

CSAH-SQUICH® series

Connection without tools, slim version

CSAH-SQUICH® inserts

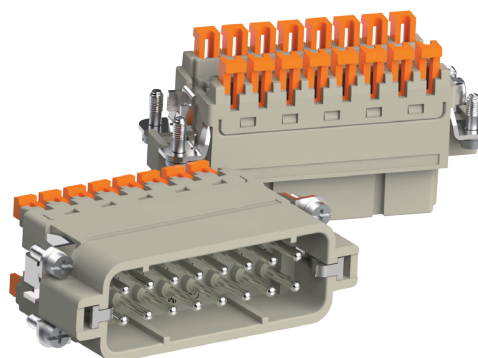
To improve high performance industrial connections, ILME has developed and evolved its own spring clamp connectors to meet the market needs and make installation simpler.

The SQUICH® inserts are adaptable to any type of solid or flexible conductor, including unprepared conductors

Each of the spring terminals has an actuator button, suitably shaped and incorporated in the cavity. When this button is pressed, it triggers the closure of the spring device of the corresponding terminal, safely and reliably connecting the conductor to its respective electric contact in the connector.

The actuator buttons are supplied raised, in the "open terminal" position and are easily distinguishable by the **orange colour which makes them stand out from the insulating body of the connector.**

The advantage of such an **exclusive solution** is that the **actuators disappear completely within the body of the connector**, making it easy to identify terminals not yet closed and eliminating possible obstacles to the movement of the conductors during installation and maintenance. In this manner during the cabling phase the **need for a tool to activate the terminal is completely eliminated and a simple operation is all you need to make the connection.**



CSAH-SQUICH® INSERTS SUM-UP

- ☑ **Reduced space**
- ☑ **Reduced wiring time**
- ☑ **No need for tools**
- ☑ **Quick identification of wired and non-wired terminals**
- ☑ **Terminals already open and ready for conductor clamping**
- ☑ **Built-in silver plated contacts**
- ☑ **Excellent fastening solution**
- ☑ **Great resistance to strong vibration**

Shaped button for measuring instruments

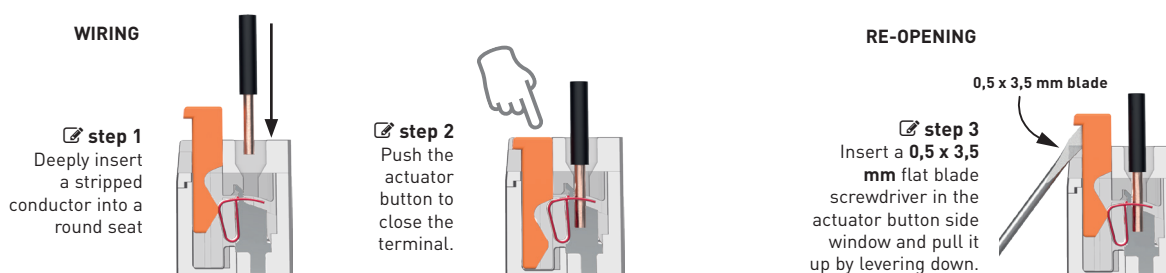
The profile of the button used in the **SQUICH®** series inserts **allow a measuring probe to be inserted.**

This allows checks to be carried out to ensure that the wiring is correct.

Simple terminal reopening

To reopen the terminals, simply introduce the tip of a common 0,5 x 3,5 mm flat blade screwdriver in the shaped pocket on the head of the actuator, and slightly rotate the screwdriver downwards: this will lift the actuator into its open terminal position.

☑ **SQUICH®** Connection technology



CSAH-SQUICH® 10 poles + ⊕ 16A - 250V

enclosures:
size "49.16"

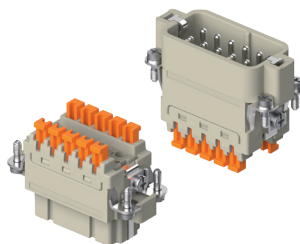
page:

IL-BRID	374 - 377, 382
CZ7 IP67, single lever	384
W-TYPE for aggressive environments	519
E-Xtreme® corrosion proof	540
EMC	576

panel supports:
COB + adapter

page:
652 - 654

inserts,
spring terminal connections without tools



description

part No.

spring terminals with actuator button
female inserts with female contacts
male inserts with male contacts

CSAHF 10
CSAHM 10

- characteristics according to EN 61984:

