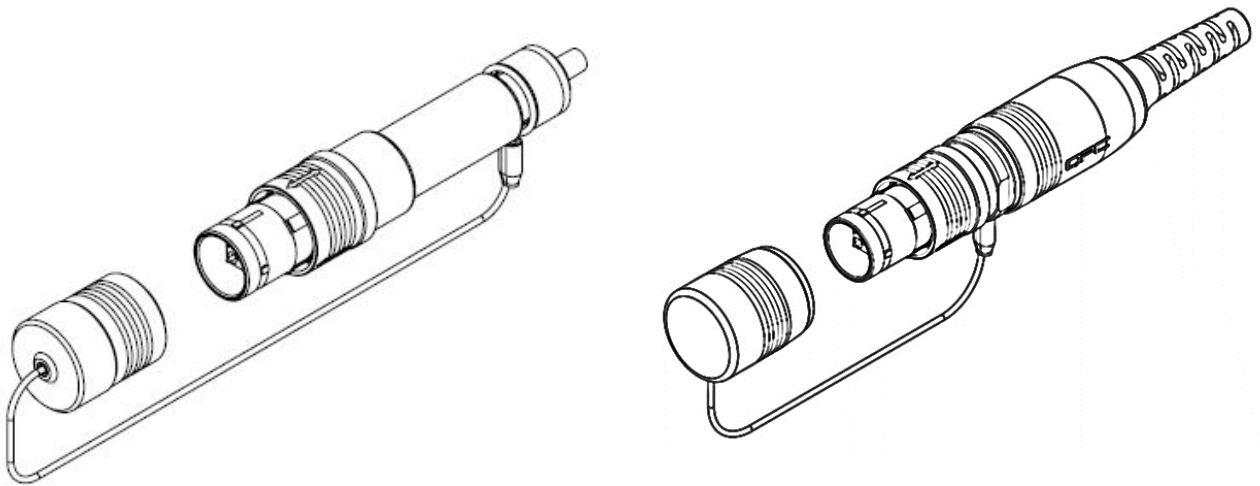


QSEAL PLUG CUSTOMER ASSEMBLY INSTRUCTIONS



DOCUMENT: CAI-QSP-01
REVISION: 0
REVISION DATE: 8/14/2019

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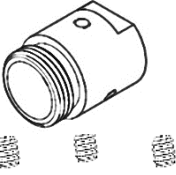


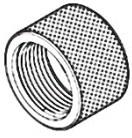


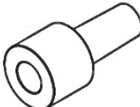

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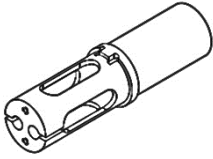



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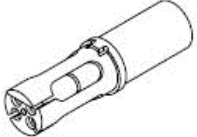
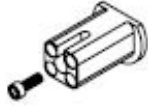

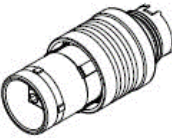
SCOPE

This document will describe the Assembly Instructions for the QPC QSeal Plug Connector in the 2-Channel and 4-Channel configurations.

