



IEC 60130-9

Edition 4.0 2011-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Connectors for frequencies below 3 MHz –  
Part 9: Circular connectors for radio and associated sound equipment**

**Connecteurs utilisés aux fréquences jusqu'à 3 MHz –  
Partie 9: Connecteurs circulaires pour appareils de radiodiffusion et  
équipements électroacoustiques associés**



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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## CONNECTORS FOR FREQUENCIES BELOW 3 MHz –

### Part 9: Circular connectors for radio and associated sound equipment

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International Standard IEC 60130-9 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This fourth edition cancels and replaces the third edition of IEC 60130-9, published in 2000, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- the scope has been amended to clarify its separation through its field of application, from IEC 61076-2-106;
- 8-pole connector styles 60130-9 IEC-22 through 60130-9 IEC-25 with screw locking have been deleted as obsolete and overlapping with some styles of IEC 61076-2-106;

- application and connections in Table 1 have been deleted because of referencing obsolete sound equipment. Titles of the dimension sheets and the clause headlines of Annex A have been amended accordingly;
- the reference to safety requirements according to IEC 60065 has been deleted.

The text of this standard is based on the third edition and on the following documents:

CDV	Report on voting
48B/2180/CDV	48B/2222/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

A list of all parts of IEC 60130 series, under the general title *Connectors for frequencies below 3 MHz*, can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.



## CONNECTORS FOR FREQUENCIES BELOW 3 MHz –

### Part 9: Circular connectors for radio and associated sound equipment

#### 1 Scope

This part of IEC 60130 relates to circular connectors for radio and associated sound equipment.

NOTE IEC 61076-2-106 specifies connectors with a similar mating interface for connectors M16x0,75 with screw-locking and degree of protection IP40 or IP65/IP67 and with M16x0,75 screw-locking accessory. As the IEC 60130-9 connector styles mating with the corresponding ones of IEC 61076-2-106 do not have a locking mechanism specified they are therefore not appropriate for industrial process measurement and control equipment. Users of this IEC 60130-9 standard should be aware that some of the IEC 61076-2-106 styles could be mated but not locked to some connector styles of this IEC 60130-9 standard.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1: 1988, *Environmental testing – Part 1: General and guidance*  
Amendment 1 (1992)

IEC 60512 (all parts), *Connectors for electronic equipment – Basic testing procedures and measuring methods*

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electronic continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-3-1, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-7-1, *Connectors for electronic equipment – Tests and measurements – Part 7-1: Impact tests (free connectors) – Test 7a: Free fall (repeated)*

IEC 60512-7-2, *Connectors for electronic equipment – Tests and measurements – Part 7-2: Impact tests (free components) – Test 7b: Mechanical strength impacts and measurements*<sup>1</sup>

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<sup>1</sup> To be published.

IEC 60512-9-1, *Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation*

IEC 60512-11-1, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 11 – Section 1: Test 11a – Climatic sequence*

IEC 60512-11-3, *Connectors for electronic equipment – Tests and measurements – Part 11-3: Climatic tests – Test 11c: Damp heat, steady state*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-11-12, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

IEC 60512-13-2, *Connectors for electronic equipment – Tests and measurements – Part 13-2: Mechanical operation tests – Test 13b: Insertion and withdrawal forces*

IEC 60512-16-5, *Connectors for electronic equipment – Tests and measurements – Part 16-5: Mechanical tests on contacts and terminations – Test 16e: Gauge retention force (resilient contacts)*

IEC 60512-17-1, *Connectors for electronic equipment – Tests and measurements – Part 17-1: Cable clamping tests – Test 17a: Cable clamp robustness*

IEC 60512-17-2, *Connectors for electronic equipment – Tests and measurements – Part 17-2: Cable clamping tests – Test 17b: Cable clamp resistance to cable rotation<sup>2</sup>*

IEC 60512-17-3, *Connectors for electronic equipment – Tests and measurements – Part 17-3: Cable clamping tests – Test 17c: Cable clamp resistance to cable pull (tensile)*

IEC 60512-17-4, *Connectors for electronic equipment – Tests and measurements – Part 17-4: Cable clamping tests – Test 17d: Cable clamp resistance to cable Torsion*

