



Gaussmeters

PROBES AND ACCESSORIES



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For over 60 years, F.W. Bell has been recognized as the world's leading manufacturer of Hall-effect Gauss/Tesla-Meters. F.W. Bell continues this tradition as the leader in magnetic instrumentation with the comprehensive product line of two handheld Gauss/Tesla-Meters and three benchtop Gauss/Tesla-meters. All of our F.W. Bell brand of Gauss-Meters, built to ISO 9001 standards, are easy to use, highly accurate and include a comprehensive set of features - ranging from relative, Min/Max and Auto Calibration to temperature and 3-axis measurement.



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4100 Series Hand-Held ELF Meters



Features

- Low Cost, Small, Lightweight, and Portable
- High Accuracy
- Gauss or Tesla Display Units
- 0.1 mG / .01 μ T Resolution
- Low Battery Detection
- Waveform and RMS Analog Output (4190)
- Selectable X, Y, or Z Axis plus Vector Summation
- Min/Max Hold
- True RMS Reading
- Relative Mode
- Universal Serial Bus Interface

Lightweight and completely self contained, the easy to use 4100 Series ELF Meters are ideal for commercial or home use. The 4100 Series accurately measures Extremely Low Frequency Magnetic Fields generated by electrical equipment. Applications include detecting magnetic field emissions from a wide variety of sources, including video display terminals, AC power lines, office equipment, household appliances, and all types of electronic equipment.

This new meter represents the most recent design from the world leader in magnetic measuring equipment. Key features include Min./Max./Peak Hold Auto Range and Relative Mode. Both models allow the user to select Gauss or Tesla Readings.

The 4100 Series Hand-Held Gaussmeter's built-in software eliminates the need for complex calibration procedures. User prompts on the custom formatted LCD allow fast, simple push button operation. All models come with instruction manual, soft carrying case, and four AAA batteries.

Specifications

	Model 4180	Model 4190
Measuring Ranges	0.1 to 599 mG 0.01 to 59.9 μ T	0.1 to 1999 mG 0.01 to 199.9 μ T
Basic Accuracy	\pm (2% + 1 digit) typical	\pm (1% + 1 digit) typical
Frequency Range \pm5%	30 - 2kHz	30 - 2kHz
Operating Temperature	-10°C to +50°C	-10°C to +50°C
Size	H: 4.7" W: 3.0" D: 1.75"	H: 4.7" W: 3.0" D: 1.75"
Weight	6 oz.	6 oz.

Standard Features - Model 4190

A - Analog Output - This 4190 feature provides a buffered output for viewing analog waveform on an oscilloscope, spectrum analyzer, or similar test equipment. This is useful for determining harmonic content and other waveform properties. Output scaling is 1V FS (200 mG or 2000 mG).

D - DC Output - This 4190 feature provides a voltage level proportional to the displayed level of the magnetic field. It is useful for driving chart recorders, data loggers, and other data acquisition equipment. 10 mV/mG; 2V FS (200 mG or 2000 mG). (User activated through sequence of key strokes).

Standard Features - Models 4180/4190

X - Switchable Single Axis Mode - This 4190/4180 feature allows users to display the vector components of the magnetic field. This option should be specified in applications that require the direction of the magnetic field be known as well as the level. (User activated through sequence of key strokes).

F20 - Extended Bandwidth - This feature extends the -3dB frequency response of the instrument from 20 to 2,000 Hz and is included with all 4180 and 4190 Elf meters. This is useful if the measurements are required for sources with high harmonic content. Standard calibration frequency of 55Hz covers both 50Hz and 60Hz with a .2% variation.

Note: Due to continuous process improvement, specifications subject to change without notice.

5100 Series Gauss/Tesla meters



The 5100 Series Hall effect portable gaussmeters represent the most recent design from the world leader in magnetic measuring equipment. This new design incorporates the use of digital signal processing technology making it the world's first hand-held gaussmeter to have a digital signal processor (DSP) on board. F.W. Bell's exclusive Dynamic Probe Correction allows measurements from 0 to 30 kG with a basic accuracy of 1%.

Key features include Auto Zero, Min./Max./Peak Hold, Auto Range and Relative Mode. Both models allow the user to select Gauss, Tesla or Ampere/Meter readings. The Model 5180 features a corrected analog output ($\pm 3V$ FS) and a USB communications port.

The 5100 Series Hand-Held Gaussmeter's built-in software eliminates the need for complex calibration procedures. User prompts on the custom formatted LCD allow fast, simple push button operation. All models come equipped with a detachable transverse probe, zero gauss chamber, instruction manual, hard carrying case, and four AA batteries. Axial, ultra thin transverse and low-field probes are available as options.

Applications for the 5100 Series range from the most sensitive laboratory environment to the most rugged industrial setting. All instruments are CE compliant.

Specifications

Model	5170	5180
Ranges		
DC mode		
Low Range	1.25 + 4	0.8 + 4
Mid & High Range	1.00 + 3	0.6 + 3
AC mode Ranges (for sinewave >6G or 0.6mT) {1}		
10 - 20 Hz	3.50 + 8	3.0 + 8
20 - 20,000 Hz	2.50 + 5	2.0 + 5
20kHz to 25kHz (1x axial probe only)	N/A	3.0 + 5
{1} additional ± 8 counts tolerance for signals <4% of lowest range and >2kHz		

Accuracy, Analog Output of Model 5180

(\pm % of Reading \pm mV)	
DC mode	
Low Range	0.75 + 6
Mid & High Range	0.50 + 5
AC mode Ranges (for sinewave >6G or 0.6mT) {2}	
10 - 20 Hz	3.00 + 8
20 - 5000 Hz	2.50 + 5
Analog output - 3dB point is approximately 22kHz	
Delay Time: 30 μ s	
Sample Rate: 8 μ s with variable moving average filtering	
Risettime: DC Mode = 250 μ s DC Peak Hold = 60 μ s	
AC Mode and AC Peak Hold: from 30 μ s to 2ms depending on freq.	
{2} additional ± 8 mV tolerance for signals <4% of lowest range and >2kHz	

Battery Type: 1.5V AA (x4)

Battery Life: 20 hours typical, alkaline batteries

Auxilliary Power: +5 Vdc, 300 mA (Regulated)

Auxilliary Power Connector: Standard 2.5mm I.D. /5.5mm O.D. connector. Center post is (+) polarity.

Analog Output Connector: BNC

Operating Temperature: 0 to +50°C (+32 to +122°F)

Storage Temperature: -25 to +70°C (-13 to 158°F)

Meter Dimensions: Length: 17.5 cm (6.9 in)

Width: 9.9 cm (3.9 in)

Height: 3.6 cm (1.4 in)

Weight: Meter w/batteries: 400g (14 oz)

Shipping: 1.59 kg (3 lb., 8 oz)

Features

- The best accuracy in its class
- Data logging capability
- 100X lower resolution (with low-field probe)
- Relative Mode
- Auto Zero
- Auto Range
- Min/Max/Peak Hold
- Universal Serial Bus Interface
- The only handheld meter with DSP (Digital Signal Processing)

Probe accuracy must be added to meter accuracy to determine overall accuracy

Warmup Time To Rated Accuracy	5 minutes
Min / Max Hold Acquisition Time:	DC mode: 100 ms typical AC mode: 700 ms at 10 Hz to 500 ms at 300 Hz 250 ms at 300 - 4000 Hz 100 ms > 4kHz
Peak Hold Acquisition Time:	DC or AC mode: 128 μ s minimum
Analog Output Scaling:	DC mode: $\pm 3V$ dc AC mode: 3 Vrms
Analog Output Noise:	(Hi-Range) 1.5mV rms (Mid-Range) 4.5mV rms (Low-Range) 15.5mV rms
Analog Output Load:	10 kOhm min, 100 pF max.
Accuracy Change with Temperature (not including probe)	
0-20°C and 26-50°C (typical)	
Low Range: $\pm 0.25\%$ + 3.0 counts / °C	
Mid & High Ranges: $\pm 0.02\%$ + 0.2 counts / °C	