16A 250V 4kV 3

16A 400V 4kV 2

- cULus (UL for USA and Canada),



ERC certified

- rated voltage according to UL/CSA: 600V

- insulation resistance: $\geq 10 \text{ G}\Omega$

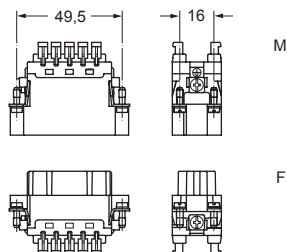
- ambient temperature limit: $-40^\circ\text{C} \dots +125^\circ\text{C}$

- made of self-extinguishing thermoplastic resin UL 94V-0

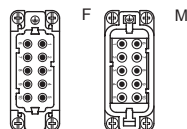
- mechanical life: ≥ 500 cycles

- contact resistance: $\leq 3 \text{ m}\Omega$

- for max. current load see the connector inserts derating diagram below; for more information see page 28

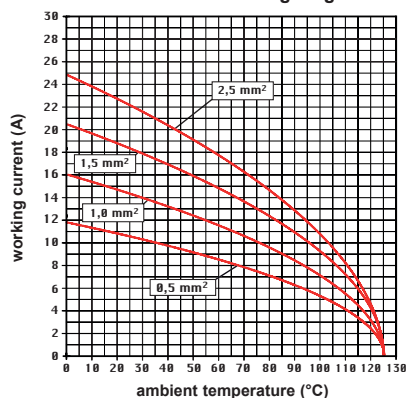


contacts side (front view)



- inserts for conductors cross-sectional areas:
0,14 - 2,5 mm² - AWG 26 - 14
- for wires prepared with crimped ferrule, usable
conductor cross-sectional areas:
up to 1,5 mm² (AWG 16)
- conductors stripping length: 9...11 mm

CSAH 10 poles connector inserts
Maximum current load derating diagram



SQUICH®-spring connection technology

WIRING

1. Deeply insert a stripped conductor into a round terminal.
2. Push the actuator button to close the terminal.

RE-OPENING

3. Insert a 0,5 x 3,5 mm flat blade screwdriver in the actuator button side window and pull it up by levering down.

CSAH-SQUICH® 16 poles + ⊕ 16A - 250V

enclosures:
size "66.16"

page:

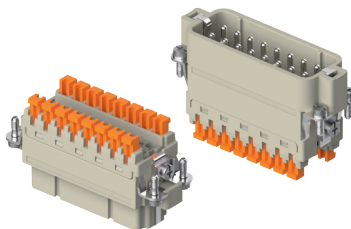
IL-BRID
CZ7 IP67, single lever
W-TYPE for aggressive environments
E-Xtreme® corrosion proof
EMC

378 - 382
385
520
541
577

panel supports:
COB + adapter

page:
652 - 654

inserts,
spring terminal connections without tools



description

part No.

spring terminals with actuator button
female inserts with female contacts
male inserts with male contacts

CSAHF 16
CSAHM 16

- characteristics according to EN 61984:

16A 250V 4kV 3

16A 400V 4kV 2

-  (UL for USA and Canada),  

ERC certified

- rated voltage according to UL/CSA: 600V

- insulation resistance: $\geq 10 \text{ G}\Omega$

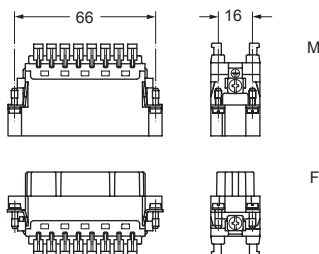
- ambient temperature limit: $-40^\circ\text{C} \dots +125^\circ\text{C}$

- made of self-extinguishing thermoplastic resin UL 94V-0

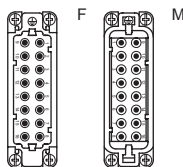
- mechanical life: ≥ 500 cycles

- contact resistance: $\leq 3 \text{ m}\Omega$

- for max. current load see the connector inserts derating diagram below; for more information see page 28

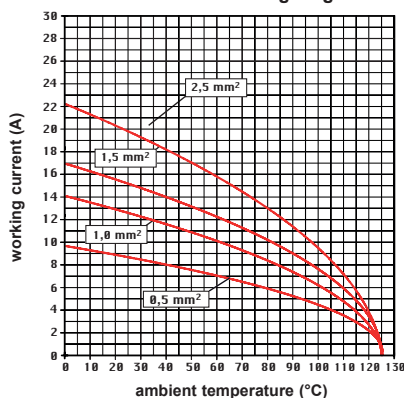


contacts side (front view)



