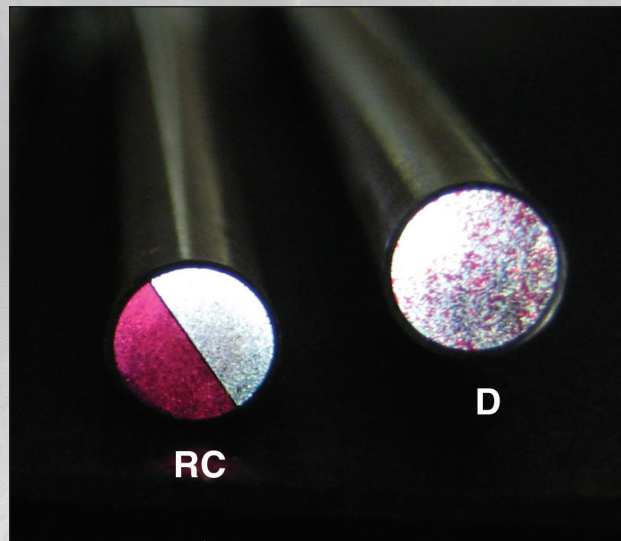# *Fiber Optic* Displacement Sensors

PRODUCT CATALOG
Jan 2025

PHILTEC®

Foreward

Philtec has been providing innovative fiber optic displacement sensing solutions since 1988. Ranges of operation are from 0.76 to 76 mm.

The product line includes:

- 11 Reflectance Dependent (**D Models)** for Single Axis Motion
- 12 Reflectance Compensated (**RC Models**) for Multi Axis Motion

The product line includes:

- Sensors with Analog Voltage Output
- Sensors with Digital Output, USB and RS232
- Dual Channel Digital Sensors
- WiFi Sensors
- Turbine Casing Roundness Measurement Systems

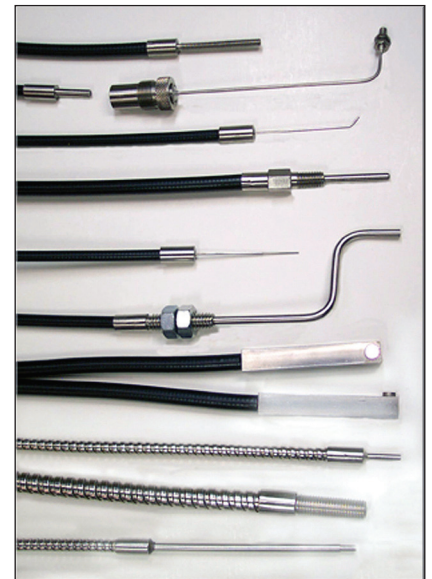**Standard** sensor units include:

- The Signal Processing Enclosure
- A One Meter Long Integral FO Cable
- The Basic Probe Tip Shown in the Product Data Sheets

We Customize

Custom tips and cables are often required in special environments such as vacuum, high pressure and cryogenic fluids. Dozens of options are available for customizing the sensor component parts including:

- The Electronics
- FO Cable Lengths and Jacket Materials
- Connectors and Vacuum Passthru Hardware
- Probe Shapes and Materials

ANALOG SENSORS
with VOLTAGE OUTPUT

Standard single channel units include amplifier and sensor tip with 914 mm (3 Feet) long fiberoptic cable, require +12 VDC input power, and provide 0 to +5 volt analog output with DC - 20 KHz bandwidth.

D MODELS *REFLECTANCE DEPENDENT*		
MODEL	Operating Range	
	mm	mINCH
D20	1.25	50
D21	2	80
D47	5	200
D63	3	120
D64	6	240
D100	10	400
D125	15	600
D169	20	750
D170	30	1200
D171	50	2000
D240	76	3000

140 x 82 x 48 mm Enclosure
With Barrier Terminal Block for
Input Power and Output Signal

RC MODELS *REFLECTANCE COMPENSATED*		
MODEL	Operating Range	
	mm	mINCH
RC19	0.76	30
RC20	1.65	65
RC25	0.76	30
RC31	1	40
RC32	2	80
RC59	2	80
RC60	3.2	125
RC100	5.1	200
RC125	9	350
RC171	12.7	500
RC225	25	1000
RC290	41	1600

DIGITAL SENSORS
DISTANCE OUTPUT via RS232

mDMS sensors use RS232 communication with 5,000 samples/sec maximum data rate. The standard fiberoptic cable is 914 mm (3 Feet). All units include Philtec DMS Control Software for Sensor Setup and Data Collection.

