UTL Series
145

SOURIAU

UTL Field Installation – 5 pos

Make your field installation Quick & Reliable.

Time Saving ■ UTL field installation has been designed to be used in an easy way without additional operations which are time consuming

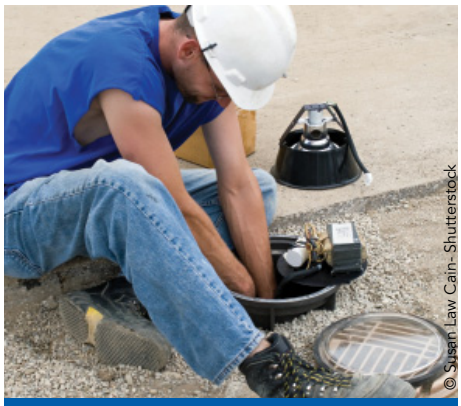
Long Life Expectancy ■ High quality materials are used to guaranty the maintain of performances (IP68, IK08, UV resistance, moisture proof) during a long period

Reliable Installation ■ An audible click guaranties the correct assembly of parts during the installation

Cost Saving ■ UTL Field installation is designed to mix within the same connector power and signal (DALI, DMX, RS485)

Esterline
Connection Technologies

Typical Applications



Stage & Light

Energy - Power

Building Automation & Control

Telecom - Data infrastructure

Instrumentation & Measurement

Description

- The UTL Series is a plastic connector range that meets industrial safety standards.
- The «Key hole» of the coupling system allows blind mating. In dark conditions the mechanical discriminations allow easy mating to avoid connector damage.
- The stainless steel latch coupling system is simple to use. With only 1 finger, connectors are mated with an audible click.
- The UTL Series is rated at IP68/69K even in dynamic conditions and remains sealed even when used continuously underwater or cleaned using a high pressure hose while the cable is moving.
- The UTL Series uses an outdoor rated material per Underwriters Laboratories.
- Screw terminaison contact for an installation only with a screw driver.

Technical Features

Materials

- **Housing:** Thermoplastic
- **Contacts:** Aluminium alloy
- **Latch:** Stainless steel

Electrical

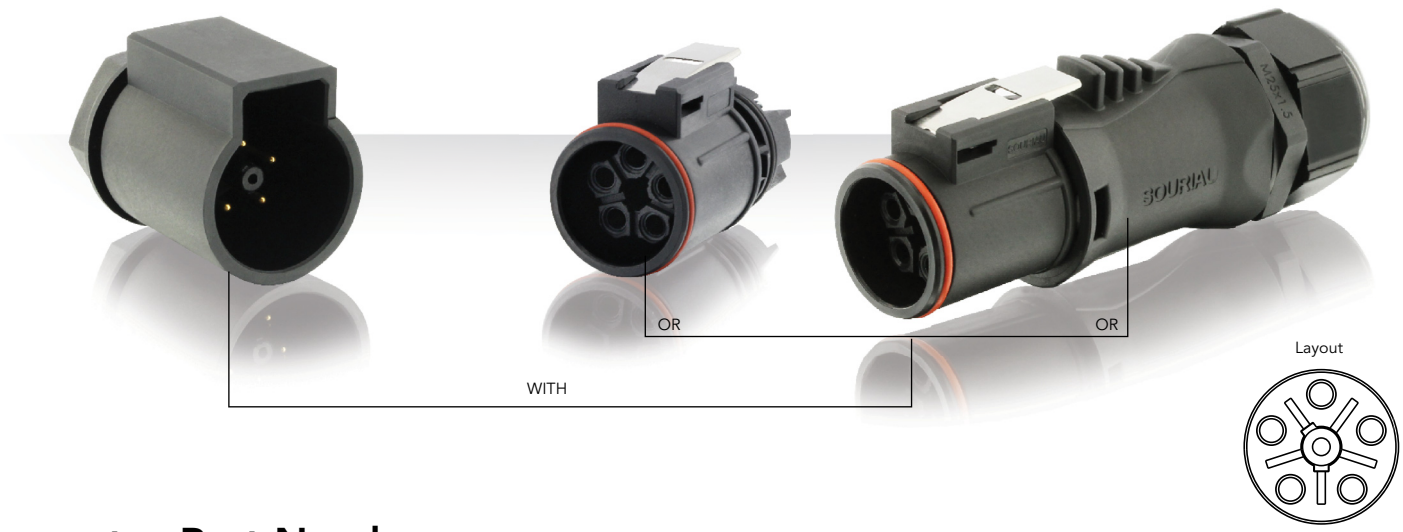
- Marking: L, N, PE, 1, 2
- UL: 16A 600V V0
  13A 277V for CBC use
- CN: 13A 600V
  10A 277V for CBC use
- IEC: 16A 500V 4KV 4
  13A 250V 2.5KV 4 for CBC use
- First Mate Last Break contact mating on ground line
- Finger touch proof
- **In accordance with:**
  - Lighting equipment standards: IEC60598, UL1598, UL498
  - Connector standards: IEC61535, IEC61984, UL1977

