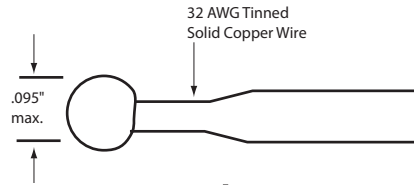


# Thermistors

## 44000 Series



### Precision Interchangeable Thermistors

Thermistors provide highly accurate and stable temperature sensing for applications of temperature measurement, control, indication and compensation. Typical uses include precise measurements without the necessity of individual circuit calibration and with the advantage of precision interchangeability of sensors. Precise cold junction compensation of thermocouples may be designed directly without "bread boarding" after mathematically deriving the circuit because of the superior interchangeability of YSI precision thermistors.

Two interchangeability tolerances and two thermistor configurations are offered. Teflon encased thermistors allow exposure to hostile environments such as conductive or corrosive liquids and particulate suspensions. A stiff wire placed in the tube also allows the thermistor leads to be formed to various shapes with slight finger pressure.

### Time Constant

The time required for a thermistor to indicate 63% of a newly impressed temperature is the time constant. For a thermistor suspended by its leads in a well-stirred oil bath it is 1 sec. max. for standard thermistor and 2.5 sec. max. for teflon encased thermistors. In still air it is 10 sec. max. for standard thermistors and 25 sec. max. for Teflon encased thermistors.

### Dissipation Constant

The power in mW required to raise a thermistor 1°C above surrounding temperature is the dissipation constant. For all thermistors suspended by their leads in a well-stirred oil bath it is 8mW/°C min. or 1mW/°C in still air.

### Stability

YSI thermistors are chemically stable and not significantly affected by aging or exposure to strong nuclear radiation.

Ordering Part #	Power Resistance	Resistance Ratio	Max Working Temp °C	Store & Work. Temp for best Stability °C	Price Standard
Standard	Teflon Encased	Ohms @25°C	25-125°C		
<b>±0.2°C Interchangeability Tolerance 0 to 70°</b>					
44001A		100	11.49	100°C	\$8.00
44002A		300	15.15	100°C	8.00
44003A		1000	17.33	100°C	8.00
44035		1000	17.33	100°C	9.00
44004	44104	2252	29.26	150°C	6.00
44005	44105	3000	29.26	150°C	6.00
44007	44107	5000	29.26	150°C	6.00
44017		6000	29.26	150°C	6.00
44016		10K	29.26	150°C	6.00
44006	44106	10K	23.51	150°C	6.00
44008	44108	30K	29.15	150°C	6.00
44011	44111	100K	34.82	150°C	8.00
44014	44114	300K	46.02	150°C	8.00
44015	44115	1Meg	61.96	150°C	8.00
<b>±0.1°C Interchangeability Tolerance 0 to 70°</b>					
44033		2252	29.26	75°C	\$9.00
44030		3000	29.26	75°C	9.00
44034		5000	29.26	75°C	9.00
44036		10K	29.26	75°C	9.00
44037		6K	29.26	75°C	9.00
44031		10K	23.51	75°C	9.00
44032		30K	29.15	75°C	9.00

# Thermistors

## 55000 Series Glass Encapsulated Material

The GEM thermistor product line combines the benefits of high accuracy and super stable thermistors with low cost automated assembly technology. The result is a unique product line that defines a new cost versus performance model.

The specially formulated glass material provides a hermetic package rugged enough for most industrial applications. GEM thermistors have high temperature capability, to 200°C, and improved stability compared to epoxy or plastic encapsulated thermistors. GEM thermistors are ideal for applications which are subject to moist environments. Two interchangeability tolerances are offered.

### Time Constant

The time required for a thermistor to indicate 63% of a newly impressed temperature is a time constant. For GEM thermistors in a well stirred oil bath it is 1.5 seconds maximum. In still air it is 15 seconds maximum.

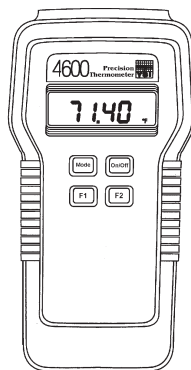
### Dissipation Constant

The power in mW required to raise a thermistor 1°C above surrounding temperature is the dissipation constant. For GEM thermistors, when suspended by their leads in a well-stirred oil bath it is 6 mW/°C, or 1.5 mW/°C in still air.

