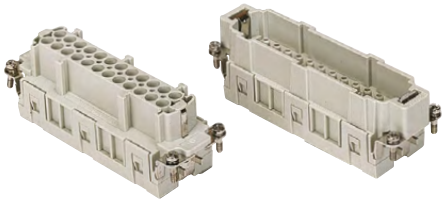
CCE series

TECHNICAL FEATURES

CCE series are the evolution of former CC series for removable crimp contacts CC series, with rated current up to 16A per pole.
It shares the four (six with double inserts) mating interfaces with series: **CNE** (screw-type), **CSH** (spring-type with actuator button, SQUICH® technology), **CSS** (double spring-type), CT (screw-type with 45° terminal block), **CTSE** (spring-type with 45° terminal block).
As for CNE series with former CN series, also CCE series are the result of a complete overhaul of the preceding CC series. Whereas CC series relied upon additional stainless steel spring element to perform contact retention, CCE series applies the modern and equally reliable concept of retention in the insulating body by a resilient element directly obtained in the contact holder. This enhances insulation, simplifies manufacturing and improves reliability.



CCE series, through increase of creepage distances, attains as well the **rated voltage increase to 500V from previous 400V value.**
Solid machined crimp contacts and the relevant connector inserts are the preferred option in fields of application subject to high vibration levels, such as railway rolling stock and everywhere transportation and moving parts are foreseen with e.g. motors as potential source of vibration.

Insert series		**CCE**
No. of poles 1)	Main contacts + ⏚	**6, 10, 16, 24, (32 = 2x16), (48 = 2x24)**
	auxiliary contacts	—
Rated current 2)		16A
EN IEC 61984 Pollution degree 3	rated voltage	500V
	rated impulse voltage	6kV
	pollution degree	**3**
EN IEC 61984 Pollution degree 2	rated voltage	400/690V
	rated impulse voltage	6kV
	pollution degree	**2**
UL / CSA certification	rated voltage (a.c./d.c.)	600V
Contact resistance		≤ 1 mΩ
Insulation resistance		≥ 10 GΩ
Ambient temperature limit (°C)	min	-40 °C
	max	70 °C
Degree of protection	with enclosures	**IP65**, **IP66**/IP69, IP66/**IP67**/IP69,IP66/**IP68**/IP69 (according to type and model)
	without enclosures (in mated condition) - termination side on male and female inserts - mating side on female inserts	**IP20** (IPXXB)
Conductor connections		crimp
Conductor cross-sectional area	mm^2	0,14 - 4
	AWG	26 - 12
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)

CQE series

TECHNICAL FEATURES

CQE connector inserts are designed for removable crimp contacts series **CC** (solid pin ø 2,5 mm), (including male pins **CC x.x AN** for advanced opening) with rated current up to **16A** per pole, and are the "high density" evolution of historic series **CCE**: in the same housing sizes, the number of pole (contact density) is increased as shown in this table:

Size	series CCE # of poles	series CQE # of poles	density increase
44.27	6 + ⏚	10 + ⏚	1,67
57.27	10 + ⏚	18 + ⏚	1,80
77.27	16 + ⏚	32 + ⏚	2,00
104.27	24 + ⏚	46 + ⏚	1,92
77.62	32 + ⏚ (2x16)	64 + ⏚ (2x32)	2,00
104.62	48 + ⏚ (2x24)	92 + ⏚ (2x46)	1,92

NOTE - The contact density is almost doubled in the same footprint by doubling the number of rows of contacts from 2 to 4. Except for size 77.27, which shows 4 rows of contacts seats equally dimensioned, central rows - due to space constraints to keep the required insulating distances towards the PE lateral contacts - are limited in number to one contact seat less than the peripheral rows.

This allows using the same size of connector housing for wiring almost twice the amount of circuits, or conversely to step down by one size the dimension of the connector housing to wire the same number of circuits, with cost and space efficiency. The only precaution is to suitably select the size of cable entry in case of increase of number of individual wires or diameter of a multi-core cable. Contact retention is operated by the retainers incorporated in the insulating body contact holder. Suitable removal tool **CQES**.

