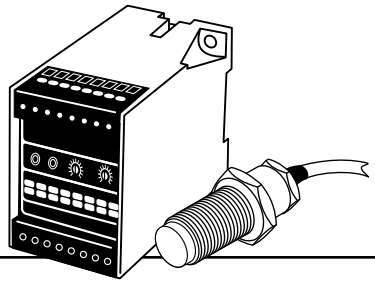
Machinery Protection Flow Sensors



- **Sensor does not impede media flow**
- **Totally solid-state—no mechanical parts to wear out**
- **Monitors both flow and temperature of media**
- **Rugged, stainless steel sensor**

Namco Flow Sensors operate on the calorimetric flow principal providing an economical, reliable way to detect variations in media flow by thermal conduction.

To measure the "heat sinking" capability, or thermal transfer of the media, two temperature sensitive silicon semiconductors and a heater are mounted directly underneath the sensor face. Flow rates deviating from the user set points are detected by a Wheatstone-Bridge/Amplifier package. This design combines a proven method of measurement with a fully encapsulated, industrial quality, flat-head sensor.

The sensor head is constructed so that no protrusions into the flow media occur. The sensor itself is made entirely of stainless steel. Both flow and temperature are monitored and user adjustable. Switching functions are indicated by LEDs.

The remote electronic packaging enables the system to be operated in applications where monitoring and/or adjusting flow and setpoints is difficult or hazardous such as in a robot cell. The remote electronic module can be mounted outside of the cell while the sensor is inside enabling easy access even while the robot is in motion.

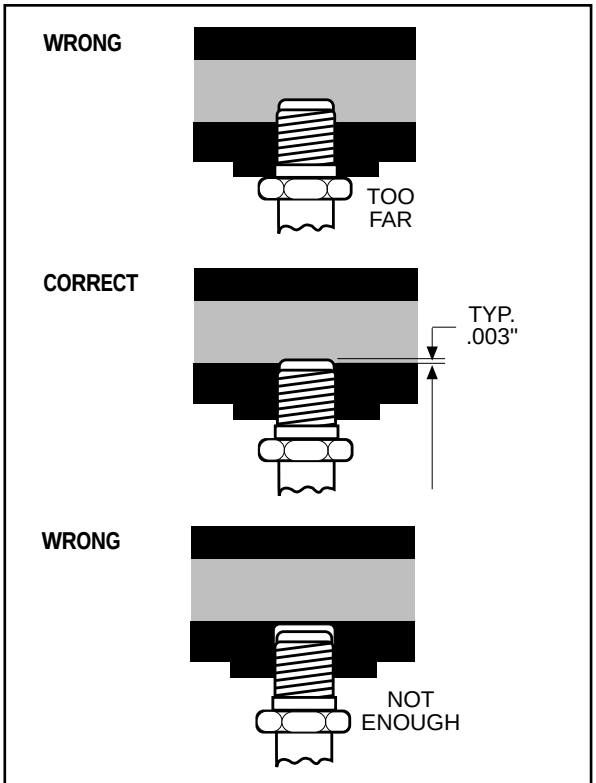
Applications

Coolant, water or lubricant temperature and/or flow indication.

- Dry running protection of pumps
- Flow rate control in boiler systems
- Flow rate monitoring of coolant in welding machines
- Heating systems and exchangers
- Chemical process monitoring
- Pharmaceutical process control
- Lubrication flow rate monitoring
- Process control monitoring of media flow in food and beverage, sewage/ wastewater industries, etc.

Model Number	Supply Voltage	Output
Total System (Sensor & Control Module)		
ER320-10000	110VAC	Thyristor NO/NC
ER320-10002	110VAC	DPDT Relay
ER320-10001	24VDC	NPN & PNP Transistor NO/NC
Sensor Only		
ER310-10000	—	—
Control Module Only		
ER300-10000	110VAC	Thyristor NO/NC
ER300-10002	110VAC	DPDT Relay
ER300-10001	24VDC	NPN & PNP Transistor NO/NC

Typical Sensor Installation



Sensor surface to have minimal protrusion into flow.

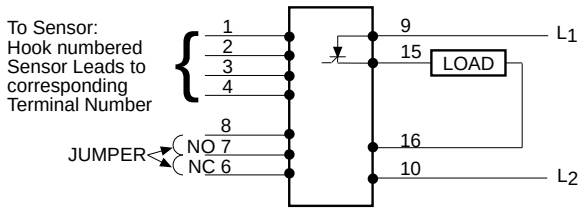
Common Sensor Characteristics

FLOW SENSOR SYSTEMS			
	AC/Thyristor	**AC/Relay**	**DC/Transistor**
Pipe O.D. (inches)	Min. Detectable Flow (gal/min)		Max. Detectable Flow (gal/min)
1/2"	0.020		6.023
3/4"	0.045		13.551
1"	0.080		24.090
1 1/4"	0.125		37.641
1 1/2"	0.181		54.203
2"	0.321		96.360
Supply Voltage	110 VAC 50/60 Hz	110 VAC 50/60 Hz	24VDC
Power Consumption	3VA	4VA	2W
Sensor Pressure Rating	435 psi max.		
Ambient Temperature	+14˚F to +158˚F		
Media Temperature	+14˚F to +176˚F		
Temperature Set Point	+23˚F to +176˚F		
Flow and Temperature Adjustment	Potentiometer and LED		
Output	Thyristor	DPDT Relay	NPN & PNP Transistor
Load Current	30 mA min. 300 mA max.	8A @ 220VAC	500mA
Short Circuit Protection	Yes	No	Yes
Response Time	<5 seconds		

