



Product Brochure

# BRONZE 6100 Series

Thermal Flow, Level & Interface Switch



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## Principle of Operation – Thermal Dispersion

Kurz switches use proven thermal dispersion technology to create a very accurate, economical and rugged method of sensing flow, level & interface.

The sensors incorporate two platinum Resistance Temperature Detectors (RTD's), one RTD measures the actual process temperature while the other RTD is heated to create a temperature differential.

### Flow:

As the process travels over the tip of the sensor, the increased flow of the process reduces the temperature of the heated RTD. This reduced temperature difference between the two RTD's is monitored by the electronics and the switch changes state once the set point is reached.

### Level:

In a dry to wet application, the fluid surrounds the tip of the sensor, thus dispersing some of the heat from the heated RTD. This reduced temperature difference between the two RTD's is monitored by the electronics and the switch changes state once the set point is reached.

## Applications

- Pump Protection – Dry Alarm
- Leak Detection
- Flow Monitoring & Verification
- Tank Overflow Protection
- Monitoring Purge Air Flow
- Drain Line Flow
- Interface Control in Separation Vessels
- Vent Monitoring
- Emergency Eye Wash Stations
- Liquids, Air, Inert Gases & Steam
- Slurries
- Interface Detection
- Corrosive Liquids
- General-Purpose Areas
- Interface Control & Level Detection in Settling Vessels
- Chemical Injection/Additive Flow Monitoring

## BRONZE Models – General Purpose

### Applications: Flow & Level

The BRONZE Series for **liquids, inert gases, air and slurries**. For general-purpose applications. Reliable 'no moving parts' stainless steel sensors.



BRONZE 6112 & 6115



BRONZE 6122 & 6125

## BRONZE 6100 Specifications

**Applications:**

- **Flow:** Model 6112 & 6122 for liquids only  
Model 6115 & 6125 for inert gas only
- **Level:** Model 6115 & 6125

**Process Connections:**

- 3/4" MNPT
- Sanitary Flanged

**Insertion 'U' Lengths:**

- **Imperial:** 1.2", 2" & 4"
- **Metric:** 3 cm, 5 cm & 10.1 cm

**Wetted Material:**

- 304/316L Stainless Steel w/Nickel Braze (sanitary models)

**Temperature Range – Continuous Service:**

- **Sensor:** -40°F to +185°F (-40°C to +85°C)
- **Electronics:** -40°F to +185°F (-40°C to +85°C)

**Operating Pressure – Continuous Service:**

- Maximum Working Pressure: 3.6 Mpa (525 psig) at 70°F (21°C).

**Input Power:**

- 12-36 VDC
- LED indicates power on

**Power Consumption:**

- **Maximum:** 3.9 watts @ 24 VDC

**Heater Power:**

- Fixed

**Outputs:**

- Single SPDT sealed relay rated @ 0.5 amp resistive 36 volts AC/DC

**Cable Lengths:**

- **Imperial:** 10', 20', 30', 40' & 50'
- **Metric:** 3.0 m, 6.0 m, 9.1 m, 12.1 m & 15.2 m

**Flow Switch Rates:**

- **Inert Gases:** 0.25 to 125 feet/sec  
(0.076 to 38.1 meters/sec)  
Standard conditions: 70°F (21°C) at 14.7 psi (1 atm)
- **Water-based Liquids:** 0.01 to 3.0 feet/sec  
(0.003 to 0.91 meter/sec)

**Accuracy:**

- **Flow Service:** ±5% Set Point Velocity over operating range of ±50°F (±28°C)
- **Level Service:** ±0.50 inches (±1.3 cm)

**Response Rates:**

- 0.5 to 30 seconds.

## BRONZE Electronics

### Microprocessor Based Electronics

The electronics are epoxy encapsulated within the sensor housing offering a **simple operating status display** and trim-pot.



