



Circular connectors M12x1 IP67

Connector series for industrial applications

M12x1 Bulkhead Sockets X-coded IP67



An important part of the M12x1 connector series are the bulkhead sockets in $Cat.6_A$. They are available with housings for front or back mounting as well as versions without housings with a

fourfold shield connection to the printed circuit board and feature versatile mounting possibilities.



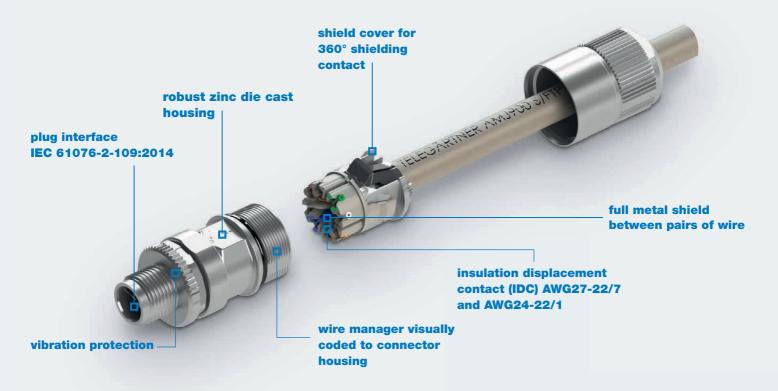
M12x1 Bulkhead Socket X-coded	
Mechanical Characteristics	
Connectors	IEC 61076-2-109:2014
Insertion force	≤ 30 N
Durability (mating cycles)	≥100
Material: housing	zinc diecast nickel plated / brass nickel plated
Material: contact body	PA
Material: contacts	CuSn
Material: contact finish	Au
Material: gaskets	FKM; NBR
Environmental Requirements	
Shock	50 g
Protection against particulate ingress	IP6X
Protection against water / immersion	IPX7
Ambient temperature	-40° C to +85° C
Electrical Characteristics	
Contact resistance	≤ 5 mΩ
Insulation resistance	≥ 100 MΩ
Voltage proof: contact-contact	≥ 500 V, DC
Voltage proof: contact-shield	≥ 500 V, DC
PoE+ acc to IEEE 802.3at	Adequate for Power over Ethernet+
Transmission Characteristics	
10 Gigabit Ethernet acc. to IEEE 802.3an	Adequate for 10 Gigabit Ethernet
Category 6 _A	ISO/IEC 11801; DIN EN 50173-1
Class E _A	ISO/IEC 11801; DIN EN 50173-1

M12x1 Cable Plug X-coded IP67



The basic structure of the new connector with X-coding corresponds to M12 system in world-wide use that has found its way into applications in many different branches with extreme conditions thanks to its compact design and industrial compatibility. The extremely robust M12x1 connector in $Cat.6_A$

from the programme can be fitted on site without any special tools. This assembly-friendly connector also features very good shield contacting and covers a wide range of wire diameters (0.9 - 1.6 mm) and cable diameters (5.5 - 9 mm).



Mechanical Characteristics	
Connectors	IEC 61076-2-109:2014
Insertion force	≤ 30 N
Durability (mating cycles)	≥ 100
Material: housing	zinc diecast nickel plated / brass nickel-plated
Material: wire pair presorting	PA UL94 V0
Material: shield	German silver
Material: pressure screw	brass nickel-plated
Material: contacts	brass
Material: contact finish	Au over Ni
Wire diameter	0.9 - 1.6 mm
Cu-Conductor diameter: stranded	0.46 - 0.76 mm (AWG27 - 22/7)
Cu-Conductor diameter: solid	0.51 - 0.64 mm (AWG24 - 22/1)
Cable diameter	5.5 - 9.0 mm
Environmental Requirements	
Shock	50 g
Protection against particulate ingress	IP6X
Protection against water / immersion	IPX7
Ambient temperature	-40° C to +85° C
Electrical Characteristics	
Contact resistance	\leq 10 m Ω
Insulation resistance	≥ 100 MΩ
Voltage proof: contact-contact	≥ 500 V, DC
Voltage proof: contact-shield	≥ 500 V, DC
PoE+ acc to IEEE 802.3at	Adequate for Power over Ethernet+
Transmission Characteristics	
10 Gigabit Ethernet acc. to IEEE 802.3an	Adequate for 10 Gigabit Ethernet
Category 6 _A	ISO/IEC 11801; DIN EN 50173-1
Class E _A	ISO/IEC 11801; DIN EN 50173-1