MAIN COMPONENTS

			OPTIONAL METAL BACKSHELL	
				
BACKSHELL RUBBER GRIP w/ DUST COVER	STRAIN RELIEF & 3x SET SCREWS	CABLE SEAL	METAL BACKSHELL w/ DUST COVER	BACK NUT
				
CRIMP	CRIMP SUPPORT		BEND LIMITER	NYLON WASHER

2-CHANNEL PLUG			
			
SPACER	INSERT W/ SCREWS	TERMINI & SPRINGS	BODY ASSEMBLY

4-CHANNEL PLUG			
			
SPACER	INSERT W/ SCREW	TERMINI & SPRINGS	BODY ASSEMBLY

TOOL LIST

TK-060 QPC Cable and Connector Prep Tool Kit – (Equivalent tools may be used)	
PT-062	Miller Kevlar Scissors (Carbon Molybdenum & Vanadium Steel Blade)
PT-500	Precise-Control .050" Screwdriver (1.27mm) Hex
PT-501	Precise-Control Screwdriver, 1/16" Hex
PT-503	Precise-Control Screwdriver, 5/64" (2mm) Hex
PT-502	Precise-Control Screwdriver, 3/32" Hex
PT-504	Precise-Control Screwdriver, 2.5mm Hex
PT-505	Screwdriver, Number 1 Phillips, 6-3/4" Overall Length
PT-506	Dial Torque-Measuring Wrench, 3/8" Square Drive, 0 to 150in.-lbs. and 0 to 18NM Torque
PT-536	Crow's Foot Wrench Adjustable 3/8" Square Drive 0.0-1.125"(0-28.57mm)
PT-545	Crow's Foot Wrench Adjustable 1/2" Square Drive .236-1.771" (6-45mm)
PT-546	3/8" Female x 1/2" Male Square Drive Adapter, Chrome
PT-532	Long-Nose Pliers with Flat Jaws, Cushion Grip, 6-3/4" Overall, Manual Jaws with Wire Cutter
PT-599	Hex Bit Set, 5 pcs (.050", 1/16", 5/64", 3/32", 2.5mm) 1/4" Shank, Overall Length 2"
PT-590	Torque-Measuring Screwdriver, Hex Drive, 2.5 to 11.5 in.-lbs. Adjustable Torque
PT-591	4" Drill Press Vise with 2 x Machined Plastic Jaws with Groove
PT-415	Square Driver Strap Wrench

TK-050 QPC QSeal Tool Kit – (Equivalent tools may be used)	
PT-315	QSeal 4Ch Torque Fixture
PT-316	QSeal 2Ch Torque Fixture
PT-317	QSeal 2Ch and 4Ch Torque Fixture Stand
PT-540	Hydraulic Crimping Tool
PT-541	Die Set, 0.324 Hex, Hydraulic Hand Crimper

TORQUE TABLE

Component	Strain Relief	Backshell	Set Screw	Insert Screw
Torque Values	26 – 35 in-lb	57 – 62 in-lb	5 – 6 in-lb	3 – 4 in-lb
	3.0 – 4.0 N • m	6.5 – 7.0 N • m	.56 – .68 N • m	.34 – .45 N • m

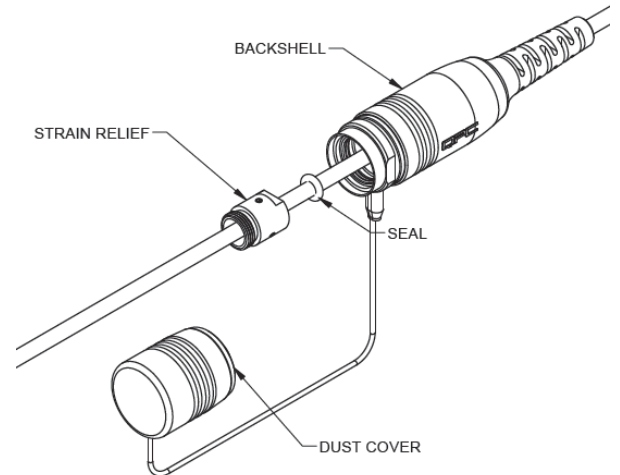
CABLE PREPARATION

Slide the components onto the cable in the following order as seen in the image to the right:

For Rubber Grip Backshell:

1. Backshell
2. Seal
3. Strain Relief

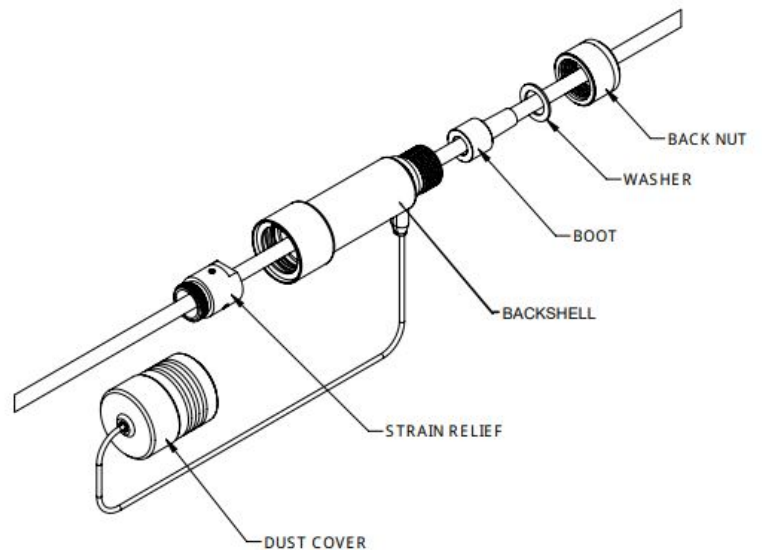
Note: The Strain Relief has 3 set screws loosely installed.



