



SOURIAU

UTL Series



Dynamic IP68/69K • UV Resistant • UL/IEC Compliant



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series

UTL Series

Overview

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UTL Series

Overview

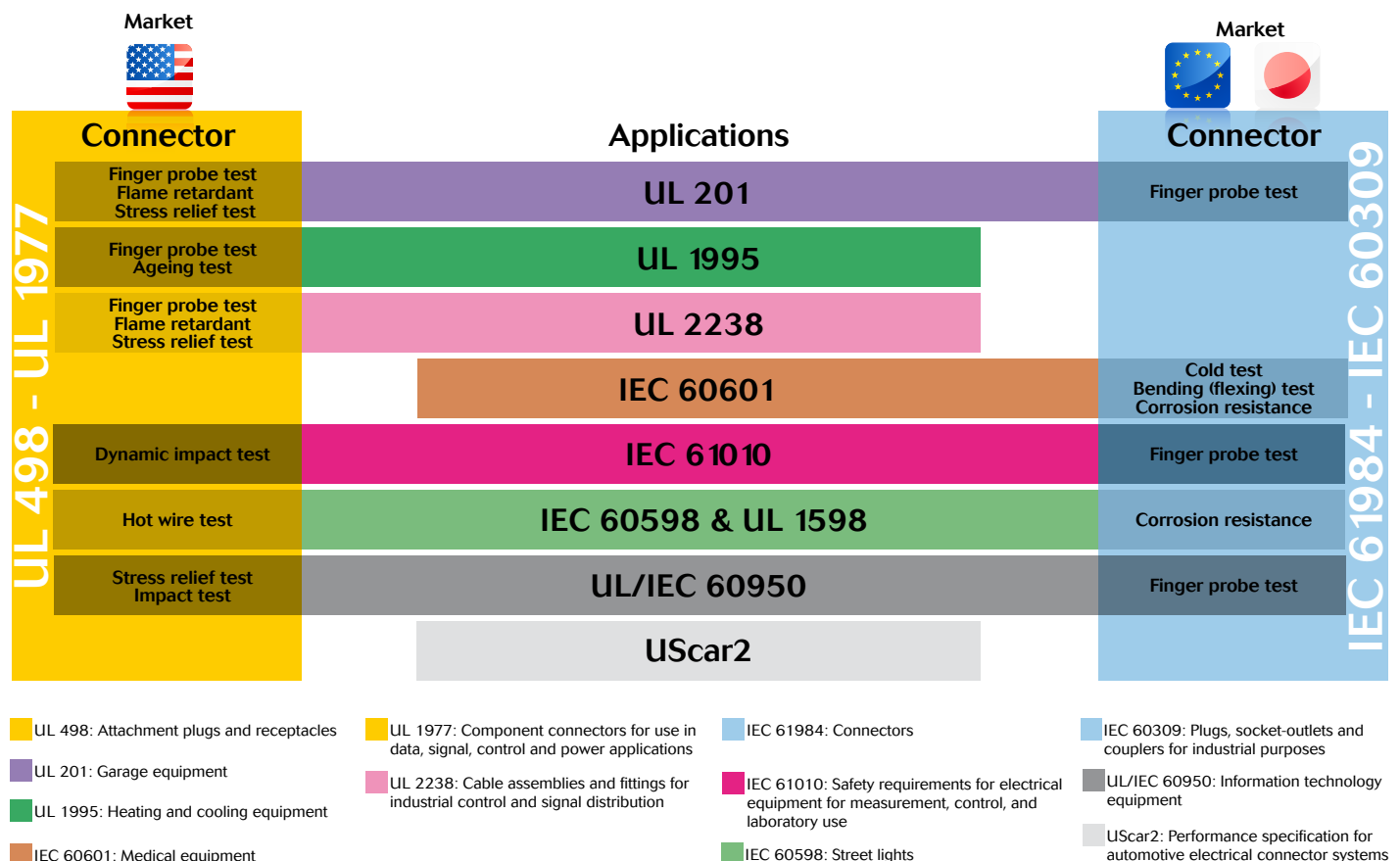


In today fast paced environment we are all buying electronic devices with confidence. To achieve a high such level of trust, the legislator had to put in place a wide variety of safety standards

Being conscious of the number of standards and the difficulty to find an appropriate connector, Souriau decided to release an all-in-one solution. The UTL series is a unique connector which is compliant with ALL industry standards you can see nowadays.

In addition to this it has been designed to be exclusively overmolded o prevent unwanted tamper. Souriau having the ability to supply cable assemblies it is therefore a gain of time with a one stop shopping supplier. There is no need anymore to look for a cable house able to terminate this fantastic product.

Interact safety standards



UTL Series

Overview



UTL range overview

The UTL Series is a plastic connector range designed to respect modern safety standards.

The stainless steel latch coupling system makes it simple to use. With only 1 finger, connectors are mated with an audible and sensitive "click". The key shape of the coupling system makes it blind mateable. In dark conditions the color and mechanical discriminations helps you to do it and avoid you to damage connectors.



The philosophy of the UTL Series is built around three key elements:

Dynamic IP68/69K



The UTL Series is rated at IP68/69K... even in dynamic conditions. This means that it remain sealed even when used continuously underwater or cleaned using a high pressure hose and cable is moving.

If this same level of performance is required even when connectors then we have special sealed contacts. This unique fetature helps you to product your electronics from ingress of water. This is particulary interesting when using with NEMA enclosure or outdoor luminaires.

UV Resistant



In most applications, our connectors are exposed to extreme climatic conditions; it was therefore key for us to select the materials best able to cope with the targeted environment.

In most applications, our connectors are exposed to extreme climatic conditions; it was therefore key for us to select the materials best able to cope with the targeted environment.

The UTL Series uses an outdoor rated material. Underwriters Laboratories classifies it "F1" per UL746C.

UL/IEC Compliant



The outmost priority for any electrical installation is to protect personnel from any shock hazard.

In North America, Underwriters Laboratories insisted that connector manufacturers, depending of the application, respect their standards. The UTL Series had thus been qualified, certified by this organisation and compliant with the UL 1598, UL1977, UL498, UL60320.

In Europe and in Asia, IEC standards are better known and trusted by end users. Like its American equivalent, the IEC refers to safety rules. The UTL Series was obviously designed to respect these rules and especially the IEC 60598, IEC60065, IEC60320, IEC61076-2-103.

UTL Series Overview



UTL Series

UTL Series Crimp contact

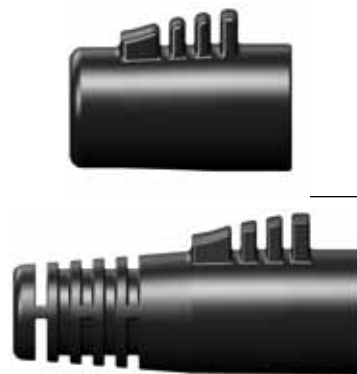


Sealed: IP68/69K
UV resistant
UL/IEC compliant

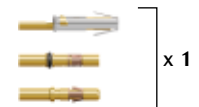


Plugs

Overmolding cable plug

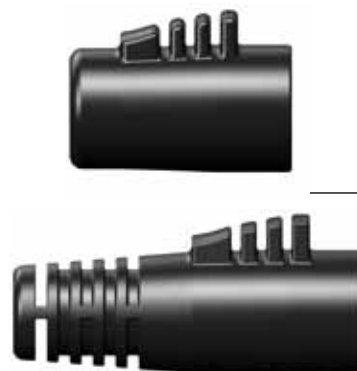


Ground line



Phase line
Neutral line

Overmolding cable plug



Ground line

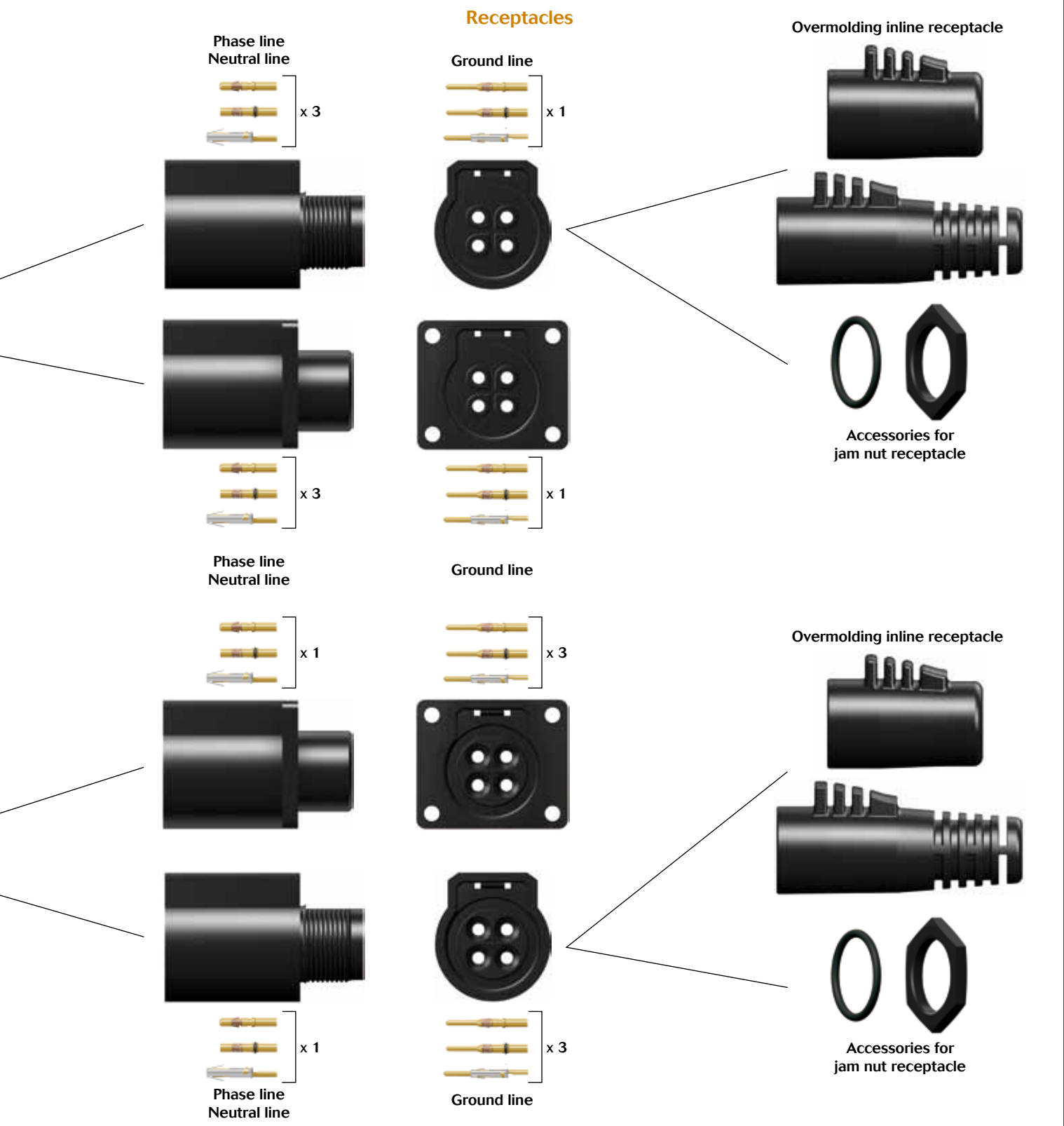


Phase line
Neutral line

UTL Series Overview



range overview





Mechanical

- 1 • Durability:
500 matings & unmatings (with stamped and formed contact, S18 plating)

Environmental

- 3 • Operating temperature:
from -40°C to +105°C
- Flammability rating:
UL 94 5VA
- Salt spray:
≥1000 hours
- UV resistant:
No mechanical degradation or important variation of colour of exposure in natural environment (F1 material per the UL 746C)
- 4 • Sealing:
 - IP68/69K mated with standard contacts
 - IP68/69K even unmated with sealed contacts (see p23)
- Fluid resistance:
 - Gasoil
 - Mineral oil
 - Acid bath
 - Basic bath



UTL Series

Overview



characteristics



Electrical

- UL: 600V 16A
277V 13A for CBC use
- CN: 600V 13A
277V 10A for CBC use
- IEC: 230/400V 16A
- 2 • Connector for Breaking circuit
- First Mate Last Break contact mating on earth line

Material

- Body connector + Backshell: Thermoplastic
- Insert: Connector: Thermoplastic
- Contacts: See page 22
- Nut: Metal
- Halogen free
- RoHS compliant & conform to the Chinese standard SJ/T1166-2006 (Chinese RoHS equivalent)



Qualification

- In accordance with:
 - IEC60065, IEC60598, UL1598, IEC60320, UL498, UL94, UL746, IEC61076-2-103
 - UL 1977: UL file number E169916
 - IEC 61984: Pending



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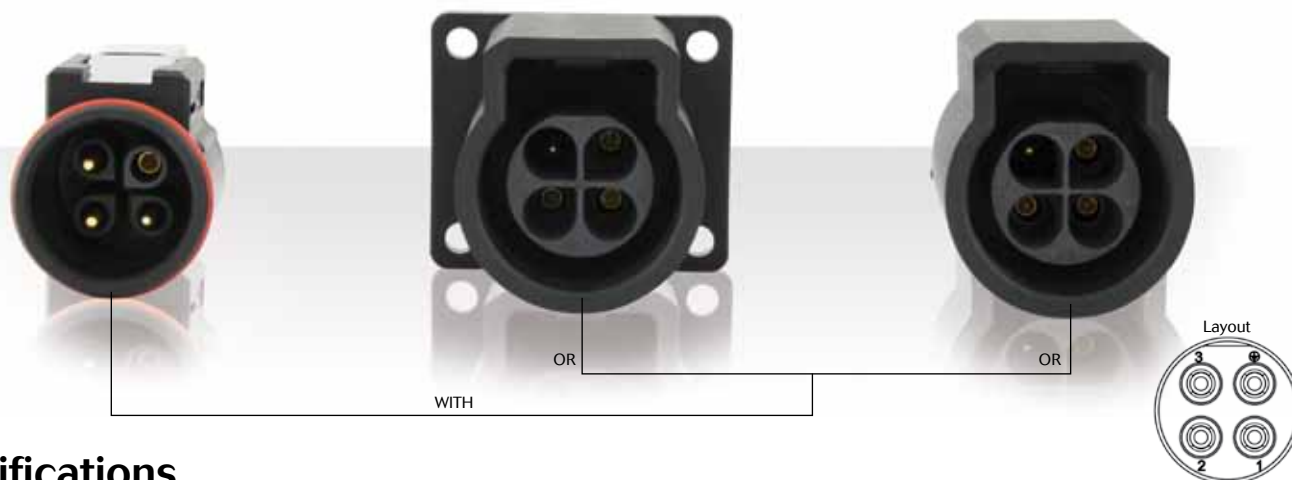
UTL Series

Mechanics

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UTL Series

103G1



Specifications

| Contact type | Connector type | Part number | | | |
|--|--------------------------|--------------|--------------|---------------|--------------|
| | | Male insert | | Female insert | |
| | | Black color | Grey color | Black color | grey color |
| Crimp contacts supply separately see page 17 | Square flange receptacle | UTL0103G1P ✓ | UTL0103G1P03 | UTL0103G1S | UTL0103G1S03 |
| | Plug | UTL6103G1P | UTL6103G1P03 | UTL6103G1S ✓ | UTL6103G1S03 |
| | Jam nut receptacle | UTL7103G1P ✓ | UTL7103G1P03 | UTL7103G1S | UTL7103G1S03 |
| | In line receptacle | UTL1103G1P ✓ | UTL1103G1P03 | UTL1103G1S | UTL1103G1S03 |

48h sample service ✓

Harnesses

| Connector type | Overmolded harnesses, straight ending | | | | | |
|----------------|---------------------------------------|----------------|-----------------|------------------|------------------|-------------------|
| | Male insert | | | Female insert | | |
| | 3 ft | 6 ft | 12 ft | 3 ft | 6 ft | 12 ft |
| Plug 1 side | UTLMKT63G1P3FT | UTLMKT63G1P6FT | UTLMKT63G1P12FT | UTLMKT63G1S3FT | UTLMKT63G1S6FT | UTLMKT63G1S12FT |
| Plug 2 sides | - | - | - | UTLMKT63G1SP3FT | UTLMKT63G1SP6FT | UTLMKT63G1SP12FT |
| Plug + in line | - | - | - | UTLMKT613G1SP3FT | UTLMKT613G1SP6FT | UTLMKT613G1SP12FT |