M12x1 Connecting Cable X-coded



For the connection between machines or other terminating equipments as well as connection of the machine or terminating equipment to the control cabinet, also offers pre-assembled

connecting cables in Cat.6_A. The connecting cables M12x1 with x-coding an S/FTP 4x2xAWG26/7 PUR structure and are suitable for an increased temperature range of -40 $^{\circ}$ C to +85 $^{\circ}$ C.



M12 Connecting Cable X-coded	
•	
	Connecting Cable S/FTP Cat.7 PUR
Mechanical Characteristics	
Durability (mating cycles) M12	≥ 100
Durability (mating cycles) RJ45	≥750
Cable structure	LI02YSC11Y PUR 4x2xAWG 26/7 PiMF
Stranded wire	AWG26 (7 x 0.16 mm)
Wire insulation	Foam PE, Ø 1.04 mm
Pair shielding	Al-foil, outside conducting
Overall shielding	tin plated copper braid
Outer jacket	Ø 6.2 ±0.2 mm
Colour	RAL 6018
Thermal and Climatic Characteristics	
Flame-retardant test	IEC 60332-1
Operating temperature in °C	-40° C to +85° C

Assembly of the M12x1 connector X-coded



Thanks an intelligent wire management and a simple screw connection system, the individual components of the M12x1 cable plug can be assembled quickly and easily on site completely without the use of special tools.



Step 1: **Prepare cables**

- Slide over cable gland and seal at least 40 mm
- Remove outer jacket, fold braid shield backwards
- Pre-sort pairs of wire



Step 2: Insert cables

- Insert pairs of wire into the wire manager, actuate the shield spring
- Untwist pairs of wire, insert the individual wires into the wire manager and cut off protruding wire flush



Step 3: Screw on connector

- Insert wire manager into plug body (pay attention to position)
- Tighten the cable gland with an open-ended wrench
- Use an additional seal for cable diameters between 5.5 and 7.5 mm

Order Information:



Product			Order no.	Description	Coding
M12x1 Cable Plug		-70 -70 -70 -70 -70 -70 -70 -70 -70 -70	DT12 DM	M12x1 CP D-cod. Cat.5 4 pole, D-coded, straight, plug set, 360° shielding, screw termination, length of connector: 70 mm, field assembly	
	The same	700.2 10 2.1 0.5 10 2.1 0.5 10 10 10 10 10 10 10 10 10 10 10 10 10	DT12 D2F10	M12x1 BS D-cod. Cat.5 4 pole, D-coded, straight, 2 pc. single design, screen connection single, solder connection THR, gap to PCB 10 mm, back mounting	b
nead Socke		\$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$	DT12 DF5.7	M12x1 BS D-cod. Cat.5 4 pole, D-coded, straight, 1 pc. design, screen connection quad, solder connection THR, gap to PCB 5.7 mm, back mounting	D-code
M12x1 Bulkhead Socket		02 3 3 5 5 5 5 7 7 5 5 7 7 7 5 5 7 7 7 5 5 7	DT12 DF11	M12x1 BS D-cod. Cat.5 4 pole, D-coded, straight, 1 pc. design, screen connection 360°, solder connection THR, gap to PCB 11 mm, front mounting	
2			DT12 DFB	M12x1 BS D-cod. Cat.5 4 pole, D-coded, straight, without housing, screen connection single, solder connection THR, back mounting	
M12x1 Cable Plug		500 500 500 500 500 500 500 500 500 500	DT12 XM	M12x1 CP X-cod. Cat.6 _A 8 pole, X-coded, straight, plug set, 360° shielding, IDC, plug length: 59 mm, field assembly	
		min 2 10 2 2 10 10 10 10 10 10 10 10 10 10 10 10 10	DT12 XF10 DT12 X2F10	M12x1 BS X-cod. Cat.6 _A 8 pole, X-coded, straight, 1 pc. (DT12 XF10) resp. 2 pc. (DT12 X2F10) design, screen connection quad, solder connection THR, gap to PCB 10 mm, back mounting	
M12x1 Bulkhead Socket		92 457 2 2 3 8 4 2 2 3 W 12 2	DT12 XF6.7	M12x1 BS X-cod. Cat.6 _A 8 pole, X-coded, straight, 1 pc. design, screen connection quad, solder connection THR, gap to PCB 6,7 mm, back mounting	
M2x1 Bulk		25 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	DT12 XF12.7	M12x1 BS X-cod. Cat.6 _A 8 pole, X-coded, straight, 1 pc. design, screen connection quad.solder connection THR, gap to PCB 12,7 mm, front mounting	0
		24.6	DT12 XFB	M12x1 BS X-cod. Cat.6 _A 8 pole, X-coded, straight, without housing, screen connection quad, solder connection THR, gap to PCB customized, back mounting	y-cod
er.		(W 12)	DT12 XFF	M12x1-M12x1 CO X-cod. Cat.6 _A mating face 1: 8 pole, X-coded, straight; mating face 2: 8 pole, X-coded, straight; Cat.6 _A	
M12x1 Coupler		350 351 351 351 351 351 351 351 351 351 351	DT12 XFJF	M12x1-RJ45 CO X-cod. Cat.6 _A mating face 1: 8 pole, X-coded, straight; mating face 2: RJ45, straight; Cat.6 _A	
Σ		3 - 251 - 25 - 25 - 25 - 25 - 25 - 25 - 2	DT12 XFJFA	M12x1-RJ45 CO X-cod. Cat.6 _A mating face 1: 8 pole , X-coded, straight; mating face 2: RJ45, angled; Cat.6 _A	
M12x1 Accessories		- 175	DT12 MCS	M12x1 plug protective cap with wrist strap	pu _
		915	DT12 FC	M12x1 socket protective cap	or D- al -coded
			DT12 FCS	M12x1 socket protective cap with wrist strap	ō ×



Connecting Cables:

Length 5.0 m

Length 7.5 m

Length 10.0 m

DTW X5FM

DTW X7.5FM

DTW X10FM



M12x1 D-coded	2x M12x1 Cable Plug black overmoulded IP67 Cable: SF/UTP, 2x2xAWG22/7, Cat.5, PUR, Outer Jacket green	M12x1 Cable Plug black overmoulded IP67 to RJ45 Plug Crimp IP20 Cable: SF/UTP, 2x2xAWG22/7, Cat.5, PUR, Outer Jacket green	M12x1 Cable Plug black overmoulded IP67 to free cable end Cable: SF/UTP, 2x2xAWG22/7, Cat.5, PUR, Outer Jacket green
Length 0.5 m	DTW D0.5M	DTW DJ0.5M	DTW D0.5MW
Length 1.0 m	DTW D1M	DTW DJ1M	DTW D1MW
Length 2.0 m	DTW D2M	DTW DJ2M	DTW D2MW
Length 3.0 m	DTW D3M	DTW DJ3M	DTW D3MW
Length 5.0 m	DTW D5M	DTW DJ5M	DTW D5MW
Length 7.5 m	DTW D7.5M		DTW D7.5MW
Length 10.0 m	DTW D10M		DTW D10MW



M12x1 X-coded	2x M12x1 Cable Plug black overmoulded IP67 Cable: S/FTP, 4x2xAWG26/7, Cat.7, PUR, Colour Outer jacket green	M12x1 Cable Plug black overmoulded IP67 to RJ45 Plug Crimp IP20 Cable: S/FTP, 4x2xAWG26/7, Cat.7, PUR, Colour Outer jacket green	M12x1 Cable Plug black overmoulded IP67 to free cable end Cable: S/FTP, 4x2xAWG26/7, Cat.7, PUR, Colour Outer Jacket green		
Length 0.5 m	DTW X0.5M	DTW XJ0.5M	DTW X0.5MW		
Length 1.0 m	DTW X1M	DTW XJ1M	DTW X1MW		
Length 2.0 m	DTW X2M	DTW XJ2M	DTW X2MW		
Length 3.0 m	DTW X3M	DTW XJ3M	DTW X3MW		
Length 5.0 m	DTW X5M	DTW XJ5M	DTW X5MW		
Length 7.5 m	DTW X7.5M	DTW XJ7.5M	DTW X7.5MW		
Length 10.0 m	DTW X10M	DTW XJ10M	DTW X10MW		