For Metal Backshell Option:

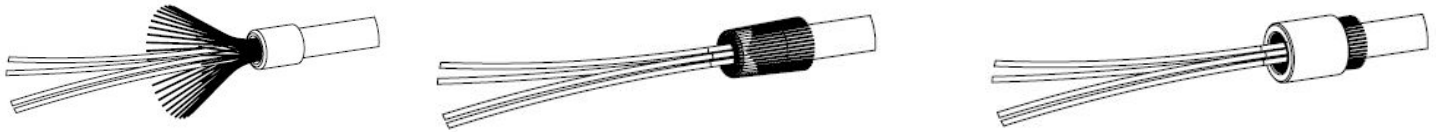
1. Back Nut
2. Nylon Washer
3. Bend Limiter
4. Backshell
5. Strain Relief

Note: The Strain Relief has 3 set screws loosely installed.



STRIP CABLE

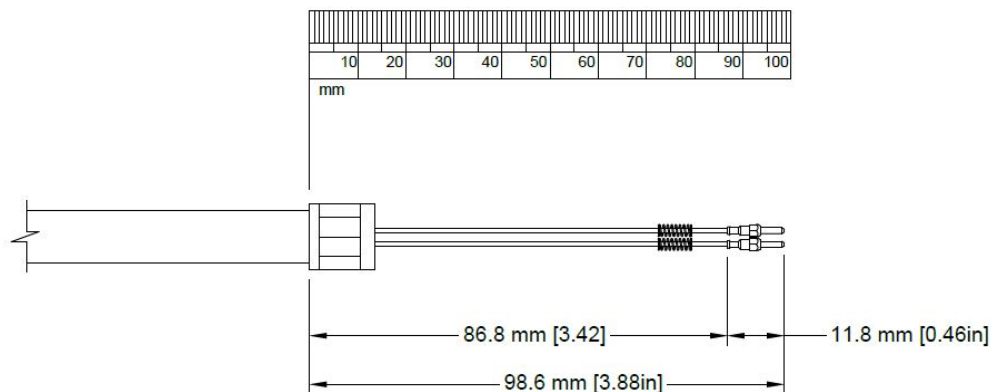
Strip cable jacket approximately 6" (152 mm) from end and place Crimp Support over fiber and Kevlar so that it stops at the end of the jacket. Bend Kevlar back over the Crimp Support. Slide second Crimp over Kevlar and Crimp Support and secure with tape for crimping after termination and polishing.



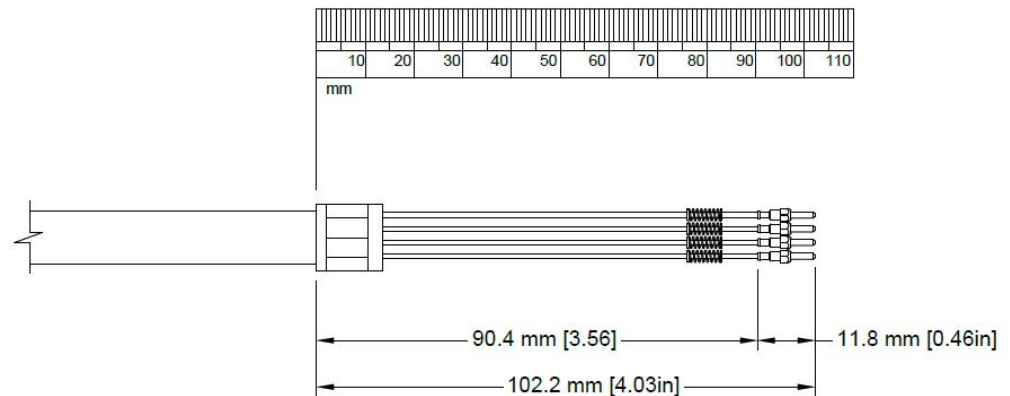
TERMINATE

Use the 2-Channel or 4-Channel Stripping Length Diagrams seen below (and located at the end of this instruction) to Terminate and Polish the Fiber Optic Termini. Be sure to include a spring on each of the fibers. For Termination and Polishing details, reference CAI-TERM-01.

