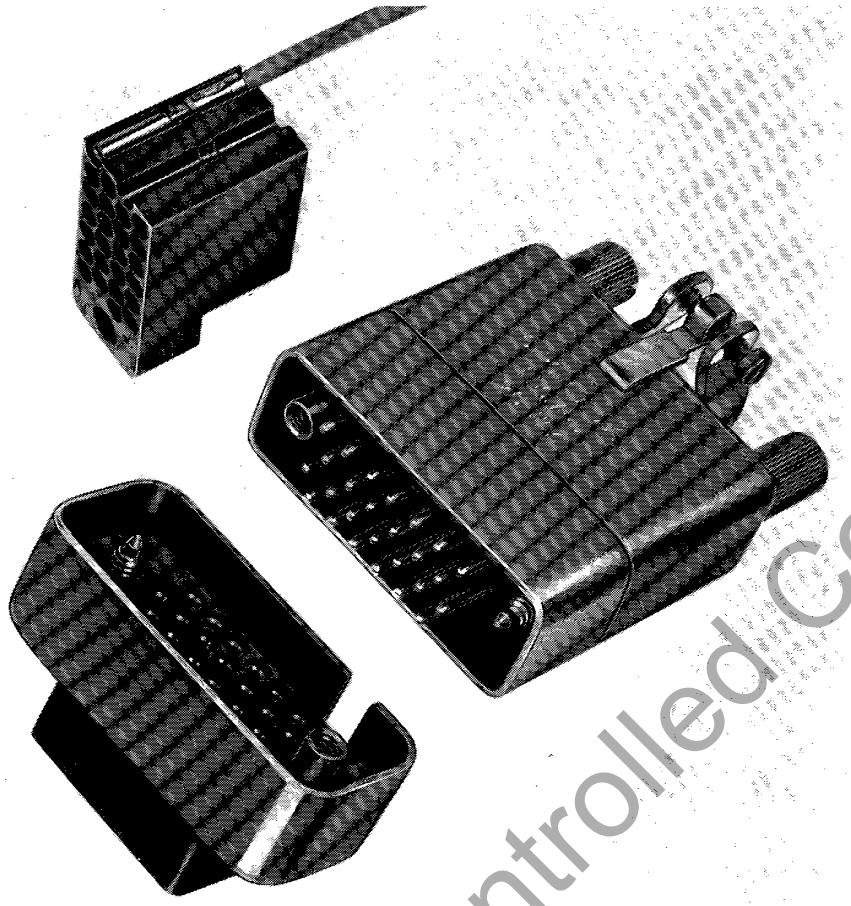
Series MRAC Removable Contact Connectors

with 14, 18, 26, 34, 50, 75 and 104 contacts
Contact diameter 0·062 inch



General Description

The MRAC is a high-reliability series of removable contact connectors designed primarily for inter-chassis applications.
Glass-filled D.A.P. mouldings provide high arc resistance, high dielectric and mechanical strength.
Closed-entry sockets minimise equipment alignment problems and preclude the possibility of contact-area damage. Easy removal and re-insertion of contacts facilitate circuit revision and final wiring after mechanical assembly. Series MRAC connectors are equally suitable for military or commercial use, and their high reliability has been proven throughout the world in high-quality professional equipment.

Specification

Contact current rating
13A per contact
(Limiting temperature 125°C per connector.)

Contact identification
Standard identification is alphabetical, except for MRAC 75 which has numerical identification

Working voltage
700 V dc

Proof voltage at sea level
2100 V dc between contacts

Moulding material
Standard moulding material is glass-filled diallyl phthalate (D.A.P.)

Temperature Range
—55°C to 125°C

Contacts
Sockets: phosphor bronze; gold over nickel or gold plate 0·0002 in
Pins: leaded commercial bronze, gold over nickel or gold plate 0·0002 in

A range of three crimp pin and socket styles to accommodate all wire sizes between 7/·004in (7/·12mm), 40/·0076in (32/·2mm),

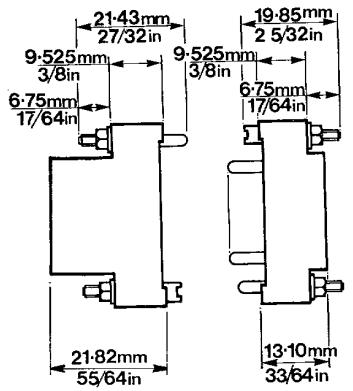
Solder and wire wrapping removable contacts are also available

Also, to accommodate co-axial cable, shielded contacts, covering a range of cable sizes are available

Shielded contacts are plated gold over copper flash

Contacts shown on pages 8 – 11 and are ordered separately.