DTW XJ5FM

DTW X5FW

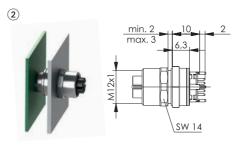
DTW X7.5FW

DTW X10FW

Versatile mounting possibilities



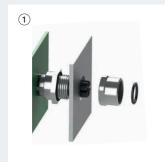


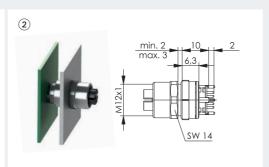


Back mounting:

- M12 bulkhead socket
- X-coded
- 2 piece design
- distance from PCB to housing 10 mm

Order no.: DT12 X2F10

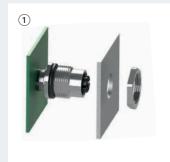


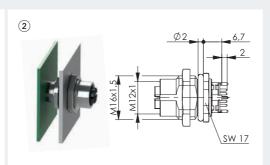


Back mounting:

- M12 bulkhead socket
- X-coded
- 1 piece design
- distance from PCB to housing 10 mm

Order no.: DT12 XF10



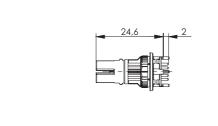


Back mounting:

- M12 bulkhead socket
- X-coded
- 1 piece design
- distance from PCB to housing 6.7 mm

Order no.: DT12 XF6.7



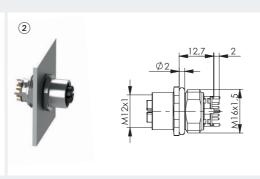


Back mounting:

- M12 bulkhead socket
- X-coded
- without housing
- distance from PCB customer-specific

Order no.: DT12 XFB





Front mounting:

- M12 bulkhead socket
- X-coded
- 1 piece design
- distance from PCB to housing 12.7 mm

Order no.: DT12 XF12.7

Data cables for railway applications



The M12x1 X-coded connecting cables in Category 6_A guarantee a transmission rate of 10 Gigabit Ethernet. They are available in different lengths. The cable sheath consists of an cross-linked compound specifically developed for increased fire protection required in rail vehicles. An injection moulded robust bend relief prevents excessive bending.

To meet the standards of the rail industry, data cables must satisfy the requirements of specially defined standards. Data cable meets the increased requirements for fire protection systems in rail vehicles. This has been successfully tested according to the specifications of EN 45545-2:2013. That standard defines fire behaviour in materials and components for use in rail vehicles.

Connecting Cables:





CW Connecting Cables for MIXO RJ45 Series



M12x1 X-coded	M12x1 Cable Plug black overmoulded IP67 to RJ45 Plug Crimp IP20 Cable: S/FTP, 4x2xAWG26/7, Cat.7, PUR, Colour Outer jacket green	M12x1 Cable Socket IP20 to RJ45 Plug Crimp IP20 Cable: S/FTP, 4x2xAWG26/7, Cat.7, PUR, Colour Outer Jacket green
Length 0.5 m	CW XJ0.5M	CW XJ0.5FM
Length 1.0 m	CW XJ1M	CW XJ1FM
Length 2.0 m	CW XJ2M	CW XJ2FM
Length 3.0 m	CW XJ3M	CW XJ3FM
Length 5.0 m	CW XJ5M	CW XJ5FM
Length 7.5 m	CW XJ7.5M	
Length 10.0 m	CW XJ10M	