IEC 61076-2-106, *Connectors for electronic equipment – Product requirements – Part 2-106: Circular connectors – Detail specification for connectors M 16 x 0,75 with screw-locking and degree of protection IP40 or IP65/67<sup>3</sup>*

ISO 1302, *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation*

### **3 Technical information**

#### **3.1 IEC type designation**

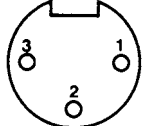
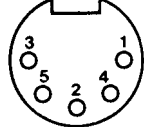
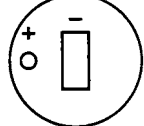
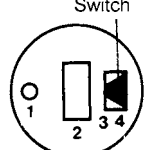
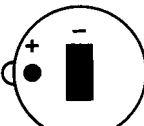
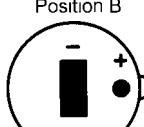

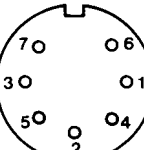
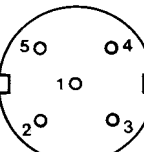
Connectors according to this part of IEC 60130 shall be designated by:

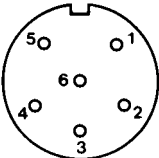
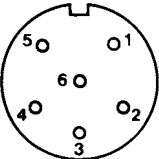
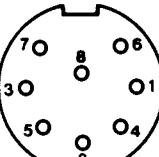
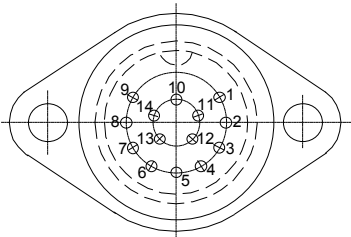
- a) the reference to this standard: 60130-9 IEC;
- b) a serial number according Table 1.

<sup>2</sup> Under consideration.

<sup>3</sup> To be published.

**Table 1 – Type designation**

Contact arrangement	Type designation	
See note 1 of 3.2	Male connector	Female connector
	60130-9 IEC-01	60130-9 IEC-02
	60130-9 IEC-03	60130-9 IEC-04
	60130-9 IEC-06	60130-9 IEC-07 60130-9 IEC-09
		60130-9 IEC-08 See note 2 of 3.2
<p>Position A</p>  <p>Position B</p>  <p>Pin connector</p>	60130-9 IEC-05 See note 2	
	60130-9 IEC-10	60130-9 IEC-11
	60130-9 IEC-12	60130-9 IEC-13
	60130-9 IEC-14	60130-9 IEC-15 60130-9 IEC-15a

Contact arrangement	Type designation	
See note 1 of 3.2	Male connector	Female connector
	60130-9 IEC-16	60130-9 IEC-17
	60130-9 IEC-19	60130-9 IEC-18
	60130-9 IEC-20	60130-9 IEC-21
	60130-9 IEC-26 Fixed connector	60130-9 IEC-27 Free connector
	60130-9 IEC-28 Free connector	60130-9 IEC-29 Fixed connector

### 3.2 Contact arrangements and connections

The contact arrangements of each type of connector are shown in Table 1.

NOTE 1 The numbering of the contacts is shown as seen on the mating face of the female connector, unless otherwise indicated.

NOTE 2 The male connector Type 05 can be inserted in a female connector Type 08 in either of the two positions A or B (see Annex C).

The switch is actuated by the short round pin 1, when the male connector is inserted in position B.

The construction of the switch shall be such that it opens properly when the round pin is inserted and spring 4 is in contact with the pin. In this position, there shall be no connection between contact 3 and the round pin.

The use of the socket connector with switch and its circuitry depends upon the switching function which is to take place when the male connector is inserted.

The circuitry shown in Annex C is suggested to illustrate the use of the switch.

## 4 Dimensional information

The dimensions in millimetres are original.

Dimensions and tolerances are given in Tables 2 up to and including Table 29.

The size and suspension system of the sockets shall be such that the insertion and withdrawal forces are in accordance with the requirements given in Clause 8.