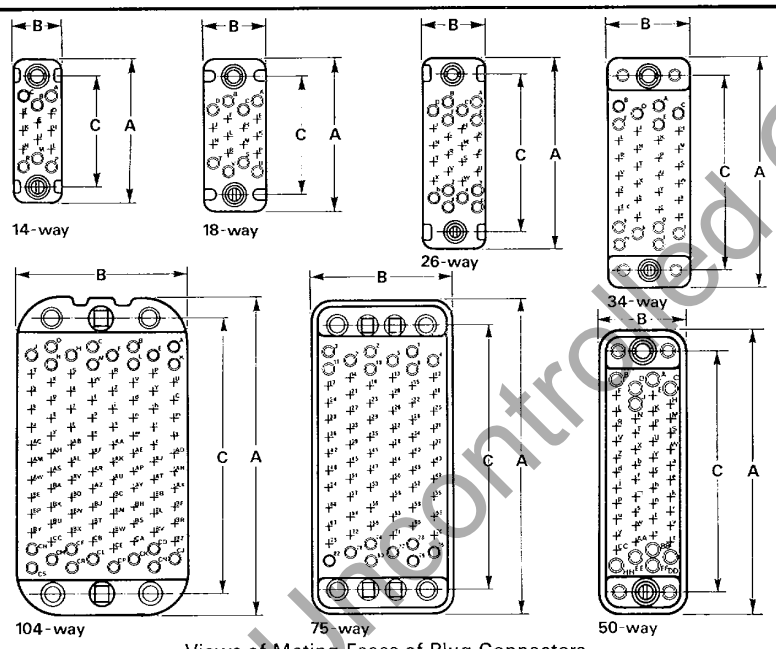
Contact arrangements and dimensions



Dimensions of GN Guides fitted to any MRAC plug or socket

GN Guides

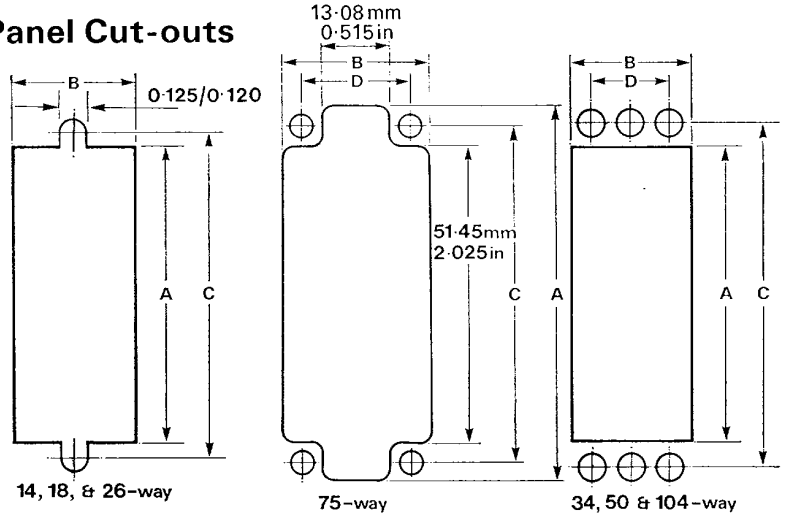
All connectors in the series can be fitted with GN-type guides, which protect the contact pins and ensure positive polarisation. They should be fitted at all times unless jackscrews are to be used. Stainless steel or spring guides are also available; if you prefer them, please replace the ordering suffix GN with GSS or GC. If guides are not required, simply omit GN from the Type number.



Views of Mating Faces of Plug Connectors

Size	A	B	C
14 in	1 1/4	7/16	0·937
way mm	31·75	11·11	23·81
18 in	1 5/16	9/16	1·000
way mm	33·34	14·29	25·4
26 in	1 5/8	9/16	1·312
way mm	41·28	14·29	33·34
34 in	2	3/4	1·688
way mm	50·8	19·05	42·86
50 in	2 23/32	7/8	2·282
way mm	69·04	22·23	57·96
75 in	2 23/32	1 15/64	2·282
way mm	69·04	31·35	57·96
104 in	2 3/4	1 17/32	2·375
way mm	69·85	38·89	60·33

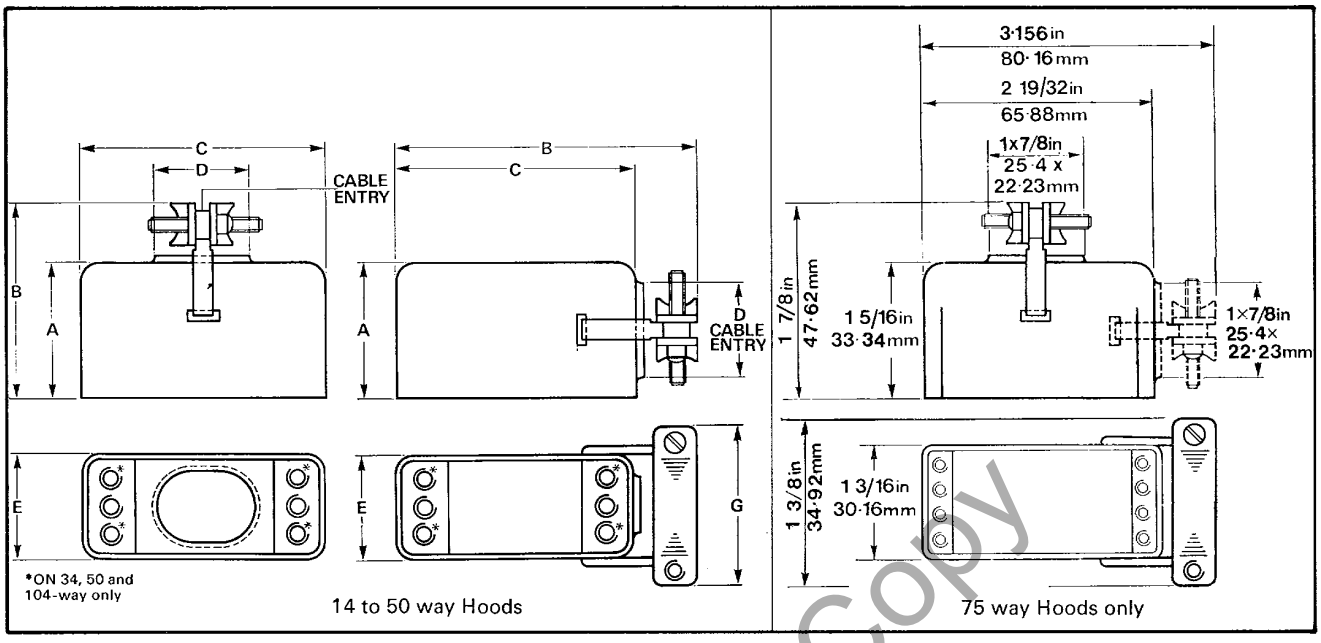
Panel Cut-outs



HOLE DIAMETERS ·120/125, except on 104 way ·145/·150

Size	A	B	C	D
14 in	0·788	0·452	0·937	—
way mm	20·00	11·48	23·81	—
18 in	0·788	0·578	1·000	—
way mm	20·00	14·68	25·4	—
26 in	1·082	0·578	1·312	—
way mm	27·5	14·68	33·34	—
34 in	1·399	0·781	1·688	0·468
way mm	35·53	19·84	42·86	11·89
50 in	1·993	0·781	2·282	0·468
way mm	50·62	19·84	57·94	11·89
75 in	2·599	1·127	2·282	0·766
way mm	66·01	28·63	57·94	19·45
104 in	2·068	1·491	2·375	0·875
way mm	52·53	37·87	60·33	22·23

Accessories for MRAC Connectors



Hoods

(anodised aluminium)

Hoods give protection to the wire connections, provide support and strain relief for the cable, and facilitate the disengagement of mated connectors.

Top Entry Hood: Type HD

Fits connector	A	B	C	D	E	G
14 way in	1	1 7/16	1 11/32	7/16 × 5/16	17/32	61/64
14 way mm	25·4	36·51	34·13	11·11 × 7·94	13·49	24·21
18 way in	1	1 7/16	1 13/32	21/32 × 15/32	21/32	1 5/64
18 way mm	25·4	36·51	35·72	16·67 × 11·91	16·67	27·38
26 way in	1	1 7/16	1 23/32	21/32 × 15/32	21/32	1 5/64
26 way mm	25·4	36·51	43·64	16·67 × 11·91	16·67	27·38
34 way in	1 1/4	1 11/16	2 3/32	3/4 × 9/16	27/32	61/64
34 way mm	31·75	42·86	53·18	16·67 × 14·29	21·43	24·21
*50 way in	1 1/4	1 11/16	2 11/16	3/4 × 9/16	27/32	61/64
*50 way mm	31·75	42·86	68·25	19·05 × 14·29	21·43	24·21
104 way in	2 1/4	2 13/16	2 27/32	1 3/8 diameter	1 5/8	1 13/16
104 way mm	57·15	61·12	72·23	34·93	41·28	46·04

