Quick Connectors

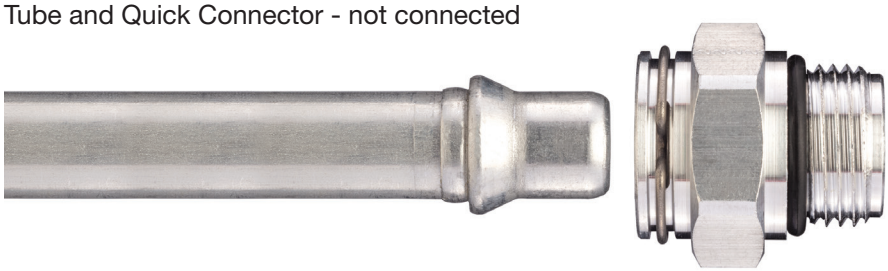
Connection Verification Design Guide

Reliable Connections

TUBE AND QUICK CONNECTOR ASSEMBLY

Tube - not connected

Tube and Quick Connector - not connected



Tube and Quick Connector - connected

Oetiker has developed solutions for the Quick Connector product line that provide additional verification and assurance that the quick connection has been properly made.

Having multiple connection verification technologies available and some still in development, this “Oetiker Quick Connector Connection Verification Design Guide” has been created to help our customers choose an appropriate connection verification technology.

Included in this guide are the different verification technologies which Oetiker offers, and the relevant critical information and dimensions recommended for use.

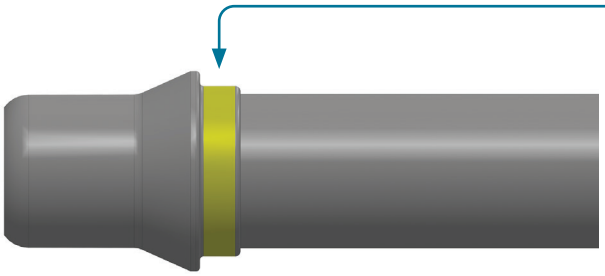
CONNECTION ASSURANCE DESIGN MATRIX OVERVIEW:

Oetiker technology	Verification connection type	Imperial sizes available	Minimum packaging space for assembly	Minimum straight distance from tube flare	Maximum outside diameter	Detection ranking
Tube Bead Paint Mark	Visual	3/8", 1/2" 5/8", 3/4"	2.4 mm - 5 mm	N/A	N/A	+
Standard Assurance Cap	Mechanical	3/8", 1/2" 5/8", 3/4"	6.7 mm - 12 mm	9.5 mm - 17.4 mm	23.5 mm - 35.9 mm	++
Locking Assurance Cap	Mechanical	3/8", 1/2"	13 mm - 14 mm	16 mm - 17.5 mm	22 mm - 27 mm	+++
Connection Verification Aid*	Electronic	3/8", 1/2"	13 mm - 15 mm	45 mm	34 mm	++++

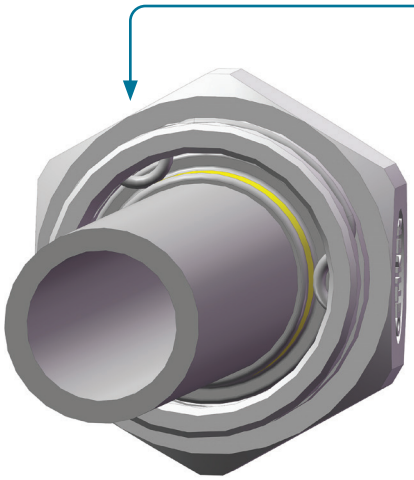
Note: Sizes are in metric unless specified by fraction and symbol (") for imperial

* Connection Verification Aid dimensions are referenced differently. See page 5 for details.

TUBE BEAD PAINT MARK



The Tube Bead Paint Mark is a yellow identification band that is standard on all current production tubes. This indicates the fitting is connected.



Once the tube is fully installed into the quick connector, the paint mark is no longer visible when looking perpendicular to tube.

