

**VIBRATION  
SENSORS FOR  
INDUSTRIAL  
MONITORING**



[www.dytran.com](http://www.dytran.com)



Catastrophic bearing failure can result in costly repairs and down time. Early detection of faulty bearings results in a scheduled service interruption, not-all-out panic. The path to a successful monitoring program begins with selecting the right sensors.

Dytran sensors have provided critical vibration data to predictive maintenance operations in a wide spectrum of industries, maximizing plant productivity by providing **reliable and accurate** readings to your information management system.



Since 1980, Dytran has specialized in the design and manufacture of piezoelectric sensors. We have developed the outstanding line of products in this brochure to meet the demanding requirements of the industrial user. Our sensors operate from industry standard internal power sources available in most spectrum analyzers and

are interchangeable with all internally amplified piezoelectric sensors on the market today. Dytran sensors are compatible with CSI, DLI, Scientific Atlanta, Dynamic Instruments, Metrix, Hewlett-Packard, IRD, SKF, Zonic / A&D, Vibration Specialty Corp., Entek and many more.

Industrial monitoring professionals choose Dytran as much for our people as for our products. The real difference between us and the competition lies not only with the products, but with the people who stand behind the products. Integrity, reliability and service: these things sets us apart and keep our customers coming back for more.

All of these factors point to Dytran as a worthy partner for a successful monitoring program. Call us today to discuss your application.



## ***Serving the following industries:***

**Petro Chemical  
Pulp and Paper  
Plant Maintenance  
Utilities  
Steel Making  
Mining**

**Water Treatment  
Food / Kindred Processing  
Machine Tools  
Maritime  
Pipeline  
Cooling Tower**



## PIEZOELECTRIC ACCELEROMETERS

MODEL	Sensitivity mV/g	Weight Grams	Linear Range (g)	Shock Limit (g)	Frequency Response Hz(+/-5%)	Min. Temp. °C (°F)	Max. Temp. °C (°F)	Electrical Isolation	Hermetic Seal	Mounting Method
3019A	10	8	500	3000	1-10000	-51 (-60)	121 (250)	YES	YES	STUD
3019A1	10	8	500	3000	1-10000	-51 (-60)	121 (250)	YES	YES	STUD
3058A	100	38	50	5000	.5-10000	-51 (-60)	121 (250)	YES	YES	STUD
3059A	100	72	50	3000	.5-8000	-51 (-60)	121 (250)	YES	YES	STUD
3063B	100	245	50	2000	0.1-5000	-51 (-60)	121 (250)	YES	YES	SCREW
3148D	100	66	50	3000	1-5000	-51 (-60)	121 (250)	YES	YES	STUD
3166B	100	225	50	3000	0.3-10000	-51 (-60)	121 (250)	YES	YES	SCREW
3166B1	500	225	10	3000	0.3-10000	-51 (-60)	121 (250)	YES	YES	SCREW
3176B	100	44	50	3000	0.3-10000	-51 (-60)	121 (250)	YES	YES	STUD
3176B1	100	44	50	3000	0.3-10000	-51 (-60)	121 (250)	YES	YES	STUD
3184E	100	107	50	3000	0.3-8000	-51 (-60)	121 (250)	YES	YES	STUD
3185D	100	55	50	3000	0.3-10000	-51 (-60)	121 (250)	YES	YES	STUD
3187D	500	108	10	3000	0.3-1000	-51 (-60)	121 (250)	YES	YES	STUD
3191A	5000	775	1	100	0.1-1000	-51 (-60)	121 (250)	YES	YES	STUD
3191A1	10000	775	0.5	100	0.1-1000	-51 (-60)	121 (250)	YES	YES	STUD
3192A	1000	190	5	100	.5-1000	-51 (-60)	121 (250)	YES	YES	STUD
3202A	100	160	50	3000	0.5-5000	-51 (-60)	121 (250)	YES	YES	SCREW
3202A1	500	160	10	1500	0.5-5000	-51 (-60)	121 (250)	YES	YES	SCREW
3202A2	100	160	50	3000	0.5-5000	-51 (-60)	121 (250)	YES	YES	SCREW
3202A3	500	160	10	1500	0.5-5000	-51 (-60)	121 (250)	YES	YES	SCREW

# VIBRATION SENSOR SPECIFICATIONS

## COMMON SPECIFICATIONS

**Supply Current Required:**  
2-20mA, constant

**Supply Voltage Required:**  
+18 to +30 VDC  $\Delta$

$\Delta$  Sensors will operate from 15 VDC compliance voltage with reduced F.S. range.  
Check factory for details.