Regulatory Information:

Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 61326-1:1997+A1:1998 Electrical equipment for measurement, control and laboratory use EMC requirements

Immunity:

IEC 61000-4-2 Electrostatic Discharge (ESD)
IEC 61000-4-3 Electromagnetic Field (RF)

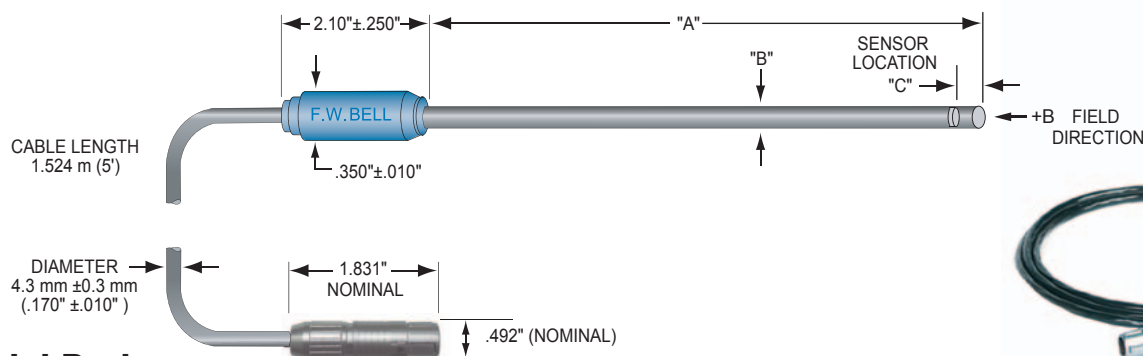
Emissions:

EN 55022 Class B Radiated and conducted emissions

Communications Port:

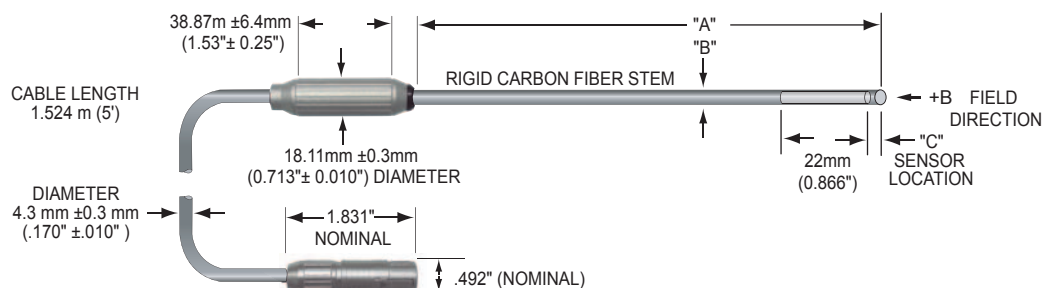
Format: Universal Serial Bus (USB)
Lines supported: Transmit, receive, common
Connector type: Mini USB Type B
Cable length: 3 m (9.8ft.) maximum
Standards supported: IEEE-1987.2, SCPI-1991

5100 Series Probes



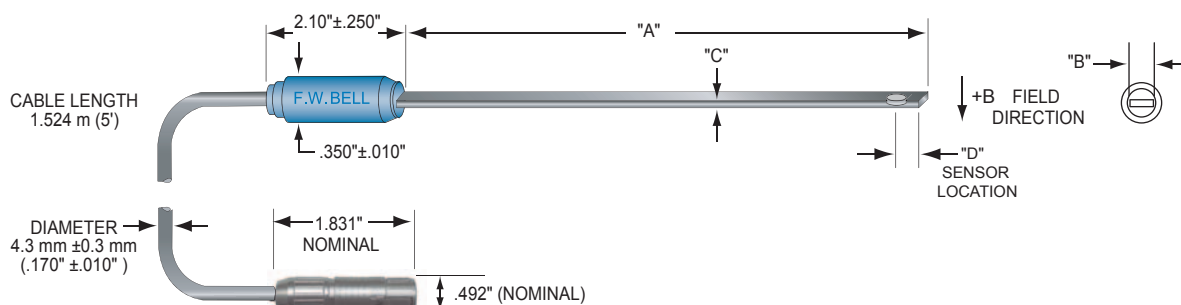
Axial Probes

Model	A ±.063"	B	C	Stem Material	Corrected Linearity	Sensitivity	Active area	Operating temp. range	Temp. stability (typical)		Frequency Response
	Zero								Calibrate		
SAD18-1902	2"	0.187" ±.006"	0.010" (NOMINAL)	RIGID PHENOLIC	0.5%/30kG	1X	0.015" DIA. (NOM)	0°C to +75°C	±0.300 Gauss / °C	-0.05% % / °C	DC to 20kHz
SAD18-1904	4"				1.0%/20kG						DC to 10kHz
SAH17-1902	2"										
SAH17-1904	4"										



Low Field Axial Probes

Model	A ±.063"	B	C	Stem Material	Corrected Linearity	Sensitivity	Active area	Operating temp. range	Temp. stability (typical)		Frequency Response
									Zero	Calibrate	
MOS51-3204	4"	0.285" ±0.006"	0.050" (NOMINAL)	RIGID PHENOLIC	0.75%/1G	.01X	0.866" (NOM)	0°C to +75°C	±0.02 mG/°C	-0.001% / °C	DC to 750Hz (-3dB)



Transverse Probes

Model	A ±.063"	B	C	D	Material	Corrected Linearity	Sensitivity	Active area	Operating temp. range	Temp. stability (typical)		Frequency Response
										Zero	Calibrate	
STD18-0402	2"	0.150" ±.004"	0.045" ±.004"	0.0335" (NOMINAL)	POLY- PROPYLENE	0.5%/30kG	1X	0.015" DIA. (NOM)	0°C to +75°C	±0.300 Gauss / °C (typical)	-0.05% % / °C (typical)	DC to 20kHz
STD18-0404	4"					1.0%/20kG						DC to 10kHz
STH17-0402	2"				1.0%/20kG							DC to 10kHz
STH17-0404	4"				1.0%/20kG							DC to 20kHz
HTH17-0604	4"	0.180" ±.004"	0.060" +.000" -.004"		ALUMINUM 3003 3/4 FH	1.0%/20kG						DC to 10kHz
HTD18-0604	4"					0.5%/30kG						DC to 20kHz
STB1X-0201	1"	.050" ±.005"	.020" MAX	0.030" (NOMINAL)	KAPTON	1.0%/10kG		0.025" DIA (NOM.)		±0.200 Gauss / °C	-0.1 % / °C	DC only

Note: Due to continuous process improvement, specifications subject to change without notice.

5100 Series Frequently Asked Questions

▶ What are the update rates for the 5100 gaussmeter?

Display = 4 samples / second (max) (5180)

USB port = 1 sample / second (max) (5180 only)

Corrected analog output = 100K samples / second (5180 only)

▶ What is the frequency response of the 5100 gaussmeter?

In the AC mode, the analog output jack has typically -3dB of attenuation at 22 kHz.

▶ What is the recommended load for the analog output of the 5100 gaussmeter?

The recommended load for the analog outputs is greater than 10,000 ohms and less than 100 picofarad.

▶ How much noise will be present at the analog output jack?

The analog output jack is specified to have a typical output noise of: 1.5mVrms (high range)

4.5mVrms (mid range)

15.5mVrms (low range).

▶ Can I use any AC power adapter as long as its output is 9 VDC?

No. The output of the AC power adapter has to be capable of supplying 300 milliamps of current. The AC power adapter also has to be well regulated. F.W. Bell offers an approved adapter for use with the 5100 series gaussmeters. Use of any other AC adapter may result in damage to the gaussmeter and will void the owner's warranty.

