

Capacitive Probe Cabling Considerations

Applicable Equipment:

Capacitive displacement measurement systems.

Applications:

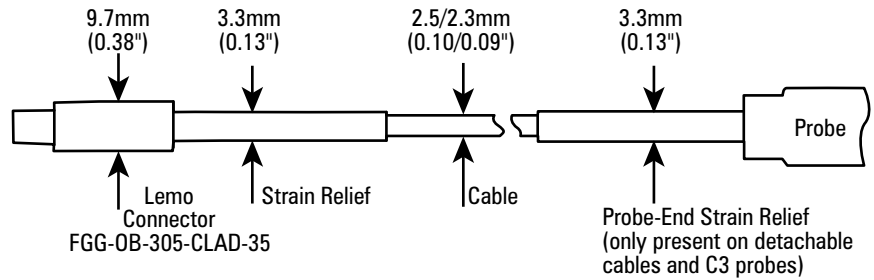
All capacitive measurements.

Summary:

Specifications and recommendations for capacitive probe cables to maximize performance and durability.

Mechanical

FEP (Teflon™) Cable



Operating Temperature:

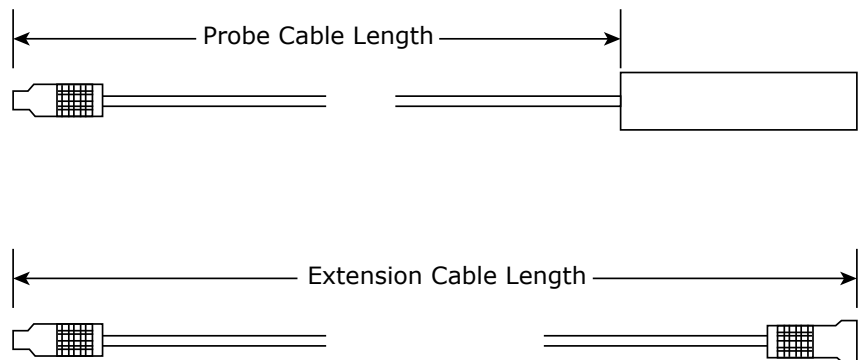
-250°C to 200°C (cable only)

Capacitive probes are only rated for a temperature range of 4°C to 50°C. The cable has a much wider temperature range.

Cable Length/Extensions

Cable length effects calibration because drivers transmit a high-frequency signal to the probe through the cable. Sensors should be calibrated with the same cables and cable lengths that will be used in operation. If extensions are going to be used, the system must be calibrated with the extensions.

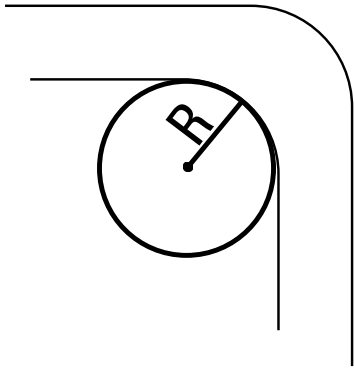
Standard cable length is 2 meters. Custom cable lengths can be ordered.



Cable Movement During Measurement

Error Noise Generation

Moving the cable can generate noise caused by the “triboelectric” effect. This effect creates small voltage spikes in the cable due to static charges created when the conductors and insulation rub together. This noise is then amplified by the driver electronics and appears in the output signal of the sensor as an error component.



Bend radius is measured on the "inside" of the bend.

This effect is part of the physics of cabling and is not a function of the driver or probe design. Cable used in Lion Precision probes is specially designed to minimize triboelectric noise.

Generally, this effect is dependent on acceleration. Quick movements of the cable generate more noise than gradual movements of the cable. Impacts on the cable are worst case.

Flexibility (Minimum Bend Radius)

The cable is most vulnerable to damage where it exits the probe. The cable should be restrained in some way to prevent repeated motion of the cable at the probe.

The allowable bend radius depends on the application. Select an application below to find the minimum bend radius. Note the measurement of the bend radius on the left.

Dynamic Applications:

Repeated bending

At cable/probe junction:

None. Secure cable to prevent repeated motion at the junction of the cable and probe.

Along cable length:

50mm (2")

Static Applications:

Bent occasionally during installation

At cable/probe junction:

25mm (1")

Along cable length:

7.5mm (0.3")

Extreme Applications:

Bent only once for extremely tight installations

At cable/probe junction:

13mm (0.5")

Along cable length:

2.5mm (0.1")