Ordering Part #	Power Resistance Ohms @25°C	Resistance Ratio 25-125°C	Short Term Temp °C	Stor. & Work. Temp for best Stability °C	Price
<b>±0.2°C Interchangeability Tolerance 0 to 70°</b>					
55004	2252	29.26	250°C	-80 - +200C	\$10.00
55005	3000	29.26	250°C	-80 - +200°C	10.00
55007	5000	29.26	250°C	-80 - +200°C	10.00
55017	6000	29.26	250°C	-80 - +200°C	10.00
55006	10K	23.51	200°C	-80 - +150°C	10.00
55016	10K	29.26	250°C	-80 - +200°C	10.00
55008	30K	29.15	200°C	-80 - +150°C	10.00
<b>±0.1°C Interchangeability Tolerance 0 to 70°</b>					
55033	2252	29.26	250°C	-80 - +125°C	14.00
55034	5000	29.26	250°C	-80 - +125°C	14.00
55036	10K	29.26	250°C	-80 - +125°C	14.00
55031	10K	29.26	200°C	-80 - +100°C	14.00
55032	30K	29.15	200°C	-80 - +100°C	14.00

## Precision Thermometer Series 4600

- Ultra-high system accuracy (to ±0.025°C from 0 to 50°C)
- High resolution (up to 0.01°C)
- Wide range (-20 to +130°C)
- RS232 with software
- NIST traceable
- Programmable functions—Hold, Min/Max, Delta T, Store, °C/°F
- 4 1/2 digit LCD Display



The 4600 series thermometers are rugged handheld temperature measurement instruments which utilize a broad selection of precision interchangeable probes. The 4600 is a general purpose thermometer covering a wide temperature range using the industry standard 400 series probes.

The 4610 provides an even higher accuracy over a limited temperature range and requires uniquely designed 4610 series thermistor probes.

### Prices

#### 4600 Series Thermometers:

4600 Thermometer (use 400 series probes) **\$550.**  
4610 Thermometer (use 4610 series probes) **\$595**

#### 4610 Series Probes:

4611 1mm x 30cm general purpose, flexible **\$295**  
4612 general purpose, flexible **\$250**

# Thermistors

## Thermistor Probes

Two series of precision probes, Industry standards since 1948. For manufacturing, research and medicine, the benefits of these probes set us apart.

- Every probe traceable to the NIST
- Substitute any probe in either series for any other in the same series with no loss of accuracy
- YSI Series 700 Probes provide linear response

- Made without latex to reduce allergic reactions
- Probes are electrically-isolated
- Durable molded phone plugs
- Extension leads

### Series 400 Probes

**Temperature Range:** -40 to +150°C (-40 to +300°F) except as specified. Lead wires may be subjected to 100°C.

**Interchangeability:** ±0.40°C at -40°C; ±0.10°C from 0 to 70°C; ±0.21°C at 100°C; ±0.40° at 150°C.

**Time Constant:** Derived from measurements in water at 3 feet per second. A probe requires approximately 5 time constants to read 99% of a total change.

**Termination:** Right-angle molded phone plug, except as specified. Gray plugs are 2-conductor.

**Electrical Isolation:** Sensing elements and lead wires are electrically isolated from the outer probe surfaces, except as noted.

**Cleaning:** All probes are EtO-sterilizable.

### Series 700 Probes

**Temperature Range:** -30 to +100°C (-22 to +212°F) except as specified. Lead wires may be subjected to 100°C.

**Interchangeability:** ±0.15°C from -30 to +100°C.

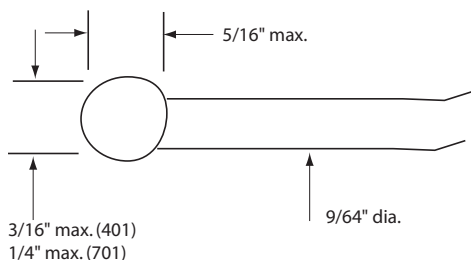
**Time Constant:** Derived from measurements in water at 3 feet per second. A probe requires approximately 5 time constants to read 99% of a total change.

**Termination:** Right-angle molded phone plug, except as specified. Black plugs are 3-conductor.

**Electrical Isolation:** Sensing elements and lead wires are electrically isolated from the outer probe surfaces, except as noted.

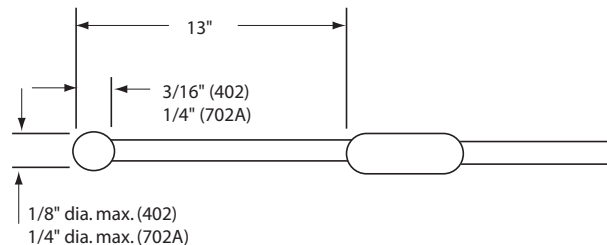
**Cleaning:** All probes are EtO-sterilizable.

### 401 & 701 General-Purpose



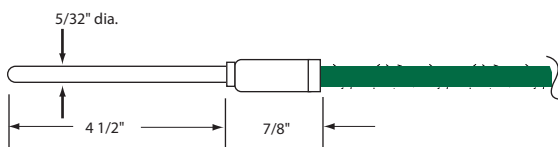
- Rugged vinyl probe
- For air, sub-soil and short-term water
- Time constant 401: 7 sec; 701: 9 sec
- Range 401: -40 to +100°C; 701: -30 to +100°C
- 401 \$52.50 701 \$99.00

### 402 & 702A Small Vinyl



- Smaller flexible versions of YSI 401 and 701
- For patient monitoring with quick response time
- Time constant 402: 3.2 sec; 702A: 3.6 sec
- Range 402: -40 to +100°C; 702A: -30 to +100°C
- 402 = \$79.30 702A = \$120.00

