The crimping concept

The crimp connection is an irreversible, non-reusable connection between one or two conductors and a crimp contact. It is obtained by compression deformation (cold forming) and consequent reshaping of the contact crimping stem, or crimp barrel. A good crimp connection is provided by a suitable combination between the crimping dies, the contact crimp barrel (hence the crimp contact), and the cross-section of the conductor.

These considerations refer to crimped connections made with flexible copper conductors of class 5 (flexible) or 6 (more flexible than class 5) according to EN IEC 60228 standard.

Solid copper conductors (class 1) or conductors made by other materials (aluminium, iron, etc.) often require special precautions for both crimp contacts and crimping tools, to be agreed upon with the manufacturer.

The main technical advantages provided by crimped connections over soldered connections are:

- Independence from temperature, being this a “cold” process, performed without using heat and not requiring further materials.
- Elimination of the contact uncertainties due to cold solders.
- No degradation of the elastic characteristics of the female contacts (a problem that arises with soldering temperatures).
- No health risks connected with the use of heavy metals or fumes generated from the soldering process.
- Preservation of the conductor’s flexibility immediately beyond connection.
- No conductors with burned, discoloured or overheated insulating material.
- Excellent reproducibility of the performances of the electrical and mechanical connections.
- Easier production controls.

Other advantages obtained by crimping connections over screw-type connections are:

- Lower voltage drop across the connection.
- High stability in time even in the presence of vibrations.
- High durability in presence of corrosion (gas-tightness).
- Individual insertion of the contacts in the connector (it is possible to eliminate unnecessary contacts).
- Less time required for connection.
- Possibility of pre-production of the terminated conductors with crimp contacts.
- Easy replacement of individual contacts during maintenance.
- Possibility of selectively isolating the circuits during maintenance via the extraction of the contacts from the connector.

The crimped connections for wire sections up to 10 mm^2 are covered by the EN 60352-2:2006 European standard equivalent to the IEC 60352-2 Issue 2 (2006-02) international standard.

The **EN 60352-2** standard also includes a practical guidance, which lists the following main points.

The quality of a crimped connection is mainly affected by the quality of the materials used and by the condition of the surfaces both of the crimp contact (in particular the crimp barrel) and of the conductor.

To ensure a good quality crimped connection, an essential parameter is the mechanical retention of the conductor in the contact. The standard makes a distinction between the closed crimp barrel, inherently stronger, and the open crimp barrel. ILME crimp contacts are closed crimp barrel contacts, with inspection hole which ensure a higher mechanical performance compared to the open barrel crimp contacts, such as better mechanical robustness and stability during operation. They have been high speed precision-machined, thus ensuring a better electrical performance (better conductivity).

In 2002 the Amendment 2 of the previous IEC standard had controversially unified the minimum tensile strength for open crimp barrel contacts (curve B of former Figure 5) and closed crimp barrel contacts (curve A of former Figure 5) making them both equal to the lower values (those of curve B), which can be achieved by open barrel crimp contacts. This change has determined an arguable relaxation of the suitability requirements both for closed crimp barrel, typically larger, machine turned and for crimp tools specially made for these contacts. Several industries continue to prefer the higher performance ensured by closed crimp barrel contacts, the only ones able to ensure the higher resistance to tensile stress values believed to be essential for the most demanding industrial applications.

Therefore, ILME continues to refer to curve A of Figure 5 illustrated in the EN 60352-2:1994 standard: ILME closed crimp barrel contacts, used with flexible copper wires, featuring a cross-sectional area included in the ranges shown and correctly crimped with the recommended tools, ensure tensile breaking resistant connections at least equal to the values shown in the table below (for reference, the corresponding R_t/S unified tensile stress load value is also shown [N/mm^2]). See Table 1.

Section S		Resistance to traction R_t	R_t/S
AWG	mm²	(N)	(N/mm²)
26	0,12	18	150
-	0,14	21	150
24	0,22	33	150
-	0,25	37,5	150
22	0,32	48	150
-	0,37	55,5	150
20	(0,6)	75	150
-	0,75	112,5	150
18	(0,82)	125	150
-	1	150	150
16	(1,3)	195	150
-	1,5	220	147
14	(2,1)	300	143
-	2,5	325	130
12	(3,3)	430	130
-	4	500	125
10	(5,3)	635	120
-	6	650	108
7	10	1000	100
		(1300)	*(130)*
-	16	*1650*	*103*
-	25	*2300*	*92*
-	35	*2800*	*80*
	50	*3300*	*66*
-	70	*3900*	*56*

Table 1.

NOTE - For 10 mm² wire sections, the resistance to tensile stress shown in *italics* are those specified in the NF F 61-030 standard (for 10 mm², the value in brackets).

The basic criterion used for the tensile strength values required by EN 60352-2 standard is that such resistance is at least equal to 60% of the per unit breaking load of the same annealed copper conductor.

This applies to conductor cross-sectional areas up to about 1,5 mm²; above this cross-section, the ratio is slightly lower, as retention is also affected by friction, which increases linearly with the housing diameter, whilst the cross-section increases by the square.

IEC/EN 60352-2 standard, which historically targeted the electronics industry, restricts its requirements to crimp connections for conductors with a maximum cross-sectional area of 10 mm². For cross-sections higher than 10 mm², up to 70 mm², the standard to refer to is the NF F 61-030:1989 French standard which relates to electrical connectors to be used on board of railway rolling stock, in particular for large crimp contacts, such as those manufactured by ILME.

NOTE - Alternatively, for wire sections between 35 mm² and 300 mm², EN 61238-1:2003 standard can be referred to.
This standard requires constant R_t/S values equal to 60 N/mm², lower than those established by the above mentioned French standard.

Selecting the crimping tool and relevant controls

When you have selected quality crimp contacts and conductors, the next and most important step is to select the correct crimp tool. The practical guidance of standard EN 60352-2 provides the following recommendations on the subject, listing some of the ideal requirements for crimping tools, some optional characteristics, but, above all, it provides a preview of the indispensable controls:

a) The crimping tools and the contacts used shall be supplied by the same manufacturer, otherwise the user shall assume all responsibility for the quality and reliability of the crimp connections.

b) The crimping tools must function correctly and provide a correct crimp without damage to the pin or the component to crimp.

c) In order to obtain a reliable crimp connection, a crimping device with a mechanism that controls the entire crimping cycle shall be used. At the end of the crimping cycle the handles and the ratchet must return to the open position.

d) In all cases the crimping operation shall be made in one single phase, with no further interventions.

e) The removable parts of the tool such as the crimping dies and the locators must be designed in such a way as to make it possible to be inserted within the tool only in the correct manner.

f) The tools must be supplied with the appropriate means for a correct positioning of the pins to be crimped and of the conductors during crimping.

g) The tools must be designed in such a way so that only the necessary adjustments may be made.

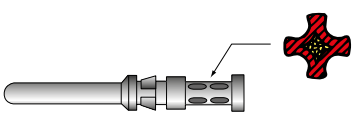
h) The action of the tool must be such that both the pin to be crimped and the fixture of the isolation (when present) are respectively crimped or compressed with a single action.

i) The design of the tool must ensure that the dies for a particular tool may be interchangeable within tools of the same type.
If they are not interchangeable, the identification of tools for which they are suitable must be marked on the dies.

j) The tools may be designed so as to produce a marking or coding of the die on the pin to be crimped so that the crimping may be checked for verification of the correct die.

k) The design of the tool must allow the verification of the dies with gauges to measure wear.
The gauge verification method must be that specified by the manufacturer of the tools.

With suitable flexible copper conductors, the crimping tool proposed by ILME gives 8-indent crimping (**see figure**) in conformity with standard EN 60352-2. Periodic control of the wear of the crimping dies can be carried out with the appropriate “go – no go” gauges (to be purchased separately). For extra operational details, consult the following pages on tools, and the relevant instruction sheets and/or use and maintenance manuals.



The manual and automatic crimping tools selected by ILME are carefully designed to ensure symmetrical deformation of the crimping area of the contact and wire, by means of their own, internal high pressure forming parts. The positioner ensures that the wire and crimp contact meet in the appropriate part of the tool. Sprung mechanisms built into the tools ensure that the contacts are not inserted in the tool before the indenters are fully open, and that the tool does not open before the crimping process has been completed.

The **CIPZ D** (for 5A crimp contacts), **CCPZ MIL** (for 10A and 16A crimp contacts) and **CXPZ D** (for 40A crimp contacts) manual crimping tools are suitable for use when compressed air sources are unavailable, for low or medium-low workloads.

The **CCPZ RN** (for 10A, 16A and 40A crimp contacts) manual crimping tool is also suitable for low or medium-low workloads.

All the above tools provide 8-indent crimping.

The **CCPZ TP** (for 10A and 16A crimp contacts) and **CXPZ TP** (for 40A crimp contacts) manual crimping tools are also suitable for low or medium-low workloads and provide a “square shaped” crimping cross-section. Crimped connections produced by these tools are in compliance with the requirements of EN 60352-2.

The **CCPZP** pneumatic crimping bench tool without automatic positioner (for 10A and 16A crimp contacts) is suitable for use in the workshop (where compressed air is available) for high or medium-high workloads. Using the same manual crimping tool turrets, it is possible to change rapidly from crimping on male contacts to crimping on female contacts of the same series (10A and 16A).

The **CCPZPA** pneumatic crimping bench tool with automatic positioner (for 10A and 16A crimp contacts) is suitable for workshop jobs (where compressed air is available) for medium-high or high workloads. It is recommended in particular for crimping high quantities of contacts that are the same type or have the same section, thus saving a significant amount of time thanks to automatic operation and reduced operator fatigue. Where the type or kind of contact must be changed frequently, it is preferred to use the version without automatic positioner.

The **CXPZP D** pneumatic crimping bench tool without automatic positioner (for 40A crimp contacts) is suitable for use in the workshop (where compressed air is available) for high or medium-high workloads. By using the same positioners as those of manual crimper CXPZ D, the size of a contact can be rapidly changed with one of the same type.

The semiautomatic stripping-crimping machine, type **ZFU-CD**, is suitable to be used in workshops (where an electrical or pneumatic power supply is available) and for heavy workloads. It enables to produce large amounts of crimped connections in less time because of the possibility of simultaneously carrying out stripping and crimping operations. The contact and tool replacement operations, which are minimized because of the pre-set programs that can be stored and customized by the user, require the production to be programmed to reduce downtime. When a sequential processing is required despite the economic advantages offered by the above-described solution, it is preferable to use pneumatic bench pliers without the above-described positioner or one of the manual pliers.

In any case, the quality of the results from the crimping tools, combined with the ILME crimp contacts, is identical and at the highest market levels, exceeding the requirements of the standard EN 60352-2.

Although the crimping appliances and tools suggested here include a set of control automatisms and mechanisms, which prevent the chief misunderstandings and errors, the operator is advised to always take care not to work in inappropriate conditions.

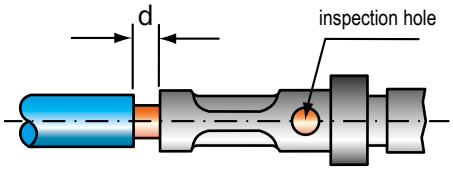
The crimping operation

The practical guide in standard EN 60352-2 supplies further general information regarding crimp contacts for multipole connectors.

1. Insertion of the conductor in the crimp contacts

The conductor must be correctly positioned in the pin to be crimped.
The crimping indentations must be correctly positioned on the foot to be crimped. There must be sufficient space, in conformity with the manufacturer's instructions, between the end of the insulating material of the conductor and the pin to be crimped ("d").
As a general rule, the stripping length is equal to the pin insertion depth + 1 mm (for sections up to 1 mm²) and + 2 mm (for sections from 1 to 10 mm²) *. When using closed crimp pins with an inspection hole, the crimp conductor must be visible through the inspection holes.

* Keeping the conductor strands visible above the contact collar enables you to check correct, i.e. make sure no strands have been cut. This also ensures a certain flexibility for the connection, by not transmitting to the contact any flexure stresses caused by installation. However, in practice, some operators give priority to insulation, by reducing to zero the gap between cable insulation and the contact collar.



2. Insertion of crimped contacts in the connector insert

It is recommended that the crimped contacts be perfectly straight and inserted within the contact slots in a single operation and without excessive force until a clicking sound is heard.
The correct retention of the contact should be verified with a light pulling of the wire. Non alignment of the crimped contacts must be avoided because this could cause possible loosening of the retention springs and consequently jeopardise the retention of the contact in the insert.
For small section conductors (≤ 0,35 mm²) or for specific application, the use of the insertion tool specified by the manufacturer is recommended.

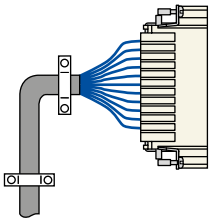
3. Removal of inserted contacts

In the case of incorrect insertion or wiring substitution, inserted contacts may only be removed using the removal tools specified by the manufacturer.

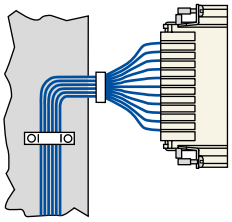
4. Mounting and flexure of multi-wired bundles or multipolar cables with crimp contacts

Bundles of conductors or multipolar cables with crimp contacts for multipole connectors must not cause stress to the inserted contacts with their weight as this would cause the contacts to bend over to the coupling area of the connectors and consequently damage them. The connectors must therefore be provided with cable clamps or the conductor bundles or multipolar cables must be mounted as described in the figures below.

