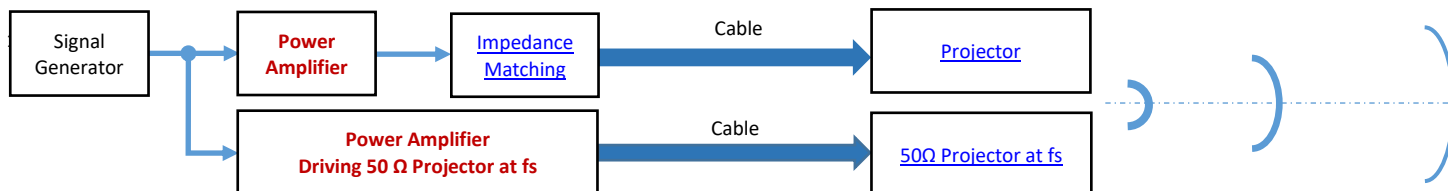


BII5060 Series Power Amplifier

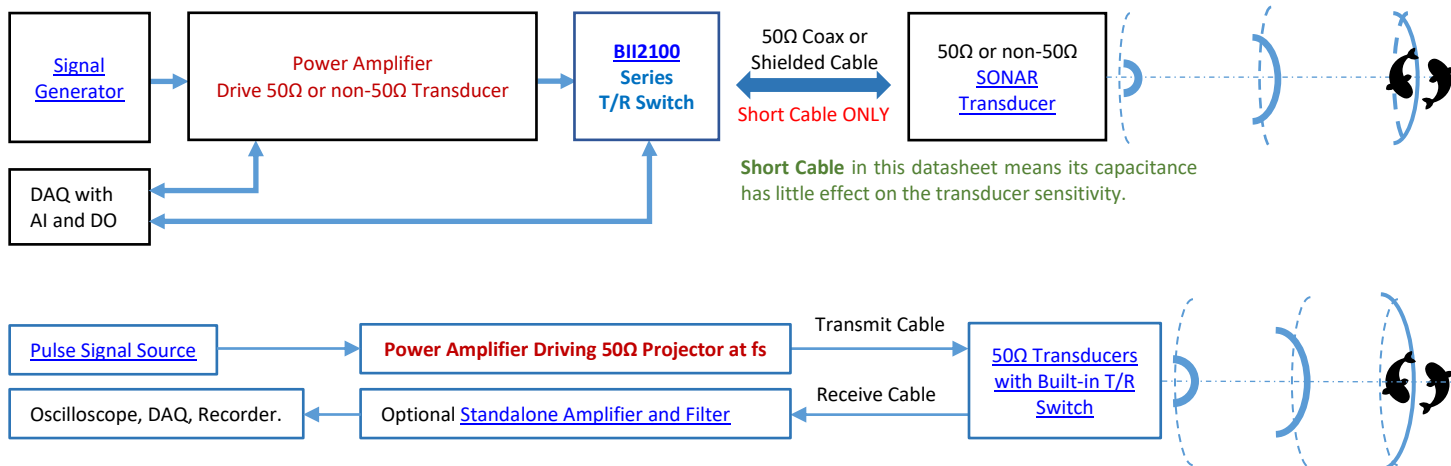
Engineered for the precise excitation of piezoelectric transducers over the 135 Hz to 100 kHz frequency range, these linear power amplifiers deliver the high output power, low distortion, and wide bandwidth required by demanding underwater acoustic systems, including SONAR, echo sounding, sub-bottom profiling, underwater communications, positioning system, bioacoustics, noise and acoustic target simulation, and High-Intensity Focused Ultrasound (HIFU).

SYSTEM CONFIGURATION

(a) Transmitting Sounds.



(b) Transmitting and Receiving Sounds.



Related Product:

Underwater Transducer : SONAR, NDT, and HIFU.	Impedance Matching between Transducers and Amplifiers.
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APPLICATIONS

SONAR, Sub-bottom Investigation, Echo Sounding	Phantom Echo Generation, Phantom Clicks, Sound Playback, Bioacoustics, Acoustic Deterrent
Navigation, Obstacle Avoidance, Inspection and Survey	Communication, Modem, Beacon, Positioning, Chirp, FSK, PSK and Spread Spectrum System

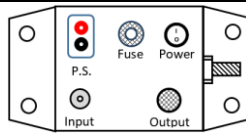
Which Power Amplifier, Linear or Switching, Is Suitable to Drive Piezoelectric SONAR, HIFU, and NDT Transducers?

Parameter	Linear Power Amplifier	Switching Power Amplifier
Input Signal:	Analog Voltage Signals from Analog Output or D/A Converter.	Digital Voltage Signals from Digital Outputs.
Output Signal:	Analog Signals: SINE, SINE Pulse, Chirp/FM, FSK, PSK, Spikes, etc.	Pulse Signals: Square Signal, Spikes, Single Pulse, etc.
Power Efficiency:	$\eta \leq 70\%$	$\eta \geq 90\%$
Power Capacity:	High Power with Heavy Bulky Physical Size.	High Power with Light Small Physical Size.
Air-Flow Cooling:	Forced-air Fan is necessary in high power CW applications.	Not necessary in most high-power applications.
Harmonics:	None or very low.	Odd frequency Harmonics.
	Impedance matching device, Piezoelectric transducers and Air/water/Solids are bandpass filters which attenuate specific signals.	

ABSOLUTE MAXIMUM RATINGS

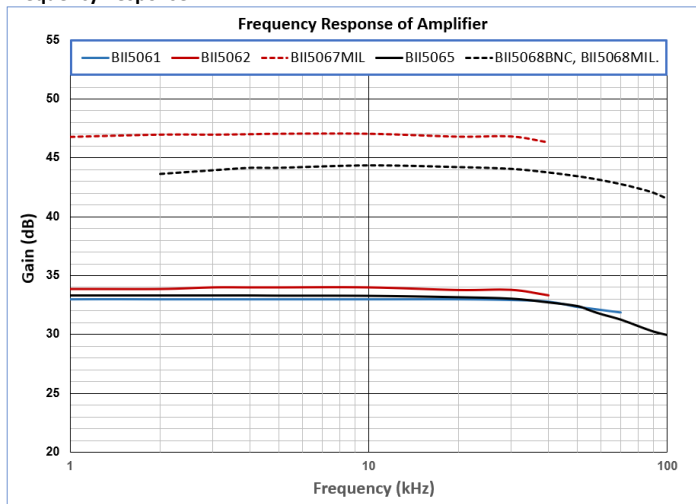
Power Amplifier	BII5062	BII5061, BII5065.	BII5067MIL	BII5068BNC, BII5068MIL.
DC Supply Voltage:	+60 VDC	+60 VDC	+60 VDC	+60 VDC
Input Voltage:	10 Vpp	10 Vpp	10 Vpp	10 Vpp
Output Peak Current:	20 A	10 A	4.5 A	3.2 A

