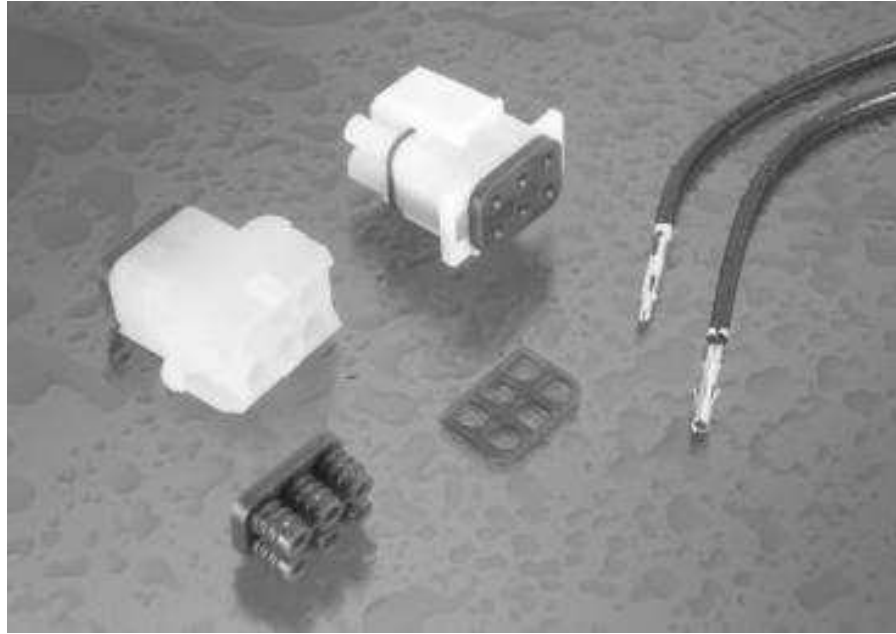


## Splash Proof/Sealed Universal MATE-N-LOK Connectors

### Product Facts

- Pins and sockets can be intermixed in the same housing
- Positive polarization
- Rear cavity identification
- Contacts completely enclosed in housings
- Positive locking housings
- Insulation capability of .060 - .130 mm [1.52 - 3.30 in.]
- Removable, crimp snap-in contacts
- Low contact mating force
- Contacts accept .05 - 5.0 mm<sup>2</sup> [#24 - #22] AWG wire sizes
- Contacts available with pre-tin or gold plating
- Dual locking lances provide optimum contact stability
- Panel mount or free hanging
- Mate with Universal MATE-N-LOK II Housings
- Available in UL 94V-0 flame retardant material. Meets the material requirements of table 25.1 of U.L. Standard 1410 (television receivers and video products)
- Not for interrupting current
- Harness to PC Board capability using pin or socket headers
- Pin and socket headers are available in both vertical and right angle style
- Solderability—headers meet MIL-STD 202 Method 208
- Contacts are on 6.35 mm [.250 in.] centerline spacing
- Recognized under the Component Program of Underwriters Laboratories, Inc. File No. E28476
- Certified by Canadian Standards Association File No. LR 7189
- Passed test by VDE under their Registration Number 5618/Continuous Surveillance



### Performance Characteristics

The Universal MATE-N-LOK Connector performance characteristics are based on the hanging and panel mount connectors, loaded with contacts crimped on stranded wire.

**Dielectric Withstanding Voltage**  
5.0 KVAC or 10.0 KVDC between adjacent circuits

**Insulation Resistance**  
1000 megohms minimum initial between adjacent circuits

**Voltage Rating**  
600V AC or DC

**Connector Mating**  
Solid Pin—3.0 lb. max. per circuit  
Split Pin—1.5 lb. max per circuit

**Connector Unmating**  
Solid Pin—.7 lb. min. per circuit  
Split Pin—.5 lb. min per circuit

**Contact Insertion Force**  
5.0 lb. max. per contact

**Contact Retention**  
15 lb. min. per contact

**Durability**  
50 cycles, mating and unmating

### Technical Documents

#### Product Specifications

- 108-1031 Universal MATE-N-LOK Connectors
- 108-1053 Universal MATE-N-LOK PC Board Headers
- 108-1031-1 Splash Proof Seal, Universal MATE-N-LOK Connectors

#### Application Specification

- 114-1010 Universal MATE-N-LOK Contacts

#### Instruction Sheet

- 408-7714 Plug, Cap, Headers, Pin, Socket and Accessories
- 408-3392 Universal MATE-N-LOK Splash Proof Seals