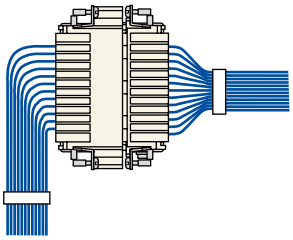
Multipolar cable



Conductor cables



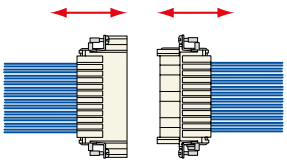
If the conductor bundles or the multipolar cables have to be immediately folded over on the back of the connector insert, it is recommended not to use any mechanical force in the axial direction with respect to the coupled contacts. The figure shows a correct bending and clamping of the multiwire bundles using the crimp contacts.



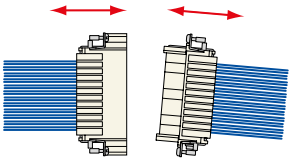
5. Coupling and uncoupling of multipolar connectors with crimp contacts

In order to prevent stress on the crimp contacts, the connectors must be coupled and uncoupled in the axial direction with respect to the contacts, without touching the conductor bundles or cables.
Standard DIN 43652 (incorporated into specification EN 175301-801) that applies to the ILME inserts of the CD series (this recommendation is also valid for the CDD series) prescribes a maximum deflection from the axis of ± 5° on the greater side and ± 2° on the smaller side.

Correct



Incorrect

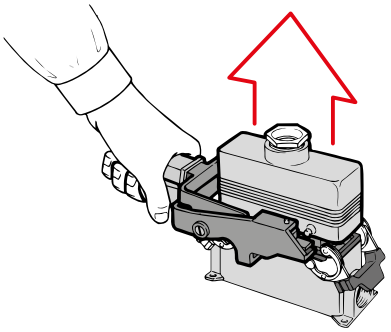


To keep the play within this limit, especially during the uncoupling phase, guide pins CRM and CRF may be used. The use of ILME pliers (code number CPES) is recommended for the uncoupling operations for CD inserts (64 poles) and CDD inserts (108 poles).The pliers work on the fulcrum and lever principle and perform the following main tasks:

I - Reduce effort and coupling times to the minimum, even when working in the most impractical and inaccessible points.

II- Perform the uncoupling of multipolar connectors in full conformity of standard DIN 43652 (now EN 175301-801).

The pliers allow the extraction of the inserts to be made perfectly axially with respect to the contacts, evenly distributing the pressure on four points (housing pins).



Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CD	(10A)	**66 - 74**
CDD	(10A)	**76 - 83**
CDC	(16A)	**104 - 106**
CCE	(16A)	**130 - 135**
CMCE	(16A)	**137 - 145**
CQE	(16A)	**168 - 173**
CQEE	(16A)	**176 - 177**
CQ	(10A/16A)	**186 - 193**
CX 8/24	(16A/10A)	**194**
CX 6/**36** *	(10A)	**198**
CX 12/**2** *	(10A)	**199**
CX 6/**6** *	(16A)	**206**
MIXO	(10A/16A)	**271 - 306**

* the underlined polarities indicate those contacts that require the tools shown in this page

manual crimping tool positioner - gauge

insertion tool - removal tools replacement tip

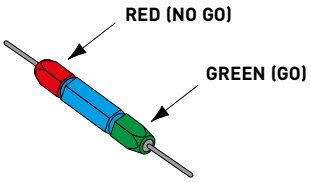
description	part No.	part No.
crimping tool for **10A** and **16A** contacts DANIELS AF8 model (turret excluded)	**CCPZ MIL**	
positioner inserts (see note) for **10A** contacts (CDF and CDM series) for **16A** contacts (CCF and CCM series)	**CCTP 10** **CCTP 16**	
"go / no go" control gauge to verify indenter closure (see note)	**CCPNP**	
insertion tool for insertion of the contacts into the inserts for crimped contacts up to 0,75 mm²		**CCINA**
removal tools for the extraction of contacts from the inserts for **10A** contacts (CD) [1] for **16A** contacts (CC) [2]		**CCES** **CQES**
replacement tip for CCES removal tool		**CCPR RN**

[1] for CQ, CD, CDD, CX inserts (10A auxiliary contacts) and MIXO module (10A)
[2] for CQ, CQE, CQEE, CCE, CMCE inserts (excluded 16+2), MIXO module (16A), CX6/6 (16A) and CDC. For CMCE (16+2), CX inserts (contacts 16A insert CX 8/24) using a flat 3 mm screwdriver.

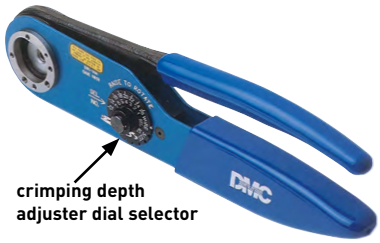
Notes:
Positioner / Head turret
conforms to international standard MIL-C-22520/1
- An interchangeable and indispensable accessory of the CCPZ MIL crimping tool, it precisely positions the contact where crimping is performed. Each series of contacts requires its own turret.

"go / no go" control gauge
conforms with international standard MIL-C-22520/3
- A tool used to periodically check that the crimping tool meets standard requirements.

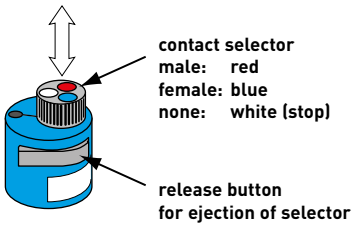
CCPNP



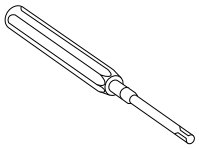
CCPZ MIL



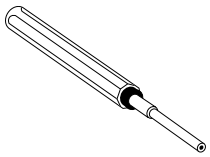
CCTP



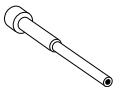
CCINA



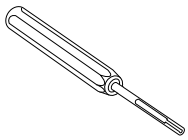
CCES



CCPR RN



CQES



16A - CONTACT HEAD TURRET / POSITIONER

CCMA - CCFA CCMD - CCFD		0,14 mm²	0,25 mm²	0,34 mm²	0,5 mm²	0,75 mm²	1,0 mm²	1,5 mm²	2,5 mm²	3,0 mm²	4,0 mm²	conductor section	
red	blue												
male	female	26	24	22	20	18	17	16	14	12	12	AWG	
0,3	0,3	5	5	6								crimping depth adjuster selector	CCTP 16
0,5	0,5		6	6	7								
0,7	0,7			6	6	7							
1,0	1,0			6	6	7	7						
1,5	1,5				6	7	7	8					
2,5	2,5					6	6	7	7				
3,0	3,0							6	7	7			
4,0	4,0									7	8		

10A - CONTACT HEAD TURRET / POSITIONER

CDMA - CDFA CDMD - CDFD		0,14 mm²	0,25 mm²	0,34 mm²	0,5 mm²	0,75 mm²	1,0 mm²	1,5 mm²	2,5 mm²	conductor section	
red	blue										
male	female	26	24	22	20	18	17	16	14	AWG	
0,3	0,3	5	5	6						crimping depth adjuster selector	CCTP 10
0,5	0,5				6						
0,7	0,7					6					
1,0	1,0						6				
1,5	1,5							7			
2,5	2,5								7		

Use and maintenance instructions

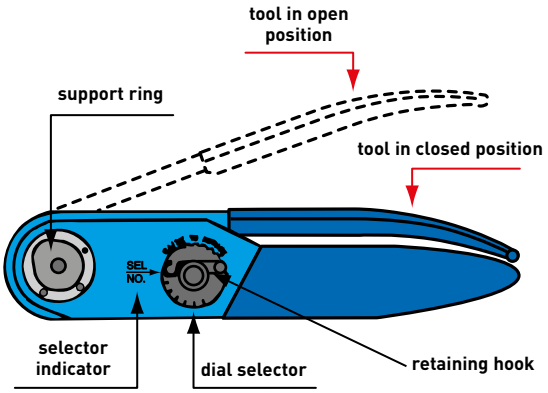
1. General specifications

The **CCPZ MIL crimping tool** conforms to the international standard MIL-C-22520/1. Crimping is performed with 8 pressure points. The tool is equipped with a geared mechanism to control the complete crimping cycle.
The tool must be equipped with an interchangeable positioner (CCTP) according to the series of contacts to be crimped.

1.1 Crimping range

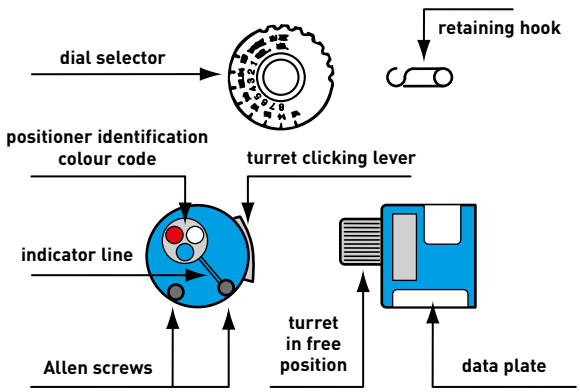
Conductor cross-sectional area range:
from 0,14 mm² (26 AWG) to 4 mm² (12 AWG) for positioner 16A,
from 0,14 mm² (26 AWG) to 2,5 mm² (14 AWG) for positioner 10A

Caution!
The handle of the tool must be in the open position when the turret is installed, disassembled or opened. If not, the turret and the crimping tool may be damaged.



2. CCTP positioner installation

1 The crimping tool must be in the open position.
2 Press the clicking lever that releases the positioner in the adjustment position.
3 Position the previously selected CCTP positioner on the support ring located on the crimping tool (matching the special pin on the base of the turret with the corresponding hole on the support ring), aligning the tapped holes with the socket head screws.
4 With the CCTP positioner positioned against the support ring, tighten the socket head screws with the 3,5 mm Allen wrench (supplied with the kit).
5 Refer to the data plate on the CCTP positioner. From the colour code column, select the colour of the positioner that corresponds to the appropriate code and dimension of the contact to be crimped.
6 With the CCTP positioner in the adjustment position, turn the turret until the colour-coded positioner is aligned with the indicator line. Press the turret until it clicks into the connected position.
7 Refer to the data plate on the CCTP positioner. From the column indicating the proper conductor section, determine the number that corresponds to the contact being used.
8 Remove the retaining hook from the crimping tool dial selector. Lift the dial selector and turn it until the selector number is aligned with the indicator (SEL. NO.). Replace the retaining hook (if necessary).



3. Crimping instructions

1 Insert the contact and the prepared conductor through the opening of the indenter in the turret positioner.
2 Tighten the crimping tool handle until the stop gear is released.
The tool will return to the open position.
3 Check the position of the crimping on the contact crimping foot. Ideally, the crimping should be between the inspection hole and the top edge of the crimping foot.
The head of the contact should not be squared and the inspection hole should be intact.

4. Removing the CCTP positioner

With the crimping tool in the open position, to disassemble the positioner, loosen the socket head screws using the 3,5 mm Allen key wrench (supplied with the kit). After the threads are released from the support ring, pull off the positioner with a straight movement.

5. Instructions to check calibration

The operations to check the crimping tool must be carried out with the dial selector in position 4 and the CCPNP gauge.
ATTENTION! Do not crimp the gauge.

5.1 Calibration check

Put the crimping tool in the completely closed position.
"GO" - Insert the end (green) of the gauge as shown **(Fig. 1).**
The gauge must pass freely between the indenter tips.
"NO GO" - Insert the end (red) of the gauge as shown **(Fig. 2).**
The gauge should not pass through the opening.

Gauge	tool selector pos. No.	Ø A ± 0,00254 mm (GO) green	Ø B ± 0,00254 mm (NO GO) red
CCPNP	**4**	0,991 (mm)	1,118 (mm)
		0,0390 (in)	0,0440 (in)

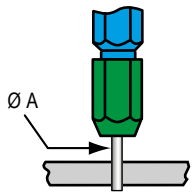


Fig. 1

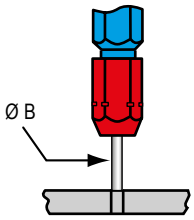


Fig. 2

6. Crimping tool maintenance

No maintenance is required.
However, it is good practice to keep the indenter tips free from residual deposits of the coloured band (some types of crimp contacts as per MIL standards are identified by coloured bands in the crimping area) and any other debris.
A metal brush may be used for this purpose.
The following is strongly recommended:

1 DO NOT immerse the tools in a solution to clean them.
2 DO NOT brush oil in the tools to lubricate them.
3 DO NOT try to disassemble the tool or repair it.

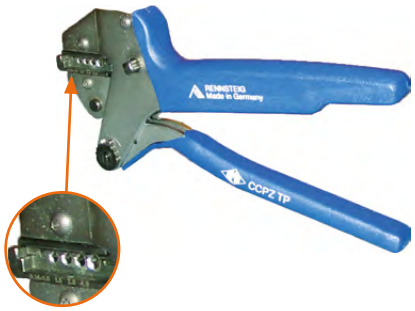
This is a high-precision manual crimping tool and must be used as such.
For automatic crimping operations refer to the CCPZP and/or CCPZPA crimping tool models.

Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CD	(10A)	**66 - 74**
CDD	(10A)	**76 - 83**
CDC	(16A)	**104 - 106**
CCE	(16A)	**130 - 135**
CMCE	(16A)	**137 - 145**
CQE	(16A)	**168 - 173**
CQEE	(16A)	**176 - 177**
CQ	(10A/16A)	**186 - 193**
CX 8/24	(16A/10)	**194**
CX 6/**12** *	(10A)	**197**
CX 6/**36** *	(10A)	**198**
CX 12/**2** *	(10A)	**199**
CX 6/**6** *	(16A)	**206**
RD (HNM)	(10A)	**208 - 209**
RDD (HNM)	(10A)	**210 - 213**
RCE (HNM)	(16A)	**214 - 217**
RQEE (HNM)	(16A)	**218 - 219**
MIXO	(10A/16A)	**271 - 306**

* the underlined polarities indicate those contacts that require the tools shown in this page

manual crimping tool



front view showing incorporated crimping dies

insertion tool
removal tools - tip

CCPR RN

description	part No.	part No.
crimping tool for **10A** and **16A** contacts RENNSTEIG model (crimping dies and turret head are included)	**CCPZ TP**	
insertion tool for insertion of the contacts into the inserts for crimped contacts up to 0,75 mm²		**CCINA**
removal tools for the extraction of contacts from the inserts for **10A** (CD) contacts		**CCES**
for **16A** (CC) contacts		**CQES**
replacement tip for CCES removal tool		**CCPR RN**

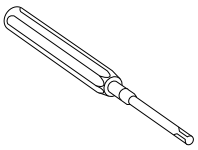
CCPZ TP is a simple but effective “square shaping” manual crimping tool incorporating discrete (4-size nests) crimping dies and dedicated turret positioner for relevant crimp contacts series and sizes.