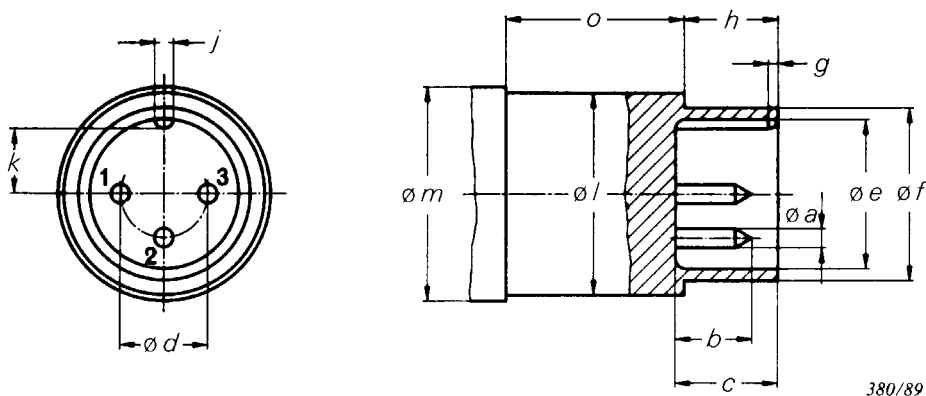
It shall not be possible to insert a wire having a diameter of 1 mm (0,04 in) either in the entry of female contacts or in the interior of the connector.

All female connectors shall have solder tags accommodating two wires having a diameter up to 0,64 mm (0,025 in).

**FREE CONNECTOR, THREE MALE CONTACTS**
**60130-9 IEC-01**

Numbering of contacts seen at the mating face

*The millimetre dimensions are original dimensions*



**Figure 1 – Free connector 60130-9 IEC-01**

**Table 2 – Free connector 60130-9 IEC-01**

Reference	mm		in	
	Max.	Min.	Max.	Min.
ø a	1,5	1,46	0,059	0,057
b	8,5	7,5	0,335	0,295
c	9,3	8,8	0,366	0,346
ø d	7,05	6,95	0,278	0,274
ø e	12,4	12,1	0,488	0,476
ø f	13,6	13,1	0,535	0,516
g	1	–	0,039	–
h	9	8,5	0,354	0,335
j	2,4	2,2	0,095	0,087
k	4,9	4,55	0,193	0,179
ø l	16,5	–	0,650	–
ø m	18	–	0,709	–
o	–	15	–	0,591

