Type 557, 558, 571

EXTERNAL IMPEDANCE CONVERTERS AND RANGE CAPACITORS

The low impedance voltage mode piezoelectric sensor such as the Piezotron type, incorporates a miniature MOSFET electronic circuit inside the sensor housing. The internal circuitry converts the high impedance charge generated by the quartz crystals to a high level voltage signal with an output impedance of less than 100 ohms. The advantages of using a stand alone low impedance voltage mode sensor are now available in a hybrid system combining a high impedance accelerometer, pressure or force transducer with an impedance converter. A distinct advantage of this system is that high temperature measurements can be made by separating both components and placing the quartz sensor in a considerably higher temperature environment than that of the impedance converter.

- Compatible with high impedance charge, mode sensors
- Miniature construction
- In-line or direct attachment to sensor
- Optional range capacitors to tailor output signal
- Two wire, constant current source operation


557

Photo Scale1:1


558


571

Technical Data	Units	557/ 558
Output Characteristics:		
Voltage	V	±5
Impedance	Ω	100
Current	mA	2
Bias nom.	V	11
Input Characteristics:		
Voltage FSO	V	±5
Resistance min. at R.T.	Ω	5×10^{10}
Capacitance nom.	pF	3
Time Constant nom.	s	5
Transfer Characteristics		
Non-linearity	%	1
Voltage Gain nom.	V	0.97
Noise 10 ... 300 Hz	μV_{rms}	60
Environmental Characteristics		
Temperature Range	°F	−65 ... 250
	°C	−54 ... 121
Temperature Effect on Gain	%	2
Temperature Effect on Bias	V	±2
Shock 1 ms pulse width	g_{pk}	2000
Vibration Limit	g_{pk}	500
Power Supply Characteristics		
Voltage	VDC	20 ... 30
Current	mA	4
Ripple	mV_{rms}	1

1 ***g*** = 9.80665 m/s², 1 inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.1129 Nm

000-388e-02.01 (DBK13.557/558e-02.01)

Kistler Instrument Corporation, 75 John Glenn Drive, Amherst NY 14228
Phone 716-691-5100, Fax 716-691-5226, e-mail: kicsales@kistler.com, www.kistler.com

Applications

- Conversions of charge signals from piezoelectric sensors into proportional voltage signals
- High temperature installations requiring charge output sensors

Signal Polarities

Most high impedance sensors develop a negative-going signal with increasing measurand. This produces positive-going output signals from charge amplifiers which invert polarities. When these sensors are used with Piezotron Impedance Converters, increasing measurands yield negative-going output signals.

Low frequency response relates inversely to the Input Time Constant. The approximate frequency at which 5% attenuation occurs is: f (Hz) = 0.5 / Input Time Constant

High frequency response depends upon output cable capacitance. Typical response –5% at ±1V with cable capacitance of 5000 pF is 100 000 Hz. (Response with 50 000 pF is 10 000 Hz.)

Selecting a Range Capacitor

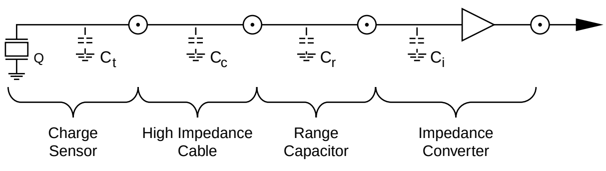
An impedance converter uses a MOSFET I.C. circuit, operating as a source follower with unity gain. For certain applications it may be necessary to use a range capacitor to reduce the voltage level from the sensor. A variety of range capacitors are offered:

1 Estimating max. pressure, force, or acceleration to be measured
2 Select sensor
3 Multiply sensor sensitivity (from data sheet) by estimated max. range as determined in step 1.
4 Select range capacitor
5 If possible, select one of four standard range capacitors which are stocked. Capacitance values below 100pF can be obtained by varying length of the sensor cable, Type 1631 series cable capacitance is 30 pF/ft. Type 1601 series cable capacitance is 20 pF/ft.
6 Compute exact system sensitivity ($V = Q/C_S$)

Range Capacitors

571...	A1	A2	A3	A4	A5	A6	A7
pF	100	220	470	1000	2200	4700	10 000

Nominal Sensitivity



$V = Q/C_S$ where: $C_S = C_t + C_c + C_r + C_i$

Q = Sensor change sensitivity (i.e. pC/psi, pC/*g*, pC/lbf etc.)

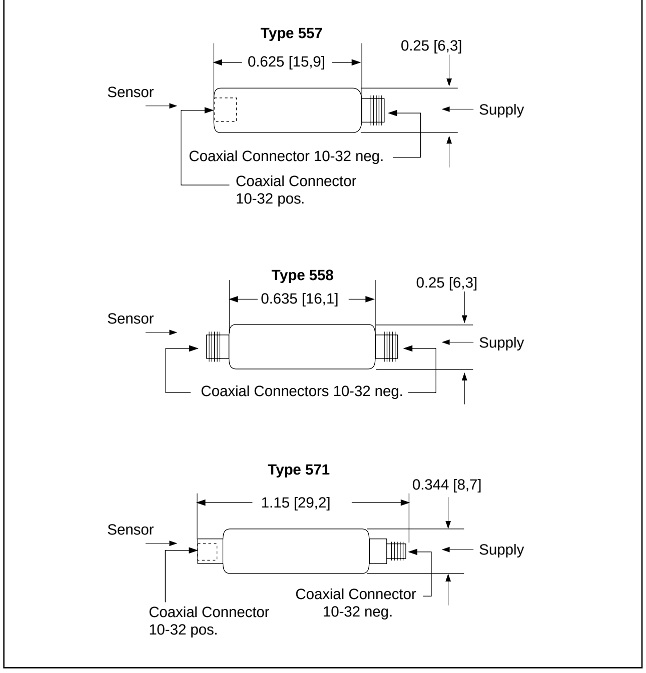
C_S = Total capacitance at input of impedance converter (pF)

C_t = Sensor capacitance

C_c = Input cable capacitance

C_r = Range capacitor

C_i = Impedance converter input capacitance

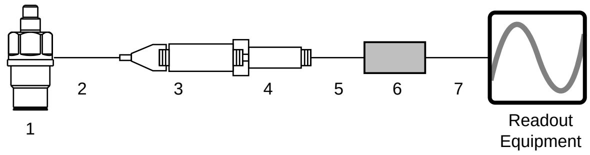


Mounting Options

Model 557: mounts directly on sensor for highest sensitivity, and lowest noise.

Model 558: mounts in-line with the same characteristics as Model 557, and features all welded construction and hermetic sealing.

Ordering Information



Specify:

1 - charge sensor	specify a high impedance sensor
2 - 1631A...	low noise cable, 10-32 pos. to BNC pos. or
1631C...	premium low noise cable, 10-32 pos. to BNC pos., specify length in meters
3 - 571A...	range capacitor
4 - 557	impedance converter or
558	In-line impedance converter
5 - 1761B...	general purpose 10-32 pos. to BNC pos., specify length in meters
6 - 5100...	coupler series
7 - 1511...	output cable, BNC pos. to BNC pos., specify length in meters

000-388e-02.01 (DBK13.557/558e-02.01)

Kistler Instrument AG Winterthur, Postfach 304, CH-8408 Winterthur
Tel + 41 - 052 - 224 11 11, Fax + 41 - 052 - 224 14 14, sales@kistler.ch, www.kistler.com

Kistler Instrument Corporation, 75 John Glenn Drive, Amherst NY 14228
Phone 716-691-5100, Fax 716-691-5226, e-mail: kicsales@kistler.com, www.kistler.com