2-Channel Stripping Length Diagram

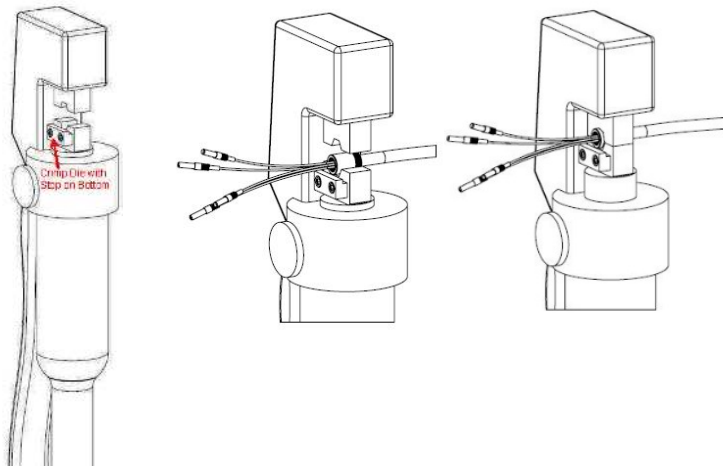


4-Channel Stripping Length Diagram

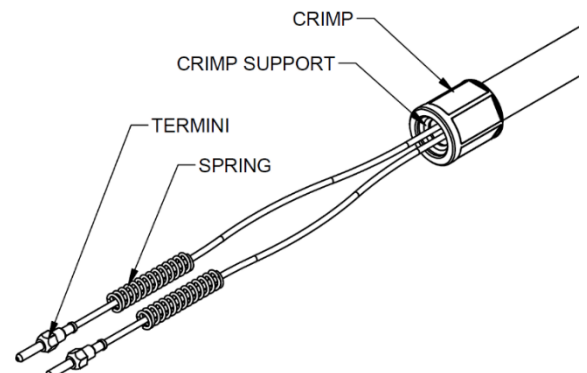


CRIMP TO CABLE

Remove tape after polishing the Fiber Optic Termini. Use Kevlar Scissors PT-062 to remove any excess Kevlar that is sticking out from the Crimp. Setup the Hydraulic Crimping tool PT-540 with the Die Set PT-541. The Crimp Die with Stop needs to be placed on the bottom facing out and with the Crimp against the stop as seen in the image below. Turn the knob clockwise on the Hydraulic Crimper, so that the handles can be pumped to crimp. Place the cable in the lower Crimp Die with the fiber facing out. Pump the handles until the Crimp Dies are touching. Release crimp by turning knob counterclockwise.

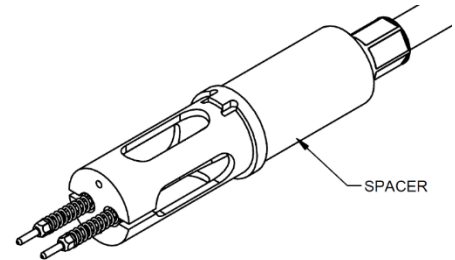


After crimping, the Crimp should have a hexagon shape as seen in the image below.

