

## CNE - CNE...RY series

### CNE series

**CNE Series are the evolution of former series CN**, one of the oldest and most successful heavy-duty multipole connection products of ILME. The evolution consisted in the complete overhauling of the connector bodies, the introduction of a **captive stainless steel protection plate for unprepared conductor strands** in the screw terminals, the adoption of galvanized steel terminal screws and the **increase of the rated voltage from former 400V to 500V**.

The ancestor series CN was intermateable with the German industry standard design with screw-type terminals, for **16A** rated current per pole and solid pins Ø 2,5 mm. The two larger sizes of this series – ILME designation “77.27” for **16 P + PE** and “104.27” for **24 P + PE** – share the dimensions of a similarly old and very popular series (series **CD** in this catalogue) dimensionally standardized by the historic standards of series **DIN 43652**, later replaced by **EN 175 301-801**. The lower sizes “44.27” for **6 P + PE** and “57.27” for **10 P + PE** were proportionally scaled down from the above mentioned larger sizes.

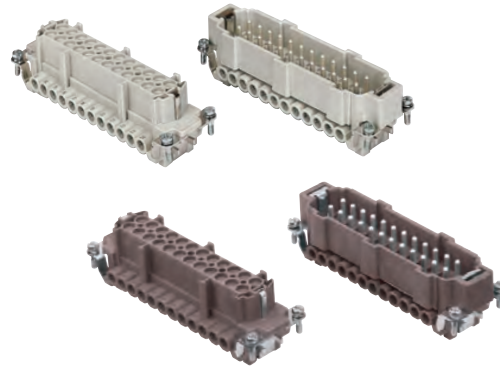
CNE connectors series come in two main variants:

- with pressure (protection) plate, **for unprepared conductors**, to preserve conductor strands from being cut from the screw head, or
- without pressure (protection) plate **[suffix X]**, for **prepared conductors** (crimped with insulated or non-insulated wire ferrule of suitable size).

**Q NOTE** – Prepared conductors in principle do not need any pressure (protection) plate. Use of prepared conductors is possible – although with no added value – also for CNE with pressure plate, but the highest conductor cross-sectional area 4 mm<sup>2</sup> / 12 AWG can be used only unprepared.

**CNE** series connection technology is **screw-type**, requiring very simple and popular tools, like a 0,8x4 mm flat blade screwdriver or a Ph0 cross-headed screwdriver (torque to apply 0,5 Nm). All connectors series CNE have their contact holder (wiring side) duly cone shaped around each terminal cavity to securely guide all stranded wires inside the terminal seat. Terminal screw are unlosably retained in their seats.

**All terminals are presented completely open** (unscrewed), ready to be wired, to allow spare of assembly time. The PE terminal is also screw-type (M4 screw with pressure plate, torque to apply 1,2 Nm) and is located on the mounting bracket on the pole #1 side. It covers the same conductor cross-sectional area range of the line terminals. Due to its design, the PE terminal allows two conductors per terminal (one on each side of the M4 screw); in such case it is recommended that these conductors are of the same size. Series CNE connectors are **polarized against 180° incorrect mating** by a system of keys and keyways along the contour of their mating faces.



CNE...RY variant

By partial or total replacement of the four M3 fixing screws, CNE connectors series may also use three different series of **coding and guide pins** to implement, e.g. in case of multiple identical connectors installed side by side, an “idiot-proof” system to avoid mating mismatches with counterpart.

**Q NOTE** – Coding may be obtained respectively by using: **CR 20 or CR 20 D single coding pins**, for up to 6 different codings, **CRF / CRM or CRF D / CRM D double coding and guide pins**, for up to 16 different codings, and the previous **double coding and guide pins plus a third element CR 72 or CR 72 D**, to allow up to 72 different coding combinations.

**Connectors series CNE come in four sizes:**

- size “44.27”      6 P + ⊕
- size “57.27”      10 P + ⊕
- size “77.27”      16 P + ⊕
- size “104.27”     24 P + ⊕

Two inserts – one with suffix **N** to denote special numbering, respectively CNEF/M 16 TN (or TXN) with pole numbering 17 to 32, CNEF/M 24 TN (or TXN) with numbering 25 to 48 – can be used with connector enclosures sized “77.62” or “104.62” to provide:

- size “77.62”      32 P + ⊕
- size “104.62”     48 P + ⊕

### CNE...RY series for high temperatures

CNE series are available also in the **CNE...RY variant for use at high ambient temperatures up to 180 °C**.

Thanks to a specific thermoplastic insulating material (whose natural colour is brown) and in combination with the dedicated connector enclosures “R-Type” for 180 °C temperature withstand, these multipole connectors are particularly suitable for installation in places in proximity of heat sources such as near ovens, moulds for thermoplastic or rubber moulding, moulds in foundries, paint booths, etc.

# CNE and CSH-SQUICH® series

## TECHNICAL FEATURES

Insert series		CNE (with pressure plate) CNE...X (w/o pressure plate) CNE...RY (for high temperature)	CSH-SQUICH®
No. of poles <sup>1)</sup>	Main contacts + ⊕	<b>6, 10, 16, 24, (32 = 2x16) (48 = 2x24)</b>	
	auxiliary contacts	—	
Rated current <sup>2)</sup>		16A	
EN IEC 61984 Pollution degree 3	rated voltage	500V	
	rated impulse voltage	6kV	
	<b>pollution degree</b>	<b>3</b>	
EN IEC 61984 Pollution degree 2	rated voltage	400/690V	
	rated impulse voltage	6kV	
	<b>pollution degree</b>	<b>2</b>	
UL / CSA certification	rated voltage (a.c./d.c.)	600V	
Contact resistance		≤ 1 mΩ	≤ 3 mΩ
Insulation resistance		≥ 10 GΩ	
Ambient temperature limit (°C)	min	-40 °C	-40 °C
	max	+125 °C / <b>+180 °C (CNE...RY)</b>	+125 °C
Degree of protection	with enclosures (according to type)	<b>IP65, IP66/IP69, IP66/IP67/IP69, IP66/IP68/IP69</b>	
	without enclosures (in mated condition) - termination side on male and female inserts - mating side on female inserts	<b>IP20 (IPXXB)</b>	
Conductor connections		screw type	spring and clamp with actuator button
Conductor cross-sectional area	mm <sup>2</sup>	0,5 - 4 <b>(CNE)</b>	0,14 - 2,5
		0,25 - 2,5 <b>(CNE...X)</b>	
	AWG	20 - 12 <b>(CNE)</b> 24 - 14 <b>(CNE...X)</b>	26 - 14
Mechanical endurance (mating cycles)		≥ 500	

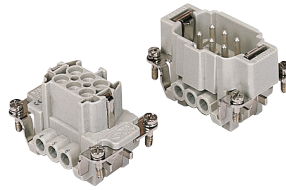
1) Polarities shown in brackets may be obtained by using two inserts in their own double-sized housings