For series CD (10A) and CC (16A) contacts (and their corresponding **HNM** variants series RD and RC) manual crimping tool **CCPZ MIL** – or their equivalent pneumatic **CCPZP** or **CCPZPA** for large volumes of crimps, or even the fully automatic stripper crimper machine **ZFU** – as well as the universal crimping tool **CCPZ RN**, by providing 8-indent crimping, are recommended for highly demanding applications, such as in transportation.

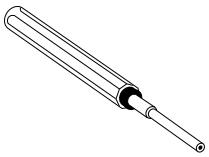
CCPZ TP

rear view showing incorporated turret head positioner

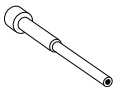
CCINA



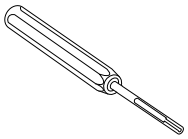
CCES



CCPR RN



CQES

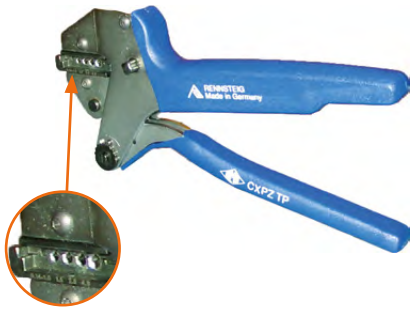


Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CQ4 03	(40A)	**184**
CQ 04/2	(40A)	**182**
CQ 04/2 H	(40A)	**183**
CX 6/12 *	(40A)	**197**
CX 6/36 *	(40A)	**198**
CX 12/2 *	(40A)	**199**
MIXO	(40A)	**267 - 272**

* the underlined polarities indicate those contacts that require the tools shown in this page

manual crimping tool



front view showing incorporated crimping dies

removal tool

description	part No.	part No.
crimping tool for 40A contacts RENNSTEIG model (crimping dies and turret head are included)	**CXPZ TP**	
removal tool for the extraction of contacts from the inserts for **40A** (CX) contacts		**CXES**

CXPZ TP is a simple but effective “square shaping” manual crimping tool incorporating discrete (3-size nests) crimping dies and turret positioner for relevant crimp contacts sizes ranging from size 1.5 to size 6.0. Size 10 requires **CCPZ RN** (Rennsteig PEW 8.75 universal manual crimp tool) or **CXPZP D** (Daniels WA27-309-EP pneumatic tool)

For series CX (40A) contacts (and their corresponding **HNM** variants series RX) manual crimping tool **CXPZ D** (Daniels M309) up to size 6.0 or CCPZ RN (Rennsteig PEW 8.75) for all sizes – or the pneumatic **CXPZP D** for large volumes of crimps, by providing 8-indent crimping, are recommended for highly demanding applications, such as in transportation.

CXPZ TP

rear view showing incorporated turret head positioner

Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CX 6/12 *	(40A)	**197**
CX 6/36 *	(40A)	**198**
CX 12/2 *	(40A)	**199**
MIXO	(40A)	**267 - 272**

***** the underlined polarities indicate those contacts that require the tools shown in this page

manual crimping tool positioner - gauge

removal tool

description	part No.	part No.
crimping tool for **40A** DANIELS M309 model (turret excluded)	**CXPZ D**	
positioner (see note) for contacts **40A** (**CX** and **RX HNM** series)	**CXTP 40**	
"go / no go" control gauge to verify indenter closure (see note)	**CXPNP**	
removal tool for the extraction of contacts from the inserts for **40A** (CX) contacts		**CXES**

Notes:

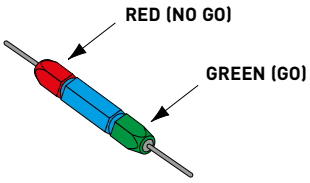
Positioner

- An interchangeable and indispensable accessory of the CXPZ D crimping tool, it precisely positions the contact where crimping is performed.

"go / no go" control gauge

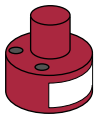
- A tool used to periodically check that the crimping tool meets standard requirements.

CXPNP



CXPZ D

CXTP 40



CXTP 40

CONTACT	CXMA/CXFA	1.5	2.5	4.0	6.0	10
WIRE SIZE	mm²	1,5	2,5	4	6	10
	AWG	16	14	12	10	8
SEL. NO.		5	5	5	7	8
USE WITH		M309				
		WA-27-309-EP				

Use and maintenance instructions

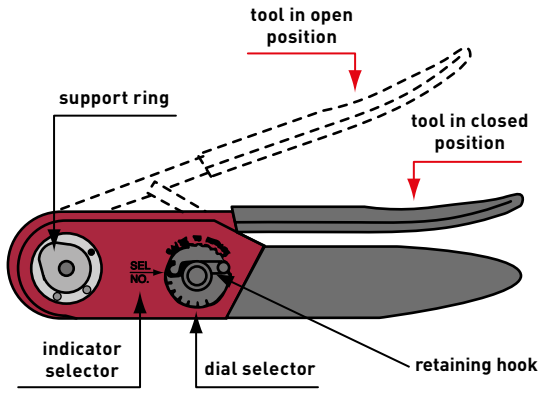
1. General specifications

The **CXPZ D crimping tool** performed with 8 pressure points.
The tool is equipped with a geared mechanism to control the complete crimping cycle.
The tool must be equipped with an interchangeable turret (CXTP) according to the series of contacts to be crimped.

1.1 Crimping range

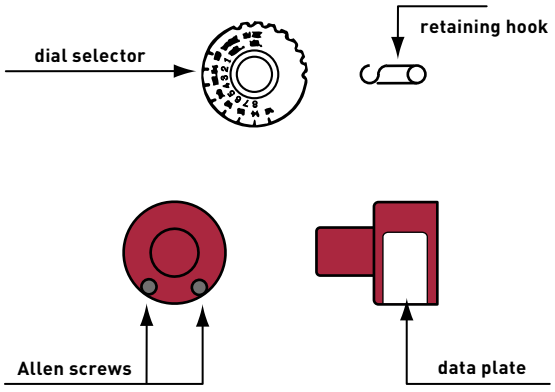
Conductor cross-sectional area range: from 1,5 mm² (16 AWG) to 6 mm² (10 AWG).

Caution!
The handle of the tool must be in the open position when the turret is installed, disassembled or opened. If not, the turret and the crimping tool may be damaged.



2. CXTP positioner installation

1 The crimping tool must be in the open position.
2 Position the CXTP 40 positioner on the support ring located on the crimping tool (matching the special pin on the base of the turret with the corresponding hole on the support ring), aligning the tapped holes with the socket head screws.
3 With the CXTP 40 positioner positioned against the support ring, tighten the socket head screws with the 3,5 mm Allen wrench (supplied with the kit).
4 Refer to the data plate on the CXTP 40 positioner.
From the column indicating the proper conductor cross-sectional area, determine the number that corresponds to the contact being used.
5 Remove the retaining hook from the crimping tool dial selector.
Lift the dial selector and turn it until the selector number is aligned with the indicator (SEL.NO.).
Replace the retaining hook (if necessary).



3. Crimping instructions

1 Insert the contact and the prepared * conductor through the opening of the indenter in the turret positioner.
2 Tighten the crimping tool handle until the stop gear is released.
The tool will return to the open position.
3 Check the position of the crimping on the contact crimping foot. Ideally, the crimping should be between the inspection hole and the top edge of the crimping foot.
The head of the contact should not be squared and the inspection hole should be intact.

* i.e. stripped at the correct length and with strands lightly twisted to recover regular lay of strands

4. Removing the CXPT 40 positioner

With the crimping tool in the open position, to disassemble the turret, loosen the socket head screws using the 3,5 mm Allen wrench (supplied with the kit).
After the threads are released from the support ring, pull off the positioner with a straight movement.

5. Instructions to check calibration

The operations to check the crimping tool must be carried out with the dial selector in position 4 and with the CXPNP gauge (formerly Daniels G425, now Daniels G436 or G1004 which are equivalent for the purpose).
ATTENTION! Do not crimp the gauge.

5.1 Calibration check

Put the crimping tool in the completely closed position.
"GO" - Insert the end (green) of the gauge as shown **(Fig. 1).**
The gauge must pass freely between the indenter tips.
"NO GO" - Insert the end (red) of the gauge as shown **(Fig. 2).**
The gauge should not pass through the opening.

Gauge	tool selector pos. No.	Ø A ± 0,00254 mm (GO) green	Ø B ± 0,00254 mm (NO GO) red
CXPNP	**4**	1,549 (mm)	1,676 (mm)
		0,0609 (in)	0,0659 (in)

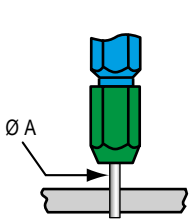


Fig. 1

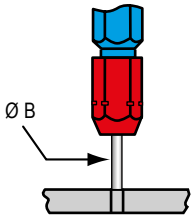


Fig. 2

6. Crimping tool maintenance

No maintenance is required.
However, it is good practice to keep the indenter tips free from residual deposits of the coloured band (some types of crimp contacts as per MIL standards are identified by coloured bands in the crimping area) and any other debris.
A metal brush may be used for this purpose.
The following is strongly recommended:

1 DO NOT immerse the tools in a solution to clean them.
2 DO NOT brush oil in the tools to lubricate them.
3 DO NOT try to disassemble the tool or repair it.

This is a high-precision manual crimping tool and must be used as such.

Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CD	(10A)	**66 - 74**
CDD	(10A)	**76 - 83**
CDC	(16A)	**104 - 106**
CCE	(16A)	**130 - 135**
CQE	(16A)	**168 - 173**
CQEE	(16A)	**176 - 177**
CMCE	(16A)	**137 - 145**
CQ	(10A/16A)	**186 - 193**
CX 8/24	(16A/10A)	**194**
CX 6/36	(40A/10A)	**198**
CX 12/2	(40A/10A)	**199**
CX 6/**6** *	(16A)	**206**
MIXO	(40A/16A/10A)	**267 - 306**

* the underlined polarities indicate those contacts that require the tools shown in this page

manual crimping tool gauge

insertion tool - removal tools replacement tip

CCPR RN

description	part No.	part No.
crimping tool for **10A, 16A and 40A** contacts RENNSTEIG model (turret included)	**CCPZ RN**	
"go / no go" control gauge to verify indenter closure (see note)	**CCPNP RN**	
insertion tool for insertion of the contacts into the inserts for crimped contacts up to 0,75 mm²		**CCINA**
removal tools for the extraction of contacts from the inserts for **10A** (CD) contacts [1] for **16A** (CC) contacts [2] for **40A** (CX) contacts [3] and cables Ø < 5 mm for **40A** (CX) contacts [4] and cables Ø < 7,5 mm		 **CCES** **CQES** **CXES** **CXES-10**
replacement tip for CCES removal tool		**CCPR RN**

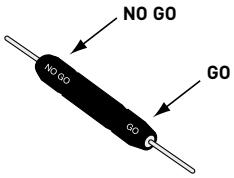
[1] for CQ, CD, CDD, CX inserts (10A auxiliary contacts) and MIXO module (10A)
[2] for CQ, CQE, CQEE, CCE, CMCE inserts (excluded 16+2), MIXO module (16A), CX6/6 (16A) and CDC. For CMCE (16+2), CX inserts (contacts 16A insert CX 8/24) using a flat 3 mm screwdriver.
[3] for CX inserts (40A contacts) and MIXO module (40A)
[4] for MIXO module CX 03 4B and contacts 10 mm².

Notes:

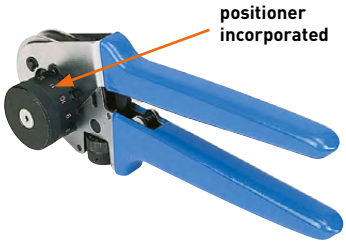
"go / no go" control gauge

- A tool used to periodically check that the crimping tool meets standard requirements.

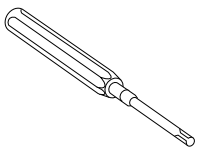
CCPNP RN



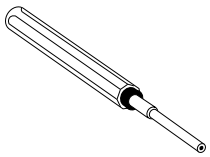
CCPZ RN



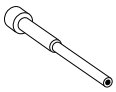
CCINA



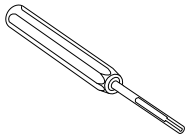
CCES



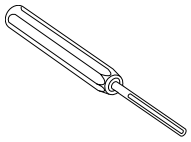
CCPR RN



CQES



CXES - CXES-10



Watch our online tutorial

CRIMPING TOOLS

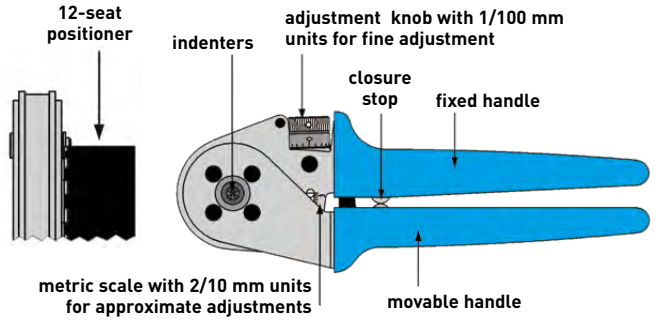
Use and maintenance instructions

1. General specifications

The **CCPZ RN crimping tool** crimps with 8 pressure points, obtaining similar results to the prescriptions of standard MIL-C-22520/1.
The tool has a geared mechanism for controlling the complete crimping cycle, and houses a positioning turret with 12 positions, six of which can be used for positioning the ILME male and female crimping contacts of series CD (10A max), CC (16A max) and CX (40A max).