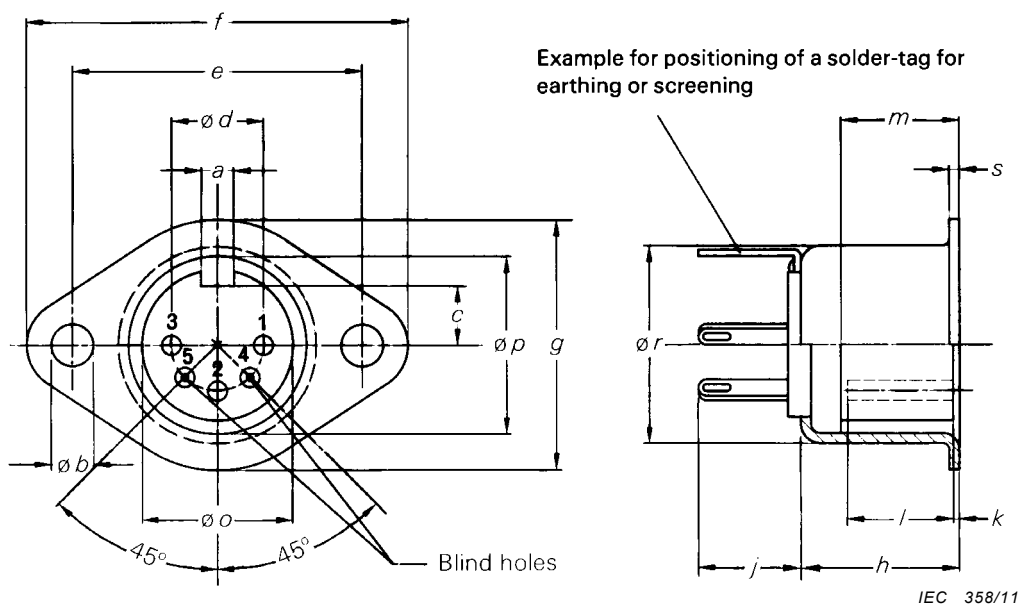
First angle projection

Date: 1989

**FIXED CONNECTOR, THREE FEMALE CONTACTS****60130-9 IEC-02**

Numbering of contacts seen at the mating face

*The millimetre dimensions are original dimensions*



**Figure 2 – Fixed connector 60130-9 IEC-02**

**Table 3 – Fixed connector 60130-9 IEC-02**

Reference	mm		in	
	Max.	Min.	Max.	Min.
a	2,7	2,5	0,106	0,098
Ø b	3,3	3,2	0,130	0,126
c	4,5	–	0,177	–
Ø d	7,05	6,95	0,278	0,274
e	22,3	22,1	0,878	0,870
f	29	–	1,142	–
g	19	–	0,748	–
h	12,6	11,9	0,496	0,469
j	8	–	0,315	–
k	1	–	0,039	–
l	–	8,7	–	0,343
m	–	9	–	0,354
Ø o	11,8	11,6	0,465	0,457
Ø p	14,0	13,8	0,551	0,543
Ø r	16,2	–	0,638	–
s (metal)	1,3	1,0	0,051	0,039
s (plastic)	3,4	3,0	0,134	0,118

First angle projection

Date: 1989

# FREE CONNECTOR, FIVE MALE CONTACTS

60130-9 IEC-03

Numbering of contacts seen at the mating face

The millimetre dimensions are original dimensions

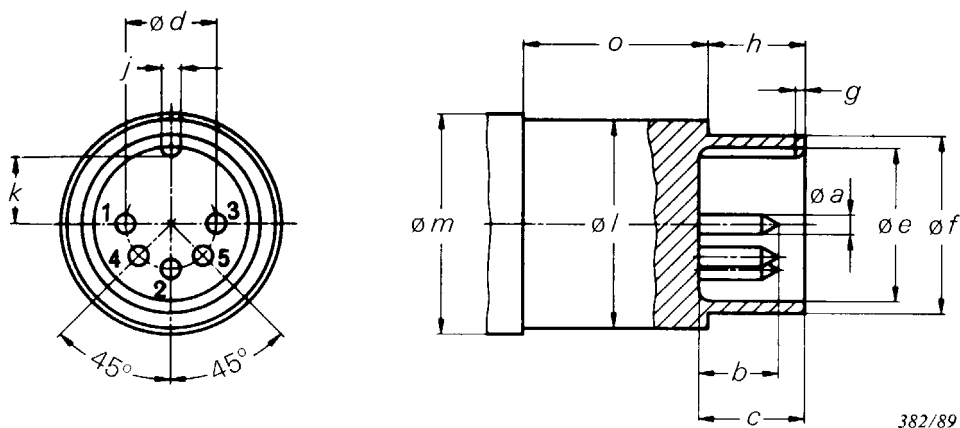


Figure 3 – Free connector 60130-9 IEC-03

Table 4 – Free connector 60130-9 IEC-03

Reference	mm		in	
	Max.	Min.	Max.	Min.
$\varnothing a$	1,5	1,46	0,059	0,057
$b$	8,5	7,5	0,335	0,295
$c$	9,3	8,8	0,366	0,346
$\varnothing d$	7,05	6,95	0,278	0,274
$\varnothing e$	12,4	12,1	0,488	0,476
$\varnothing f$	13,6	13,1	0,535	0,516
$g$	1	–	0,039	–
$h$	9	8,5	0,354	0,335
$j$	2,4	2,2	0,095	0,087
$k$	4,9	4,55	0,193	0,179
$\varnothing l$	16,5	–	0,650	–
$\varnothing m$	18	–	0,709	–
$o$	–	15	–	0,591