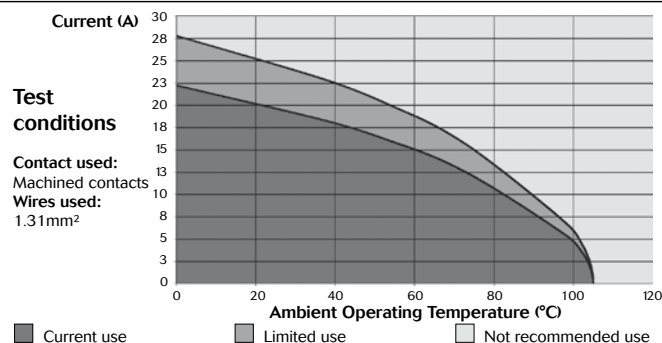
Electrical characteristics

UL
600V 16A
277V 10A for CBC use

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

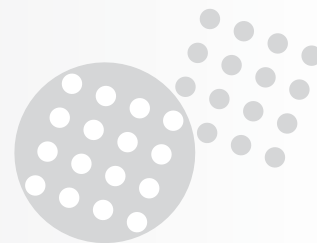
IEC
16A 230/400V 16A

UTL103G1 derating curves



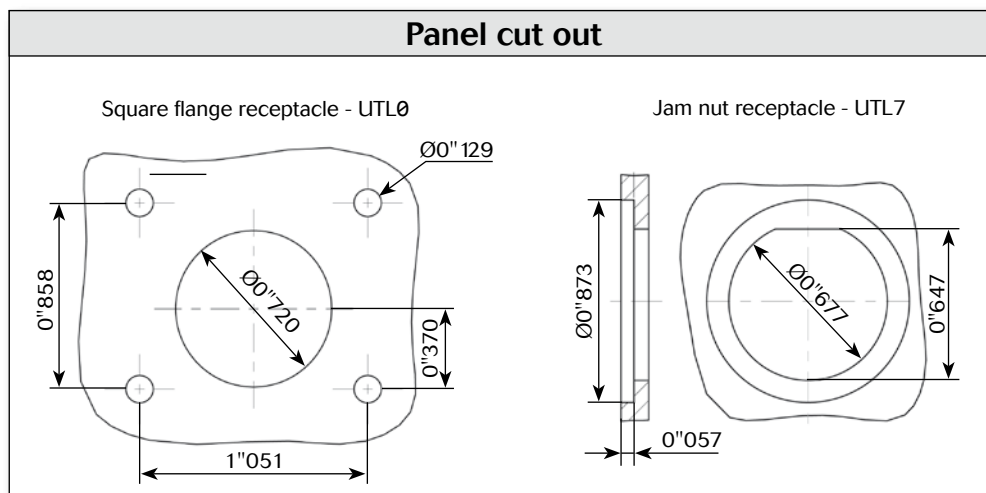
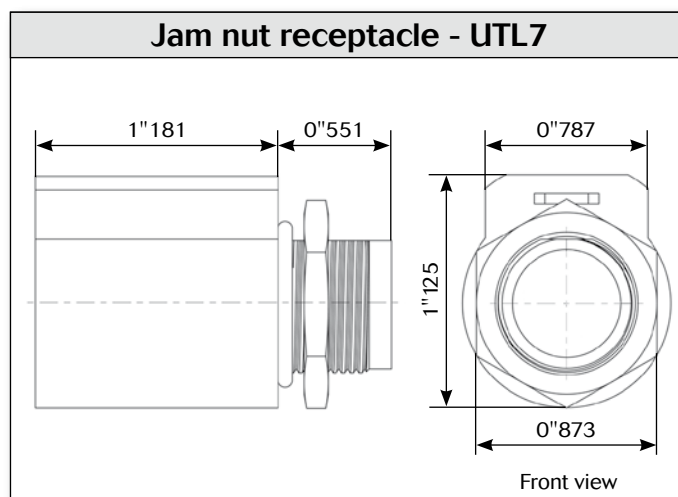
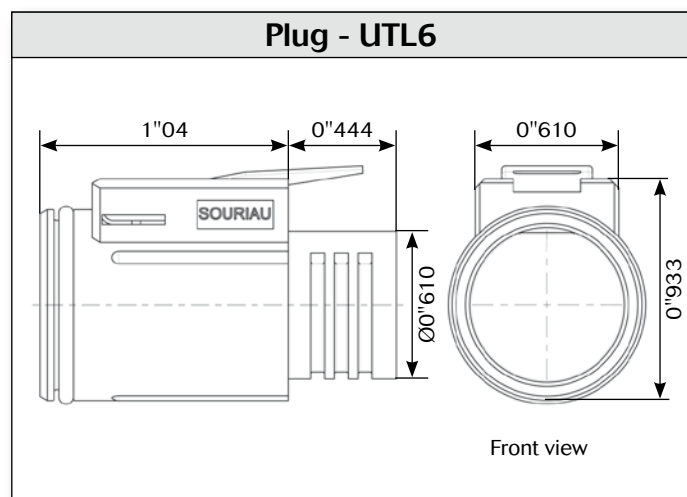
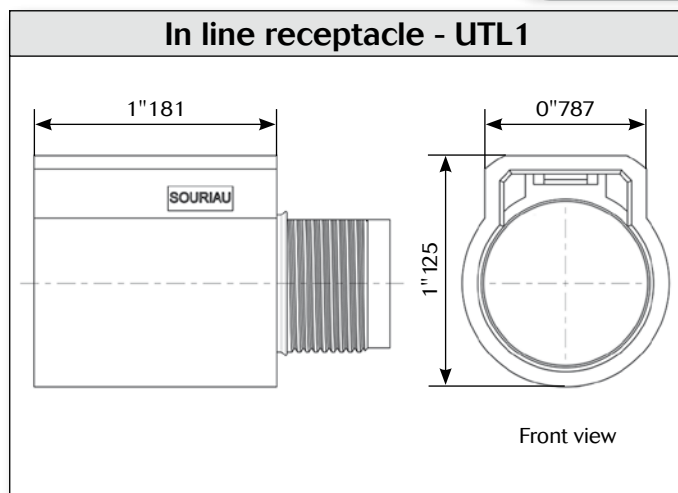
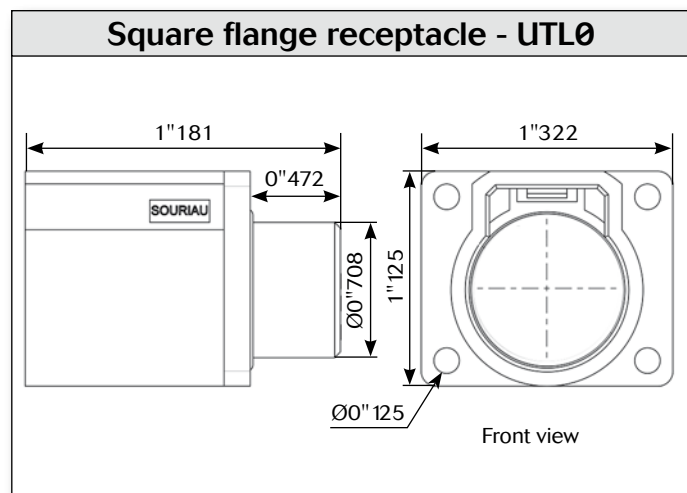
UTL Series

103G1



3 + ground
16A/600V
per UL1977

Dimensions



Note:
all dimensions are in inch

UTL Series

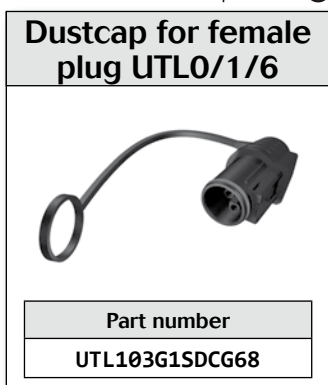
103G1



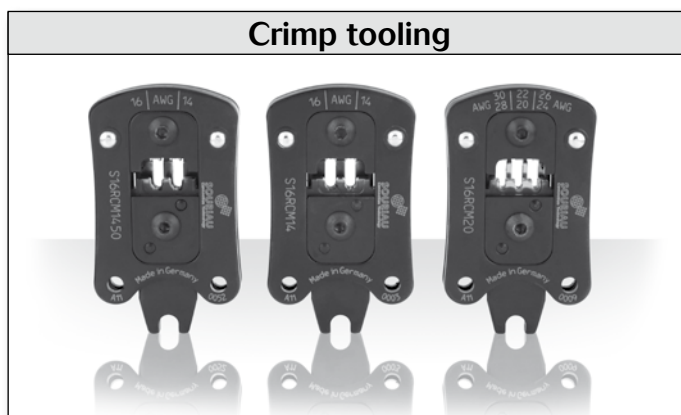
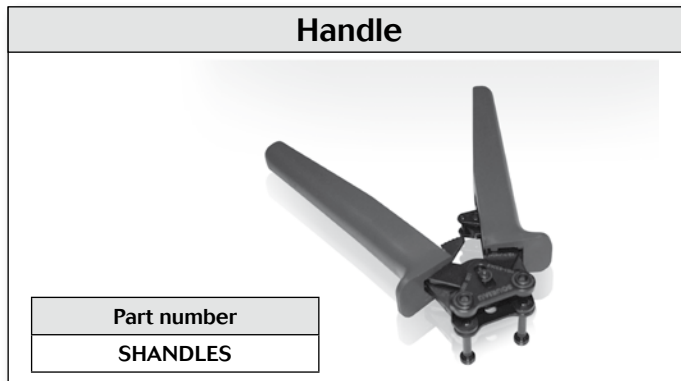
Accessories



48h sample service



Tooling



| 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 |
| RM/RC 16M25K | | S16RCM1625 |
| RM/RC 14M25K | | S16RCM1425 |
| 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 |
| RMDXK10D28K | Coaxial contacts | M10S-1J |
| RCDXK1D28K | | M10S-1J |
| RM/RC DX60xxD28K | | M10S-1J |
| RM/RC DXK10D28 + yolk090 | | M10S-1J |
| RM/RC DX60xxD28 | | M10S-1J |

(1): example of plating, for other plating see page 21

UTL Series

103G1



3 + ground
16A/600V
per UL 1977

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 | 1.1 |
| | | 26-24 | RM24M9K ⁽¹⁾ Ⓢ | RC24M9K ⁽¹⁾ Ⓢ | 0.8 | 1.6 |
| | | 22-20 | RM20M13K ⁽¹⁾ Ⓢ | RC20M13K ⁽¹⁾ Ⓢ | 1.18 | 1.8 |
| | | 22-20 | RM20M12K ⁽¹⁾ Ⓢ | RC20M12K ⁽¹⁾ Ⓢ | 1.18 | 2.2 |
| | | 20-16 | RM16M23K ⁽¹⁾ Ⓢ | RC16M23K ⁽¹⁾ Ⓢ | 1.8 | 3.2 |
| | | 16-14 | RM14M30K ⁽¹⁾ Ⓢ | RC14M30K ⁽¹⁾ Ⓢ | 2.28 | 3.2 |
| | Machined with o-ring | 20-16 | RM16M25K ⁽³⁾ Ⓢ | RC16M25K ⁽³⁾ Ⓢ | 1.8 | 3.2 |
| | | 16-14 | RM14M25K ⁽³⁾ | RC14M25K ⁽³⁾ | 2.28 | 3.2 |
| | Stamped & formed reeled contacts | 26-24 | SM24M1TK6 ⁽¹⁾⁽²⁾ | SC24M1TK6 ⁽¹⁾⁽²⁾ | 0.89-1.28 | - |
| | | 22-20 | SM20M1TK6 ⁽¹⁾⁽²⁾ | SC20M1TK6 ⁽¹⁾⁽²⁾ | 1.17-2.08 | - |
| | | 18-16 | SM16M1TK6 ⁽¹⁾⁽²⁾ | SC16M1TK6 ⁽¹⁾⁽²⁾ | 3.0 | - |
| | | 18-16 | SM16M11TK6 ⁽¹⁾⁽²⁾ | SC16M11TK6 ⁽¹⁾⁽²⁾ | 2.0-3.0 | - |
| | | 14 | SM14M1TK6 ⁽¹⁾⁽²⁾ | SC14M1TK6 ⁽¹⁾⁽²⁾ | 3.2 | - |
| Coaxial | Cable Multipiece | - | 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 see page 21

(2): Loose piece contact available if putting L. Example: SM20ML1TK6

(3): Sealed contacts

48h sample service Ⓢ

Prototype kit - See instructions page 36

| Connector type | Wire section | Boot | Part number | |
|--------------------------|--------------|------|-----------------|-----------------|
| | | | Male insert | Female insert |
| Plug | AWG 20 | 1 | UTL6103G1P20AWG | UTL6103G1S20AWG |
| | AWG 16 | 1 | UTL6103G1P16AWG | UTL6103G1S16AWG |
| | AWG 14 | 1 | UTL6103G1P14AWG | UTL6103G1S14AWG |
| Inline receptacle | AWG 20 | 1 | UTL1103G1P20AWG | UTL1103G1S20AWG |
| | AWG 16 | 1 | UTL1103G1P16AWG | UTL1103G1S16AWG |
| | AWG 14 | 1 | UTL1103G1P14AWG | UTL1103G1S14AWG |
| Jam nut receptacle | AWG 20 | 1 | UTL7103G1P20AWG | UTL7103G1S20AWG |
| | AWG 16 | 1 | UTL7103G1P16AWG | UTL7103G1S16AWG |
| | AWG 14 | 1 | UTL7103G1P14AWG | UTL7103G1S14AWG |
| Square flange receptacle | AWG 20 | | UTL0103G1P20AWG | UTL0103G1S20AWG |
| | AWG 16 | | UTL0103G1P16AWG | UTL0103G1S16AWG |
| | AWG 14 | | UTL0103G1P14AWG | UTL0103G1S14AWG |

NB: Contacts supplied (S31 plating)

UTIL
series



Contacts

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Contacts



Description

The UTL series is delivered without contact (crimp version). Contacts are not loaded, this series offers the unique possibility to use the same contact in any layout as long as it receives the same active part size. Thus it is possible to buy only one contact reference and equip all connectors even if housings are different.

The main benefit is the standardisation which means reduction of inventory cost.

Bearing in mind that any additional tool or complicated assembly process should be avoided, our contacts are based on a snap-in principle which avoid the use of an insertion tool.

Crimp contacts are available in different versions:



• machined



• stamped & formed



• coaxial

In addition, UTL series can obviously be equipped with solder contacts, PCB contacts.

UTL Series Contacts



Contact plating selector guide

As soon as you know what contact size you need, you next have to decide on which type to use.

Souriau proposes mainly two different types of electrical contacts:

- Machined
- Stamped & formed

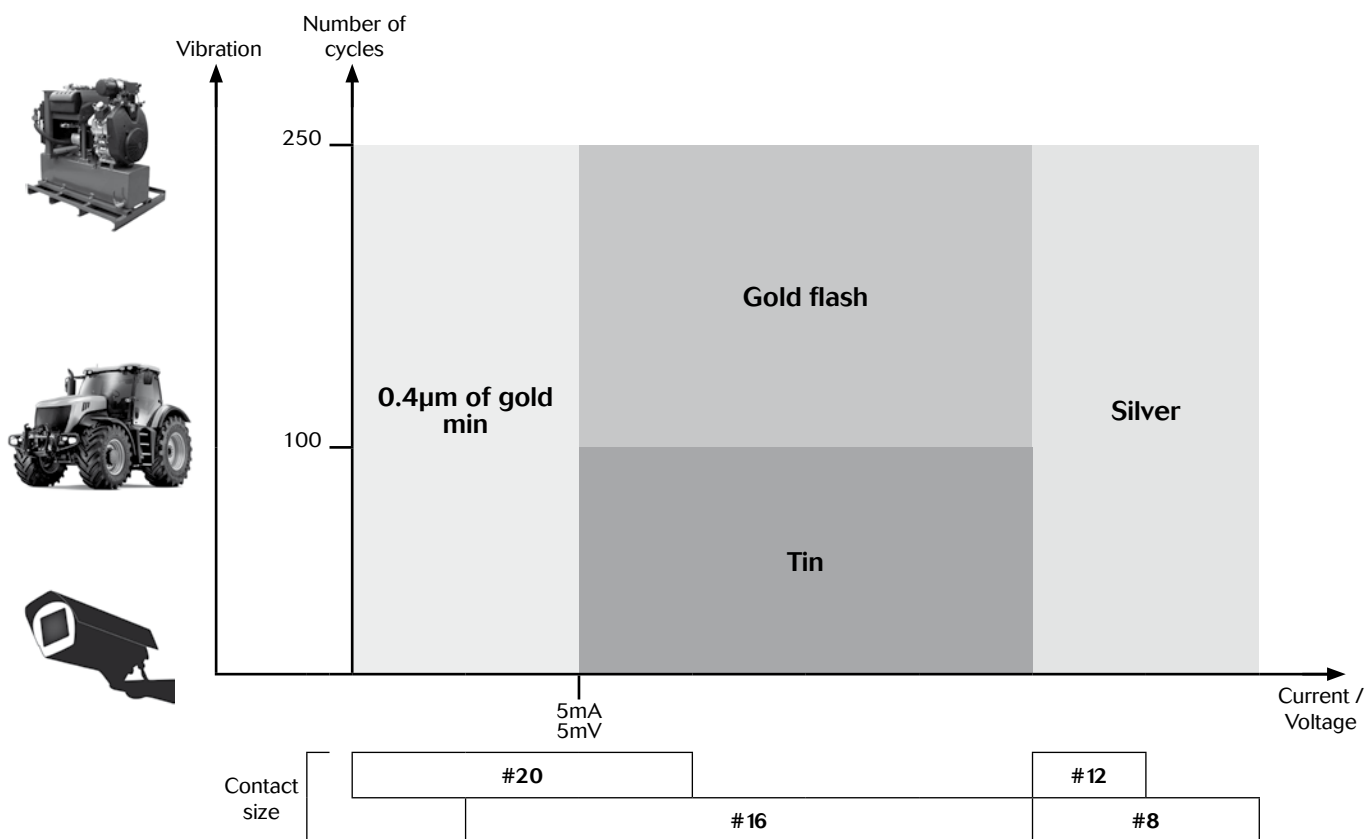
Machined contacts are generally chosen for low quantities purpose as well as a better solution for power applications.