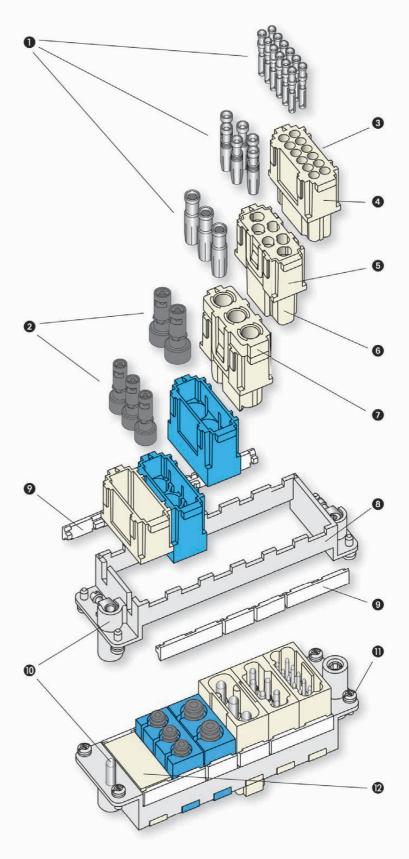


MIXO series

Modular units for multipole connectors

Characteristics

- Electric contacts in silver-plated or gold-plated brass with connections to the conductors via crimping, spring clamp or axial screw.
- 2 Pneumatic contacts in plastic with insertion tube connection.
- 3 Modular inserts of identical size with insertion system for forming the complete module and frame lock tab.
- 4 Inserts in self-extinguishing thermoplastic material, reinforced with glass fibre, UL 94-V0 approved, with a working temperature range of -40 °C to +125 °C.
- Inserts in conformance with the requirements of the EN 61984 standard and certified and marked with the UL, CSA, CCC, DNV-GL, EAC marks.
- 6 Inserts with asymmetric guide rails to prevent incorrect coupling.
- Position of contacts identified with numbers or codes on both sides of every insert.
- (3) Male/female module carrier frames with mandatory housings and polarity, in die-cast zinc alloy.
- Module lock tab, may be divided according to the number of modules used; guarantees a perfect stability of the modules during wiring and coupling/uncoupling of the connectors.
- Asymmetric earth contacts (two for frame) with wide contact surface to prevent incorrect coupling; when two or more identical connectors of the MIXO series are used, coded pins prevent incorrect coupling.
- Captive frame fastening screws, with flexible spring washer.
- Dummy module for unused frame slots.



MIXO modular units

1 seat for 1 RJ45 connector Cat. 6 Class EA

housing for RJ45 male connectors,

RJ45 female connectors



The modular inserts must be installed in suitable frames which are then mounted in traditional housings or COB panel support.

frames for modular units .. page: 214 - 215 1)

characteristics according to EN 61984

1A 50V 0,8kV 3

- insulation resistance: ≥ 10 GΩ
- are made of self-extinguishing thermoplastic resin UI 94 V0
- mechanical life: ≥ 500 cycles temperature range: from -40 °C to +70 °C
- we recommend to fix the cable with cable tie
- for contact crimping instructions see the crimping tool on page 554 and 555

WARNING:

description

inserts can be used on high enclosures or bulkhead housings only.

1) refer to catalogue page CN.16

- female insert with 1 RJ45 female connector,

- male insert for 1 RJ45 male crimp connector (without RJ45 connector, to be ordered separately) or connecting cables
- male insert for 1 RJ45 male IDC connector, (without RJ45 connector, to be ordered separately)

part No.

CX 01 J8F CX 01 J8M

CX 01 J8IM **

part No.

crimp and IDC termination,

RJ45 male connectors

- RJ45 male crimp connector, 8 data contacts

- RJ45 male IDC connector, 8 data contacts

- CX 01 J8F technical data:
 RJ45 female insert, Cat. 6 Class E_A
- shielding housing: zinc diecast

- housing finish: nickel-plated
 current carrying capacity at 50 °C: 1A
 adequate for Power over Ethernet:
 PoE according to IEEE 802.3af
 connectors: IEC 60603-7-5
- adequate for 10 Gigabit Ethernet
- 10 Gigabit Ethernet acc. to IEEE 802.3an custom-designed cabling systems: PROFINET
- Installation Guideline
- generic cabling systems: ANSI/TIA/EIA-568-C.2
- ISO/IEC 11801 EN 50173-1
- ISO/IEC 24702
- EN 61918
- class EA (channel): ISO/IEC 11801, EN 50173-1