### 403 & 703 Stainless Steel Tubular



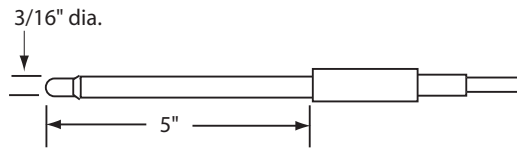
- Sheath compatible with many fluids
- Time constant 403: 3.4 sec; 703: 3.6 sec
- Range 403: -40 to +150°C; 703: -30 to +150°C
- 403 = \$99.00 703 = \$135.00

**Therm-x manufactures  
custom temperature sensors  
for all applications.  
Call for a quote.**

# Thermistors

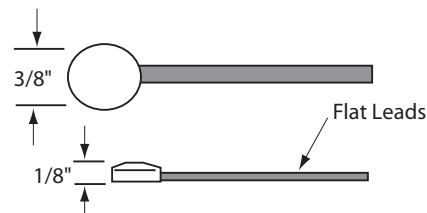
## 400 and 700 Probes Cont'd

### 404 & 704 Pyrex Tubular



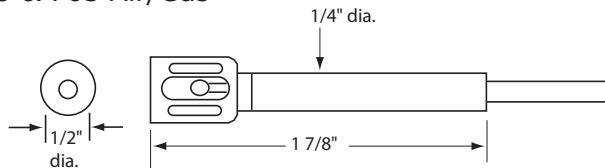
- Chemically inert for immersion
- Time constant 4.2 sec
- Range 404: -40 to +150°C; 704: -30 to +150°C
- 404 \$114.00 704 \$141.00

### 409B & 709B Rugged Surface



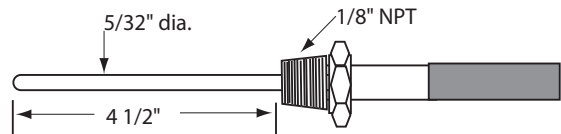
- More rugged than YSI 409A and 709A
- Vinyl-covered leads; time constant 1.1 sec
- Range 409B: -40 to +100°C; 709B: -30 to +100°C
- 409B \$80.00 709B \$113.00

### 405 & 705 Air/Gas



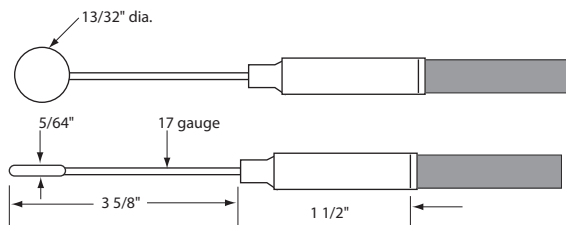
- For low humidity such as incubators, test rooms, gas streams
- Time constant 10 sec in 3 ft/sec air at 0% RH
- Range -40 to +150°C
- 405 \$112.00 705 \$145.00

### 410 & 710 Tubular with NPT Fitting



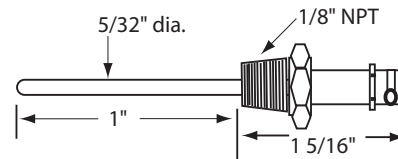
- 316 stainless steel withstands 500 psi
- Time constant 3.4 sec
- Range 410: -40 to +150°C; 710: -40 to +150°C
- 410 \$113.00 710 \$132.00

### 408 & 708 Banjo Surface



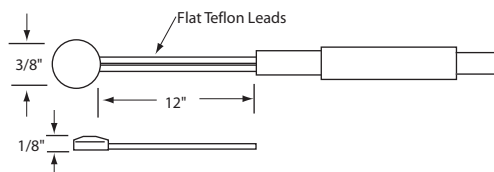
- Handle simplifies use
- Time constant 408: 0.6 sec; 708: 1.0 sec
- Range 408: -40 to +150°C; 708: -30 to +100°C
- 408 \$130.00 708 \$160.00

### 416 Autoclavable Tubular



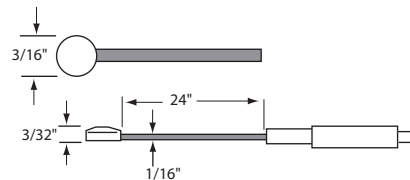
- Stainless steel fitting and sheath
- Not electrically isolated; Detachable lead
- Time constant 3.4 sec
- Range -40 to +150°C
- 416 \$150.00

### 409A & 709A High-Temperature



- Stainless steel disc with epoxy back protects probe from environment, 12" teflon leads
- Time constant 1.1 sec
- Range 409A: -40 to +150°C; 709A: -30 to +100°C
- 409A \$97.00 709A \$131.00

### 427 & 729 Small Surface



- Stainless steel disk with epoxy back
- Time constant 0.3 sec
- Range 427: -40 to +150°C; 729: -30 to +100°C
- 427 \$120.00 729 \$140.00