▶ Why do I get a different value when in the standard measure mode and min/max mode than in the peak hold mode?

In the measure and max or min hold mode, the displayed value is the rms value and in the peak hold mode the displayed value is the peak value. The peak value should be 1.414 times the other values for sinusoidal wave forms.

6000 Series Hall Effect Gaussmeters



The Model 6010 Hall-effect Gauss/Tesla-Meter features F.W. Bell's exclusive Dynamic Probe Correction, along with temperature compensation and allows measurements up to 300 kG with a basic accuracy of 0.25%. Key features include Peak Hold, Max/Min Hold, Auto Zero, Auto Range, Relative Mode and Temperature measurement. The Model 6010 allows the user to select Gauss, Tesla or Ampere/Meter readings. The Model 6010 also features a corrected analog output (± 3 V Full Scale for each range),

an RS-232 communications port, a rechargeable battery and probe temperature compensation. The temperature measurement feature, used with the new 6000 Series 5th Generation Hall-effect Gauss/Tesla-Meter probes, allow the user to take temperature readings (0°C to +75°C) while monitoring the magnetic field. The easy-to-read large format alpha-numeric LCD, with dual 3 3/4 digit read outs, gives the user magnetic field flux density readings while also displaying temperature (or Peak Hold, or Max/Min Hold).

User prompts on the custom formatted LCD allow fast, simple push button operation. All models come equipped with a zero gauss chamber, accessory hard case, built-in rechargeable battery, quick reference card and instruction manual. A wide range of axial and transverse probes are available as options.

Applications for the Model 6010 range from the most sensitive laboratory environments to rugged industrial settings. All instruments are fully CE compliant.

Specifications

Ranges

3G (300 μ T)*	3kG (300mT)	
30G (3mT)*	30kG (3T)	* Low field probe
300G (30mT)	300kG (30T)†	† High field probe

Accuracy (Displayed Readings)

DC basic	$\pm 0.25\%$ of reading
AC basic	$\pm 1.0\%$ of reading

Frequency Range

DC mode	DC
AC mode	20Hz to 20kHz

Temperature Range

Operating	0°C to +50°C
Storage	-20°C to +70°C

Communications Port

RS-232	Standard 9-pin "D" connector
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Size H: 4.5" W: 10" D: 12.5"

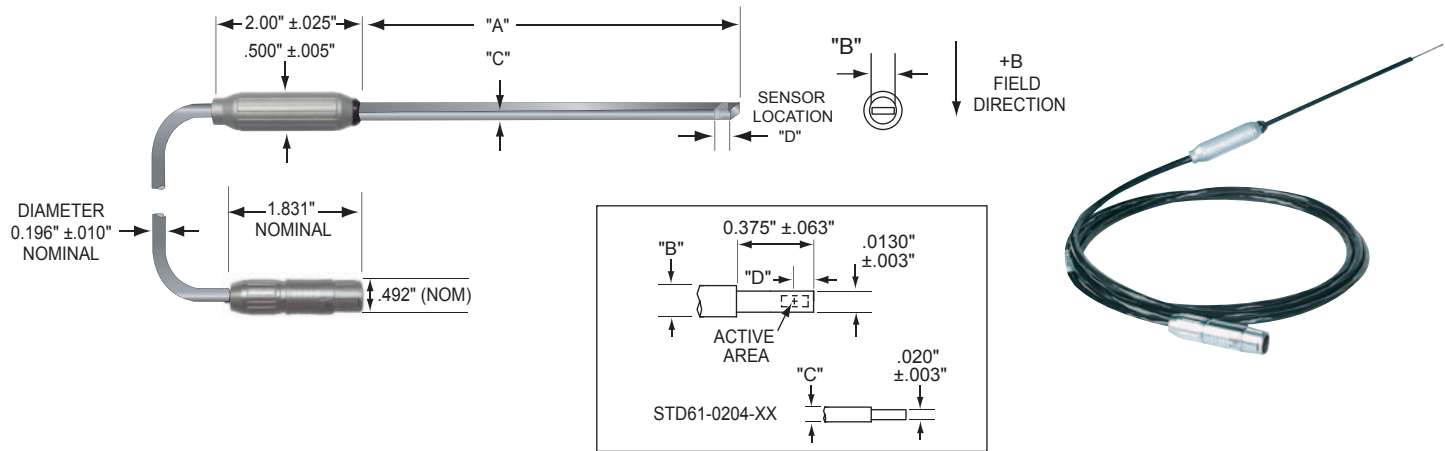
Shipping Weight Domestic: 8.8 lbs (4.0kg)
International: 13.7 lbs (6.2kg)

Features

- Large Format LCD
- Dual 3 3/4 digit readouts
- Temperature measurement
- Displays in Gauss, Tesla or Ampere/Meters
- Peak Hold
- Max/Min Hold
- Corrected Analog Output
- Auto Range
- Temperature Compensated Probes
- Auto zero/Auto calibration
- RS-232 Interface
- Rechargeable Battery
- Compatible with Model 9200 probes
- CE Compliant

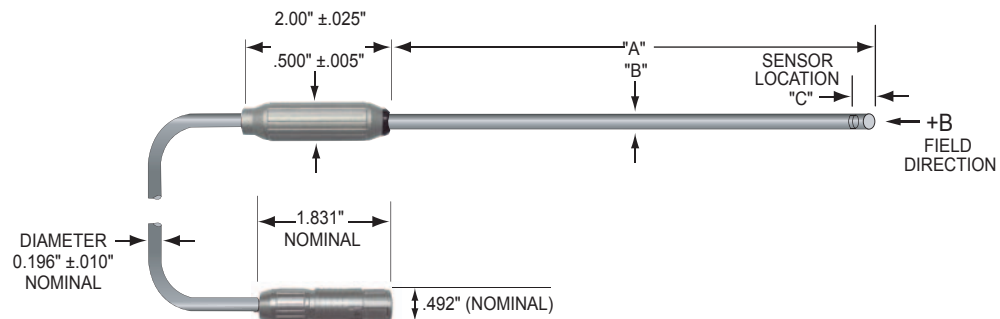
Note: Due to continuous process improvement, specifications subject to change without notice.

6000 Series Gaussmeter Probes



Transverse Probes

Model	A ±.063"	B	C	D	Material	Corrected Linearity	Sens.	Active area	Op. temp. range	Temp. stability (max)		Frequency Response
										Zero	Calibrate	
HTD61-0608-05-T	8"	0.180" ±.003"	0.060" +.000" -.004"	0.150" ±0.020"	ALUMINUM 3003 3/4 FH	0.5%/30kG	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC to 20kHz
HTD61-0608-15-T												DC
HTD61-0608-30-T												
HTD61-0608-05												
HTD61-0608-15												
HTD61-0608-30												
HTR61-0608-05												
HTR61-0608-15												
HTR61-0608-30												
STD61-0404-05	4"	0.150" ±.004"	0.045" ±.004"	0.130" ±0.008"	POLY- PROPYLENE	0.5%/30kG	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC to 20kHz
STD61-0404-15												
STD61-0404-30												
STD61-0402-05	2"	0.150" ±.004"	0.045" ±.004"	0.130" ±0.008"	POLY- PROPYLENE	0.5%/30kG	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC to 20kHz
STD61-0402-15												
STD61-0402-30												
STD61-0204-05	4"	0.155" ±.005"	0.040" +.002" -.009"	0.130" ±0.008"	FLEXIBLE RUBBER	0.5%/30kG	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC to 20kHz
STD61-0204-15												
STD61-0204-30												



