

PRODUCT SPECIFICATION 02-09

1.0 SCOPE

1.1 This specification covers the .093 diameter pin and socket terminal product line with their associated connector housings designed for use on copper wire.

2.0 PRODUCT DESCRIPTION

2.1 The product line described in general terms is found in catalog M200. The standard connector is made in 1, 2, 3, 4, 5, 6, 9, 12, and 15 circuit sizes. Connector plugs and receptacles are nylon and provided with optional mounting ears for snap-in panel mounting. The housing accepts wire ranges 30 thru 14 AWG wires and insulation diameter range of .030 thru .160 inches.

2.2 Besides the standard connector housing, a special housing is available that has .250" center to center spacing between terminals and is approved for use in the European market (VDE). The connector is made in 3, 6, 9 and 15 circuit sizes. Terminals are identical to standard housing terminals.

3.0 RECOGNIZED AGENCY APPROVALS

3.1 Underwriters' Laboratories: E29179

3.2 Canadian Standards Association: 19980

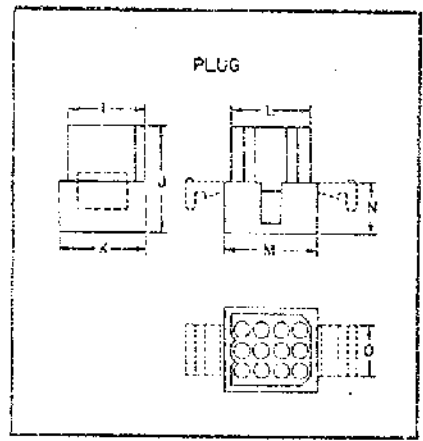
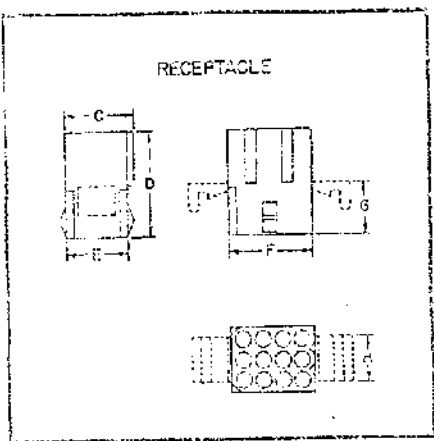
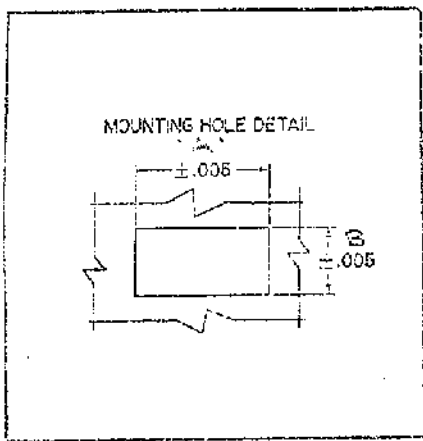
3.3 European Standards Association: VDE approval (Connector mentioned in 2.2 only)

REVISIONS A REUSED # 10-28-71 HC/4/4 B SALES/4/4 C X-RELEASE 10-28-71 D 10-28-71 E 10-28-71 F 10-28-71 G 10-28-71 H 10-28-71 I 10-28-71 J 10-28-71 K 10-28-71 L 10-28-71 M 10-28-71 N 10-28-71 O 10-28-71 P 10-28-71 Q 10-28-71 R 10-28-71 S 10-28-71 T 10-28-71 U 10-28-71 V 10-28-71 W 10-28-71 X 10-28-71 Y 10-28-71 Z 10-28-71	UNLESS OTHERWISE SPECIFIED TOLERANCES: 3-PLACE DEC. DIMS ± .008 2-PLACE DEC. DIMS ± .010 FRACTIONAL DIMS ± 1/64 ANGULAR ± 1/2°  DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS, UNLESS OTHERWISE SPECIFIED.  DO NOT SCALE DRAWING	.093 STANDARD PIN TERMINALS MOLEX PRODUCTS CO. DOWNERS GROVE, ILL. 60515, U.S.A.	DATE 4/27/71
			PS. -02-09