Stamped & formed contacts offer the ability to be crimped automatically which makes them more suitable for high volume production applications.

Then comes the question: What plating should I choose ?

Hereunder is a graph with criteria to guide you:

NB: do not mix different plating (e.g. tin plated pin contact with gold plated socket contact).



UTL Series

Contacts



Contact selector guide

Contact supply separately

| Electrical characteristics: contact resistance | | |
|---|------------------|-------|
| #16 Ø1.6mm | Machined | < 3mΩ |
| | Stamped & formed | < 6mΩ |

| Available platings (contact supply separately) | |
|--|--|
| K | Min 0.4μ gold over 2μ Ni |
| S31 | Active part: Gold flash over Ni Crimp area: Nickel |
| S18 | Active part: 0.75μ gold min over 2μ Ni Crimp area: 1.3μ tin over Ni Other: Nickel |
| TK6 | 2-5μ Sn pre-plated |

Packaging

Conscious of the wide variety of applications, contact packaging has been considered for small series (bulk packaging) and high volume production (reeled contacts):

Size contact #16



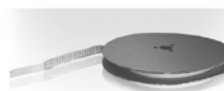
- 25 pieces bulk packing (stamped & formed contacts)



- 50 pieces bulk packing (machined contacts)



- 1000 pieces bulk packing (machined contacts)



- 3000 pieces reeled (stamped & formed contacts)



- 5000 pieces reeled (machined contacts)

UTL Series

Contacts



Crimp contacts

Standard version



| Contact size | Type | Wire size | | Part number | | Max wire Ø | Max insulator Ø | Plating available |
|-------------------|----------------------|-----------|-----------|-----------------------------------|-----------------------------------|------------|--------------------|-------------------|
| | | AWG | mm² | Male | Female | | | |
| #16 Ø1.6 mm | Machined | 30-28 | 0.05-0.08 | RM28M1- (1) ✓ | RC28M1- (1) ✓ | 0.55 | 1.1 | K |
| | Machined | 26-24 | 0.13-0.2 | RM24M9- (1) ✓ | RC24M9- (1) ✓ | 0.8 | 1.6 | K |
| | Stamped & Formed | 26-24 | 0.13-0.25 | SM24M1- (1) ✓ SM24ML1- (2) ✓ | SC24M1- (1) ✓ SC24ML1- (2) ✓ | 0.89-1.28 | Insulation grip | S31, S18, TK6 |
| | Machined | 22-20 | 0.32-0.52 | RM20M13- (1) ✓ | RC20M13- (1) ✓ | 1.18 | 1.8 | K |
| | | | | RM20M12- (1) ✓ | RC20M12- (1) ✓ | | 2.2 | |
| | Stamped & Formed | 22-20 | 0.35-0.5 | SM20M1- (1) ✓ SM20ML1- (2) ✓ | SC20M1- (1) ✓ SC20ML1- (2) ✓ | 1.17-2.08 | Insulation grip | S31, S18, TK6 |
| | Machined | 20-16 | 0.52-1.5 | RM16M23- (1) ✓ | RC16M23- (1) ✓ | 1.8 | 3.2 | K |
| | Machined with o-ring | 20-16 | 0.52-1.5 | RM16M25- (1) ✓ | RC16M25- (1) ✓ | 1.8 | 3.2 | K |
| | Stamped & Formed | 18-16 | 0.8-1.5 | SM16M1- (1) ✓ SM16ML1- (2) ✓ | SC16M1- (1) ✓ SC16ML1- (2) ✓ | 3.0 | No insulation grip | S31, S18, TK6 |
| | Stamped & Formed | 18-16 | 0.8-1.5 | SM16M11- (1) ✓ SM16ML11- (2) ✓ | SC16M11- (1) ✓ SC16ML11- (2) ✓ | 2.0-3.0 | Insulation grip | S31, S18, TK6 |
| | Machined | 16-14 | 1.5-2.5 | RM14M30- (1) ✓ | RC14M30- (1) ✓ | 2.28 | 3.2 | K |
| | Machined with o-ring | 16-14 | 1.5-2.5 | RM14M25- (1) ✓ | RC14M25- (1) ✓ | 2.28 | 3.2 | K |
| | Stamped & Formed | 14 | 2.0-2.5 | SM14M1- (1) ✓ SM14ML1- (2) ✓ | SC14M1- (1) ✓ SC14ML1- (2) ✓ | 3.2 | No insulation grip | S31, S18, TK6 |

(1) contact reeled (2) loose contact

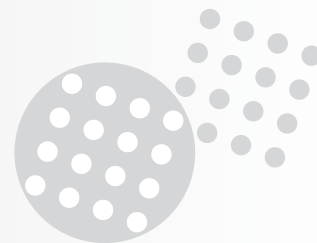
Example: RM16M23K - Size #16, Machined, AWG20 wire, gold plating.

48h sample service ✓

REMINDER

Plugs and receptacles have to be equipped with both contact genders.

EX: UTL6103G1P = 3 x SM16M1531 + 1 x SC16M1531



#16 coaxial contacts

Coaxial contact range

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 page 50 | See pages 54 & 55 |
| Monocrimp | RMDX60xxD28 | RCDX60xxD28 | | See page 56 |

48h sample service ☑

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 page 51 | See page 52 |
| Monocrimp | RMDX60xxD28 | RCDX60xxD28 | | See page 53 |

UTL Series

Contacts





Just series.

Technical information

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Tooling

Automatic crimping tools



Mecal is leader in manufacturing tooling for crimping terminals over a stripped wire.

Established in 1976, Mecal has become one of the world's leading companies dedicated to the design and manufacture of semi automatic production tools for strip fed, open barrel crimp terminals, serving the Automotive, Telecom and Datacomm industry.



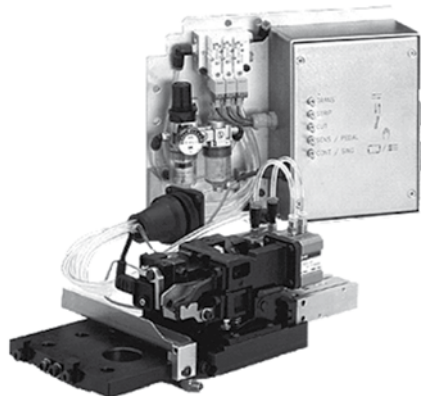
The extreme environment interconnect specialist "from deep sea to deep space".

Souriau designs manufactures and markets high performance interconnect solutions for severe environments dedicated to the aerospace, defence, light and heavy industry markets.

Souriau has been working in partnership with Mecal for a good number of years. With sales offices located in all major industrial regions of the world, the combined strengths of both organisations has resulted in a truly global solution to all your production tooling needs.



Mini Applicator



Stripper



Presses

Mecal sales network:

www.mecal.net/eng/retevendita.php

UTL Series

Technical information



Crimptooling table

Standard contacts

| Contact size | Part number | Head | Handles | Extraction tools |
|---------------|--------------|-----------|----------|------------------|
| #16 0"062 | RM/RC 28M1- | S16RCM20 | SHANDLES | RX2025GE1 |
| | RM/RC 24M9- | | | |
| | RM/RC 20M13- | | | |
| | RM/RC 20M12- | | | |
| | RM/RC 16M23- | S16RCM16 | | |
| | RM/RC 14M30- | S16RCM14 | | |
| | SM/SC 24M1- | S16SCM20 | | |
| | SM/SC 24ML1- | | | |
| | SM/SC 20M1- | | | |
| | SM/SC 20ML1- | S16SCML1 | | |
| | SM/SC 16M1- | | | |
| | SM/SC 16ML1- | | | |
| | SM/SC 14M1- | S16SCML11 | | |
| SM/SC 14ML1- | | | | |
| SM/SC 16M11- | | | | |
| SM/SC 16ML11- | | | | |

Note: endurance of SHANDLES tool = 5 000 cycles.

Specific contacts sealed

| Contact size | Part number | Head | Handles | Extraction tools |
|--------------|--------------|------------|----------|------------------|
| #16 0"062 | RM/RC 16M25- | S16RCM1625 | SHANDLES | RX2025GE1 |
| | RM/RC 14M25- | S16RCM1425 | | |

Coaxial contacts

See cabling notice chapter Appendices, pages 52 to 56.

Extraction tools

| Contact size | Extractor |
|--------------|-----------|
| #16 | RX2025GE1 |



RX2025GE1

Extraction tools instruction

Extraction:

Place the tool into the cavity from front face of the connector, push on the handle, then remove the contact.

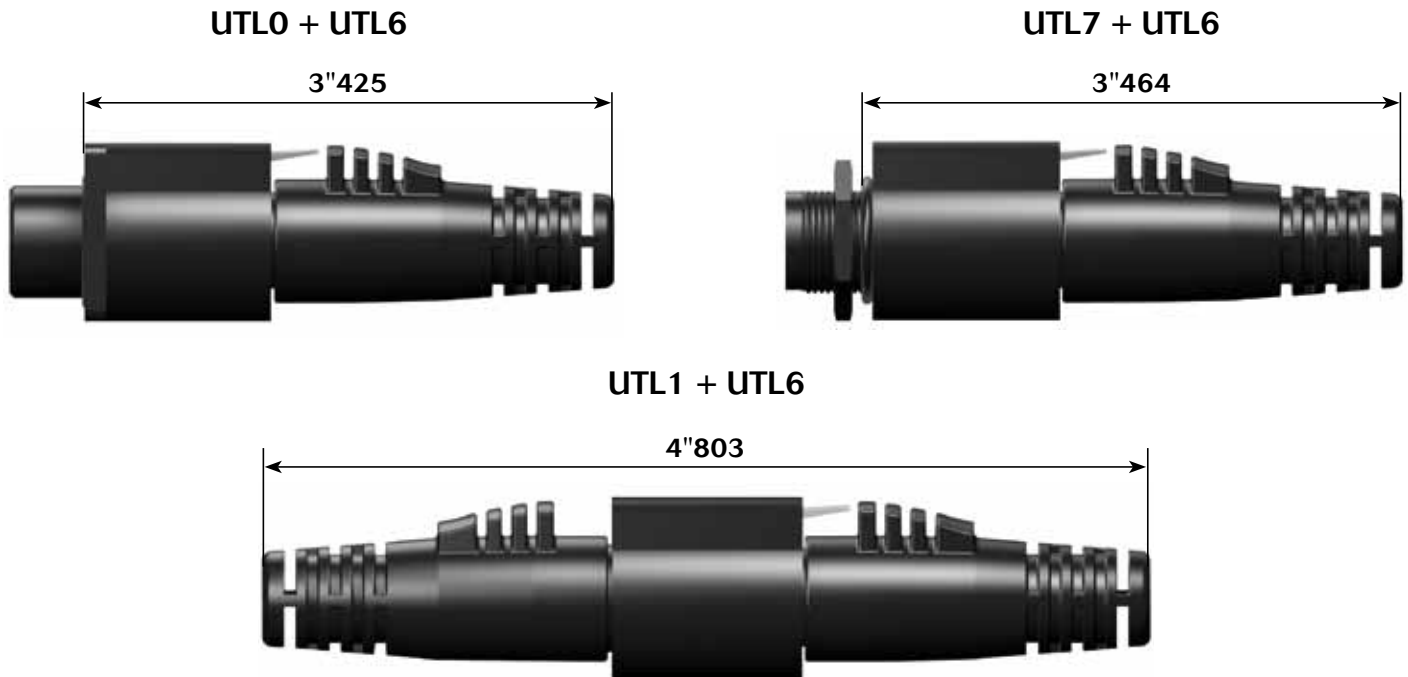


UTL Series

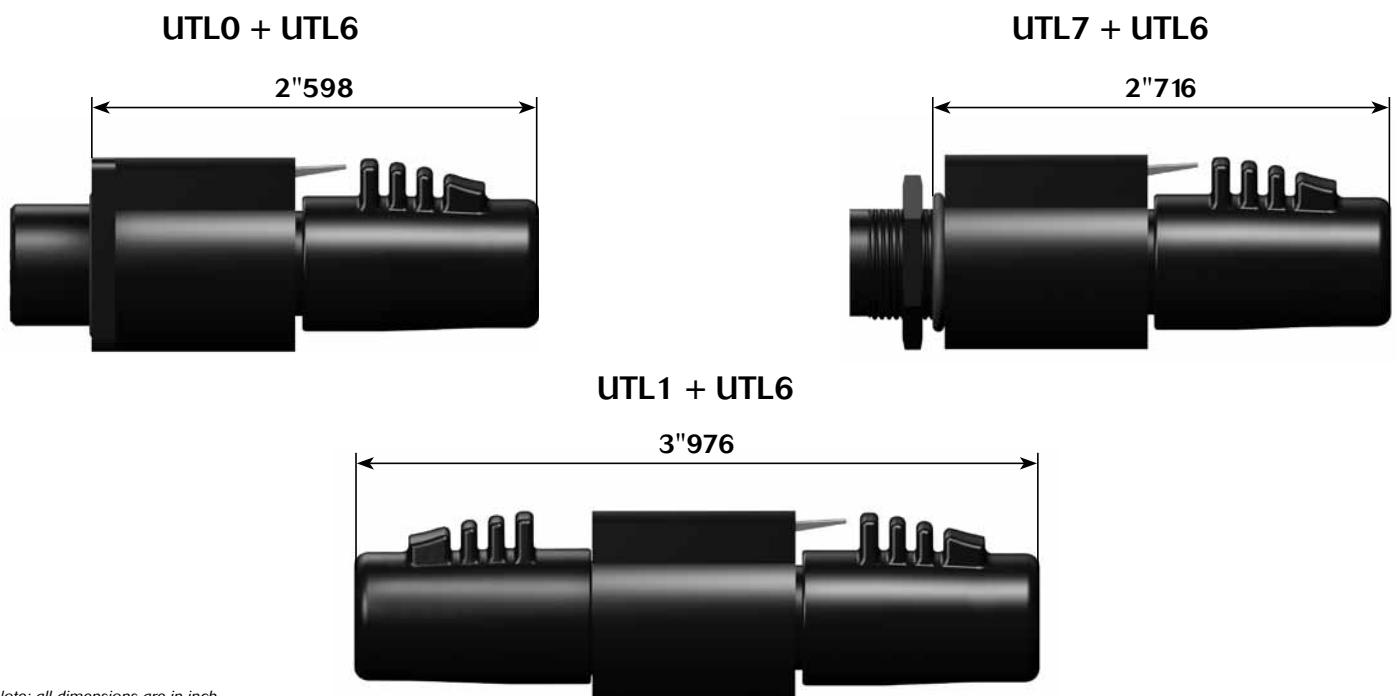
Technical information

Dimensions mated connector

Long version: with strain relief



Short version: without strain relief



Note: all dimensions are in inch



Handle & Interchangeable Heads

User guide

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



- 2) Choose the adapted head (sold separately), keep vertically
and slide it into the handle till the mecanical end.



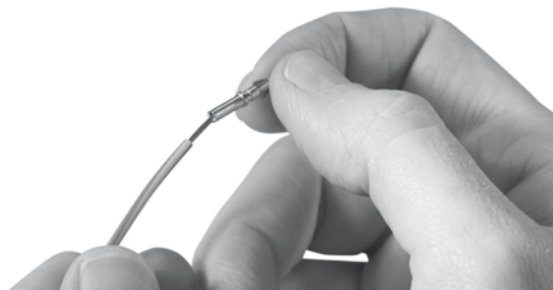
- 3) Close simultaneously the two pins to maintain the head.



- 4) Strip the cable properly checking the size recommended
in the catalog.



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



- 6) Position the contact in the bottom of the tools by checking out
its orientation.



- 7) To crimp contact assembly-cable, tighten sharply the clip
to the end of the mechanism.






- 8) To control crimp quality, slightly pull cable with two fingers
to control retention.