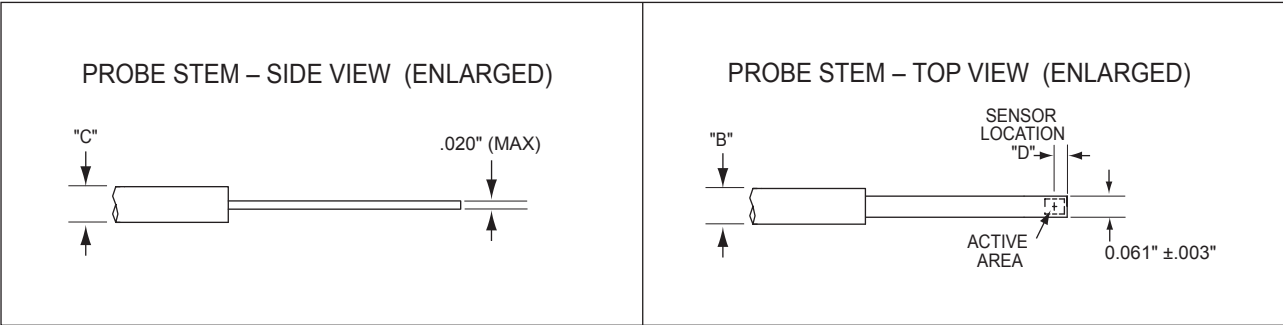
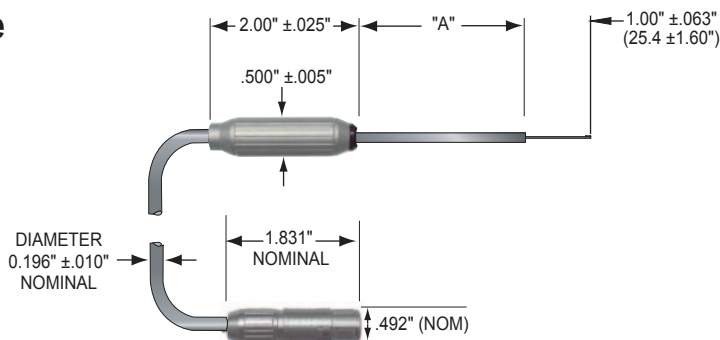
Axial Probes

Model	A ±.063"	B	C	Material	Corrected Linearity	Sens.	Active area	Op. temp. range	Temp. stability (max)		Frequency Response
									Zero	Calibrate	
HAD61-2508-05-T	8"	0.250" ±.005"	0.015" ±.010"	ALUMINUM 3003 3/4 FH	0.5%/30kG	1X	0.030" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC to 20kHz
HAD61-2508-15-T											
HAD61-2508-30-T											
HAD61-2508-05											
HAD61-2508-15											
HAD61-2508-30											
SAR61-1802-05	2"	0.180" +.002" -.007"	0.015" ±.010"	RIGID PHENOLIC	1.0%/100kG	10X	0.030" Dia. (NOM)	0°C to +75°C	±0.300 Gauss / °C (TYP)	-0.05 % / °C (TYP)	DC
SAR61-1802-15											
SAR61-1802-30											

Note: Due to continuous process improvement, specifications subject to change without notice.

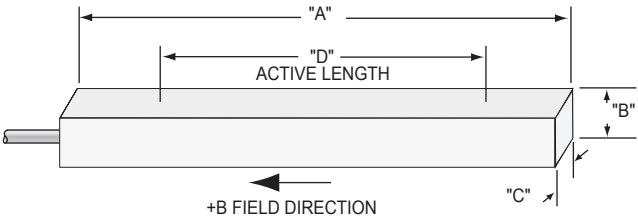
6000 Series Gaussmeter Probes

Ultra Thin Hall-Effect Probe



Model	A $\pm 0.63"$	B	C	D	Material	Corrected Linearity	Sens.	Active area	Op. temp. range	Temp. stability (max)		Frequency Response
										Zero	Calibrate	
STD61-0202-05	2"	0.155" $\pm .005"$	0.040" $+ .002"$ $- .009"$	0.020" $\pm .001"$	POLY-PROPYLENE & KAPTON TIP	0.5%/30kG	1X	0.005" Dia. (NOM)	0°C to +75°C	± 0.55 Gauss / °C (MAX)	-0.7 % / °C	DC to 200Hz
STD61-0202-15												
STD61-0202-30												

Magnaprobe (low field)



Model	A	B	C	D	Material	Corrected Linearity	Sensitivity	Active area	Operating temp. range	Temp. stability (max)		Frequency Response
										Zero	Calibrate	
MOW61-2506-05	9" $\pm .030"$	0.480" $\pm .030"$	0.250" $\pm .010"$	6"	Lexan	$\pm 4\%/2G$.01X	6" X .25" (NOM)	0°C to +75°C	± 0.001 Gauss / °C	-0.05 % / °C	DC to 400Hz
MOW61-2506-15												
MOW61-2506-30												

Note: Due to continuous process improvement, specifications subject to change without notice.

6000 Series Frequently Asked Questions

▶ What are the update rates for the 6010 gaussmeter?

Display = 5 samples / second (max)

RS-232 port = 5 samples / second (max)

Corrected analog output = 50K samples / second

Uncorrected analog output = real time

▶ What is the maximum probe cable length that can be used by the 6010 gaussmeter?

The maximum probe cable length that can be used with the 6010 gaussmeters is 100 feet (30.48 meters).

Consult the factory for custom probe cable length pricing.

▶ What is the recommended load for the analog outputs?

The recommended load for the analog outputs is greater than 10,000 ohms.

▶ Can F.W. Bell provide extension cables for 6000 series probes?

Extension cables are not available for the 6000 series probes. Standard probe cable lengths are 5, 15 and 30 feet. Custom cable length probe can be manufactured up to a maximum of 100 feet in length. Consult factory for pricing.

▶ Can a 9200, 9500 or 9900 probe be used with the 6010 gaussmeter?

The 6010 gaussmeter was designed to identify 9200, 9500 and 9900 probes and make proper correction.

A probe adapter can be purchased to allow attachment.



7000 Series Gauss/Tesla Meters



The F.W. Bell 7000 Series Gauss/Tesla-Meters lead the way for Advanced Hall Effect Magnetic measuring technology. The easy-to-use front-panel programming feature incorporates the latest in user control operations. The 7000 Series instruments are capable of simultaneously measuring and displaying seven different parameters per channel – 27 total parameters for the 7030 three-channel model.

The single-channel 7010 and three-channel 7030 models are high accuracy instruments fully equipped to meet most magnetic measuring applications. And F.W. Bell's exclusive dynamic probe correcting software actually increases the 7000 Series measurement capabilities to make it the most versatile magnetic measuring tool in the world.

Key features include high-resolution, high-accuracy and high-speed with a bright 1/4 VGA display. The 7000 Series features 50 kHz frequency response, a 100 samples-per-second update rate, temperature and frequency measurements, Auto Zero, Auto Range, Hold functions for Peak, Valley, Min and Max, Corrected and Uncorrected outputs for each channel and Vector Summation and angle (three-channel model). The 7000 Series Gaussmeters provide readings in Gauss, Tesla, Oe and A/m, as well as IEEE-488, RS-232 communications ports and Classifier output, and are fully CE compliant.