#### LED Indicator:

- Green LED** Indicates the relay is energized
- Blue LED** Indicates power on

#### Standard Features:

- Solid state electronics
- Relay can be set to energize above or below Setpoint
- Setpoint adjustable with the trim-pot
- Available in Threaded and Sanitary Flanged configurations




**Threaded Assembly View**



**Sanitary Assembly View**


6112 Threaded

6112	CODE	Sensor Operating Temperature Range							 <p>Flow &amp; Level Switch (Liquids)</p>
.	T	'T' Type Sensor							
.	.	CODE	Material of Construction - Sensor						
.	.	A	316L Stainless Steel						
.	.	.	CODE	Process Connection					
.	.	.	D	3/4" MNPT					
.	.	.	.	CODE	Insertion 'U' Lengths				
.	.	.	.	0012	1.2"	(3.0 cm)			
.	.	.	.	0020	2"	(5.0 cm)			
.	.	.	.	0040	4"	(10.1 cm)			
.	.	.	.	.	CODE	Input Power			
.	.	.	.	.	E	12-36 VDC			
.	.	.	.	.	.	Electronics			
.	.	.	.	.	.	Epoxy Encapsulated within Sensor Housing.			
.	.	.	.	.	.	Single SPST sealed relay contact.			
.	.	.	.	.	.	CODE	Agency Approvals		
.	.	.	.	.	.	6	None - Non-hazardous only		
.	.	.	.	.	.	CODE	Language		
.	.	.	.	.	.	E	English		
.	.	.	.	.	.	CODE	Cable Length		
.	.	.	.	.	.	0100	10'	(3.0 m)	
.	.	.	.	.	.	0300	30'	(9.1 m)	
.	.	.	.	.	.	0500	50'	(15.2 m)	
6112	T	A	D	0020	E		6	E	0100

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Please refer to kurzinstruments.com for current specifications, configurations and prices.

Model Number Legend  
Doc. #: KUML-112-002-000


6115 Threaded

6115	CODE	Sensor Operating Temperature Range							 <p>Flow Switch (Inert Gases)</p>
.	T	'T' Type Sensor							
.	CODE	Material of Construction - Sensor							
.	A	316L Stainless Steel							
.	CODE	Process Connection							
.	D	3/4" MNPT							
.	CODE	Insertion 'U' Lengths							
.	0012	1.2"	(3.0 cm)						
.	0020	2"	(5.0 cm)						
.	0040	4"	(10.1 cm)						
.	CODE	Input Power							
.	E	12-36 VDC							
.	Electronics								
.	Epoxy Encapsulated within Sensor Housing.								
.	Single SPST sealed relay contact.								
.	CODE	Agency Approvals							
.	6	None - Non-hazardous only							
.	CODE	Language							
.	E	English							
.	CODE	Cable Length							
.	0100	10'	(3.0 m)						
.	0300	30'	(9.1 m)						
.	0500	50'	(15.2 m)						
6115	T	A	D	0020	E	6	E	0100	

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Model Number Legend  
Doc. #: KUML-115-002-000


### 6122 Sanitary Flange

6122	CODE	Sensor Operating Temperature Range		 <p>Flow &amp; Level Switch (<b>Liquids</b>)</p>					
.	T	'T' Type Sensor							
.	CODE	Material of Construction - Sensor (3A Compliant)							
.	A6	304/316L Stainless Steel - Sanitary							
.	CODE	Process Connection - Sanitary Flange							
.	E	1" (Tri-Clamp)							
.	G	1.5" (Tri-Clamp)							
.	H	2" (Tri-Clamp)							
.	J	2.5" (Tri-Clamp)							
.	K	3" (Tri-Clamp)							
.	L	3.5" (Tri-Clamp)							
.	CODE	Insertion 'U' Lengths							
.	0020	2"	(5.0 cm)						
.	0030	3"	(7.5 cm)						
.	0040	4"	(10.1 cm)						
.	CODE	Input Power							
.	E	12-36 VDC							
.	Electronics		Epoxy Encapsulated within Sensor Housing.						
.	Single SPST sealed relay contact.								
.	CODE	Agency Approvals							
.	6	None - Non-hazardous only							
.	CODE	Language							
.	E	English							
.	CODE	Cable Length							
.	0100	10'	(3.0 m)						
.	0300	30'	(9.1 m)						
.	0500	50'	(15.2 m)						
6122	T	A6	G	0020	E	6	E	0100	

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Model Number Legend  
 Doc. #: KURL-122-002-000