D MODELS *REFLECTANCE DEPENDENT*		
MODEL	Operating Range	
	mm	mINCH
mDMS-D20	1.3	50
mDMS-D21	2	80
mDMS-D47	6	200
mDMS-D63	3	120
mDMS-D64	6	240
mDMS-D100	10	400
mDMS-D125	15	600
mDMS-D169	19	750
mDMS-D170	30	1200
mDMS-D171	50	2000
mDMS-D240	76	3000

140 x 61 x 33 mm enclosure
Includes:
· Universal AC/DC Power Adaptor
· Y Cable Adaptor for power input and signal output
· RS232 Cable
· RS232 to USB Adapter
· DMS Control Software

RC MODELS *REFLECTANCE COMPENSATED*		
MODEL	Operating Range	
	mm	mINCH
mDMS-RC19	0.76	30
mDMS-RC20	1.5	65
mDMS-RC25		
mDMS-RC31	1	40
mDMS-RC32	2	80
mDMS-RC59	2	80
mDMS-RC60	3.2	125
mDMS-RC100	5	200
mDMS-RC125	9	350
mDMS-RC171	12.7	500
mDMS-RC225	25	1000
mDMS-RC290	41	1600

DIGITAL SENSORS
DISTANCE OUTPUT via USB

muDMS sensors use USB communication with 5,000 samples/sec maximum data rate. The standard fiberoptic cable is 914 mm (3 Feet). All units include Philtec DMS Control Software for Sensor Setup and Data Collection.

D MODELS REFLECTANCE DEPENDENT		
MODEL	Operating Range	
	mm	mINCH
muDMS-D20	1.25	50
muDMS-D21	2	80
muDMS-D47	5	200
muDMS-D63	3	120
muDMS-D64	6	240
muDMS-D100	10	400
muDMS-D125	15	600
muDMS-D169	19	750
muDMS-D170	30	1200
muDMS-D171	50	2000
muDMS-D240	76	3000

mu2DMS-RC20

140 x 82 x 48 mm enclosure
Includes:
· Universal AC/DC Power Adaptor
· mini-USB to standard USB adapter cable
· DMS Control Software

RC MODELS REFLECTANCE COMPENSATED		
MODEL	Operating Range	
	mm	mINCH
muDMS-RC19	0.76	30
muDMS-RC20	1.65	65
muDMS-RC25	0.76	30
muDMS-RC31	1	40
muDMS-RC32	2	80
muDMS-RC59	2	80
muDMS-RC60	4	125
muDMS-RC100	5	200
muDMS-RC125	9	350
muDMS-RC171	12.7	500
muDMS-RC225	25	1000
muDMS-RC290	41	1600

DIGITAL SENSORS
DUAL CHANNEL UNITS

Two independent sensor channels in one enclosure. Can be any two D Models or any two RC models. D and RC models can not be combined in a two-channel enclosure. Includes both USB and RS232 outputs.

D MODELS REFLECTANCE DEPENDENT		
MODEL	Operating Range	
	mm	mINCH
mu2DMS-D20	1.25	50
mu2DMS-D21	2	80
mu2DMS-D47	5	200
mu2DMS-D63	3	120
mu2DMS-D64	6	240
mu2DMS-D100	10	400
mu2DMS-D125	15	600
mu2DMS-D169	19	750
mu2DMS-D170	30	1200
mu2DMS-D171	50	2000
mu2DMS-D240	75	3000

178 x 102 x 57 mm Enclosure
Includes:
· Universal AC/DC Power Adaptor
· USB Cable
· RS232 Cable
· Control Software

RC MODELS REFLECTANCE COMPENSATED		
MODEL	Operating Range	
	mm	mINCH
mu2DMS-RC19	0.76	30
mu2DMS-RC20	1.65	65
mu2DMS-RC25	0.76	30
mu2DMS-RC31	1	40
mu2DMS-RC32	2	80
mu2DMS-RC59	2	80
mu2DMS-RC60	3.2	125
mu2DMS-RC100	5	200
mu2DMS-RC125	9	350
mu2DMS-RC171	12.7	500
mu2DMS-RC225	25	1000
mu2DMS-RC290	40	1600

WiFi SENSORS

WIFI DISPLACEMENT SENSORS include:
- Non-Contact Fiber Optic Displacement Probe
- Sensor Gap Module with Replaceable Battery, Angle Sensor and WiFi Radio

D MODELS *REFLECTANCE DEPENDENT*		
MODEL	Operating Range	
	mm	mINCH
wDMS-D20	1	40
wDMS-D21	2	80
wDMS-D47	1.25	50
wDMS-D63	2	80
wDMS-D64	5	200
wDMS-D100	3	120
wDMS-D125	6	240
wDMS-D169	10	400
wDMS-D170	15	600
wDMS-D171	20	750

114 x 63 x 28 mm Enclosure x 2.5 Kg

RC MODELS *REFLECTANCE COMPENSATED*		
MODEL	Operating Range	
	mm	mINCH
wDMS-RC19	0.76	30
wDMS-RC20	1.65	65
wDMS-RC25	0.76	30
wDMS-RC32	2	80
wDMS-RC59	2	80
wDMS-RC60	4	125
wDMS-RC100	5.1	200
wDMS-RC125	9	350
wDMS-RC171	12.7	500

Specifications

- USB @ 500ma
- Time To Charge: 4 Hours
- Run Time: 10 Hours w/full charge
- Standby Mode: 2 Weeks
- Run Time: 3 Hours After 2 weeks Standby
- Max. Data Rate = 32,000 Samples/Second
- Philtec DMS Control Software enables sensor operation & data collection
- Battery Module Packaged in 114 x 64 x 31 mm ABS Plastic enclosure.