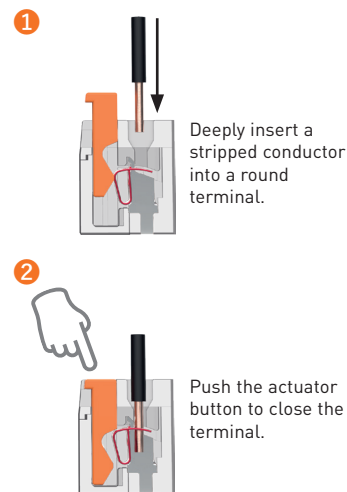
- inserts for conductors cross-sectional areas:
0,14 - 2,5 mm² - AWG 26 - 14
- for wires prepared with crimped ferrule, usable
conductor cross-sectional areas:
up to 1,5 mm² (AWG 16)
- conductors stripping length: 9...11 mm

CSAH 16 poles connector inserts
Maximum current load derating diagram

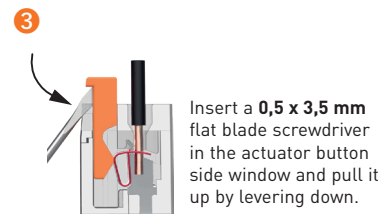


SQUICH®-spring connection technology

WIRING



RE-OPENING



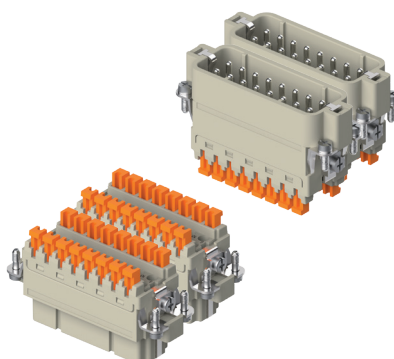
enclosures:
size "66.40"

page:




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

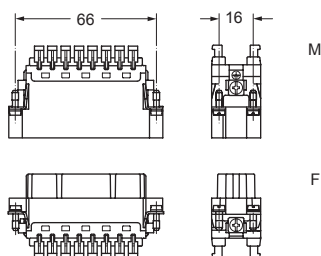
431 - 434
527
548

**inserts,
spring terminal connections without tools**

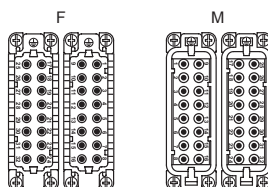


description	part No.	part No.
spring terminals with actuator button female inserts, No.(1-16) and (17-32)	CSAHF 16	CSAHF 16 N
male inserts, No.(1-16) and (17-32)	CSAHM 16	CSAHM 16 N

- characteristics according to EN 61984:
16A 250V 4kV 3
16A 400V 4kV 2
-  (UL for USA and Canada),   **DNV VERITAS**
- **EAC** 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: ≥ 500 cycles
- contact resistance: $\leq 3 \text{ m}\Omega$
- for max. current load see the connector inserts derating diagram below; for more information see page 28

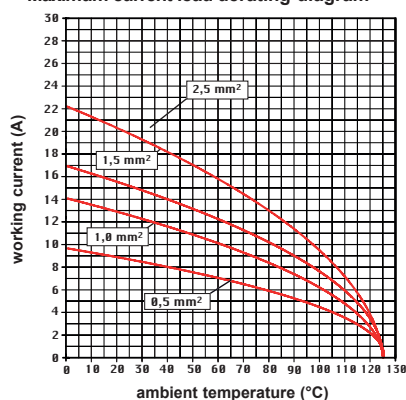


contacts side (front view)



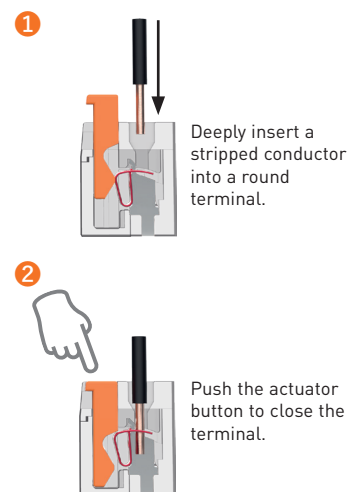
- inserts for conductors cross-sectional areas:
0,14 - 2,5 mm² - AWG 26 - 14
- for wires prepared with crimped ferrule, usable
conductor cross-sectional areas:
up to 1,5 mm² (AWG 16)
- conductors stripping length: 9...11 mm