4.0 MECHANICAL SPECIFICATIONS

4.1 Materials, dimensions

4.1.1 Standard .198" Center to center spacing on Nylon connector housing

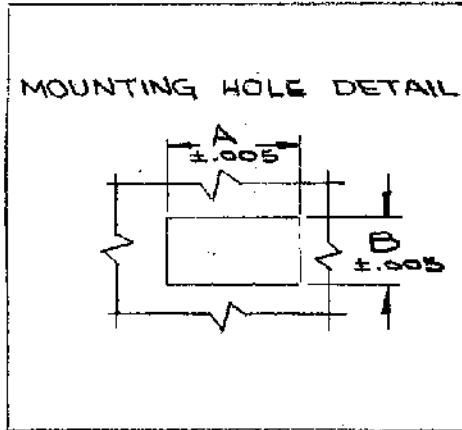


ENG. NO.	1619		1545		1396		1490		1653		1261		1292		1360		1375	
NO. OF CIRCUIT	1		2		3		4		5		6		9		12		15	
	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P
A	N/A	N/A	.725	.800	.840	.933	1.038	1.131	N/A	N/A	.718	.750	.828	.937	1.050	1.155	1.240	1.343
B	N/A	N/A	.312	.375	.312	.375	.312	.375	N/A	N/A	.600	.695	.725	.725	.655	.760	.655	.760
C	.234 Dia.		.250		.234		.236		.234		.632		.625		.633		.632	
D	.990		1.000		1.031		1.000		1.000		1.031		1.031		1.031		1.031	
E	N/A		.250		.234		.236		.234		.632		.625		.633		.632	
F	N/A		.536		.671		.868		1.066		.434		.666		.870		1.067	
G	N/A		.442		.442		.437		.437		.442		.442		.442		.442	
H	N/A		.250		.234		.236		N/A		.562		.562		.562		.562	
I	.241 Dia.		.257		.240		.338		.250		.734		.634		.634		.629	
J	.968		.968		.968		.968		.968		.968		.968		.968		.968	
K	.353 Dia.		.352		.338		.338		.343		.733		.730		.737		.734	
L	N/A		.531		.566		.864		1.066		.536		.775		.975		1.169	
M	N/A		.640		.773		.971		1.171		.536		.775		.975		1.169	
N	N/A		.421		.421		.421		.421		.421		N/A		.421		.421	
O	N/A		.250		.244		.245		N/A		.562		.562		.562		.562	

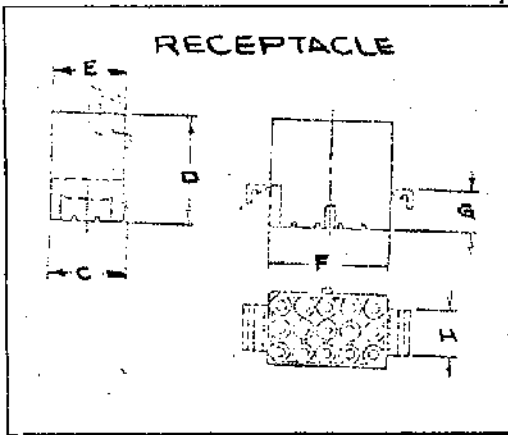
Dimensions subject to nominal variation N/A—Not Applicable.  
Dimensions C to O are included for reference only.

SEE SHT. 1 FILMED MICROFILMED D 22 JAN 74 C 10-8-13 E 16-28-71 REVISIONS	UNLESS OTHERWISE SPECIFIED TOLERANCES: 9-PLACE DEC. DIMS ±.005 2-PLACE DEC. DIMS ±.010 FRACTIONAL DIMS ±1/64 ANGULAR ±1/2°  DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS. UNLESS OTHERWISE SPECIFIED.  DO NOT SCALE DRAWING	SCALE 2	.093 STANDARD PIN TERMINALS	
		DRAWN BY CHK'D BY 4/m	MOLEX PRODUCTS CO. DOWNERS GROVE, ILL. 60515, U.S.A.	
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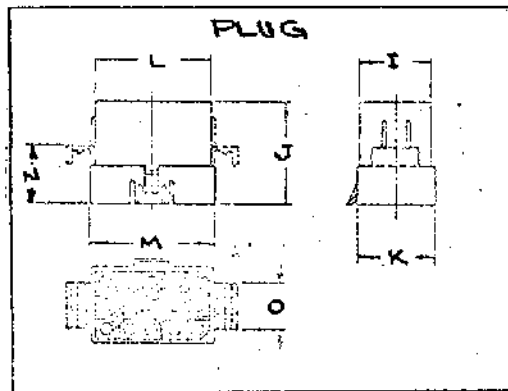
4.1.2 Special .250-inch center to center spacing molded Nylon connectors