1.1 Crimping range

Conductor cross-sectional area range: from 0,14 mm² (26 AWG) to 10 mm² (8 AWG).
Caution! The handle of the tool must be in the open position when the turret is installed, disassembled or opened. If not, the turret and the crimping tool may be damaged.



2. Description of tool

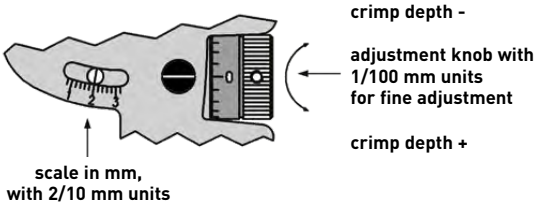
Crimping tool components: a first mobile handle, with a precision stop mechanism with teeth and an opening limiting guide; a second fixed handle with metric scale (units of 2/10 mm); an adjustment system with fine step adjustments of 1/100 mm; four indenters; a 12-seat positioner, fully rotating through 360° for accurate positioning of contacts. A reference table engraved on the tool surface provides the positioner (POS) number and crimping depth (SET) to select according to the type and size of the ILME contact (the crimping tool can be set to any crimping depth which may be required by the contact manufacturer).

3. Adjustment of crimp depth

Crimp depth to be adjusted ad follows:
the adjustment knob should be turned clockwise to reduce crimping depth, and anti-clockwise to increase it.

3.1 Adjustment tolerances:

- 1 scale mark on the knob = adjustment of 1/100 mm (0,01 mm);
- 1 complete rotation of knob = adjustment of 2/10 mm (0,2 mm, this indication can be read on the knob and on the approximate scale);
- 5 knob rotations = adjustment of 1,0 mm (this indication can be read on the scale).



4. Crimping instructions

The reference matrix on the crimping tool indicates the correct seat of the positioner (POS M1, F2, M3, F4, M5, F6) to select, and the crimping depth (SET) to adjust for the contact to be crimped.
The contact is inserted through the crimper entry hole on the opposite side of the positioner.
The contact is closed by closing the handles in the first stop position, in order to prevent the contact coming out off the crimper and to facilitate fitting the conductor in the contact.
The precision stop mechanism with teeth ensures consistently precise crimps, by forcing the crimper to close completely and finish the crimping cycle before the crimper can be re-opened.

Tool adjustment

Positioner seat = M1 (male) - F2 (female)

CDMA/D (male) CDFA/D (female)	Section (mm²)	Crimp depth (mm)
0,3	0,14 0,25 0,37	1,3
0,5	0,5	1,55
0,7	0,75	1,55
1,0	1,0	1,55
1,5	1,5	1,55
2,5	2,5	1,55

Positioner seat = M3 (male) - F4 (female)

CCMA/D (male) CCFA/D (female)	Section (mm²)	Crimp depth (mm)
0,3	0,14	1,2
0,3	0,25-0,37	1,3
0,5	0,5	1,55
0,7	0,75	1,55
1,0	1,0	1,55
1,5	1,5	1,8
2,5	2,5	1,8
3,0	3,0	1,9
4,0	4,0	2,0

Positioner seat = M5 (male) - F6 (female)

CXMA/D (male) CXFA/D (female)	Section (mm²)	Crimp depth (mm)
1,5	1,5	1,55
2,5	2,5	1,8
4,0	4,0	2,0
6,0	6,0	2,5
10,0	10,0	2,3

5. Calibration check

The crimping tool is adjusted in the manufacturer's plant.
To ensure correct calibration, we advise you to check the tool with a gauge every working day.
This is easily done with the CCPNP RN cylindrical gauge in the 2,0 mm Ø position.
ATTENTION!: Do not crimp the gauge.
Crimping depth of 2 mm can be adjusted with the adjustment knob (scale marked on "2", screw indicator on "0" as shown in the above figure).
Put the crimping tool in the completely position.
"GO" - Insert the end of the gauge as shown **(Fig. 1)**.
The gauge must pass freely between the indenter tips.
"NO GO" - Insert the end of the gauge as shown **(Fig. 2)**.
The gauge should not pass through the opening.

Gauge	tool selector pos. No.	Ø A GO	Ø B NO GO
CCPNP RN	**2,00 (mm)**	1,94 (mm)	2,06 (mm)

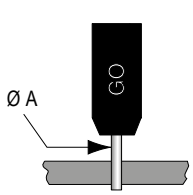


Fig. 1

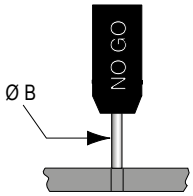


Fig. 2

6. Maintenance and repair

Keep the crimping tool clean and store it correctly when not in use.
The joints need to be lubricated periodically, and the pin stop circular clips must always stay in position.
This is a high precision crimping tool and must be used as such.

Tools and accessories for crimp contacts

for contacts of inserts series:	page:
MIXO (CI contacts, 25 poles)	**284**
MIXO Gigabit (CI contacts, 8 poles)	**286**
MIXO (CI contacts, 8 poles)	**293**

manual crimping tool
positioner - gauge

N.B.:
CITP D positioner
(to be ordered separately)

insertion / removal tool

description	part No.	part No.
crimping tool for **CI** contacts DANIELS AFM8 model (**positioner excluded**)	**CIPZ D**	
positioner (DANIELS K1450I) for **CI** contacts (CIMA - CIFA - CIFD - CIMD series)	**CITP D**	
"go / no go" control gauge (DANIELS G125) to verify indenter closure (see note)	**CCPNP**	
insertion tool: for insertion of the contacts into the inserts, and removal tool: for the extraction of contacts from the inserts for **CI** contacts 0,2 - 0,5 mm² (CIMA - CIFA - CIFD - CIMD series)		**CIES**
for **CI** contacts 0,75 mm² (CIMA - CIFA - CIFD - CIMD series)		**CIES B**

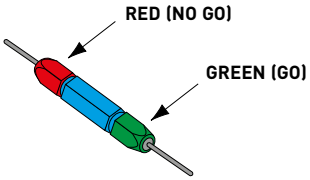
Notes:
"go / no go" control gauge
conforms with international standard MIL-C-22520/3
- A tool used to periodically check that the crimping tool meets standard requirements.

CIMA - CIFA - CIFD - CIMD

WIRE	mm²	0,08-0,75
WIRE	AWG	28 - 18
SEL	NO.	7

CITP D

CCPNP



Watch our online tutorial

Tools and accessories for crimp contacts

for contacts of inserts series:	page:
MIXO (D-SUB)	**296**

manual crimping tool
positioner - gauge

N.B.:
CIVTP D positioner
(to be ordered separately)

insertion / removal tool

description	part No.	part No.
crimping tool for **5A** D-SUB contacts (CIVFD and CIVMD series) DANIELS AFM8 model (**positioner excluded**)	**CIPZ D**	
positioner (DANIELS K761) for **5A** D-SUB contacts (CIVFD and CIVMD series)	**CIVTP D**	
"go / no go" control gauge (DANIELS G125) to verify indenter closure (see note)	**CCPNP**	
insertion tool: for insertion of the contacts into the inserts, and removal tool: for the extraction of contacts from the inserts for **5A** D-SUB contacts (CIVFD and CIVMD series)		**CIVES**

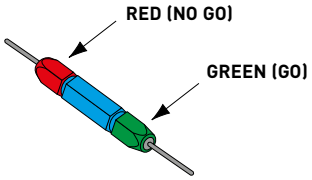
Notes:
"go / no go" control gauge
conforms with international standard MIL-C-22520/3
- A tool used to periodically check that the crimping tool meets standard requirements.

CIVFD - CIVMD

mm²	0,08	0,13	0,20	0,32	0,52	0,82
AWG	28	26	24	22	20	18
SEL	6	6	5	6	6	6

CIVTP D

CCPNP



Watch our online tutorial

Use and maintenance instructions

1. General specifications

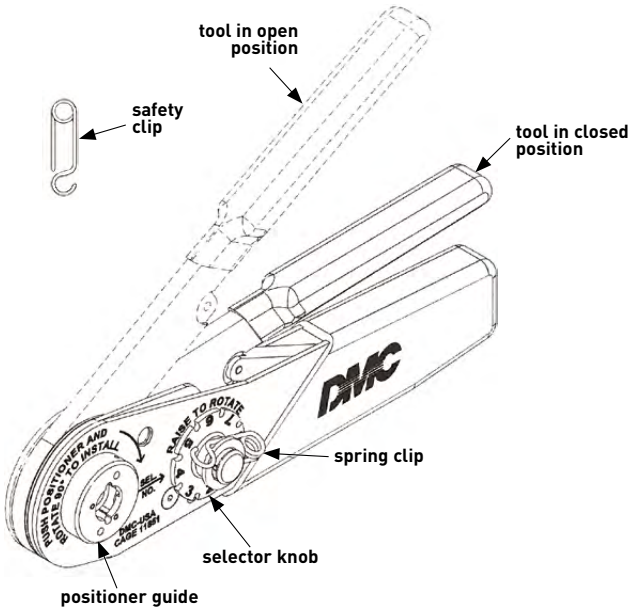
The **CIPZ D crimping tool** (Daniels designation AFM8) conforms to the U.S. Military Standard **MIL-C-22520/2C** (designation M22520/2-01) [1]. Crimping is performed with 8 pressure points and the tool is equipped with a geared mechanism to control the complete crimping cycle.
The tool must be equipped with an interchangeable positioner (CITP D or CIVTP D) according to the series of contacts to be crimped.

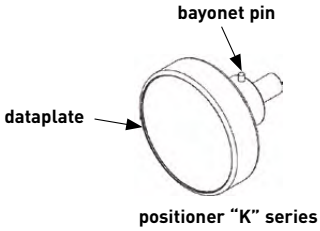
[1] Since October 2011 the MIL-C-22520 series is being progressively replaced by a corresponding **SAE** [1] **AS22520** series. The military series will be fully cancelled once all SAE parts will be published. SAE International, so named since 2006 and established in 1905 as the *Society of Automotive Engineers*, is a U.S.-based, globally active professional association and standards developing organization working in various industries, having as core business the transport industries such as automotive, aerospace, and commercial vehicles.

2. Crimping range

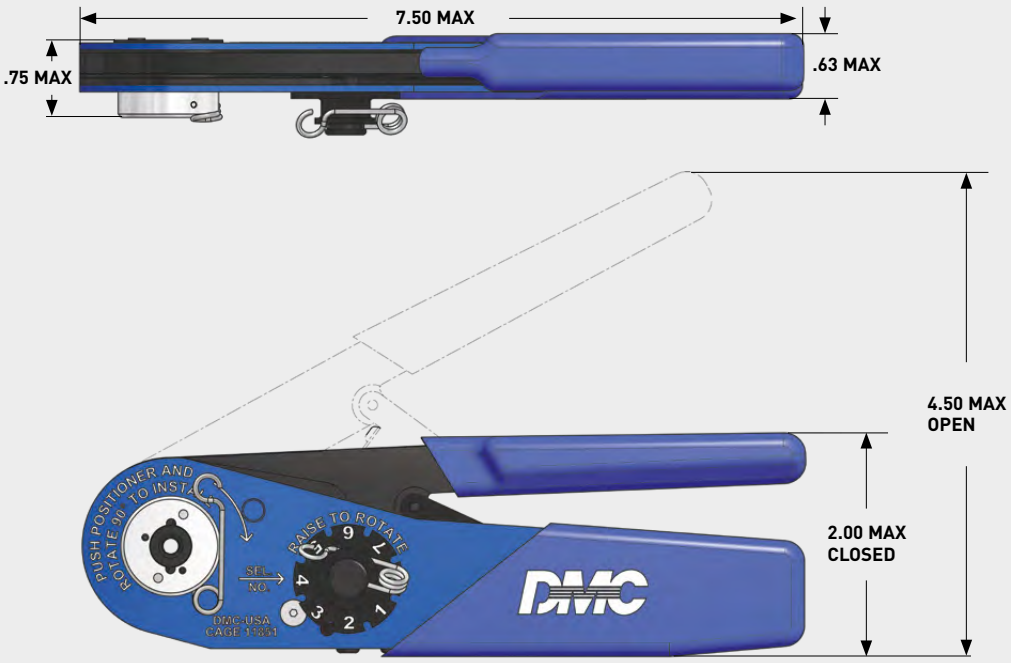
Conductor cross-sectional area range: from 0,08 mm² (28 AWG) to 0,52 mm² (20 AWG).

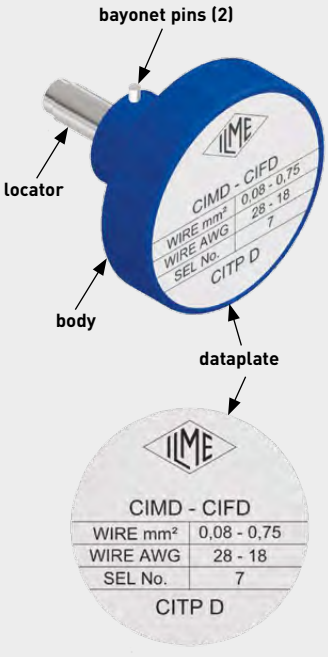
Caution!
The handle of the tool must be in the open position when the positioner is installed, disassembled or opened. If not, the positioner and the crimping tool may be damaged.