SPECIFICATIONS

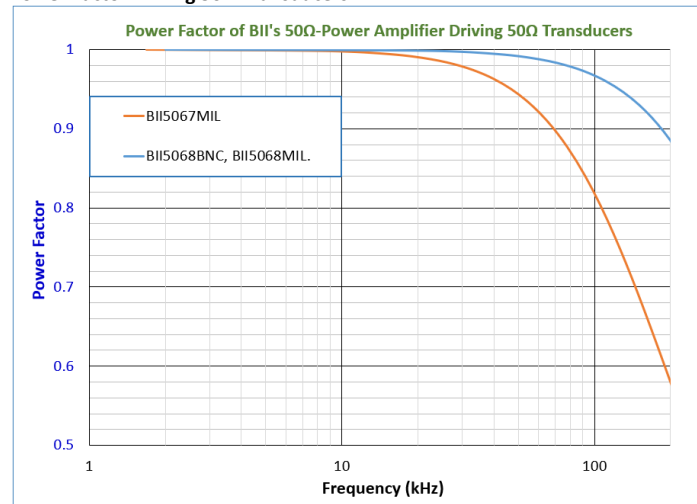
	BII5062	BII5061	BII5065	BII5067MIL	BII5068BNC, BII5068MIL
Power Amplifier					
Status:	ACTIVE	LIFEBUY	ACTIVE	ACTIVE	ACTIVE
	ACTIVE: Product device recommended for new designs. LIFEBUY: BII has announced that the device will be discontinued, and a lifetime-buy period is in effect. OBSOLETE: BII has discontinued production of the device.				
Waterproof:	Not waterproof. Always use the device in Dry Air for electrical safety.				
Power Bandwidth: (-3dB)	135 Hz to 40 kHz	135 Hz to 90 kHz	135 Hz to 90 kHz	1.7 to 40 kHz	2 to 70 kHz
	Warning: DO NOT operate the device at frequencies lower than the minimum frequency stated above to avoid performance degradation and device damage.				
Signal Type:	SINE Pulse/Burst, Chirp/FM, FSK and PSK, Arbitrary Waveform, Spread Spectrum, Marine Animal Sound, Continuous Signals, etc.			Pulse Signal Only: Duty Cycle D ≤ 25%, Pulse Duration PD ≤ 10 Seconds.	
	197 + η + DI	194 + η + DI	194 + η + DI	197 + η + DI	194 + η + DI
	in dB re μPa at 1m. DI: Directivity Index (dB) of Transducer, η: Transducer Efficiency, in dB.				
	η of broadband planar transducers such as NDT Transducers could be ≤ -5dB, η of broadband spherical or cylindrical transducers could be ≥ -0.5dB.				
	For low and medium frequency (large size) cylindrical and spherical transducer, η ≥ 0.85.				
Source Level Capability: (dB re μPa at 1m)	Sound Level SL of BII5061, BII5065, and BII5068BNC (BII5068MIL): SL ≈ 193.5 dB at η = 0.9 (or -0.46 dB), DI = 0 dB (cylindrical or spherical transducers). SL ≈ 201.5 dB at η = 0.4 (or -4.0 dB), DI = 11.5 dB (typical directional communication transducers without side lobes). SL ≈ 216.8 dB at η = 0.3 (or -5.2 dB), DI = 28 dB (typical echo sounding directional transducers with -3dB Beam Angle of 6° to 8°). Sound Level SL of BII5062 and BII5067MIL: SL ≈ 196.5 dB at η = 0.9 (or -0.46 dB), DI = 0 dB (cylindrical or spherical transducers). SL ≈ 204.5 dB at η = 0.4 (or -4.0 dB), DI = 11.5 dB (typical directional communication transducers without side lobes). SL ≈ 219.8 dB at η = 0.3 (or -5.2 dB), DI = 28 dB (typical echo sounding directional transducers with -3dB Beam Angle of 6° to 8°).				
Operating Mode:	Linear				
Impedance Matching:	None	None	None	Built-in Impedance Matching.	
Gain:	34 dB or x50	32.5 dB or x42	34 dB or x50	47 dB or x223.6	44 dB or x158
Input Type:	Single ended				
Input Connector:	On-board	On-board	On-board	BNC Jack	BNC Jack
Input Impedance:	20 KΩ 7 pF				
Maximum Input Level:	Maximum Output Level/Gain, or 2 Vpp, whichever is less.				
Output Type:	Differential	Differential	Differential	Single ended	Single ended
Output Impedance Zo:	Zo = -j0.6773/f, in Ω. f: Operating Frequency, in kHz. For example, Zo of BII5068BNC = j1.3 Ω at 10 kHz.			Zo = j0.35*f, in Ω.	Zo = j0.13*f, in Ω.
Output Connector:	On-board	On-board	On-board	MIL-5015 Connector, Socket.	BNC Jack, or MIL-5015 Connector Socket.
Voltage Output:	Vo ≤ 2*Supply Voltage Vs – 16, in Vpp.			Vo ≤ 4.47*(2*Vs – 16), in Vpp.	Vo ≤ 3.16*(2*Vs – 16), in Vpp.
Current Output:	Io ≤ 20 A peak	Io ≤ 10 A peak	Io ≤ 10 A peak	Io ≤ 4.47 A peak	Io ≤ 3.16 A peak
Load:	≥ Vo/Io	≥ Vo/Io	≥ Vo/Io	50Ω Transducers	
Shut-down Control:	On-board ON/OFF Switch: Manually or Digitally			None	
Shut-down Switch:	OFF Position: Output Enabled. Operates normally. DIO Position: TTL/CMOS Logic High: Output Enabled. TTL/CMOS Logic Low: Output Disabled.			N/A	
Stand-by Control Voltage: (Shutdown)	TTL/CMOS Compatible. Logic Low "0": Output Disabled. Logic Low "0": 0 to +0.8 VDC. Logic High "1": Output enabled. Logic High "1": +2.4 VDC to Vs.			N/A	
Output Disable Time:	1 μS				
Output Enable Time:	3 μS				
RMS Power Capability: (SINE Signal)	415W@+58VDC. 315W@+48VDC. 195W@+36VDC. 75W @+24VDC.	208W@+58VDC. 158W@+48VDC. 98W @+36VDC. 38W @+24VDC.	208W@+58VDC. 158W@+48VDC. 98W @+36VDC. 38W @+24VDC.	415W@+58VDC. 315W@+48VDC. 195W@+36VDC. 75W @+24VDC.	208W@+58VDC. 158W@+48VDC. 98W @+36VDC. 38W @+24VDC.
Power Efficiency: (Operating at Iomax)	Driving Tuned Transducers (Resistive load): 67% at +58 VDC. 64% at +48 VDC. 60% at +36 VDC. 50% at +24 VDC. Driving Untuned Transducers: Power Efficiency of driving tuned transducers*cosθ. θ: Impedance Phase of Untuned Transducers.				
DC Supply Voltage Vs:	+8 to +58 VDC Warning: DC Supply voltage greater than MAXIMUM RATINGS will damage the devices.				
DC Supply Current Is: (at Maximum Power)	14.2 A.	7.1 A.	7.1 A.	14.2 A.	7.1 A.
	DC Supply Current of Pulsing Signals:				