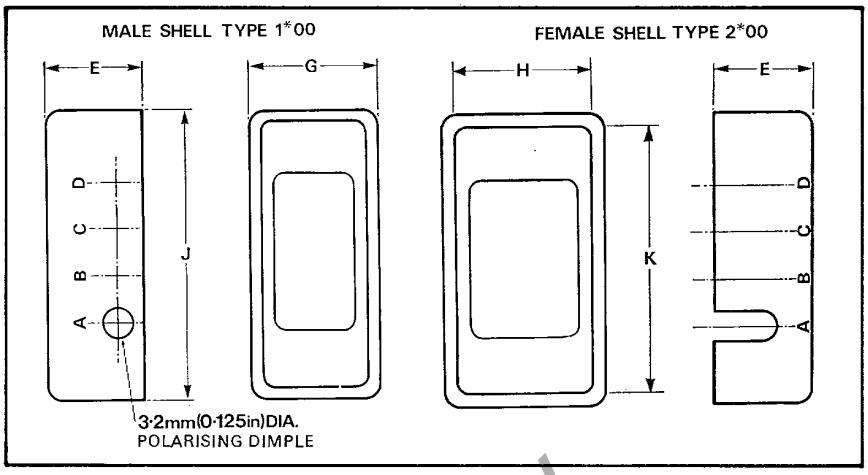
*Also available is type 50 HD LE with extra large cable entry of 9/16 × 1 1/4 in (14·29 × 31·75 mm Top Entry only.)

Side Entry Hood: Type H1–D

Fits connector	A	B	C	D	E	G
14 way in	1	1 25/32	1 11/32	7/16 × 5/16	17/32	61/64
14 way mm	25·4	45·24	34·13	11·11 × 7·94	13·49	24·21
18 way in	1	1 27/32	1 13/32	17/32 × 15/32	21/32	1 5/64
18 way mm	25·4	46·83	35·72	13·49 × 11·91	16·67	27·38
26 way in	1	2 5/32	1 23/32	17/32 × 15/32	21/32	1 5/64
26 way mm	25·4	54·77	43·64	13·49 × 11·91	16·67	27·38
34 way in	1 1/4	2 17/32	2 3/32	3/4 × 9/16	27/32	61/64
34 way mm	31·75	64·29	53·18	19·05 × 14·29	21·43	24·21
50 way in	1 1/4	3 1/8	2 11/16	3/4 × 9/16	27/32	61/64
50 way mm	31·75	79·38	68·25	19·05 × 14·29	21·43	24·21
104 way in	2 1/4	3 13/32	2 27/32	1 3/8 diameter	1 5/8	1 13/16
104 way mm	57·15	86·52	72·23	34·93	41·28	46·04

Shells
(anodised aluminium)

Shells give protection against mechanical damage to the plastic moulding, help to exclude dust and other foreign matter from the contact areas, and in most cases provide additional polarising facilities.



*Add polarisation reference A, B, C and D, if required.
The drawing shows shells polarised at position 'A' i.e. male shell 1A00 female shell 2A00

Fits connector		E	G	H	J	K
14 way	in	0·625	0·560	0·580	1·370	1·390
	mm	15·88	14·22	14·73	34·80	35·31
18 way	in	0·625	0·687	0·707	1·442	1·452
	mm	15·88	17·45	17·96	36·63	36·88
26 way	in	0·625	0·687	0·707	1·750	1·770
	mm	15·88	17·45	17·96	44·45	44·96
34 way	in	0·625	0·870	0·890	2·120	2·135
	mm	15·88	22·10	22·606	53·85	54·23
50 way	in	0·625	1·000	1·020	2·843	2·863
	mm	15·88	25·4	25·91	72·21	72·72
75 way	in	0·725	1·359	1·390	2·843	2·875
	mm	18·41	34·52	35·30	72·21	73·00
104 way	in	0·727	1·755	1·765	2·974	2·985
	mm	18·47	44·58	44·83	75·54	75·82

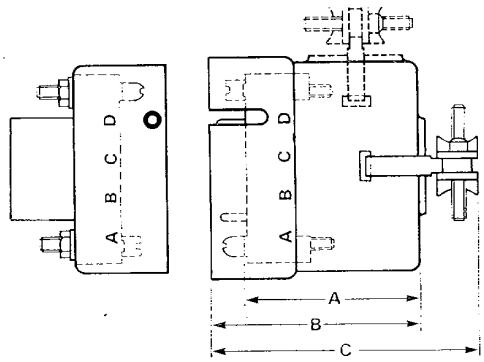
Hoods and Shells

Dimensions of hoods and shells assembled together

Fits connector		A	B	C*
14–26 way	in	$1\frac{3}{8}$	$1\frac{5}{8}$	$2\frac{1}{16}$
	mm	34·93	41·28	52·39
34–50 way	in	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{5}{16}$
	mm	41·28	47·63	58·74
75 way	in	$1\frac{11}{16}$	$2\frac{3}{64}$	$2\frac{39}{64}$
	mm	42·86	51·99	66·27
104 way	in	$2\frac{5}{8}$	$2\frac{31}{32}$	$3\frac{7}{16}$
	mm	66·68	75·39	87·31

*Top entry hoods only

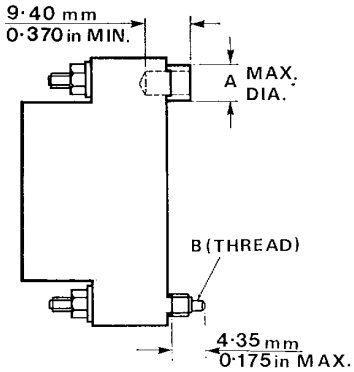
This typical plug and socket assembly shown polarised at position D



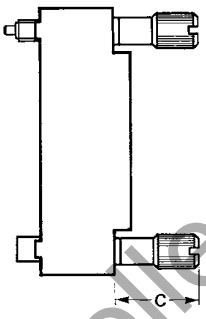
14-26, 34-50, 75 and 104 way

Jackscrews

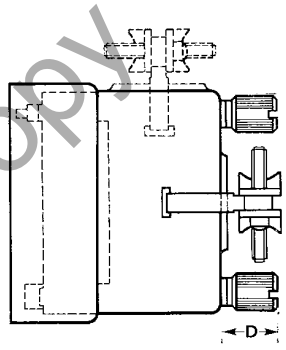
Jackscrew locking devices provide a positive method of mating and locking together two halves of a connector. They prevent accidental disconnection due to vibration or physical shock, and simplify the engagement and disengagement of connectors in confined locations. Jackscrews are manufactured from stainless steel and nickel-plated brass and are available as fixed or turnable types. The turnable types are manufactured in nickel-plated brass.