Note: dimensions in inches





CITP D positioner

3. CITP D or CIVTP D positioner installation

1 The crimping tool must be in the open position.
2 Remove the safety clip from the positioner guide.
3 Insert the previously selected **CITP D** or **CIVTP D** positioner into the positioner guide on the head of the tool. Push down and rotate 90 degrees until bayonet pins lock.
4 Refer to the data plate on the **CITP D** or **CIVTP D** positioner for the setup of the selector number that determines crimp height, based on the contact size and conductor size.
5 With the tool in open position, remove the spring clip then raise and rotate selector knob until number indicated on data plate for conductor size to be crimped is in line with SEL. NO. arrow. Reinstall spring clip to avoid unintended change of setup

4. Crimping instructions

1 Insert the contact and the prepared (correctly stripped) conductor through the indenter opening in the positioner.
2 Squeeze the crimping tool handles together until ratchet releases. Handles will return to open position.
3 Check the position of the crimping on the contact crimp barrel. Ideally, the crimping should be between the inspection hole and the top edge of the crimp barrel.

The edge of the contact barrel should not result squared and the inspection hole should remain intact.

5. Removing the CITP D or CIVTP D positioner

With the crimping tool in the open position, to disassemble the positioner, push down on the positioner to release the bayonet pins from the positioner guide. Turn 90 degrees anticlockwise and remove the positioner from the tool.

6. Instructions to check calibration

The operations to check the crimping tool must be carried out with the dial selector in position 8 and the CCPNP gauge.
CAUTION! Do not crimp gauge!

6.1 Calibration check

Put the crimping tool in the completely closed position.
"GO" - Insert the end (green) of the gauge as shown **(Fig. 1).**
The gauge must pass freely between the indenter tips.
"NO GO" - Insert the end (red) of the gauge as shown **(Fig. 2).**
The gauge should not pass through the opening.

Gauge	tool selector pos. No.	Ø A ± 0,00254 mm (GO) green	Ø B ± 0,00254 mm (NO GO) red
CCPNP	**8**	0,991 (mm)	1,118 (mm)
		0,0390 (in)	0,0440 (in)

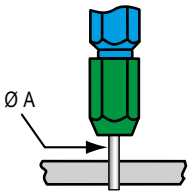


Fig. 1

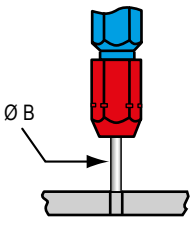


Fig. 2

7. Crimping tool maintenance

No maintenance is required. However, it is good practice to keep the indenter tips free from residual deposits of the coloured band (some types of crimp contacts as per SAE (MIL) standards are identified by coloured bands in the crimping area) and any other debris. A small wire brush may be used for this purpose.

The following is strongly recommended:
1 DO NOT immerse the tools in a solution to clean them.
2 DO NOT brush oil in the tools to lubricate them.
3 DO NOT try to disassemble the tool or repair it.

This is a high-precision manual crimping tool and must be used as such.

Tools and accessories for crimp contacts

for contacts of inserts series:		page:
CX 6/6	(100A)	**206**
MIXO	(200A/100A/70A)	**262 - 266**

manual crimping tool
crimping dies

removal tool

description	part No.	part No.
crimping tool for **70A/100A/200A** series contacts basic tool mod. CEMBRE HT 45 excluding crimping dies and locators [1]	**CPPZ C**	
crimping dies for CX7 contacts with 10 mm² (AWG 8 - 7) section for CX7 contacts with 16 mm² (AWG 6 - 5) section for CX7 contacts with 25 mm² (AWG 4 - 3) section	 **CGD 10 C** **CGD 16 C** **CGD 25 C**	
crimping dies for CG contacts with 10 mm² (AWG 8 - 7) section for CG contacts with 16 mm² (AWG 6 - 5) section for CG contacts with 25 mm² (AWG 4 - 3) section for CG contacts with 35 mm² (AWG 2) section	 **CGD 10 C** **CGD 16 C** **CGD 25 C** **CGD 35 C**	
crimping dies for CY contacts section 16 mm² (AWG 6) for CY contacts section 25 mm² (AWG 4) and section 35 mm² (AWG 2) for CY contacts section 50 mm² (AWG 1) for CY contacts section 70 mm² (AWG 2/0)	 **CGD 25 C** **CYD 35 C** **CYD 50 C** **CYD 70 C**	
locator for CX7 contacts for CG contacts for CY contacts	 **CX7PZ LOC** **CGPZ LOC** **CYPZ LOC**	
removal tool for 70A CX7 series contact		**C7ES**

[1] part No. **CPPZ CF:** manual crimping tool carrying case (CGPZ VLG) complete with crimping tool (CPPZ C),crimping dies (CGD/CYD) and locator (CX7PZ LOC, CGPZ LOC, CYPZ LOC).

NOTE:
For **CGMA 35** and **CGFA 35** contacts, and their corresponding **CGD 35 C** matrix pair, the contact may be inserted even after closing the head.

part No.	punching	contacts	mm²	AWG min (mm²)	AWG max (mm²)
CGD 10 C	ME 2	**CX7MA 10, CX7FA 10, CGT 6.0, CGT 10**	10	8 (8,4)	7 (10,6)
CGD 16 C	ME 3	**CX7MA 16, CX7FA 16**	16	6 (13,3)	5 (16,8)
CGD 25 C	ME 5	**CX7MA 25, CX7FA 25**	25	4 (21,2)	3 (26,7)
CGD 10 C	ME 2	**CGMA 10, CGFA 10**	10	8 (8,4)	7 (10,6)
CGD 16 C	ME 3	**CGMA 16, CGFA 16, CGT 16**	16	6 (13,3)	5 (16,8)
CGD 25 C	ME 5	**CGMA 25, CGFA 25, CGT 25**	25	4 (21,2)	3 (26,7)
CGD 35 C	ME 7	**CGMA 35, CGFA 35**	35	—	2 (33,6)
CGD 25 C	ME 5	**CYMA 16, CYFA 16**	16	6 (13,3)	—
CYD 35 C	ME 9	**CYMA 25, CYFA 25**	25	4 (21,2)	—
		CYMA 35, CYFA 35	35	2 (33,6)	—
CYD 50 C	ME 12	**CYMA 50, CYFA 50**	50	1 (42,4)	—
CYD 70 C	ME 17	**CYMA 70, CYFA 70**	70	2/0 (67,4)	—

Watch our online tutorial

Use and maintenance instructions

General specifications

The **CPPZ C crimping tool** is a hydraulically operated tool suitable for manually crimping contact series (70A/100A/200A max) removable crimp contacts which may be used in **MIXO** series type **CX7, CG, CY** and **CGT** adaptors. By using a suitable, hexagonal footprint crimp matrix pair, these pliers allow crimped connections to be made which conform to the highest quality standards.

The main features of these pliers are listed below:
- Scope of application: suitable for crimping wire terminals for up to 150 mm² flexible copper wires.
- Force developed: 50 kN (6 tons).
- Nominal operating pressure: 600 bar (8.600 psi).
- Dimensions: length 346 mm (13,6");
  width (locked moving handle) 130 mm (5,1");
  width (free moving handle) 250 mm (9,8").
- Weight: (without matrixes and without ILME locator) 2,0 kg (4,4 lbs).
- Recommended oil: AGIP ARNICA 32 or SHELL TELLUS OIL TX 32 or equivalent.
- Other features: please read the user and maintenance manual supplied with the tool.

The pliers are equipped with a locator specifically designed for ILME crimp contacts to be mounted on the moving part of the pliers head by means of the Allen screw provided.

NOTE: It is possible to use the CPPZ C pliers with the CX7 70A, CG 100A and CY 200A contact series, by simply fitting the CX7PZ LOC, CGPZ LOC or CYPZ LOC locator and crimping matrixes to be purchased separately.

WARNING: For crimping the CGT adaptors, the crimp locating operation must be carried out by the user.

User instructions

1. Preliminary operations

According to requirements, the pliers can be fitted with one or more pairs of crimp matrixes selected from the matrixes listed in the catalogue, to crimp the contacts shown in the table page 720.

NOTE: *The crimp contacts are only suitable for crimping flexible copper wires featuring a nominal section shown in the table with the crimp matrixes shown in the table. Any contacts – wires – matrixes combination which does not conform to these instructions is not physically possible (ex: using 35 mm² contacts with CGD 25 C matrixes is not possible because the pliers head would not close) or produces non conforming crimped connections or not usable in the MIXO series.*

Open the tool head by moving the matrix supporting hook ❸ outwards until the matrix support ❶ is released.

With reference to **Figures 1 and 2**, select a pair of matrixes suitable to the type of contact and insert them in the housings: one in the matrix support ❶, the other one in the matrix pusher support ❷. (NB: the two matrixes of each pair are the same).

Insert the contact by resting it in the locator with the tip forward, then close the head.

The contact crimp housing will be accessible in the mouth between the matrixes.

Remove the moving handle ❹ by removing the handle locking belt from the handle.

Before carrying out the next operations, make sure the head is fully closed to avoid damages.

The pliers head can rotate by 180° in relation to the body, thus allowing the operator to work in the most comfortable position.

WARNING: do not force the head by trying to rotate it when the tool is under pressure.

2. Approaching the matrixes

If possible closing the dies, rest the pliers head on a work top, then move the moving handle to start moving the matrixes closer to the contact, then carry on moving them until the contact is locked between the matrixes.

Push the correctly stripped and suitable long (**15 mm**) wire all the way in the contact (or the CGT adaptors) crimp housing by carefully checking that the braids are fully compacted, are not damaged and, above all, are all fully inserted. Correctly pushing the contact in the locator ensures that the matrixes are exactly in the right area to compress (the contact crimp shaft centre). Make sure that the locator is free from any residue which would alter the position of the contact. For crimping the CGT 16 earth adaptor, manually locate the area to be crimped between the matrixes. If necessary, re-open the matrixes by following the instructions described in paragraph 4 and reposition the contact.

3. Crimping

Continue to operate the moving handle (pumping): the piston will gradually move forward until the matrixes come into contact.

Continue the pumping action until the maximum pressure valve clicks in.

4. Releasing the dies

Fully press the pressure release lever ❺ located on the pliers pumping body until the piston goes back and the matrixes open.

To remove the crimped contact, re-open the pliers head.

5. Storage

Fully return the piston as described in paragraph 4, then lock the moving handle in position by using the belt provided.

Cleaning and maintenance

The tool is very sturdy and does not required any special care; a correct operation is ensured by following a few simple precautions.

The tool is supplied with a user and maintenance manual, which gives all detailed instructions. Read this manual before use.

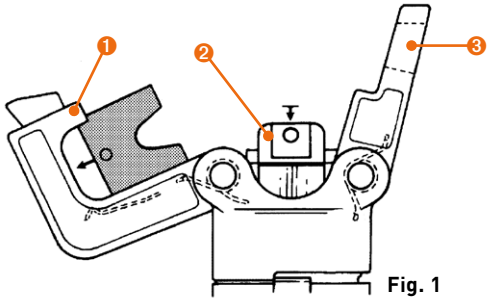


Fig. 1

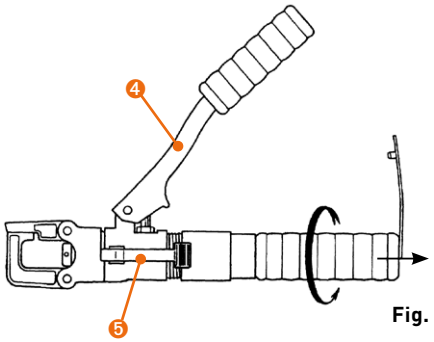


Fig. 2

CGPZ VLG carrying case

for CPPZ C * crimping tool
- dimensions 445 x 290 x h 95 mm
- weight 1,2 kg

houses 20 pairs of matrixes

* to store the CPPZ C crimping tool inside the carrying case, turn the pliers head by 180° so that the locator becomes visible.

Tools and accessories for crimp contacts

for contacts series:	page:
CX PLF/PLM	299
CX MLF/MLM	299

manual crimping tool

Front view

polishing disc, polish paper, removal tool, jacket stripper and fibre stripper, cable cutter

CLES

description	part No.	part No.
crimping tool for POF **CX PL** and MOST **CX ML** contacts RENNSTEIG model [1]	**CLPZ R**	
polishing disc (RATIOPLAST 910 PS 0SC 00 001) for POF [2] and MOST [3] contacts		**CLDL**
polish paper: grain size 1000 (RATIOPLAST 910 PB 001 00 001)		**CLC1**
grain size 4000 (RATIOPLAST 910 PB 001 40 250)		**CLC4**
removal tool for the extraction of contacts from the CX L inserts		**CLES**
jacket stripper (RATIOPLAST 910 AZ 001 00 PA1) for POF [2] and MOST [3] fibre optic with PA jacket		**CLSG**
fibre stripper (RATIOPLAST 910 AB 001 00 001) for POF [2] fibre optic		**CLSP**
cable cutter (RATIOPLAST 910 SW 001 00 001) for Ø 2,3 mm max, for POF [2] and MOST [3] fibre optic		**CLTE**

[1] on request tool **CLPZ** RATIOPLAST 910 CZ 001 00 008 for contacts POF [2] **/** MOST [3] crimping on the back
[2] **POF = POLYMER OPTICAL FIBRE**
[3] **MOST = MEDIA ORIENTED SYSTEM TRANSPORT**

Note:
as alternative to crimping please use glue UHU PLUS ENDFEST 300 (BICOMPONENT), part No. "**CL GL**" (provide a strain relief by cable glands):
- mix the two components on a sheet (just a drop/each)
- the stripped ca. 5 mm POF [2] (that means the inner fibre) has to be dipped in the glue (just 5 mm);
- the POF [2] has to be pushed now in the contact/ferrule;
- min. one night to hard/dry the glue;
- finally the POF [2] has to be polished (polishing disc).