First angle projection

Date: 1989

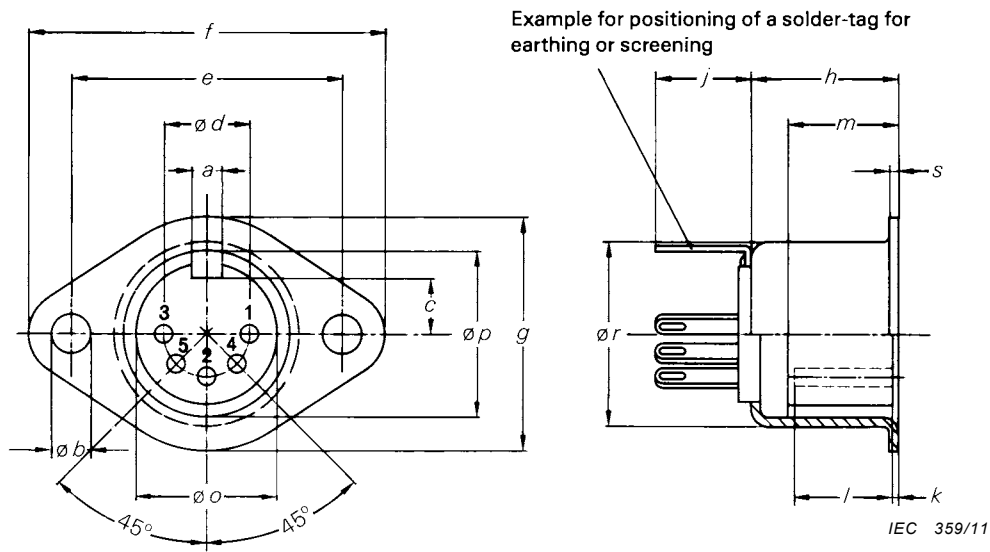


**FIXED CONNECTOR, FIVE FEMALE CONTACTS**

**60130-9 IEC-04**

Numbering of contacts seen at the mating face

*The millimetre dimensions are original dimensions*



**Figure 4 – Fixed connector 60130-9 IEC-04**

**Table 5 – Fixed connector 60130-9 IEC-04**

Reference	mm		in	
	Max.	Min.	Max.	Min.
a	2,7	2,5	0,106	0,098
∅ b	3,3	3,2	0,130	0,126
c	4,5	–	0,177	–
∅ d	7,05	6,95	0,278	0,274
e	22,3	22,1	0,878	0,870
f	29	–	1,142	–
g	19	–	0,748	–
h	12,6	11,9	0,496	0,469
j	8	–	0,315	–
k	1	–	0,039	–
l	–	8,7	–	0,343
m	–	9	–	0,354
∅ o	11,8	11,6	0,465	0,457
∅ p	14,0	13,8	0,551	0,543
∅ r	16,2	–	0,638	–
s (metal)	1,3	1,0	0,051	0,039
s (plastic)	3,4	3,0	0,134	0,118