Assembly instruction

| Wire stripping crimp version | | | |
|--|--|--|---------------------------|
| | Part number | | Stripping length L (inch) |
| | Male | Female | |
| Machined contact | # 16 | | |
|  | RM28M1- / RM24M9- RM20M13- / RM20M12- | RC28M1- / RC24M9- RC20M13- / RC20M12- | 0"188 |
| | RM16M23- / RM14M30- | RC16M23- / RC14M30- | 0"279 |
| | RM16M25K / RM14M25K | RC16M25K / RC14M25K | 0"216 / 0"208 |
| Stamped & formed | # 16 | | |
| Without insulation support | | | |
|  | SM24M1- / SM24ML1- SM20M1- / SM20ML1 | SC24M1- / SC24ML1- SC20M1- / SC20ML1- | 0"157 |
| | SM16M11- / SM16ML11- | SC16M11- / SC16ML11- | 0"183 |
| With insulation support | | | |
|  | SM16M1- / SM16ML1- | SC16M1- / SC16ML1- | 0"249 |
| | SM14M1- / SM14ML1- | SC16M11- / SC16ML11- | 0"249 |

UTL Series

Technical information



Crimping

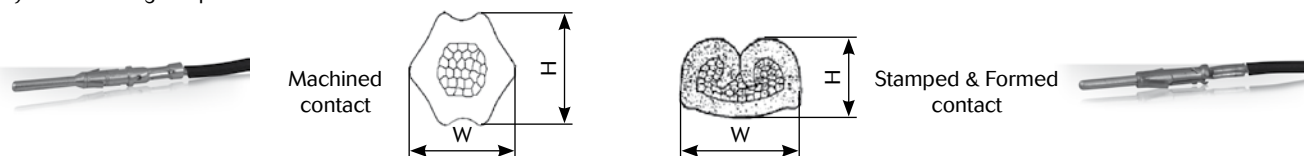
One of the key factors which affects the performance of a connector, is the way contacts are terminated. Crimped connections are nowadays seen as the best solution to ensure quality throughout the lifetime of the product. Here are some reasons why we recommend this method of termination for UTS connectors:

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 burnt, 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 full forces are indicated in the tables below:



| 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) | Head's P/N |
|---------------------------|------------------|-----------------------|--------------------|---------------|------------------------------|---------------------------|--------------------------|------------|
| Machined contacts size 16 | RM/RC 28M1K* | 30/28 | AWG 30 | 0.05 min | 11 N | 1.14 | 1.41 | S16RCM20 |
| | | | AWG 28 | 0.08 max | 11 N | | | |
| | RM/RC 24M9K* | 26/24 | AWG 26 | 0.12 min | 15 N | 1.15 | 1.41 | |
| | | | AWG 24 | 0.25 max | 32 N | | | |
| | RM/RC 20M13K* | 22/20 | AWG 22 | 0.32 min | 40 N | 1.26 | 1.76 | |
| | | | AWG 20 | 0.50 max | 60 N | | | |
| | RM/RC 20M12K* | | AWG 22 | 0.32 min | 40 N | | | |
| | | | AWG 20 | 0.50 max | 60 N | | | |
| | RM/RC 16M23K* | 20 | AWG 20 | 0.50 max | 60 N | 1.66 | 2.18 | S16RCM16 |
| | | 18 | AWG 18 | 0.82 max | 90 N | 1.80 | 2.28 | |
| | | 16 | AWG 16 | 1.50 max | 150 N | 1.96 | 2.43 | |
| | RM/RC 14M25K | 16 | AWG 16 | 1.50 min | 150 N | 2.10 | 2.68 | S16RCM1425 |
| | | 14 | AWG 14 | 2.50 min | 230 N | 2.30 | 2.78 | |
| RM/RC 16M25K | 18 | AWG 18 | 0.82 max | 90 N | 1.80 | 2.28 | S16RCM1625 | |
| | 16 | AWG 16 | 1.50 max | 150 N | 1.96 | 2.43 | | |
| RM/RC 14M30K* | 16 | AWG 16 | 1.50 min | 150 N | 2.10 | 2.68 | S16RCM14 | |
| | 14 | AWG 14 | 2.50 min | 230 N | 2.30 | 2.78 | | |
| S & F contacts size 16 | SM/SC 24ML1TK6* | 26/24 | AWG 26 | 0.12 min | 15 N | 0.84 | 1.50 | S16SCM20 |
| | | | AWG 24 | 0.25 max | 32 N | | | |
| | SM/SC 20ML1TK6* | 22/20 | AWG 22 | 0.32 min | 40 N | 1.02 | 1.54 | |
| | | | AWG 20 | 0.50 max | 60 N | | | |
| | SM/SC 16ML11TK6* | 18 | AWG 18 | 0.82 min | 90 N | 1.32 | 2.09 | S16SCML11 |
| | | 16 | AWG 16 | 1.50 max | 150 N | 1.36 | 2.10 | |
| | SM/SC 16ML1TK6* | 18 | AWG 18 | 0.82 min | 90 N | 1.49 | 2.02 | S16SCML1 |
| | | 16 | AWG 16 | 1.50 max | 150 N | 1.7 | 2.05 | |
| SM/SC14ML1TK6* | 14 | AWG 14 | 2.50 max | 230 N | 1.79 | 2.58 | | |

(1): example of plating, for other plating see page 21

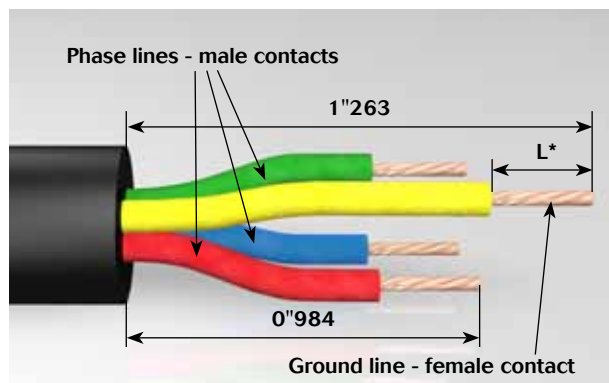


Assembly instruction

UTL stripping dimensions

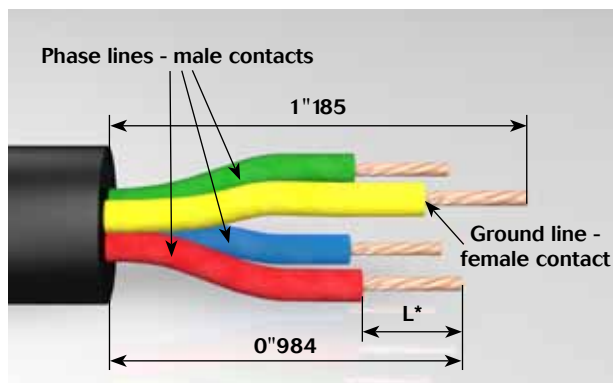
- 1 - Female insulator: Strip external cable sheath, adjust ground cable length
- 2 - Male insulator: Strip external cable sheath, adjust signal cable lengths
- 3 - Crimp contacts
- 4 - Place the lubricant on the contact orings
- 5 - Place all the contacts inside the corresponding cavities in the same time
- 6 - Manually push each contact, or use specific tools, until audible click.
Check each contact retention, with a traction with two fingers

**Plug: UTL0103G1P - UTL6103G1P -
UTL7103G1P - UTL1103G1P**



* see page 32

**Receptacle: UTL0103G1P - UTL6103G1S -
UTL7103G1S - UTL1103G1S**

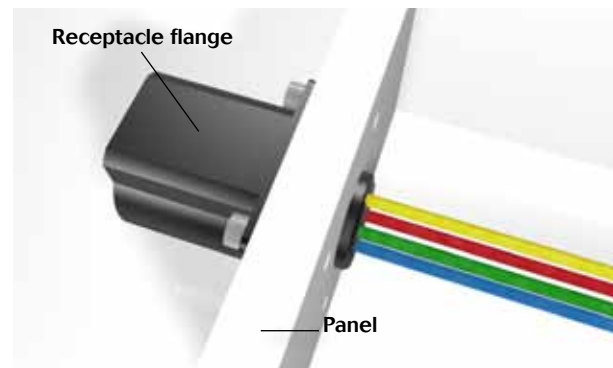
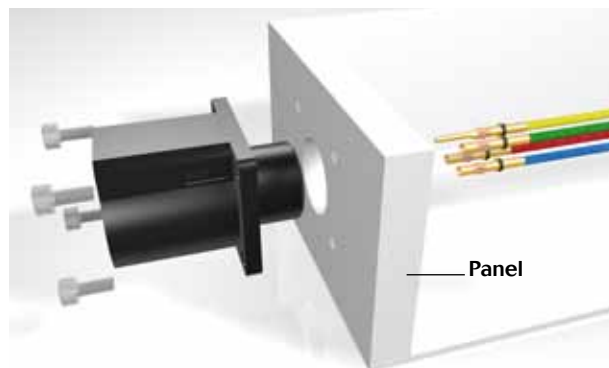


Ground contact must be different compared to the others

Note: all dimensions are in inch

UTL Ø assembly (mounting suggestion)

- Strip wires, crimp contacts
- Insert contacts into connector cavities (insert manually or use tool RTM205 crimp contacts)
- Place receptacle in the panel cut-out (see dimension page 15)
- Secure receptacle with M3 screws (not supplied), torque 0.7 N.m maxi



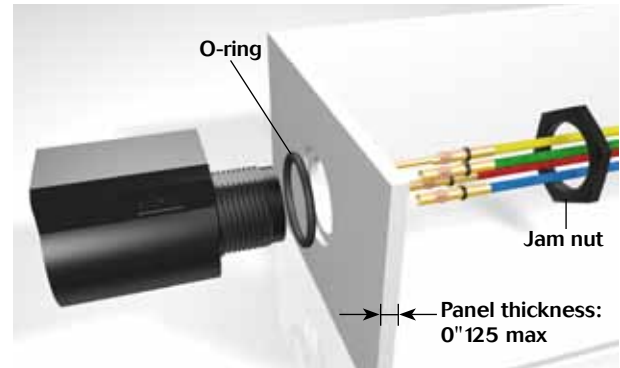
UTL Series

Technical information

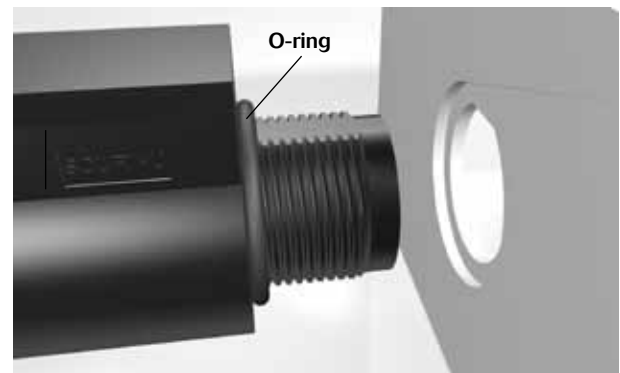


UTL 7 assembly (mounting suggestion)

- Strip wires, crimp contacts
- Insert contacts into connector cavities (insert manually or use tool RTM205 crimp contacts)
- Seat o-ring, place receptacle in the panel cut-out (see dimension page 15)
- Tighten jam nut
- Jam nut torque: 2.5 Nm maxi, tool tightening: 7/8"



Finally



Note: all dimensions are in inch

UTL 6 assembly

- Slide nut on the cable
- Strip external cable jacket
- Strip wires, crimp contacts
- Insert contacts into connector cavities (insert manually or use tool RTM205 crimp contacts)
- Place nut



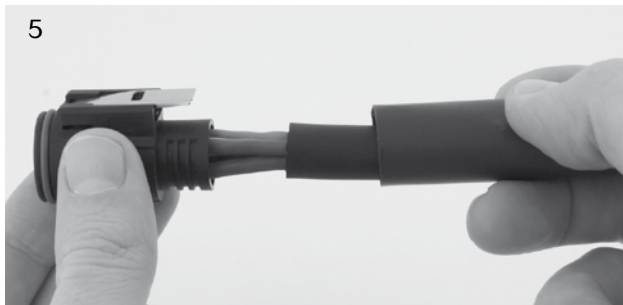
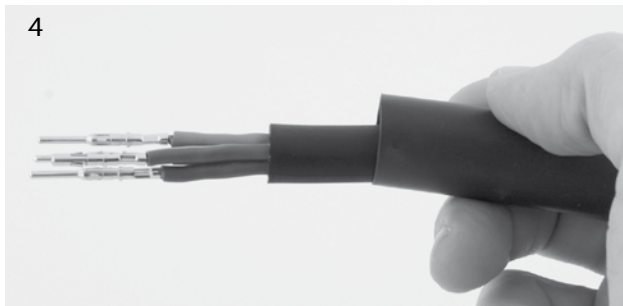


Assembly instruction

Prototype kit

The boot is semi-flexible and heat-shrinkable with a moldable adhesive inner lining.

- 1 - Place the heat shrink boot over the cable
- 2 - Strip the cable jacket (see page 34)
- 3 - Strip the individual wires (see page 32)
- 4 - Crimp the contacts
- 5 - Place the contacts in their cavities, checking the retention by slightly pulling the cable.
- 6 - Clean the connector surface and the cable jacket with isopropyl alcohol
- 7 - Position the boot over the rear threads
- 8 - Heat the boot with a heat gun: minimum shrink temp: 80°C - minimum full recovery temp: 110°C make sure to apply the heat evenly around the boot. Starting by applying the heat from the rear of the connector.
Do not apply excessive heat, as it will damage the connector and/or boot.
- 9 - Let the boot cool down
- 10 - Check for good retention and the boot glue grip.
- 11 - It is advised to rub the jacket with sand paper and clean the jacket before shrinking the boot.



UTL Series

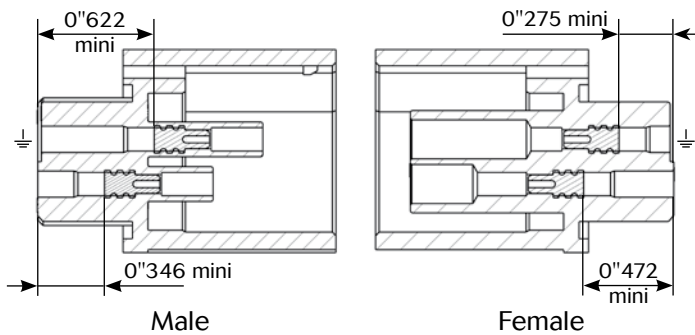
Technical information



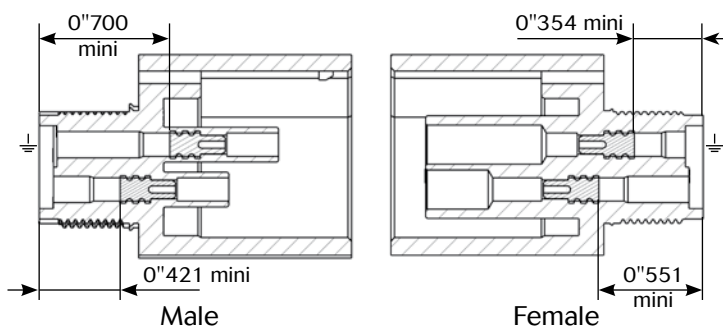
SWS mounting

Push the sealing plug into each connector cavity to seal until a mechanical stop.