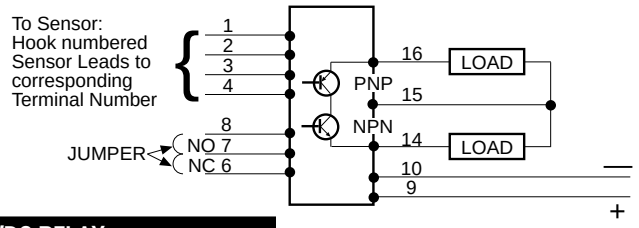
Maximum distance between Control Module and Sensor is 328 ft. using low inductance cable.

Circuit Drawings

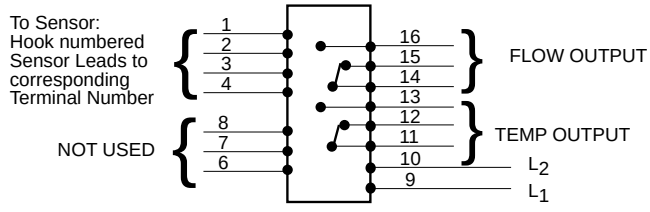
AC THYRISTOR MODELS



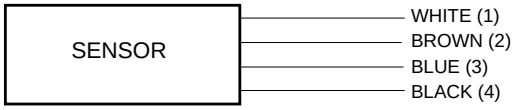
DC TRANSISTOR MODELS



AC/DC RELAY

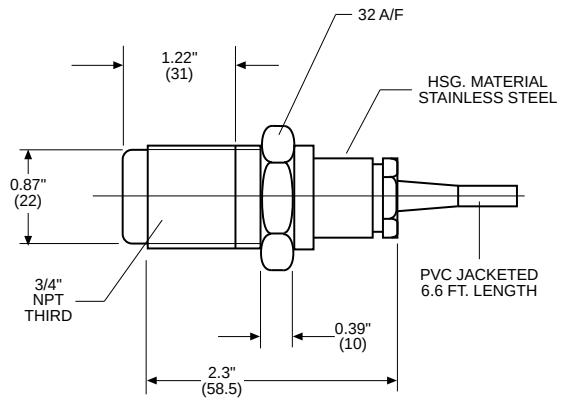


SENSOR WIRING

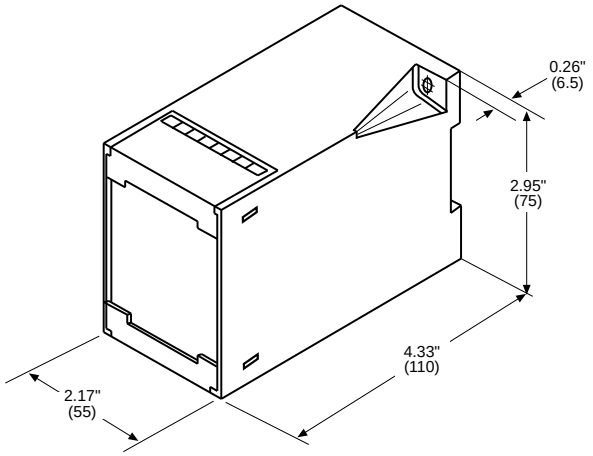


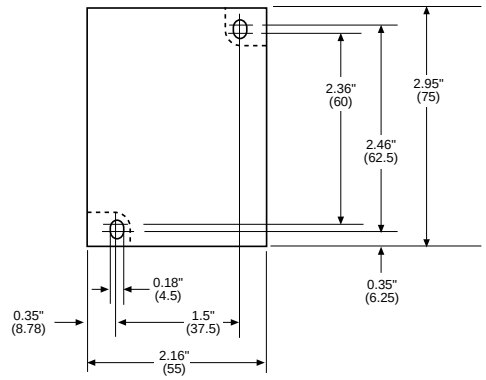
Dimensional Drawings Flow Sensors

SENSOR



CONTROL MODULE





Special Application Solutions

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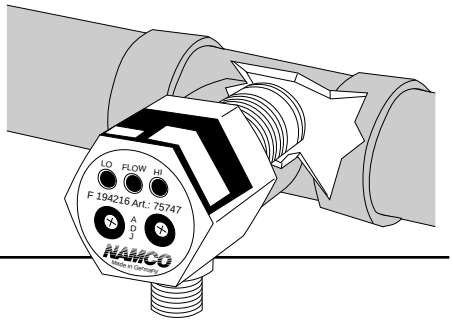
For technical assistance, call 1-800-NAMTECH

Self-Contained

Machinery Protection Flow Sensors



Applications:

Coolant, water or lubricant temperature and/or flow indication.