Inserts series		**CQE**
No. of poles [1]	main contacts + ⏚	**10, 18, 32, 46, (64 = 2x32), (92 = 2x46)**
	auxiliary contacts	--
rated current [2]		16A
EN IEC 61984 pollution degree 3	rated voltage	500V
	rated impulse voltage	6kV
	pollution degree	3
EN IEC 61984 pollution degree 2	rated voltage	830V
	rated impulse voltage	8kV
	pollution degree	2
UL/CSA certification	rated voltage AC/DC	600V
contact resistance		≤ 1 mΩ
insulation resistance		≥ 10 GΩ
ambient temperature limit (°C)	min	-40 °C
	max	+125 °C
degree of protection	with enclosures	**IP65**, **IP66**/IP69, IP66/**IP67**/IP69, IP66/**IP68**/IP69 (according to type and model)
	without enclosures (in mated condition) - termination side on male and female inserts; - mating side on female inserts	**IP20** (IPXXB)
conductor connections		crimp (⏚ only: screw)
conductor cross-sectional area	mm^2	0,14 - 2,5
	AWG	26 - 12
mechanical endurance (mating cycles)		≥ 500

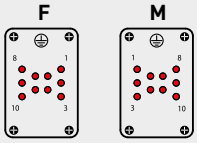
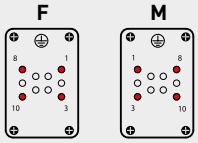
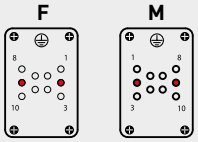
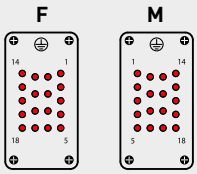
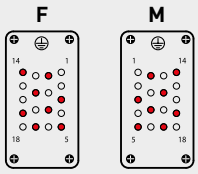
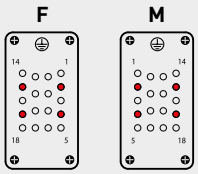
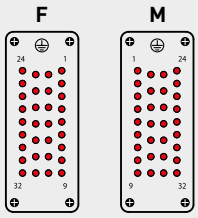
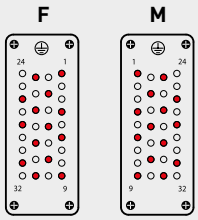
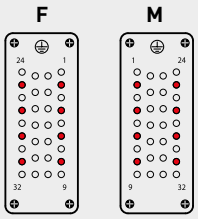
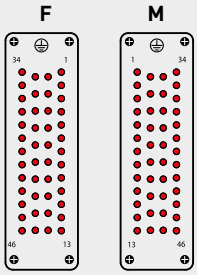
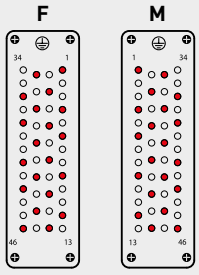
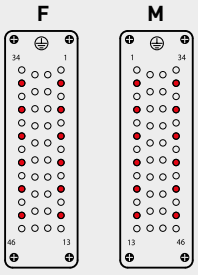
1) Polarities shown in brackets may be obtained by using two inserts in their own double-sized housings

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 that 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)

When all the contacts are used, CQE connector inserts may be used at rated voltage up to 500V (first column) pollution degree 3, in accordance with the standard EN 61984. If the number of contacts is reduced and the contacts accordingly assigned, these connectors may be used at higher voltages.

This is possible because the decrease in the number of contacts leads to an increase clearences and creepage distances.
When the contacts are arranged as shown below, the inserts may be used at rated voltages of 690V (second column) and 1000V (third column) pollution degree 3, in accordance with the standard EN 61984.