	When a device works with pulsing signals such as SINE pulse or voltage spikes, the DC current from DC power supply is much less than the rating. $Current = Rated\ DC\ Supply\ Current * \sqrt{D}$. D: Duty Cycle of the pulsing signal = Pulse Width / Period. For example: BII5065 drives a transducer with SINE pulse whose D = 1%, DC current from DC power supply $I_s = 7.1A * \sqrt{0.01} = 0.71A$.				
Suggested DC Supply:	Marine Battery, Automobile Battery, or DC Power Supply with Grounded Output and Protection of Output Current Limit. Fully charged 12V Automobile or Marine Battery are from 12.6 to 14.4 VDC. Ensure that voltage of battery pack is less than maximum DC supply voltage.				
Quiescent Current:	Active: 104 mA Shutdown: 27 mA	Active: 59 mA Shutdown: 24 mA	Active: 59 mA Shutdown: 24 mA	104 mA	59 mA
DC Supply Connector:	On-board	On-board	On-board	Sheathed Banana Jack	
Fuse:	None	None	None	Installed	Installed
Accessory Cable:	6" or 0.15m wires	6" or 0.15m wires	6" or 0.15m wires	1. DC Power Supply Cables: DCBP18 .	
Cable Connector:	Wire Leads	Wire Leads	Wire Leads	2. Grounding Cable: GWL18 .	
Package:	Rectangular PCB	Round PCB	Rectangular PCB	Metal Enclosure	
Grounding Terminal:	N/A	N/A	N/A	Grounding Stud #10-24.	
Mounting Hole:	6x4.87mm (Φ0.192")	4xΦ4.87mm (Φ0.192")	4xΦ4.87mm (Φ0.192")	4 x Φ5.5mm (Φ0.217")	
Size LxWxH (mm):	139.7x95.25x46.5	ΦDxH=Φ101.6x50.8	112x69x46.5	254.2x147.7x94	231x120x75
Weight in Air:	0.4 kg	0.2 kg	0.225 kg	2.2 kg	1.8 kg
Operating Temperature:	-20 to 70°C or -4 to 158°F				
Storage Temperature:	-20 to 70°C or -4 to 158°F				
Note: Forced-air cooling by a fan is recommended to cool down the amplifier (PCB Package) during service of full power and continuous waveform.					
WARNING: The buyer should observe the National Electrical Code or other related codes of buyer's country to assemble and integrate this device into buyer's product or system and follow the code to ground and insulate this device. It is buyer's sole responsibility to make sure the proper insulation and grounding for operating safety before putting the device into service.					

Frequency Response

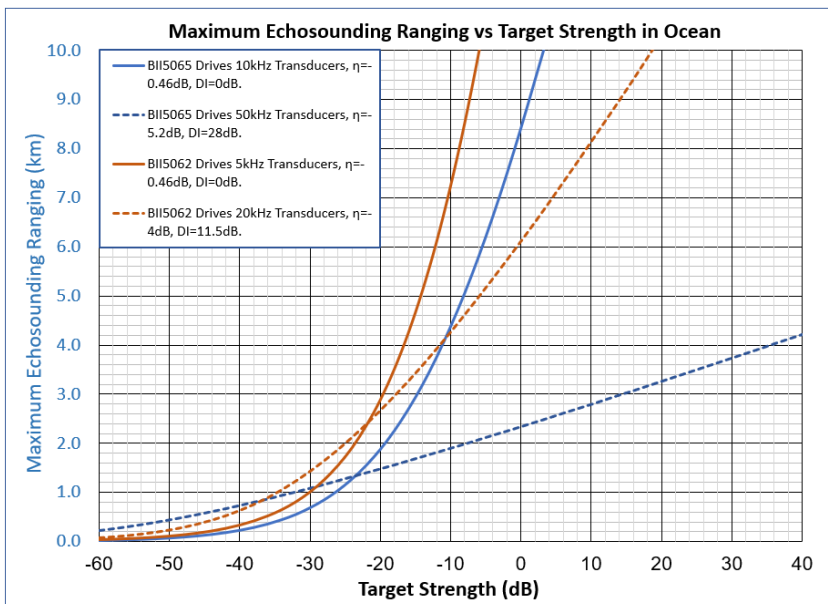


Power Factor Driving 50Ω Transducers



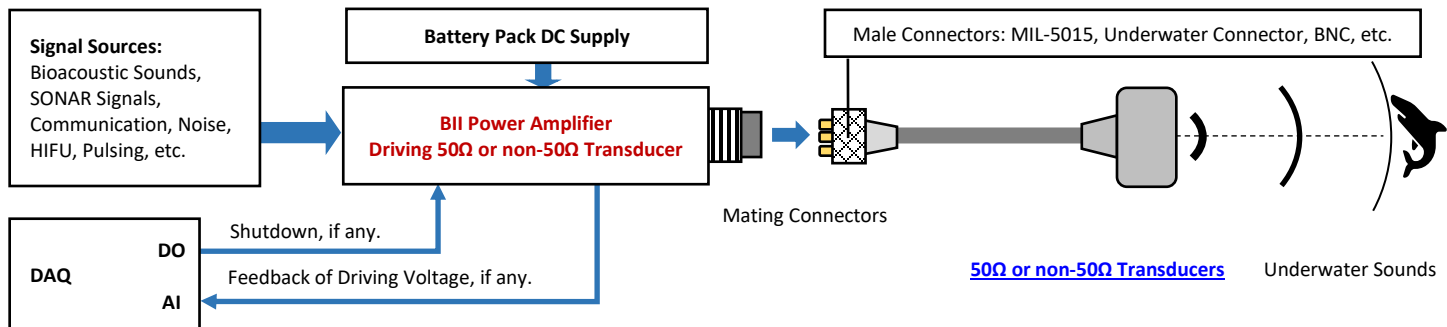
Echo Sounding Range in Water (Communication Range = 2 * Echo Sounding Range at 0dB Target Strength)

BII5061, BII5068BNC, and BII5068MIL have same performance as BII5065 on Echo Sounding Range in Water;
BII5067MIL has same performance as BII5062 on Echo Sounding Range in Water.