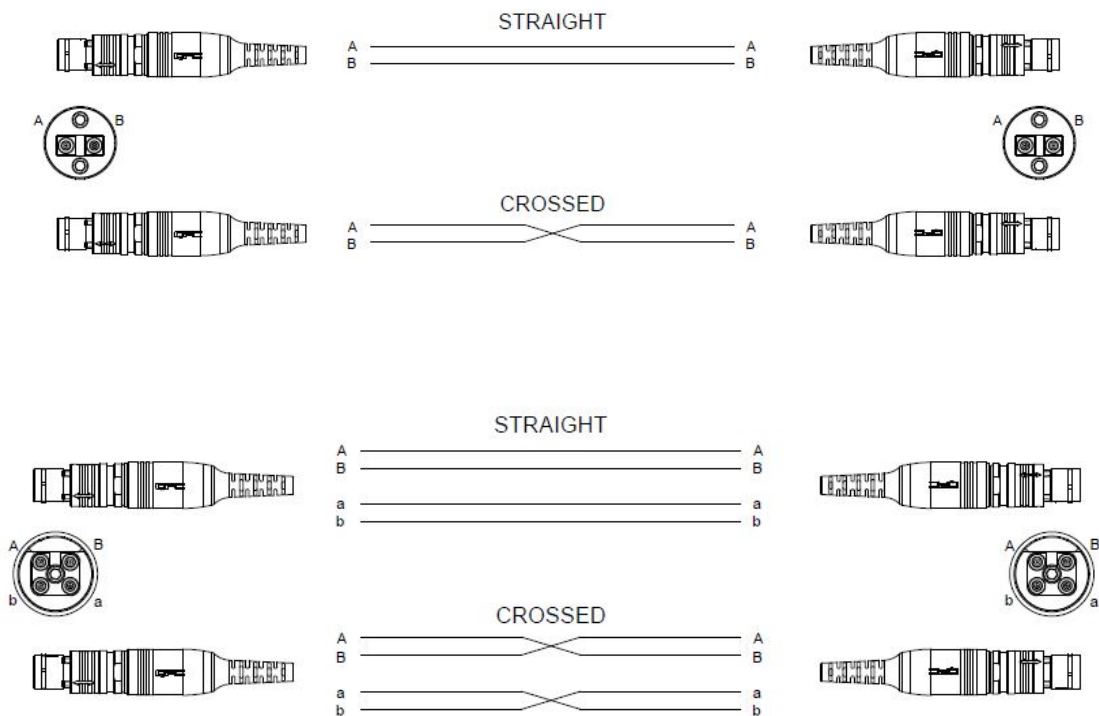


POPULATE THE INSERT

Insert the Fiber Optic Termini through the back and out the side windows of the Spacer as seen in the image to the right. Tweezers may help guide the Fiber Optic Termini into position.

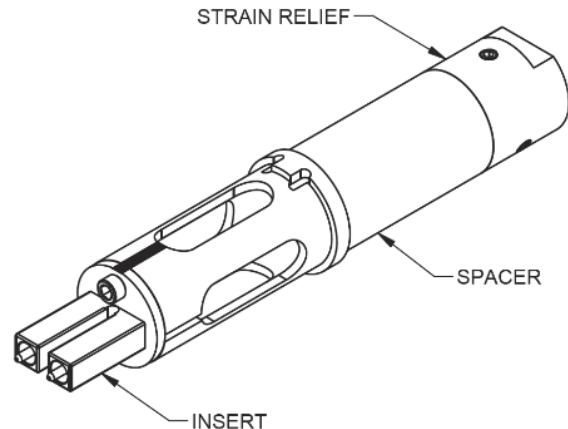


Populate the insert according to the required configurations, crossed or straight as seen in the diagrams below.

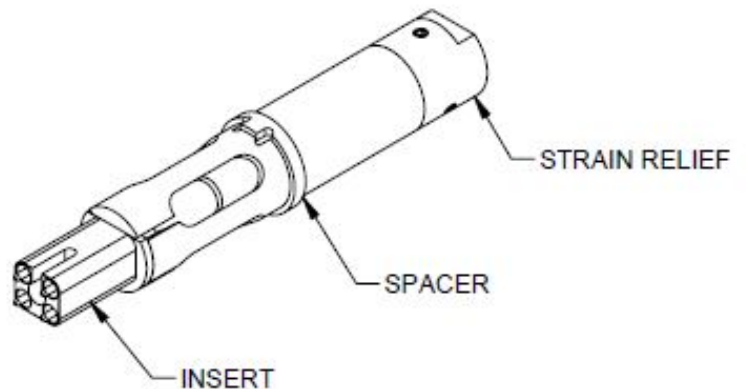


Apply Loctite 243 on the Socket Head Cap Screw threads per manufacturer's instructions or equivalent may be used and screw the Insert onto the Spacer using Hex Driver PT-503. Use Torque Driver PT-590 with Hex Bit 5/64" PT-599 and torque the Socket Head Cap Screw(s) to the values in the above Torque Table.