Angle Measurement

The orientation angle of the Sensor Module is measured with 0.1° resolution, where 0.0° is at the 12 o'clock position as shown here.

Sensor Module at 0°

MULTI-CHANNEL SYSTEMS
- Non-Contact Fiberoptic Gap Probe
- Gap Sensor Module/Battery Pack
- WiFi Access Point Module
- USB Charging Station
- USB Power Pack
- Windows Tablet with Preinstalled Control Software

ROUNDNESS MEASUREMENT SYSTEMS

WiFi Non-contact GAP & ANGLE MEASURES

DESCRIPTION

The CMS 4000 series are WiFi instrumentation systems for non-contact measurement of clearance and roundness in large gas turbine casings. The systems include:

- 20 mm Range Fiberoptic Gap Measuring Probes
- Module with WiFi, Battery and Sensor Electronics for Gap and Angle Measures
- 8" Ultra Rugged Windows Tablet Preloaded with Philtec's WDMS Control Software
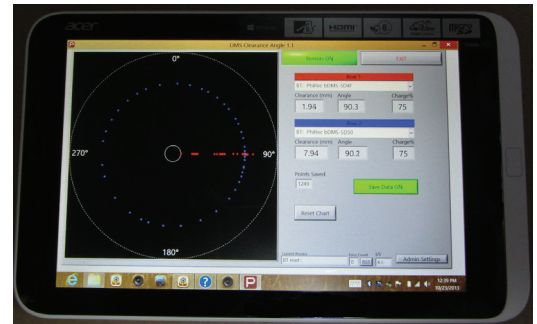
**Tablet for Display
and Data Collection**

114 x 63 x 28 mm Enclosure
x 2.5 Kg

OPERATION

The Gap Probe and Sensor Module are mounted on adjacent turbine blades at four locations on the rotor (on 2 blade rows at each end). The rotor is slowly turned 360° as the tablet records the blade tip-to-casing clearance variations. Eccentricities and ovalizations are measured with these systems that digitally capture the full 360° map of casing roundness and gap data. Using the Quad System, data is collected from four rows of blades simultaneously.

Note: *The end user provides all the means for mounting and fixturing the CMS components to the tur-*

MODEL	# channels
CMS 4100	Single (1)
CMS 4200	Dual (2)
CMS 4400	Quad (4)