2) Please check the inserts derating diagrams to establish the actual maximum operating current according to the ambient temperature, the conductor cross-sectional area, the polarity of the connector, and any external constraint may derive e.g. by the continuous operating temperature sustained by the chosen conductor sheathing or by end-product safety standards fixing max allowed temperature rise on terminals (e.g. 30 K, 45 K or 50 K)

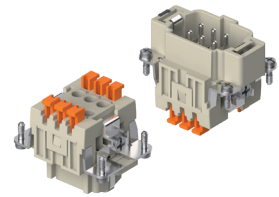
# CNE CSH-SQUICH® 6 poles + ⊕ 16A - 500V

enclosures: size "44.27"	page:
C-TYPE IP65 or IP66/IP69	387 - 392
C7 IP67, single lever	436 - 437
V-TYPE IP65 or IP66/IP69, single lever	444 - 447
BIG hoods	466 - 467
T-TYPE IP65 insulating	480 - 481
T-TYPE / W IP66/IP69 insulating	489
HYGIENIC T-TYPE / H IP66/IP69	501
HYGIENIC T-TYPE / C IP66/IP69, -50 °C	506
W-TYPE for aggressive environments	521
E-Xtreme® corrosion proof	530 - 531, 542, 550 - 551
EMC	578
Central lever	603 - 605
LS-TYPE	618 - 619
IP68	632 - 635
panel supports: COB	page: 652 - 653

inserts,  
screw terminal connections

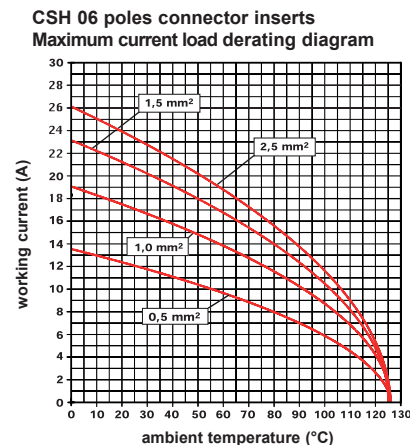
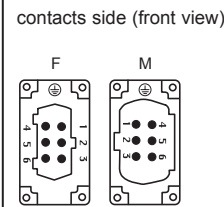
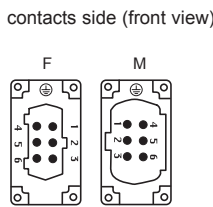
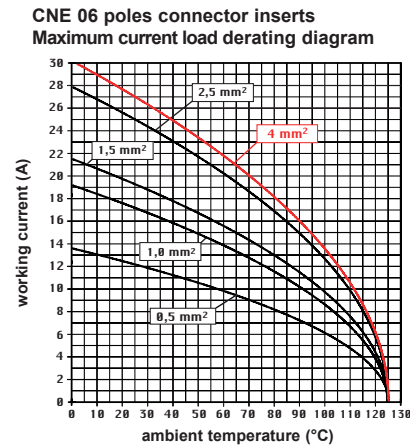
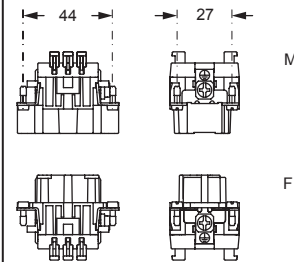
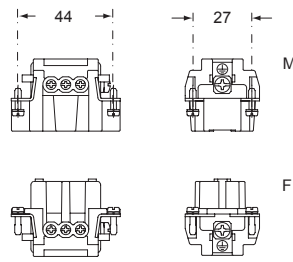


inserts,  
spring terminal connections without tools



description	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 06 T</b> <b>CNEM 06 T</b>	
direct, without plate <sup>2)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 06 TX</b> <b>CNEM 06 TX</b>	
spring terminals with actuator button female inserts with female contacts male inserts with male contacts		<b>CSHF 06</b> <b>CSHM 06</b>

- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- (UL for USA and Canada), certified
- rated voltage according to UL/CSA: 600V
- insulation resistance: ≥ 10 GΩ
- ambient temperature limit: -40 °C ... +125 °C
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life: ≥ 500 cycles
- contact resistance: ≤ 1 mΩ (CNE) - ≤ 3 mΩ (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28



- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21

- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

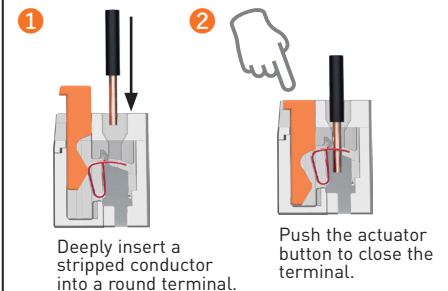
<sup>1)</sup> for unprepared conductors



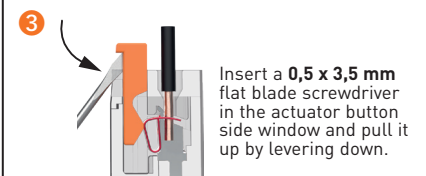
<sup>2)</sup> for conductors with end sleeve ferrule



**SQUICH®-spring connection technology**  
**WIRING**



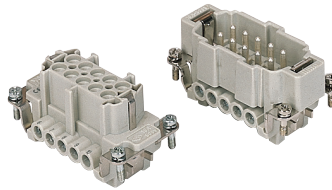
**RE-OPENING**



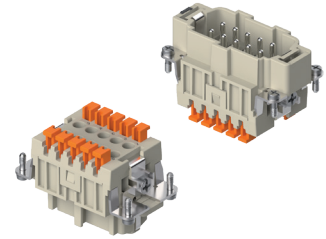
# CNE CSH-SQUICH® 10 poles + ⊕ 16A - 500V

<b>enclosures:</b> size "57.27"	<b>page:</b>
C-TYPE IP65 or IP66/IP69	393 - 401
C7 IP67, two levers	438
V-TYPE IP65 or IP66/IP69, single lever	448 - 453
BIG hoods	468 - 469
T-TYPE IP65 insulating	482 - 483
T-TYPE / W IP66/IP69 insulating	490
HYGIENIC T-TYPE / H IP66/IP69	502
HYGIENIC T-TYPE / C IP66/IP69, -50 °C	507
W-TYPE for aggressive environments	522
E-Xtreme® corrosion proof	532 - 533, 543, 552 - 553
EMC	579
Central lever	606 - 608
LS-TYPE	620 - 621
IP68	636 - 639
<b>panel supports:</b> COB	<b>page:</b> 652 - 653

## inserts, screw terminal connections

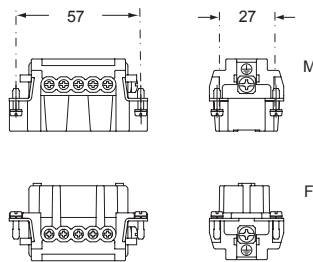


## inserts, spring terminal connections without tools

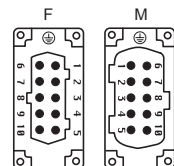


description	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 10 T</b> <b>CNEM 10 T</b>	
direct, without plate <sup>2)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 10 TX</b> <b>CNEM 10 TX</b>	
spring terminals with actuator button female inserts with female contacts male inserts with male contacts		<b>CSHF 10</b> <b>CSHM 10</b>

- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- (UL for USA and Canada), certified
- rated voltage according to UL/CSA: 600V
- insulation resistance: ≥ 10 GΩ
- ambient temperature limit: -40 °C ... +125 °C
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life: ≥ 500 cycles
- contact resistance: ≤ 1 mΩ (CNE) - ≤ 3 mΩ (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28



contacts side (front view)

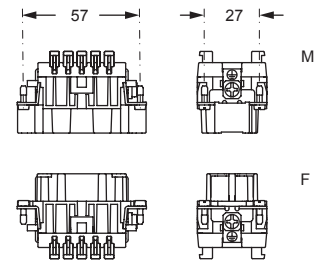


- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21

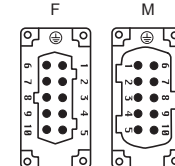
<sup>1)</sup> for unprepared conductors



<sup>2)</sup> for conductors with end sleeve ferrule

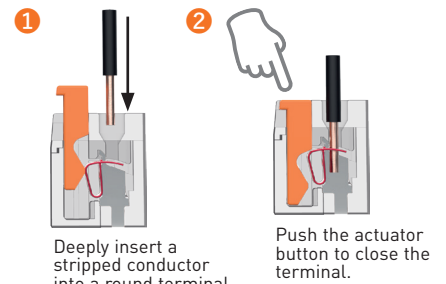


contacts side (front view)

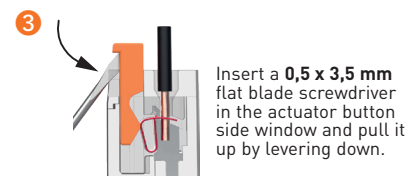


- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

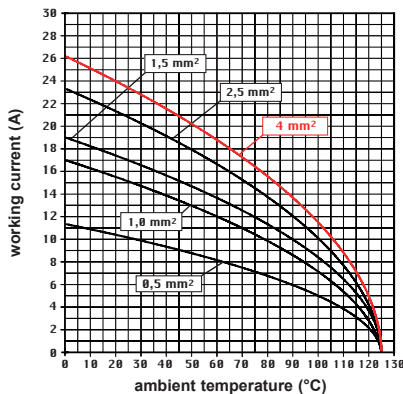
### SQUICH®-spring connection technology WIRING



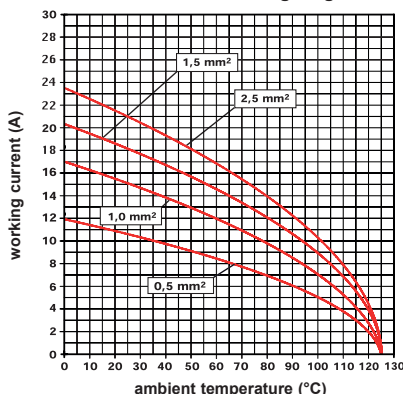
### RE-OPENING



**CNE 10 poles connector inserts**  
Maximum current load derating diagram



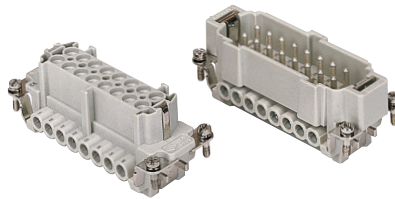
**CSH 10 poles connector inserts**  
Maximum current load derating diagram



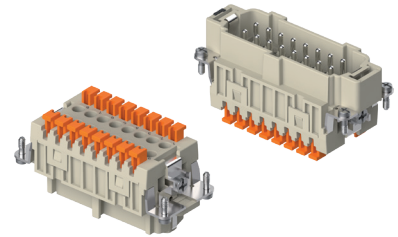
# CNE CSH-SQUICH® 16 poles + ⊕ 16A - 500V

<b>enclosures:</b> size "77.27"	<b>page:</b>
C-TYPE IP65 or IP66/IP69	402 - 411
C7 IP67, two levers	439 - 440
V-TYPE IP65 or IP66/IP69, single lever	454 - 458
BIG hoods	470 - 471
T-TYPE IP65 insulating	484 - 485
T-TYPE / W IP66/IP69 insulating	491
HYGIENIC T-TYPE / H IP66/IP69	503
HYGIENIC T-TYPE / C IP66/IP69, -50 °C	508
W-TYPE for aggressive environments	523
E-Xtreme® corrosion proof	534 - 535, 544, 554 - 555
EMC	580
Central lever	609 - 611
LS-TYPE	622 - 623
IP68	640 - 643
<b>panel supports:</b> COB	<b>page:</b> 652 - 653

**inserts,  
screw terminal connections**

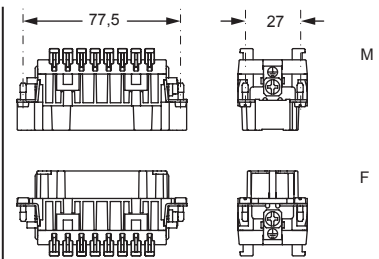
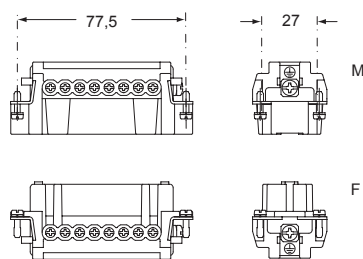


**inserts,  
spring terminal connections without tools**

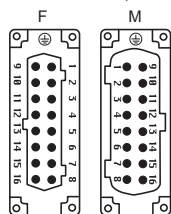


description	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 16 T</b> <b>CNEM 16 T</b>	
direct, without plate <sup>2)</sup> female inserts with female contacts male inserts with male contacts	<b>CNEF 16 TX</b> <b>CNEM 16 TX</b>	
spring terminals with actuator button female inserts with female contacts male inserts with male contacts		<b>CSHF 16</b> <b>CSHM 16</b>

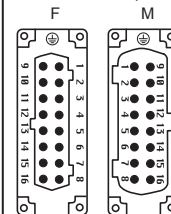
- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- (UL for USA and Canada),
- certified
- rated voltage according to UL/CSA: 600V
- insulation resistance: ≥ 10 GΩ
- ambient temperature limit: -40 °C ... +125 °C
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life: ≥ 500 cycles
- contact resistance: ≤ 1 mΩ (CNE) - ≤ 3 mΩ (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28



contacts side (front view)



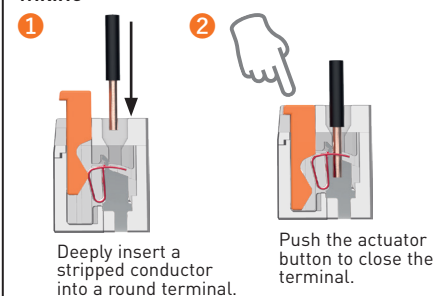
contacts side (front view)



