

# +GF+ SIGNET

## 2450 Pressure Sensor

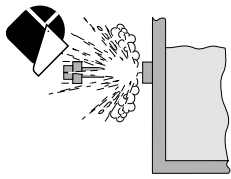


3-2450.090-1

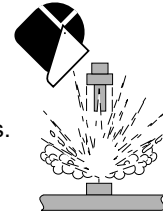


D (12/02) English

### Safety Instructions



1. Prior to installation or removal:
  - Depressurize and vent system
  - Drain below sensor level
2. Confirm chemical compatibility before use.
3. Do not exceed maximum temperature/pressure specifications.
4. Wear safety goggles or faceshield during installation/service.
5. Do not alter product construction.
6. Dispose of properly; DO NOT INCINERATE!



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## 1. Description

The 2450 Pressure Sensor has a one-piece injection molded PVDF body and ceramic diaphragm for superior compatibility in corrosive liquids. These sensors are available with S<sup>3</sup>L™ digital output or field-scaleable 4 to 20 mA output. Select from three (3) pressure ranges for optimal measurement resolution. Built-in temperature compensation provides outstanding accuracy over a wide operating range. Dual threaded ends allow submersion in process vessels, or in-line installation with conduit connection. Versions with 1/2 in. union process connection are recommended for in-line installations. Integral adapters (sold separately) may be used to create a compact assembly with field mount versions of the 8250 Level Transmitter and the 8450 Pressure Transmitter.

## 2. Specifications

### Compatibility

	5097	8250	8450	8600
2450-1, -2, -3, -4	●	●	●	●
2450-5, -7	●	●	●	●

### 2.1 General

Wetted materials:

- Sensor housing: PVDF
- Diaphragm: Ceramic
- Seal: FPM

Process connection:

- -1X, -2X, -5X: 3/4 in. NPT male thread
- -3X, -4X, -7X: 1/2 in. Union male thread

Rear connection:

- 3/4 in. NPT male thread
- 3 cond + shield, 22 AWG, Blk/Red/Wht/Shld

Cable type:

Standard cable length:

- 2450-1x, -3x, 5x, 7x: 4.6 m (15 ft.)
- 2450-2x, -4x: 16 cm (6 in.)

Sensor Accuracy:

±1% of full scale @ 25°C

Thermal sensitivity shift:

±0.03% of full scale per °C

Shipping weight:

- 2450-1, 2450-3: 0.3 kg (0.65 lb)
- 2450-2, 2450-4: 0.22 kg (0.48 lb)

### Power requirements

S<sup>3</sup>L™ models:

5 VDC ±10%, <1.5mA

4-20 mA models:

12-24 VDC ±10%

Short circuit & reverse polarity protected

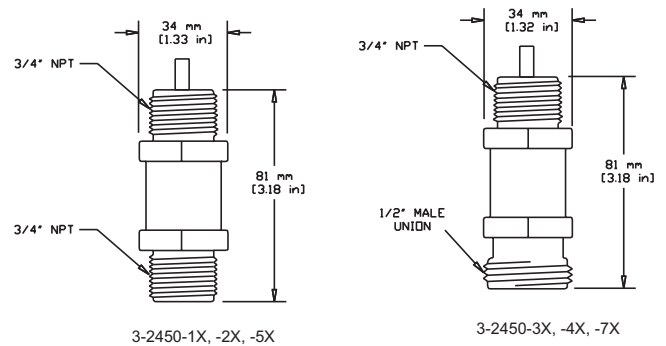
### S<sup>3</sup>L™ output:

- Accuracy: ±1% of full scale @ 25°C
- Repeatability: ±0.5% of full scale
- Resolution: 0.01 psi (0.001 psi for -XU)
- Update rate: <100 ms

### 4-20 mA output:

- Accuracy: ±1% of full scale @ 25°C
- Repeatability: ±0.5% of full scale
- Resolution: <5 µA
- Span: Field-scaleable (see section 6.3 for factory settings)
- Max loop impedance: 50Ω @ 12 V  
325 Ω @ 18 V  
600Ω @ 24 V
- Update rate: <100 ms