SENSOR OPTIONS

FOR ANALOG MODELS	FOR DIGITAL MODELS	OPTION CODE	FEATURE
√	N/A	A1	PROVIDES TEMPERATURE STABILIZED ELECTRONICS FOR LOW DRIFT & HIGH ACCURACY
N/A	√	A2	PROVIDES LOW SPEED ANALOG OUTPUTS FOR muDMS SENSORS
√	√	B	CONNECTORIZES SENSOR SYSTEM WITH FINGER TIGHT IN-LINE CONNECTOR. (RC19, RC20 n/a) *OPTION B IS ALSO REQUIRED FOR USE WITH VACUUM PASSTHRU FLANGES & ASSEMBLIES BV2, BV3, BV4, BVF*
√	√	Bw	CONNECTORIZES SENSOR SYSTEM WITH WRENCH TIGHT IN-LINE CONNECTOR. (RC19, RC20 n/a)
√	√	2B	CONNECTORIZES SENSOR SYSTEM WITH TWO IN-LINE CONNECTORS. *NOT AVAILABLE FOR ALL MODELS*
√	√	3B	CONNECTORIZES SENSOR SYSTEM WITH THREE CONNECTORS. *NOT AVAILABLE FOR ALL MODELS*
√	√	B1	CONNECTORIZES SENSOR SYSTEM WITH BULKHEAD CONNECTOR (RC19, RC20 n/a)
√	√	Bv1	CONNECTORIZES SENSOR SYSTEM WITH SINGLE CHANNEL VACUUM PASSTHRU HARDWARE FOR 10 E-7 TORR. INCLUDES ULTRA-TORR COMPRESSION FITTING (RC19, RC20 n/a)
√	√	Bv1-C133	SAME AS Bv1 WITH Ø 1.33" MINI-CF FLANGE FOR BULKHEAD MOUNTING
√	√	Bv1-C275	SAME AS Bv1 WITH Ø 2.75" CF FLANGE FOR BULKHEAD MOUNTING
√	√	Bv1-K25	SAME AS Bv1 WITH KF25 FLANGE FOR BULKHEAD MOUNTING
√	√	Bv1-K50	SAME AS Bv1 WITH KF50 FLANGE FOR BULKHEAD MOUNTING
√	√	Bv2	2 PORT SINGLE CHANNEL VACUUM PASSTHRU FLANGE FOR D MODELS UP TO 10 E-11 TORR, Ø 2.75" CF (D6 n/a) *ALSO REQUIRES OPTION B*
√	√	Bv3	3 PORT SINGLE CHANNEL VACUUM PASSTHRU FLANGE FOR RC MODELS FOR 10 E-11 TORR , Ø 3.375 CF (RC19, RC20 n/a), *ALSO REQUIRES OPTION B*
√	√	Bv4	4 PORT DUAL CHANNEL VACUUM PASSTHRU FLANGE FOR TWO D MODELS UP TO 10 E-11 TORR, Ø 3.375 CF (D6 n/a) *ALSO REQUIRES OPTION B*
√	√	BvF	MULTI-CHANNEL VACUUM PASSTHRU ASSEMBLY FOR 10 E-7 TORR. Ø 6" CF OR ISO-100 K FLANGE, CAN HAVE 8 D TYPE OR 5 RC TYPE SENSORS. (RC19 & RC20 n/a) *ALSO REQUIRES OPTION B*
√	√	--	STANDARD JACKET: PVC/MONOCOIL - PVC OVER A STEEL HELICAL WINDING. GOOD FLEXIBILITY, SEMI-CRUSH-PROOF, LIQUID-TIGHT, NOT VACUUM NOR MRI COMPATIBLE. GOOD TO 105C.
√	√	C1	JACKET: INTERLOCKING STAINLESS STEEL - FLEXIBLE, CRUSH PROOF, NOT LIQUID TIGHT.
√	√	C2	JACKET: SILICONE-FIBERGLASS OVER STEEL MONOCOIL - FLEXIBLE, SEMI-CRUSH-PROOF. EXCELLENT FLEX LIFE AND RESISTANCE TO FATIGUE, RADIATION RESISTANT. GOOD TO 220C,
√	√	C3	JACKET: SILICONE-FIBERGLASS ONLY - FLEXIBLE, NOT CRUSH-PROOF. EXCELLENT FLEX LIFE AND RESISTANCE TO FATIGUE, RADIATION RESISTANT. GOOD TO 220C,
√	√	C5	JACKET: PVC/SS INTERLOCK - EXCELLENT PLIABILITY, RESISTS LATERAL PRESSURE, TWISTING AND PULLING. DOES NOT STRETCH, WITHSTANDS REPEATED BENDING, GOOD TO 105C,
√	√	C6	JACKET: CONVOLUTED PTFE - SEMI-CRUSH-PROOF, VERY FLEXIBLE, VAPOR BARRIER, EMF & MRI COMPATIBLE. GOOD TO 260C.
√	√	C7	JACKET: PTFE TUBING - MRI & EMF COMPATIBLE, VAPOR BARRIER, POOR FLEXIBILITY. GOOD TO 260C.
√	√	C8	JACKET: PVC - VERY FLEXIBLE, NOT CRUSH-PROOF, LIQUID-TIGHT, EMF & MRI COMPATIBLE. GOOD TO 105C.
√	√	C9	JACKET: ANNEALED (semi-rigid) STAINLESS STEEL TUBING. LIQUID TIGHT. GOOD TO 350C.
√	√	C11	JACKET: POLYOLEFIN SHRINK TUBING - THIN WALL MOISTURE / VAPOR BARRIER, NOT CRUSH-PROOF, POOR FLEXIBILITY. GOOD TO 150C.
√	√	C12	JACKET: POLYOLEFIN OVER SS INTERLOK - THIN WALL MOISTURE / VAPOR BARRIER, CRUSH-PROOF, FLEXIBLE. GOOD TO 150C.
√	√	C13	JACKET: FURCATION TUBING- PVC / KEVLAR / PTFE. HIGH TENSILE STRENGTH FOR SENSORS < Ø2 MM. GOOD TO 85°C.
√	√	C14	JACKET: BRAIDED SS over PTFE. VERY POOR FLEXIBILITY, LIQUID TIGHT, GOOD FOR HIGH PRESSURE AND 200°C
√	√	E1	EXTRA LENGTH OF FIBEROPTIC CABLE, models D20 - D64 and RC19 - RC64
√	√	E2	EXTRA LENGTH OF FIBEROPTIC CABLE, models D100 - D171 and RC100 - RC225
√	√	E3	EXTRA LENGTH OF FIBEROPTIC CABLE, models D240 and RC290
√	√	Fv1	LOW VACUUM PASSTHRU FOR 10 E-4 TORR. PROVIDES Ø 0.375" X 3"L SOLID SECTION ON FO CABLE, COMPRESSION FITTING, AND STAINLESS STEEL INTERLOK SHEATHING ON VACUUM SIDE
√	√	Fv2	LOW VACUUM PASSTHRU, SAME AS Fv1, PROVIDES Ø 0.250" X 3"L SOLID SECTION ON FO CABLE
√	√	Fv3	LOW VACUUM PASSTHRU, SAME AS Fv1, PROVIDES Ø 0.500" X 3"L SOLID SECTION ON FO CABLE