Rear view

CLDL

CLC1 / CLC4

CLSG

CLSP

CLTE

General specifications

Strip the fibre about 12 mm for male contact and about 15 mm for female contact (see Figures 1 and 2).

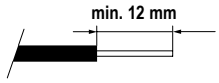


Fig. 1 - Example of cable stripping for male crimp contact

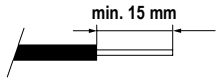


Fig. 2 - Example of cable stripping for female crimp contact

Crimping instructions

- The data sheet for crimping tool **CLPZ R** explains how the crimping tool works and how to adjust the crimping depth and locator for the contacts to be crimped. Position the turret on 3, push and turn of 90° the knob of turret. Adjust the crimping depth on 2 (unscrew the allen screw, after adjusting refix the screw). For the female contact: unscrew the back of the contact, pull out the internal central part; on Figure 3 is indicated the crimping area (front part of contact). For male contact: crimp the front part of contact.
- Push the stripped fibre as far as possible into the contact sleeve so that it protrudes approx. 1 mm from the tip of the contact.

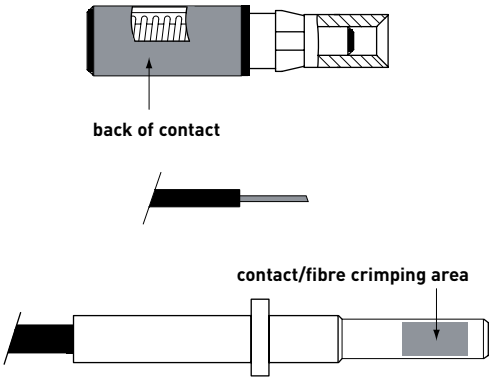


Fig. 3 - Female contact/fibre crimping area

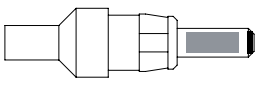
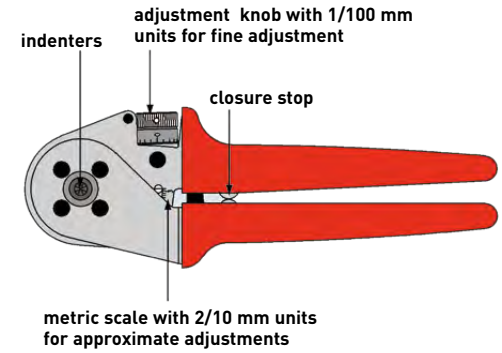


Fig. 4 - Male contact/fibre crimping area

- Insert the contact together with the fibre optic cable as far as possible into the crimping opening of the crimping tool (**CLPZ R**, see Figure 5) while applying gentle pressure to the fibre optic cable and connector, close the tool until you hear it disengages.



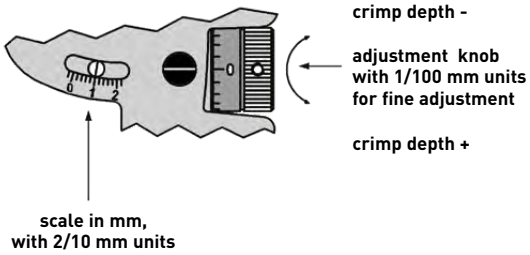


Fig. 5 - Manual crimping tool

Finishing the front surface

- Insert the contact into the polishing disc (**CLDL**) as shown in Figure 6. Work on a smooth surface (such as a sheet of glass), use grade 1000 polishing paper to grind off the protruding fibre and polish it with grade 4000 polishing paper.
- Wipe away any residue remaining after grinding. The best optical attenuation values are achieved when a wet grinding method is used.

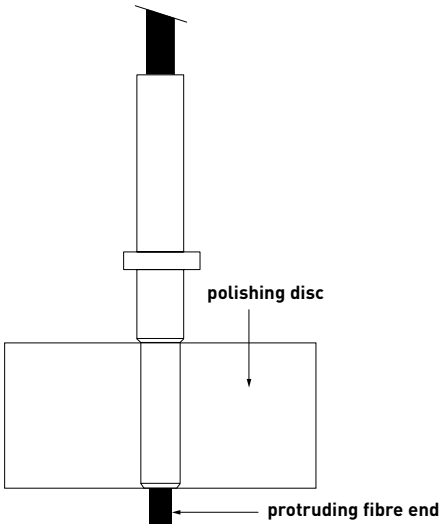


Fig. 6 - Polishing Disc with Guide for Connector Sleeve

Final mounting instructions

Screw the back female part contact. Put inside the CX 04 LF/ CX 04 LM insert.

Tools and accessories for crimp contacts

for contacts series:	page:
CLF DD/CLM DD	677

manual crimping tool

Front view

polishing disc, polish paper, removal tool, jacket stripper and fibre stripper, cable cutter

CCES

description	part No.	part No.
RENNSTEIG model crimping tool for POF [1] CLF DD / CLM DD contacts	**CLPZ R**	
polishing disc (RATIOPLAST 910 PS 0SC 00 001) for POF [1] contacts		**CLDL DD**
polish paper: grain size 1000 (RATIOPLAST 910 PB 001 00 001)		**CLC1**
grain size 4000 (RATIOPLAST 910 PB 001 40 250)		**CLC4**
removal tool, for the extraction of contacts from the CD, CDD, CX inserts		**CCES**
jacket stripper (RATIOPLAST 910 AZ 001 00 PA1) for POF [1] fibre optic with PA jacket		**CLSG**
fibre stripper (RATIOPLAST 910 AB 001 00 001) for POF [1] fibre optic		**CLSP**
cable cutter (RATIOPLAST 910 SW 001 00 001) for Ø 2,3 mm max, for POF [1] fibre optic		**CLTE**

[1] **POF = POLYMER OPTICAL FIBRE**

Rear view

CLDL DD

CLC1 / CLC4

CLSG

CLSP

CLTE

Finishing the front surface of the fibre optic

- Before crimping, insert POF fibre optic into the polishing disc (CLDL DD) as shown in Fig. 1.
- Work on a smooth surface (such as a sheet of glass), use grade 1000 polishing paper to grind off the protruding fibre and polish it with grade 4000 polishing paper.
- Polish making 8-shape circles.
- Wipe away any residue remaining after grinding.

The best optical attenuation values are achieved when a wet grinding method is used.

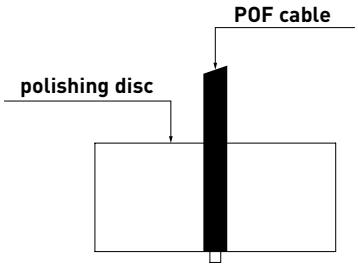


Fig. 1 - Polishing Disc with Guide for POF fibre

General specifications

Strip the fibre 19 mm for male contact and 14 mm for female contact (refer to Figures 2 and 3).

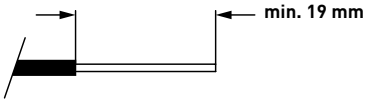


Fig. 2 - Example of cable stripping for male crimp contact

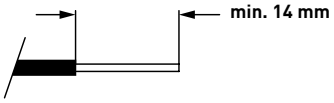


Fig. 3 - Example of cable stripping for female crimp contact

Crimping instructions

- The **CLPZ R** crimping tool data sheet explains how the crimping tool works and how to adjust the crimping depth and locator to crimp the contacts as shown in Fig. 4.
- Select position no. 1 on the turret (for male contact) and no. 2 (for female contact), push and turn of 90° the knob of the turret.
- Adjust the crimping depth on 1,45 (unscrew the allen screw, after adjusting refix the screw).
- Insert the contact together with the fibre optic cable as far as possible into the crimping opening of the crimping tool (**CLPZ R**, refer to Fig. 5) while applying gentle pressure to the fibre optic connector, close the tool until you hear it disengages.

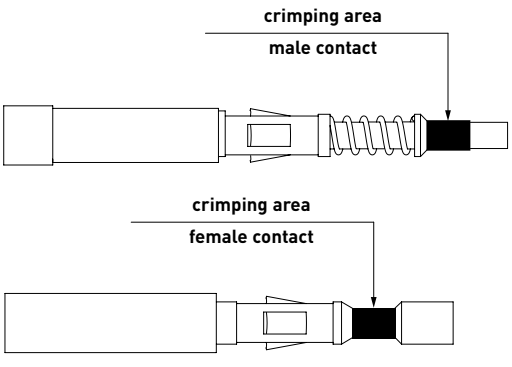


Fig. 4 - Crimping area

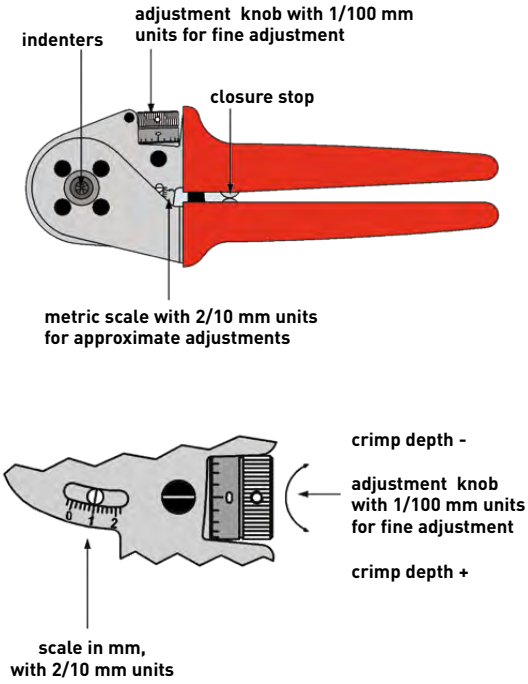


Fig. 5 - Manual crimping tool

Final mounting instructions

Screw the back female part contact. Put inside the CD/CDD/CX insert.

Watch our online tutorial

Tools and accessories for crimp contacts

for contacts series:	page:
CX 50 RF/M	300
CX 75 RF/M	300

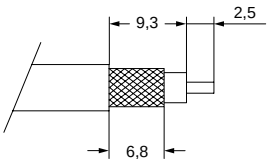
manual crimping tool

removal tool
coaxial cable stripper

description	part No.	part No.
crimping tool for **CX 50 RF/M** and **CX 75 RF/M** coaxial contacts	**COPZ**	
removal tool for the extraction of contacts from the CX R inserts		**CLES**
coaxial cable stripper for the preparation of the cable according to the drawing		**COST**

Watch our online tutorial

conductor stripping

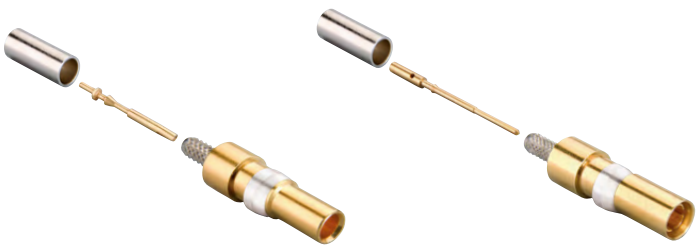


coaxial contacts	for cables	ø external	part No.
50Ω	RG 316/U	2,49 ±0,1	CX 50 RF CX 50 RM
	RG 174/U	2,79 ±0,127	
	RG 188 A/U	2,79 max	
75Ω	RG 179 B/U	2,54 ±0,127	CX 75 RF CX 75 RM
	RG 187 A/U	2,79 max	
	TZC 75 101	2,79 max	

Crimping instructions
1) Strip the cable as per drawing using the tool COST.
2) Crimp the central contact of coaxial connector in the correct crimping area with the position 0,72 of crimping tool COPZ.
3) Insert the brass back end on the cable.
4) Insert the central contact in the coaxial connector, put the braid shield around the back cylinder of contact.
5) Insert the brass back end on the braid shield.
6) Crimp the ferrule with position 3,25 of crimping tool COPZ.

We recommend the use of code pins CRF CX / CRM CX.
fit the brass tube on the cable
As alternative to crimping, it is possible to solder the central contact.