Fixed jackscrews type J2 fitted to socket

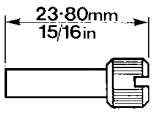


Turnable jackscrews type JT2 fitted to plug

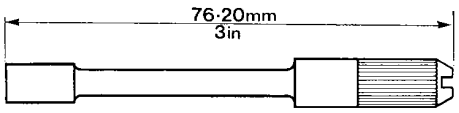


Long turnable jackscrews type JTC2 fitted to plug with hood and shell

Fits connector		A	B	C	D
14 to 75 way	in	0·195	6–32 UNC 2A	$1\frac{1}{32}$	$\frac{33}{64}$
	mm	4·85		26·19	12·7
104 way	in	0·221	8–32 UNC 2A	$\frac{31}{32}$	$\frac{3}{4}$
	mm	5·61		24·61	19·05



Short turnable jackscrew for MRAC 104 only

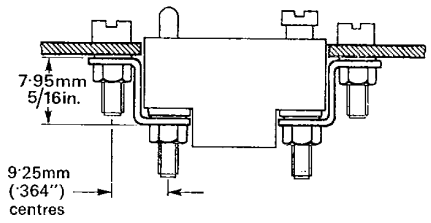


Long turnable jackscrew for MRAC 104 only

Chassis mounting brackets

(Type MRB)

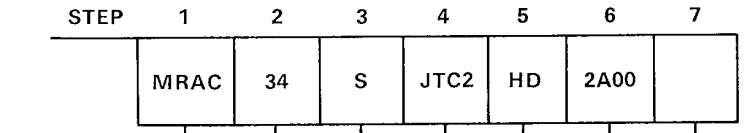
These provide a simple method of mounting an MRAC plug or socket unit on a chassis so that its mating face is flush with the surface of the chassis.



14-34 way only

Ordering information for assemblies of MRAC Connectors

(Contacts are ordered separately details shown on pages 8 to 11)



STEP 1
Insert code series

STEP 2
Number of contact positions
14, 18, 26, 34, 50, 75, 104

STEP 3
Contact designation
P – Plug Moulding
S – Socket Moulding
When mouldings are ordered separately state size of connector and in the case of a 34 or 50 way state "drilled" if to be used with long turnable jackscrews e.g. MRAC 50P (Drilled).

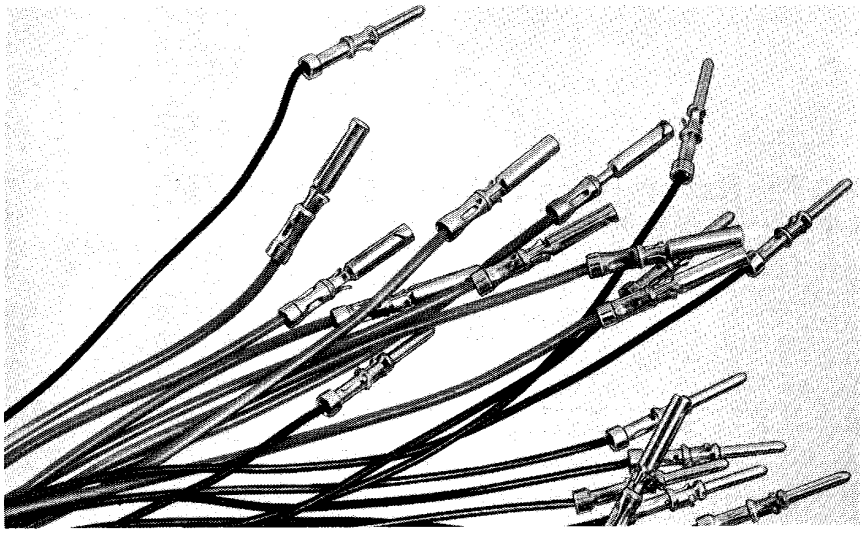
STEP 4
Guides or Jackscrews
Guides:
GN – Standard brass guides
GC – Spring guides
GSS – Stainless steel guides
Jackscrews:
J2 – Polarized fixed jackscrew and jacksocket
JT2 – Polarized short turning jackscrew and jacksocket
JTC2 – Polarized long turning jackscrew and jacksocket
When jackscrews are ordered separately state size of connector e.g. MRAC 50JTC2

STEP 5
HD – Deep drawn hood – top entry
HID – Deep drawn hood – side entry
HD/LE – Deep drawn hood – special large entry – 50-way only
When hoods are ordered separately state size of connector and "drilled" if JTC2 jackscrews are to be used e.g. MRAC 50H1D drilled.
For 75-way only state if hood is to be drilled for a plug or socket e.g. MRAC 75 H1 drilled socket.
(Side entry 75 way hood – H1)
(Top entry 75 way hood – H8)

STEP 6
Polarized shells
1 – Plug shell style 1* 00
2 – Receptacle shell style 2* 00
*Indicates polarizing position if required: A, B, C, D
When shells are ordered separately state size of connector e.g. MRAC 50 1A00 is a 50-Way Plug Shell polarized at "A".

STEP 7
Special Options

Removable Contacts for Series MRAC Connectors Contact diameter 0·062 inch



CRIMP AND SOLDER BARREL CONTACTS

General Description

Removable contacts allow quick, easy removal and replacement of any contact without disturbing another – and without discarding the connector. They offer exceptional flexibility in both the choice and revision of circuitry for rack and panel equipment at substantial savings in replacement and installation time. In addition, wiring costs are significantly lowered, as wires may be assembled away from the connector itself. Assembly of contacts to wires is further simplified by crimp type contacts. A contact is slipped on the wire, inserted in the crimping tool and crimped securely in place in seconds. Compact, and self-aligning, these removable contacts provide high retention force and exceptional mechanical and electrical reliability.