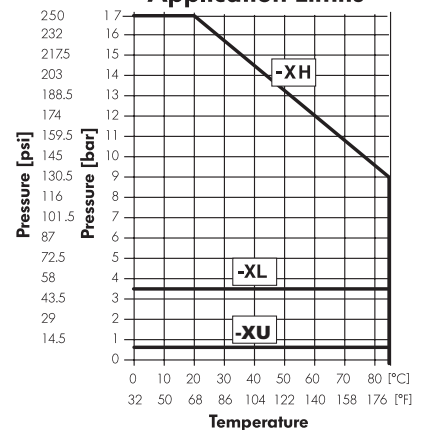
### Dimensions



### Environmental

- Relative humidity: 0 to 95% (Non-condensing)
- Storage temperature: -20°C to 100°C (-4°F to 212°F)
- Operating temperature: -15°C to 85°C (5°F to 185°F)
- Operating range:
  - XU 0-10 psig (0-0.7 bar)
  - XL 0-50 psig (0-3.4 bar)
  - XH 0-250 psig (0-17.2 bar)
- Proof pressure:
  - XU 20 psig (1.4 bar)
  - XL 75 psig (5.2 bar)
  - XH 300 psig (20.7 bar)

### Application Limits

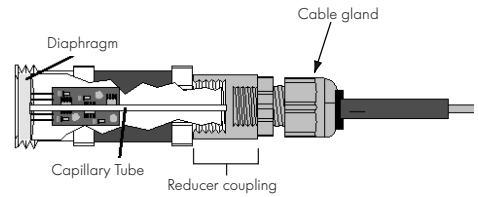


### Approvals & Standards

- CE
- EN 61326-2 Heavy Industry Immunity
- EN 55011 Class A Heavy Industry Emissions
- Manufactured under ISO 9001 and ISO 14001

### 3. Installation

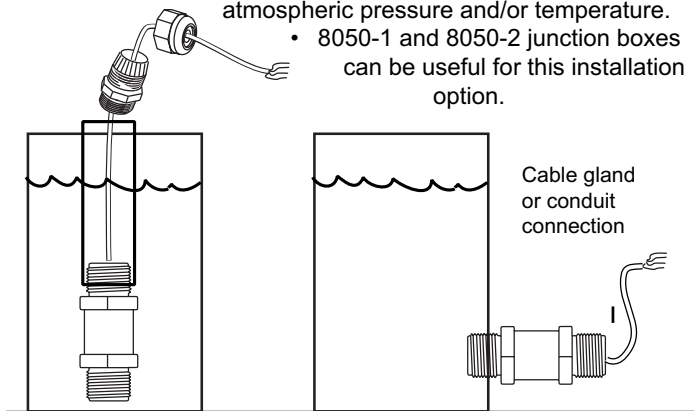
- +GF+ SIGNET 2450 Pressure Sensors are gauge pressure sensors. Gauge pressure sensors measure the difference in pressure between the process on one side of a diaphragm and the atmospheric pressure on the opposite side of the diaphragm. A tiny capillary tube inside the sensor body is used to ensure that the back of the diaphragm remains at atmospheric pressure. If moisture is allowed to propagate down this tube to the rear of the diaphragm, the sensor may be damaged.



- The ceramic diaphragm is subject to breakage by over-pressure conditions or mechanical contact. **HANDLE WITH CARE**
- The 3-2450-XU Ultra-low Pressure Sensors (0 to 10 psig) have a proof pressure rating of 20 psig maximum. This sensitivity makes them suitable for continuous level measurements (up to about 22.4 feet of water) but the diaphragms are fragile and can be easily ruptured by pushing the gauge with a finger or pencil tip. Handle these sensors carefully to avoid permanent damage.

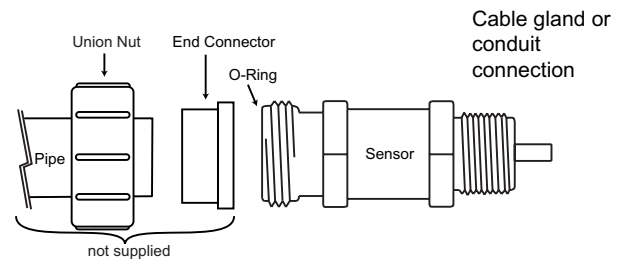
#### 3.1 Submersible Installation With 3/4 Inch NPT Sensors

- Use the 2450-1X or 2450-5X sensor with 15 ft. cable.
- Mount the sensor to an extension pipe or watertight conduit using thread sealant.
- Use a cable gland at the top of the extension to prevent moisture intrusion/accumulation inside the pipe.
- DO NOT hermetically seal (i.e. applying silicone sealant or epoxy) the back of the sensor. To do so may introduce measurement errors resulting from changes in atmospheric pressure and/or temperature.
  - 8050-1 and 8050-2 junction boxes can be useful for this installation option.