SENSOR OPTIONS

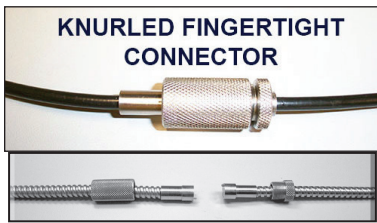| FOR ANALOG MODELS	FOR DIGITAL MODELS	OPTION CODE	FEATURE
√	N/A	G1	ADDITIONAL OUTPUT, DC COUPLED WITH 10x GAIN and ADJUSTABLE DC OFFSET
√	N/A	G2	ADDITIONAL OUTPUT, AC COUPLED WITH 10x GAIN
√	N/A	G3	ADDITIONAL OUTPUT, BINARY TTL OUTPUT 0/5 VOLTS
√	N/A	H1	HIGH FREQUENCY AMPLIFIER FOR D MODELS UP TO 200 KHZ BANDWIDTH
√	N/A	H2	HIGH FREQUENCY AMPLIFIER FOR D MODELS ABOVE 200 KHZ TO 1 MHZ BANDWIDTH
√	N/A	H3	HIGH FREQUENCY AMPLIFIER FOR RC MODELS UP TO 350 KHZ BANDWIDTH
√	N/A	+H1	ADDITIONAL OUTPUT FOR D MODELS WITH BANDWIDTHS UP TO 200 KHZ
√	N/A	+H2	ADDITIONAL OUTPUT FOR D MODELS WITH BANDWIDTHS EXCEEDING 200 KHz UP TO 1 MHZ
√	N/A	+H3	ADDITIONAL OUTPUT FOR RC MODELS WITH BANDWIDTHS UP TO 350 KHZ
√	N/A	L	LOW FREQUENCY AMPLIFIER (< 20 KHz), 100 Hz STD
√	N/A	+L	ADDITIONAL OUTPUT WITH LOW FREQUENCY BANDWIDTH (< 20 KHz), 100 Hz STD
√	N/A	M	DIGITAL DISPLAY - DC VOLTS
√	N/A	N	LOW NOISE AMPLIFIER (RC sensors only)
√	N/A	O	ADJUSTABLE DC OFFSET
√	N/A	P	POLYNOMIAL CURVE FIT TO SPECIFIED CALCULATION RANGE
√	√	Q	CONNECTORIZED AC/DC POWER ADAPTOR AND BNC OUTPUT
√	√	Q2	CONNECTORIZED AC/DC POWER ADAPTOR AND BNC OUTPUT FOR TWO SENSORS
√	√	Q4	CONNECTORIZED AC/DC POWER ADAPTOR AND BNC OUTPUT FOR FOUR SENSORS
√	√	R1	AMBIENT LIGHT REJECTION AT 850 ±22 .5 nm
√	√	R2	BLUE LIGHT SENSOR, 470 nm
√	√	---	STANDARD STRAIGHT TIP: 200°C CONTINUOUS, 300°C INTERMITTENT
√	√	T1	TIP: STRAIGHT, CUSTOMIZED
√	√	T2	TIP: THREADED STANDARD SIZE. PLEASE RFQ FOR NON-STANDARD THREADS
√	√	T3	TIP: NON-METALLIC , (TORLON OR PEEK)
√	√	T4	TIP: 90° TUBING
√	√	T5	TIP: 90° SQUARE BODY, UNTHREADED END
√	√	T6	TIP: 90° SQUARE BODY, THREADED END
√	√	T7	TIP: MADE TO CUSTOMER SPECIFICATIONS
√	√	T8	TIP: HIGH TEMPERATURE, 250°C CONTINUOUS, 300°C INTERMITTENT
√	√	T9	TIP: HIGH TEMPERATURE, 350°C CONTINUOUS, 400°C INTERMITTENT
√	√	T10	TIP: HIGH TEMPERATURE, 900°F NO EPOXY, MECHANICALLY BONDED FIBERS
√	√	T10F	TIP: HIGH TEMPERATURE, 800°C FUSED-END QUARTZ FIBER (END FACE ONLY)
√	√	T11	TIP: NON-MAGNETIC (BRASS OR ALUMINUM)
√	√	T12	TIP: INVAR (LOW EXPANSION COEFFICIENT)
√	N/A	V	PROVIDES SENSOR AMPLIFIER WITH 0 - 10 VOLT OUTPUT
√	√	W	WINDOW: RECESSED SAPPHIRE EPOXIED INTO TIP FOR HIGH PRESSURE OR VACUUM
√	√	Wb	WINDOW: SAPPHIRE BRAZED TO SENSOR TIP FOR HIGH PRESSURE OR VACUUM please contact the factory

CONNECTORS FOR FIBEROPTIC CABLES

Connectors offer several advantages such as:
- Easy replacement of damaged tips
- Substitution of alternate tips
- Disconnect from sensor electronics
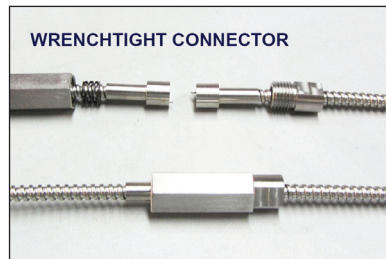- Longer cable lengths

Sensors are available with three types of connectors:
- Option B or Bw ... in-line connectors
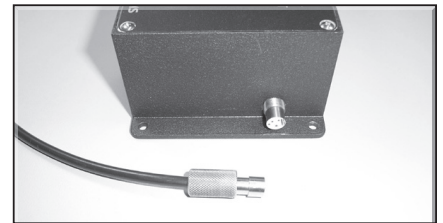- Option B1 ... bulkhead mounted connectors.