CX 8 J6M technical data:

- RJ45 male crimp connectors Cat. 6A
- crimp pliers: CJPZ T
- screened cable stripper: CJST
- Cu-conductor diameter solid: 0,40 0,51 mm (AWG 26/1 24/1) stranded: 0,46 0,61 mm (AWG 27/7 24/7)
- insulation diameter: 0,85 1,05 mm cable diameter: 5,0 6,6 mm
- connectors: IEC 60603-7-51
- to lifectors. IEC 6006-7-51 10 Gigabit Ethernet acc. to IEEE 802.3an: adequate for 10 Gigabit Ethernet category 6a: ISO/IEC 11801; EN 50173-1 class Ea : ISO/IEC 11801; EN 50173-1 category 6a : ANSI/TIA/EIA-568-C.2

CX 8 J6IM technical data:

- RJ45 male IDC connectors Cat. 6 Class EA
- Cu-conductor diameter solid: 0,41 0,64 mm (AWG 26/1 22/1)

- solid: 0,41 0,64 mm (AWG 26/1 22/1)
 stranded: 0,48 0,76 mm (AWG 26/7 22/7)
 insulation diameter: 0,85 1,6 mm
 cable diameter: 5,5 7,3 mm
 connectors: IEC 60603-7-5
 category 6a: ISO/IEC 11801; DIN EN 50173-1
 wrenches pilers for CX 8 J6IM: CJPW K

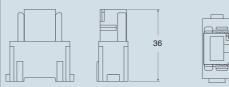
- 10 Gigabit Ethernet acc. to IEEE 802.3an: adequate for 10 Gigabit Ethernet
 class Ea: ISO/IEC 11801; EN 50173-1

- category 6: ANSI/TIA/EIA-568-C.2
 custom-designed cabling systems: according to PROFINET Installation Guideline

dimensions shown are not binding and may be changed without notice

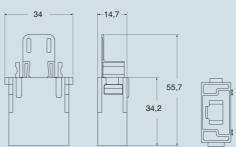
dimensions in mm

CX 01 J8F

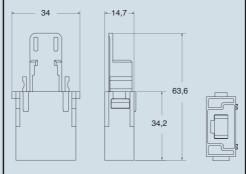


CX 01 J8M

Can be used with connecting cables CW Series (page 8)



CX 01 J8IM **

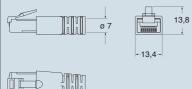


** CX 01 J8IM: to be used with high enclosures (T-TYPE hood M32/M40 only and CZAV/MZAV top entry hood only), bulkhead housings or COB ... BC/TCQ/TSF/ TSFS only

CX 8 J6M CX 8 J6IM

dimensions in mm

can be used with CX 01 J8M

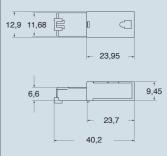




For free cable end X-coded DTW X...W (page 5)

CX 8 J6IM

can be used with CX 01 J8IM



For free cable end DTW...W (page 5)

tools and accessories for crimp contacts

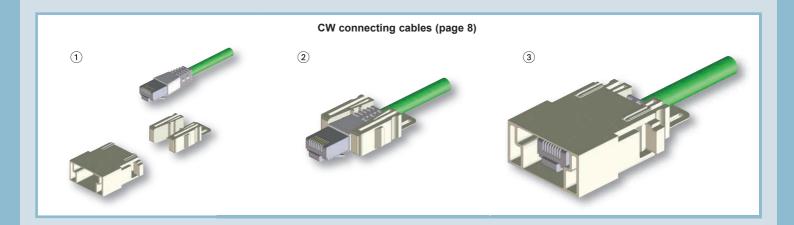


	manual IDC pliers	manual crimp pliers
description	part No.	part No.
wrenches pliers for connectors CX 8 J6IM	CJPW K	
crimp pliers for connectors CX 8 J6M		CJPZ T

Connection			Application					
RJ45 PIN	Colour T5	68	DIN 47100	Industrial PROFINET	10BT/ 100BT	1 Gigabit	Token Ring ISDN/So	Upo/TEL
No.	Α	В				Ethernet		
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









The company and the product

I.L.M.E. SpA - INDUSTRIA LOMBARDA MATERIALE ELETTRICO - has been operating in Milan since 1938 , in particular in the electrotechnical sector for the manufacture of equipment for industrial installations.