#### 3.2 1/2 Inch Male Union Installation

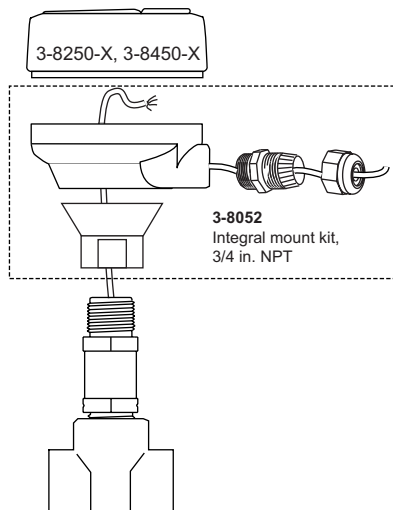
- The 2450-3X, the 2450-4X and the 2450-7X sensors have a union-style process connection. To assemble:
  - Slide union nut onto pipe or flexible tubing.
  - Install end connectors.
  - Hand-tighten union nut to secure.
  - A 3/4 in. NPT thread is provided to attach a cable gland or conduit.



#### 3.3 In-line Integral Assembly

The 3-8052 Integral Kit connects the 8450 Pressure Transmitter and 8250 Level Transmitter directly onto the 2450 sensor.

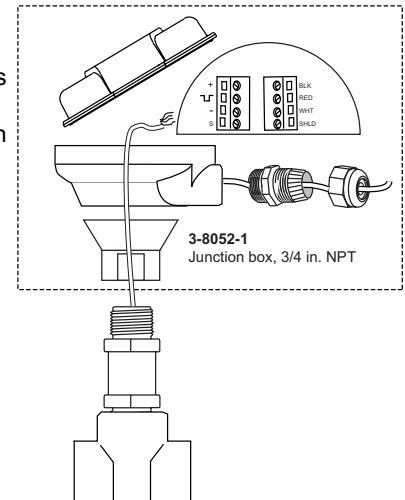
- Use the 2450-2X sensor with 6 in. cable and S<sup>3</sup>L™ output.
- The 3-8052 Integral kit includes:
  - 3/4 in. NPT sensor connection
  - 3-9000.392-1 liquid tight connector, 1/2 in. NPT
  - Conduit base to attach 8250 or 8450.
- Apply sealant or PTFE tape to the process connection threads, after inspecting threads to ensure integrity. Do not install a sensor with damaged threads.
- Tighten the sensor 1 1/2 turns past finger tight into the process connection.



#### 3.4 In-line Remote Assembly (2450-2, 2450-5)

The optional 3-8052-1 Integral kit w/Junction box and 3/4 in. NPT sensor connection provides a convenient terminal point to extend the 2450 cable over a distance.

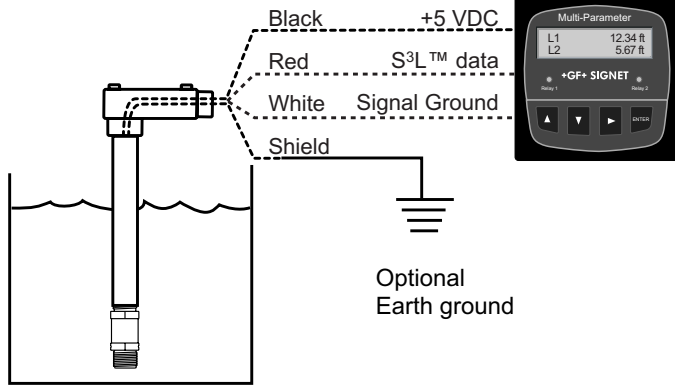
- The kit includes:
  - 3/4 in. NPT sensor connection
  - Conduit base and cap with junction terminals
  - 3-9000.392-1 liquid tight connector, 1/2 in. NPT
- Apply sealant or PTFE tape to the process connection threads, after inspecting threads to ensure integrity. Do not install a sensor with damaged threads.
- Tighten the sensor 1 1/2 turns past finger tight into the process connection.