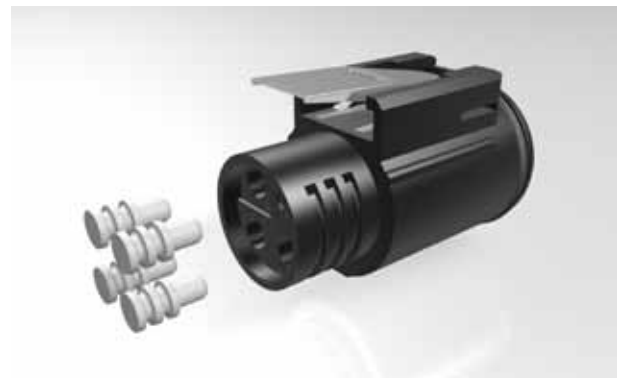
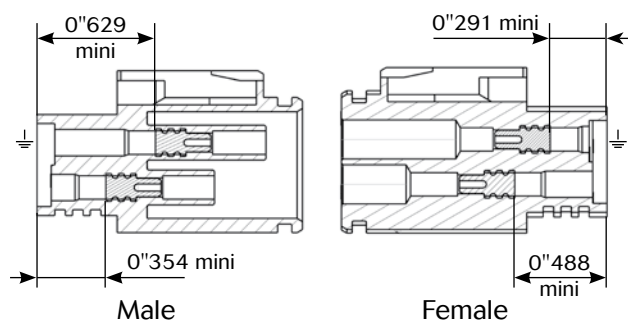
UTL0



UTL7



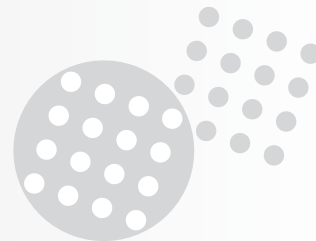
UTL6



Note: all dimensions are in inch

UTL Series

Technical information

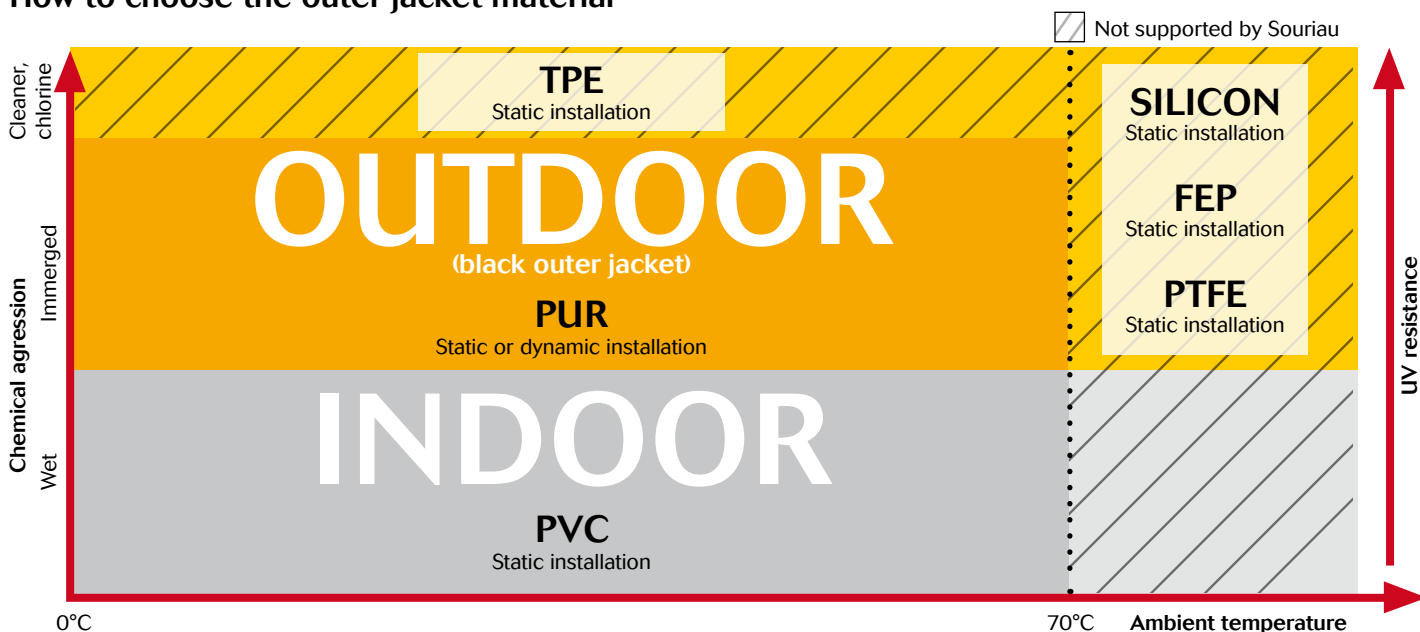


Cable assembly

Souriau provides connectors in various applications for more than 90 years in the most extreme environment. Being conscious about the difficulty to find a quick and a reliable harness manufacturer, we decided years ago to start in house cable assembly production. It allows customers to reduce the number of suppliers, and to take advantage of the "best in class" quality of the Souriau group. Overmoulding is a process that further enhances the sealing properties of the UTL range, especially over many years of use. Overmoulding provides the opportunity to change the cable exit from straight through 90 degrees and avoid any stress on the cable terminated to the connector. Also, as the wires are encapsulated inside the moulding, a barrier is created which prevents from any liquid from entering the equipment through the connector if the cable jacket is breached.

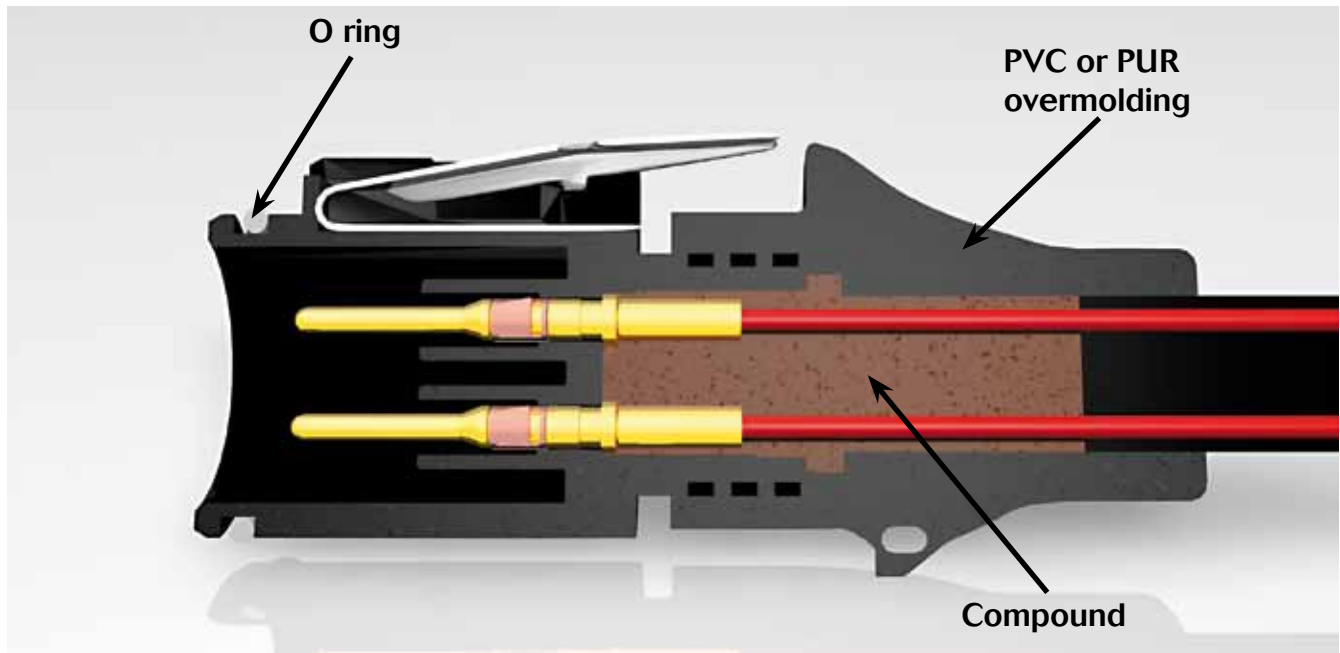


How to choose the outer jacket material





Overmolding description



Discrete connector



Overmoulded connector



UTL Series

Technical information



Cable information

Construction

- Polyurethane Jacket (Black)
- 16 AWG conductors
- Multi-conductor 4, 8, or 12
- 300V or 600V
- Shielded or Unshielded
- Flammability rating UL 1581 Sec.1080 (VW-1)

Applications

- Machining Centers (Oil Resistant)
- Assembly Automation Equipment
- Geophysical Equipment
- Solar (UV Stable)
- Outdoor Displays

Standardization of American cable

Nomenclature Key

- S:** Service Grade (also means extra hard service when not followed by J, V, or P)
- J:** Hard Service
- V:** Vacuum cleaner cord (also light duty cable)
- P:** Parallel cord (also known as zip cord) – Always light duty
- E:** Thermoplastic Elastomer (UL/NEC designation ONLY)
- O:** Oil Resistant*
- T:** Thermoplastic
- W:** Outdoor-includes sunlight resistant jacket and wet location rated conductors (formerly "W-A")
- H:** Heater cable
- VW-1:** Flame retardant
- FT2:** Flame retardant

Definitions of Cable Types

- SVT:** Thermoplastic insulated vacuum cleaner cord, with or without 3rd conductor for grounding purposes; 300V. (PVC)
- SJT:** Junior hard service, thermoplastic insulated conductors and jacket. 300V. (PVC)
- SJTW:** Same as SJT except outdoor rated. (PVC)
- SJTO:** Same as SJT but oil resistant outer jacket. (PVC)
- SJTOW:** Same as SJTO except outdoor rated. (PVC)
- ST:** Hard service cord with all thermoplastic construction, 600V. (PVC)
- STW:** Same as ST except outdoor rated. (PVC)
- STO:** Same as ST but with oil resistant outer jacket. (PVC)
- STOW:** Same as STO except outdoor rated. (PVC)

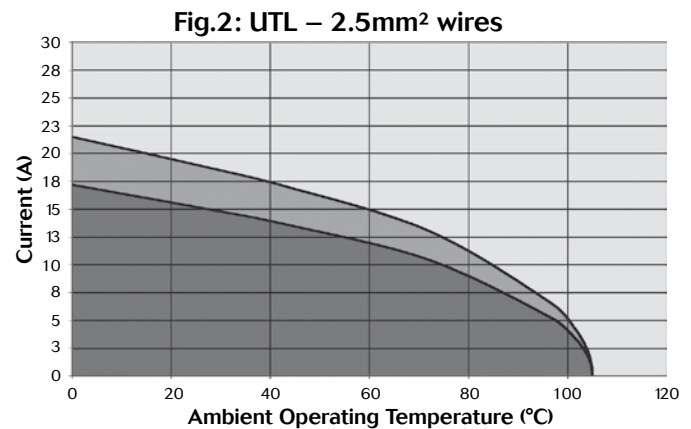
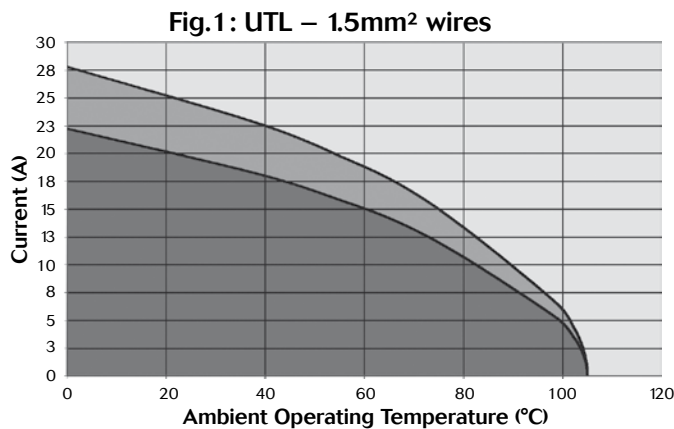


Rated current & working voltage

Current carrying capacity

The current carrying capacity of a connector is limited by the thermal properties of materials used in its construction. The amount of current that can be handled depends on the size of cable used, the ambient temperature and the heat that is generated inside the connector. Part 3 of the IEC 60512 standard determines through a derating curve, the maximum current permissible, which varies from one layout to another (Fig.1 & Fig.2). Wire size plays an important role as well, since they help to dissipate heat and avoid overheating (Fig.1 & Fig.3).

Please note that the curve should be adjusted when dealing with potential hot spots, which can occur as a result of unequal loading of current across a number of contacts. As a general rule, it is best to avoid locating power handling contacts in the middle of the connector; try to locate them towards the edge where heat can be dissipated more effectively. Eventually you should find a level which represents the permissible operating range:



Current use
 Limited use
 Not recommended use

The **rated current** is defined as uninterrupted continuous current that a connector can take when all contacts are energized simultaneously without exceeding the maximum limit of temperature. The earth contact is never loaded.

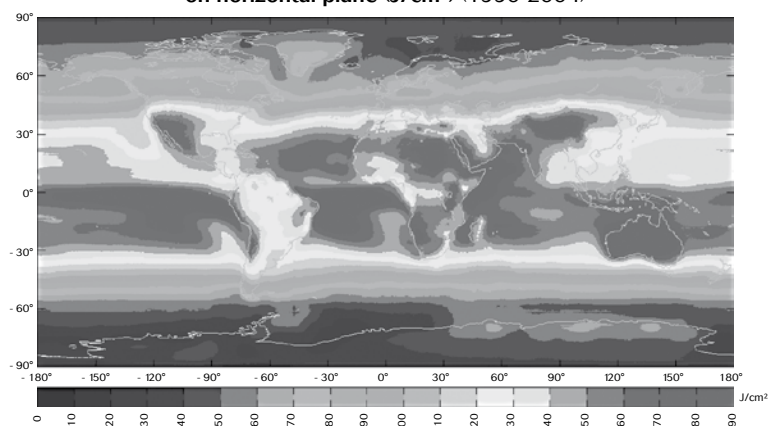
UV resistance

Solar radiation affects all materials, but plastics can be susceptible to extreme degradation over time. The choice of materials for the UTL series was therefore a critical consideration.

All over the world we are not exposed to the same amount of energy given by the sun. The chart shown here clearly illustrates this.

So Souriau has chosen a polymeric material able to withstand sunlight over a long period of time. For that we carefully followed the UL 746C and finally picked up a "f1" material. As a consequence our connector has been approved for outdoor use.

Yearly mean of daily irradiation in UV (280-400 nm) on horizontal plane J/cm² (1990-2004)





There are two main standards for industrial connectors: UL94 & UL1977

UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

This standard is dedicated to plastics flammability. It characterises how the material burns in various orientation and thicknesses. Whereas most of our competitor are using a 50W test to classified the ability of their solution to withstand fire, Souriau decided to increase this to a 500W test. New regulations tend to emphasize the importance of burning behavior making the 50W test less and less relevant.

The UTL series has been rated at 5VA.

Procedure: Bar specimens are to be 4"921 long by 0"511 wide, and provided in the minimum thickness.

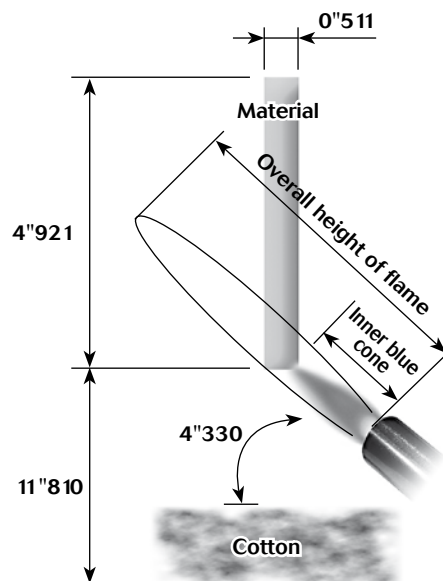
Plaque specimens are to be 5"905 by 5"905 and provided in the minimum thickness.

Thicker specimens may also be provided and shall be tested if the results obtained on the minimum thickness indicate inconsistent test results. The maximum thickness is not to exceed 0"511.

| Conditions | 94-5VA |
|--|--------|
| Afterflame time plus afterglow time after fifth flame application for each individual bar specimen | ≤60s |
| Cotton indicator ignited by flaming particles or drops from any bar specimen | No |
| Burn-through (hole) of any plaque specimen | No |

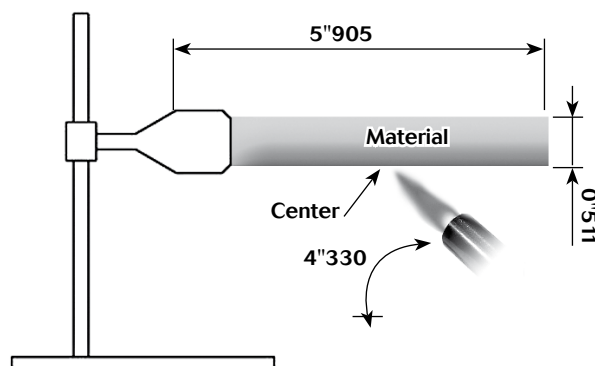
5VA Vertical burning:

- The specimen is clamped from the upper 0"236 of the specimen, with the longitudinal axis vertical, so that the lower end of the specimen is 11"810 above a horizontal layer of not more than 0.08 g of absorbent cotton thinned to approximately 1"968 x 1"968 and a maximum thickness of 0"236.
- The 500W flame is then to be applied to one of the lower corners of the specimen so that the tip of the blue cone is within 0 to 0"118 of the specimen edge.
- Apply the flame for 5 ±0.5 seconds and then remove for 5 ±0.5 seconds. Repeat the operation until the specimen has been subjected to five applications of the test flame.



5VA Horizontal burning:

- Support the plaque specimen by a clamp in the horizontal plane.
- The flame is then to be applied to the centre of the bottom surface of the plaque so that the tip of the blue cone is within 0 to 0"118 of the plaque surface.
- Apply the flame for 5 ±0.5 seconds and then remove for 5 ±0.5 seconds. Repeat the operation until the plaque specimen has been subjected to five applications of the test flame.
- After the fifth application of the test flame, and after all flaming or glowing combustion has ceased, it is to be observed whether or not the flame penetrated (burned through) the plaque material. In addition, no opening greater than 0"118 shall appear after the test.



UTL Series

Technical information



Underwriter Laboratories **UL** [®] **US**

UL1977

There are several standards which deal with plug and receptacle. Each of them is only for a small area of applications. It could be telecommunication, Etc. The UL 1977 covers single and multipole connectors intended for factory assembly.

Requirements apply to devices in taking into account intensity and voltage. There are categories as follows:

| | 0 | 30 V (42 V peak) | 600 V |
|--------|---------|---------------------|-------|
| 0 | Type 0 | Type 1A | |
| 8.3 A | | Type 2 | |
| 31 A | Type 1B | Type 3 | |
| 200 A | | | |
| 1000 A | | Type 4 | |

According to above table, the level of performance that has to be reached could be different. Most of them are explained in the following page.