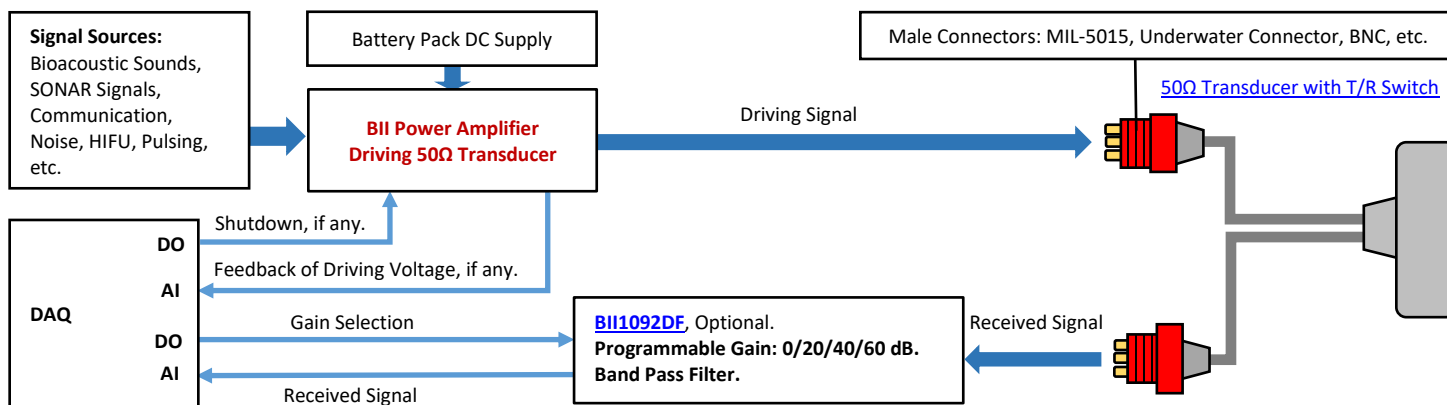
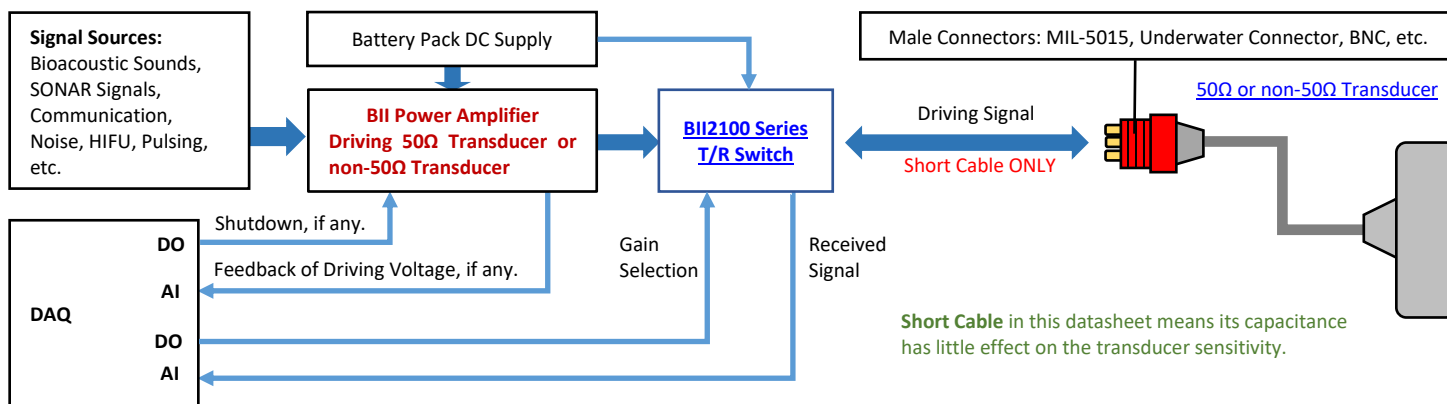


Acoustic System Block Diagram

1. Generate Sounds and Waves.



2. Transmitting and Receiving Sounds and Waves



Are 50Ω Power Amplifiers suitable to drive non-50Ω transducers?

- (1) If the impedance of a transducer is greater than 50 Ω at operating frequency, the 50Ω Power Amplifiers can drive this non-50Ω transducer, but the power delivered to non-50Ω transducer is reduced.
- (2) A 50Ω Power Amplifier should NOT drive a transducer whose impedance is less than 50Ω. The power amplifier is most likely to be damaged by overvoltage, exceeding rated power or overheating.

How do I connect the BII Power Amplifier wires to my devices?

WARNING: HIGH VOLTAGES MAY BE PRESENT AT THE OUTPUT OF THIS UNIT. DO NOT TOUCH THE DEVICE, ITS WIRES, CABLES, AND CONNECTORS BEFORE THE POWER SUPPLIES AND SIGNAL SOURCES ARE SHUT DOWN.

- 1. Wire Splicing Methods: Soldering or Crimp.**
- 2. Proper Insulation for Safety:** All exposed bare wires, metal wires, wire leads, solders, and joints are insulated with insulation material such as heat shrink tubing, fully insulated wire splice connector, etc. The insulation voltage must be greater than twice the maximum voltage of the device.
- 3. Grounding the device** (including metal chassis and/or metal housing, cable shield, etc.) firmly for operation safety.

How to Extend Input and Output Wires of Power Amplifiers (PCB Package for Embedded Applications.)?

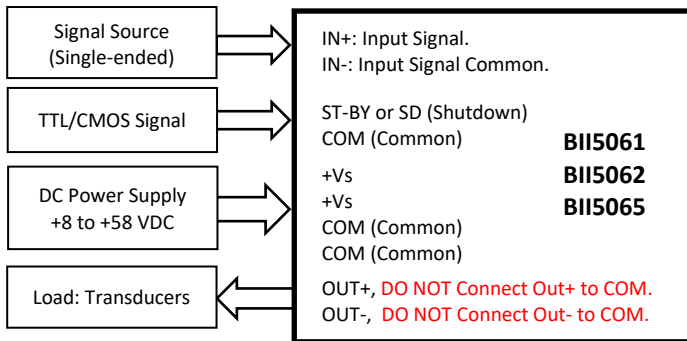
Input and output wires of BII PA (PCB Package) are 0.15m (6") **AWG16** wires with wire leads.

- 1. Butt Splice Connectors, Fully Insulated.** Buyers shall refer to the instructions of the manufacturer to strip proper wire leads and crimp the connector for secure connection. If possible, **heat shrink tube** is recommended to sheath the splice and function as strain relief.
- 2. Banana Jack and Plug, Fully Insulated, Free Hanging (In-Line).** Crimp or solder. Crimp is recommended.

Note: a. by default, BII does NOT provide these connectors. If buyer needs connectors, please specify when ordering.

b. When wiring, please ensure insulation (avoid short circuit to damage the devices) and safety of operation.

SUGGESTED WIRING:



Configurations of ST-BY SWITCH (Shutdown SWITCH)		
OFF Position	DIO Position	
Output Enabled. Operates normally.	TTL/CMOS Logic High: Output Enabled.	TTL/CMOS Logic Low: Output Disabled.
When the Switch is open, the logic = "0" or low.		

WARNING:

Outputs of the Power amplifier are differential, DO NOT Connect Out + or Out - to COM.

