

## Model 1151/3051LTR Remote Diaphragm Level Transmitter



STONG M&C's 3051(&1151) LTR remote diaphragm level transmitter provides a kind of reliable measuring way. It is designed on the basis of 1151/3051DP & 1151/3051LT and used for measuring pressure (differential pressure), level, and density of liquid, gas or steam. The value is converted into current signal output or digital protocol output. The pressures are directly applied to the isolating diaphragm that provides isolation and resistance against process fluid corrosion. The relationship between the level and differential pressure is:

$$\Delta P = 0.0098 \rho L$$

$\Delta P$ =Differential Pressure;  $\rho$ (g/cm<sup>3</sup>)=Density; L=Level

Being microprocessor based, the electronic circuit is extremely versatile and accurate.

Combined with the sensor precision, it provides the high accuracy and range ability.

Transmitter performance is improved by continuous monitoring of the sensor temperature and corresponding corrections. A local display permits easy reading and writing of data.

STONG M&C's 3051(&1151) LTR remote diaphragm level transmitter is designed for preventing survey medium from directly entering into the internal transmitter. The sensor receives the change of pressure by the diaphragm on the remoter flange which is connected with the transmitter through capillary filled with silicon oil. Transmitters with remote device are suitable for the following operation conditions:

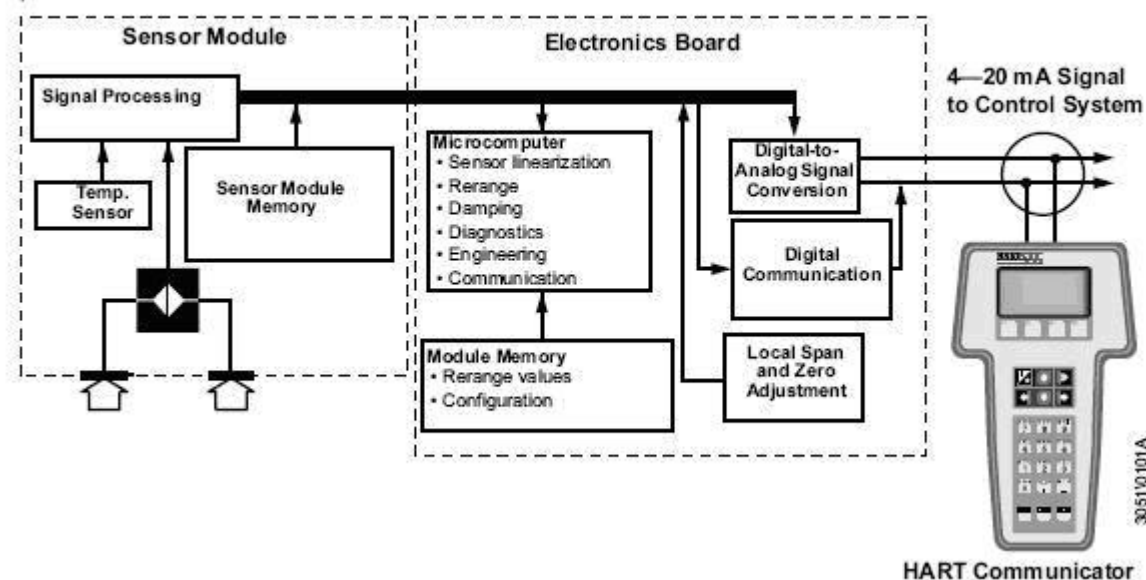
1. Mediums with high temperature should be isolated with transmitter.
2. Measured mediums are severe corrosive to sensitive parts of transmitters.
3. Suspending liquid or mediums with high viscosity
4. Measured mediums are easy solidized or crystallized due to change of environment or technological process.
5. Strict purification of measuring head is needed for replacing measured mediums
6. Measuring head must be kept clean and sanitary.
7. Seal pressure container measurement.

The Model 3051 utilizes capacitance sensor technology for pressure measuring. The major components of the Model 3051 are the sensor module and the electronics housing. The sensor module contains the oil filled sensor system (isolating diaphragms, oil fill system, sensor and mounting flange) and the sensor electronics. The sensor electronics are installed within the sensor module and include a temperature sensor (RTD), a memory module, and the capacitance to digital signal converter (C/D converter). The electrical signals from the sensor module are transmitted to the output electronics in the electronics housing. The electronics housing contains the output electronics board (microprocessor, memory module, digital to analog signal converter or D/A converter), the local zero and span buttons, and the terminal block.

For the Model 3051 design pressure is applied to the isolating diaphragms, the oil deflects the center diaphragm, which then changes the capacitance. This capacitance signal is then changed to a digital signal in the C/D converter. The microprocessor then takes the signals from the RTD and C/D converter calculates the correct output of the transmitter. This signal is then sent to the D/A converter, which converts the signal back to an analog signal and superimposes the HART signal on the 4-20 mA output. For the Model 3051LTR design

pressure is applied to the isolating diaphragm which is welded on the flange. Flat flange and insert flange are available. The sizes of the flange can be customized according to use's requirements. The material of diaphragm can be optional for different kinds of corrosive liquid as well.