Environmental

- **Operating temperature (according to IEC61984):**
  From -40°C to +105°C
- **Flammability rating:**
  UL 94: V-0 for connector
- **Salt spray:**
  ≥1,000 hours
- **UV resistant:**
  No mechanical degradation or important color variation due to environmental exposure (F1 material per the UL 746C)
- **Sealing:**
  - IP68/69K mated with standard contacts
  - IP68/69K unmated with specific contacts
  - Moisture proof capability
- **Fluid resistance:**
  - Gas and oil
  - Mineral oil
  - Acid bath
  - Basic bath
  - for other fluid, please contact us
- **RoHS compliant**

Mechanical

- **Durability:** 500 mating cycles
- **Coupling system:**
  - Sensitive and audible click
  - Blind mating
  - Key hole design
- **Touchproof:**
  IP2X in unmated conditions (connector equipped with socket contacts)
- **Shock:**
  IK08 according to IEC60984



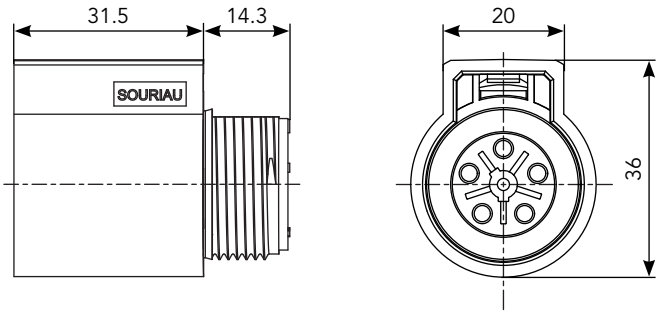
Connector Part Number

Contact type	Connector type	Part number	
		Male insert	Female insert
Crimp contacts to be ordered separately see page 7	Plug with backshell*	-	UTL6JC145S
	Plug without backshell	-	UTL6145S
	Jam-nut without backshell	UTL7145P	-
	In-line receptacle without backshell	UTL1145P	-
Screw termination contacts, delivered with connector	Plug with backshell*	-	UTL6JC145SSCR
	Plug without backshell	-	UTL6145SSCR

* Non removable backshell when mated. IP68/69K not guarantee if backshell removed.

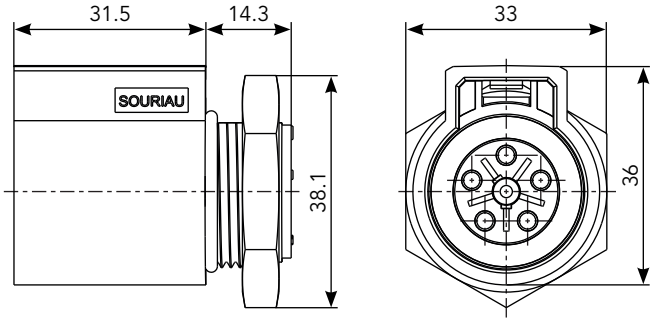
Dimensions (For mated connector lengths see page 15)