	1991-3		1991-6		1991-9		1991-15	
	R	P	R	P	R	P	R	P-2
A	.920	1.022	.946	1.048	.946	1.048	1.442	1.552
B	.310	.365	.608	.658	.850	.910	.850	.910
C	.300		.59		.83		.83	
D	1.14		1.14		1.14		1.14	
E	.250		.54		.79		.79	
F	.76		.79		.79		1.28	
G	.45		.44		.44		.44	
H	.25		.37		.50		.50	
I	.254		.54		.79		.79	
J	1.10		1.10		1.10		1.10	
K	.35		.64		.89		.89	
L	.760		.79		.79		1.28	
M	.862		.89		.89		1.39	
N	.422		.42		.42		.63	
O	.25		.37		.50		.50	



Dimensions C thru O are subject to nominal variation and are given for reference only.



F SEE SAT. 1	MICROFILMED	D 22-446-74	C 110-8-73	REVISIONS	UNLESS OTHERWISE SPECIFIED TOLERANCES: 3-PLACE DEC. DIMS ±.005 2-PLACE DEC. DIMS ±.010 FRACTIONAL DIMS ±1/64 ANGULAR ±1/2°	DRAWN BY: ERL	CHECKED BY: JAM	SCALE: 1/4" = 1"	.093 STANDARD PIN TERMINALS	
									MOLEX PRODUCTS CO.	
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS. UNLESS OTHERWISE SPECIFIED.						MOLEX		PS -02-09		
DO NOT SCALE DRAWING						DOWNERS GROVE, ILL. 60515, U.S.A.		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO THE MOLEX PRODUCTS COMPANY AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.		

.093 STANDARD PIN TERMINALS

4.1.3 Terminals: Refer to sales drawing 02-09-\* (SD-1190 Series)

4.2 Ambient temperature range: -40°C to 105°C.

4.3 Humidity:

4.3.1 Test method - exposure period shall be 96 hours with a 95% to 100% relative humidity and a temperature of 100° ± 5°F. A one ampere current shall be placed through a male/female assembly within one hour after removing from the Humidity Chamber. (18 AWG stranded wire).

4.3.2 Requirement - the maximum MV drop across both terminals shall be 15 MV. The probe should be placed on the wire approximately 1" from the crimp barrel.

4.4 Engage/Disengage Forces for standard terminal (.010 stock 70/30 brass):

4.4.1 Initial typical plug and receptacle - Engage/Disengage forces:

Single Circuit	ENGAGE	DISENGAGE	ENGAGE (lbs.)		DISENGAGE (lbs.)	
			Min.	Max.	Min.	Max.
2 circuit	3.5 Tbs.	2.75 lbs.	2.	6.4	.9	5.6
3 circuit	7.0	5.5				
4 circuit	10.5	8.25				
5 circuit	14.0	11.0				
6 circuit	17.5	13.75				
9 circuit	21.0	16.5				
12 circuit	31.5	24.75				
15 circuit	42.0	33.0				
	52.5	41.25				

NO DIMPLE

WITH DIMPLE

4.4.2 Terminal Insertion and Retention in Connector Housing.

(E)      INSERTION      RETENTION

Male & Female 3 Lbs. 8 Ozs. Max. 20 Lbs. Min.

4.5 Terminal crimp strength - a minimum pull out force in pounds is given in the following table for various wire sizes (AWG).

WIRE GAGE	14	16	18	20	22	24	26	28	30
PULL OUT FORCE (LBS.)	35	30	25	15	10	8	5	3	2

5.0 ELECTRICAL SPECIFICATIONS

5.1 Rated Voltages, Currents

5.1.1 Standard Housings

Catalog Number	Configuration	No. of Circuits	Plug		Receptacle				*Per Circuit	
			WITH EARS	WITHOUT EARS	WITH MTS. EARS ONLY	WITH HOLDING TABS ONLY	WITH EARS AND TABS	WITHOUT EARS OR TABS	Max. Amp.	Max. Volts
1619	Plug	1		P					12	250
1619	Receptacle	1				R			12	250
1545	Plug	2	P	P-1					12	250
1545	Receptacle	2				R-1	R		12	250
1396	Plug	3	P	P-1					12	250
1396	Receptacle	3				R-1	R		12	250
1490	Plug	4	P	P-1					9	250
1490	Receptacle	4				R-1	R		9	250
1653	Plug	5		P-1					9	250
1653	Receptacle	5				R-1			9	250
1261	Plug	6	P	P-1					9	250
1261	Receptacle	6			R-1		R	R-2	9	250
1292	Plug	9	P	P-1					9	250
1292	Receptacle	9			R-1	R-3	R	R-2	9	250
1360	Plug	12	P-1	P					7.5	250
1360	Receptacle	12			R			R-1	7.5	250
1375*	Plug	15	P-2						7.5	250
1375	Receptacle	15			R				7.5	250