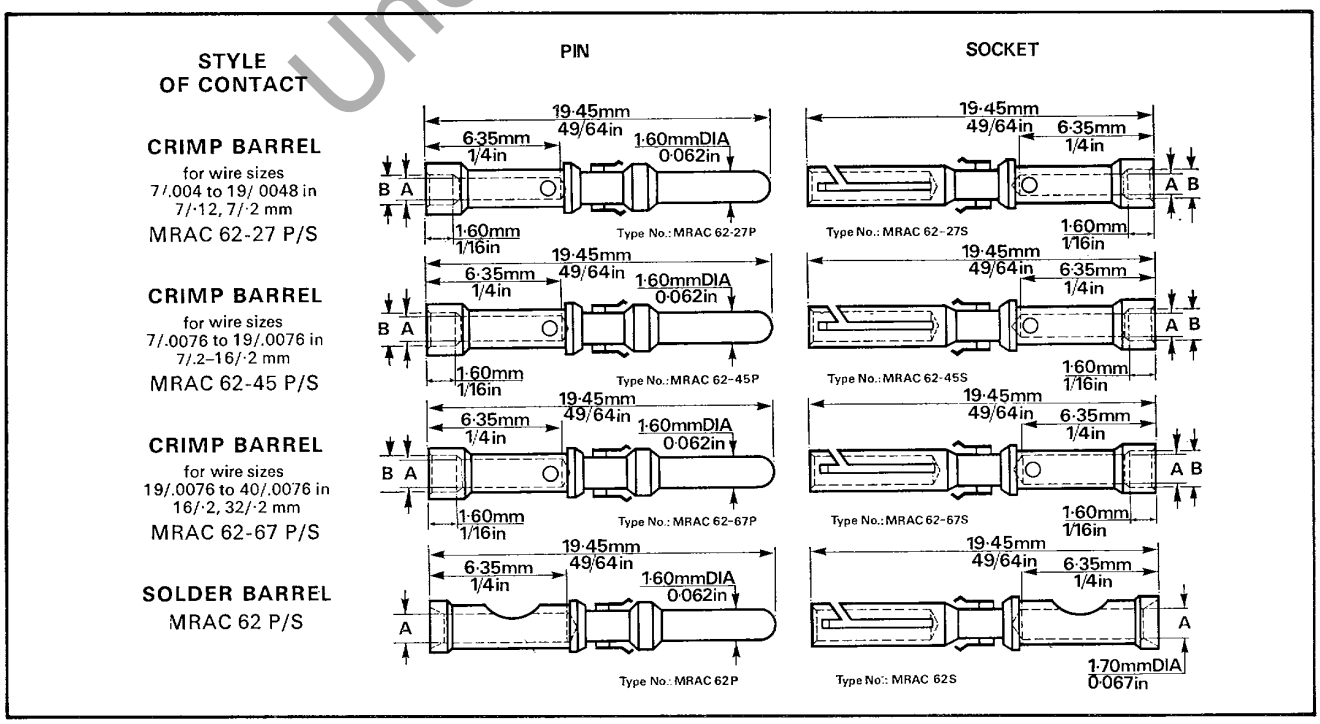
Type Number	in A	mm	in B	mm
MRAC 62-27 P/S	0·027	0·70	0·055	1·40
MRAC 62-45 P/S	0·045	1·15	0·065	1·65
MRAC 62-67 P/S	0·067	1·70	0·097	2·50
MRAC 62 P/S	0·067	1·70		

Specification

Contact current rating: 13A.
Sockets: phosphor bronze plated gold over nickel or gold plate 0·0002 in.
Pins: leaded commercial bronze plated gold over nickel or gold plate 0·0002 in.

Ordering Information

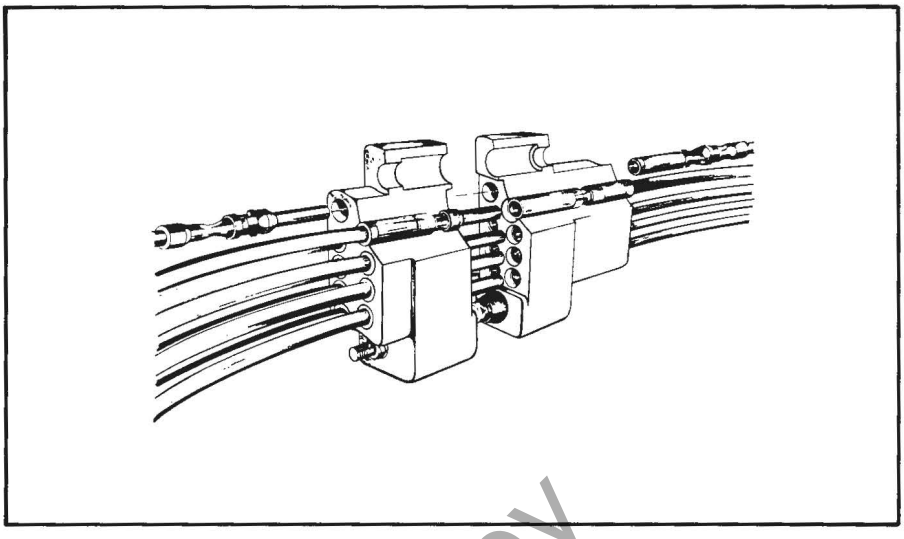
To order Series MRAC contacts, please specify the type number shown against the relevant illustration below. If heavy gold plating (0·0002 in) is required, please add '/02' to the type number, e.g. MRAC 62–27P/02.
All contacts are supplied in bags of 100.
Contacts must be ordered separately



Miniature Removable Shielded Contacts for Series MRAC Connectors

General Description

These contacts are fully interchangeable with the unshielded contacts shown opposite. Thus you can intermix power, shielded signal and signal circuits to any connector made to MIL–C–22857B. They even retrofit into existing assemblies.
In the Series MRAC design, the contact seating is recessed into the moulding, cross talk is positively eliminated, and the need for RFI backshields and other insulators is obviated. Contact-to-cable strength is equal to the maximum force sustainable by the braided shield for superior reliability.
Conforming to MS 18232, MS 18233 and MIL–C–23216



Specification

Pin Contact Assembly

① Pin contact (outer)
Phosphor bronze, QQ–B–750 gold over copper flash
② Socket contact (inner)
Beryllium copper, QQ–C–530 gold over copper flash
③ Insulating sleeve (long)
Polypropylene
④ Crimp ferrule
Beryllium copper, QQ–C–530 gold over copper flash
⑤ Retaining clip
Beryllium copper, QQ–C–533 gold over copper flash

Socket Contact Assembly

① Socket contact (outer)
Beryllium copper, QQ–C–530 gold over copper flash
② Pin Contact (inner)
Phosphor bronze, QQ–B–750 gold over copper flash
③ Insulating sleeve (short)
Polypropylene
④ Crimp ferrule
Beryllium copper, QQ–C–530 gold over copper flash
⑤ Retaining clip
Beryllium copper, QQ–C–533 gold over copper flash

