### Honeywell

# Model 3719 Bolt and Engine Mount Force Sensor



### DESCRIPTION

The bolt force sensor is a unique transducer which is essentially a hollow-compression strain gage load cell. It is designed to be used with most strain gage indicators. The bolt force sensor is a three-piece assembly consisting of: 1. a large hardened and ground flat washer with one side beveled, 2. the sensor, and 3. a small hardened and ground washer.

The three pieces are assembled for various applications. The large washer isolates the sensor from the force application tool.

The beveled hole in this washer, which always faces away from the sensor, provides clearance for the bolt head radius. When a torque wrench is used, a torque vs. clamp force curve can be generated. The 3719 bolt force sensor is designed for use in fastener testing where the compression loading of the sensor is induced by the tensile loading of the fastener. The bolt force sensor must be used with the size fastener for which it was designed.

#### **FEATURES**

- Compact
- High output
- Standard models for bolts size no. 6 thru 2 in and up to 20 mm
- Sensor and washers carpenter 440C stainless steel
- Sensitive to neither bolt nor nut-applied torque

### Model 3719

### PERFORMANCE SPECIFICATIONS

| Characteristic                                   | Measure   |
|--|---|
| Load range <sup>1</sup>                          | 1200 lb to 300000 lb                            |
| Non-linearity - ranges up to 25K lb (67K N)      | ±3.0 % of rated output                          |
| Non-linearity - ranges 30K<br>Ib and up (102K N) | ±4.0 % of rated output                          |
| Hysteresis<br>ranges up to 25K lb (67K N)        | ±5.0 % of rated output                          |
| Hysteresis - ranges 30K lb<br>and up (102K N)    | ±7.0 % of rated output                          |
| Repeatability                                    | ±0.10 % of rated output                         |
| Output @ rated capacity                          | ±2 mV/V to 3.5 mV/V depending on size (nominal) |
| Resolution                                       | Infinite  |
| Standard calibration                             | Compression                                     |

### ENVIRONMENTAL SPECIFICATIONS

| Characteristic                                     | Measure                            |
|--|------------------------------------|
| Temperature, operating                             | -54 °C to 93 °C [-65 °F to 200 °F] |
| Temperature, compensated                           | 21 °C to 77 °C [70 °F to 170 °F]   |
| Temperature effect, zero ranges up to 12K lb       | ±0.01 % of full scale/°F           |
| Temperature effect, zero<br>ranges 18K lb and up   | ±0.007 % of full scale/°F          |
| Temperature effect, output ranges up to 12K lb     | ±0.02 % of reading/°F              |
| Temperature effect, output<br>ranges 18K lb and up | ±0.0035 % of reading/°F            |

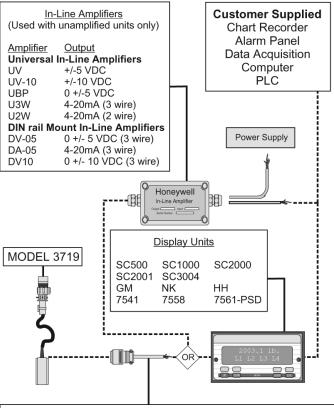
#### **ELECTRICAL SPECIFICATIONS**

| Characteristic                        | Measure              |
|---------------------------------------|----------------------|
| Excitation (maximum)                  | 10 Vdc or Vac RMS    |
| Insulation resistance,<br>bridge case | > 5000 mOhm @ 50 Vdc |
| Bridge resistance<br>(tolerance)      | 350 ohm              |
| Number of bridges                     | 1                    |
| Zero balance                          | ±1.0                 |

### **MECHANICAL SPECIFICATIONS**

| Characteristic           | Measure                   |  |  |  |
|--------------------------|---------------------------|--|--|--|
| Static overload capacity | 150 % of nominal capacity |  |  |  |

#### **TYPICAL SYSTEM DIAGRAM**



#### Mating Connectors & Cables

| 064-LW13621                         | Mating connector  |
|-------------------------------------|---|
| 7200-76-XX*                         | Mating connector and six conductor cable  |
| 7200-75-XX**                        | (unamplified unit with sense leads but not shunt cal)<br>Mating connector (MS - 5 pin) and four conductor cable |
| 1200-13-77                          | (unamplified sensor without sense leads)  |
| 7200-111-XX**                       | Mating connector ( MS – 5 pin ) & 6 conductor cable   |
|                                     | for connection to 7541  |
| 7200-110-XX**                       | Mating connector ( MS – 5 pin ) & 4 conductor cable   |
|                                     | for connection to 7541  |
| * XX represents<br>** XX represents |   |