**Seal:** Hermetic

**Case Material:**

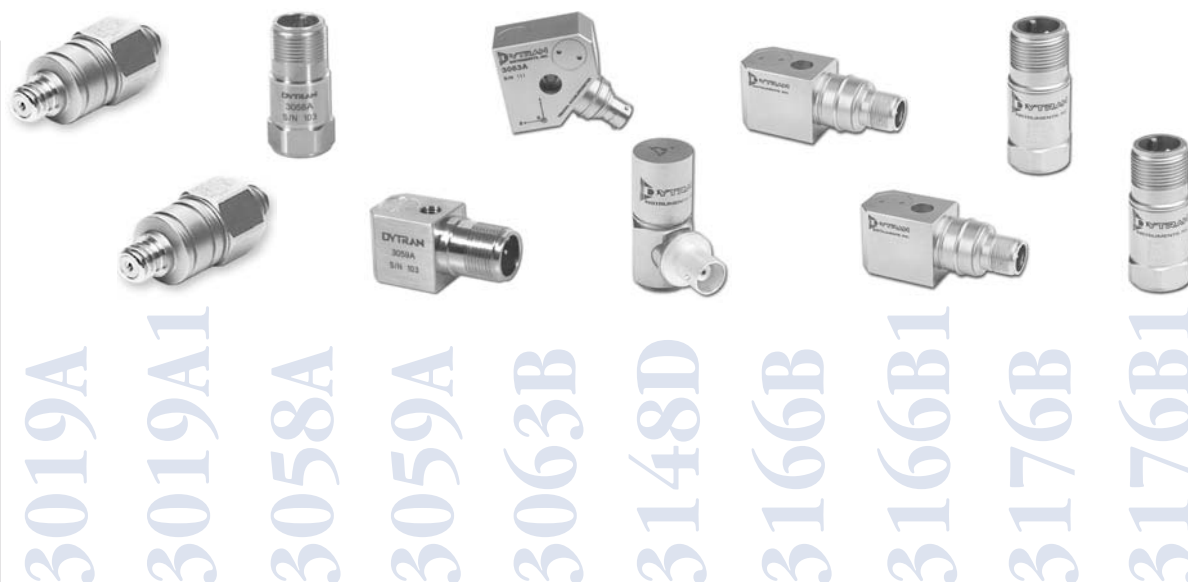
Stainless Steel

**Temp. Range**

-65 to +250°F

**Shock Overload Protection:**

All Models



MODEL	3019A	3019A1	3058A	3059A	3063B	3148D	3166B	3166B1	3176B	3176B1
<b>SENSITIVITY</b> (mV/g)	10( $\pm 5\%$ )	10( $\pm 5\%$ )	100( $\pm 5\%$ )	100( $\pm 5\%$ )	100( $\pm 5\%$ )	100( $\pm 5\%$ )	100( $\pm 5\%$ )	500( $\pm 5\%$ )	100( $\pm 5\%$ )	100( $\pm 5\%$ )
<b>FULL SCALE RANGE, G'S</b> (Full Scale = 5 Volts)	500	500	50	50	50	50	50	10	50	50
<b>FREQUENCY RANGE (Hz)</b>	1 - 10,000	1 - 10,000	.5 - 10,000	.5 - 8,000	.3 - 5,000	.4 - 8,000	.3 - 10,000	.3 - 1,000	.3 - 10,000	.3 - 10,000
<b>ELECTRICAL ISOLATION</b>	Base Isolation	Base Isolation	Case Isolation	Case Isolation	Case Isolation	Base Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation
<b>CONNECTOR</b>	10-32	10-32	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-26482 4-Pin	BNC	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin
<b>MOUNTING PROVISION</b>	1/4-28 Integral Stud	10-32 Integral Stud	1/4-28 Tapped Hole	1/4-28 Thru Hole	1/4-28 Cap Screw	10-32 Tapped Hole	1/4-28 Cap Screw	1/4-28 Cap Screw	10-32 Tapped Hole	1/4-28 Tapped Hole
<b>WEIGHT (Grams)</b>	8	8	38	72	245	66	225	230	44	44
<b>RECOMMENDED CABLE</b>	Any Cable with 10-32 Coaxial Connector	Any Cable with 10-32 Coaxial Connector	Group C Page 9	Group C Page 9	6428A	Group A Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9
<b>SUPPLIED ACCESSORIES</b>	N/A	N/A	6176 Stud	6184 Screw	6524 Stud	6200S Stud 6292 Cap	6523 Screw	6523 Screw	6200S Stud	6176 Stud
<b>IMMERSION PROOF BOOT</b> (optional, not supplied)	N/A	N/A	N/A	N/A	6529	N/A	6194	6194	N/A	N/A

\*Photos not to scale See page 10 for product dimensions.

FOR MORE INFORMATION, PLEASE CALL: 818.700.7818 • FAX: 818.700.7880 • WWW.DYTRAN.COM • E-MAIL: INFO@DYTRAN.COM