## 4. S<sup>3</sup>L™ wiring

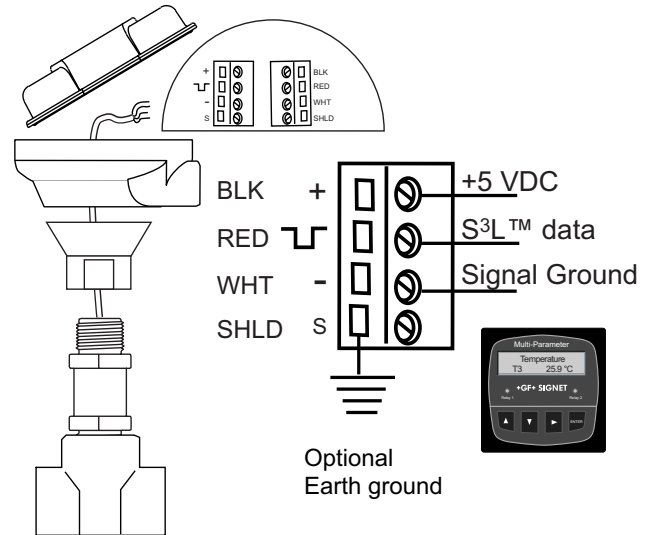
- All models of the 2450 provide S<sup>3</sup>L™ output when powered with 5 VDC.
- Connecting the SHIELD to a direct Earth ground may reduce electrical noise interference.
- The maximum S<sup>3</sup>L™ cable length is dependent upon the instrument to which the sensor is connected. Consult the instrument manual for details.

### 4.1 S<sup>3</sup>L™ With No Junction Box



- Connect the 2450 cable directly to S<sup>3</sup>L I/O terminals.

### 4.2 S<sup>3</sup>L™ With Junction Box

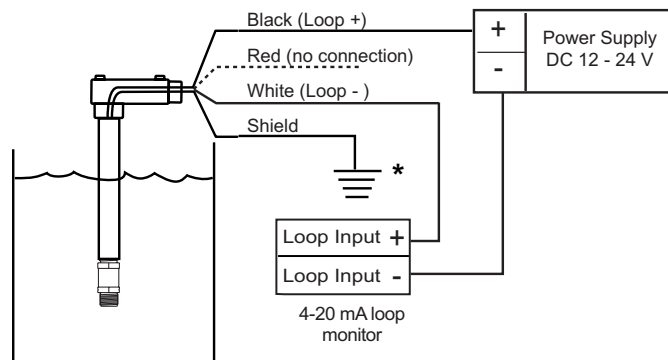


- When the 2450 includes a junction box, connect the 2450 terminals to any S<sup>3</sup>L™ I/O port as shown.

## 5. 4-20 mA Loop Wiring

- The 2450-5X and 2450-7X models provide a 4-20 mA loop output when powered with 24 VDC.
- Connecting the SHIELD to a direct Earth ground may reduce electrical noise interference.

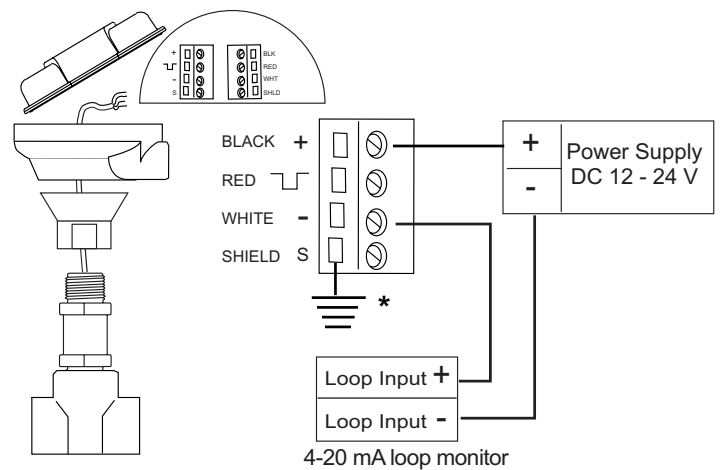
### 5.1 Current Loop With No Junction Box



\*Optional Earth ground

- Connect the 2450 cable directly to a Loop device as shown.

### 5.2 Current Loop With Junction Box



\*Optional Earth ground

- When the 2450 includes a junction box, connect the 2450 terminals to the Loop device as shown.

## 6. 4 to 20mA Span Adjustment

The 4 to 20 mA endpoint values are independent of one another and may be adjusted in the field. For example, to reduce the 20 mA endpoint value from the maximum full scale limit set at the factory, but to allow the 4 mA endpoint to remain at 0 psig, perform only the steps listed in 6.2 below. NOTE: The RED wire, which is not connected during normal 4 to 20 mA operation, assumes an important role in the following procedures.