TUBE BEAD PAINT MARK

Imperial sizes available	Distance from back flare	Nominal tube diameter
3/8"	2.4 mm	9.53 mm
1/2"	3.2 mm	12.7 mm
5/8"	4 mm	5.88 mm
3/4"	5 mm	19.05 mm

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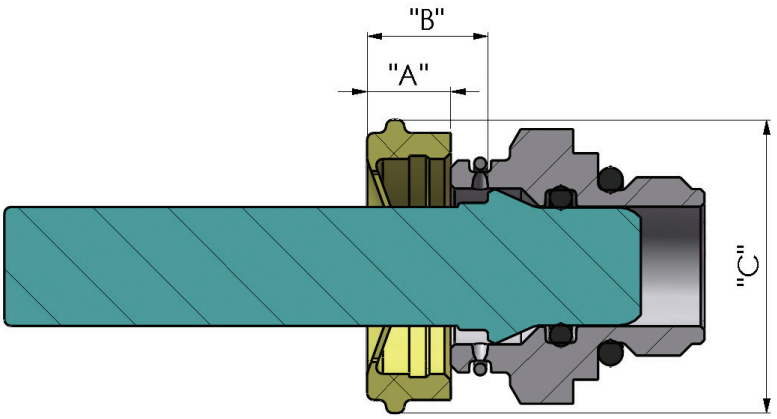
STANDARD ASSURANCE CAP

The Standard Assurance Cap functions as a gauge to identify the state of connection. It is installed after the tube to quick connector assembly.

The Standard Assurance Cap can only be fully installed if the tube is fully inserted into the quick connector. This can be confirmed by pulling back on the Standard Assurance Cap.



STANDARD ASSURANCE CAP

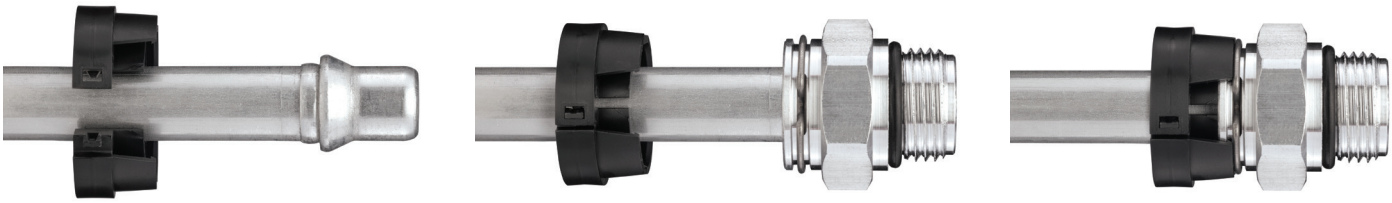
Imperial sizes available	"A" = Minimum package space needed to assemble	"B" = Minimum straight distance from tube flare	"C" = Maximum outside diameter of cap
3/8"	6.7 mm	9.5 mm	23.5 mm
1/2"	8.7 mm	12.5 mm	28.7 mm
5/8"	9.9 mm	14.4 mm	33.5 mm
3/4"	12 mm	17.4 mm	35.9 mm

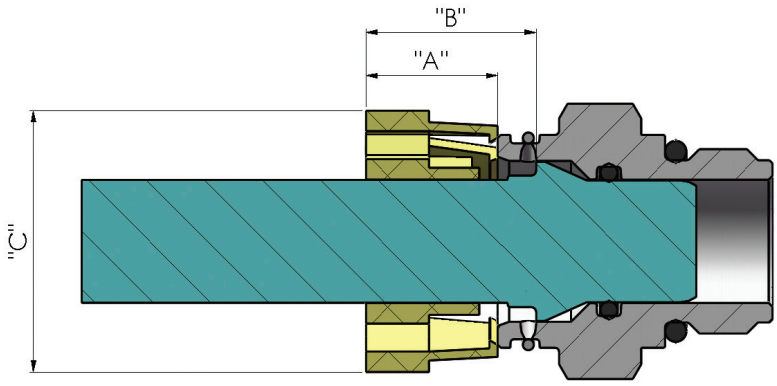
Note: Sizes are in metric unless specified by fraction and symbol (") for imperial

LOCKING ASSURANCE CAP (LAC)

The Locking Assurance Cap (LAC) is an accessory for Oetiker's Locking Assurance Quick Connectors 201 & 210 and provides instant connection verification. The LAC is installed after the tube to the quick connector assembly (as shown below).