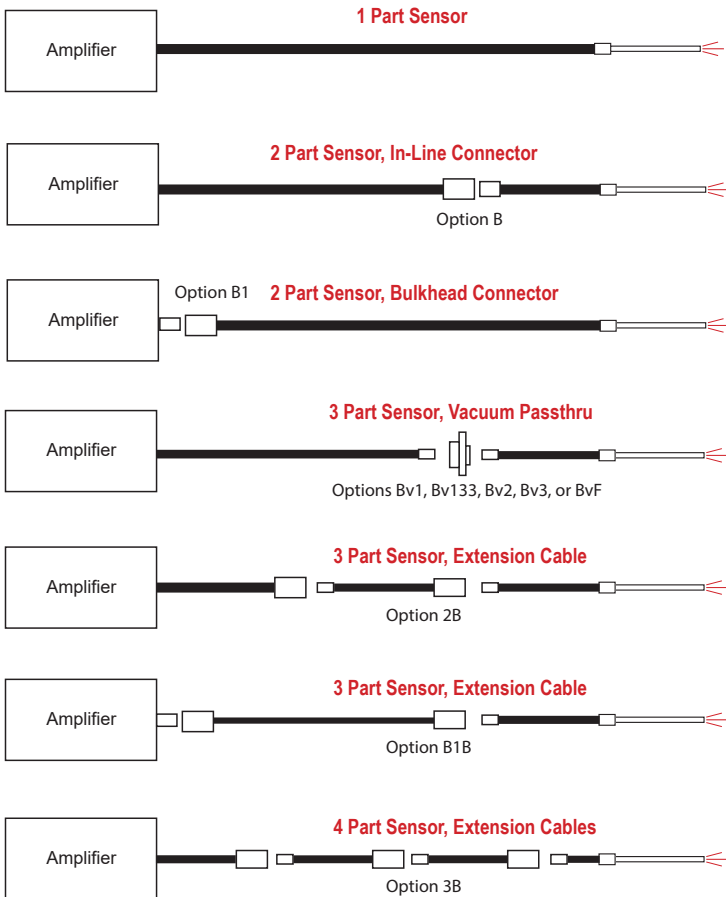## B

KNURLED FINGERTIGHT CONNECTOR

Bw

WRENCHTIGHT CONNECTOR

B1

SENSOR CONFIGURATIONS

1 Part Sensor

Amplifier

2 Part Sensor, In-Line Connector

Amplifier

Option B

2 Part Sensor, Bulkhead Connector

Option B1

Amplifier

3 Part Sensor, Vacuum Passthru

Amplifier

Options Bv1, Bv133, Bv2, Bv3, or BvF

3 Part Sensor, Extension Cable

Amplifier

Option 2B

3 Part Sensor, Extension Cable

Amplifier

Option B1B

4 Part Sensor, Extension Cables
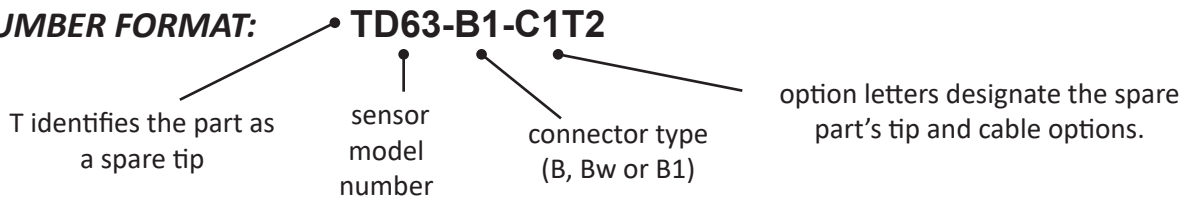
Amplifier

Option 3B

Multi-Part Sensor Systems

All sensor models can be supplied as a 2 part system with one connector interface.

Some models can be supplied with as many as four parts with three connector interfaces. Please contact the factory for design guidance with these options.

- **PHILTEC, Inc., Annapolis, MD** • **410-757-4404** • **sales@philtec.com** • 9

REPLACEABLE SENSOR TIPS

MODEL NUMBER FORMAT: **TD63-B1-C1T2**

T identifies the part as a spare tip

sensor model number

connector type (B, Bw or B1)

option letters designate the spare part's tip and cable options.