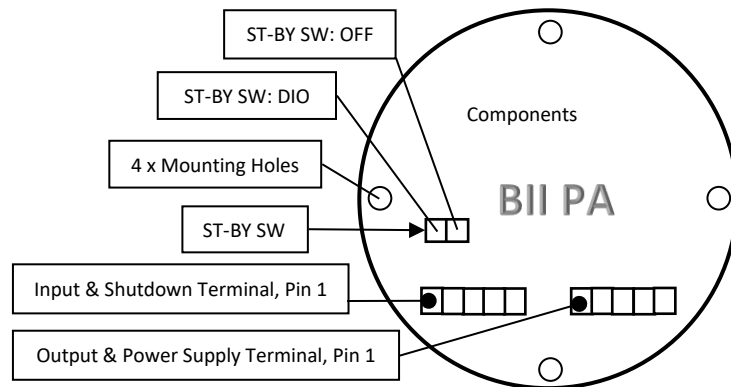
BII5061 TERMINALS and WIRINGS

Input and ST-by (Shutdown) Terminal

Pin 1: ST-BY (Shutdown)	White,	6" Wire
Pin 2: COM (Common)	Black,	6" Wire
Pin 3: IN+ (Input Signal)	Blue,	6" Wire
Pin 4: IN- (Input Common)	Yellow,	6" Wire
Pin 5: COM (Common)	Black,	6" Wire

Output and Power Supply Terminal

Pin 1: +Vs	Red,	6" Wire
Pin 2: +Vs	Red,	6" Wire
Pin 3: COM (Common)	Black,	6" Wire
Pin 4: OUT+	Blue,	6" Wire
Pin 5: OUT-	Yellow,	6" Wire



BII5062 TERMINALS and WIRINGS

Input and Shutdown (SD) Terminal

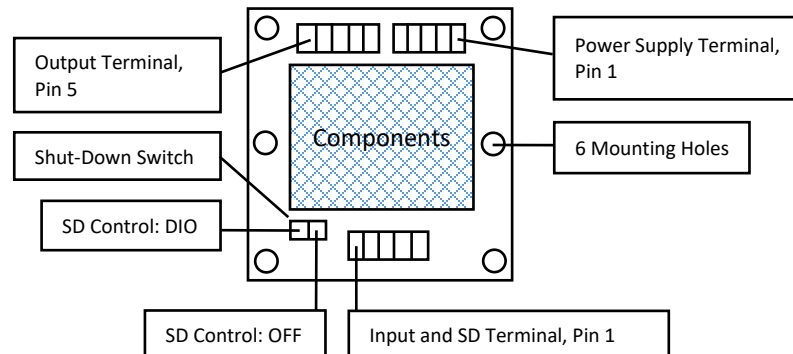
Pin 1: SD (Shutdown)	White,	6" Wire
Pin 2: COM (Common)	Black,	6" Wire
Pin 3: IN+ (Input Signal)	Blue,	6" Wire
Pin 4: IN- (Input Common)	Yellow,	6" Wire
Pin 5: COM (Common)	No Wire.	

Power Supply Terminal

Pin 1: +Vs	Red,	6" Wire
Pin 2: +Vs	Red,	6" Wire
Pin 3: COM (Common)	Black,	6" Wire
Pin 4: COM (Common)	Black,	6" Wire
Pin 5: COM (Common)	No Wire.	

Output Terminal

Pin 1: COM (Common)	No Wire.	
Pin 2: OUT-	Yellow,	6" Wire
Pin 3: OUT-	Yellow,	6" Wire
Pin 4: OUT+	Blue,	6" Wire
Pin 5: OUT+	Blue,	6" Wire



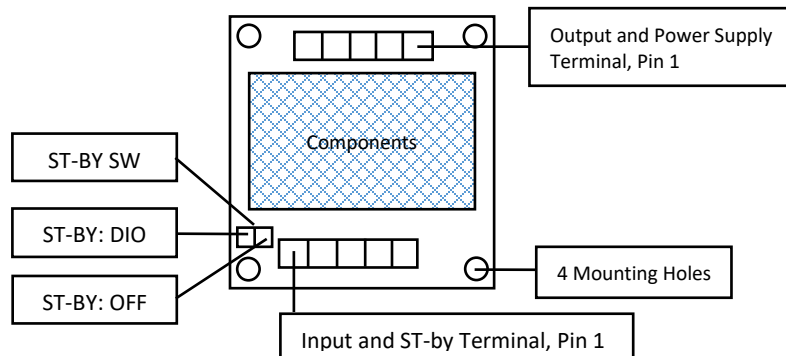
BII5065 TERMINALS and WIRINGS

Input and ST-by Terminal

Pin 1: ST-BY (Shutdown)	White,	6" Wire
Pin 2: COM (Common)	Black,	6" Wire
Pin 3: IN+ (Input Signal)	Blue,	6" Wire
Pin 4: IN- (Input Common)	Yellow,	6" Wire
Pin 5: COM (Common)	Black,	6" Wire

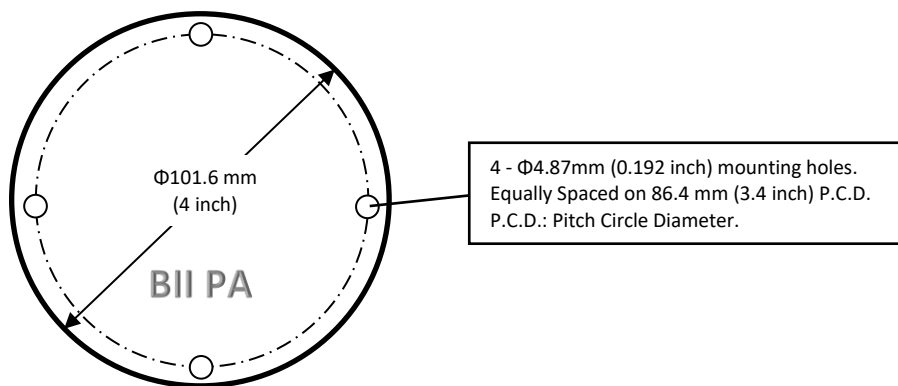
Output and Power Supply Terminal

Pin 1: +Vs	Red,	6" Wire
Pin 2 ⁽¹⁾ : +Vs	Red,	6" Wire
or COM (Common)	Black,	6" Wire
Pin 4: COM (Common)	Black,	6" Wire
Pin 4: OUT-	Blue,	6" Wire
Pin 5: OUT+	Yellow,	6" Wire

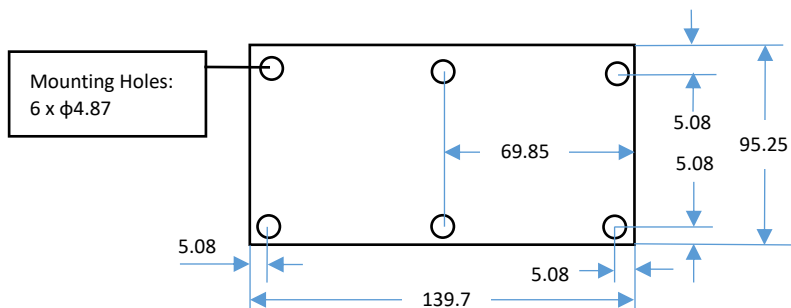


Note⁽¹⁾: The Pin 2 is +Vs if its wire is Red, or COM (Common) if its wire is black.