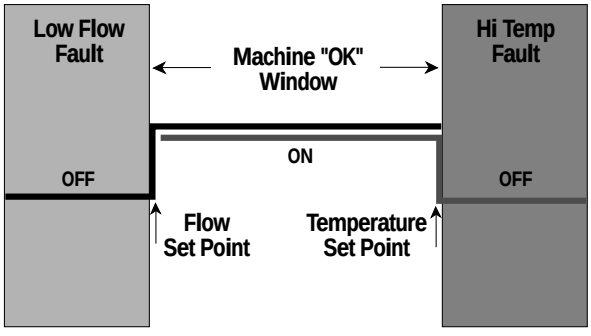
- **Dry running protection of pumps**
- **Flow rate monitoring of coolant in welding machines**
- **Heating systems and exchangers**
- **Chemical process monitoring**
- **Pharmaceutical process control**
- **Lubrication flow rate monitoring**
- **Process control monitoring of media flow in food and beverage, sewage/ wastewater industries, etc.**

The Namco ER330-10004 (GmbH # 75743) High Temp/Low Flow Sensor acts as a comprehensive machinery coolant or lubrication system monitor. It monitors two key indicators of your machinery's health: the temperature and flow of either coolant or lubricants. The switch alarms when flow is too low or when temperature is too high.

The sensor mounts into fluid supply lines using a 3/4" NPT pipe fitting. Its self-contained design uses a "flat head" sensing surface that does not protrude into the media, so it doesn't obstruct media flow. Solid state circuitry within the sensor detects flow variations based on thermal conduction. Construction is all stainless steel.

The high temp/low flow sensor monitors media temperature and will signal when coolant is too hot (indicating your equipment is overheating) or when coolant flow is too low. These sensors are both 24 VDC only.

High Temp/Low Flow Sensor



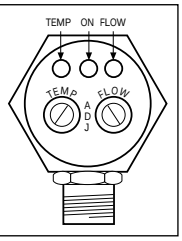
Common Sensor Characteristics

SELF-CONTAINED FLOW SENSORS		
Pipe O.D. (inches)	Min. Detectable Flow (gal/min)	Max. Detectable Flow (gal/min)
1/2"	0.020	6.023
3/4"	0.045	13.551
1"	0.080	24.090
1 1/4"	0.125	37.641
1 1/2"	0.181	54.203
2"	0.321	96.360

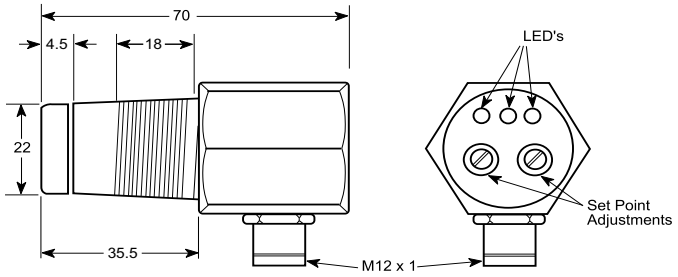
Response Time	<5 seconds
Ambient Temperature	-10°C to +70°C
Media Temperature	-10°C to +80°C
Temperature Set Points	Potentiometer and LED
Adjustment	Potentiometer and LED
Supply Voltage	24 VDC
Power Consumption	<2 Watts
Load Current	0.5 to 300mA
Voltage Drop	<3.5 VDC
Leakage Current	<10µA
On/Off Indication	LED
Short Circuit Protection	Yes
Reverse Polarity Protection	Yes
Protection Class	IP 67
Housing Material	Stainless Steel
Pressure Rating	Maximum 435 PSI
Connector	4-pin Euro Style

High Temp/Low Flow - LED Functions

RED	GREEN	RED	CONDITION
Over Temp (TEMP)	Power (ON)	Flow-in-Range (FLOW)	High Temp/Low Flow (ER330-10004)
OFF	ON	OFF	Under-flow Fault
OFF	ON	ON	Temp/Flow Okay
ON	ON	OFF	Over-temperature Fault

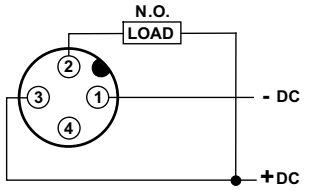


Dimensional Drawings

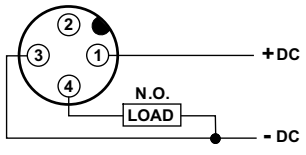


Wiring Diagrams

NPN (Sinking) N.O.



PNP (Sourcing) N.O.



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