In line receptacle - UTL1



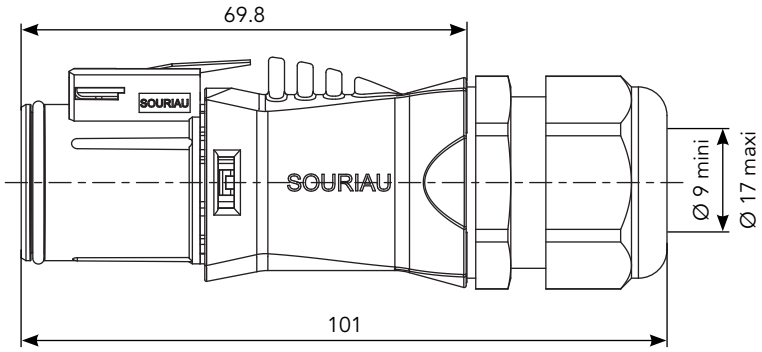
Front view

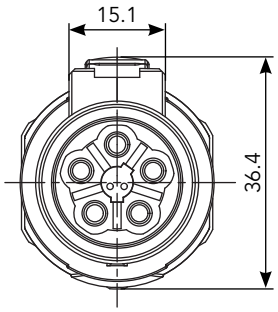
Jam nut receptacle - UTL7



Front view

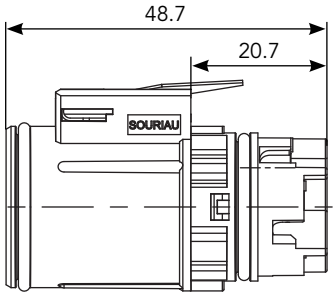
Plug - UTL6 with backshell

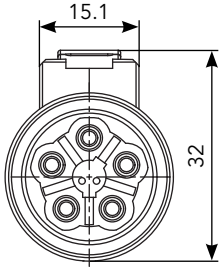




Front view

Plug - UTL6 without backshell



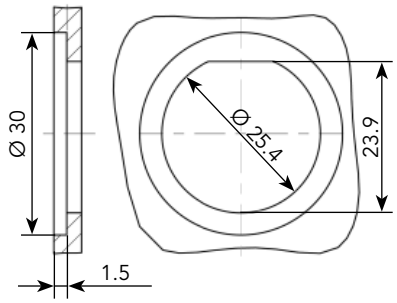


Front view

Panel cut out

Jam nut receptacle - UTL7

Maximun panel thickness: 5 mm



Note: all dimensions are in mm and for information only

Tooling for Machined Contact Only

Handle (without head)

Part number
SHANDLES

Tool kit

Part number
TOOLKIT

Head Crimp Tooling (without handle)

Contacts	Contact size	Part number of head
RM/RC 28M1K(1)	Standard contacts #16 Ø 1.6mm	S16RCM20*
RM/RC 24M9K(1)		S16RCM20*
RM/RC 20M13K(1)		S16RCM20*
RM/RC 20M12K(1)		S16RCM20*
RM/RC 16M23K(1)		S16RCM16*
RM/RC 14M30K(1)		S16RCM14*
SM/SC 24ML1TK6(1)		S16SCM20*
SM/SC 20ML1TK6(1)		S16SCM20*
SM/SC 16ML1TK6(1)		S16SCML1*
SM/SC 14ML1TK6(1)		S16SCML1*
SM/SC 16ML11TK6(1)		S16SCML11*

(1): Example of plating, for other plating options see UTL catalog
* Heads to be used with handle PN: SHANDLES

Insertion Tool #16

Part number
RTM205

Extraction Tool #16

Part number
RX2025GE1

Accessory

Backshell

Part number
UTL14JC

Contacts

#16	Contact type	AWG	Part number		Max wire Ø	Max insulator Ø
			Male	Female		
Crimp	Machined	30-28	RM28M1K(1)	RC28M1K(1)	0.55	1.00
		26-24	RM24M9K(1)	RC24M9K(1)	0.80	1.60
		22-20	RM20M13K(1)	RC20M13K(1)	1.15	1.80
		22-20	RM20M12K(1)	RC20M12K(1)	1.15	2.20
		20-16	RM16M23K(1)	RC16M23K(1)	1.80	3.20
		16-14	RM14M30K(1)	RC14M30K(1)	2.30	3.20
	Machined Sealed (with O-Ring for IP68/69K unmated)	20-16	RM16M25K	RC16M25K	1.80	3.20
		16-14	RM14M25K	RC14M25K	2.28	3.20
	Stamped & Formed Reeled Contacts See note (2) for loose piece	26-24	SM24M1TK6(1)(2)	SC24M1TK6(1)(2)	-	0.90-1.60
		22-20	SM20M1TK6(1)(2)	SC20M1TK6(1)(2)	-	1.20-2.10
		18-16	SM16M1TK6(1)(2)	SC16M1TK6(1)(2)	-	3.20
		18-16	SM16M11TK6(1)(2)	SC16M11TK6(1)(2)	-	3.00
		14	SM14M1TK6(1)(2)	SC14M1TK6(1)(2)	-	3.20
Coaxial	Cable Multipiece	see page 11	RMDXK10D28	RCDXK1D28	-	-
	Cable Monocrimp		RMDX60xxD28	RCDX60xxD28	-	-
	Twisted pair Multipiece		RMDXK10D28 + york090	RCDXK1D28 + york090	-	-
	Twisted pair Monocrimp		RMDX60xxD28	RCDX60xxD28	-	-

(1): Example of plating, for other plating options see page 8

Note: all dimensions are in mm

(2): Part number for contact reeled for loose piece contact packaging, place "L" in part number. Example: **SM20ML1TK6**

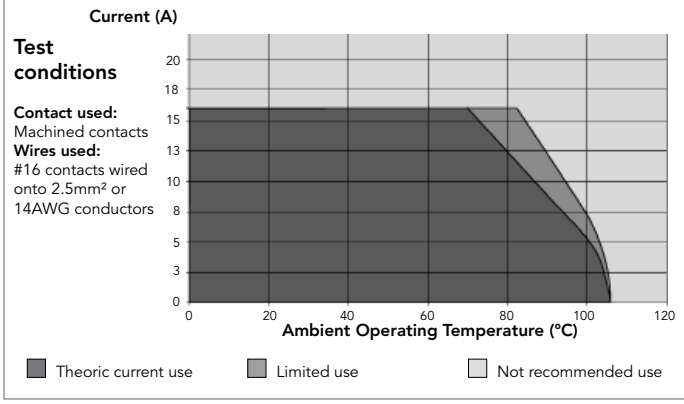
Electrical characteristics

UL
16A 600V V0
13A 277V for CBC use

CN
13A 600V
10A 277V for CBC use

IEC
16A 500V 4KV 4
13A 250V 2.5KV 4 for CBC use

UTL145 derating curves



Contacts (Continued)