Specifications

Ranges

300mG (30 μ T)* 3kG (300mT)
3G (300 μ T)* 30kG (3T)
30G (3mT) 300kG (30T) †
300G (30mT)

* Low field probe
† High field probe

Accuracy (Displayed Readings)

DC basic $\pm 0.05\%$ of reading
AC basic $\pm 2\%$ of reading

Frequency Range

DC mode DC to 100Hz
AC mode 20Hz to 50kHz

Temperature Range

Operating 0°C to +50°C
Storage -20°C to +60°C

Communication Ports

RS-232 Standard 9-pin "D" connector
IEEE-488 Standard 24-pin GPIB connector
Protocol IEEE-1987.2 and SCPI-1999

Size H: 5.2" W: 16.3" D: 13.15"

Shipping Weight 25.8 lbs (11.6kg)

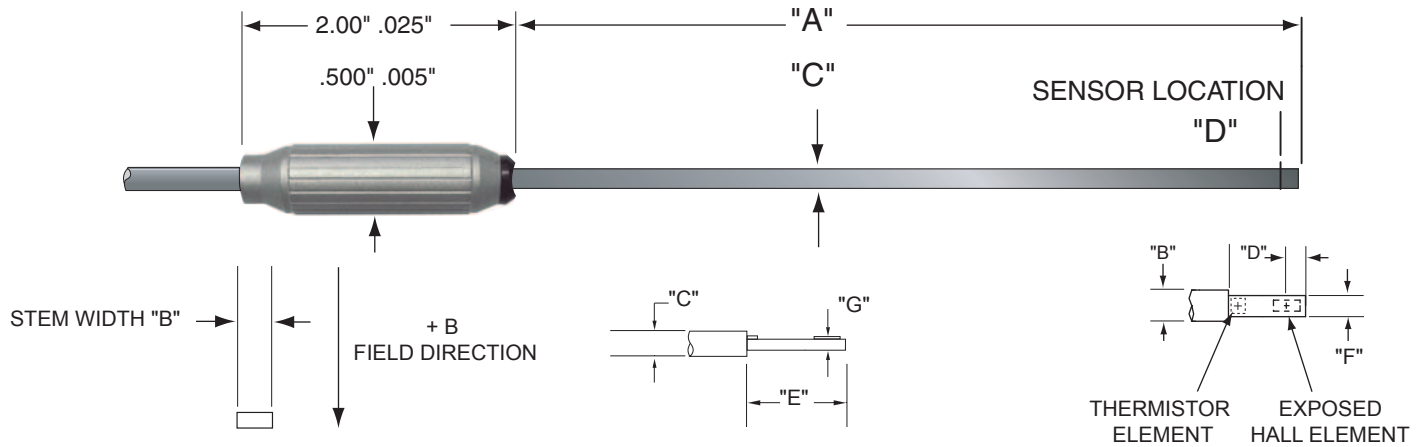
Features

- Bright 1/4-VGA readout
- Fully menu-driven for easy operation
- Large electroluminescent graphic display
- Auto Zero and Auto Calibration
- Over 100 standard probes available
- Automatic probe coefficient correction
- Displays in Gauss, Tesla, Amps/meter or Oe
- Peak/Valley capture
- Relative mode
- IEEE-488 and RS-232 interface
- CE compliant
- Manufactured to ISO 9000 standards
- Comprehensive Technical Support

Note: Due to continuous process improvement, specifications subject to change without notice.

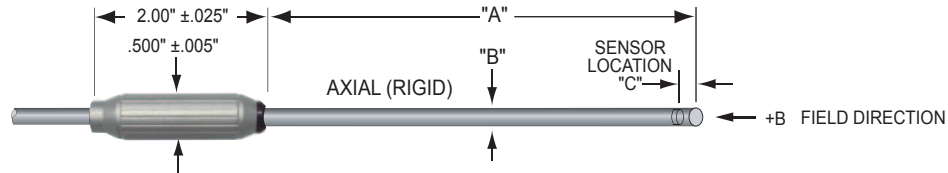
7000 Series Gaussmeter Probes

Transverse Probes



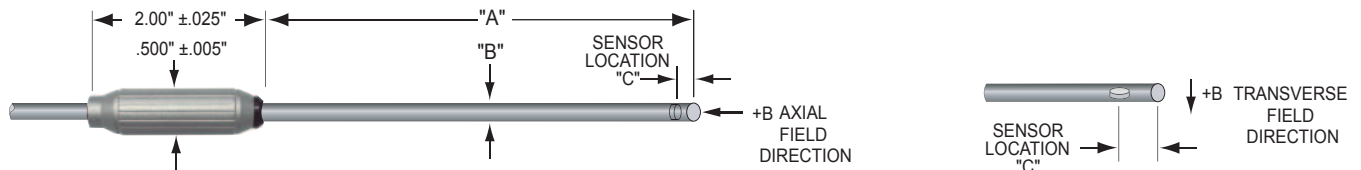
Model	A ± .063"	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)									
														Zero (G/°C)	Calibrate (%/°C)								
HTF71-0608-05	8"	0.180" ±.003"	0.060" +.000" -.004"	0.150" ±0.020"	N/A	N/A	N/A	A L U M I N U M	0.25% to 30kG	DC to 20kHz	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.090	– 0.040								
HTF71-0608-15																							
HTF71-0608-30																							
HTF71-0608-05-T																							
HTF71-0608-15-T																							
HTF71-0608-30-T																							
HTM71-0608-05								0.15% to 30kG	DC to 400Hz	10X	0.040" Dia. (NOM)	±0.130		– 0.005									
HTM71-0608-15																							
HTM71-0608-30																							
HTM71-0404-05-T																							
HTM71-0404-15-T																							
HTM71-0404-30-T																							
STF71-0402-05	2"	0.150" ±.004"	0.045" ±.004"	0.150" ±0.020"	N/A	N/A	P O L Y P R O P Y L E N E	0.25% to 30kG	DC to 20kHz	1X	0.070" Dia. (NOM)	±0.090		– 0.040									
STF71-0402-15																							
STF71-0402-30																							
STF71-0402-05-T																							
STF71-0402-15-T																							
STF71-0402-30-T																							
STF71-0404-05								4"	0.150" ±.004"	0.045" ±.004"	0.150" ±0.020"				N/A	N/A	P O L Y P R O P Y L E N E	0.25% to 30kG	DC to 20kHz	1X	0.070" Dia. (NOM)	±0.090	– 0.040
STF71-0404-15																							
STF71-0404-30																							
STF71-0404-05-T																							
STF71-0404-15-T																							
STF71-0404-30-T																							
STM71-0402-05	2"	0.150" ±.004"	0.045" ±.004"	0.150" ±0.020"	N/A	N/A	P O L Y P R O P Y L E N E	0.15% to 30kG	DC to 400Hz	10X	0.040" Dia. (NOM)	±0.130	– 0.005										
STM71-0402-15																							
STM71-0402-30																							
STM71-0402-05-T																							
STM71-0402-15-T																							
STM71-0402-30-T																							
STM71-0404-05	4"	0.150" ±.004"	0.045" ±.004"	0.150" ±0.020"	N/A	N/A	P O L Y P R O P Y L E N E	0.15% to 30kG	DC to 400Hz	10X	0.040" Dia. (NOM)	±0.130	– 0.005										
STM71-0404-15																							
STM71-0404-30																							
STM71-0404-05-T																							
STM71-0404-15-T																							
STM71-0404-30-T																							
STF71-0204-05	4"	0.155" ±.005"	0.040" +.002" -.009"	0.130" ±0.008"	0.375" ±0.063"	0.130" ±0.003"	0.020" ±0.003"		0.25% to 30kG	DC to 20kHz	1X	0.070" Dia. (NOM)	0°C to +75°C	±0.090	– 0.040								
STF71-0204-15																							
STF71-0204-30																							
STF71-0204-05-T																							
STF71-0204-15-T																							
STF71-0204-30-T																							
STM71-0204-05								0.15% to 30kG	DC to 400Hz	10X	0.040" Dia. (NOM)	±0.130		– 0.005									
STM71-0204-15																							
STM71-0204-30																							
STM71-0204-05-T																							
STM71-0204-15-T																							
STM71-0204-30-T																							

Note: Due to continuous process improvement, specifications subject to change without notice.