CSAH 32 poles connector inserts
Maximum current load derating diagram

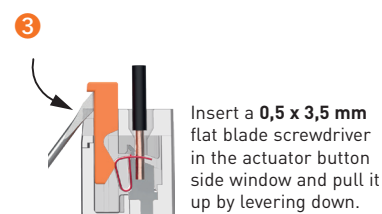


SQUICH®-spring connection technology

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

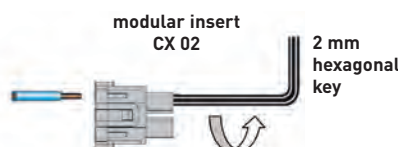
Increasing the tightening torque of terminal screws does not considerably improve the contact resistance. The screw torques are selected according to standard EN 60999-1, to provide excellent mechanical, thermal and electric behaviour. The conductor or terminal may be damaged if the recommended values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

Screw size	Connector type	Recommended tightening torque		Recommended size of screwdriver
		(Nm)	(lb.in)	
	LINE TERMINALS			
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
	PE TERMINAL			
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
	FASTENING SCREWS			
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 mm² (14 AWG to 10 AWG) (CX 02 4AF/M)
 - from 6 to 10 mm² (10 AWG to 8 AWG) (CX 02 4BF/M)
 - (extra-flexible EN 60228 class 6: 2,5... 6 mm² (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 mm² (14 AWG to 12 AWG)
 - 2 Nm (17,7 lb.in) max for conductors with section 6 ... 10 mm² (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 $W_t \leq 0,2$ mm over a distance of 200 mm (measured on the panel without load)
- Roughness $R_a \leq 16$ μ 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
Screw	(mm ²)	AWG	(mm)
CK	0,75 – 2,5	18 – 14	6
CX 4/2, CX 4/8 (poles 16A) ¹⁾	0,75 – 4	18 – 12	7
	0,75 – 2,5	18 – 14	7
CNE ¹⁾	0,5 – 4	20 – 12	7
CNE..X	0,25 – 2,5	24 – 14	7
CDA ¹⁾	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 ¹⁾	0,5 – 4	20 – 12	7
CME..X	0,5 – 2,5	20 – 14	7
CP ¹⁾	0,75 – 6	18 – 10	10,5
CX 4/.. (80A poles)	4 – 16	12 – 5	14
Crimp			
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 ²]
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
Spring			
CSE, CSH, CTSE 06..24, CMSH, MIXO [CX 05 S ²⁾ , 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	

¹⁾ 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 mm² unprepared - 2,5 mm² prepared).

²⁾ Available upon request.

LOAD CURVES

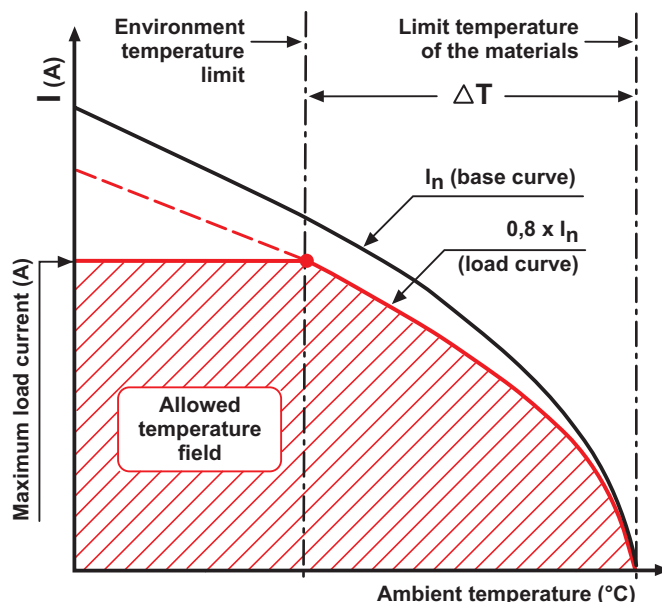
The permitted current carrying capacity for connectors is variable: it becomes lower with the increase of the number of poles and of the ambient temperature in which the connector is installed and it depends upon the thermal properties of the material used for the contacts and the insulating parts including 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 ΔT (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.

ΔT (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.