# VIBRATION SENSOR SPECIFICATIONS

## COMMON SPECIFICATIONS

**Supply Current Required:**

2-20mA, constant

**Supply Voltage Required:**

+18 to +30 VDC  $\Delta$

$\Delta$  Sensors will operate from 15 VDC compliance voltage with reduced F.S. range.  
Check factory for details.

**Seal:** Hermetic

**Case Material:**

Stainless Steel

**Temp. Range**

-65 to +250°F

**Shock Overload Protection:**

All Models



MODEL	3184E	3185D	3187D	3191A	3191A1	3192A	3202A	3202A1	3202A2	3202A3
<b>SENSITIVITY (mV/g)</b>	100( $\pm 5\%$ )	100( $\pm 5\%$ )	500( $\pm 5\%$ )	5V/g( $\pm 5\%$ )	10V/g( $\pm 5\%$ )	1V/g( $\pm 5\%$ )	100( $\pm 5\%$ )	500( $\pm 5\%$ )	100( $\pm 5\%$ )	500( $\pm 5\%$ )
<b>FULL SCALE RANGE, G'S</b> (Full Scale = 5 Volts)	50	50	10	1	1	5	50	10	50	10
<b>FREQUENCY RANGE (Hz)</b>	.4 - 8,000	.3 - 10,000	.3 - 1,000	.1 - 1,000	.1 - 1,000	.5 - 1,000	.5 - 5,000	.5 - 5,000	.5 - 5,000	.5 - 5,000
<b>ELECTRICAL ISOLATION</b>	Case Isolation	Base Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation	Case Isolation
<b>CONNECTOR</b>	MIL-C-5015 2-Pin	TNC	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin	MIL-C-5015 2-Pin
<b>MOUNTING PROVISION</b>	1/4-28 Tapped Hole	1/4-28 Tapped Hole	1/4-28 Tapped Hole	1/4-28 Tapped Hole	1/4-28 Tapped Hole	1/4-28 Tapped Hole	1/4-28 Thru Hole	1/4-28 Thru Hole	1/4-28 Thru Hole	1/4-28 Thru Hole
<b>WEIGHT (Grams)</b>	107	55	108	764	764	190	160	160	180	180
<b>RECOMMENDED CABLE</b>	Group C Page 9	Group B Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9	Group C Page 9
<b>SUPPLIED ACCESSORIES</b>	6176 Stud	6176 Stud	6176 Stud	6176 Stud	6176 Stud	6176 Stud	6523 Screw	6523 Screw	6523 Screw	6523 Screw
<b>IMMERSION PROOF BOOT</b> (optional, not supplied)	6194	6185	6194	6194	6194	N/A	N/A	N/A	6194	6194

\*Photos not to scale See page 10 for product dimensions.