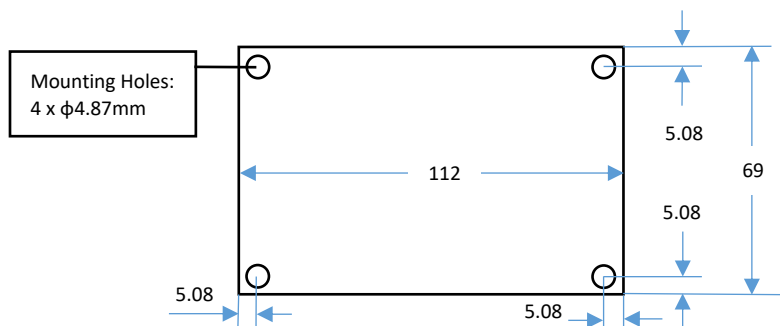
BII5061 Physical Size (unit mm): $\Phi D \times H = \Phi 101.6 \times 50.8 \text{ mm}$



BII5062 Physical Size (unit: mm): $L \times W \times H = 140 \times 95.25 \times 46.5 \text{ mm}$ or $5.5'' \times 3.5'' \times 1.83''$



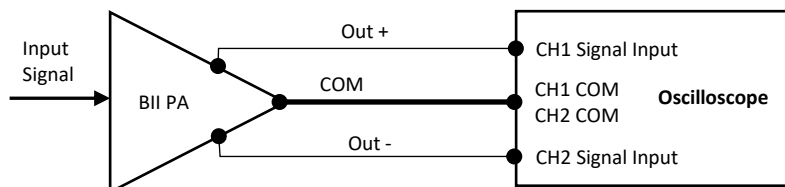
BII5065 Physical Size (unit: mm): $L \times W \times H = 112 \times 69 \times 46.5 \text{ mm}$



How to Order

Example of Part Number:	Description
BII5061	BII5061, Linear Power Amplifier.
BII5062	BII5062, Linear Power Amplifier.
BII5065	BII5065, Linear Power Amplifier.

Measure Differential Output of BII Power Amplifiers



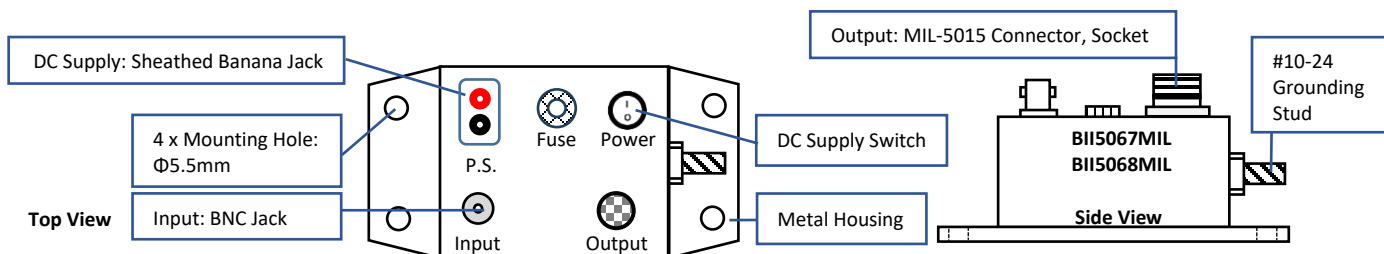
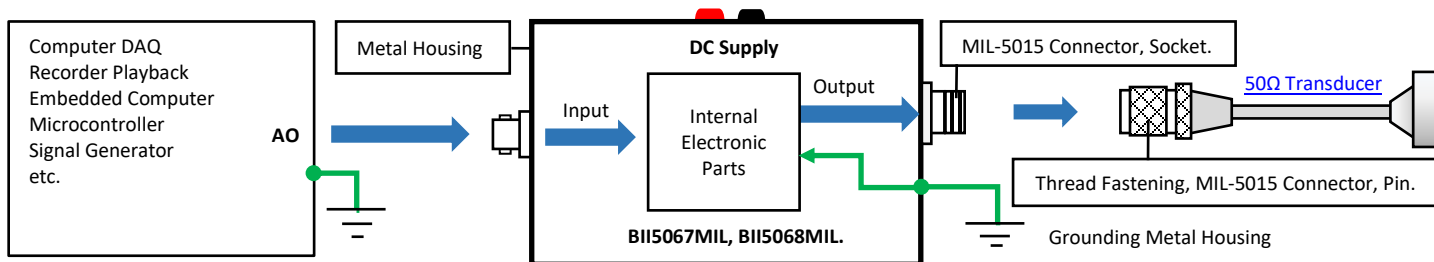
Warning: Outputs of the Power amplifier are differential,
DO NOT Connect Out + or Out - to any COM.

BII5067MIL and BII5068MIL

Output Connector: MIL-5015 Connector, Socket. Mounting Hole $\Phi 5.5\text{mm}$ ($\Phi 0.217''$) accepts M5 or #10 screw. Screws are not supplied.

BII5067MIL Metal Enclosure, Overall Size: LxWxH = 254.2x147.7x82 mm.

BII5068MIL Metal Enclosure, Overall Size: LxWxH = 231.0x120.0x75 mm. **Note: BII5068MIL is phasing out and active part number is [BII5068BNC](#).**

**System Block Diagram and Wirings: Driving 50 Ω Transducer with MIL-5015 Connector, Pin.**

Buyer's Signal Source	BII5067MIL, BII5068MIL.		Buyer's 50 Ω Transducer
	Input: BNC Jack	Output: MIL-5015 Connector, Socket.	Cable + In-line MIL-5015 (Pin)
Analog Output	Signal: Center Contact	Output Signal: Socket C	Signal: Pin C
Analog Common	Grounded Common: Body	Common: Socket B	Common: Pin B
		Grounding: Socket A	Grounding: Pin A
DC Power Supply:	Red Sheathed Banana Jack: +VDC. Black Sheathed Banana Jack: Common of the DC Power Supply.		
DC Supply Switch:	Turn ON and Turn OFF DC Supply. "I" -> ON; "O" -> OFF.		
Fuse:	BII5067MIL, 15A, 250VAC, Slow-Blow, 3AB, 3AG, 1/4" x 1-1/4".		
	BII5068MIL, 8A, 250VAC, Slow-Blow, 3AB, 3AG, 1/4" x 1-1/4".		
Accessories Included:	1. Two DC supply cables, Part Number: DCBP18. 2. One Grounding Cable, Part Number: GWL18.		
Grounding Metal Case for operating safety.	Grounding Stud: #10-24 Screw 316SS. Nut and Washer are included.		
1. Install the device on a safe solid object to avoid sliding. An air free-flowing area and good thermal conducting object allow the device to cool down.			
2. Never use the device in the event of slide happening, otherwise, loss of the device into water, property damage, and person injury may occur.			