Plating Selector Guide

Contacts Supplied Separately

Electrical characteristics: contact resistance		
#16 Ø1.6mm	Machined	< 3mΩ
	Stamped and Formed	< 6mΩ

Stamped & Formed Contacts

Contact size	Plating Digit	Plating Description	
		Active area	Other areas
#16 Ø1.6mm	S31	Gold Flash over nickel	Crimped area: 1.3µ Tin min over Nickel Other areas: 1.3µ Tin min
	S18	0,75µ Gold min over nickel	
	S6	0,75µ Gold min over nickel	Gold flash over Nickel
	D70	0,13µ Gold min over nickel	
	TK6	0,5µ - 2,5µ Sn pre-plated	-

Machined Contacts

Contact size	Contact type	Plating Digit	Plating Description
			Active area
#16 Ø1.6mm	Machined	K	Gold over Nickel 0.4 µ mini
		J	Gold over Nickel 0.05 µ mini
		T	Tin 3 µ (-0/+2)
		D28*	Gold over Nickel 0.75 µ mini

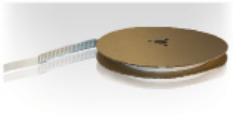
* For Coax contacts only

Packaging - Size contacts #16

Due to the wide variety of applications, contact packaging is offered for small series (bulk package) and high volume production (reeled contacts):

Stamped & Formed

• 25 pieces loose package

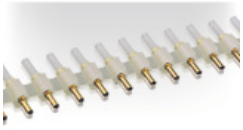


• 3 000 pieces reeled

Machined contacts

• 50 pieces bulk package

• 1 000 pieces bulk package



• 2 000 pieces reeled

Note : 1 000 pieces bulk package available by adding 1000 at the end of the part number: e.g. RC16M23K1000
2 000 pieces reeled package available by adding K at the begining of the part number: e.g. KRC16M23K

Crimp Contacts

First Mate Last Break Contacts

Contact size	Type	Wire size		Part number		Max wire Ø (mm)	Max insulator Ø (mm)	Color band		Available plating
		AWG	mm²	Male	Female			Front	Rear	
#16 Ø1.6 mm Longer male contact (+1mm)	Machined	30-28	0.05-0.08	RM28M1GE1-	-	0.55	1.1	-	Red	KorJ
		26-24	0.13-0.2	RM24M9GE1-		0.8	1.6	Red	Red	
		22-20	0.32-0.52	RM20M13GE1-		1.18	1.8	Black	Red	
				RM20M12GE1-			2.2	Blue	Red	
		20-16	0.52-1.5	RM16M23GE1-		1.8	3.2	-	Red	
		16-14	1.5-2.5	RM14M30GE1-		2.28	-	-	Red	
#16 Ø1.6 mm Shorter female contact (-0.7mm)	Machined	30-28	0.05-0.08	-	RC28M1GE7-	0.55	1.1	-	Blue	KorJ
		26-24	0.13-0.2		RC24M9GE7-	0.8	1.6	Red	Blue	
		22-20	0.32-0.52		RC20M13GE7-	1.18	1.8	Black	Blue	
					RC20M12GE7-		2.2	Blue	Blue	
		20-16	0.52-1.5		RC16M23GE7-	1.8	3.2	-	Blue	
		16-14	1.5-2.5		RC14M30GE7-	2.28	-	-	Blue	

How to Make FMLB / LMFB Connection

Contact 1 / Contact 2	Standard male contact	Standard female contact	Longer male contact
Standard male contact		✓	
Standard female contact	✓		✓ FMLB
Shorter female contact	✓ LMFB		

First Mate Last Break contacts should be chosen only if the cavity is not marked with the ground symbol. For cavities marked with the ground symbol, standard contacts will fulfill the same role as a first mate, last break contact used in a standard cavity.

Ground symbol

Note: all dimensions are in mm

#16 Coaxial Contacts

Coaxial Contact Range

Note: Coax contacts cannot be used in the ground cavity
We provide 2 types of coaxial contacts suitable for 50 or 75Ω, coaxial cable or twisted pair cable.

Monocrimp Coaxial Contact

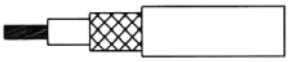
- The monocrimp one-piece coaxial contacts offer high reliability plus the economic advantage of a 95% reduction in installation time over conventional assembly methods.
- This economy is achieved by simultaneously crimping both the inner conductor and outer braid or drain wire.