# IMPULSE HAMMERS

## FOR USE WITH MULTICHANNEL SPECTRUM ANALYZERS

Impulse hammers are used as a means of excitation. For advanced dynamic analysis of machinery mounts, foundations, tanks, bridges, towers and other structures. The hammer is input to one channel of a spectrum analyzer and a response accelerometer is used on another. Cross channel measurements are performed by the analyzer to search for resonance frequencies, mode shapes and other dynamic characteristics of the structure under test. Contact the factory for recommendations.



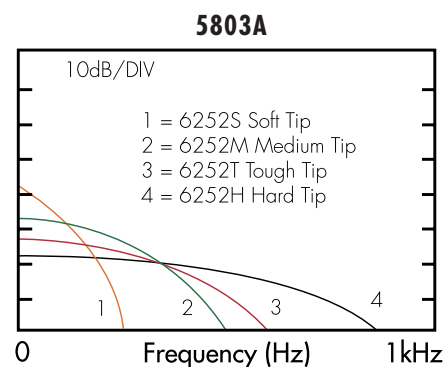
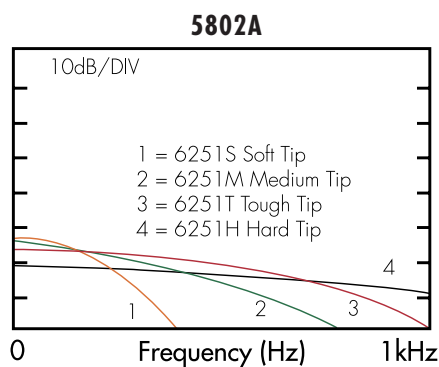
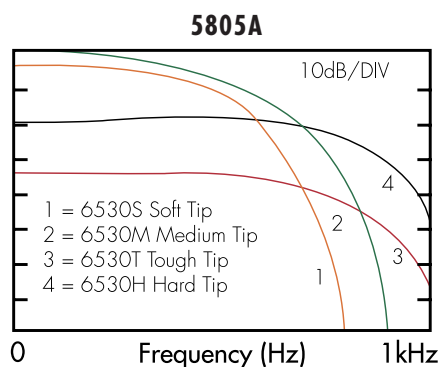
### SPECIFICATIONS

	5805A	5802A	5803A
Sensitivity	1mV/LbF	1mV/LbF	1mV/LbF
Force Range	5,000 LbF	5,000 LbF	5,000 LbF
Electrical Connector	BNC	BNC	BNC
Head Weight	1 Lb.	3 Lb.	12 Lb.
Overall Length	5"	10"	35"
Handle Material	Wood	Wood	Wood

### SUPPLIED ACCESSORIES

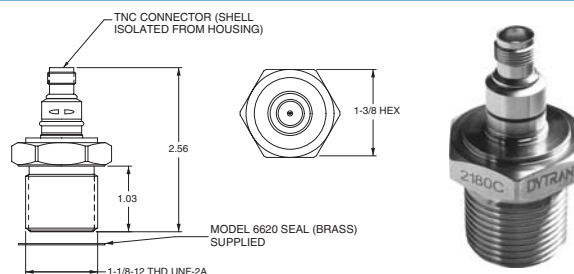
	5805A	5802A	5803A
Hard Face	6530H	6251H	6252H
Tough Face	6530T	6251T	6252T
Medium Face	6530M	6251M	6252M
Soft Face	6252S	6251S	6252S
Case	6319	6305	6306

### PERFORMANCE SPECTRA



## HIGH INTENSITY ACOUSTIC SENSOR

MODEL	2180C
Nominal Sensitivity (pC/psi)	-500
Full Scale Range psi (dB)	10 (191)
Maximum Pressure psi (dB)	600 (226)
Weight (grams)	157
Temperature Range (°F)	-60 to +500
Application	turbine combustor dynamics



## MODEL 4177 VIBRATION METER - Acceleration, Velocity and Displacement

A simple battery operated vibration meter with selectable readout in peak g's, peak In/Sec or peak to peak Mil's. Accepts inputs from 100mV/g sensors. LCD readout displays three full-scale ranges for each of the three parameters: 1, 10 & 100 with a 100 mV/g sensor. The power is provided by a 7.2 Volt rechargeable NI-CAD battery.