How to Order

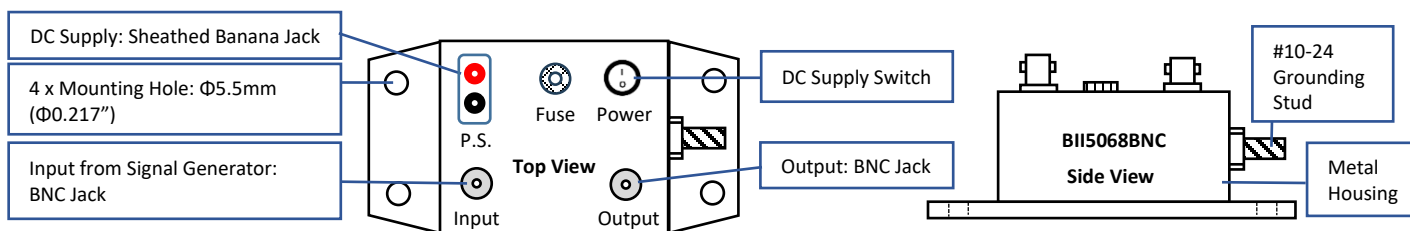
BII5067MIL, BII5068MIL	-Adaptor Accessory
Example of Part Number:	Description
BII5067MIL	BII5067MIL, Linear Power Amplifier.
BII5068MIL	BII5068MIL, Linear Power Amplifier.
BII5067MIL-MIL-UMC	BII5067MIL, Linear Power Amplifier with Adaptor Accessory: MIL-UMC.
BII5068MIL-MIL-SUMC	BII5068MIL, Linear Power Amplifier with Adaptor Accessory: MIL-SUMC.

Customer's Question: What if the connector of my transducer/projector is NOT MIL-5015 Connector with Pins?

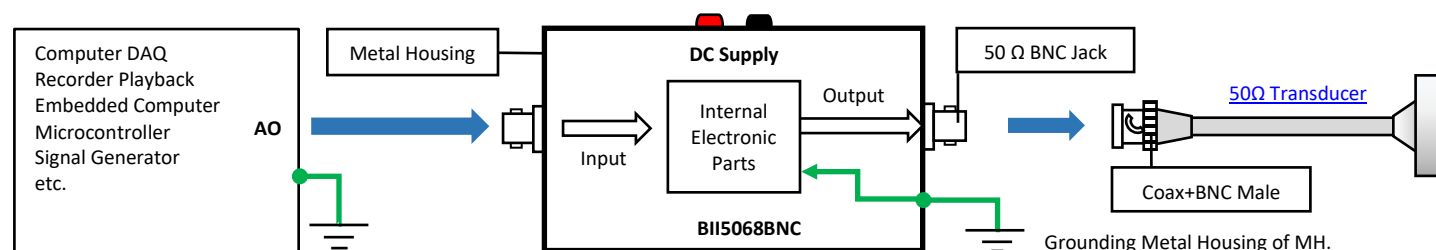
BII Answers: Buyer may order a MIL-5015 Connector (Pins) from BII to replace original transducer connector or use it as a component of the connector adaptor. MIL-5015 Connector has solder contacts. Buyer may also order the connector from local electronic distributors in buyer's country. For example, if you have a transducer with Underwater connector (pin), you may make a connector adaptor from MIL-5015 (pin) to Underwater connector (Socket). BII may make this connector adaptor as accessory of the device. Please discuss with BII for customizations.

BII5068BNC.

Output Connector: BNC Jack. Metal Enclosure, Overall Size: LxWxH = 231x120x75mm. Mounting Hole $\Phi 5.5\text{mm}$ ($\Phi 0.217''$) accepts M5 or #10 screw. Screws are not supplied.



System Block Diagram: Driving 50 Ω Transducer with BNC Male.



Buyer's Signal Source	BII5068BNC		50Ω Transducer
	Input: BNC Jack	Output: BNC Jack	Coax + In-line BNC (Male)
Analog Output	Signal: Center Contact	Output Signal: Center Socket.	Signal: Center Pin.
Analog Common	Grounded Common: Body	Grounded Common: Body.	Grounded Common: Body.
DC Power Supply:	Red Sheathed Banana Jack: +VDC. Black Sheathed Banana Jack: Common of the DC Power Supply.		
DC Supply Switch:	Turn ON and Turn OFF DC Supply.		
Fuse:	8A, 250VAC, Slow-Blow, 3AB, 3AG, 1/4" x 1-1/4".		
Accessories included:	1. Two DC supply cables, Part Number: DCBP18 . 2. Included: One Grounding Cable, Part Number: GWL18 .		
Grounding Metal Case for operating safety.	Grounding Stud: #10-24 Screw 316SS. Nut and Washer are included.		
1. Install the device on a safe solid object to avoid sliding. An air free-flowing area and good thermal conducting object allow the device to cool down. 2. Never use the device in the event of slide happening, otherwise, loss of the device into water, property damage, and person injury may occur.			

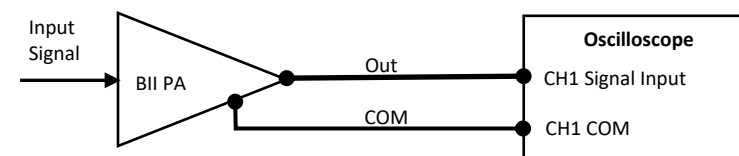
How to Order

Example of Part Number:	Description
BII5068BNC	BII5068BNC, Linear Power Amplifier, Driving 50 Ω Transducer.

Customer's Question: What if the connector of my transducer/projector is SMA or SMC Connector?

BII Answers: Buyer may order a BNC to SMA (or SMC) adaptor from local electronic distributors in buyer's country. BII may ship the adaptor as accessory of the device. Please discuss with BII for customizations.

Measure Single Ended Output of BII Power Amplifiers



Warning:

1. Outputs of the power amplifier is high voltage, choose suitable oscilloscope probe with correct attenuation and voltage rating.
2. for operating safety, ensure proper grounding, and shut down power supply of the device before handing the cables, wiring and hookup, etc.

DC Supply Cable Pair: Part Number **DCBP18**.

To Terminals of DC Supply:

- One Red 4mm Banana Plug.
- One Black 4mm Banana Plug.



Sheathed Banana Plug.
To sheathed Banana Jack
of Power Amplifier.