\*Also available with pull tabs and without mounting ears (P)

\*For 30° C. Rise

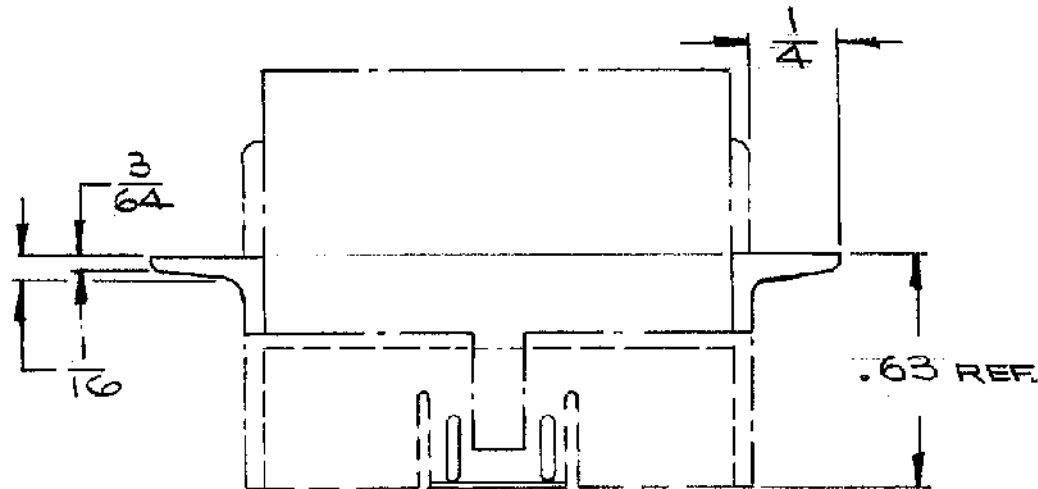
F SEE SHT. 1	FILMED MICROFILMED	D 22-JAN-74	C 10-8-73	B 10-28-71	REVISIONS	UNLESS OTHERWISE SPECIFIED TOLERANCES: 3-PLACE DEC. DIMS ± .008 2-PLACE DEC. DIMS ± .010 FRACTIONAL DIMS ± 1/64 ANGULAR ± 1/2°	SCALE 2	.093 STANDARD PIN TERMINALS		
						DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS, UNLESS OTHERWISE SPECIFIED.	CHKD BY JHM	MOLEX PRODUCTS CO.		DATE 4/27/71
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5.1.2 Special .250 spacing housings

PS-02-09

CATALOG NUMBER	CONFIGURATION	NO. OF CIRCUITS	PLUG			RECEPTACLE		* PER CIRCUIT	
			WITH MOUNTING EARS	WITH PULL TABS	NEITHER	MOUNTING EARS		MAX. AMP	MAX. VOLT
						WITH	WITHOUT		
1991-3	Plug	3	P		P-1			11	600
1991-3	Rec.	3				R	R-1	11	600
1991-6	PLUG	6	P		P-1			*9	600
1991-6	REC	6				R	R-1	*9	600
1991-9	Plug	9	P		P-1			8	600
1991-9	Rec.	9				R	R-1	8	600
1991-15	Plug	15	P-2	P				6	600
1991-15	Rec.	15				R	R-1	6	600

\* For 30<sup>0</sup> C. Rise



PULL TAB DETAIL

F SEE SHIP. Z MICROFILMED D 22 JAN 74 C 10-8-73 B 10-28-71 REVISIONS	UNLESS OTHERWISE SPECIFIED TOLERANCES: 3-PLACE DEC. DIMS ± .005 2-PLACE DEC. DIMS ± .010 FRACTIONAL DIMS ± 1/64 ANGULAR ± 1/2°	SCALE DRAWN BY ER CHECKED BY HM	.093 STANDARD PIN TERMINALS	
	DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS, UNLESS OTHERWISE SPECIFIED. DO NOT SCALE DRAWING		MOLEX PRODUCTS CO.	DATE 5-14-73
	DOWNERS GROVE, ILL. 60515, U.S.A.		PS-02-09	

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5.2 Terminal Resistance (Voltage Drop) MV Drop/Amp.