Multipiece Crimp Coaxial Contact

- The inner conductor and outer braid is crimped individually.
- The thermoplastic insulating bushing in the outer body is designed to accept and permanently retain the inner contact.
- An outer ferrule is used to connect the braid to the outer contact and provide cable support to ensure against bending and vibration.

Suitable for Coaxial Cable or Twisted Cable

- For jacket diameter from 1.78 to 3.05mm
  Inner conductor up to 2.44mm diameter



- For jacket diameter from 0.64 to 1.45mm
  Inner conductor from AWG30 to AWG24

Contacts for Coaxial Cable Summary

Contact type	Contact range		Contact part number with cable combination	Cabling notice
	Male contact	Female contact		
Multipiece	RMDXK10D28	RCDXK1D28	See UTL catalog	See UTL catalog
Monocrimp	RMDX60xxD28	RCDX60xxD28		See UTL catalog

Contacts for Twisted Pairs Cable Summary

Contact type	Contact range		Contact part number with cable combination	Cabling notice
	Male contact	Female contact		
Multipiece	RMDXK10D28 + YORK090	RCDXK1D28 + YORK090	See UTL catalog	See UTL catalog
Monocrimp	RMDX60xxD28	RCDX60xxD28		See UTL catalog

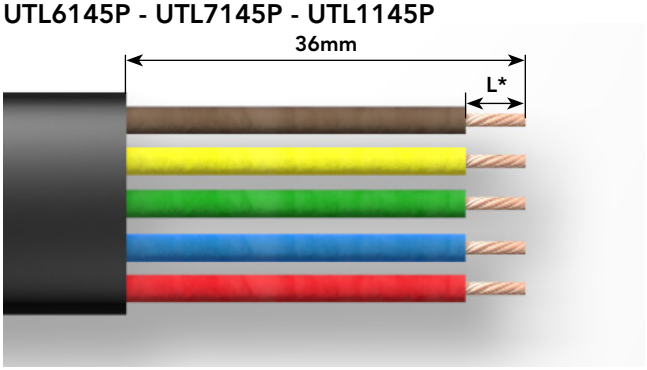
Assembly Instructions

Stripping

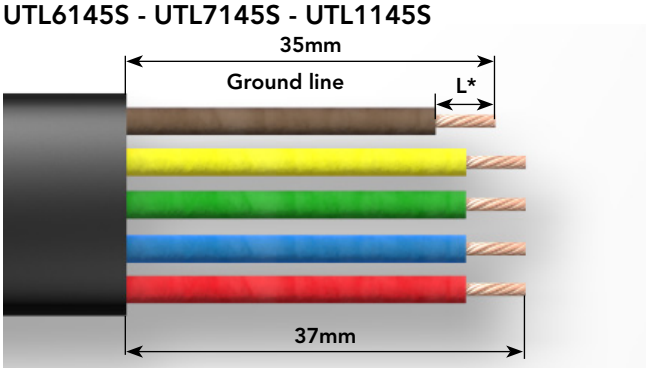
- Female insulator: Strip external cable sheath, adjust ground cable length
- Male insulator: Strip external cable sheath, adjust signal cable lengths
- Then strip individual cable core following below information

5 pos.

UTL6145P - UTL7145P - UTL1145P

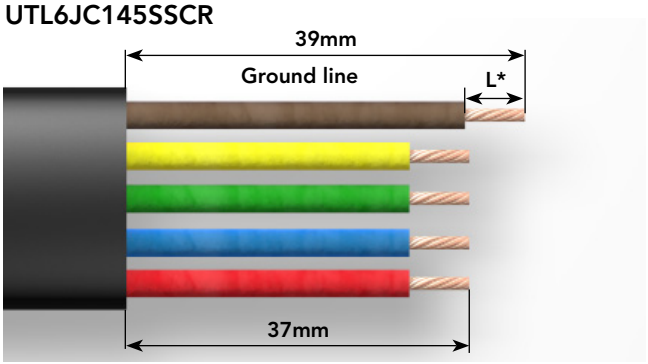


UTL6145S - UTL7145S - UTL1145S



Assembly operations mentioned above shall not interfere or to be in contradiction with the IPC-WHMA-A-620B.

UTL6JC145SSCR



Dimensions and colors for information only, stripping dimensions could be adjusted according to the cable type.