Axial Probes

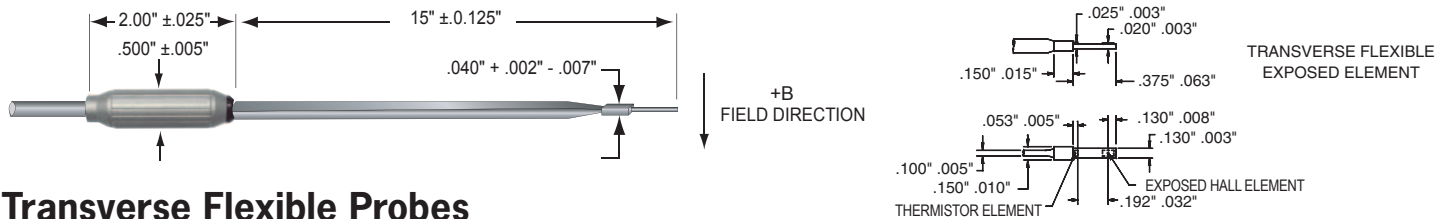
Model	A ±.063"	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)					
							Zero (G/°C)							Calibrate (%/°C)					
HAF71-2502-05	2"	0.250" ±.005"	0.015" ±0.010"	N/A	N/A	N/A	N/A	A L U M I N U M	0.25% to 30kG	DC to 20kHz	1X	0.030" Dia. (NOM)	0°C to +75°C	±0.090	– 0.040				
HAF71-2502-15																			
HAF71-2502-30																			
HAF71-2502-05-T																			
HAF71-2502-15-T																			
HAF71-2502-30-T																			
HAF71-2508-05	8"													0.15% to 30kG	DC to 400Hz	10X	±0.130	– 0.005	
HAF71-2508-15																			
HAF71-2508-30																			
HAF71-2508-05-T																			
HAF71-2508-15-T																			
HAF71-2508-30-T																			
HAM71-2502-05	2"								0.180" +0.002" -0.007"	0.25% to 30kG	DC to 20kHz						1X	±0.090	– 0.040
HAM71-2502-15																			
HAM71-2502-30																			
HAM71-2502-05-T																			
HAM71-2502-15-T																			
HAM71-2502-30-T																			
HAM71-2508-05	8"													0.15% to 30kG	DC to 400Hz	10X		±0.130	– 0.005
HAM71-2508-15																			
HAM71-2508-30																			
HAM71-2508-05-T																			
HAM71-2508-15-T																			
HAM71-2508-30-T																			
SAF71-1802-05	2"	0.180" +0.002" -0.007"								0.25% to 30kG	DC to 20kHz						1X	±0.090	– 0.040
SAF71-1802-15																			
SAF71-1802-30																			
SAF71-1802-05-T																			
SAF71-1802-15-T																			
SAF71-1802-30-T																			
SAF71-1808-05	8"													0.15% to 30kG	DC to 400Hz	10X		±0.130	– 0.005
SAF71-1808-15																			
SAF71-1808-30																			
SAF71-1808-05-T																			
SAF71-1808-15-T																			
SAF71-1808-30-T																			
SAM71-1802-05	2"								0.180" +0.002" -0.007"	0.15% to 30kG	DC to 400Hz						10X	±0.130	– 0.005
SAM71-1802-15																			
SAM71-1802-30																			
SAM71-1802-05-T																			
SAM71-1802-15-T																			
SAM71-1802-30-T																			
SAM71-1808-05	8"													0.15% to 30kG	DC to 400Hz	10X		±0.130	– 0.005
SAM71-1808-15																			
SAM71-1808-30																			
SAM71-1808-05-T																			
SAM71-1808-15-T																			
SAM71-1808-30-T																			



Cryogenic Probes

Model	A ±.063"	B	C	Stem Material	Linearity % of Reading	Sensitivity	Nominal Active Area	Frequency Range	Oper. Temp. Range	Temp. Stability (Max)		
										Zero (G/°C)	Calibrate (%/°C)	
CTU71-3260-15	60"	0.312" ±.005"	0.320" ±0.063"	STAINLESS STEEL	2.0% to 100kG	10X	0.040" Dia. (NOM)	DC only	-269°C to +75°C	±0.130	±0.010	
CTU71-3260-30					1.0% to 30kG							
CTP71-3260-15					2.0% to 100kG							
CTP71-3260-30					1.0% to 30kG							
CAU71-2560-15		0.250" ±.005"	0.250" ±0.063"		2.0% to 100kG		0.030" Dia. (NOM)					
CAU71-2560-30					1.0% to 30kG							
CAP71-2560-15												
CAP71-2560-30												

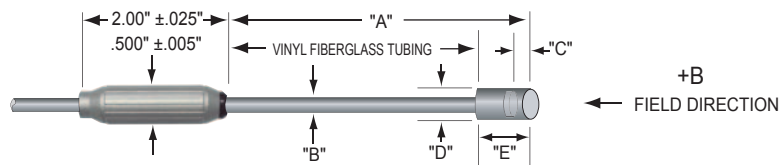
Note: Due to continuous process improvement, specifications subject to change without notice.



Transverse Flexible Probes

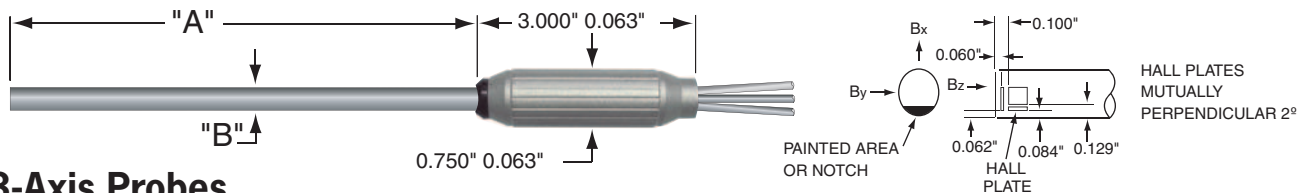
Model	A	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)	
														Zero (G/°C)	Calibrate (%/°C)
FTF71-0215-05	SEE FIGURES ABOVE FOR DIMENSIONS							*F S E D	0.25% to 30kG	DC to 20kHz	1X	0.070" Dia.	0°C to +75°C	±0.090	- 0.040
FTF71-0215-15															
FTF71-0215-30															
FTF71-0215-05-T															
FTF71-0215-15-T															
FTF71-0215-30-T															
FTM71-0215-05									0.15% to 30kG	DC to 400kHz	10X	0.040" Dia.		±0.130	± 0.005
FTM71-0215-15															
FTM71-0215-30															
FTM71-0215-05-T															
FTM71-0215-15-T															
FTM71-0215-30-T															

*FLEXIBLE STEM EXPOSED DEVICE



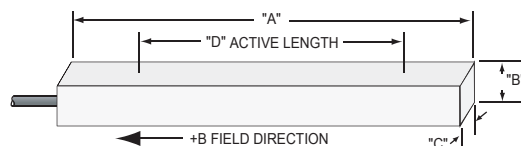
Axial Flexible Probes

Model	A	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)	
														Zero (G/°C)	Calibrate (%/°C)
FAF71-1815-05	15" ±0.125"	0.100" ±0.005"	0.015" ±0.010"	0.180" +0.002" -0.004"	1.00" ±0.010"	N/A	N/A	ALUMINUM	0.25% to 30kG	DC to 20kHz	1X	0.030" Dia.	0°C to +75°C	±0.090	- 0.040
FAF71-1815-15															
FAF71-1815-30															
FAF71-1815-05-T															
FAF71-1815-15-T															
FAF71-1815-30-T															
FAM71-1815-05									0.15% to 30kG	DC to 400kHz	10X			±0.130	± 0.005
FAM71-1815-15															
FAM71-1815-30															
FAM71-1815-05-T															
FAM71-1815-15-T															
FAM71-1815-30-T															