## 6125 Sanitary Flange

6125	CODE	Sensor Operating Temperature Range		 <p>Flow Switch (Inert Gases)</p>					
.	T	'T' Type Sensor							
.	CODE	Material of Construction - Sensor							
.	A6	304/316L Stainless Steel - Sanitary (3A Compliant)							
.	CODE	Process Connection - Sanitary Flange							
.	E	1" (Tri-Clamp)							
.	G	1.5" (Tri-Clamp)							
.	H	2" (Tri-Clamp)							
.	J	2.5" (Tri-Clamp)							
.	K	3" (Tri-Clamp)							
.	L	3.5" (Tri-Clamp)							
.	CODE	Insertion 'U' Lengths							
.	0020	2"	(5.0 cm)						
.	0030	3"	(7.5 cm)						
.	0040	4"	(10.1 cm)						
.	CODE	Input Power							
.	E	12-36 VDC							
.	Electronics		Epoxy Encapsulated within Sensor Housing.						
.	Single SPST sealed relay contact.								
.	CODE	Agency Approvals							
.	6	None - Non-hazardous only							
.	CODE	Language							
.	E	English							
.	CODE	Cable Length							
.	0100	10'	(3.0 m)						
.	0300	30'	(9.1 m)						
.	0500	50'	(15.2 m)						
6125	T	A6	G	0020	E		6	E	0100

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Acceptable & Unacceptable Process Factors for Thermal Switches
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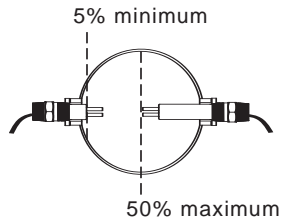
- |                                  |                                 |
|----------------------------------|---------------------------------|
| ✓ Consistent process composition | ✗ Aerated fluids                |
| ✓ Consistent process temperature | ✗ Large temperature swings      |
| ✓ Clean or dirty process         | ✗ Wet or saturated air/gas      |
| ✓ Liquids                        | ✗ Solids                        |
| ✓ Dry air & gas                  | ✗ Turbulence                    |
| ✓ Slurries                       | ✗ Sediment covering sensing tip |
| ✓ Emulsion                       |                                 |

Flow

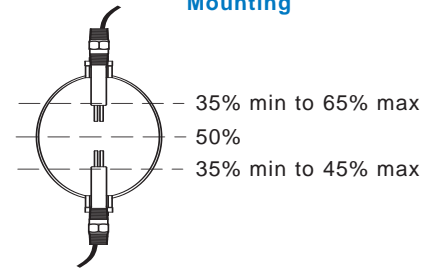
### Insertion Depth

For optimum performance the sensing tip should be positioned in contact with the process at all times.

#### Horizontal Mounting

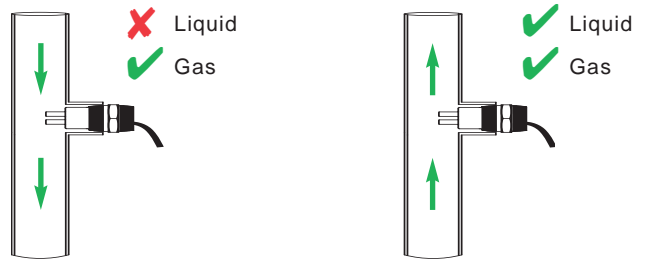


#### Vertical Up/Down Mounting



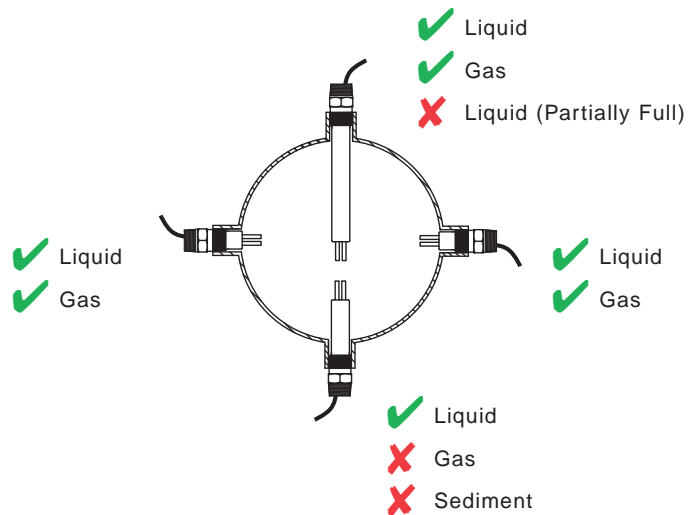
### Vertical Pipe:

Flow Direction



### Horizontal Pipe:

Sensor Positioning



Flow (Liquids, Slurries, Air & Inert Gases)