Wire Stripping Length

	Part number		Stripping length L* (mm)
	Male	Female	
Machined contact	#16 - Ø 1.6mm		
	RM28M1-/RM24M9-/RM20M13-/RM20M12-	RC28M1-/RC24M9-/RC20M13-/RC20M12-	4.8
	RM16M23-/RM14M30-	RC16M23-/RC14M30-	7.1
Stamped & formed with insulation support	#16 - Ø 1.6mm		
	SM24M1-/SM24ML1-/SM20M1-/SM20ML1-	SC24M1-/SC24ML1-/SC20M1-/SC20ML1-	4
	SM16M11-/SM16ML11-	SC16M11-/SC16ML11-	4.65
Stamped & formed without insulation support	#16 - Ø 1.6mm		
	SM16M1-/SM16ML1-	SC16M1-/SC16ML1-	6.35
	SM14M1-/SM14ML1-	SC14M1-/SC14ML1-	6.35
Screw contact	#16 - Ø 1.6mm		
	-		5.8

Section: 1.5²mm or AWG16 max, 0.5²mm or AWG20 min. - Insulate diameter: Ø4mm maxi. - Cable diameter : Ø9mm to Ø17mm maxi

Handle & Interchangeable Heads

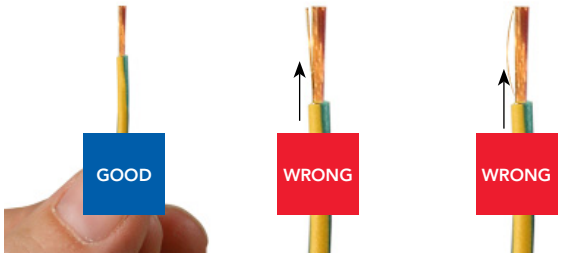
Crimping with SOURIAU Tooling

1) Fully close then release the tool, keep it open. Open the 2 pins.

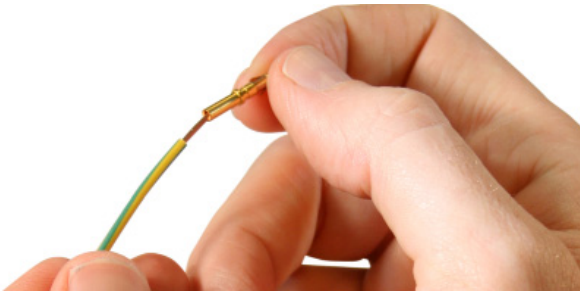
2) Choose the adapter head (sold separately), keep vertical and slide it into the handle until the mechanical end.

3) Close the two pins simultaneously to maintain the head.

4) Strip the cable properly check the recommended size in the catalog on page 10.



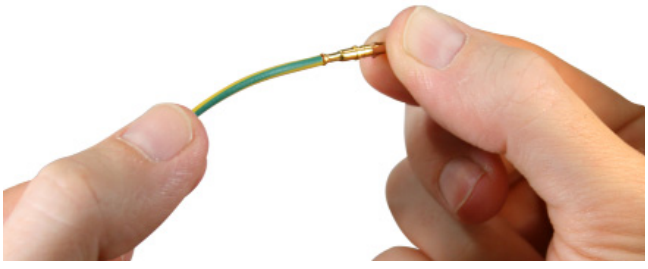
5) Place conductors, with no deterioration, in the contact bucket. All strands to be located in the crimp bucket.



6) Position the contact in the bottom of the tool by checking its orientation. Maintain the wire in position.

7) Tighten sharply the handles to the end of the mechanism (max 175 N). After handles are opened, extract the contact.

8) Control the quality of crimping (see next page).



Note: Assembly operations mentioned above shall not interfere or to be in contradiction with the IPC-WHMA-A-620B

Crimping Instruction

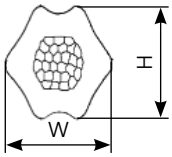
Crimping Control

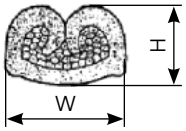
One of the key factors which affects the performance of a connector is the way contacts are terminated. Crimped connections are nowadays seen as the best solution to ensure quality throughout the lifetime of the product. Here are some reasons why we recommend this method of termination for UTL connectors:

Advantages (Extract from the IEC 60352-2):
- Efficient processing of connections at each production level
- Processing by fully-automatic or semi- automatic crimping machines, or with hand operated tools
- No cold-soldered joints
- No degradation of the spring characteristic of female contacts by the soldering temperature
- No health risk from heavy metal and flux steam
- Preservation of conductor flexibility behind the crimped connection
- No burned, discolored and overheated wire insulation
- Good connections with reproducible electrical and mechanical performances
- Easy production control.