- 1) 1st Terminal Engagement 3.0 MV ± 10%
- 2) 10th Terminal Engagement 3.1 MV ± 10%

The voltage drop includes the mated terminals plus both crimps. The probe should be placed on the wire approximately 1" from the crimp barrel. (18 AWG stranded wire).

5.3 High Voltage Test

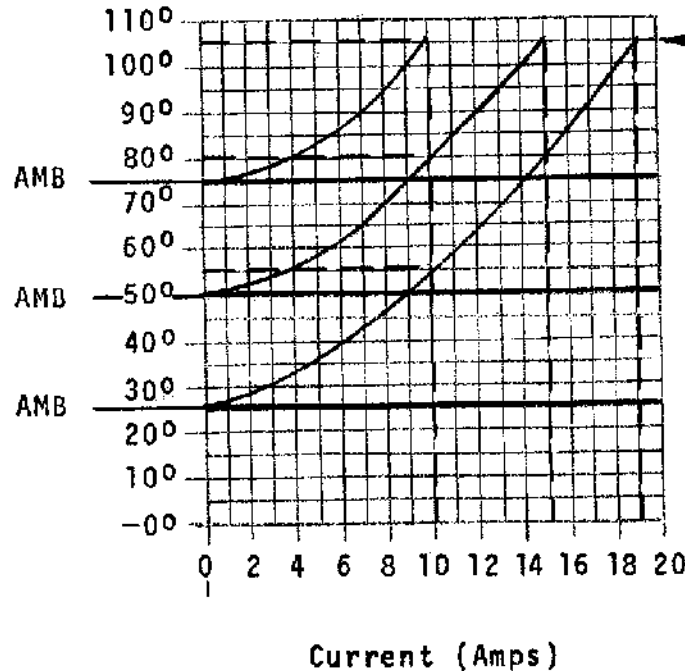
Terminals mounted in a connector must withstand 1500 volts RMS applied between adjacent terminals for 60 seconds without breakdown.

Reference: QC Spec M-50-001

F SEE SMT. 1	FILMED MICROFILMED	D 22 JAN-74	C 10-8-73	B 10-28-71	REVISIONS	UNLESS OTHERWISE SPECIFIED TOLERANCES: 3-PLACE DEC. DIMS ± .005 2-PLACE DEC. DIMS ± .010 FRACTIONAL DIMS ± 1/64 ANGULAR ± 1/2°	SCALE	2	.093 STANDARD PIN TERMINALS	MOLEX PRODUCTS CO.	DATE	4/27/71
							CHKD BY	W			DOWNERS GROVE, ILL. 60515, U.S.A.	PS -02-09
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS, UNLESS OTHERWISE SPECIFIED.						DO NOT SCALE DRAWING	THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO THE MOLEX PRODUCTS COMPANY AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.					

5.4 Heat Rise vs. Current to 105°C/221°F. (Typical temperatures for 1360 Connector, same current all circuits, 14 AWG wire)  
Applications requiring current levels over the recommended values in 5.1 are possible. However, those applications must be reviewed by Molex before any recommendations can be made.

°C Heat Rise over ambient



Housing insulation rating for Nylon Zytel 101

A	F SEE SHIT 1	FILMED MICROFILMED	22-JAN-74	ADDED THIS PAGE 18 OF 8 X REL 2290X 10-873 JHL	UNLESS OTHERWISE SPECIFIED TOLERANCE: 3 PLACE DEC. DIMS ± .008 2 PLACE DEC. DIMS ± .010 1 PLACE DEC. DIMS ± .015 ANGULAR 1/2° DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS UNLESS OTHERWISE SPECIFIED. DO NOT SCALE DRAWING.		TITLE .093 STANDARD PIN TERMINALS		
					REVISIONS	DRWG. BY J.H.L.	CHK'D BY	MOLEX INCORPORATED LISLE, ILL. 60532 U.S.A.	DATE 10/8/73
					LTR	APP'D BY <i>[Signature]</i>	SCALE <i>[Signature]</i>	PART NO.	ENG. NO. PS/-02-09

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