## Flow

### Mount the Sensing Element:

- Where the process flow is NON-TURBULENT.
- At least 5 pipe diameters downstream and 2 pipe diameters upstream from any bends or elbows in the pipe.
- At least 30 pipe diameters downstream and 2 pipe diameters upstream from any valves in the pipe.
- At least 15 pipe diameters downstream and 2 pipe diameters upstream from any pumps, fans or compressors.
- Ensure the arrows on the sensor are oriented parallel to the process flow.
- Liquids & Slurries: When mounted in a tee or section of pipe larger than the normal process pipe, position sensor in a vertical run of pipe with flow upward. This will prevent air or gas bubbles from becoming trapped around the sensing tip.
- Avoid locations where sediment may accumulate and eventually isolate the sensing tip from the process. Situating the sensing tip in the sediment may render the switch ineffective as it will not be able to recognize any changes in the process as the sediment will insulate the sensing tip.

### Horizontal Piping – Side Mount (Ideal)

Ensure sensing tip is fully inside the pipe wall as a minimum and to the center of the pipe as a maximum. Avoid locations where sediment may accumulate and eventually isolate the sensing tip from the process.

### Horizontal Piping – Top Mount

Ensure sensing tip is fully inside the pipe wall to a position where it will be constantly and fully exposed to the process in order for the flow or lack of flow to be recognized at any given time.

### Horizontal Piping – Bottom Mount

Ensure sensing tip is fully inside the pipe wall to a position where it will be constantly covered by the process in order for the flow or lack of flow to be recognized at any given time. Ensure the process covers the sensing tip – if the sensing tip is situated near the top of the pipe, the process must be filling the pipe to a level where the sensing tip is covered at all times. A wide selection of insertion ‘U’ lengths are available starting at 1.2”.

Avoid locations where sediment may accumulate and eventually isolate the sensing tip from the process.

**Note for Vertical Piping:** Mounting any thermal switch in a liquid process is best suited to horizontal piping, however vertical runs will work if necessary provided the instructions herein are adhered to.

### Vertical Piping – Side Mount (Acceptable)

Ensure sensing tip is fully inside the pipe wall as a minimum and to the center of the pipe as a maximum.

**Please note:** When installing the switch in vertical piping, Kurz strongly recommends installing thermal switches at a point of UPWARD process flow to ensure continued total immersion of the sensing tip.

### Vertical Pipe with Flow Downward:

- Is only recommended for higher flow rates where the LINE IS KEPT FULL OF LIQUID/SLURRY
- Installation in a vertical gravity flow, the switch must be distant enough from an open outlet that air cavitation does not extend to the sensing tip and cause a false flow signal. A constriction at the outlet avoids this problem.
- A waterfall effect will occur in vertical pipe with low flow rates and the process is likely to become substantially aerated and will therefore fool the switch into interpreting the aeration as a substantially lower flow rate.

## Flow (Liquids, Slurries, Air & Inert Gases)

### Vertical Piping – Top & Bottom Mount (Not Recommended)

Positioning the sensor on a corner or elbow is not recommended as the process will be turbulent and the switch will likely interpret the turbulence as a constantly changing flow rate.

## Level

### Liquid Level

#### Mount the Sensing Element:

- Where the process is NON-TURBULENT.
- AWAY from inlets or outlets where sensing tip will experience flow and / or turbulence.
- Ensure the arrows on the sensor are oriented parallel to the process surface.
- Keep sensing tip clear of any mixing devices that may cause damage.

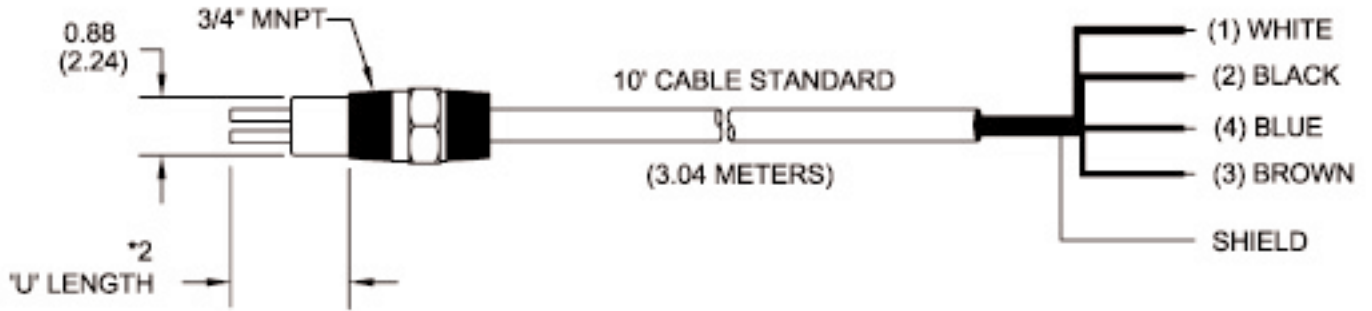
### Tanks and Vessels – Side Mount (Ideal)

Ensure sensing tip is fully inside the tank wall as a minimum.