Standard 3-Axis Probes

Model	A	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)	
														Zero (G/°C)	Calibrate (%/°C)
ZOA73-3208-05	8.0" ±0.125"	0.312" ±0.005"	N/A	N/A	N/A	N/A	N/A	Alum.	0.25% to 10kG	DC to 400Hz	1X	0.060" Dia.	0°C to +75°C	±0.100	- 0.040
ZOA73-3208-05-T															
ZOA73-3208-15															
ZOA73-3208-15-T															
ZOA73-3208-30															
ZOA73-3208-30-T															



Magnaprob

Model	A	B	C	D	E	F	G	Stem Material	Linearity % of Reading	Frequency Range	Sensitivity	Nominal Active Area	Oper. Temp. Range	Temp. Stability (Max)	
														Zero (G/°C)	Calibrate (%/°C)
MOX71-2506-05	9" ±0.030"	0.480" ±0.030"	0.250" ±0.010"	6"	N/A	N/A	N/A	Lexan	.5% to 2G	DC to 400Hz	.01X	6" x .25	0°C to +75°C	±0.070	- 0.040
MOX71-2506-15															
MOX71-2506-30															

7000 Series Frequently Asked Questions

▶ What are the update rates for the 7010 gaussmeter?

Display = 5 samples / second (max)

RS-232 port = 100 samples / second (max)

IEEE-488 port = 100 samples / second (max)

Corrected analog output = 50K samples / second

(the update rate of the corrected analog output is affected by the analog filter settings)

Uncorrected analog output = real time

▶ What are the update rates for the 7030 gaussmeter?

Display = 5 samples / second (max)

RS-232 port = 100 samples / second (max)

IEEE-488 port = 100 samples / second (max)

Corrected analog output = 50K samples / second with one channel active

Corrected analog output = 40K samples / second with two channels active

Corrected analog output = 30K samples / second with three channels active

(the update rates of the corrected analog outputs are affected by the analog filter settings)

Vector sum corrected analog output = 1K samples / second

Uncorrected analog output = real time

▶ What is the maximum probe cable length that can be used by the 7000 series gaussmeters?

The maximum probe cable length that can be used with the 7000 series gaussmeters is 100 feet (30.48 meters).

Consult the factory for custom probe cable length pricing.

▶ What is the output resistance of the analog outputs?

The output resistance of the analog outputs is specified to be less than 100 ohms.

▶ What is the recommended load for the analog outputs?

The recommended load for the analog outputs is greater than 10,000 ohms.

▶ Can F.W. Bell provide extension cables for 7000 series probes?

Extension cables are not available for the 7000 series probes. Standard probe cable lengths are 5, 15 and 30 feet.

Custom cable length probe can be manufactured up to a maximum of 100 feet in length. Consult factory for pricing.

Instrument Accessories

Reference Magnets

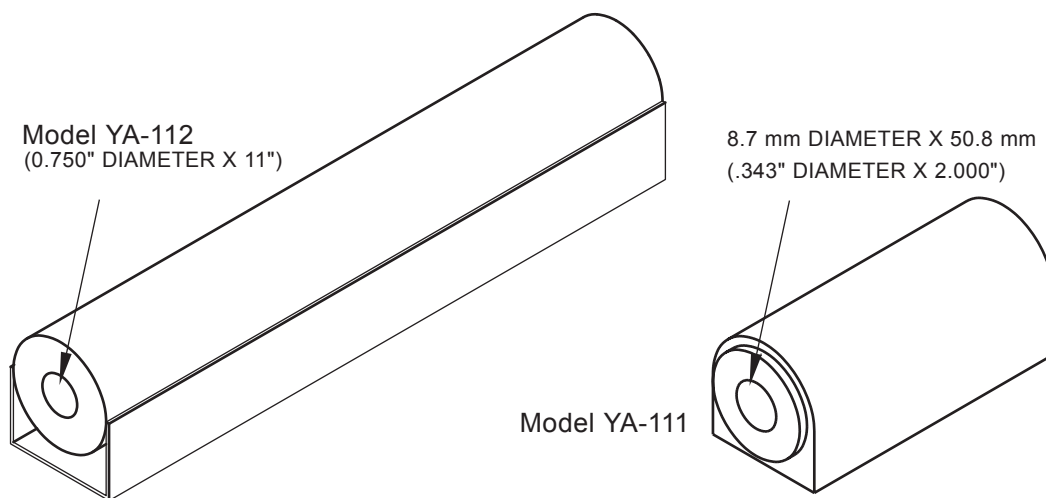
Reference magnets are used to quickly check the calibration of a Gauss/Tesla-Meter. They are calibrated permanent magnets traceable to NIST with an aperture for a Gauss/Tesla-Meter probe to be inserted. These devices can be used in conjunction with annual calibration of the instruments to guarantee continuous reliable performance.



Model	Gauss Level	Aperture Size	Probe Type
VT-500	500	0.062"	Transverse
VT-1K	1,000	0.062"	Transverse
VT-5K	5,000	0.062"	Transverse
VT-10K	10,000	0.062"	Transverse
VA-500	500	0.312"	Axial
VA-2K	2,000	0.312"	Axial

Zero Gauss Chamber

Model YA-111 provides up to 80 dB attenuation in fields up to 300 G, and can be used with all standard axial or transverse probes. Model YA-112 provides attenuation up to 60 dB in fields up to 300 G and can be used with the Magnaprobe in addition to all standard probes. Both units feature a double shielded design with a mumetal chamber for screening out earth's fields as well as other stray magnetic fields.



Carrying Cases

The carry case for the 7000 series instrument is rugged, and has locations for manuals, probes, a zero gauss/tesla chamber and other accessories. Perfect for operators that need to work outside the laboratory, or those traveling abroad. The case has air ventilation to allow the instrument to operate and provides access to the rear panel. Various storage areas have room for up to eight probes.

The carry case for the 6000 series instrument is rugged, and has locations for manuals, probes, a zero gauss chamber and other accessories. Perfect for operators that need to work outside the laboratory, or those traveling abroad. The case has access to the rear panel, and storage areas for up to six probes.

Gaussmeter Probes

F.W. Bell's gaussmeter probes are designed to meet the electrical and mechanical requirements of virtually any application. Models are available for Transverse, Axial, and 2 or 3-axis field measurements. High sensitivity Magnaprobes which offer 100 times the sensitivity of our standard probes and Cryogenic probes are also available.

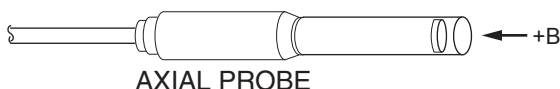
Before selecting a probe it is important to know the direction of the magnetic lines of flux (choose between axial or transverse), the measurement environment, and any limiting physical constraint. There are six different parameters which must be considered and decided upon when selecting a Hall Effect Gaussmeter:

1. Probe Style

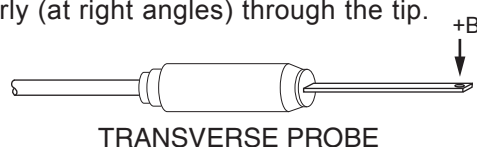
Generally dependent upon the measurement environment. The Standard (Polypropylene) is recommended for laboratory or light handling environment, while the Heavy Duty (aluminum stem) is recommended for production or heavy handling environments.

2. Probe Type

- Axial: Measures lines of magnetic flux through the length of the probe



- Transverse: Measures lines of flux moving perpendicularly (at right angles) through the tip.



3. Electrical Performance

There are three parameters to consider when choosing a probe:

- The Accuracy
- Upper field limit
- Sensitivity to full scale range

4. Gaussmeter Probe Model

Gaussmeter Series

Total Probe Models Available*

7000 Series.....	Over 100 Standard Models
6000 Series.....	36 Standard Models
5100 Series.....	Over 10 Standard Models

* Custom Models also available

5. OD or Thickness

Is very important if there is a constraint on the size of the gap in which the probe is inserted.