First angle projection

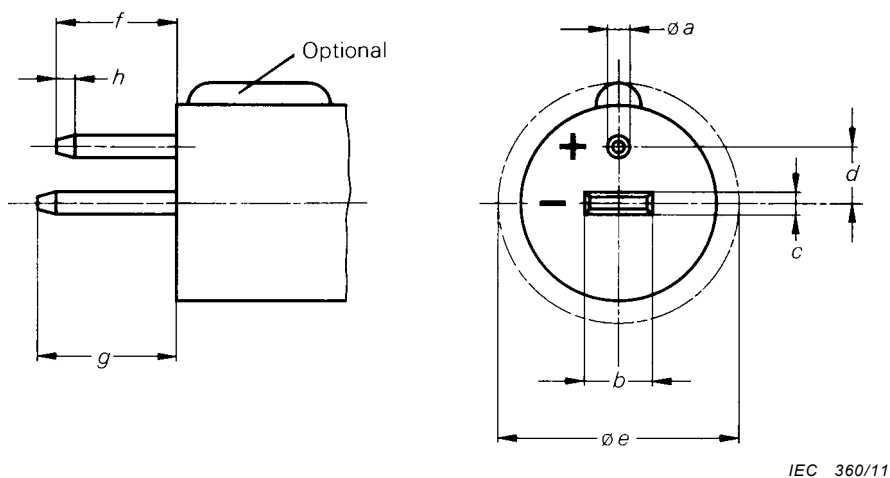
Date: 1989

# FREE CONNECTOR, TWO MALE CONTACTS

60130-9 IEC-05

Numbering of contacts seen at the mating face

*The millimetre dimensions are original dimensions*



**Figure 5 – Free connector 60130-9 IEC-05**

**Table 6 – Free connector 60130-9 IEC-05**

Reference	mm		in	
	Max.	Min.	Max.	Min.
$\varnothing a$	1,5	1,46	0,059	0,057
$b$	4,5	4,3	0,177	0,169
$c$	1,535	1,465	0,0604	0,0576
$d$	3,55	3,45	0,140	0,136
$\varnothing e$	16	–	0,630	–
$f$	8,5	8,0	0,335	0,315
$g$	9,5	9,0	0,374	0,354
$h$	1,3	0,8	0,051	0,031

First angle projection

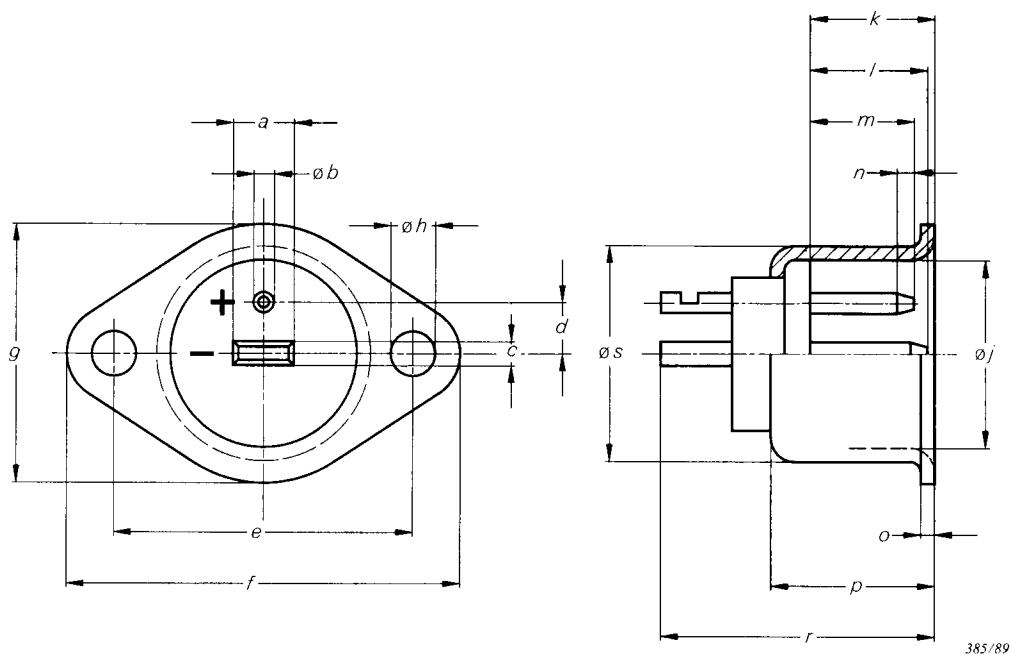
Date: 1989

**FIXED CONNECTOR, TWO MALE CONTACTS**

**60130-9 IEC-06**

Numbering of contacts seen at the mating face

*The millimetre dimensions are original dimensions*



**Figure 6 – Fixed connector 60130-9 IEC-06**

**Table 7 – Fixed connector 60130-9 IEC-06**

Reference	mm		in	
	Max.	Min.	Max.	Min.
a	4,5	4,3	0,177	0,169
Ø b	1,5	1,46	0,059	0,0574
c	1,535	1,465	0,0604	0,0576
d	3,55	3,45	0,140	0,136
e	22,3	22,1	0,878	0,870
f	29	–	1,142	–
g	19	–	0,748	–
Ø h	3,3	3,2	0,130	0,126
Ø j	14,0	13,8	0,554	0,543
k	10,0	9,5	0,394	0,374
l	9,5	9,0	0,374	0,354
m	8,5	8,0	0,335	0,315
n	1,3	–	0,051	–
o	1,3	1,0	0,051	0,039
p	12,6	11,9	0,496	0,469
r	20	–	0,787	–
Ø s	16,2	–	0,638	–

First angle projection

Date: 1989