### FEATURES:

- Sensor Circuit Checkout Lights
- Battery Test
- BNC Output Jack
- Case Size: (L x W x H) 7" x 4.5" x 1.5"
- Weight: 1 Lb.
- Overload Indicator
- Battery Charger Supplied
- Recommended System: 3148D Accelerometer, 6190 Magnet, 6436A05 Cable



## FIXED FREQUENCY PORTABLE SHAKER - Model 5350

The Model 5350 Fixed Frequency Portable Shaker is a field portable vibration transducer tester for verifying the performance of vibration transducers and cables, as well as for checking the functionality and accuracy of a measurement loop.

The User selects Acceleration, Velocity or Displacement in English or Metric units. The vibration frequency is fixed, yet amplitude is adjustable. A built-in reference accelerometer and digital indicator allow precise test level setting.

### FEATURES:

- Built-in NIST traceable reference accelerometer
- Portable, battery powered
- Digital display of Acceleration, Velocity or Displacement
- Adjustable test level



## JUNCTION BOXES - 6 or 12 Channel

Non-powered junction boxes allow remotely mounted sensors to be routed to a safe, convenient location. Speeds data collection and saves route time by centralizing measurement locations. NEMA 4 enclosure resists moisture penetration. Data collector provides power to sensor as the rotary switch in the junction box is turned. Installs with 4 bolt pattern.

- 6 Channel: Model 4206, BNC output jack
- 12 Channel: Model 4212, BNC output jack



## CABLE TERMINATION BOXES - 1, 2, 3 or 4 Channel

These non-powered Nema 4X cable termination boxes allow one, two, three or four accelerometer channels to be conveniently routed to a centralized location. The BNC outputs with protective caps promote hassle free data collection. Inputs are provided with moisture resistant cord grips for sturdy cable strain relief. Input cables are electrically connected via a convenient terminal strip located inside the box. Installs with four bolt mounting pattern. Box dimensions: 2" x 4" x 1.5".

- 1 Channel: Model 4301, BNC output jacks
- 2 Channel: Model 4302, BNC output jacks
- 3 Channel: Model 4303, BNC output jacks
- 4 Channel: Model 4304, BNC output jacks





# ACCESSORIES

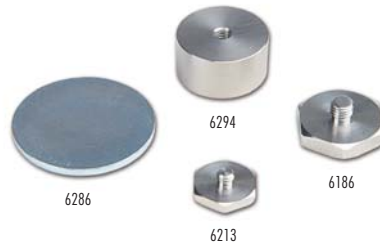
## MAGNETS



Rare earth magnets provide unsurpassed pull strength. Two pole configurations assure a steady grip on curved surfaces. Flat magnets are for use on flat surfaces for high frequency response. Use caution when applying to ferromagnetic surfaces as excessive metal to metal shock can damage unprotected accelerometers.

- 6187** 2-Pole, 1.5" dia. x 1.5" tall, 1/4-28 mtg. hole
- 6190** 2-Pole, 1.25" dia. x .90 tall, 1/4-28 mtg. hole
- 6196** Flat, 3/4" hex x .250 thick, 10-32 mtg. stud
- 6537** Flat, 7/8" hex x .190 thick, 10-32 mtg. stud
- 6540** Flat, .950 dia. x .420 thick, 1/4-28 mtg. stud

## ADHESIVE PADS



Mounting pads assure that data is taken at the same location each time on a properly prepared surface. Pads should be used whenever drilling and tapping a mounting hole in the monitoring target is prohibited.