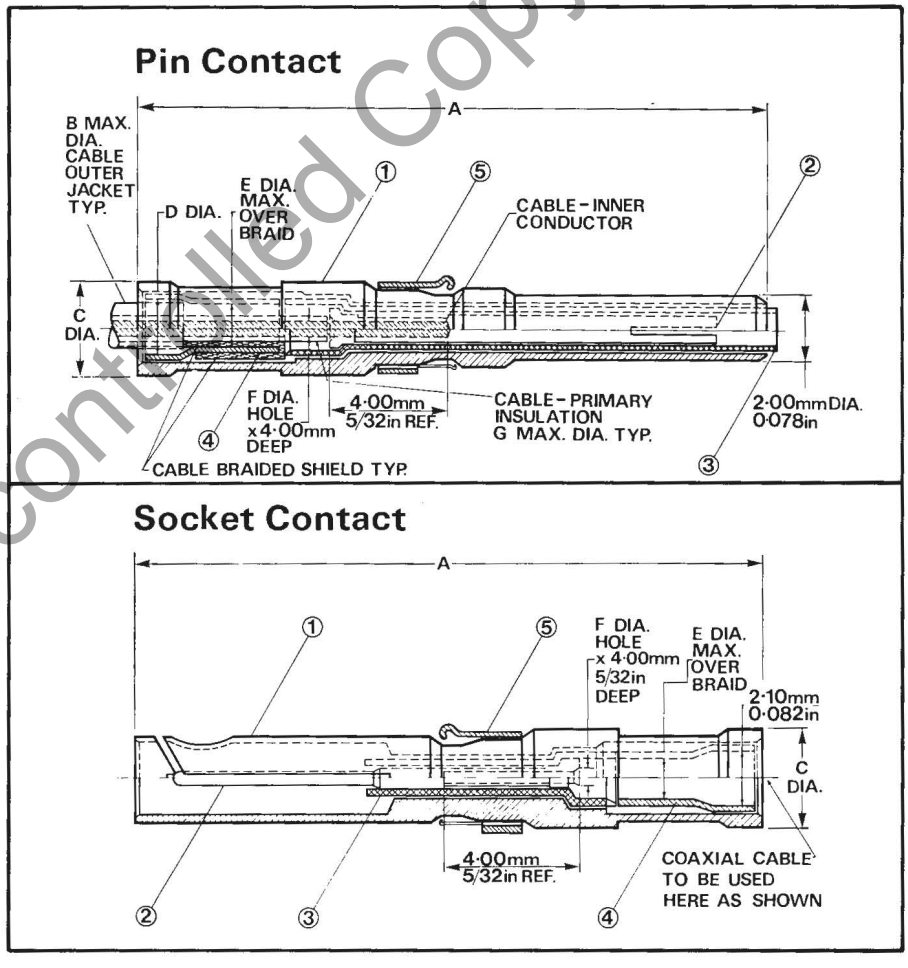
Crimping Tools

Outer Contact
Tool MS 3191 locator 613116
Inner Contact
Tool MS 611331 locator 613022

Plating

Pin and Socket Contacts:
·00005″ min. gold (MIL-G-45204) over ·00001″ copper (MIL-C-14550)

Ferrules and Retaining Clips:
·00003″ min. gold over ·00001″ copper

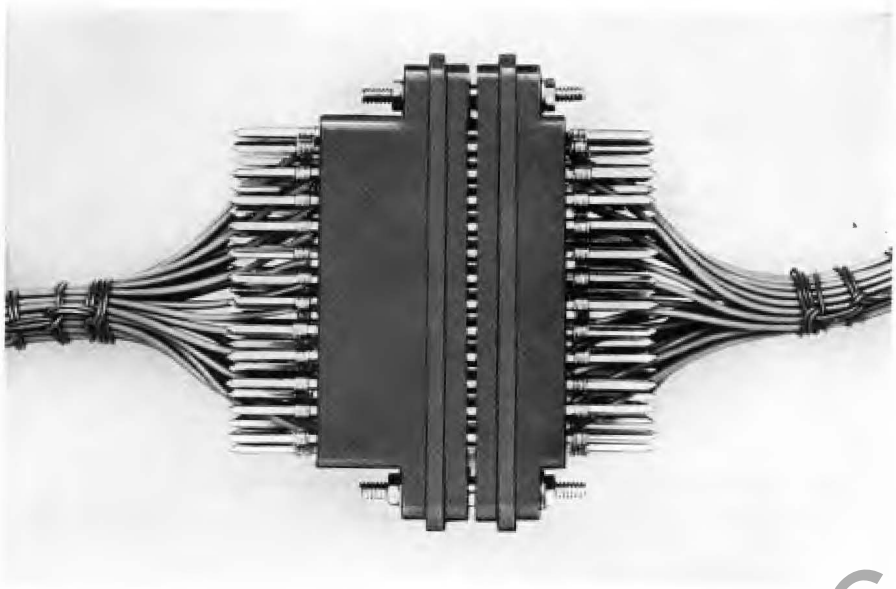


MS No.	Type No.	Style	Cable Sizes		Dimensions						
					A	B	C	D	E	F	G
MS 18232	100–8000P	Pin	RG178/U	in	51/64	·080	·120	·083	·060	·020	·036
MS 18233	100–8000S	Socket	RG196/U	mm	20·220	2·03	3·05	2·08	1·52	0·51	0·91

Ordering Information

MRAC 100 - 8000P Pin
MRAC 100 - 8000S Socket

MRAC Wire-wrapping Removable Contacts



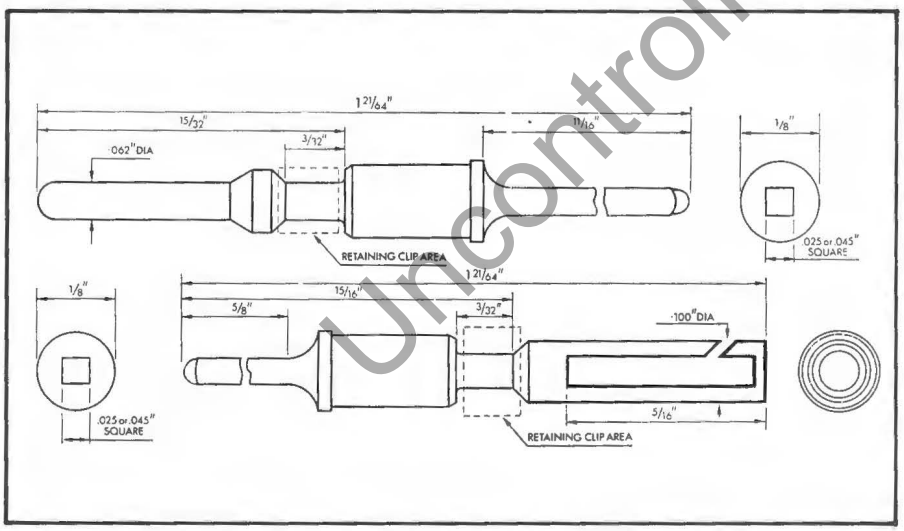
General Description

Wire wrapping contacts are fully inter-mateable with other MRAC contacts – crimped or soldered terminated.
Wire wrapping contacts simply push-fit into standard MRAC mouldings, and the only additional items requiring to be stocked are the contacts themselves. Contacts are available separately, or mouldings can be supplied completely or partially equipped with contacts, to suit individual specifications. Being standard, any MRAC moulding can accommodate a mixture of wire wrapped, crimped, soldered and screen terminated contacts if required.