6. Probe Length

Probe Length allows the flexibility to shorten or lengthen the stem of the probe. For customer convenience, F.W. Bell's most frequently purchased probes, are available for shipment within one to two business weeks. All other probes in the catalog are available within three to four business weeks. Gaussmeter availability is in four to six weeks.

Probe Calibration Methodology

The National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS), no longer provides magnetic calibration services. However, this service, using Nuclear Magnetic Resonance, a technology similar to the one used by NBS, is provided by F.W. Bell for calibrating its reference magnets, gaussmeter probes and Hall generators.

The measurements are made by immersing material containing nuclei, of a known gyromagnetic ratio, in the steady field to be measured. By means of surrounding coils, the sample is subjected to an alternating magnetic field at right angles to the steady field.

The frequency of the alternating field is adjusted to equal the resonant frequency of the nuclei in the sample. This frequency is directly proportional to the intensity of the steady field, and there is an absorption of energy from the exciting circuit by the sample. The unknown field is then calculated by the following equation:

When	Then
B = the unknown field	$B = 2 (f/yp)$
f = frequency of the induced alternating field	
yp = the known gyromagnetic constant	

This NMR technique is used to regularly calibrate our top echelon 3 kG transverse magnets and rotating coil Gaussmeters which are then used for calibration of all transverse and axial gaussmeter probes and Hall generators.

The top echelon 3 kG magnet and rotating coil gaussmeters are used to calibrate Hall effect gaussmeters and probes. The gaussmeter and probe are then used to calibrate our reference magnets.

This procedure ensures accurate, traceable calibration.

Documentation:

Certificate of Calibration

This document certifies that the primary standards used for calibration are traceable to the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS) or have been derived from accepted values of natural physical constants.

Gauss/Tesla-Meters

Certification of the reading at $B = 3$ kG with a factory-maintained probe of known error at 3 kG or with customer's probe.

Note: If the gauss/tesla-meter is to be used with a particular probe(s), best results are obtained when gauss/tesla-meter and probe(s) are calibrated together.

Gauss/Tesla-Meter Probes

Gauss/Tesla-Meter probe certification is performed at a reading of $B = 3$ kG with a factory-maintained gauss/tesla-meter of known error.

Reference Magnets

Customer-owned reference magnets can be sent to the factory for recertification of their flux density (valid for 12 months). A Certificate of Calibration is included with each new reference magnet at no extra charge (valid for 6 months).

Certificate of Compliance

This document certifies that all parts furnished on an order are in accordance with the specifications in the detailed drawings called for in the purchase order. This is a no charge option available for most F. W. Bell products.

Probe Linearity Deviation Curves

These are graphs plotting the deviation of the output, in percent of readings, vs. the appropriate input quantity. (Standard linearity deviation curves are available for the Gauss/Tesla-Meters only).

The graph plots the deviation of the output vs. the magnetic flux density, B . $B = +10$ kG or $+30$ kG, as applicable.

Probe Temperature Deviation Curves

These graphs plot the deviation of the output (in gauss) vs. temperature. The temperature range is -10°C to $+60^{\circ}\text{C}$. $B = 5$ kG or 10 kG, as applicable unless specified otherwise by the user. The curve is run on the "bare" Hall generator prior to encapsulation in the probe stem.

Special Tests

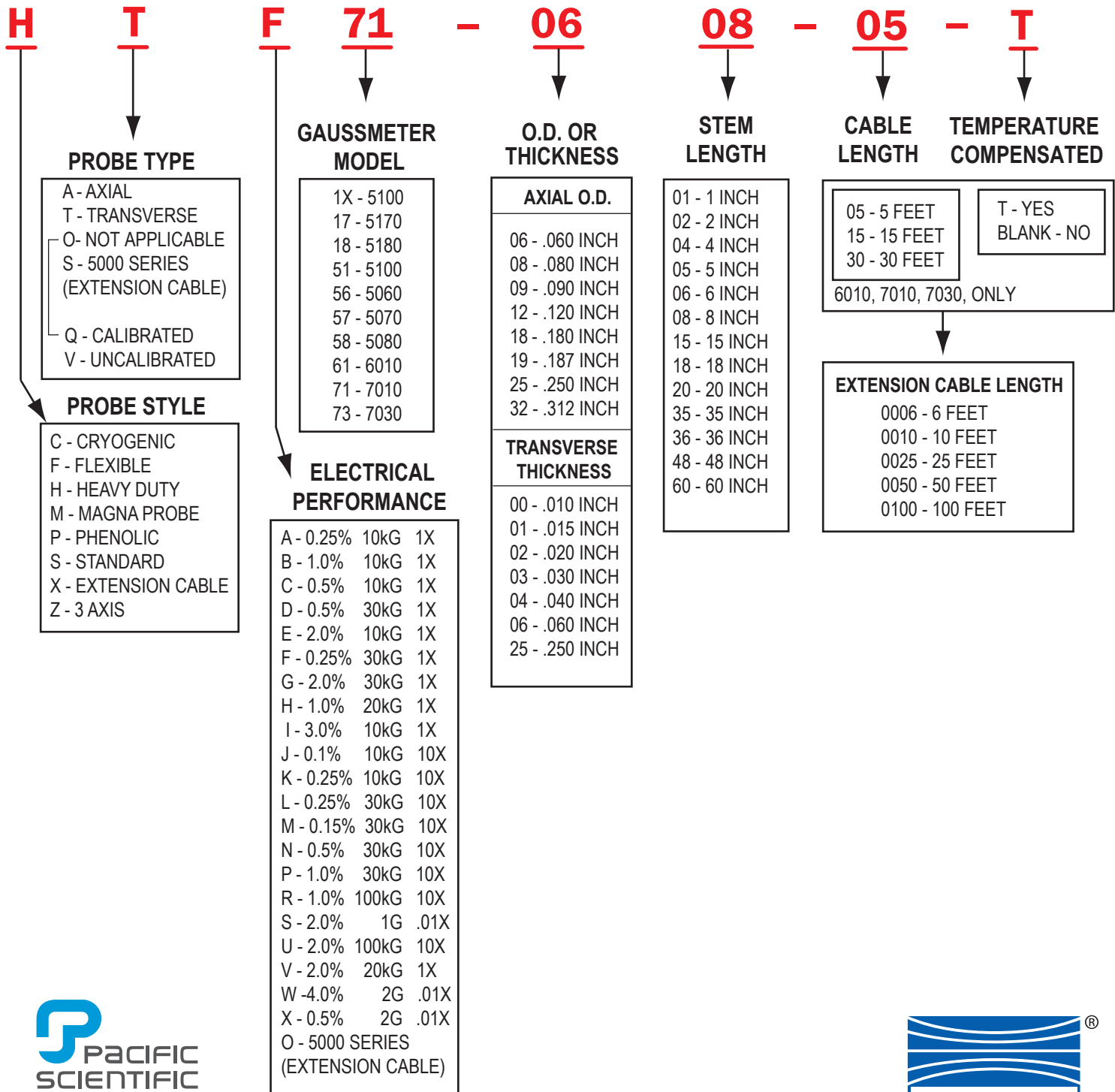
Almost any parameter of any device can be tested and documented for a customer. Contact the factory for details of test conditions, methods of accuracy, and prices.

Gaussmeter Probe Model Number Chart

Each probe model is designated with an alphanumeric model number. The chart below shows the significance of each letter and numeral. The probes are assembled and calibrated at the factory to match the input characteristics of each Gaussmeter.

Note – Not all variations are available for each meter. (The chart below is intended to provide insight on F.W. Bell part number derivation and is not intended to be a customer order form. Only the probes that are listed within this catalog are available for customer purchase).

Probe Model: **HTF71-0608-05-T**



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