Special voltages for CQE inserts

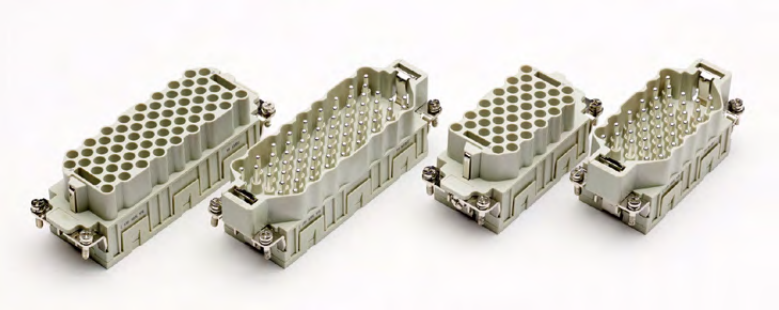
For use up to 500V pollution degree 3	For use up to 690V pollution degree 3	For use up to 1000V pollution degree 3
diagrams contacts side (front view)	diagrams contacts side (front view)	diagrams contacts side (front view)
CQE 10 - 10 + ⏚	**CQE 10 - 4 +** ⏚	**CQE 10 - 2 +** ⏚
		
CQE 18 - 18 + ⏚	**CQE 18 - 8 +** ⏚	**CQE 18 - 4 +** ⏚
		
CQE 32 - 32 + ⏚	**CQE 32 - 14 +** ⏚	**CQE 32 - 8 +** ⏚
		
CQE 46 - 46 + ⏚	**CQE 46 - 20 +** ⏚	**CQE 46 - 12 +** ⏚
		

Legend:

- ● working contact
- ○ without contact
- M = male insert
- F = female insert

CQEE series

TECHNICAL FEATURES



Connector inserts series **CQEE** are the logical extension of the existing series CQE for removable crimp contacts series CC (16A max, available both in gold plated and in silver plated version) that include the CC…AN pin contacts with anticipated opening (first-to-break) and delayed closing (last-to-make).

Compared with the connector inserts of the same size of series CQE, connector inserts series **CQEE** provide a sensibly higher number of contacts: 64P+⏚ instead of 46P+⏚ for size 104.27 (+39%), 40P+⏚ instead of 32P+⏚ for size 77.27 (+25%).

With the same number of circuits, it is conversely possible to reduce the size of the connector inserts and of the related hood and housing, thus reducing the overall cost.

Connector inserts series **CQEE** may replace in the same size (77.27, 104.27) and with the same contact density (40P+⏚ and 64P+⏚) the corresponding inserts of series CD for removable crimp contacts series CD (10A max).

This may be particularly useful when, as a function of the intended use, it is required:

- to use the connector at a higher rated voltage: CQEE covers use at 500V / 6kV / 3 where CD stops at 250V / 4kV /3;
- to assign a larger current-carrying capacity, both due to the lower contact resistance (1 mΩ instead of 3 mΩ) and the larger wire size available for series CC compared with series CD contacts;
- to use wires with the larger cross-sectional area of 4 mm^2 / AWG 12, in order to contain the percent voltage drop [%] in circuits fed with extra-low voltage and with comparatively high currents, or in circuits of considerable length;
- to use crimp contacts with inherently higher mechanical robustness;
- to use anticipated pin contacts CC…AN (e.g. for the remote signal ling of the “OPEN” or “CLOSED” status of the connector).

CQEE series

TECHNICAL FEATURES

Inserts series		**CQEE**
No. of poles	main contacts + ⏚	**40 + ⏚, 64 + ⏚**
rated current [1)]		16A
EN 61984 pollution degree 3	rated voltage	500V
	rated impulse voltage	6kV
	pollution degree	3
EN 61984 pollution degree 2	rated voltage rated impulse voltage	830V 6kV
	pollution degree	2
UL/CSA certification	rated voltage AC/DC	600V
contact resistance		≤ 1 mΩ
insulation resistance		≥ 10 GΩ
ambient temperature limit (°C)	min	-40 °C
	max	+125 °C
degree of protection	with enclosures (according to version)	**IP65**, **IP66**/IP69, IP66/**IP67**/IP69, IP66/**IP68**/IP69 (according to type and model)
	without enclosures (in mated condition)	**IP20** (IPXXB)
conductor connections		crimp (only ⏚: screw)
conductor cross-section (CC contact series)	mm^2	0,14 4,0
	AWG	26 - 12
stripping length	mm	7,5
mechanical endurance (mating cycles)		≥ 500

[1)] 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 that 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)