CX 50 RF/M and CX 75 RF/M coaxial contacts



dimensions shown in mm are not binding and may be changed without notice

Tools and accessories for crimp contacts

for insert series:	page:
CJ (RJ45)	223
MIXO (RJ45)	304 - 307

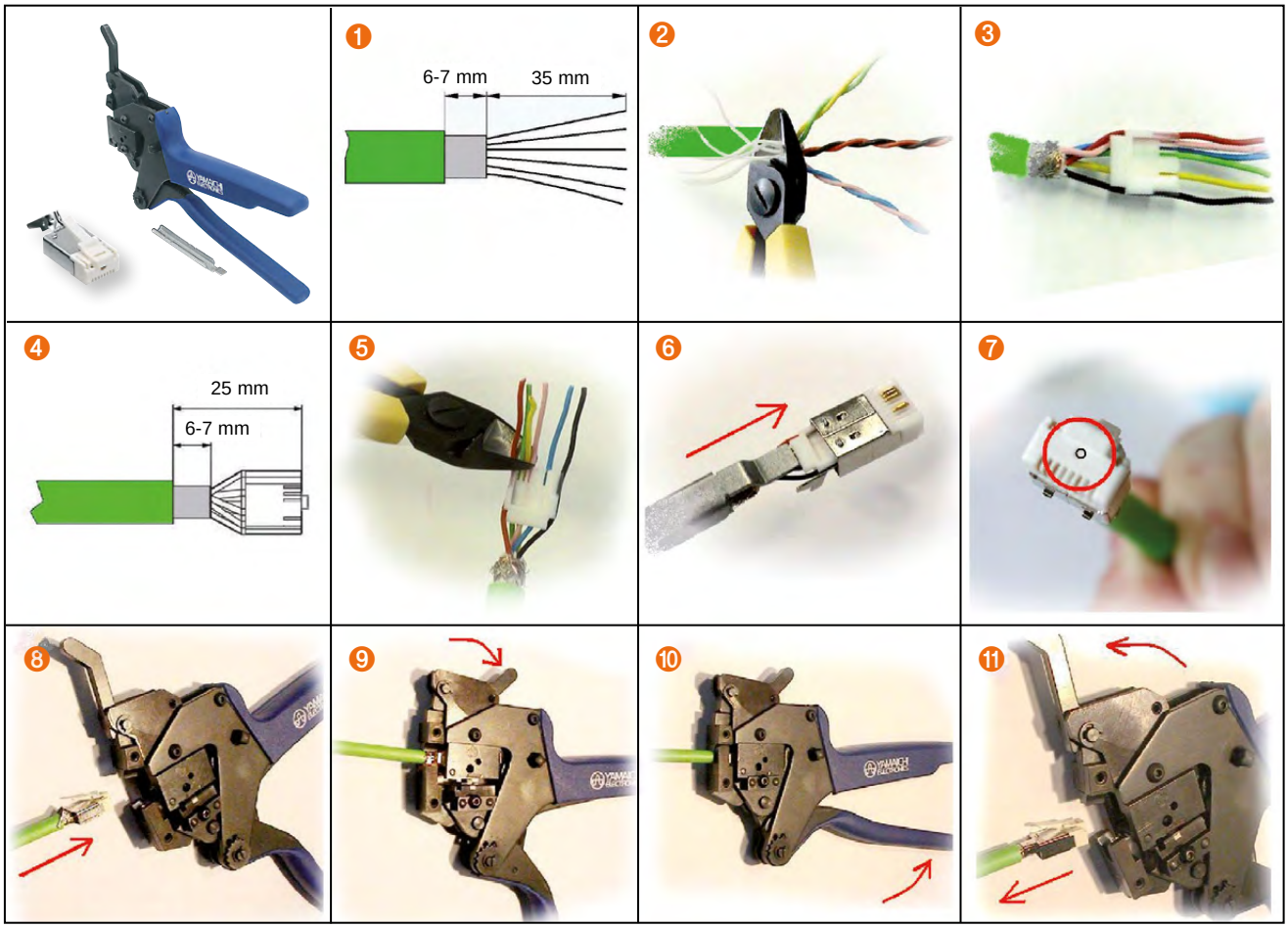
manual crimp pliers

shielded cable stripper

description	part No.	part No.
RJ45 CJ series plug insert crimp pliers basic tool YAMAICHI Y-ConTool-11 mod. with plug insert inserter	**CJPZ Y**	
Y-ConTool-20 cable stripper cuts the cable sheath and releases the wires in a single operation		**CJST**

Watch our CX 8 JM online tutorial

RJ45 plug insert crimp pliers mounting instructions



Tools and accessories for crimp contacts

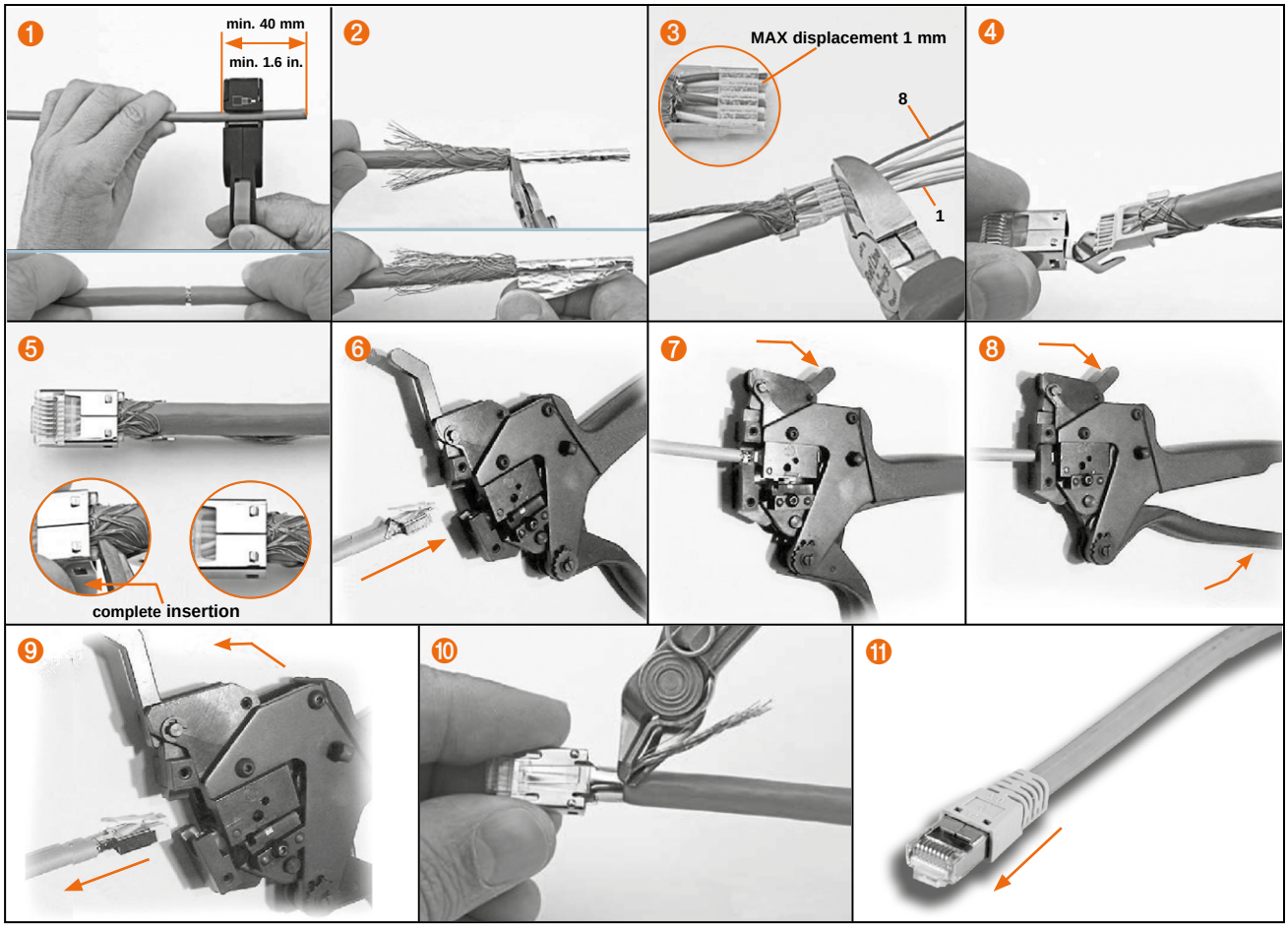
inserts:	page:
MIXO (RJ45) CX 8 J6M	302

manual crimp pliers

shielded cable stripper

description	part No.	part No.
RJ45 CJ series plug insert crimp pliers	**CJPZ T**	
cable stripper cuts the cable sheath and releases the wires in a single operation		**CJST**

RJ45 plug insert crimp pliers mounting instructions



Watch our online tutorial

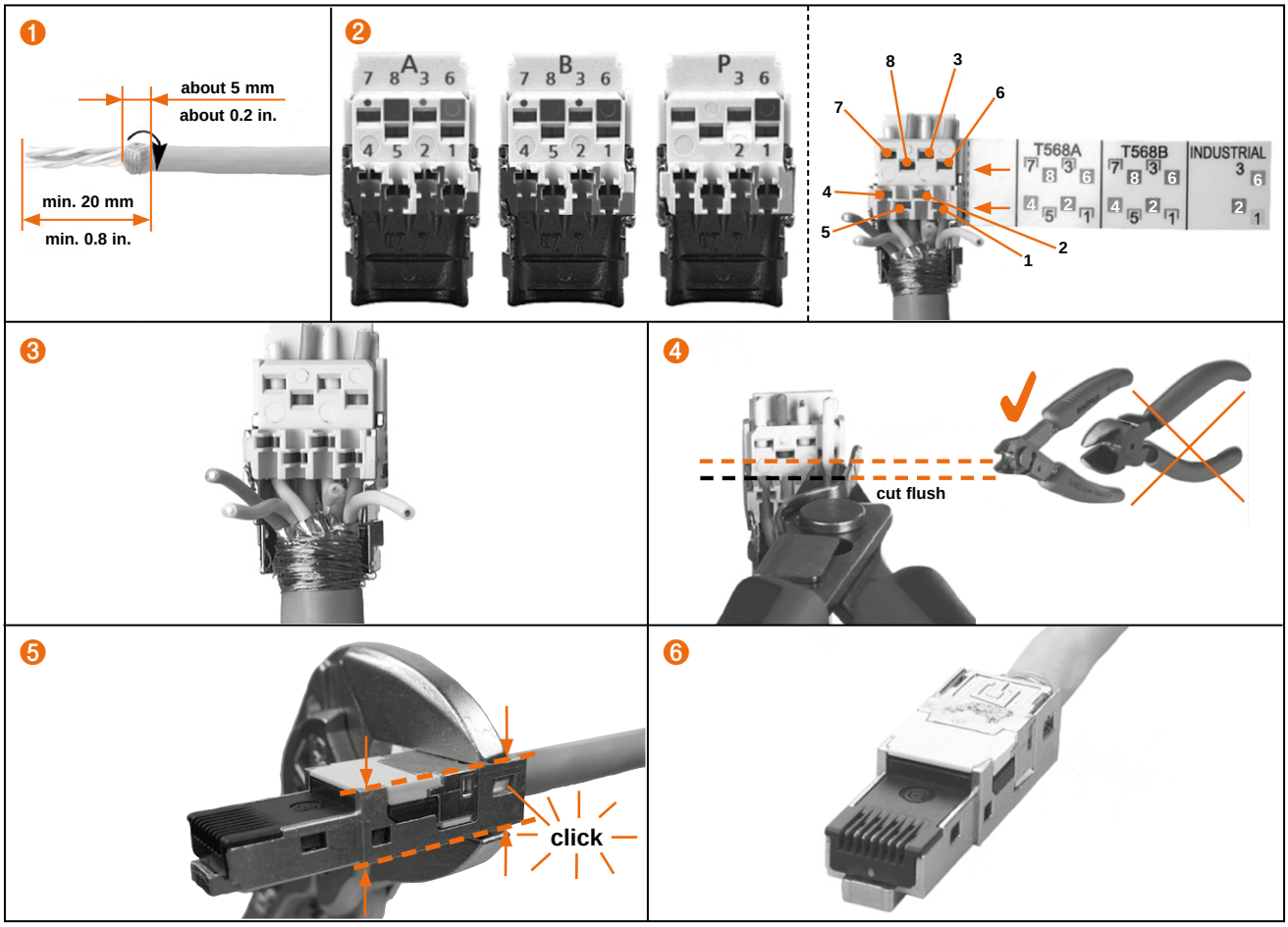
Tools and accessories for crimp contacts

inserts:	page:
MIXO (RJ45) CX 8 J6IM	302

manual IDC pliers

description	part No.
wrench pliers for CX 8 J6IM	**CJPW K**

CX 8 J6IM IDC plug insert crimp pliers mounting instructions



Connection					Application			
RJ45 PIN No.	Colour Code T568 A	Colour Code T568 B	DIN 47100	Industrial PROFINET	10BT/ 100BT	1 Gigabit 10 Gigabit Ethernet	Token Ring ISDN/So	Upo/ TEL
1	WH-GN	WH-OG	WH	YE	•	•		
2	GN	OG	BN	OG	•	•		
3	WH-OG	WH-GN	GN	WH	•	•	•	
4	BU	BU	YE	-		•	•	•
5	WH-BU	WH-BU	GY	-		•	•	•
6	OG	GN	PK	BU	•	•	•	
7	WH-BN	WH-BN	BU	-		•		
8	BN	BN	RD	-		•		

Legend

BN = brown
BU = blue
GN = green
GY = grey
OG = orange
PK = pink
RD = red
WH = white
YE = yellow

Watch our online tutorial

CRIMPING TOOLS

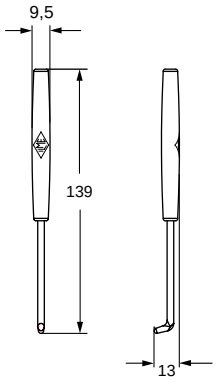
for insert series:	page:
CDSH	86 - 91
CSAH	99 - 103
CSH	110 - 115
CSH S	122 - 127
CMSH	136 - 144

SQUICH® reopening tool

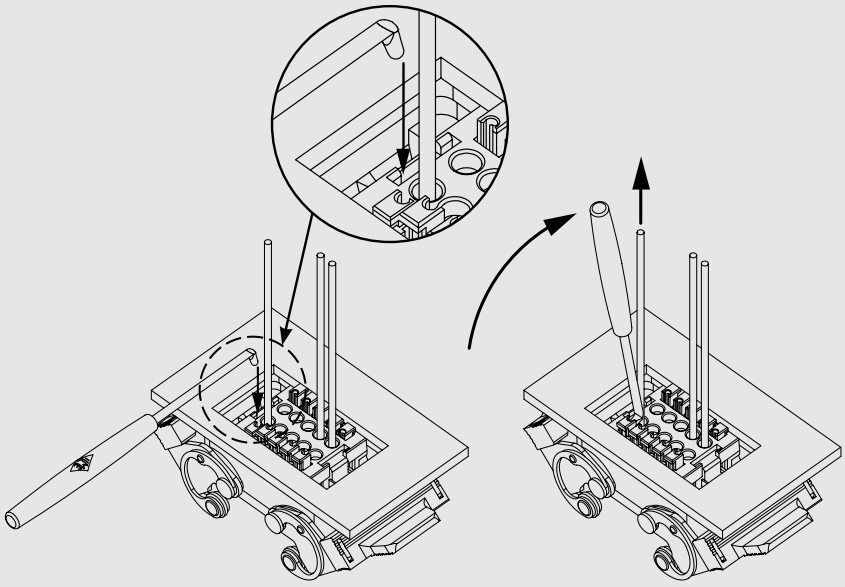
description	part No.
reopening tool for **SQUICH®** actuator button	**CSHES**

It allows the release of the connection from a SQUICH® terminal without disassembly of the connector insert from the bulkhead mounting housing, by operating from the accessible rear side of the control panel.
With mains power disconnected (connector not under voltage), the smoothed hook-shaped tool tip is inserted in the slot of the actuator button head of the corresponding terminal, then by a delicate tilt towards the centre of the connector, the tools acts as a lifting lever for the actuator button, releasing the wire.