Figure 1-1. Block diagram of operation



## SEVERAL TYPES OF REMOTE DEVICE

1199PFW Flat Remote Device

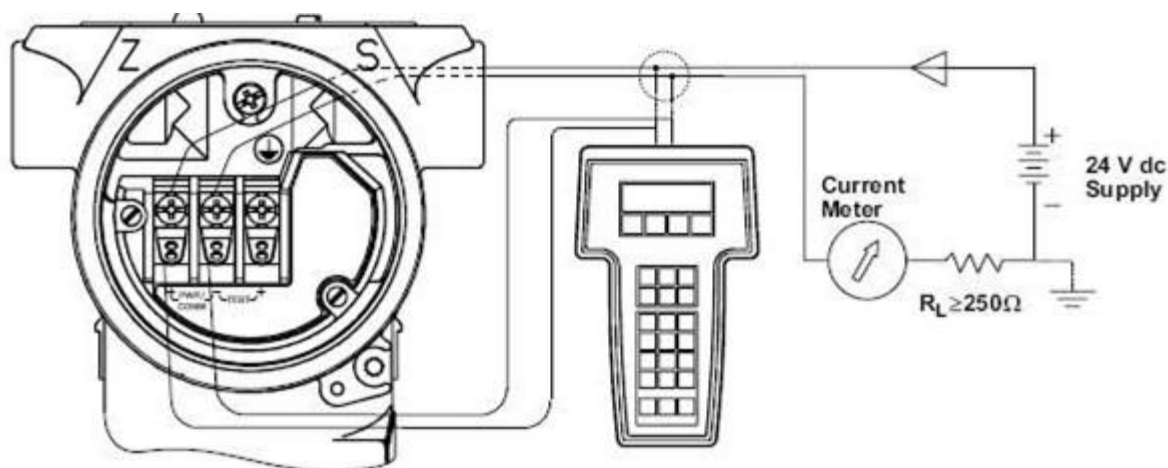
1199EFW Insert Tube Remote Device

1199RTW Thread Mounting Remote Device

1199RFW Flange Mounting Remote Device

## WIRING DIAGRAMS

Connect the bench equipment as shown in Figure, and turn on the HART-based communicator by pressing the ON/OFF key. The communicator will search for a HART-compatible device and will indicate when the connection is made. If the communicator fails to connect, it will indicate that no device was found.



### TECHNICAL SPECIFICATIONS

Measuring object: liquid, gas and steam

Measuring range: 0~0.1kPa to 0~40MPa

Output signal: 4~20mA DC+HART protocol

Power supply: 12~45V DC, generally 24V DC

Range and null point: adjustable

Humidity: relative humidity 5~95%

Precision: 0.25%FS

Converter housing: Low copper cast aluminum alloy with Polyurethane paint

Fill Fluid: Silicon / Fluorine Oil

Process Connections: 1/2NPT, 1/4NPT

Protection Class: IP65

Maximum positive shift is 500% of minimum adjusting span; maximum negative shift is 600% of minimum adjusting span.

Mounting : Flange

Material:

Flange : Stainless Steel

Drains/Vents: Stainless Steel 316/Monel / Hastelloy

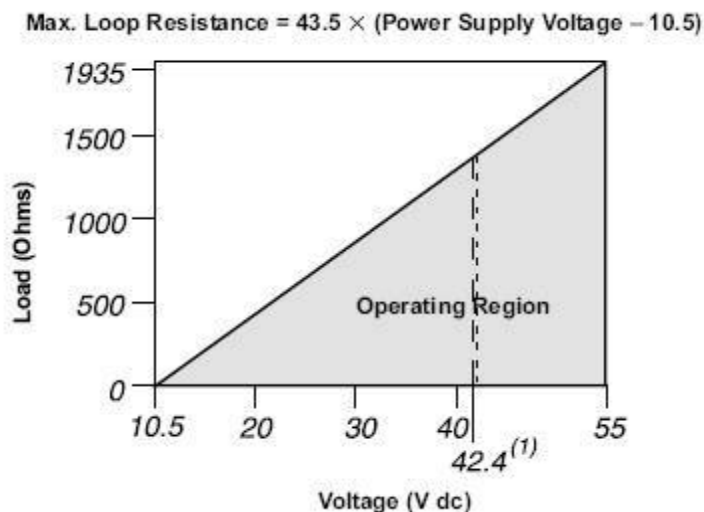
Diaphragms: Stainless Steel 316/Monel /Hastelloy C/ Tantalum

Wetted O-Ring: Viton/ Buna-N

Seal O-Ring: Viton/ Buna-N

Bolts & Nuts: Carbon Steel/Stainless Steel316

### POWER SUPPLY LOAD LIMITATIONS, 4–20 MA TRANSMITTERS



**ORDERING CODES**

1151/3051DPR		Remote Diaphragm Differential Pressure Transmitter	
		Range	
3		0-1.3~7.5KPa	
4		0-6.2~37.4KPa	
5		0-31.1~186.8KPa	
6		0-117~690KPa	
7		0-345~2068KPa	
8		0-117KPa~1MPa	
9		0-0.4~2.5MPa	
0		0-1.6~10MPa	
		Output	
	E	4-20mADC	
	S	Smart 4-20mA+HART Protocol	
		Material of structure	
	22	Standard	
		Quality of Remote Device	
	S1	One set of Remote Device	
	S2	Two sets of Remote Device	
		Optional	
	M1	0-100% Indicator Meter	
	M3	3 1/2 LCD Meter	
	M4	Smart Meter	
	B1	2" Pipe Mounting Angle Bracket, Carbon steel	
	B2	Wall Mounting Angle Bracket, Carbon Steel	
	B3	2" Pipe Mounting Bracket, Carbon steel	

**NOTES:**

200 series silicon oil filled in capillary for medium temperature -40~+149°C;

High temperature silicon oil filled in capillary for medium temperature -20~+315°C;

Pls select anti-corrosive material of flange diaphragm for corrosive medium.