To ensure that the crimp tooling is performing according to original specifications, it is important to carry out regular checks. A common way to check the performance of tooling is with a simple pull test, ideally using a dedicated electric pull tester. Minimum recommended pull forces are indicated in the tables below:

Machined contact





Stamped & Formed contact

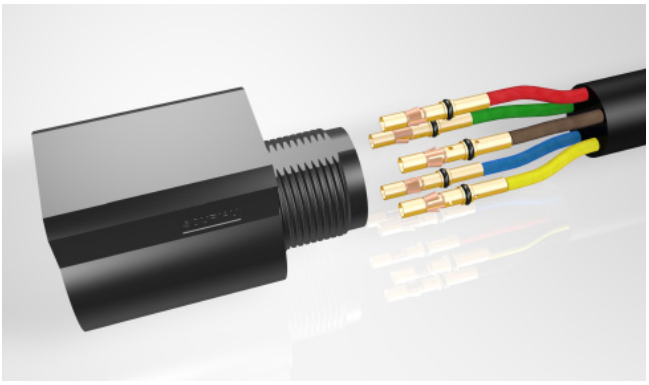
Active contact part	Contact type	Die location on heads	Wire section range	Section (mm²)	Tensile straight test (mini)	Height (mm) H (±0.075)	Width (mm) W (±0.075)	Tooling head part number
Machined contacts size #16 Ø 1.6 mm	RM28M1K* RC28M1K*	30/28	30 AWG	0.05 min	11 N	1.14	1.41	S16RCM20
			28 AWG	0.08 max	11 N			
	RM24M9K* RC24M9K*	26/24	26 AWG	0.12 min	15 N	1.15	1.41	
			24 AWG	0.25 max	32 N			
	RM20M13K* RC20M13K*	22/20	22 AWG	0.32 min	40 N	1.26	1.76	
			20 AWG	0.50 max	60 N			
	RM20M12K* RC20M12K*		22 AWG	0.32 min	40 N			
			20 AWG	0.50 max	60 N			
	RM16M23K* RC16M23K*	20	20 AWG	0.50 max	60 N	1.66	2.18	S16RCM16
		18	18 AWG	0.82 max	90 N	1.80	2.28	
		16	16 AWG	1.50 max	150 N	1.96	2.43	
	RM14M30K* RC14M30K*	16	16 AWG	1.50 min	150 N	2.10	2.68	S16RCM14
		14	14 AWG	2.50 min	230 N	2.30	2.78	
S & F contacts size #16 Ø 1.6 mm	SM24ML1TK6* SC24ML1TK6*	26/24	26 AWG	0.12 min	15 N	0.84	1.50	S16SCM20
			24 AWG	0.25 max	32 N			
	SM20ML1TK6* SC20ML1TK6*	22/20	22 AWG	0.32 min	40 N	1.02	1.54	
			20 AWG	0.50 max	60 N			
	SM16ML11TK6* SC16ML11TK6*	18	18 AWG	0.82 min	90 N	1.32	2.09	S16SCML11
		16	16 AWG	1.50 max	150 N	1.36	2.10	
	SM16ML1TK6* SC16ML1TK6*	18	18 AWG	0.82 min	90 N	1.49	2.02	S16SCML1
		16	16 AWG	1.50 max	150 N	1.7	2.05	
	SM14ML1TK6* SC14ML1TK6*	14	14 AWG	2.50 max	230 N	1.79	2.58	

* example of plating, for other plating see page 8

Assembly Instruction

UTL1 Assembly

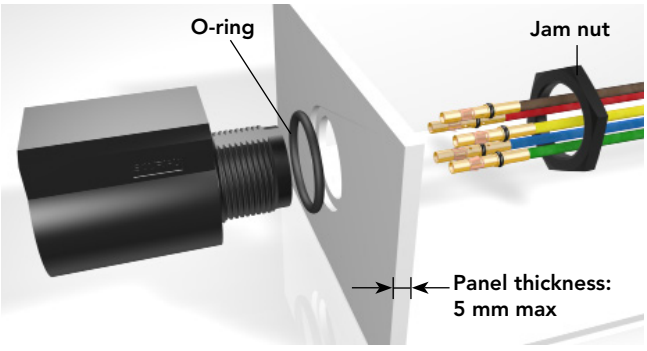
- Strip wires (see page 10)
- Crimp contacts (see page 11)
- Place all the contacts inside the corresponding cavities
- Manually push each contact, or use our tool (**RTM205**), until audible click. Check each contact retention, with two finger retraction