- 6186** Adhesive pad, 1/4-28 integral thread, 7/8" hex, for 3184E, 3185D, 3187D
- 6213** Adhesive pad, 10-32 integral thread, 5/8" hex, for 3148D
- 6294** Adhesive pad, 1/4-28 tapped hole, for 3166B, A1, 3063B
- 6286** Adhesive mounting plate for magnets, provides flat surface, repeatable data

## SILICONE GREASE



Seals Immersion Proof™ Boots against moisture and lubricates cable during installation. Always apply under Immersion Proof™ Boot to repel moisture. Lubricate the cable behind Immersion Proof™ Boots prior to sliding the boot off the accelerometer during removal.

- 6188** Dow Corning DC 111, water repellent, electrically insulating

## MOUNTING STUDS / SCREWS



Precision machined mounting hardware in corrosion resistant 316L stainless steel. The correct mounting hardware assures proper installation for the best performance results. Custom mounting hardware is available, check factory for details.

- 6176** 1/4-28 to 1/4-28, stainless, shouldered, for 3185D, 3184E, 3187D
- 6200S** 10-32 to 10-32 stainless, shouldered
- 6201S** 10-32 to 1/4-28, stainless. Interfaces 1/4-28 and 10-32 tapped holes.
- 6264S** 10-32 internal X 1/4-28 external. Converts 1/4-28 tapped hole to 10-32 tapped hole
- 6523** 1/4-28 socket head cap screw, 3166B/B1
- 6524** 1/4-28 socket head cap screw, 3063B Triax

## IMMERSION PROOF™ AND PROTECTIVE BOOTS



Sealing cable connections is critical to long term operation of on-line vibration sensors. Immersion Proof™ Boots offer "underwater" sealing technology at an affordable price. Recommended whenever sensors are permanently installed in wet conditions or outdoors.

- 6185** Immersion Proof™ Boot for 3185D
- 6194** Immersion Proof™ Boot for 3184E, 3166B, 3166B1, 3191A, 3187D
- 6292** Rubber cap for 3148D, offers mechanical and thermal protection
- 6529** Immersion Proof™ Boot for 3063B



Cables are available in any length desired. The series No. indicates the connectors and cable type used in the assembly. The length of the cable is added to the series number after the letter "A". The combination of the series No. and length constitute the Model number. No dashes or spaces are needed between the series number and length. Example: Model 6088A25 is a 6088A series cable, 25 feet long. A description of the cable used in each assembly is given in the "Cable Types" table, below. Immersion Proof™ boots must be installed prior to installing the connector. If you plan to use Immersion Proof™ boots, simply replace the "A" in the model number with a "B", signifying "Booted."



## GROUP A - For Models with BNC Connectors

SERIES NO.	CONN. 'A'	CABLE TYPE	CONN. 'B'
6020A	BNC	Type 5, Coaxial, PVC Jacket	BNC
6088A	BNC	Type 1, Two Conductor, Polyurethane Jacket	Cutoff
6089A	BNC	Type 3, Coaxial, RG174, PVC Jacket	BNC
6094A	BNC	Type 5, Coaxial, PVC Jacket	Cutoff
6098A	BNC	Type 2, Coaxial, Tefzel Jacket	Cutoff
6409A	BNC	Type 4, Two Conductor, Tefzel Jacket	Cutoff



## GROUP B - For Models with BNC Connectors

SERIES NO.	CONN. 'A'	CABLE TYPE	CONN. 'B'
6086A	TNC	Type 2, Coaxial, Tefzel Jacket	BNC
6087A	TNC	Type 4, Two Conductor, Tefzel Jacket	Cutoff
6090A	TNC	Type 1, Two Conductor, Polyurethane Jacket	Cutoff
6091A	TNC	Type 5, Coaxial, PVC Jacket	BNC
6404A	TNC	Type 5, Coaxial, PVC Jacket	Cutoff
6405A	TNC	Type 2, Coaxial, Tefzel Jacket	Cutoff
6410A	TNC	Type 3, Coaxial, RG174, PVC Jacket	BNC

## 6428AXX CABLE Cable Assembly for 3063A Triaxial Accelerometer

Model 6428A converts a 4-pin military connector to (3) BNC plugs. This assembly is also available with Immersion Proof™ boot as a "B" version. Example: 6428BXX (XX = length, in feet). Check factory for details on cable type and lengths allowable.