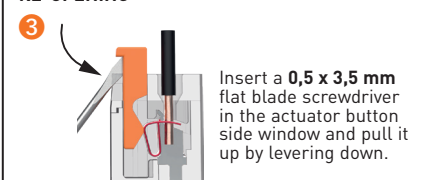
- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21

- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

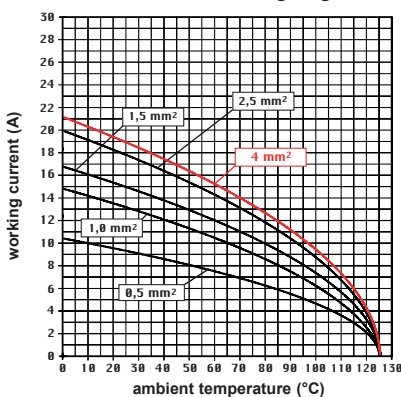
**SQUICH®-spring connection technology  
WIRING**



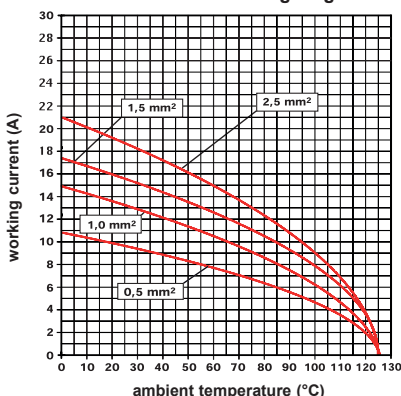
**RE-OPENING**



**CNE 16 poles connector inserts  
Maximum current load derating diagram**



**CSH 16 poles connector inserts  
Maximum current load derating diagram**



<sup>1)</sup> for unprepared conductors



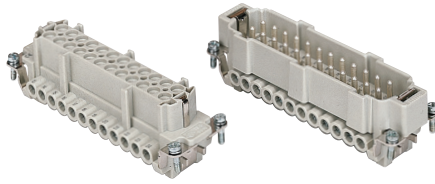
<sup>2)</sup> for conductors with end sleeve ferrule



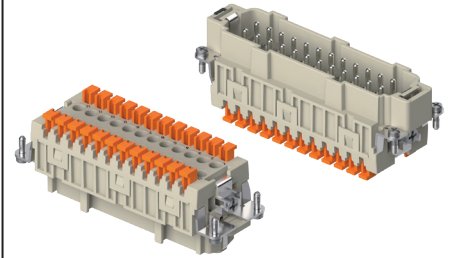
# CNE CSH-SQUICH® 24 poles + ⊕ 16A - 500V

enclosures: size "104.27"	page:
C-TYPE IP65 or IP66/IP69	412 - 423
C7 IP67, two levers	441 - 442
V-TYPE IP65 or IP66/IP69, single lever	459 - 463
BIG hoods	472 - 473
T-TYPE IP65 insulating	486 - 487
T-TYPE / W IP66/IP69 insulating	492
HYGIENIC T-TYPE / H IP66/IP69	504
HYGIENIC T-TYPE / C IP66/IP69, -50 °C	509
W-TYPE for aggressive environments	524
E-Xtreme® corrosion proof	536 - 537, 545, 556 - 557
EMC	581
Central lever	612 - 614
LS-TYPE	624 - 625
IP68	644 - 647
panel supports: COB	page: 652 - 653

## inserts, screw terminal connections

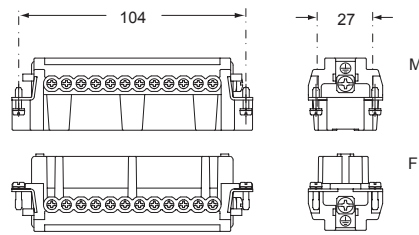


## inserts, spring terminal connections without tools

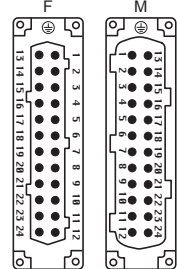


description	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts with female contacts male inserts with male contacts	CNEF 24 T CNEM 24 T	
direct, without plate <sup>2)</sup> female inserts with female contacts male inserts with male contacts	CNEF 24 TX CNEM 24 TX	
spring terminals with actuator button female inserts with female contacts male inserts with male contacts		CSHF 24 CSHM 24

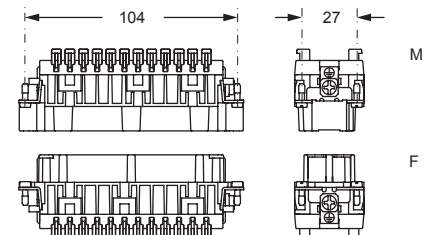
- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- cULus (UL for USA and Canada), certified
- rated voltage according to UL/GSA: 600V
- insulation resistance: ≥ 10 GΩ
- ambient temperature limit: -40 °C ... +125 °C
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life: ≥ 500 cycles
- contact resistance: ≤ 1 mΩ (CNE) - ≤ 3 mΩ (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28



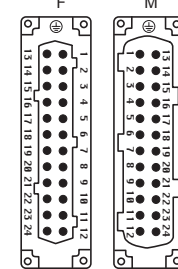
contacts side (front view)



- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21



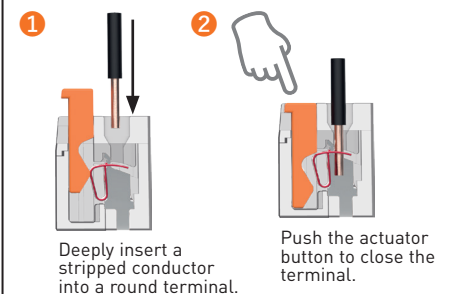
contacts side (front view)



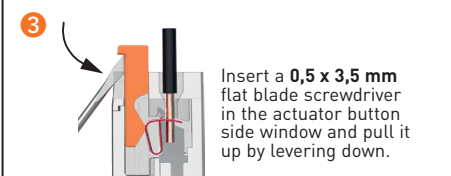
- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

### SQUICH®-spring connection technology

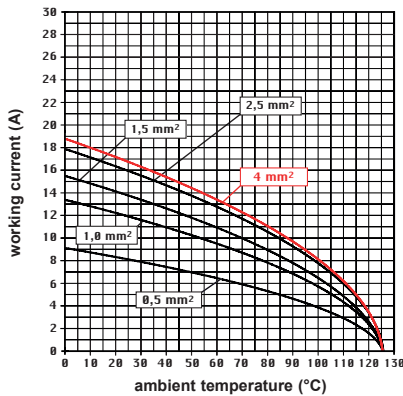
#### WIRING



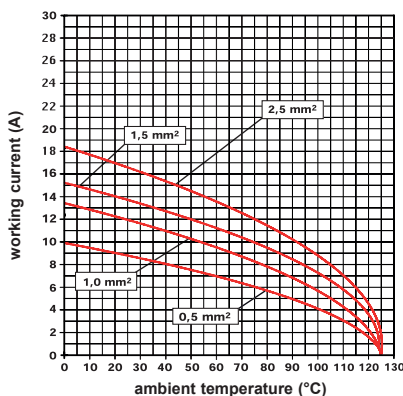
#### RE-OPENING



### CNE 24 poles connector inserts Maximum current load derating diagram



### CSH 24 poles connector inserts Maximum current load derating diagram



# CNE CSH-SQUICH® 32 poles + ⊕ 16A - 500V

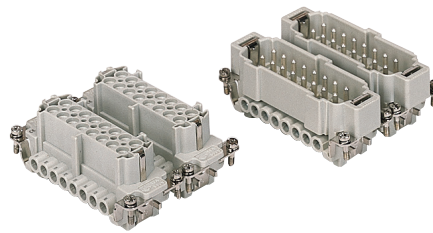
enclosures:  
size "77.62"

page:

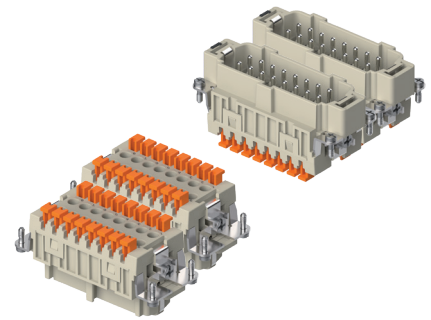
C-TYPE IP65 or IP66/IP69  
W-TYPE for aggressive environments  
E-Xtreme® corrosion proof

424 - 429  
525  
546

inserts,  
screw terminal connections

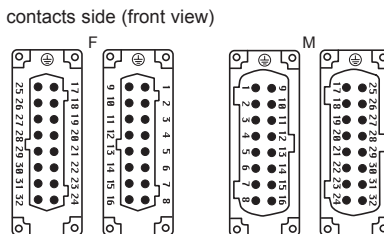
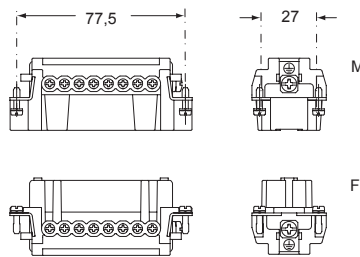


inserts,  
spring terminal connections without tools

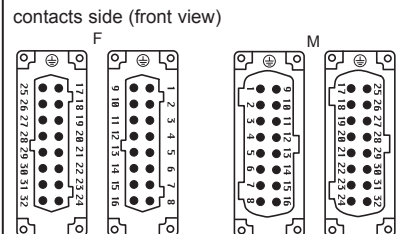
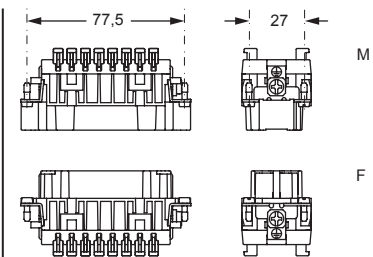


description	part No.	part No.	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts, No. (1-16) and (17-32) male inserts, No. (1-16) and (17-32)	<b>CNEF 16 T</b> <b>CNEM 16 T</b>	<b>CNEF 16 TN</b> <b>CNEM 16 TN</b>		
direct, without plate <sup>2)</sup> female inserts, No. (1-16) and (17-32) male inserts, No. (1-16) and (17-32)	<b>CNEF 16 TX</b> <b>CNEM 16 TX</b>	<b>CNEF 16 TXN</b> <b>CNEM 16 TXN</b>		
spring terminals with actuator button female inserts with female contacts, No. (1-16) and (17-32) male inserts with male contacts, No. (1-16) and (17-32)			<b>CSHF 16</b> <b>CSHM 16</b>	<b>CSHF 16 N</b> <b>CSHM 16 N</b>

- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- (UL for USA and Canada),
- certified
- rated voltage according to UL/CSA: 600V
- insulation resistance:  $\geq 10 \text{ G}\Omega$
- ambient temperature limit:  $-40 \text{ }^\circ\text{C} \dots +125 \text{ }^\circ\text{C}$
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life:  $\geq 500$  cycles
- contact resistance:  $\leq 1 \text{ m}\Omega$  (CNE) -  $\leq 3 \text{ m}\Omega$  (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28

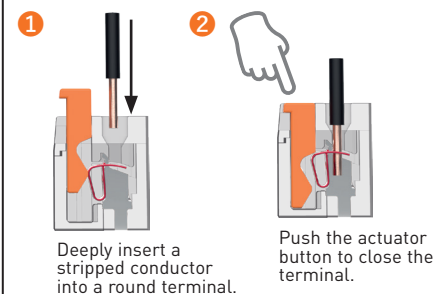


- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21

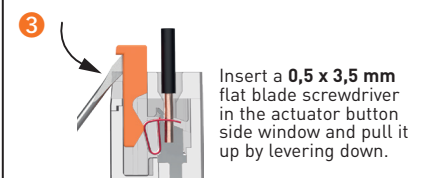


- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

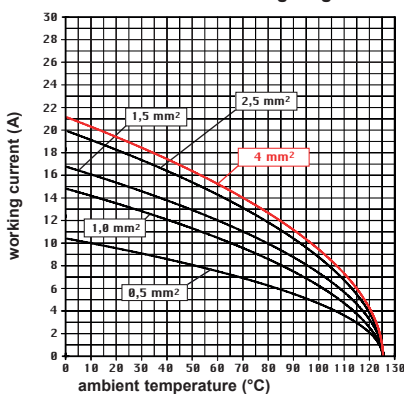
**SQUICH®-spring connection technology**  
**WIRING**



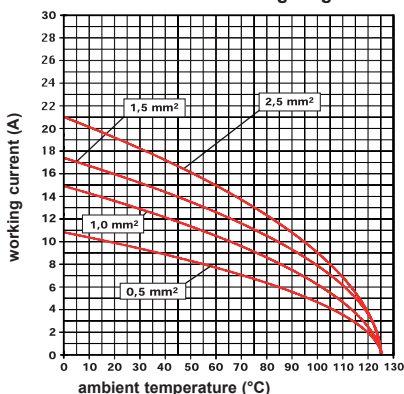
**RE-OPENING**



**CNE 32 poles connector inserts**  
**Maximum current load derating diagram**



**CSH 32 poles connector inserts**  
**Maximum current load derating diagram**



<sup>1)</sup> for unprepared conductors



<sup>2)</sup> for conductors with end sleeve ferrule



# CNE CSH-SQUICH® 48 poles + ⊕ 16A - 500V

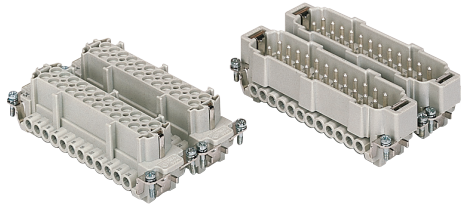
enclosures:  
size "104.62"

page:

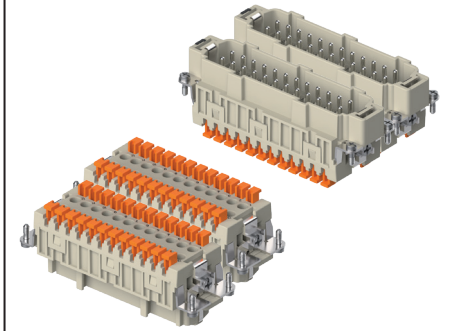
C-TYPE IP65 or IP66/IP69  
W-TYPE for aggressive environments  
E-Xtreme® corrosion proof

430  
526  
547

inserts,  
screw terminal connections



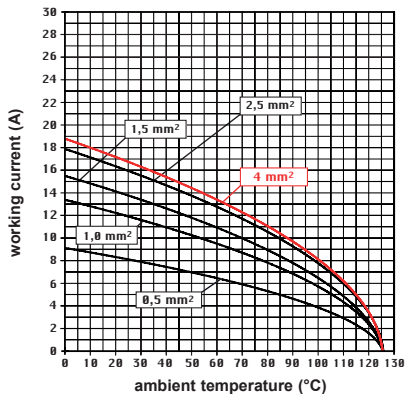
inserts,  
spring terminal connections without tools



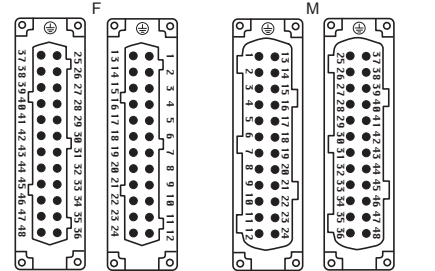
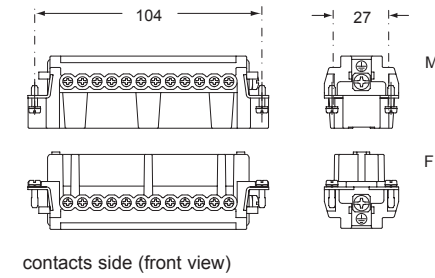
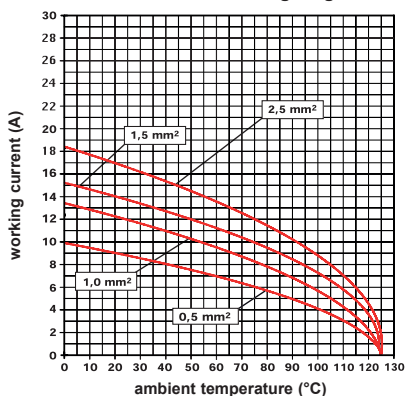
description	part No.	part No.	part No.	part No.
indirect, with plate <sup>1)</sup> female inserts, No. (1-24) and (25-48) male inserts, No. (1-24) and (25-48)	<b>CNEF 24 T</b> <b>CNEM 24 T</b>	<b>CNEF 24 TN</b> <b>CNEM 24 TN</b>		
direct, without plate <sup>2)</sup> female inserts, No. (1-24) and (25-48) male inserts, No. (1-24) and (25-48)	<b>CNEF 24 TX</b> <b>CNEM 24 TX</b>	<b>CNEF 24 TXN</b> <b>CNEM 24 TXN</b>		
spring terminals with actuator button female inserts with female contacts, No. (1-24) and (25-48) male inserts with male contacts, No. (1-24) and (25-48)			<b>CSHF 24</b> <b>CSHM 24</b>	<b>CSHF 24 N</b> <b>CSHM 24 N</b>

- characteristics according to EN 61984:  
**16A 500V 6kV 3**  
**16A 400/690V 6kV 2**
- (UL for USA and Canada),
- certified
- rated voltage according to UL/CSA: 600V
- insulation resistance:  $\geq 10 \text{ G}\Omega$
- ambient temperature limit:  $-40 \text{ }^\circ\text{C} \dots +125 \text{ }^\circ\text{C}$
- made of self-extinguishing thermoplastic resin UL 94V-0
- mechanical life:  $\geq 500$  cycles
- contact resistance:  $\leq 1 \text{ m}\Omega$  (CNE) -  $\leq 3 \text{ m}\Omega$  (CSH)
- for max. current load see the connector inserts derating diagrams below; for more information see page 28

**CNE 48 poles connector inserts**  
Maximum current load derating diagram



**CSH 48 poles connector inserts**  
Maximum current load derating diagram

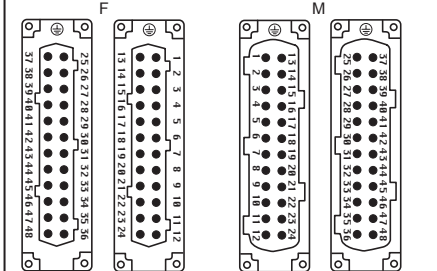
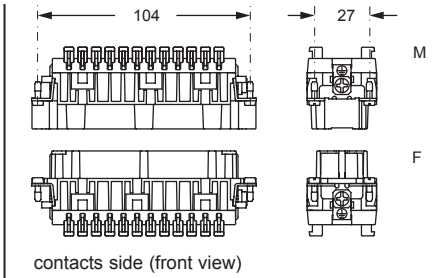


- inserts with plate for conductor cross-sections:  
0,5 - 4 mm<sup>2</sup> - AWG 20 - 12
- inserts without plate for conductor cross-sections:  
0,25 - 2,5 mm<sup>2</sup> - AWG 24 - 14
- conductors stripping length: 7 mm
- terminal screw torque: 0,5 Nm (4.4 lb.in), for more information see page 20 and 21

<sup>1)</sup> for unprepared conductors

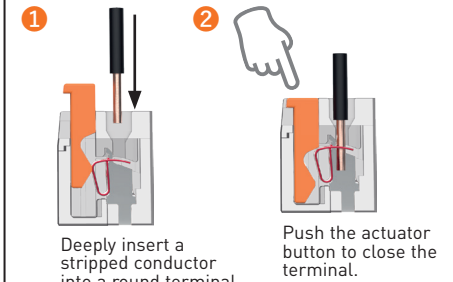


<sup>2)</sup> for conductors with end sleeve ferrule

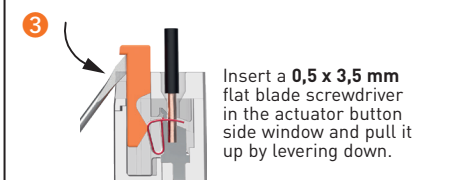


- inserts for conductors with the following sections:  
0,14 - 2,5 mm<sup>2</sup> - AWG 26 - 14
- conductors stripping length: 9...11 mm

**SQUICH®-spring connection technology**  
**WIRING**



**RE-OPENING**





## RECOMMENDED TIGHTENING TORQUE

- insert terminal screws, including PE terminal and fixing screws
- axial screw insert, MIXO series CX 02 4A / CX 02 4B
- enclosures assembly screws

### Insert terminal screws, including PE terminal and fixing screws

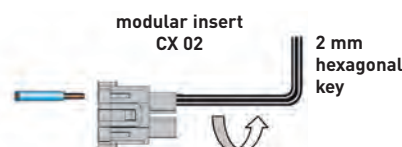
Increasing the tightening torque of terminal screws does not considerably improve the contact resistance. The screw torques are selected according to standard EN 60999-1, to provide excellent mechanical, thermal and electric behaviour. The conductor or terminal may be damaged if the recommended values are significantly exceeded.