For the 2-channel Insert, ensure that the white mark line on the Insert is on the same side as the line on the spacer. This Insert has two Screws. The insert is NOT symmetrical, the termini are slightly below the center line. The insert should only go on one way.



The 4-channel insert does not have a white mark line since it can only go in one way. This Insert has only one screw in the middle.



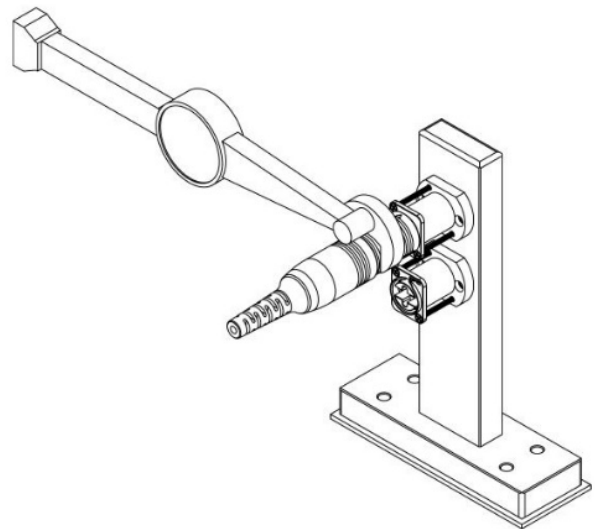
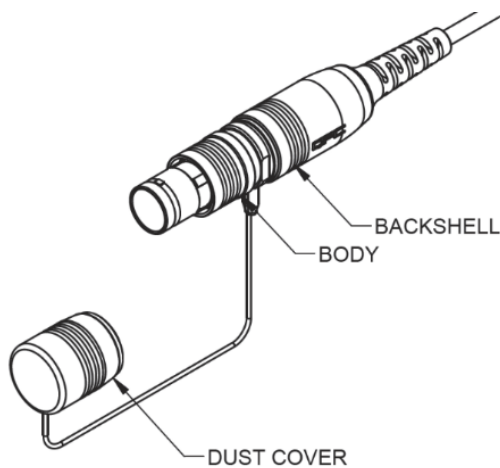
Pull Strain Relief to bottom of Spacer, apply Loctite on the Set Screw threads and tighten using Hex Driver PT-500. Use Torque Hex Driver PT-590 with Hex Bit .050" PT-599 and torque to the values in the above Torque Table.

Perform a visual check by looking through the holes in the Spacer to make sure that the fiber is not twisted or kinked.

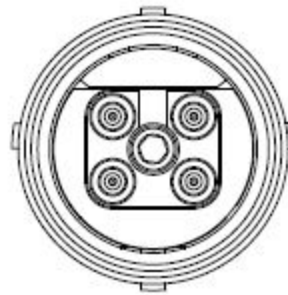
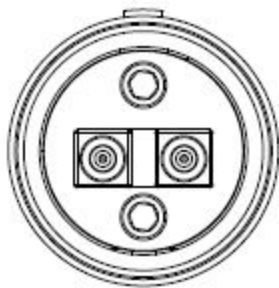
FINAL ASSEMBLY

Place the Insert end into the Body Assembly. The tabs on the Spacer should engage with the slots on the Body Assembly. Slide the Backshell into position and tighten by hand onto the Body Assembly making sure that the Spacer does not turn relative to the Body. Insert the Plug Assembly onto the Torque Fixture Stand PT-317. The fixture accommodates both the 2 and 4-channel plugs.

For the QSeal with Grip, torque the Backshell using Dial Torque-Measuring Wrench PT-506 with Crow's Foot Wrench PT-536 to the values in the above Torque Table. Make sure not to over torque the Backshell as this will cause damage.