Specification

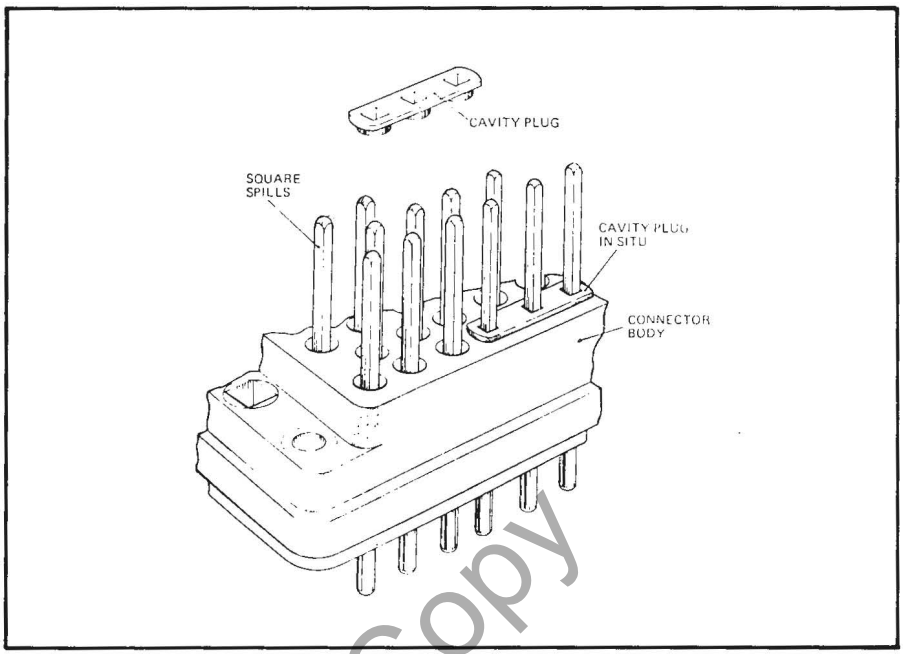
Contact diameter
0·062in
Post sizes
0·025in square × 0·530in long
0·045in square × 0·530in long
Wire sizes
24-30 AWG, 25-33 SWG
Current rating
13A maximum per contact
Material
Phosphor bronze
Plating
Gold over nickel or 0·0002in gold
Pull-off force and contact resistance:
0·045in spills wrapped with 25SWG wire exhibit average pull-off forces of 15 lbf (Defence Guide 5029 requires 7 lbf minimum); average contact resistance of 1m Ω; and negligible contact resistance variation.
0·025in spills wrapped with 33SWG wire exhibit average pull-off forces of 6 lbf; contact resistance of 2·8m Ω; and no resistance variation.
These results conform to Ministry of Aviation Specification RRE 33185.

Contact dimensions



Assembly

Wire wrapping contacts snap-in simply and positively to any MRAC Series moulding to form a reliable and permanent connector assembly. Cavity plugs are available if required for fitting over the contact spills to prevent them turning during wrapping, but they should not be necessary if a good quality wrapping tool is used.



For satisfactory results, Flexicon Systems recommend the use of the following Gardner Denver tools; however, specificatons are subject to change without prior notice and we would welcome the opportunity of discussing your wire wrapping application with you.

0·025in square spill

WIRE GAUGE	BIT	SLEEVE	WRAP	No. OF TURNS OF BARE WIRE
30 AWG } 33 SWG }	507573	507100	Modified	8

0·045in square spill

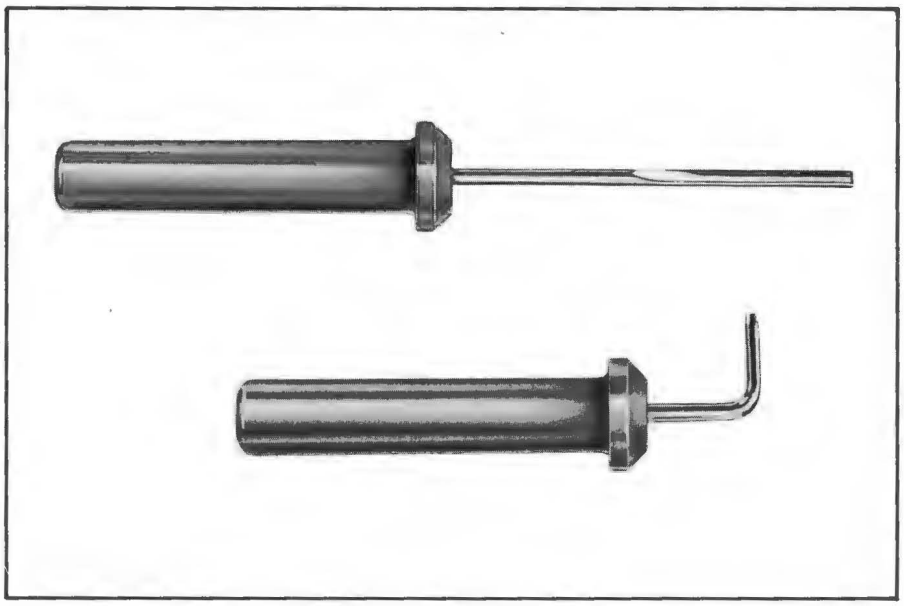
24 AWG }	26263	18840	Modified	5
25 SWG }	501696	18840	Standard	5
26 AWG }	502118	512056	Modified	6
27 SWG }	504910	512056	Standard	6
28 AWG }	505412	512056	Modified	7
30 SWG }	505373	512056	Standard	7
30 AWG } 33 SWG }	501194	502129	Modified	8

Ordering Information

If 0·0002in gold plating is required, add /02 after the ordering code.
Wire wrap contacts are supplied in bags of 100.