CAUTION: Not suitable for SQUICH® terminals of CKSH inserts or MIXO CX 05 SH modular inserts.



Reopening tool use instructions



dimensions shown in mm are not binding and may be changed without notice


IME
SIPZ W
Made in Germany
mm² 0,08-0,2
AWG 28-24
0,2-0,52 mm²
24-20 AWG

CRIMPING TOOLS

Professional crimping hand tool SIPZ W, SIPZC W for SI stamped contact Series

Easy handling tools designed both for loose and coils version of 5 A stamped crimp contacts. Application range from 0,08 mm^2 to 0,52 mm^2 (AWG 28-20). Contacts positioning with insulation stop.

CIPZP D Pneumatic crimping tool

Pneumatic version of the CIPZ D tool for 5 A turned contacts. Crimping range from 0,08 mm^2 to 0,75 mm^2 (AWG 28-18) with CITP D locator for CI and RI contacts Series.

CCPZP RN Pneumatic crimping machine

4/8 indent crimping unit with locator and digital readout display for CD, CC and CX contact Series. The machine is operated by a pneumatic foot valve according to the same crimping adjustment of CCPZ RN manual tool (crimping depth and positioner seat).

Find more information on our products at www.ilme.com

Tools and accessories for crimp contacts

for 5 A SI stamped contacts of inserts series **page:**

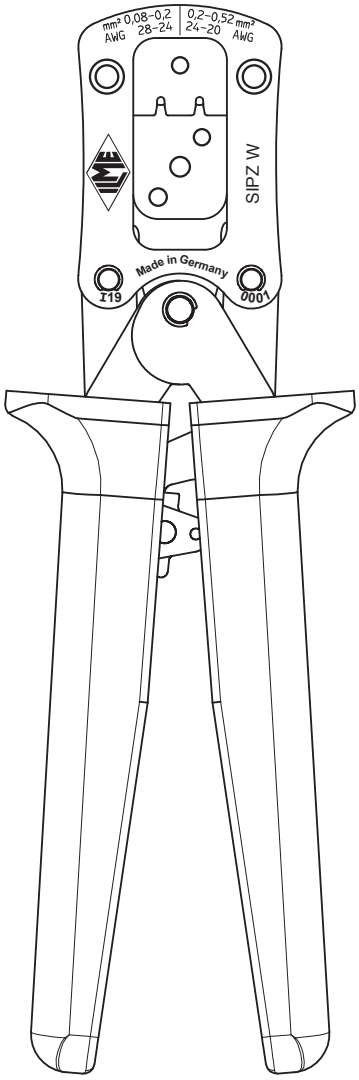
CQ (21 poles)
MIXO (25, 36 poles)
MIXO BUS (8 poles)
MIXO D-SUB (9 poles)

manual crimping tool

insertion / removal tool

description	part No.	part No.
manual crimping tool for **SI** contacts (for loose pcs.) WEZAG CS 10-D model	**SIPZ W**	
extraction tool: for the insertion and removal of the contacts into the inserts - for **SI** contacts 0,08 - 0,52 mm² (SIF..D / SIM..D Series)		**CIES**

SIPZ W
Front view



Dimensions
- Length: approx.195 mm
- Width: approx.63 mm
- Weight: approx. 290 g

Application range

Cross section range mm² / AWG	Crimp height ± 0,05	Crimp width ± 0,05	Contact Type
0,08-0,2 / 28-24	0,70	1,15	SI stamped
0,2-0,52 / 24-20	0,75	1,45	

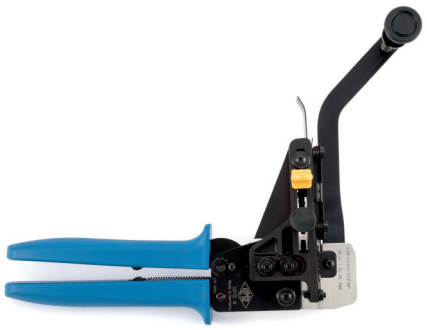
dimensions shown in mm are not binding and may be changed without notice

Tools and accessories for crimp contacts

for 5 A SI stamped contacts of inserts series **page:**

CQ (21 poles)
MIXO (25, 36 poles)
MIXO BUS (8 poles)
MIXO D-SUB (9 poles)

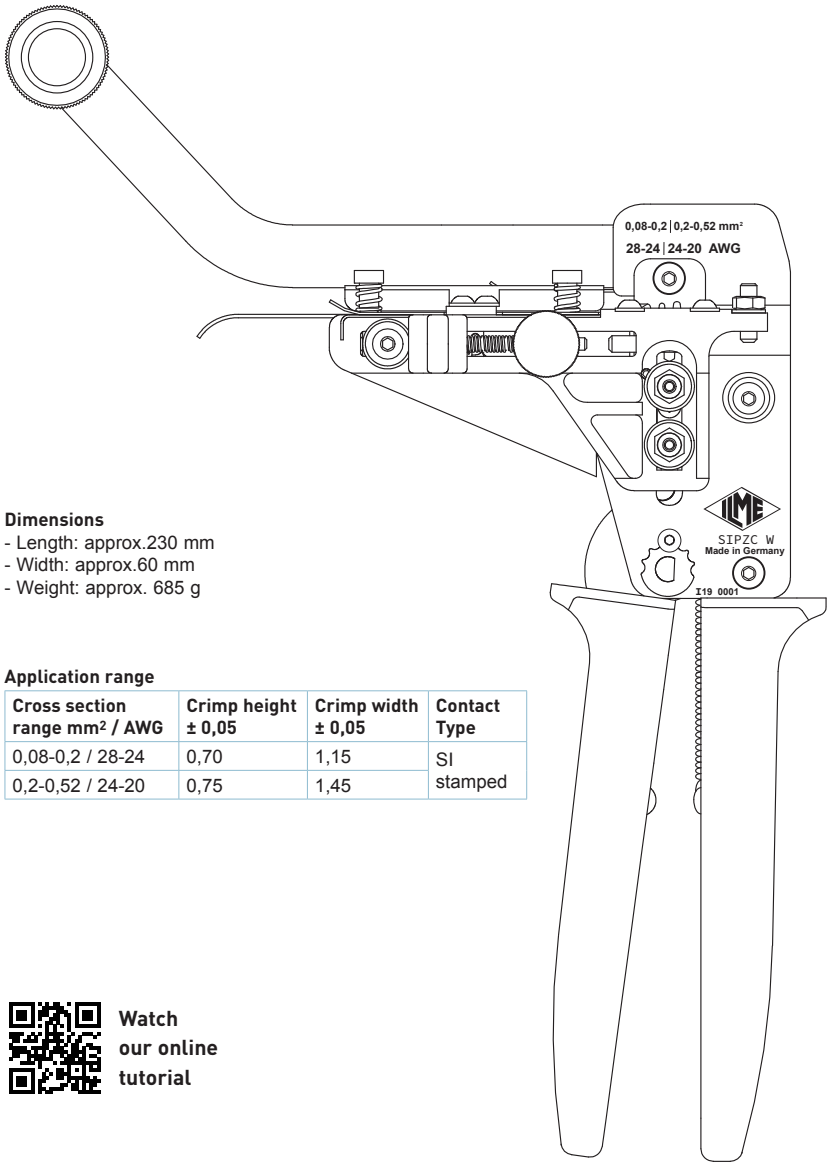
manual crimping tool



insertion / removal tool

description	part No.	part No.
manual crimping tool for **SI** contacts (for coils) WEZAG CS 20 KTVR-D model	**SIPZC W**	
extraction tool: for the insertion and removal of the contacts into the inserts - for **SI** contacts 0,08 - 0,52 mm² (SIF..D / SIM..D Series)		**CIES**

SIPZC W
Front view



Dimensions
- Length: approx.230 mm
- Width: approx.60 mm
- Weight: approx. 685 g

Application range

Cross section range mm² / AWG	Crimp height ± 0,05	Crimp width ± 0,05	Contact Type
0,08-0,2 / 28-24	0,70	1,15	SI stamped
0,2-0,52 / 24-20	0,75	1,45	

Watch our online tutorial

Tools and accessories for crimp contacts

for 5 A CI and RI turned contacts of inserts series **page:**

CQ (21 poles)
MIXO (25, 36 poles)
MIXO BUS (8 poles)
MIXO D-SUB (9 poles)
GIGABIT (8 poles)
SHIELDED (20 poles)

pneumatic crimping tool positioner - gauge

CCSPZP

CCVPP

insertion tool - removal tools

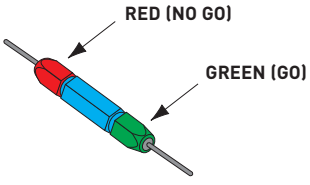
description	part No.	part No.
pneumatic crimping tool for turned **5 A** contacts model DANIELS WA22 equivalent to CIPZ D (turret excluded)	**CIPZP D**	
positioner (DANIELS K1450I) for **5 A** contacts (CIMA - CIFA - CIFD - CIMD Series)	**CITP D**	
bench support for CIPZP D pneumatic crimping tool (DANIELS BM-2A)	**CCSPZP**	
pneumatic foot valve (DANIELS WA10A)	**CCVPP**	
"go / no go" control gauge to verify indenter closure (See notes below)	**CCPNP**	
insertion and extraction tool: for the insertion and removal of the contacts into the inserts - for **CI** and **RI** contacts 0,2 - 0,5 mm² (CIMA - CIFA - CIFD - CIMD Series)		**CIES**
- for **CI** and **RI** contacts 0,75 mm² (CIMA - CIFA - CIFD - CIMD Series)		**CIES B**

Notes:

Positioner
conforms to international standard MIL-C-22520/1
- An interchangeable and indispensable accessory of the CIPZP D crimping tool, it precisely positions the contact where crimping is performed.

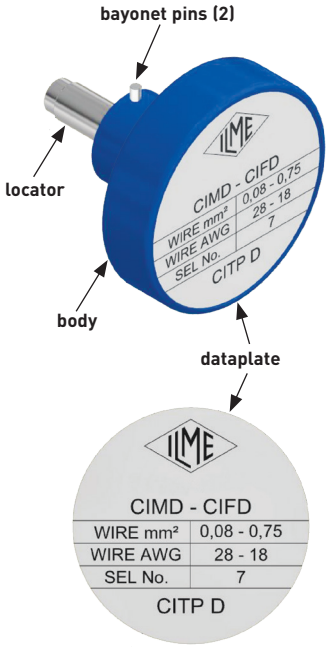
"go / no go" control gauge
conforms with international standard MIL-C-22520/3
- A tool used to periodically check that the crimping tool meets standard requirements.

CCPNP



Gauge	tool selector pos. No.	Ø A ± 0,00254 mm (GO) green	Ø B ± 0,00254 mm (NO GO) red
CCPNP	**8**	0,991 (mm)	1,118 (mm)
		0,0390 (in)	0,0440 (in)

CITP D positioner



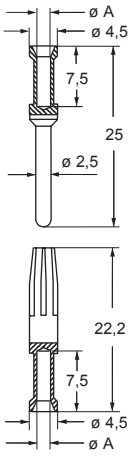
dimensions shown in mm are not binding and may be changed without notice

16 A crimp contacts
silver plated

removal tools

description			part No.		part No.
16 A female crimp contacts					
0,14-0,37 mm²	AWG 26-22	one groove	**CCFA 0.3**	silver plated	
0,5 mm²	AWG 20	with no grooves	**CCFA 0.5**		
0,75 mm²	AWG 18	one groove (back side)	**CCFA 0.7**		
1 mm²	AWG 18	one groove	**CCFA 1.0**		
1,5 mm²	AWG 16	two grooves	**CCFA 1.5**		
2,5 mm²	AWG 14	three grooves	**CCFA 2.5**		
3 mm²	AWG 12	one wide groove	**CCFA 3.0**		
4 mm²	AWG 12	with no grooves	**CCFA 4.0**		
16 A male crimp contacts					
0,14-0,37 mm²	AWG 26-22	one groove	**CCMA 0.3**		
0,5 mm²	AWG 20	with no grooves	**CCMA 0.5**		
0,75 mm²	AWG 18	one groove (back side)	**CCMA 0.7**		
1 mm²	AWG 18	one groove	**CCMA 1.0**		
1,5 mm²	AWG 16	two grooves	**CCMA 1.5**		
2,5 mm²	AWG 14	three grooves	**CCMA 2.5**		
3 mm²	AWG 12	one wide groove	**CCMA 3.0**		
4 mm²	AWG 12	with no grooves	**CCMA 4.0**		
removal tools					
for **CX7** series contacts					**CX7ES**
for **CC** series contacts					**CQES**

CCF and CCM



CCF and CCM contacts

conductor section (mm²)	conductor slot ø A (mm)	conductors stripping length (mm)
0,14-0,37	0,9	7,5
0,5	1,1	7,5
0,75	1,3	7,5
1,0	1,45	7,5
1,5	1,8	7,5
2,5	2,2	7,5
3	2,55	7,5
4	2,85	7,5