Insulating materials:

Material used for electrical insulation, as a minimum, have to comply with the characteristics shown below:

• Minimum ratings for polymeric materials

| Type | Flame rating | Relative thermal index (RTI) Electrical/mechanical w/o impact **/** |
|------|--------------|--|
| 0 | - | 50/50 |
| 1A | HB | 50/50 |
| 1B | HB | 50/50 |
| 2 | HB | 50/50 |
| 3 | HB | 50/50 |
| 4 | HB | 50/50 |

* The RTI of the material shall not be lower than the temperature measured during the Temperature Test.

** For a thickness less than that for which a value has been established, the RTI of the minimum thickness with an established value shall be used.

Assembly:

Connector has to be keyed to prevent any mismatching that can damage the machine or hurt the user. In the same way, plugs and sockets have to be equipped to protect persons against contact with live parts.

Finally the identified grounding contact shall be located so that the corresponding electrical continuity has to be completed before any other contact.



UL1977

Spacing:

For a 250V max connector, distance through air or over material shall be 0"047 whereas from 250V to 600V connector the spacing is 3.2 minimum. These distances have to be taken between uninsulated live parts as shown in the matrix below:

• Applicability of spacing requirements

| Type | Uninsulated live part - uninsulated live part of opposite polarity | Uninsulated live part - uninsulated grounded metal part | Uninsulated live part - exposed dead metal part |
|------|--|---|---|
| 0 | No | No | No |
| 1A | Yes | Yes | Yes |
| 1B | Yes | Yes | No |
| 2 | Yes | Yes | Yes |
| 3 | Yes | Yes | Yes |
| 4 | Yes | Yes | Yes |

An alternative way to determine voltage rating is with the Dielectric-Withstand test. If during one minute there is no arc-over or breakdown the rated voltage is given as given below:

- a) 500 volts for a type 1B device
- b) 1000 volts plus twice rated voltage for types 1A, 2, 3 and 4 devices.

Marking:

A device shall be legibly marked with the manufacturer's trade name, trade mark, or other descriptive marking by which the organisation responsible for the product may be identified. (Exception: If the device is too small, or where the legibility would be difficult to attain, the manufacturer's name, trademark, or other descriptive marking may appear on the smallest unit container or carton)

The following shall be marked on the device or on the smallest unit container or carton or on a stuffer sheet in the smallest unit container or carton:

- a) The catalogue number or an equivalent designation
- b) The electrical rating in both volts and amperes, if assigned
- c) Whether ac or dc, if restricted
- d) Flammability class, if identified

Example - Marking for the arrangement 10-3: **10A 500V UL94 V-0**

UTL Series

Technical information



IEC 61984

The norm is dedicated to connectors with rated voltage above 50V and up to 1000V and rated currents up to 125A per contact. But depending of your application connectors should be compliant with another standard. This has to be double checked with the customer.

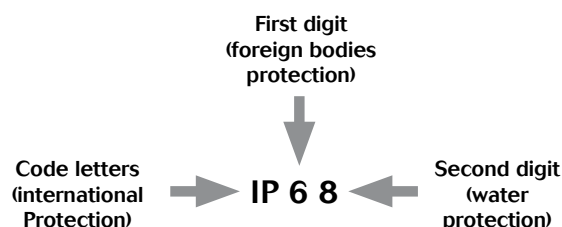
There are lot of constructional requirements and performances specified in that standard. Most of them are illustrated in greater details hereafter.

Provisions for earthing:

The UTO connector is intended to be used on Class II systems. Even if the purpose of our connector is not to interrupt current, we often see a need to add a protective earth contact. Then this one shall be a "First mate, last break" style. Critically, among all of the normal assumptions we make in designing a connector, this contact has to be considered as a live part and must be protected against electric shock by double or reinforced insulation.

IP Code:

IP is a coding system defined by the IEC 60529 to indicate the degrees of protection provided by an enclosure. The aim of this is to give information regarding the accessibility of live parts against ingress of water and other foreign bodies.



| 1 st digit | Degree of protection | 2 nd digit | Degree of protection |
|-----------------------|---|-----------------------|--|
| 0 | No protection against accidental contact. No protection against solid foreign bodies. | 0 | No protection against water. |
| 1 | Protection against contacts with any large area by hand and against large solid foreign bodies with a diameter bigger than 1"968. | 1 | Drip-proof. Protection against vertical water drips. |
| 2 | Protection against contacts with the fingers. Protection against solid foreign bodies with a diameter bigger than 0"472. | 2 | Drip-proof. Protection against water drips up to a 15° angle. |
| 3 | Protection against tools, wires or similar objects with a diameter bigger than 0"098. Protection against small solid bodies with a diameter bigger than 0"098. | 3 | Spray-proof. Protection against diagonal water drips up to a 60° angle. |
| 4 | As 3 however diameter is bigger than 0"039. | 4 | Splash-proof. Protection against splashed water from all directions. |
| 5 | Full protection against contacts. Protection against interior injurious dust deposits. | 5 | Hose-proof. Protection against water (out of a nozzle) from all directions. |
| 6 | Total protection against contacts. Protection against penetration of dust. | 6 | Protection against temporary flooding. |
| | | 7 | Protection against temporary immersions. |
| | | 8 | Protection against water pressure. Pressure to be specified by supplier. |

UTL offers high sealing performance IP68 / 69K... Even in dynamic situations.

In addition to the IEC 60529 we conjointly use the DIN 40050 part 9 which are dedicated to road vehicles. The main differences are:

- **First digit:** 5 replaced by 5K, 6 by 6K. In the DIN the tested equipment is not depressurized as it is in the IEC.
- **Second digit:** 5K and 6K has been added and are equivalent respectively to 5 and 6 but with higher pressure. 9K which represents the High pressure cleaning.

| | |
|----|--|
| 9K | High pressure hose-proof. Protection against high pressure water (out of a nozzle) from all directions. |
|----|--|



IEC 61984

Overvoltage

UTO connectors are qualified to be used on systems rated at Overvoltage category III

Per the IEC 60664-1 (formerly VDE 0110) each category is linked to the end application and where the device will be implemented:

- **Category IV** (primary overcurrent protection equipment):
Origin of the installation
- **Category III** (Any fixed installation with a permanent connection)
Fixed installation and equipment and for cases where the reliability and the availability is subject to special requirements
- **Category II** (Domestic appliances):
Energy consuming equipment to be supplied from the fixed installation
- **Category I** (Protected electronic circuit):
For connection to circuit in which measures are taken to limit transient overvoltage.

Pollution degree

Per the IEC 60664-1 (formerly VDE 0110) the environment affects the performance of the insulation. Particles can build a bridge between two metal parts. As a rule dust mixed with water can be conductive and more generally speaking metal dust is conductive. Finally, the standard defines 4 levels of pollution:

- **Degree 1** (Air conditioned dry room):
No pollution or only dry, non conductive pollution occurs. The pollution has no influence.
- **Degree 2** (Personal computer in a residential area):
Only non conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is to be expected.
- **Degree 3** (Machine tools):
Conductive pollution occurs or dry non-conductive pollution occurs which becomes conductive due to condensation which is to be expected.
- **Degree 4** (Equipments on roof, locomotives):
Continuous conductivity occurs due to conductive dust, rain or other wet conditions.

Finally, the harsher the environment is, the longer clearance and creepage distances should be. Nonetheless, according to the IEC 61984, enclosure rated at IP54 or higher can be dimensioned for a lower pollution degree. This applies to mated connectors disengaged for test and maintenance.

Marking

The marking should give enough details to the user to know what the main characteristics are and without going deep in technical documentation. Below examples identify the suitability of the connector:

- **Example 1:**
Marking of a connector with rated current 16A, rated voltage 400V, rated impulse voltage 6kV and pollution degree 3, 2 and 1 for use in any system, preferably unearthed or delta-earthed systems:

16A 400V 6kV 3

- **Example 2:**
Marking of a connector with rated current 16A, rated insulation voltages line-to-earth 250V, line-to-line 400V, rated impulse voltage 4kV and pollution degree 3, 2 and 1 for use in earthed systems:

16A 250V 400V 4kV 3



What is NEMA rating ?

- NEMA ratings vs IP ratings

Whereas IP ratings only consider protection against ingress of foreign bodies - first digit - and ingress of water (second digit), NEMA ratings consider these but also verify protection from external ice, corrosive materials, oil immersion, etc.

The correlation between NEMA & IP being limited only to dust and water, we can state that a NEMA type is *equivalent* to an IP rating but it is not possible to say the contrary.

Below a list of some NEMA standards:

| Enclosure rating | IP20 | IP22 | IP55 | IP64 | IP65 | IP66 | IP67 |
|------------------|------|------|------|------|------|------|------|
| Type 1 | • | | | | | | |
| Type 3 | | | | • | | | |
| Type 3R | | • | | | | | |
| Type 3S | | | | • | | | |
| Type 4 | | | | | | • | |
| Type 4X | | | | | | • | |
| Type 6 | | | | | | | • |
| Type 12 | | | • | | | | |
| Type 13 | | | | | • | | |

• indicates compliance



Type 6 rating can be either Type 6 or Type 6P - please see below:

| | | |
|----|------|--|
| 6 | IP67 | Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, falling dirt, hose-directed water, the entry of water during occasional temporary submersion at a limited depth and damage from external ice formation. |
| 6P | IP67 | Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, falling dirt, hose-directed water, the entry of water during prolonged submersion at a limited depth and damage from external ice formation. |

UTIL
series



Appendices

| | |
|--|----|
| ■ #16 coaxial contacts - cabling notices | 50 |
| ■ Glossary of terms | 57 |
| ■ Part number Index | 58 |



#16 coaxial contacts

Coaxial cable - Contact monocrimp and multipiece

| Cable type | Impe- dance | Contact type | Ø over jacket | | Ø over dielectric | | Inner cond size Ext. Ø mm | Ø outer braid | | Male contact kit for coaxial cable | Female contact kit for coaxial cable |
|-------------------------------|----------------|-----------------|------------------|----------|----------------------|------|---------------------------------------|---------------|----------|---------------------------------------|--|
| | | | inch | mm | inch | mm | | inch | mm | | |
| RG161/U | 75 | Multi piece | 0.09 | 2.29 | 0.057 | 1.45 | | | | RMDXK10D28 Ⓢ | RCDXK1D28 Ⓢ |
| RG179A/U | 75 | | 0.105 | 2.67 | 0.063 | 1.6 | 0.3 | 0.084 | 2.13 max | | |
| RG179B/U | 75 | | 0.105 | 2.67 | 0.063 | 1.6 | 0.3 | 0.084 | 2.13 max | | |
| RG187/U | 75 | | 0.11 | 2.79 max | 0.06 | 1.52 | 0.3 | | | | |
| RG188/U | 50 | | 0.11 | 2.79 max | 0.06 | 1.52 | 0.51 | 0.078 | 1.98 max | | |
| RG174/U | 50 | | 0.11 | 2.92 | 0.06 | 1.52 | 0.48 | 0.088 | 2.24 max | | |
| AMPHENOL 21-598 | 50 | | 0.105 | 2.67 | 0.06 | 1.52 | 0.48 | | | | |
| RG196/U | 50 | | 0.08 | 2.03 max | 0.034 | 0.86 | 0.3 | | | | |
| RG178A/U | 50 | | 0.075 | 1.91 | 0.034 | 0.86 | 0.3 | 0.054 | 1.37 max | | |
| RG188A/U | 50 | Mono crimp | 0.110 | 2.79 | 0.06 | 1.52 | 0.51 | 0.078 | 1.98 max | RMDX6036D28 Ⓢ | RCDX6036D28 Ⓢ |
| KX21TVT (europe) RG178 B/U | 50 | | 0.075 | 1.91 | 0.034 | 0.86 | 0.3 | 0.054 | 1.37 max | RMDX6034D28 | RCDX6034D28 |
| RG178 / BU | 50 | | 0.075 | 1.91 | 0.034 | 0.86 | 0.3 | 0.054 | 1.37 max | RMDX6050D28 Ⓢ | RCDX6016D28 Ⓢ |
| RG174/U | 50 | | 0.115 | 2.92 | 0.06 | 1.52 | 0.48 | 0.088 | 2.24 max | RMDX6032D28 Ⓢ | RCDX6032D28 Ⓢ |
| RG188A/U | 50 | | 0.11 | 2.79 | 0.06 | 1.52 | 0.51 | 0.078 | 1.98 max | RMDX6036D28 Ⓢ | RCDX6036D28 Ⓢ |
| RG316/U | 50 | | 0.107 | 2.72 | 0.6 | 1.52 | 0.51 | 0.078 | 2.05 max | RMDX6036D28 Ⓢ | RCDX6036D28 Ⓢ |
| raychem 5024A3111 | 50 | | 0.12 | 3.05 | 0.083 | 2.11 | 0.64 | 0.097 | 2.46 | RMDX6052D28 | RCDX6052D28 |
| raychem 5026e1614 | 50 | | 0.083 | 2.11 | 0.05 | 1.27 | 0.48 | 0.067 | 1.7 | RMDX6036D28 Ⓢ | RCDX6036D28 Ⓢ |
| surprenant pn 8134 | - | Multi piece | 0.1 | 2.54 | 0.058 | 1.47 | 0.3 | | | RMDXK10D28 Ⓢ | RCDXK1D28 Ⓢ |
| PRD PN 247AS- C123-001 | - | Mono crimp | 0.103 | 2.62 | 0.06 | 1.52 | 0.51 | 0.078 | 1.98 | RMDX6018D28 | RCDX6018D28 |
| PRD PN 247AS-C1251 | - | | 0.092 | 2.34 | 0.05 | 1.27 | 0.64 | 0.067 | 1.7 | RMDX6018D28 | RCDX6018D28 |
| JUDD C15013010902 | - | | 0.087 | 2.13 | 0.05 | 1.27 | 0.48 | 0.066 | 1.67 | RMDX6036D28 Ⓢ | RCDX6036D28 Ⓢ |
| CDC PIN22939200 | - | | 0.09 | 2.29 | 0.048 | 1.22 | 0.3 | 0.064 | 1.63 | RMDX6046D28 Ⓢ | RCDX6016D28 Ⓢ |
| CDC PIN22939200 | - | | 0.09 | 2.29 | 0.048 | 1.22 | 0.3 | 0.064 | 1.63 | RMDX6050D28 Ⓢ | RCDX6016D28 Ⓢ |
| CDC PIN245670000 | - | | 0.104 | 2.64 | 0.067 | 1.7 | 0.3 | 0.083 | 2.11 | RMDX6050D28 Ⓢ | RCDX6016D28 Ⓢ |
| ampex | - | | 0.114 | 2.9 | 0.075 | 1.91 | 0.38 | 0.09 | 1.29 | RMDX6032D28 Ⓢ | RCDX6032D28 Ⓢ |
| TI PN 920580 | - | | 0.7 | 1.78 | 0.038 | 0.96 | 0.48 | 0.054 | 1.37 | RMDX6024D28 Ⓢ | RCDX6024D28 Ⓢ |
| Honeywell PN 58000062 | - | | 0.12 | 3.05 | 0.077 | 1.96 | 0.41 solid | 0.096 | 2.44 | RMDX6026D28 Ⓢ | RCDX6026D28 Ⓢ |
| - | - | | 0.104 | 2.64 | 0.067 | 1.7 | 0.3 | | 2.11 | RMDX6050D28 Ⓢ | - |
| - | - | | 0.09 | 2.29 | 0.048 | 1.22 | 0.3 | | 1.63 | RMDX6050D28 Ⓢ | - |
| - | - | | 0.114 | 2.9 | 0.075 | 1.91 | 0.38 | | 1.29 | RMDX6032D28 Ⓢ | RCDX6032D28 Ⓢ |
| - | - | | 0.07 | 1.78 | 0.038 | 0.96 | 0.48 | | 1.37 | RMDX6024D28 Ⓢ | RCDX6024D28 Ⓢ |
| - | - | | 0.12 | 3.05 | 0.077 | 1.96 | 0.41 | | 2.44 | RMDX6026D28 Ⓢ | RCDX6026D28 Ⓢ |