Screw size	Connector type	Recommended tightening torque		Recommended size of screwdriver
		(Nm)	(lb.in)	
<b>LINE TERMINALS</b>				
M2,5	CT 40, 64	0,4	3,5	0,5 x 3
M2,6	CT 06..24	0,4	3,5	0,5 x 3
M3	CK	0,5	4,4	0,5 x 3
M3	CDA	0,5	4,4	Ph0 or 0,6 x 3,5
M3	CNE, CME	0,5	4,4	Ph0 or 0,8 x 4
M3	CX 4/2, CX 4/8 (16A)	0,5	4,4	0,6 x 3,5
M3	CX 4/8 Q (16A)	0,5	4,4	Ph0
M4	CP	1,2	10,6	Ph1 or 0,8 x 4
M6	CX 4/.. (80A)	2,5	22,1	1,0 x 5,5
<b>PE TERMINAL</b>				
M3	CK, CQ 05, CQ 07, CQ 12	0,5	4,4	0,5x3
M4	all series except CD 15, CD 25, CDA, CDC, CSAH, MIXO	1,2	10,6	Ph2 or 1,0 x 5,5
M3,5	series CD 15, CD 25, CDA, CDC, CSAH	0,8	7,1	Ph1 or 0,8 x 5,5
M3	small PE terminal, MIXO frames series	0,5	4,4	Ph1 or 1,0 x 4,5
M4	large PE terminal, MIXO frames series	1,2	10,6	Ph1 or 1,0 x 5,5
M4	PE terminal, MIXO ONE enclosures	1,2	10,6	Ph1 or 1,0 x 5,5
<b>FASTENING SCREWS</b>				
M3	CK, CKS, CKSH, CD 07, CD 08, CQ 05, CQ 07, CQ 12, CQ 21, CQ4 02 /02 H, CQ4 03, CX 1/2 BD	0,5	4,4	Ph1 or 0,8 x 5,5
M3	screw for fastening inserts to enclosures of all series except T-TYPE, CQ-MQ 08 and MIXO ONE	0,8	7,1	Ph1 or 0,8 x 4
Ø 2,9	screws for fastening "32.13" inserts CQ 04/2, CQ 08, CQ 17 to CQ-MQ 08 enclosures	0,7	6,2	Ph1
M3	screw for fastening inserts to T-TYPE enclosures	0,5	4,4	Ph1 or 0,8 x 4
Ø 2,9	series MIXO ONE enclosures, assembly of top and bottom parts	0,8	7,1	Ph1
M4	CYR 16.3, CYR 24.4 cable pass-through hoods, assembly of two halves	1,2	10,6	Ph2 or 1,0 x 5,5
M4	CYG 16 in-line joint, assembly of two halves and mounting of two bulkhead mounting housings size "77.27"	1,2	10,6	Ph2 or 1,0 x 5,5
M5	series BIG enclosures, assembly of top and bottom parts	1,0	8,8	Ph2

### Axial screw insert, MIXO series CX 02 4A / CX 02 4B

The connections of the conductors to the female and male inserts are made via axial screw. Fully insert the stripped wire in the back of the contact (axial screw terminals are supplied fully opened); while holding the wire down, insert a 2 mm hexagonal key in the front of the contact and tighten to recommended torque. After assembling the complete connector periodically check that the contact is screwed tight by re-applying the proper tightening torque.

- Usable conductor cross-sections (EN 60228 Class 5):
  - from 2,5 to 8 mm<sup>2</sup> (14 AWG to 10 AWG) (CX 02 4AF/M)
  - from 6 to 10 mm<sup>2</sup> (10 AWG to 8 AWG) (CX 02 4BF/M)
  - (extra-flexible EN 60228 class 6: 2,5... 6 mm<sup>2</sup> (14 AWG to 10 AWG))
- Use only stranded flexible copper conductors
- Do not twist the strands!
- Tightening torque with 2 mm hexagonal Allen key:
  - 1,5 Nm (13,3 lb.in) max for conductors with section 2,5 ... 4 mm<sup>2</sup> (14 AWG to 12 AWG)
  - 2 Nm (17,7 lb.in) max for conductors with section 6 ... 10 mm<sup>2</sup> (10 AWG to 8 AWG)
- Stripping length: 8+1 mm



### Enclosures assembly screws

In the table below, the recommended minimum and maximum tightening torque to apply to the fixing screws of ILME bulkhead mounting housings are shown, assuming the use of steel screws with 8.8 resistance class and a good fixing panel surface according to the requirements mentioned therein.

Series	Number of screws	Screw size	Recommended torque		Flange sealing element
			(Nm)	(lb.in)	
CK/MK, CKX, CKA/MKA, CQ	2	M3	0,8 – 1,0	7,1 – 8,9	Gasket
MIXO ONE	4	M3	0,5 – 0,9	4,4 – 8,0	Gasket
CZI 15 /25	4	M3	0,8 – 1,0	7,1 – 8,9	Gasket
CHI 50	4	M4	1,2 – 1,8	10,6 – 15,9	Gasket
CHI 06 /10 /16 /24	4	M4	0,8 – 1,2	7,1 – 10,6	Gasket
CHI 32	4	M4	1,2 – 1,8	10,6 – 15,9	Gasket
CHI 48	4	M6	3,0 – 3,6	26,6 – 31,9	Gasket
CGK/MGK (IP68)	2	M4	0,8 – 1,2	7,1 – 10,6	O-ring
CGI/ MGI 06/ 10/ 16/ 24 (IP68)	2	M6	3,0 – 3,6	26,6 – 31,9	O-ring
T-TYPE, T-TYPE/H, T-TYPE/C, T-TYPE/ W	4	M4	0,8 – 1,2	7,1 – 10,6	Gasket

To guarantee the declared IP degree of protection of the housings reported in this catalogue, according to EN IEC 60529 or to the relevant Type rating per ANSI/UL 50 and 50E (for those products bearing approval to those ratings), the surface of the mounting panel must meet the following requirements (definitions are provided in ISO 4287 standard):

- Waviness  $Wt \leq 0,2$  mm over a distance of 200 mm (measured on the panel without load)
- Roughness  $Ra \leq 16$   $\mu$ m

NOTE: The values of tightening torque indicated in the above table are just recommended values, that must be related – by the designer of the final application – to the resistance class of the screws (not included in the delivery), with the assumption that the mounting panel is sufficiently rigid (stiff). If the deflection of the panel, under the effect of tightening the screws, is greater than 0,7 mm over a distance of 100 mm, it is necessary to use the counter-flanges mentioned in our catalogue or the special flange gaskets available upon request (please contact our Sales Department). For the CGI/MGI IP68 enclosures the specific counter-flanges mentioned in our catalogue are always recommended.