## GROUP C - For Models with MIL-C-5015

SERIES NO.	CONN. 'A'	CABLE TYPE	CONN. 'B'
6038A	10SL-4S	Type 5, Coaxial, PVC Jacket	BNC
6080A	10SL-4S	Type 1, Two Conductor, Polyurethane Jacket	Cutoff
6082A	10SL-4S	Type 1, Two Conductor, Polyurethane Jacket	BNC
6406A	10SL-4S	Type 4, Two Conductor, Tefzel Jacket	Cutoff
6407A	10SL-4S	Type 4, Two Conductor, Tefzel Jacket	BNC

## CABLE TYPES

### TYPE 1

Two conductor, polyurethane jacket, .200 diameter. For general purpose low cost two conductor termination to junction panels or terminal strips. Shield left floating at sensor end; not used when terminated with coaxial connector. Not for use in corrosive environments.



### TYPE 2

Coaxial, Tefzel jacket, .200 diameter. Highly resistant Teflon jacket for use in long term monitoring programs where corrosive substances will attack polyurethane cable jackets. Tefzel cable is not as flexible, but is extremely durable.



### TYPE 3

Coaxial, RG174, PVC jacket, .110 diameter. Small diameter cable provides added protection when used with magnetically mounted sensor. Cable will "break away" if sensor or cable is caught in rotating machinery. Not for use with Immersion Proof™ boots.



### TYPE 4

Two conductor, Tefzel jacket, .200 diameter. For two conductor termination to junction panels or terminal strips. Shield left floating at sensor end; not used when terminated with coaxial connector. For use where corrosive substances will attack polyurethane.