48h sample service Ⓢ



Twisted cable - Contact monocrimp and multipiece

| Cable type | Contact type | Inner AWG cond | Ø over jacket (single wire) | | Inner cond size | | Ø outer braid | | Male contact kit for coaxial cable | Female contact kit for coaxial cable |
|---|--------------|----------------|-----------------------------|----------|---------------------|-----------|---------------|---------|------------------------------------|--------------------------------------|
| | | | inch | mm | Stranded definition | Ext. Ø mm | inch | mm | | |
| 2#24 stranded mil w 16878 type B | Multi piece | 24 | 0.049 | 1.24 max | 7/.008 | | - | - | RMDXK10D28 | RCDXK1D28 |
| 2 #24 solid mil-w-76 type LW | | 24 | 0.047 | 1.12 max | 1/.0201 | | - | - | RMDXK10D28 | RCDXK1D28 |
| 2 #26 stranded mil w 76 type LW or mil w 16878 type b&e | | 26 | 0.043 | 1.09 max | 7/.0063 | 0.16 | - | - | RMDXK10D28 | RCDXK1D28 |
| 2 #28 solid mil-w-81822/3 | | 28 | 0.028 | 0.71 max | | | - | - | RMDXK10D28 | RCDXK1D28 |
| TWISTED PAIR 1/.201 SOLID MIL w 76 TYPE lw or MIL W 16878 | | 26 | 0.044 | 1.12 max | 1/.0201 | 0.511 | - | - | RMDXK10D28 | RCDXK1D28 |
| twisted pair solid mil w 81822/3 | | 28 | 0.028 | 0.71 max | 1/.0126 | 0.32 | - | - | RMDXK10D28 | RCDXK1D28 |
| #28 7/.0036 per Hitachi spec ec-711 (13-2820) | Mono crimp | - | 0.046 | 1.17 | 7/.0036 | - | - | - | RMDX6031D28 + YORX090 | RCDX6031D28 + YORX090 |
| 20218201 | | - | 0.028 | 0.71 | - | - | - | - | RMDX6031D28 + YORX090 | RCDX6031D28 + YORX090 |
| #30 solid | | - | 0.025 | 0.64 | - | - | - | - | RMDX6015D28 + YORX090 | RCDX6015D28 + YORX090 |
| #26 7/.0063 | | 26 | 0.028 | 0.71 | 7/.063 | 0.16 | - | - | RMDX6031D28 + YORX090 | RCDX6031D28 + YORX090 |
| #26 19/.004 | | 26 | 0.049 | 1.24 | 19/.004 | - | - | - | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| #24 7/.008 | | 24 | 0.049 | 1.24 | 7/.008 | - | - | - | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| #24 19/.005 | | 24 | 0.057 | 1.45 | 19/.005 | - | - | - | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| - | | 26 | - | 1.25 | - | - | - | 19x0.1 | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| - | | 24 | - | 1.25 | - | - | - | 7x0.2 | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| - | | 24 | - | 1.45 | - | - | - | 19x0.13 | RMDX6019D28 + YORX090 | RCDX6019D28 + YORX090 |
| - | | 26 | - | 0.7 | - | - | - | 7x0.16 | RMDX6031D28 + YORX090 | RCDX6031D28 + YORX090 |

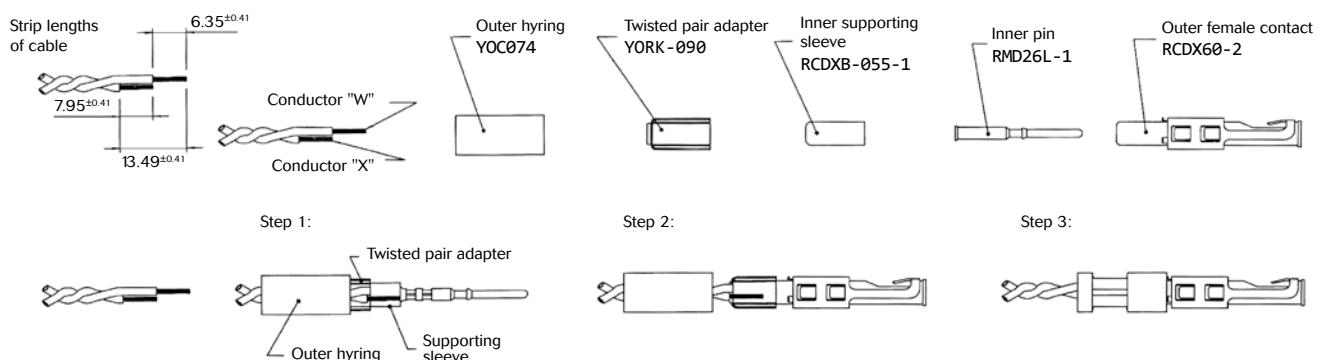


#16 coaxial contacts

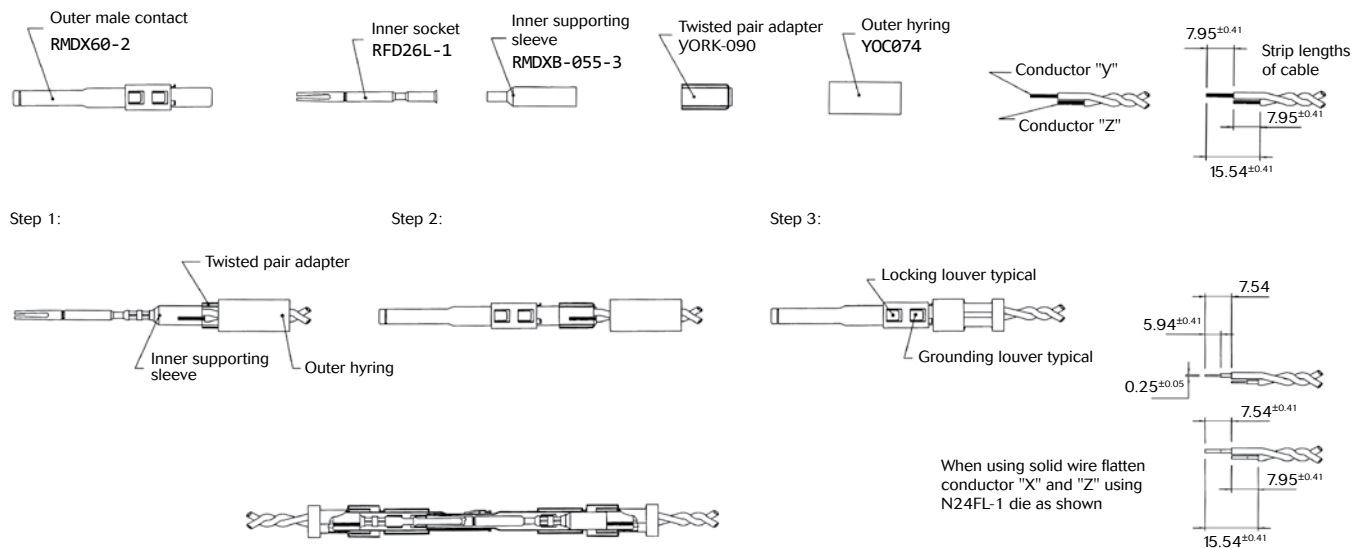
Twisted pair cable multipiece contact cabling

| Cable reference | Contact type | Male contact | Female contact | Crimp tool | Die set | Stop bushing | Cable strip length | | | Inner conductor crimp | | Braid crimp | |
|---|--------------|--------------|----------------|------------|---------|--------------|---------------------|---|---|-----------------------|-------|-------------|-------|
| | | | | | | | A | B | C | g dim | t dim | g dim | t dim |
| 2#24 stranded mil w 16878 type B | Multi piece | RMDXK10D28 | RCDXK1D28 | M10S1J | - | - | See assembly notice | | | | | | |
| 2 #24 solid mil-w-76 type LW | | | | | | | | | | | | | |
| 2 #26 stranded mil w 76 type LW or mil w 16878 type B & E | | | | | | | | | | | | | |
| 2 #28 solid mil-w-81822/3 | | | | | | | | | | | | | |
| twisted pair 17.201 solid mil w 76 type LW or mil w 16878 | | | | | | | | | | | | | |
| twisted pair solid mil w 81822/3 | | | | | | | | | | | | | |

Female contact



Male contact



Note : all dimensions are in mm

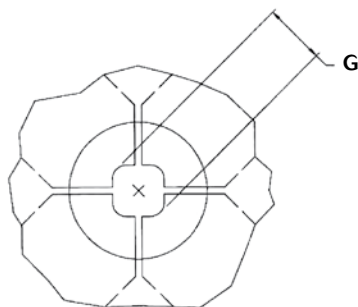
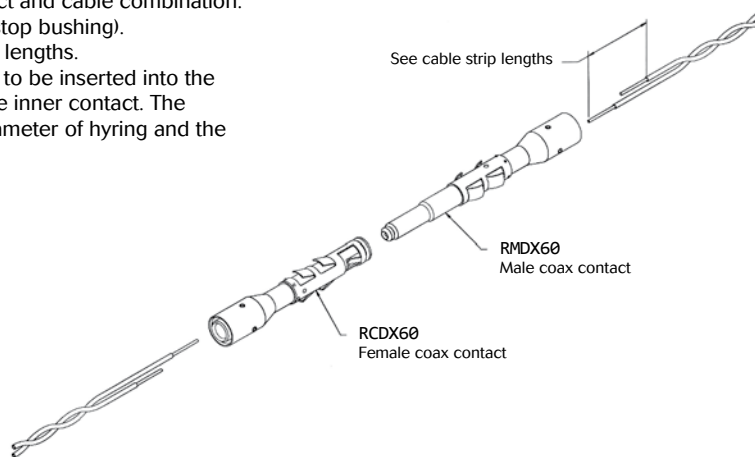
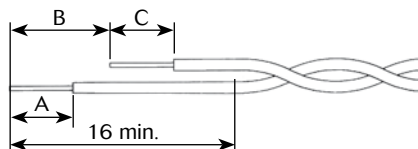


Twisted pair cable monocrimp contact cabling

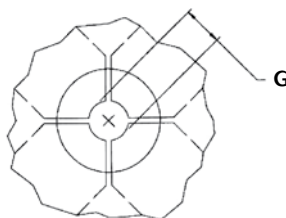
| Cable reference | Contact type | Male contact | Female contact | Crimp tool | Die set | Stop bushing | Cable strip length | | | Inner conductor crimp | | Braid crimp | | | | | |
|---|--------------|-----------------------|-----------------------|------------|---|--------------|--------------------|-----|------|-----------------------|--------------|--------------|--------------|--|--|--|--|
| | | | | | | | A | B | C | g dim | t dim | g dim | t dim | | | | |
| #28 7/.0036 per Hitachi spec ec-711 (13-2820) | Mono crimp | RMDX6031D28 + YORX090 | RCDX6031D28 + YORX090 | M10S1J | S80 | SL105 | 4.7 | 6.1 | 4.32 | 1.30 to 1.12 | 1.4 to 1.22 | 2.97 to 2.84 | 3.07 to 2.95 | | | | |
| 20218204 | | | | | S80 | SL105 | 3.94 | 6.1 | 3.16 | 1.30 to 1.17 | 1.4 to 1.22 | 2.97 to 2.84 | 3.07 to 2.79 | | | | |
| #30 solid | | | | | S83 | SL105 | 4.7 | 6.1 | 4.06 | 1.22 to 1.12 | 1.35 to 1.22 | 2.97 to 2.84 | 3.12 to 2.95 | | | | |
| #26 7/.0063 | | | | | S80 | SL105 | 4.7 | 6.1 | 4.06 | 1.30 to 1.17 | 1.4 to 1.22 | 2.97 to 2.84 | 3.07 to 2.95 | | | | |
| #26 19/.004 | | | | | M10SG8 ASSY'Y TOOL DIE SET STOP BUSHING M10S1J TOOL | | 4.7 | 6.1 | 4.06 | 1.22 to 1.17 | 1.35 to 1.22 | 2.84 to 2.79 | 3.12 to 2.97 | | | | |
| #24 7/.008 | | | | | | | 4.7 | 6.1 | 4.06 | 1.22 to 1.17 | 1.35 to 1.22 | 2.84 to 2.79 | 3.12 to 2.97 | | | | |
| #24 19/.005 | | | | | | | 4.7 | 6.1 | 4.06 | 1.22 to 1.17 | 1.35 to 1.22 | 2.84 to 2.79 | 3.12 to 2.97 | | | | |
| AWG26 (19x0.1) | | | | | M10SG8 crimping kit | | 4.7 | 6 | 4 | | | | | | | | |
| AWG24 (7x0.2) | | | | | | | | | | | | | | | | | |
| AWG24 (19x0.13) | | | | | | | | | | | | | | | | | |
| AWG26 (7x0.16) | | | | | S80 | SL150 | | | | | | | | | | | |

- Select appropriate monocrimp coax twisted pair contact and cable combination.
- Select appropriate crimp tooling (hand tool, S-die set, stop bushing).
- Strip the twisted pair cable to the designated wire strip lengths.
- Insert the stripped cable into the contact. One cable is to be inserted into the inside diameter of hyring, and pushed forward into the inner contact. The second cable is to be inserted between the outside diameter of hyring and the inside diameter of the outer contact body.
- Crimp the contact.

Cable strip length



Braid crimp (G) to be measured with die set fully closed



Inner conductor crimp (G) to be measured with die set fully closed

Note : all dimensions are in mm



#16 coaxial contacts

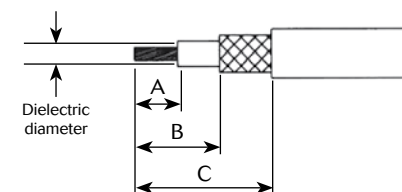
Multipiece male contact with coax cable

| Cable reference | Contact | Hyring complementary compoments | Outer contact crimp tool | | Inner contact crimp tool | | Cable strip length | | | |
|--------------------|--------------------|---------------------------------|--------------------------|---------------------|--------------------------|--------------|--------------------|-------|--------|-------|
| | | | Crimp tool M10S1J | | Crimp tool M10S1J | | | | | |
| | | | Die set | Stop bushing | Die set | Stop bushing | A | B | C | |
| | | | RG161U | Male: RMDXK10D28 | YOC074 | S221 | SL471 | S23D2 | SL46D2 | 4.37 |
| RG179 | 4.37 | 7.95 | 15.88 | | | | | | | |
| RG187U | 4.37 | 7.95 | 15.88 | | | | | | | |
| RG188/U | 4.37 | 7.95 | 15.88 | | | | | | | |
| RG174/U | YOC074 + RMDXB0553 | | S26D2 | | 4.37 | | | 7.95 | | 15.88 |
| RG178A/U | | | S23D2 | | 7.54 | | | 9.12 | | 17.53 |
| RG196U | YOC074 | | - | | 7.54 | | | 9.12 | | 17.53 |
| AMPHENOL 21-598 | | | 4.37 | | 7.95 | | | 15.88 | | |
| surprenant pn 8134 | | | - | | 4.37 | | | 7.95 | | 15.88 |

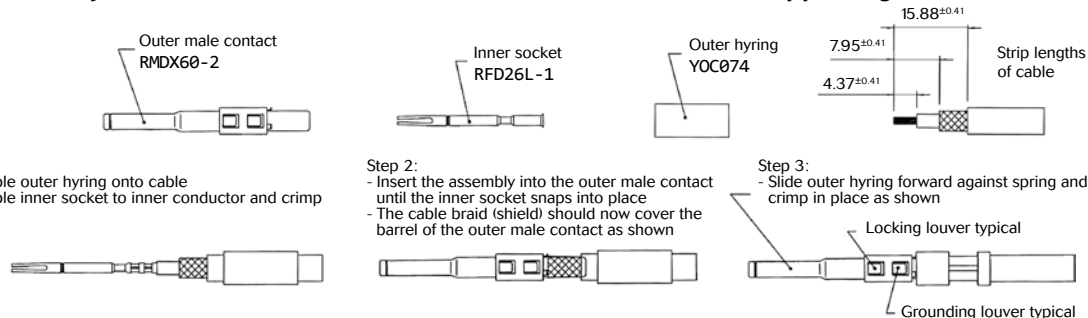
Multipiece kit details

| | | |
|---------------------|------------|-------------------------|
| RMDXK10D28 includes | RMDX60D28 | Outer contact |
| | RFD26L1D28 | Inner contact |
| | YOC074 | Outer hyring |
| | RMDXB0553 | Inner supporting sleeve |

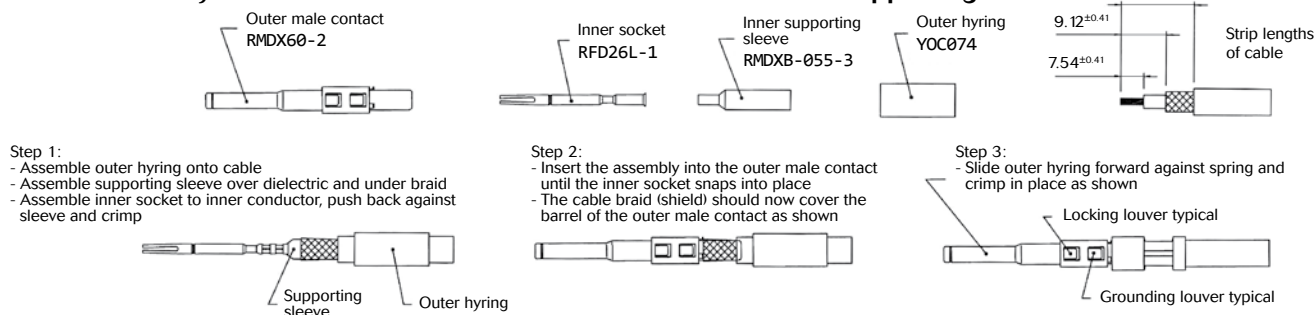
Cable strip length



Contact assembly with dielectric diameter over 1.4mm - without inner supporting sleeve



Contact assembly with dielectric diameter under 1.4mm - with inner supporting sleeve