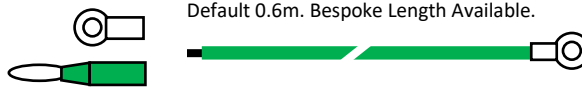


Two 0.6m DC supply cables. Red and Black. One end of the cable is wire-lead, another end is Sheathed Banana Plug. One pair banana plugs (Red and Black) are included. Depending on output terminals of buyer's DC Supply, buyer assembles Banana Plugs, or other type of connectors to DC supply cable at buyer's cost.

Grounding Cable and Terminals

Terminal to buyer's Grounding Terminal:

- a. Default: Wire Lead
- b. One #10 Ring Terminal
- c. One 4mm Banana Plug



Default 0.6m. Bespoke Length Available.

#10 Ring Terminal
#10-24 nut and #10
washer included.

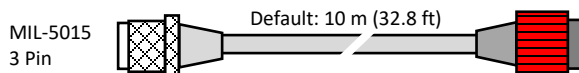


Grounding Cable, Part Number: **GWL18**, Support Single-Point Grounding with Multiple Devices.

One 0.6m AWG 18 Green Wire (or Green with a Yellow Stripe) with #10 Ring Terminal and Wire Lead. One #10 Ring Terminal and one 4mm Banana Plug (Green) are included. Depending on buyer's grounding terminal type, buyer assembles #10 Ring Terminal, 4mm Banana Plug, or other type of connectors to grounding cable at buyer's cost.

Adaptor Accessory:

Accessory A9: MIL-UMCF3S, MIL-5015 (3 Pins) to UMC3S (Underwater Connector, 3 Sockets, Locking Sleeve: DLSA-F, Size: $\Phi 35.5 \times 33.5$ mm)

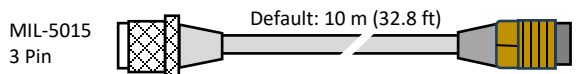


Default: 10 m (32.8 ft)

Underwater Connector, 3 Sockets.
Contact 2: Signal.
Contact 1: Common.
Contact 3: Shielding and Grounding.

Transducer with 3-Pin Underwater
Connector and DLSA-M Locking Sleeve.

Accessory A10: MIL-SUMC3S, MIL-5015 (3 Pins) to Small UMC3S (Underwater Connector, 3 Sockets, Thread Locking, Size: $\Phi 22 \times 28$ mm)

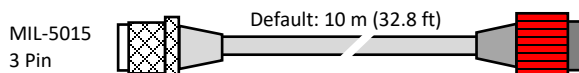


Default: 10 m (32.8 ft)

Underwater Connector, 3 Sockets.
Contact 2: Signal.
Contact 1: Common.
Contact 3: Shielding and Grounding.

Transducer with 3-Pin Underwater
Connector and MCDLS-F Locking Sleeve.

Accessory A11: MIL-UMCF2S, MIL-5015 (3 Pins) to UMC2S (Underwater Connector, 2 Sockets, Locking Sleeve: DLSA-F, Size: $\Phi 35.5 \times 33.5$ mm)

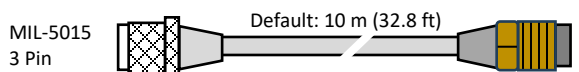


Default: 10 m (32.8 ft)

Underwater Connector, 2 Sockets.
Contact 2: Signal.
Contact 1: Common.

Transducer with 2-Pin Underwater
Connector and DLSA-M Locking Sleeve.

Accessory A12: MIL-SUMC2S, MIL-5015 (3 Pins) to Small UMC2S (Underwater Connector, 2 Sockets, Thread Locking, Size: $\Phi 22 \times 28$ mm)

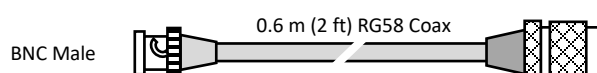


Default: 10 m (32.8 ft)

Underwater Connector, 2 Sockets.
Contact 2: Signal.
Contact 1: Common.

Transducer with 2-Pin Underwater
Connector and MCDLS-F Locking Sleeve.

Accessory A13: BNC-MIL3S, BNC Male (Pin) to MIL3S (MIL-5015 type 3-Socket Connector Thread Fastening)

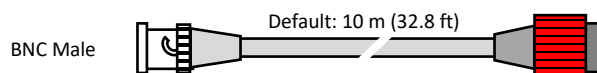


0.6 m (2 ft) RG58 Coax

MIL-5015 Connector, 3 Sockets.
Contact C or G: Signal.
Contact B: Common.
Contact A: Shielding and Grounding.

Transducer with 3-Pin MIL-5015
Connector.

Accessory A14: BNC-UMCF3S, BNC Male to UMC3S (Underwater Connector, 3 Sockets, Locking Sleeve: DLSA-F, Size: $\Phi 35.5 \times 33.5$ mm)

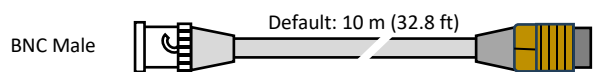


Default: 10 m (32.8 ft)

Underwater Connector, 3 Sockets.
Contact 2: Signal.
Contact 1: Common.
Contact 3: Shielding and Grounding.

Transducer with 3-Pin Underwater
Connector and DLSA-M Locking Sleeve.

Accessory A15: BNC-SUMC3S, BNC Male to Small UMC3S (Underwater Connector, 3 Sockets, Thread Locking, Size: $\Phi 22 \times 28$ mm)



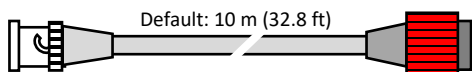
Default: 10 m (32.8 ft)

Underwater Connector, 3 Sockets.
Contact 2: Signal.
Contact 1: Common.
Contact 3: Shielding and Grounding.

Transducer with 3Pin Underwater
Connector and MCDLS-F Locking Sleeve.

Accessory A16: BNC-UMCF2S, BNC Male to UMC2S (Underwater Connector, 2 Sockets, Locking Sleeve: DLSA-F, Size: $\Phi 35.5 \times 33.5 \text{ mm}$)

BNC Male



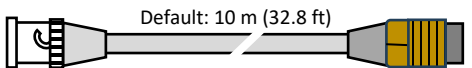
Underwater Connector, 2 Sockets.
Contact 2: Signal.
Contact 1: Common.



Transducer with 2-Pin Underwater Connector and DLSA-M Locking Sleeve.

Accessory A17: BNC-SUMC2S, BNC Male to Small UMC2S (Underwater Connector, 2 Sockets, Thread Locking, Size: $\Phi 22 \times 28 \text{ mm}$)

BNC Male



Underwater Connector, 2 Sockets.
Contact 2: Signal.
Contact 1: Common.



Transducer with 2-Pin Underwater Connector and MCDLS-F Locking Sleeve.

BII5067MIL (Sizes are in bracket), BII5068BNC (BII5068MIL) Metal Housings, Outline Dimensions (mm), Illustration only, the scale is not 1:1.