STANDARD LENGTHS

The standard lengths for spare tips are:
- 6" with Options B or Bw
- 3 Ft with Option B1

Electronics	3 Ft. (914 mm) ——— 6 in. (152 mm)

STANDARD OPTION B

Electronics	3 Ft. (914 mm)

STANDARD OPTION B1
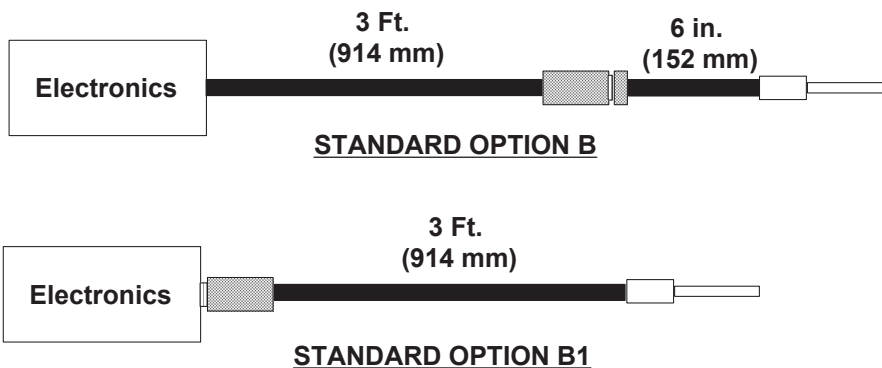
SPARE TIP NOTES

1. All fiber optic cable lengths can be extended to fit the application.

2. Different model tips and electronics can not be mixed.
A model D100 tip can only be used with a model D100 sensor package.
A model RC100 tip can only be used with a model RC100 sensor package; etc.

3. Noise Increases. Custom tips can be provided using any combination of tip, sheathing and length options. However, there are tradeoffs to consider due to light losses at the connector interfaces. Connectorized sensors have increased noise levels (2 - 3 times higher).

4. Use of connectorized fiberoptics with very dark targets is not recommended.

D MODELS REFLECTANCE DEPENDENT	
MODEL	**Connector**
TD20 - TD47	**B, B1 or Bw**
TD63 - TD125	**B, B1 or Bw**
TD170, TD171	**B, B1 or Bw**
TD240	**B, B1 or Bw**

RC MODELS REFLECTANCE COMPENSATED	
MODEL	**Connector**
TRC19, TRC20	**B, B1 or Bw**
TRC25	**B, B1 or Bw**
TRC31, TRC32, TRC59, TRC60	**B, B1 or Bw**
TRC100, TRC125	**B, B1 or Bw**
TRC171, TRC225	**B, B1 or Bw**
TRC290	**B, B1 or Bw**

VACUUM PASSTHRU HARDWARE

Vacuum passthru hardware is available in a variety of packages from low to ultra-high vacuum, and for single and multi-channel applications.

| MODEL or Option	SENSOR CHANNELS	SENSOR TYPE	TORR RATING	IMAGE
Bv1	Single	D or RC	10^{-7}	
Bv1-C133 Bv1-C275 Bv1-K25 Bv1-K50	Single	D or RC	10^{-7}	
Bv2	Single	D	10^{-11}	
Bv3	Single	RC	10^{-11}	
Bv4	Dual	D	10^{-11}	
BvF - CF	Multi	D and RC	10^{-7}	
BvF - ISO	Multi	D and RC	10^{-7}	
Fv1	Single	D or RC	10^{-4}	
Fv2	Single	D or RC	10^{-4}	
Fv3	Single	D or RC	10^{-4}	
W	Single	D or RC	10^{-7}	
Wb	Single	D or RC	10^{-11}	

ACCESSORIES & SERVICES

SENSOR CALIBRATIONS

Sensors in the field can be returned to the factory for a gap calibration in air.
Sensors can also be calibrated while submerged in a fluid sample provided by the customer.

- **SENSOR CALIBRATIONS IN AIR** .... **Cal-A**
- **SENSOR CALIBRATIONS IN AIR with Mathematical Conversion to Operation in Cryogenic Fluid**................. **Cal-AC**
- **SENSOR CALIBRATIONS IN FLUID**...**Cal-F**
- **SENSOR CALIBRATIONS IN FLUID with Mathematical Conversion to Operation in Cryogenic Fluid**................. **Cal-FC**
- *NIST TRACEABLE CALIBRATIONS available on request*

COMPRESSION FITTINGS

Swagelok fittings with nylon compression ferrules can be used to hold sensor tips and vacuum passthru fittings. Overall length is approx. 1.4". They mount into a straight threaded hole.
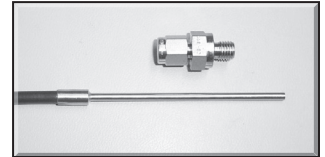
- for D47. Requires 5/16-24 threaded hole .... **Model CF63**
- for D63, D64, D100, RC100. Requires 5/16-24 threaded hole .... **Model CF125**
- for D169 - D171, RC171. Requires 3/8-24 threaded hole .... **Model CF187**
- for Fv2. Requires 7/16-20 threaded hole .... **Model CF250**
- for D240, RC190, RC290. Requires 1/2-20 threaded hole .... **Model CF312**
- for Fv1, Requires 9/16-18 threaded hole .... **Model CF375**
- for Fv3, Requires 3/4-16 threaded hole .... **Model CF500**