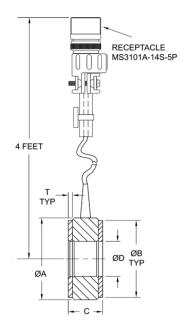
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#### MOUNTING DIMENSIONS

| Model     | Bolt size | Capacity Ib | C in   | ØD in | ØA in | ØB in | T in  |
|-----------|-----------|-------------|--------|-------|-------|-------|-------|
| 3719-138  | No. 6     | 1200        | 0.330  | 0.140 | 0.42  | 0.250 | 0.040 |
| 3719-164  | No. 8     | 1800        | 0.330  | 0.166 | 0.47  | 0.300 | 0.040 |
| 3719-190  | No. 10    | 2400        | 0.330  | 0.192 | 0.52  | 0.350 | 0.040 |
| 3719-250  | 1/4       | 5000        | 0.370  | 0.262 | 0.65  | 0.470 | 0.060 |
| 3719-312  | 5/16      | 7000        | 0.495  | 0.326 | 0.78  | 0.550 | 0.060 |
| 3719-375  | 3/8       | 10000       | 0.495  | 0.396 | 0.80  | 0.639 | 0.060 |
| 3719-437  | 7/16      | 12000       | 0.495  | 0.454 | 0.95  | 0.720 | 0.060 |
| 3719-500  | 1/2       | 20000       | 0.660  | 0.517 | 1.14  | 0.910 | 0.080 |
| 3719-562  | 9/16      | 25000       | 0.660  | 0.580 | 1.23  | 0.990 | 0.080 |
| 3719-625  | 5/8       | 30000       | 0.660  | 0.644 | 1.35  | 1.150 | 0.080 |
| 3719-750  | 3/4       | 45000       | 0.815  | 0.770 | 1.62  | 1.350 | 0.095 |
| 3719-875  | 7/8       | 60000       | 0.815  | 0.897 | 1.72  | 1.600 | 0.095 |
| 3719-1000 | 1         | 90000       | 0.815  | 1.024 | 2.00  | 1.800 | 0.095 |
| 3719-1125 | 1 1/8     | 80000       | 1.065  | 1.151 | 2.20  | 1.900 | 0.095 |
| 3719-1250 | 1 1/4     | 125000      | 1.125  | 1.279 | 2.40  | 2.250 | 0.125 |
| 3719-1500 | 1 1/2     | 190000      | 1.125  | 1.533 | 2.80  | 2.600 | 0.125 |
| 3719-1750 | 1 3/4     | 260000      | 1.300  | 1.787 | 3.20  | 3.000 | 0.150 |
| 3719-2000 | 2         | 300000      | 1.650  | 2.041 | 3.60  | 3.500 | 0.200 |
| 3719-6MM  | 6 mm      | 17000*      | 9,40*  | 6,0*  | 16,3* | 10,7* | 1,5*  |
| 3719-7MM  | 7 mm      | 27000*      | 12,57* | 7,1*  | 16,8* | 12,2* | 1,5*  |
| 3719-8MM  | 8 mm      | 31000*      | 12,57* | 8,3*  | 19,8* | 14,5* | 1,5*  |
| 3719-9MM  | 9 mm      | 36000*      | 12,57* | 9,0*  | 20,3* | 15,2* | 1,5*  |
| 3719-10MM | 10 mm     | 46000*      | 12,57* | 10,1* | 20,3* | 16,2* | 1,5*  |
| 3719-12MM | 12 mm     | 67000*      | 15,75* | 12,0* | 27,9  | 22,1* | 1,5*  |
| 3719-14MM | 14 mm     | 102000*     | 16,76* | 14,0* | 31,8* | 25,9* | 2,0*  |
| 3719-15MM | 15 mm     | 125000*     | 16,76* | 15,5* | 32,5* | 26,4* | 2,0*  |
| 3719-16MM | 16 mm     | 135000      | 16,76* | 16,1* | 34,3* | 29,2* | 2,0*  |
| 3719-18MM | 18 mm     | 156000      | 19,94* | 18,1* | 36,8* | 31,8* | 2,0*  |
| 3719-20MM | 20 mm     | 220000      | 20,70* | 20,1* | 43,2* | 36,8* | 2,4*  |

\* Capacities in Newtons, \* Dimensions in millimeters



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### NOTES

1. This unit calibrated to Imperial (non-Metric) units.

### Bolt and Engine Mount Force Sensor

Warranty. Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

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Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

### WARNING PERSONAL INJURY

• DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

### WARNING MISUSE OF DOCUMENTATION

- The information presented in this catalogue is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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