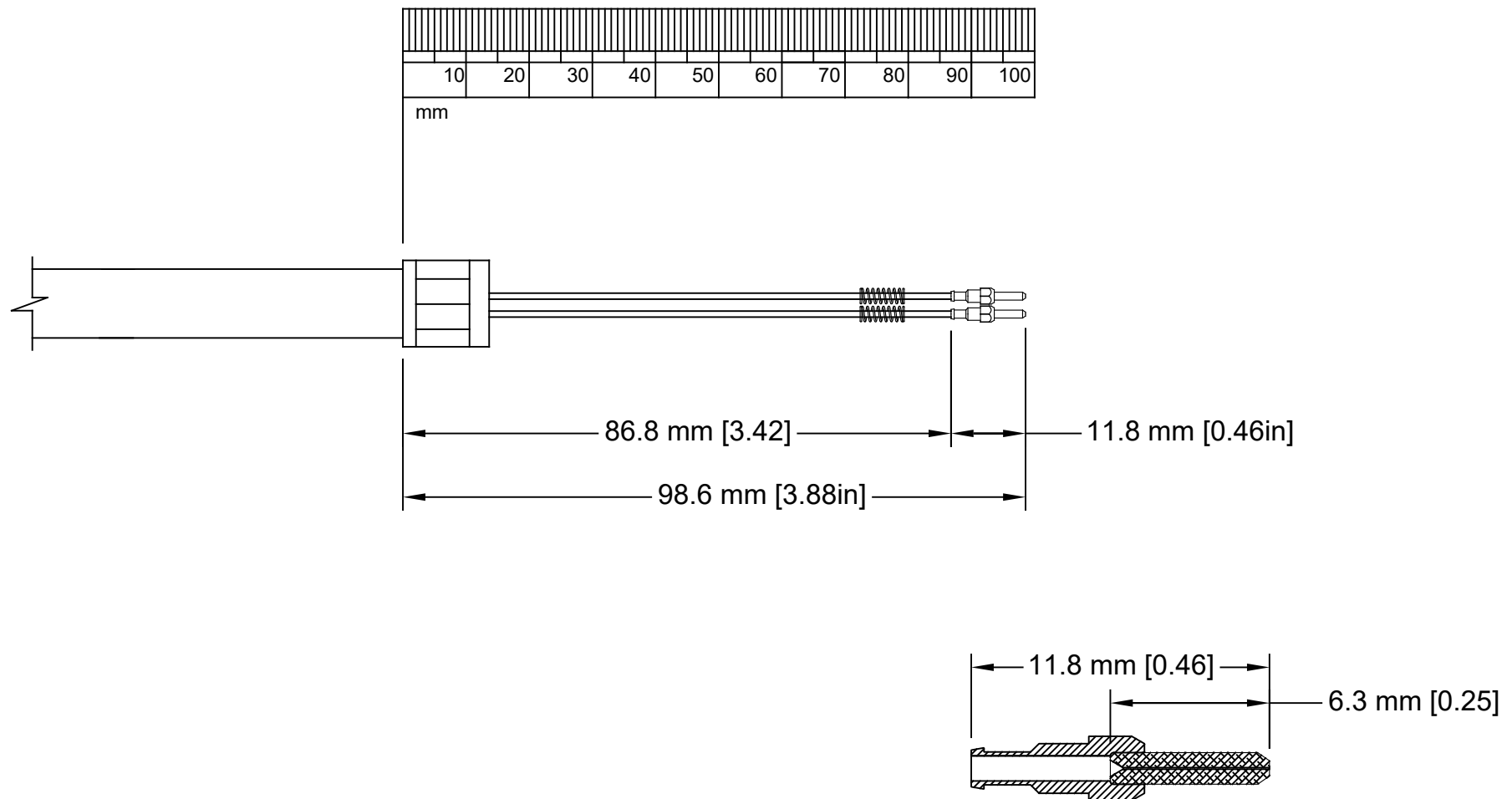


For the All-Metal Plug, tighten the Backshell using Dial Torque-Measuring Wrench PT-506 with Square Driver Strap Wrench PT-415 to the values in the Torque Table above. Finally, tighten the Back Nut using these same torque tools to the values in the Torque Table above.



NOTE: After torquing, ensure that the insert is clocked properly in the Body with respect to the main key.