MIRRORED TARGET DISCS

Type 316 stainless steel .032" thick with #8 mirror polish. When bonded to a target, these specimens present a smooth mirrored surface to optimize sensor performance.
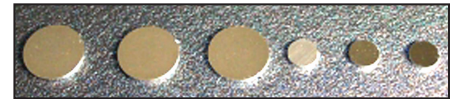
- Ø 6.35 mm (1/4") Disc .... **Model M25**
- Ø12.7 mm (1/2") Disc .... **Model M50**
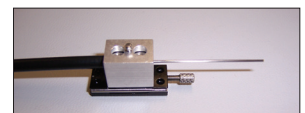
PROBE MOUNTING BLOCKS

Aluminum block for use with probes having a Ø 1/4" or Ø 3/16" collars. The block can be mounted on a linear stage to provide a fine adjustment of the sensor-to-target gap.
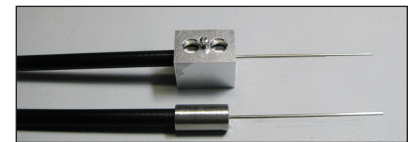
- for any model with Ø1/4" collared probes .... **Model B25**
- for any model with Ø5/16" collared probes .... **Model B31**

MICRO-STAGES

These manual linear stages provide a fine adjustment (80 TPI).

- Single Axis Stage, 5 mm Travel for use with Model B25 Block .... **Model MS-1**
- Single Axis Stage, 12.7 mm Travel for use with Model B31 Block .... **Model MS-2**

ACCESSORIES & SERVICES

Option Q

For 1 sensor:

Provides a 12 VDC, 500 ma Universal AC/DC Power Supply having a 5 foot long cable terminated with 2.1 mm jack plug connector, and a 3 foot long Adaptor Cable terminated with a 3-pin weathertight connector. Sensor is equipped with a 3-pin input and BNC output connectors.

Option Q2

For 2 sensors includes:
- A 12 VDC, 1 amp Universal AC/DC Power Supply
- A 1 to 2 channel Splitter Cable
- Two 3-pin Adaptor Cables
- Sensors are equipped with 3-pin input and BNC output connectors.

Option Q4
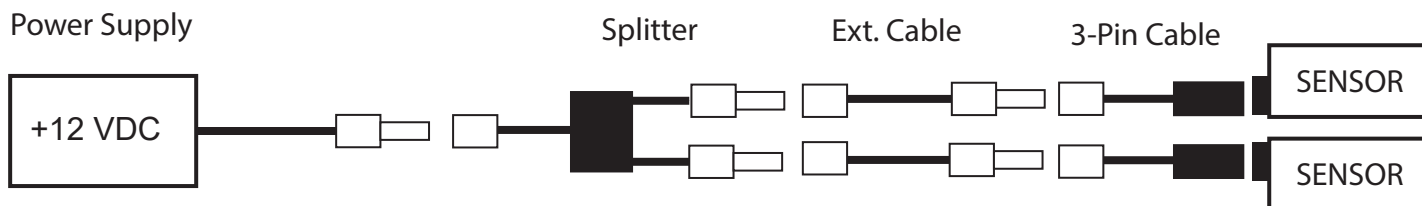
For 4 sensors includes:
- A 12 VDC, 2 amp Universal AC/DC Power Supply
- A 1 to 4 channel Splitter Cable
- Four 3-pin Adaptor Cables

Option Q Extension Cables

- **Model PS-E6** six foot cable
- **Model PS-E14** fourteen foot cable ...

Example

Power Supply   Splitter   Ext. Cable   3-Pin Cable

+12 VDC   SENSOR   SENSOR

ACCESSORIES & SERVICES

USB to RS232 Serial DB9 Male 6 foot Cable

Model ADB9 is a 500 Kbps High Speed Adaptor with 6 foot cable, 9-pin Serial Male to USB Type A Male. It provides a stable and reliable connection for transferring data between devices with RS232 serial ports and your computer or laptop.

ADB9

mini "B" to "A" USB Locking Connector

model AUSB is a 2 m long, robust dust and waterproof connection, fully shielded providing good levels of noise immunity and EMI protection. For use with muDMS sensors.
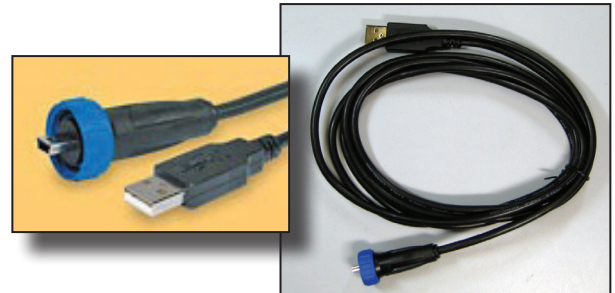
AUSB

mini-DMS Y-CABLE POWER ADAPTORS

Model PS-1 is required for operaton of any mini-DMS (mDMS) sensor. Includes a universal AC/DC power supply and Y adaptor cable with D-sub female 9 pin (standard RS-232 connector) and 2.1 mm coax male power connector.

PS-1