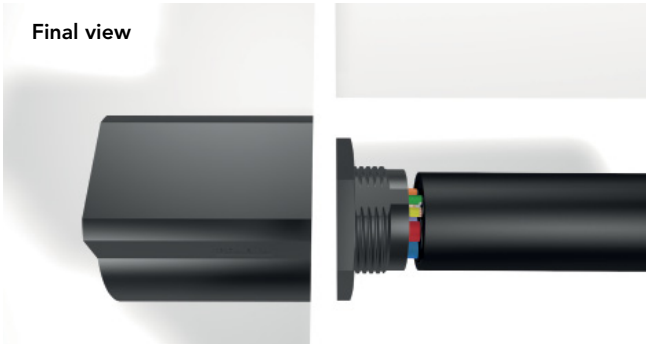


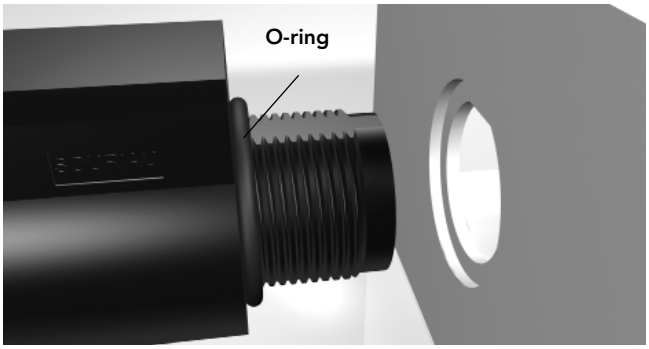
Picture for illustration purpose only.

UTL7 Assembly (Mounting Suggestion)

- Slide nut over the wires
- Strip wires (see page 10)
- Crimp contacts (see page 11)
- Place all the contacts inside the corresponding cavities
- Manually push each contact, or use our tool (**RTM205**), until audible click. Check each contact retention, with two finger retraction
- Seat o-ring, place receptacle in the panel cut-out (see dimension page 5)
- Tighten jam nut torque: 3 Nm maxi, wrench size: 30





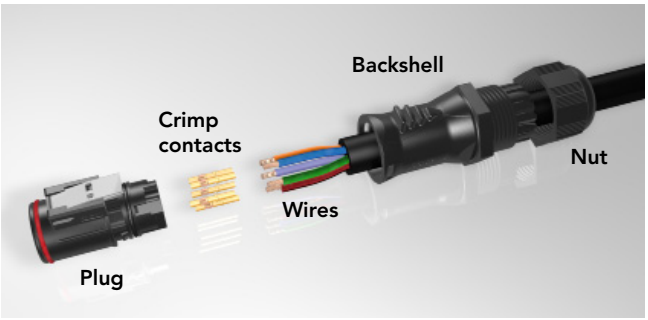


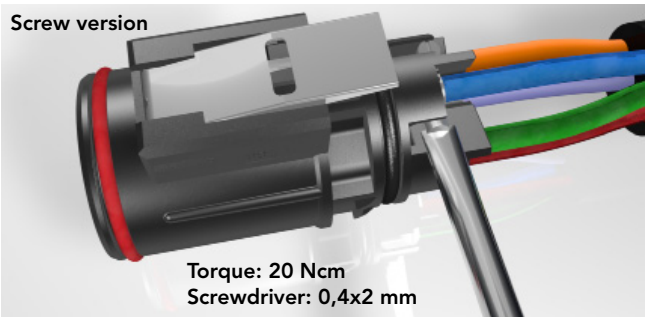
Picture for illustration purpose only.

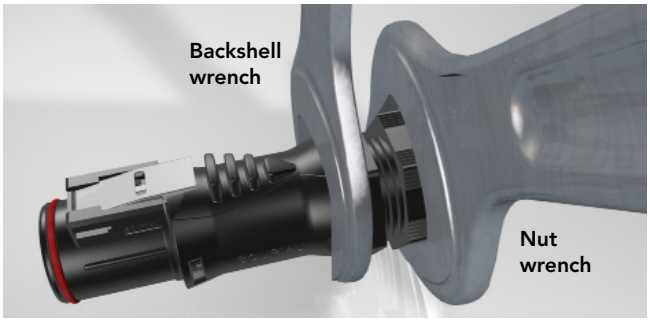
Note: Assembly operations mentioned above shall not interfere or to be in contradiction with the IPC-WHMA-A-620B

UTL6JC Assembly

- Slide backshell on the cable
- Prepare cable end (see UTL catalog)
- For screw termination version: place each stripped wire in the contact and tighten the screw, advised torque 20 Ncm
- For crimp termination version: crimp contacts on wires and insert contacts in the cavities
- Check wire retention by a slight two finger retraction
- Then click the backshell on the plug rear side
- Tighten the cable gland on the backshell, indicative torque: 3 Nm
- Finally tighten the nut on the cable gland, wrench size 30, indicative torque: 8 Nm maxi (depending on cable used)





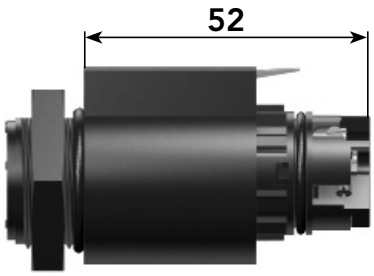


Picture for illustration purpose only.

Note: Assembly operations mentioned above shall not interfere or to be in contradiction with the IPC-WHMA-A-620B

Mated Connector Length

UTL1 or UTL7 + UTL6



UTL1 or UTL7 + UTL6JC

Note: all dimensions are in mm and for information only

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or visit our web site www.souriau-industrial.com

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