### Enclosures locking screws

Series	Number of screws	Screw size	Recommended tightening torque		Recommended size of screwdriver
			(Nm)	(lb.in)	
CGK/MGK	2	M4	1,2	10,6	1,0 x 5,5 or 7 mm hexagonal key
CG/IMG	2	M6	2,5	22,1	1,6 x 10 or 10 mm hexagonal key

## RANGE OF CONDUCTOR CROSS-SECTIONAL AREA AND STRIPPING LENGTH

Connector inserts connection technique	Range of conductor cross-sectional area		Stripping length (mm)
	(mm <sup>2</sup> )	AWG	
<b>Screw</b>			
CK	0,75 – 2,5	18 – 14	6
CX 4/2, CX 4/8 (poles 16A) <sup>1)</sup>	0,75 – 4	18 – 12	7
	0,75 – 2,5	18 – 14	7
CNE <sup>1)</sup>	0,5 – 4	20 – 12	7
CNE..X	0,25 – 2,5	24 – 14	7
CDA <sup>1)</sup>	0,5 – 4	20 – 12	7
CDA..X	0,25 – 2,5	24 – 14	7
CT 06..24	0,75 – 2,5	18 – 14	12
CT 40 and 64	0,75 – 2,5	18 – 14	12
CME <sup>1)</sup>	0,5 – 4	20 – 12	7
CME..X	0,5 – 2,5	20 – 14	7
CP <sup>1)</sup>	0,75 – 6	18 – 10	10,5
CX 4/.. (80A poles)	4 – 16	12 – 5	14
<b>Crimp</b>			
MIXO (5A), CX 25 IB	0,08 – 0,75	28 – 18	4
CQ 21	0,08 – 0,5	28 – 20	4
CDD, CD, MIXO (10A), CQ 12, CQ 07	0,14 – [2,5]*	26 – 14	8 – * [6 for 2,5 mm <sup>2</sup> ]
CCE, CDC, CMCE, CQ, CQE, CQEE, MIXO (16A)	0,14 – 4	26 – 12	7,5
CX, MIXO (40A), CQ4 03	1,5 – 2,5	16 – 14	9
	4 – 6	12 – 10	9,6
MIXO (70A)	10 – 25	7 – 4	15
MIXO (100A), CX 6/6	10 – 35	7 – 2	15
MIXO (200A)	16 – 70	6 – 2/0	15
<b>Spring</b>			
CSE, CSH, CTSE 06..24, CMSH, MIXO [CX 05 S <sup>2)</sup> , CX 05 SH], CSS	0,14 – 2,5	26 – 14	9 - 11
CTS 40/64	0,14 – 2,5 unprepared	26 – 14 unprepared	9 - 11
	0,14 – 1 prepared	26 – 18 prepared	
CKS, CKSH, CDS, CDSH, CSAH	0,14 – 2,5 unprepared	26 – 14 unprepared	9 - 11
	0,14 – 1,5 prepared	26 – 16 prepared	

<sup>1)</sup> For CNE, CDA, CP, CME, "CX 4/8 – pole 16A" series connectors with screw terminal and conductor protection plate, the use of ferrules is not necessary (= unprepared conductor). The use of ferrules (= prepared conductor) causes a reduction in maximum useful cross-section to the lower size (e.g. 4 mm<sup>2</sup> unprepared - 2,5 mm<sup>2</sup> prepared).

<sup>2)</sup> Available upon request.

## LOAD CURVES

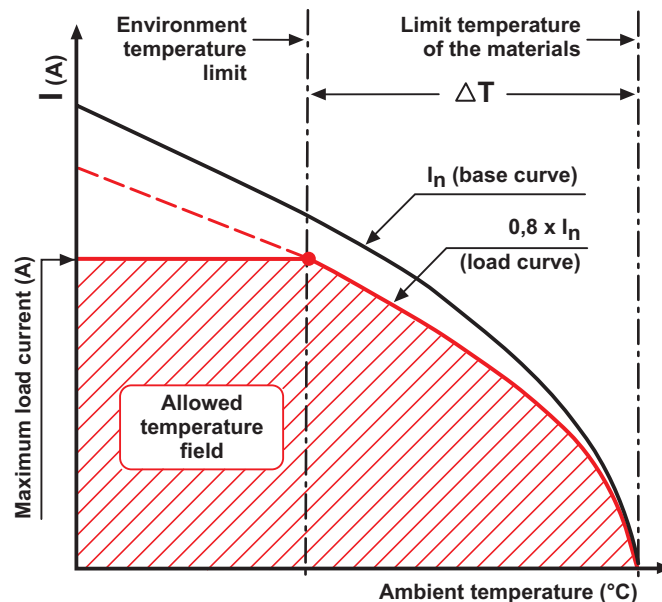
The permitted current carrying capacity for connectors is variable: it becomes lower with the increase of the number of poles and of the ambient temperature in which the connector is installed and it depends upon the thermal properties of the material used for the contacts and the insulating parts including those of the type of conductor used. The current carrying capacity is obtained from the load curves which are constructed according to standard IEC 60512-5-2 for currents circulating simultaneously in all poles.

The limit current curves express current values that determine the achievement of the upper limit temperature of the materials. The choice of the permanent load applicable on the contacts **must be made within the field of operation possible delimited by the above mentioned curves.**

Since use of connectors at the limit values of their characteristics is not recommended, the **base curve** is de-rated. The reduction of the load currents to 80% defines the correction curve where both the maximum permissible contact resistances and the inaccuracy of the temperature measurements are sufficiently taken into consideration.

The correction curve represents the final **limit current curve (load curve)** as defined by standard IEC 60512-5-2. It therefore bears in consideration the differences between the various connector inserts, as well as errors in the temperature measurements.

All the load curves presented in this catalogue include the correction. See figure below.



### Legend

#### Maximum load current (A)

Value for which the connector reaches the upper limit temperature of the material at the corresponding ambient temperature intersected on the load curve.

#### Limit temperature of the materials

Value determined by the characteristics of the material used. The sum of the environmental temperature and the increase of the  $\Delta T$  (temperature rise) caused by the current flow must not exceed the limit temperature of the materials.

#### Environment temperature limit

The environmental conditions must not exceed this value. It may be known and determines the maximum load current, or it may be directly obtained from the load curve.

#### Base curve

Set of current and temperature values obtained from laboratory tests and influenced by the connector's characteristics (number of poles, construction shape, thermal conductivity of the materials, etc.) and the cross-section of the conductor used.

#### Load curve (limit current curve)

Obtained from the base curve via the safety coefficient.

#### $\Delta T$ (temperature rise)

Temperature rise produced by a permanent current circulating through all the poles of a connector coupling; difference between the upper limit temperature of the material and the ambient temperature obtained on the limit current curve.