Note : all dimensions are in mm

48h sample service



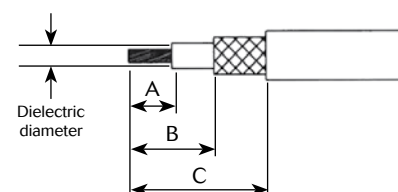
Multipiece female contact with coax cable

| Cable reference | Contact | Hying complementary compoments | Outer contact crimp tool | | Inner contact crimp tool | | Cable strip length | | |
|--------------------|----------------------|--------------------------------|--------------------------|--------------|--------------------------|--------------|--------------------|---|-------|
| | | | Crimp tool M10S1J | | Crimp tool M10S1J | | | | |
| | | | Die set | Stop bushing | Die set | Stop bushing | A | B | C |
| RG161U | Female: RCDXK1D28 | YOC074 | S221 | SL471 | S23D2 | SL46D2 | 4.37 | - | 11.13 |
| RG179 | | | | | | | 4.37 | | 11.13 |
| RG187U | | | | | | | 4.37 | | 11.13 |
| RG188/U | | | | | 4.37 | | 11.13 | | |
| RG174/U | | YOC074 + RCDXB0553 | | | S26D2 | | 4.37 | | 11.13 |
| RG178A/U | | | | | S23D2 | | 6.35 | | 11.13 |
| RG196U | | | | | | | 6.35 | | 11.13 |
| AMPHENOL 21-598 | | | | | | | - | | 4.37 |
| surprenant pn 8134 | | YOC074 | | | - | | 4.37 | | 11.13 |

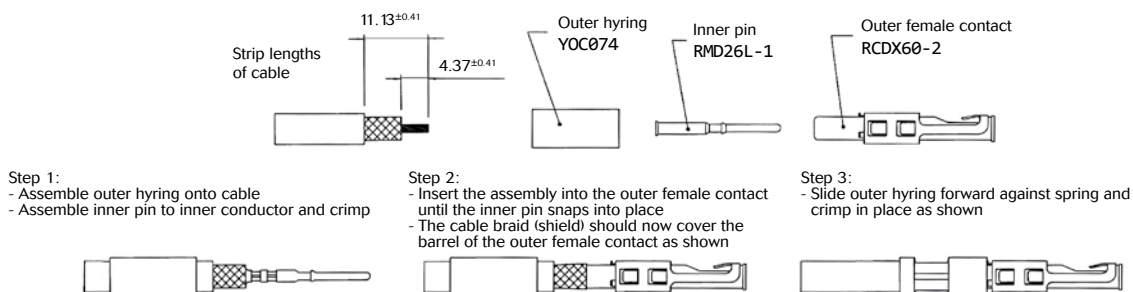
Multipiece kit details

| | | |
|--------------------|------------|-------------------------|
| RCDXK1D28 includes | RCDX602D28 | Outer contact |
| | RMD26L1D28 | Inner contact |
| | YOC074 | Outer hyring |
| | RCDXB0553 | Inner supporting sleeve |

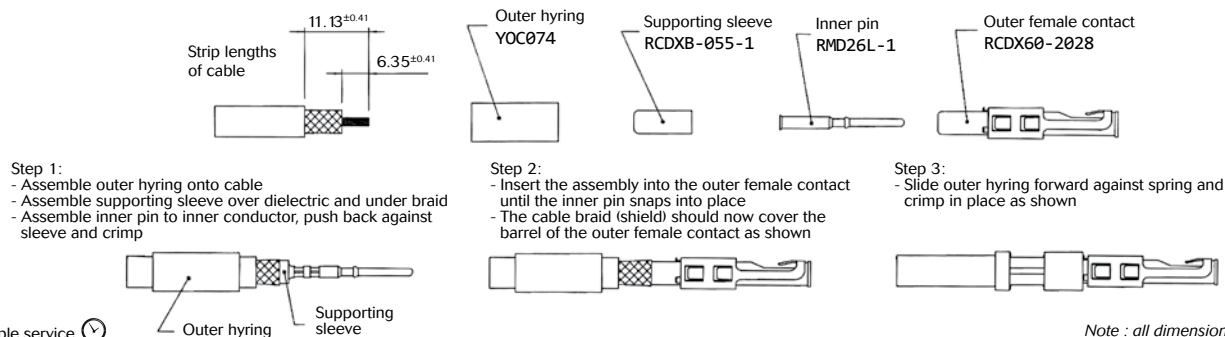
Cable strip length



Contact assembly with dielectric diameter over 1.4mm - without inner supporting sleeve



Contact assembly with dielectric diameter under 1.4mm - with inner supporting sleeve





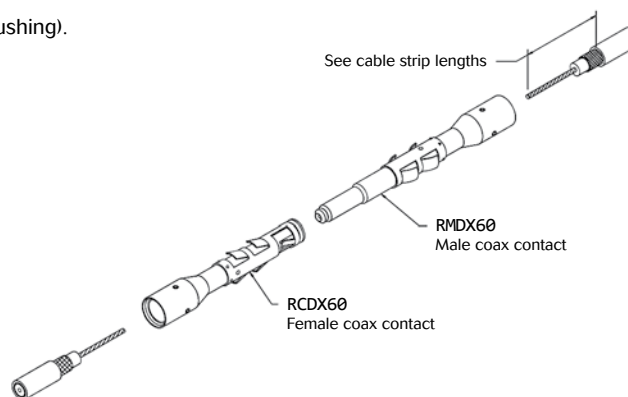
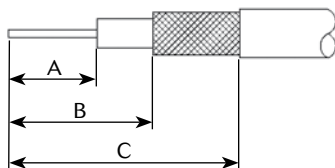
#16 coaxial contacts

Coax cable with monocrimp contact cabling

| Cable reference | Male contact | Female contact | Crimp tool | Die set | Stop bushing | Cable strip length | | | Inner conductor crimp | | Braid crimp | |
|-------------------------------------|--------------|----------------|------------|--|--------------|--------------------|------|-------|-----------------------|-----------|-------------|-----------|
| | | | | | | A | B | C | g dim | t dim | g dim | t dim |
| CDC PIN22939200 | RMDX6046D28 | RCDX6016D28 | M1051J | S80 | SL105 | 4.19 | 5.97 | 8.51 | 1.30/1.17 | 1.40/1.22 | 2.77/2.64 | 3.02/2.84 |
| CDC PIN22939200 | RMDX6046D28 | RCDX6016D28 | | S87 | SL105 | 5.08 | 6.35 | 8.89 | 1.30/1.17 | 1.40/1.22 | 2.77/2.64 | 3.02/2.84 |
| CDC PIN245670000 | RMDX6050D28 | RCDX6016D28 | | S80 | SL105 | 5.08 | 6.35 | 8.89 | 1.30/1.17 | 1.40/1.22 | 2.97/2.84 | 3.12/2.95 |
| KX21TVT (europe) RG178 B/U | RMDX6034D28 | RCDX6034D28 | | S82 | SL105 | 5.08 | 6.35 | 8.89 | 1.30/1.17 | 1.32/1.17 | 2.84/2.74 | 3.07/2.9 |
| RG178 / BU | RMDX6050D28 | RCDX6016D28 | | S87 | SL105 | 5.08 | 6.35 | 8.89 | 1.30/1.17 | 1.40/1.22 | 2.77/2.64 | 3.02/2.84 |
| ampex | RMDX6032D28 | RCDX6032D28 | | S80 | SL105 | 5.08 | 6.35 | 11.68 | 1.30/1.17 | 1.40/1.22 | 2.97/2.84 | 3.12/2.95 |
| TI PN 920580 | RMDX6024D28 | RCDX6024D28 | | S82 | SL105 | 5.08 | 6.35 | 8.89 | 1.35/1.19 | 1.42/1.27 | 2.87/2.74 | 3.07/2.9 |
| RG174/U | RMDX6032D28 | RCDX6032D28 | | S80 | SL105 | 5.08 | 6.35 | 11.68 | 1.30/1.17 | 1.40/1.22 | 2.97/2.84 | 3.12/2.95 |
| Honeywell PN 58000062 | RMDX6026D28 | RCDX6026D28 | | S82 | SL105 | 5.08 | 6.35 | 8.89 | 1.35/1.19 | 1.42/1.27 | 2.87/2.74 | 3.07/2.9 |
| RG188A/U | RMDX6036D28 | RCDX6036D28 | | S80 | SL105 | 5.08 | 6.35 | 11.68 | 1.30/1.17 | 1.40/1.22 | 2.97/2.84 | 3.12/2.95 |
| RG316/U | RMDX6036D28 | RCDX6036D28 | | S80 | SL105 | 5.08 | 6.35 | 11.68 | 1.30/1.17 | 1.40/1.22 | 2.97/2.84 | 3.12/2.95 |
| PRD PN 247AS-C123-001 | RMDX6018D28 | RCDX6018D28 | | M105G8 ASSY'Y TOOL DIE SET STOP BUSHING M1051J TOOL | | 5.08 | 6.35 | 8.89 | 1.22/1.17 | 1.35/1.22 | 2.92/2.79 | 3.12/2.97 |
| PRD PN 247AS-C1251 | RMDX6018D28 | RCDX6018D28 | | M105G8 ASSY'Y TOOL DIE SET STOP BUSHING M1051J TOOL | | 5.08 | 6.35 | 8.89 | 1.22/1.17 | 1.35/1.22 | 2.92/2.79 | 3.12/2.97 |
| raychem 5024A3111 | RMDX6052D28 | RCDX6052D28 | | S88 | SL105 | 5.08 | 6.35 | 11.68 | 1.37/1.27 | 1.45/1.32 | 2.92/2.79 | |
| raychem 5026e1614 | RMDX6036D28 | RCDX6036D28 | | M105G8 ASSY'Y TOOL DIE SET STOP BUSHING M1051J TOOL | | 5.08 | 6.35 | 8.89 | 1.22/1.17 | 1.35/1.22 | 2.92/2.79 | 3.12/2.97 |
| JUDD C15013010902 | RMDX6036D28 | RCDX6036D28 | | M105G8 ASSY'Y TOOL DIE SET STOP BUSHING M1051J TOOL | | 5.08 | 6.35 | 8.89 | 1.22/1.17 | 1.35/1.22 | 2.92/2.79 | 3.12/2.97 |
| inner cond. #30, braid diam 2.64 | RMDX6050D28 | - | | S80 | SL105 | 5.1 | 6.35 | 8.9 | - | - | - | - |
| inner cond. #30, braid diam 2.29 | RMDX6050D28 | - | | S87 | SL105 | 4.2 | 6.35 | 8.5 | - | - | - | - |
| inner cond. #28, braid diam 2.9 | RMDX6032D28 | RCDX6032D28 | | S80 | SL105 | 5.1 | 6.35 | 11.7 | - | - | - | - |
| inner cond. #26, braid diam 1.78 | RMDX6024D28 | RCDX6024D28 | | S82 | SL105 | 5.1 | 6.35 | 8.9 | - | - | - | - |
| inner cond. #26, braid diam 3.05 | RMDX6026D28 | RCDX6026D28 | | S82 | SL105 | 5.1 | 6.35 | 8.9 | - | - | - | - |

- Select appropriate cable and contact combination.
- Select appropriate crimp tooling (hand tool, S-die set, stop bushing).
- Strip coax cable to the designated wire strip lengths.
- Insert the stripped coax into the rear of the contact.
- Crimp the contact.

Cable strip length

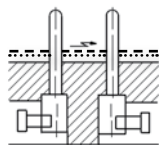




Glossary of terms

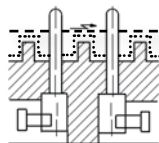
- **Clearance**

Per the IEC 60664-1 it is the shortest distance between two conductive parts even over the air.



- **Creepage distance**

Per the IEC 60664-1 it represents the shortest distance along the surface of the insulating material between two conductive parts.



— — — — — Air gap
..... Creepage distance

- **Working voltage**

Per the IEC 60664-1 it is the highest r.m.s. value of A.C. or D.C. voltage across any particular insulation which can occur when the equipment is supplied at rated voltage.

- **Rated impulse voltage**

Impulse withstands voltage value assigned by the manufacturer to the equipment or to a part of it characterizing the specified withstand capability of its insulation against transient overvoltage.

- **Working current**

It is the maximum continuous and not interrupted current able to be carried by all contacts without exceeding the maximum temperature of the insulating material.

- **Transient voltage**

Extract from the IEC 60664-1: Short duration overvoltage of a few millisecond or less, oscillatory or non-oscillatory, usually highly damped.

- **CTI (Comparative Tracking Index)**

The CTI value is commonly used to characterize the electrical breakdown properties of an insulating material. It allows users to know the tendency to create creepage paths. This value represents the maximum voltage after 50 drops of ammonium chloride solution without any breakdown.

- **RTI (Relative temperature Index):**

Extract from ULs website:

"Maximum service temperature for a material, where a class of critical property will not be unacceptably compromised through chemical thermal degradation, over the reasonable life of an electrical product, relative to a reference material having a confirmed, acceptable corresponding performance defined RTI.

- **RTI Elec:** Electrical RTI, associated with critical electrical insulating properties.

- **RTI Mech Imp:** Mechanical Impact RTI, associated with critical impact resistance, resilience and flexibility properties.

- **RTI Mech Str:** Mechanical Strength (Mechanical without Impact) RTI, associated with critical mechanical strength where impact resistance, resilience and flexibility are not essential"



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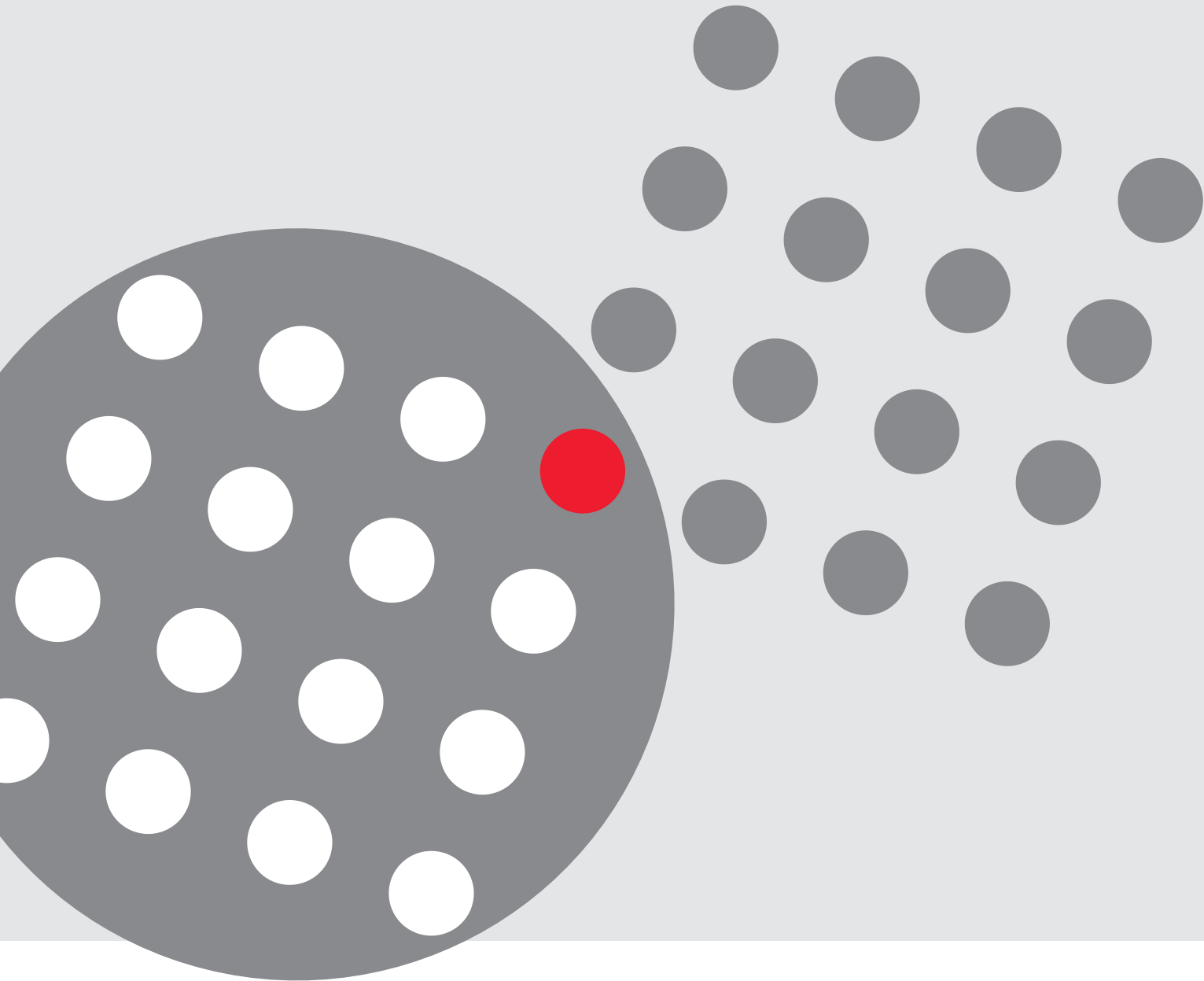
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UTL Series

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