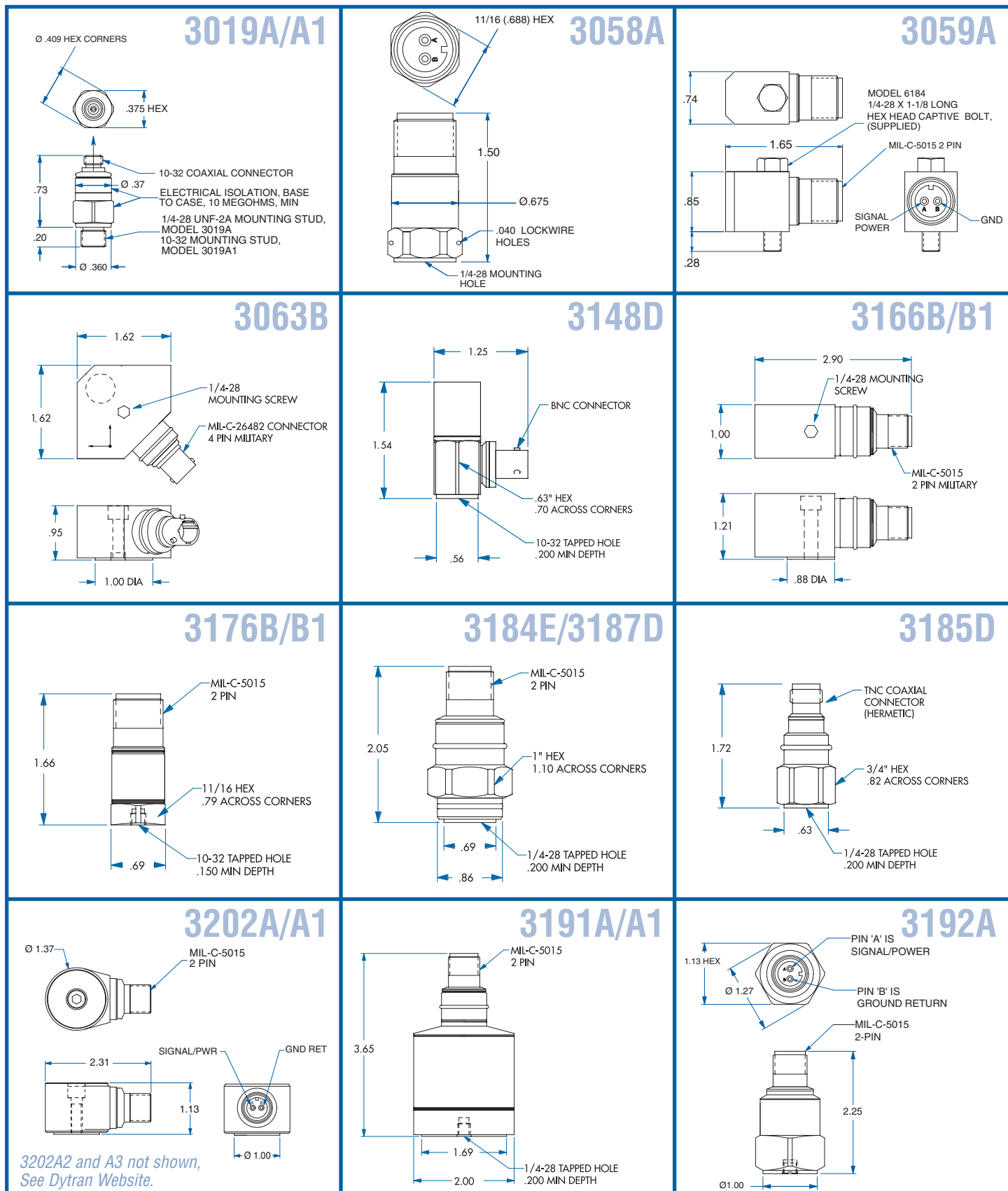


### TYPE 5

Coaxial, RG58A/U, PVC jacket, .200 diameter. Low cost coaxial cable for general purpose installation in ambient, non-corrosive environments.



# SENSOR DRAWINGS



## **WARRANTY**

Dytran products are warranted against defects in materials and workmanship for a period of one year after delivery. Dytran, at its option, will repair or replace products which prove to be defective.

Please contact the factory by phone or FAX for authorization prior to returning any product for repair or calibration.

## **ORDERING INFORMATION**

### **WHERE TO ORDER**

You may place your order directly with the factory, or through any authorized Dytran representative in the U.S. or abroad. Contact the factory for assistance in locating your local representative.

### **METHODS OF PAYMENT**

#### **OPEN ACCOUNTS**

Terms of Net 30 Days are given to industrial customers with qualifying Dunn & Bradstreet ratings, Government Agencies, Educational Institutions and to qualifying firms after approval of credit. Favorable terms for early payment are negotiated.

#### **CREDIT CARD**

Dytran accepts Visa, Mastercard, and American Express.



### **SERVICE**

#### **NON-CATALOGED ITEMS**

This catalog lists standard products only. Contact our Sales Department for information on modified or special products.

#### **BIDS**

We will gladly process all written Requests For Quote, Requests For Proposal, or Bid Requests.

#### **SCHEDULED ORDERS**

Orders may be scheduled for delivery over a 1-year period or as negotiated.

#### **SAMPLES**

Demonstration samples are available on request.

#### **PRICES**

Price lists are available on request. Prices are subject to change without notice.

#### **MINIMUM ORDERS**

A minimum order of \$50.00 is required.

### **TERMS AND CONDITIONS**

#### **SHIPPING CHARGES**

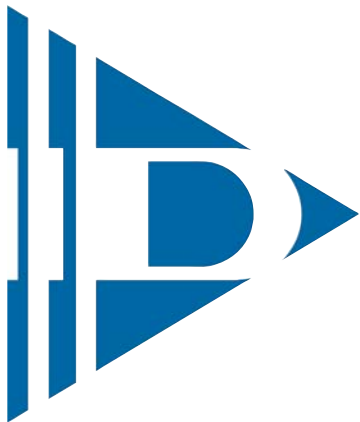
All orders are shipped FOB shipping point (factory). Shipping charges are prepaid and added to the invoice, unless otherwise specified. Drop-ship service is available. Please indicate preferred carrier when placing your order.

#### **RETURNS**

Contact our Service Department for return authorization prior to returning any items for calibration, repair or exchange.

Dytran Products are MADE IN THE USA





*Machinery  
maintenance  
through  
precision  
measurement*



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Catalog 204