QSEAL 2-Channel CONNECTOR PLUG



CABLE PREPARATION



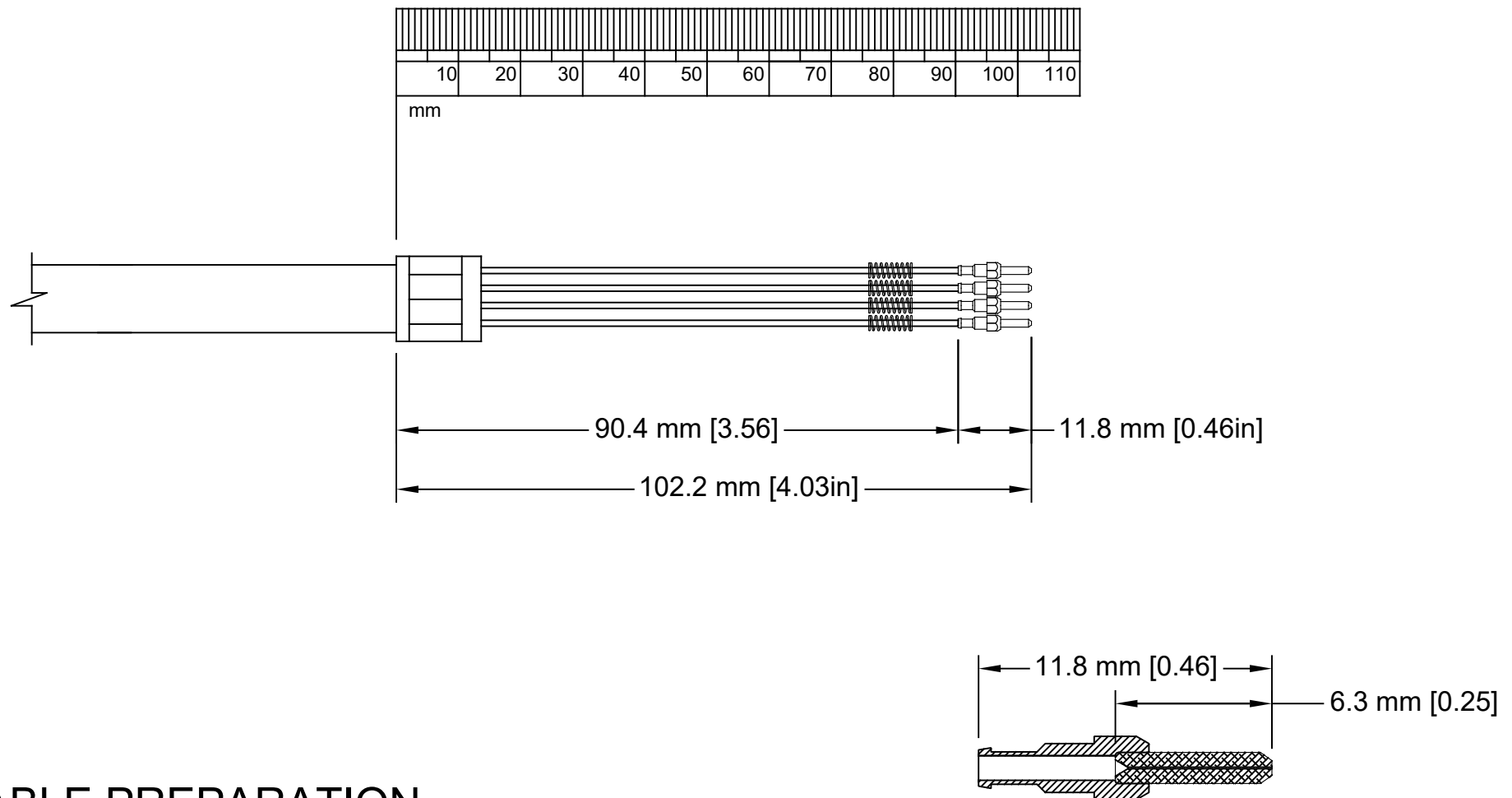
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QSEAL 4-Channel CONNECTOR PLUG



CABLE PREPARATION



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