The LAC serves as a device to provide 100% confidence the tube is fully seated into the quick connector and features durable secondary latch. The Locking Assurance Cap additionally provides an improved tactical feel and sound when installed.



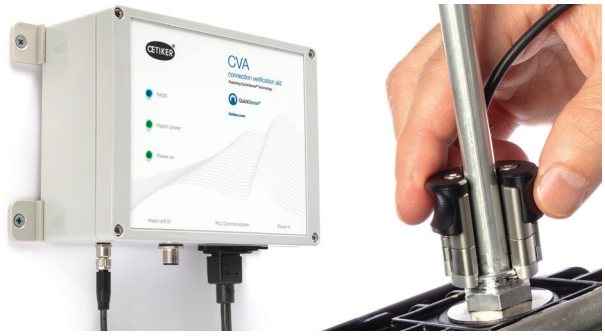


LOCKING ASSURANCE CAP (LAC)

Imperial sizes available	"A" = Minimum package space needed to assemble	"B" = Minimum straight distance from tube flare	"C" = Maximum outside diameter of cap
3/8"	13 mm	16 mm	22 mm
1/2"	14 mm	17.5 mm	27 mm

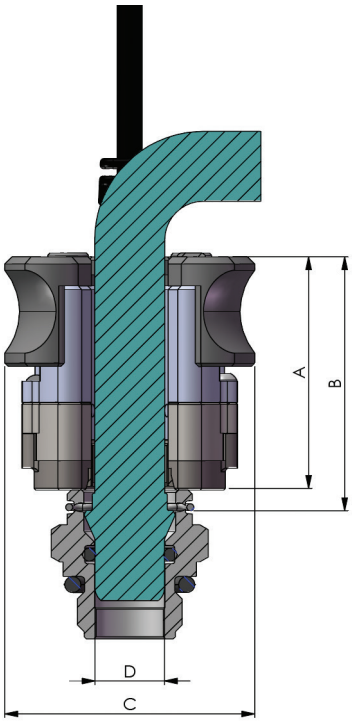
Note: Sizes are in metric unless specified by fraction and symbol (") for imperial

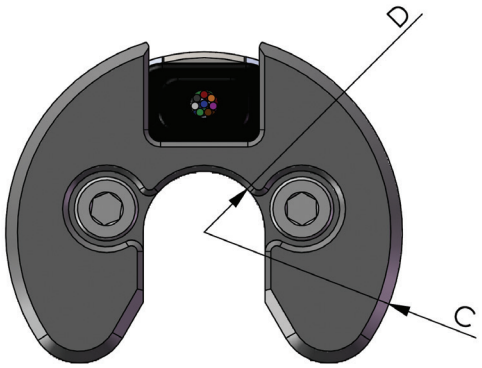
CONNECTION VERIFICATION AID (CVA)



The Connection Verification Aid (CVA) is used after the tube to quick connector is assembled.

The Connection Verification Aid (CVA) features Oetiker QuickSense® technology and provides tube to quick connector connection verification in a space-efficient manner to be integrated in final vehicle assembly.
The CVA confirms a proper tube to quick connector connection via haptic feedback to the operator and an electronic signal to a PLC connected control box, while being compact and ergonomically designed.





CONNECTION VERIFICATION AID (CVA)

Imperial sizes available	"A" = Minimum package space needed to assemble	"B" = Distance needed to operate hed unit	"C" = Maximum outside diameter	"D" = Maximum tube diameter
3/8"	45 mm	48 mm	34 mm	10.4 mm
1/2"	45 mm	49 mm	34 mm	13.2 mm

Note: Sizes are in metric unless specified by fraction and symbol (") for imperial