### 6.1 To adjust the 4 mA endpoint in the field:

- Expose the sensor to the pressure desired to correspond with 4 mA (any pressure in the operating range).
- With power applied as described in Section 5, connect the RED wire to the WHITE wire for 15 seconds.  
(After about 10 seconds the output will drop to 3.6 mA and remain there until the RED wire is disconnected.)
- Disconnect the RED wire from the WHITE wire; the 4 mA endpoint has been adjusted.

**NOTE:** The output will act as a switch if the 4 and 20 mA endpoints are set very near to the same value. Minimum span is  $\pm 2\%$  of maximum range.

### 6.2 To adjust the 20 mA endpoint in the field:

- Expose the sensor to the pressure desired to correspond with 20 mA (any pressure in the operating range).
- With power applied as described in Section 5, connect the RED wire to the BLACK wire for 15 seconds.  
(After about 10 seconds the output will rise to 22 mA and remain there until the RED wire is disconnected.)
- Disconnect the RED wire from the BLACK wire; the 20 mA endpoint has been adjusted.

**NOTE:** The output will act as a switch if the 4 and 20mA endpoints are set very near to the same value. Minimum span is  $\pm 2\%$  of maximum range.

### 6.3 To restore factory span:

- Disconnect power to the sensor. Wait 10 s to allow circuit to discharge.
- Connect the RED wire to the WHITE wire.
- Apply power as described in Section 5, but with the RED wire connected to the WHITE wire for 15 seconds.  
(After about 10 seconds the output will drop to 3.6 mA and remain there until the RED wire is disconnected.)
- Disconnect the RED wire from the WHITE wire; factory settings have been restored.

Mfr. Part No.	Factory Span	Mfr. Part No.	Factory Span
3-2450-5U	4 to 20 mA = 0 to 10 psig	3-2450-7L	4 to 20 mA = 0 to 50 psig
3-2450-7U	4 to 20 mA = 0 to 10 psig	3-2450-5H	4 to 20 mA = 0 to 250 psig
3-2450-5L	4 to 20 mA = 0 to 50 psig	3-2450-7H	4 to 20 mA = 0 to 250 psig

## 7. Ordering Information

Mfr. Part No.	Code	Description
3-2450-1U	159 000 679	10 psig, S <sup>3</sup> L™, 3/4 in. NPT, 15 ft. Cable
3-2450-2U	159 000 680	10 psig, S <sup>3</sup> L™, 3/4 in. NPT, 6 in. Cable
3-2450-3U	159 000 683	10 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 15 ft. Cable
3-2450-4U	159 000 686	10 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 6 in. Cable
3-2450-5U	159 000 905	10 psig, 4-20, 3/4 in. NPT, 15 ft. Cable
3-2450-7U	159 000 906	10 psig, 4-20, 1/2 in. Male Union, 15 ft. Cable
3-2450-1L	159 000 024	50 psig, S <sup>3</sup> L™, 3/4 in. NPT, 15 ft. Cable
3-2450-2L	159 000 025	50 psig, S <sup>3</sup> L™, 3/4 in. NPT, 6 in. Cable
3-2450-3L	159 000 682	50 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 15 ft. Cable
3-2450-4L	159 000 685	50 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 6 in. Cable
3-2450-5L	159 000 907	50 psig, 4-20, 3/4 in. NPT, 15 ft. Cable
3-2450-7L	159 000 908	50 psig, 4-20, 1/2 in. Male Union, 15 ft. Cable
3-2450-1H	159 000 026	250 psig, S <sup>3</sup> L™, 3/4 in. NPT, 15 ft. Cable
3-2450-2H	159 000 027	250 psig, S <sup>3</sup> L™, 3/4 in. NPT, 6 in. Cable
3-2450-3H	159 000 681	250 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 15 ft. Cable
3-2450-4H	159 000 684	250 psig, S <sup>3</sup> L™, 1/2 in. Male Union, 6 in. Cable
3-2450-5H	159 000 909	250 psig, 4-20, 3/4 in. NPT, 15 ft. Cable
3-2450-7H	159 000 910	250 psig, 4-20, 1/2 in. Male Union, 15 ft. Cable
3-8050-1	159 000 753	Universal Mount Junction Box
3-8052	159 000 188	3/4 in. Integral mounting kit
3-8052-1	159 000 755	3/4 in. NPT mount junction box
3-9000.392-1	159 000 839	Liquid tight connector kit, NPT (1 piece)
3-9000.392-2	159 000 841	Liquid tight connector kit, PG13.5 (1 piece)
5523-0322	159 000 761	Cable, 3 conductor + shield, 22 AWG, black/red/white/shield

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