ILME reflects the traditional entrepreneurial spirit of Lombardy, and has enjoyed continuous expansion for over half a century. The company has carved an important role for itself in the principal world markets, also operating directly in the countries that have assumed world leadership in the field of automation, including Germany and Japan.

In the **electrical connection** sector with applications in industrial automation, characterised by **top performance** and utmost **reliability** needs, ILME is today the acknowledged partner of many leading companies worldwide.



The company's fundamental values are: **Product innovation**, original solutions, excellent **price-quality ratio**, acustomer-oriented **service**, ethical behaviour and respect for the environment.

To promote the continuing improvement of its qualitative **results**, ILME has always encouraged its collaborators to work with maximum **responsibility and participation**.

The company focuses on a series of benefits to the user, including research into the most suitable materials, high quality and safe cabling, a rapid turnaround and readily available services.



As from 1st January 1997, in order to launch electrical products on the European market the manufacturer must ensure these bear the relevant CE mark, in line with the Low Voltage Directive 73/23/ EEC * (implemented in Italy as L. D. 18-10-1977 no. 791) and its modification 93/68/EEC * (implemented in Italy as L.D. 25-11-1996 no. 626/96, published in the supplement to the Gazzetta Ufficiale of 14-12-1996).

The mark must be visible on the product or, if this is not possible, on the packaging, the instructions for use or on the warranty certificate. It acts as a declaration by the manufacturer that the product complies with all relevant EU directives regarding its field of application.

ILME products bear the CE mark on the actual product or its packaging.

Almost all ILME products fall within the field of application of the Low Voltage Directive. A declaration of conformity is required in order to be able to apply the CE mark. This declaration, to which the market is not directly entitled, must be made available to the controlling authorities (in Italy, the Ministry for Industry, Commerce and Handicraft) at all times. In it, the manufacturer declares the technical safety standard(s) followed in the manufacture of the product. These standards must be, in decreasing order of preference:

- a European standard (EN prefix)
- a European harmonisation document (HD prefix)
- an international IEC standard
- a national standard
- in the absence of reference standards, the manufacturer's internal specifications guaranteeing compliance with the basic safety requirements of the directive.

Compliance with harmonised technical standards (i.e. ratified by CENELEC) also constitutes presumption of compliance with the basic safety requirements of the directives.

The CE marking of ILME products results from the declaration of conformity of the product to harmonised standards or international IEC standards.

Through the CE mark, ILME declares full compliance, not merely with the directive's basic safety requirements, but also with those international or national EU standards on which voluntary safety certification markings are based (e.g. IMQ and VDE). In this way, ILME intends to give the CE mark the value of self-certification in terms of safety, given the loss in legal value of voluntary certifications issued by third parties, ratified by directive 93/68/EEC*.

Notwithstanding the above, practically all ILME products still bear voluntary conformity markings.

This EC declaration of conformity becomes null and void when the assembly of products includes one or more components not manufactured by us and without EC approval.

*Note: The next legal reference for the Low Voltage Directive was 2006/95/EC, as consolidation of the original Directive 73/23/EEC + Directive 93/68/EEC.

On 29th March 2014, the Official Journal of the European Union published the new Low Voltage directive 2014/35/EU dd. 26th February 2014, a recast version of directive 2006/95/EC, which is in force since on 20th April 2016.

The information contained in this catalogue is not binding and may be changed without notice



ISO 9001 certification: 2008
Design, manufacture and distribution of industrial electrical equipment (IAF 19)
Certificate No. 50 100 11133 - Rev. 01

www.ilme.com