### Tanks and Vessels – Top Mount





Ensure sensing tip is fully inside the vessel to the maximum and/or minimum level to be maintained.

BRONZE 6112 & 6115



BRONZE 6112 & 6115 Threaded

## KURZ Thermal Switch Product Group Overview

Series	GOLD 6500		SILVER 6300		BRONZE 6100	
Models/ Applications	6510, 6512, 6514, 6516, 6521 & 6523: Flow, Level, Interface & Temperature 6531 & 6532: Flow & Temperature (In-Line) 6550: Flow, Level, Interface & Temperature		6310, 6312, 6314, 6316, 6521, 6523: Flow, Level & Interface 6321 & 6323: Flow & Level 6330 & 6332: Flow (In-Line) 6350: Flow, Level & Interface		6112: Flow & Level 6115: Flow & Level	6122: Flow & Level 6125: Flow & Level
Process Connections	6510 & 6310: 1/2" to 2" MNPT Threaded type 6512, 6523, 6312 & 6323: Flanged type 6514 & 6314: Flanged Retractable Packing Gland 6516 & 6316: 1" MNPT Threaded Retractable Packing Gland 6521 & 6321: 1/4" to 2" MNPT Threaded type 6528 & 6328: 1" to 3" Sanitary (Ferrule) 6530 & 6330: 3/4" FNPT (In-Line) 6532 & 6332: Flanged (In-Line) 6550 & 6350 DIN Rail type: Available with all Sensor Models & most Connection Sizes 6525: Flanged (MultiPoint)				3/4" MNPT	Sanitary (Ferrule)
Insertion 'U' Lengths	1.2", 2", 3", 4" & 6" Standard (6521, 6523, 6321 & 6323 start at 2") Custom Lengths Available				1.2", 2" & 4"	
Material of Construction: (Sensor)	316L Stainless Steel, Titanium Gr. 2, Hastelloy C-276, Alloy 20, Monel 400, Inconel 600 & Nickel 200 (6521, 6523, 6321 & 6323: 316L SS Only) 316L SS Nickel Braze (6510 & 6310 with 1/2" MNPT connection, 6530, 6532, 6330 & 6332)				316L Stainless Steel	304/316L Stainless Steel
Remote Electronics Option	Yes Explosion Proof - Standard (Maximum 1000 feet)				No	
Input Power	Universal AC & DC 6550: 24 VDC		Universal AC & DC 6350: 24 VDC		12-36 VDC	
Power Consumption	Maximum: 4.8 watts		Maximum: 6 watts		Maximum: 3.9 watts @ 24 VDC	
Communications	RS-485				None	
Outputs	Dual SPDT sealed relay contacts 5 amps res. 230 VAC / 24 VDC Modbus via RS-485. 4-20 mA current loop (except 6550)		Single SPST sealed relay contact 5 amps res. 250 VAC / 30 VDC Modbus via RS-485.		Single SPST sealed relay contact 0.5 amps res. 36 VAC / VDC	
Temperature Compensation	Yes				No	
Operating Temperature Range - Sensor	Continuous Use: -55°C to +200°C (-67°F to +392°F) (except 6514/6516)		Continuous Use: -55°C to +200°C (-67°F to +392°F) (except 6314/6316)		Continuous Use: -40°C to +85°C (-40°F to +185°F)	
Operating Pressure - Sensor	Maximum Working Pressure: 24 Mpa (3500 psig) at 21°C (70°F)		Maximum Working Pressure: 24 Mpa (3500 psig) at 21°C (70°F)		Maximum Working Pressure: 3.6 Mpa (525 psig) at 21°C (70°F)	
Self-Test	Automated diagnostics performed on electronics & sensing elements				No	
Agency Approvals	 		 		General Purpose	



## | Contact Information

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**Where to Buy**

Distributors are listed at [kurzinstruments.com](http://kurzinstruments.com), or contact us.

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