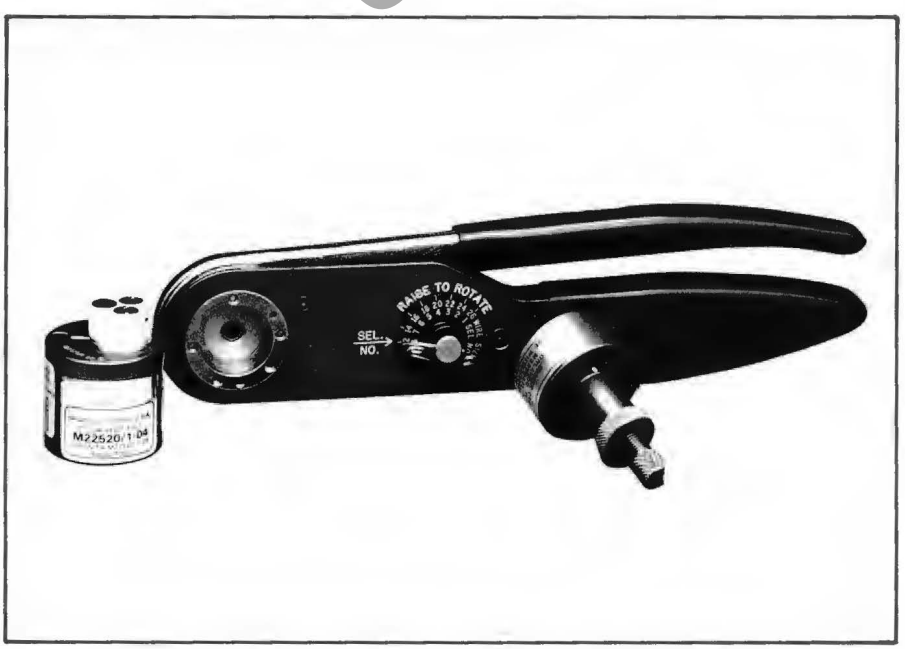
			Ordering Code
Contacts:	0·025in spill	socket pin	MRAC 8113-25S MRAC 8114-25P
	0·045in spill	socket pin	MRAC 8105-45S MRAC 8106-45P
Cavity plugs:	for 0·025in spill	2 contact type 3 contact type	MRAC NRK 25/2 MRAC NRK 25/3
	for 0·045in spill	2 contact type 3 contact type	MRAC NRK 45/2 MRAC NRK 45/3

Assembly Tools for MRAC Connectors



Contact insertion tools

Contact removal tool



Hand crimping tool

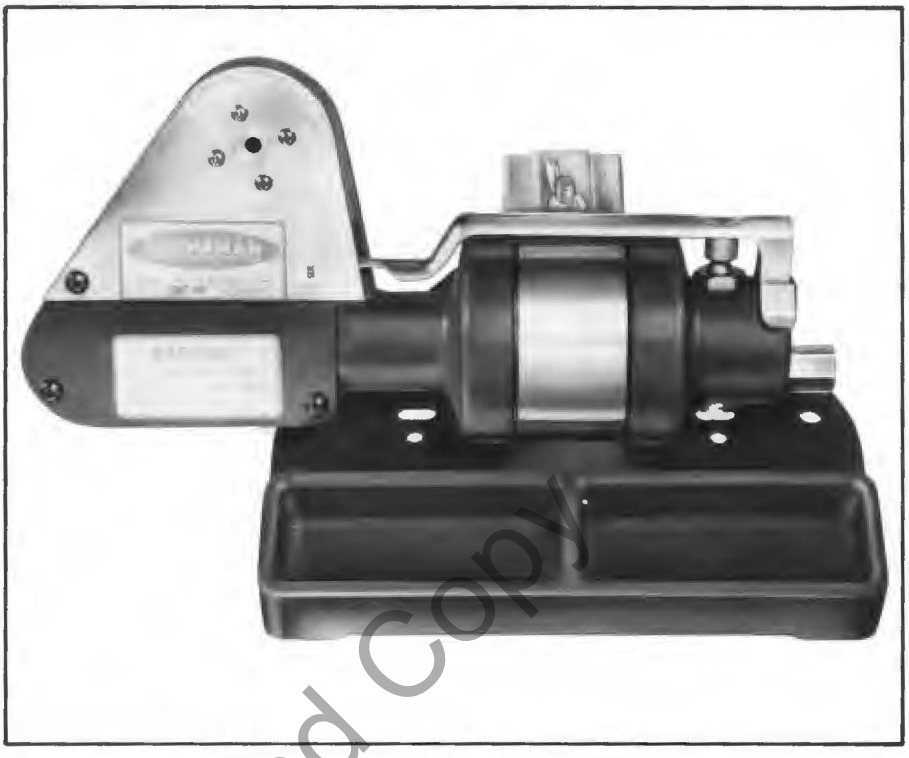
D.M.C. Type AF8 (M22520/1-01)

Suitable for all MRAC crimp contacts.
Suitable turret M22520/1-03.
GO/NOGO gauge pin should be ordered separately Ref. M22520/3-1.

Semi-Automatic Crimping Tool

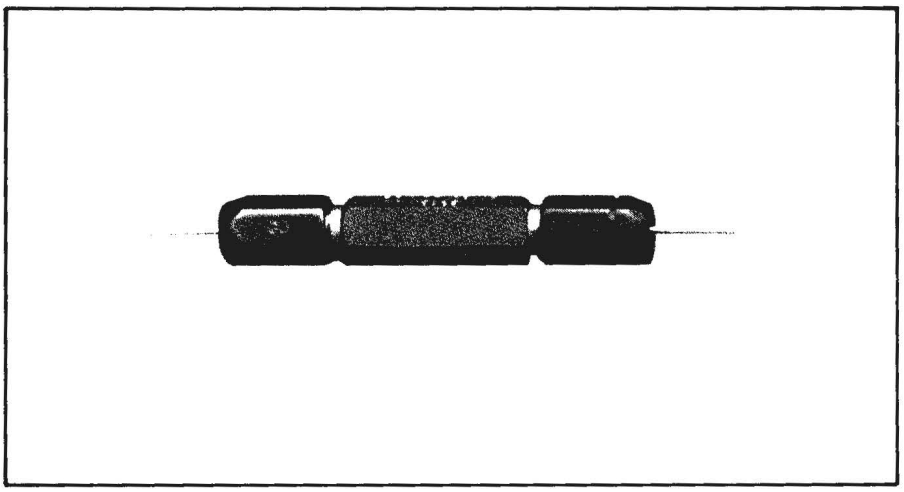
(Manual Feed)

No. 611221
Suitable for series MRAC 62–27, 62–45 and 62–67 contacts.
Crimp depths automatically controlled by using desired magazine (ordered separately).
Suitable for bench mounting.
Requires 80–120 psi air supply.



Semi-Automatic Bench Mounted Crimping Tool

No. 611148
Similar to above, but the contacts are automatically fed from a reel and it may be operated by a foot valve (both ordered separately). Depth blocks accurately control crimp depth.
Also suitable for bench mounting.
Requires 80-120 psi air supply.



Gauge Pin

M22520/3-1

Periodic gauging is recommended. To ensure accurate calibration select position '4' on hand tool and check indenting closure with GO/NOGO gauge.

Hand Crimping Tool M22520/1-01 Turret M22520/1-03		
Flexicon Contact	Wire Range	Hand Tool Selector Position
62/27P 62/27S	7/·12mm–7/·20mm	4-4
62/45P 62/45S	7/·20mm–16/·20mm	4-6
62/67P 62/67S	16/·20mm–32/·20mm	6-7