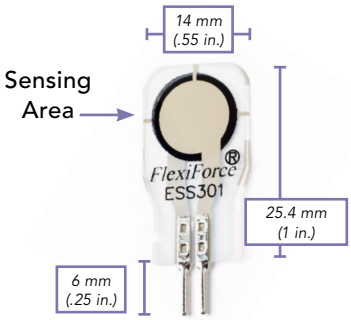
# FlexiForce™
## Standard Model ESS301

### Actual size of sensor




The ESS301 is our standard force sensor ideal for conditions with high temperature and humidity. This sensor is made from Tekscan's Enhanced Stability Series (ESS) pressure sensitive ink. This allows better performance in a wider range of operating and storage conditions. ESS301 was developed with OEM customers in mind and designed to reach the majority of our OEM customer's test expectations. The ESS301 can be used with our test & measurement, prototyping, and embedding electronics, including the OEM Development Kit, FlexiForce Quickstart Board, and the ELF™ System*. You can also use your own electronics, or multimeter.

## Physical Properties

| | |
|---|---|
| Thickness | 0.203 mm (0.008 in.) |
| Length | 25.4 mm (1 in.)* |
| Width | 14 mm (0.55 in.) |
| Sensing Area | 9.53 mm (0.375 in.) diameter |
| Connector | 2-pin Male Square Pin |
| Substrate | Polyester |
| Pin Spacing | 2.54 mm (0.1 in.) |

## Benefits

- Operates in temperatures up to 85°C approximately 185°F) and with a relative humidity up to 95%
- Thin and flexible
- Easy to use, ideal for prototyping and integrating
- Available off-the-shelf

✓ROHS COMPLIANT

** Sensor will require an adapter/extender to connect to the ELF System. Contact your Tekscan representative for assistance.*

***Length does not include pins. Please add approximately 6 mm (0.25 in.) for pin length for a total length of approximately 32 mm (1.25 in).*

***

| | Typical Performance | Evaluation Conditions |
|---|---|---|
| Linearity (Error) | < ±8.6% of full scale | Line drawn from 0 to 50% load |
| Repeatability | < ±2.5% | Conditioned sensor, 80% of full force applied |
| Hysteresis | < 5.5% of full scale | Conditioned sensor, 80% of full force applied |
| Drift | < 3.8% per logarithmic time scale | Constant load of 111 N (25 lb) |
| Response Time | < 5µsec | Impact load, output recorded on oscilloscope |
| Operating Temperature | -40°C - 85°C (-40°F - 185°F) | Convection and conduction heat sources |
| Acceptance Criteria | ±40% sensor-to-sensor variation | Output considered at test pressure |
| Durability | ≥ 3 million actuations | Perpendicular load, room temperature, 22 N (5 lb) |
| Temperature Sensitivity | 0.36%/°C (± 0.2%/°F) | Conductive heating |

*****All data above was collected utilizing an Op Amp Circuit (shown on the next page).** If your application cannot allow an Op Amp Circuit, visit www.tekscan.com/flexiforce-integration-guides, or contact a FlexiForce Applications Engineer.



*ISO 9001 Compliant & 13485 Registered*

Tekscan™

## Standard Force Ranges
### as Tested with Circuit Shown

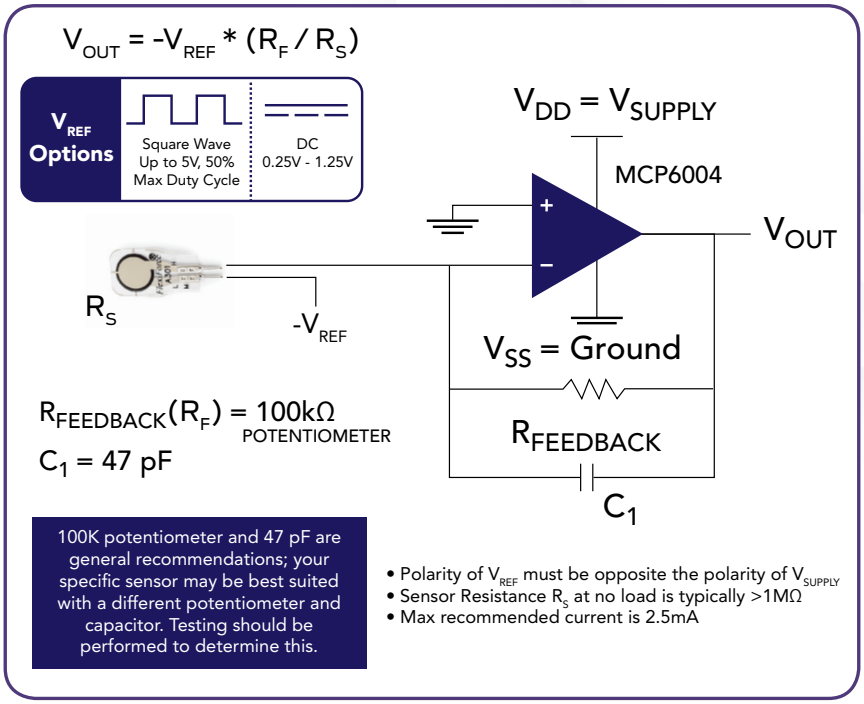
4.4 N (0 - 1 lb) †

† **This sensor can measure up to 445 N (100 lb).** The force range can be extended by reducing the drive voltage, $V_T$, or the resistance value of the feedback resistor, $R_F$. Conversely, the sensitivity can be increased for measurement of lower forces by increasing $V_T$ or $R_F$.

Sensor output is a function of many variables, including interface materials. Therefore, Tekscan recommends the user calibrate each sensor for the application. The graph on the right is an illustration of how a sensor can be used to measure varying force ranges by changing the feedback resistor (**Figure 1** should not be used as a calibration chart).

Test Conditions: Input Voltage- 0.45V; Load Applied - 1lb; Measured Current- 79uA

## Recommended Circuit




## Figure 1