## Splash Proof/Sealed Universal MATE-N-LOK Connectors (Continued)

### Performance

#### Characteristics (Continued)

**Maximum Current** Maximum current rating of Universal MATE-N-LOK connectors is limited by the maximum operating temperature of the housings which is 125°C including the temperature rise of the contacts which is a maximum of 30°C. There are several variables which have a direct effect on this maximum current-carrying capability for a given connector and must be considered for each application. These variables are:

**Wire Size** Large diameter wire will carry more current since it has less internal resistance to current flow and thus generates less heat. Longer wire lengths also enhance current carrying capabilities since the wire conducts heat away from the connector

**Connector Size** In general, the more circuits in a connector, the less current can be carried.

**Ambient Temperature** The higher the ambient temperature, the less current can be carried in any given connector.

**Printed Wiring Board Conductor Size** The finished trace conductor width and thickness should be maximized to allow for the greatest current carrying capacity and heat dissipation.

Universal MATE-N-LOK connectors also will withstand the following tests:

**Vibration** 10-55-10 cycles per minute at .06 inch total excursion

**Physical Shock** 18 drops, 50 g sawtooth at 10 milliseconds

**Housing Panel Retention** 75 lb min.

**Housing Lock Strength** 30 lb. min.

**Thermal Shock** -55°C to +85°C

**Temperature-Humidity Cycling** 25°C to 65°C at 95 RH

**Corrosion** 48 hr. at 5% salt concentration

### Related Product Data

#### Product Specifications

106-1031 Universal MATE-N-LOK Connectors

108-1053 Universal MATE-N-LOK Headers

### Current Rating Verification for 30°C Maximum Temperature Rise 100% Energized

#### Wire-to-Wire

#### UMNL Calculated Current Table

Number of Circuits	Wire Gauge									
	10	12	14	16	18	20	22	24	26	30
2	19.00	18.00	17.00	14.50	13.00	10.00	8.00	6.50	5.50	3.50
3	17.50	16.50	15.50	13.00	12.00	9.00	7.50	6.00	5.00	3.00
4	16.50	15.50	15.00	12.50	11.00	8.50	7.00	5.50	4.50	3.00
6	15.00	14.00	13.00	11.00	9.50	7.850	6.00	5.00	4.00	2.50
9	13.50	12.50	11.50	9.50	8.50	6.50	5.50	4.50	3.50	2.00
12	12.50	12.00	11.00	9.00	8.00	6.00	5.00	4.00	3.00	2.00
15	12.00	11.50	10.00	8.50	7.50	6.00	4.50	4.00	3.00	2.00

Values are based on initial Temperature Rise versus Current Testing and are intended to be a guide in the selection of a connector family. All applications should be tested by the end user. The values listed are per circuit for fully loaded housings being 100% energized. Note: All combinations were not tested, and this chart contains interpolated and extrapolated values.

#### Minimum Wire Lengths for T-Rise vs. Current Testing

AWG	Min. Length (in.)
24	129.5 [5.1]
20	198.1 [7.8]
18	238.8 [9.4]
16	287.0 [11.3]
14	348 [13.7]

Notes: If wire lengths used are less than those listed above, the current carrying ability of the system will be reduced due to less heat being conducted away from the connector. The customer should fully test all applications

#### Wire-to-Board

Due to the vast differences in trace geometry and printed circuit board configurations, we are unable to provide a separate current carrying chart for our printed circuit board header products. However, the above Wire-to-Wire charts may be used as a guideline for headers if the trace width and thickness is equal to the listed wire gauge. For vertical headers, only 75% of the Wire-to-Wire value should be used. The chart values are only a tool for connector selection and will require the customer to fully test their application.

#### Termination Resistance/Contact Crimp Tensile Force

Wire Size		Termination Resistance		Contact Crimp Tensile Force	
AWG	mm <sup>2</sup>	Test Current (Amps)	Resistance Milliohms (Max. Init.)	Force (Min.) lbs.	N
24	.2	1.5	3.50	8	36
22	.3	3	3.50	14	62
20	.5	4.5	3.00	14	62
18	.8	6	3.00	30	133
16	1.2	8	2.75	45	200
14	2.0	10	2.75	50	222

Notes: This is the total resistance between wire crimps of a mated pin and socket.

## Splash Proof/Sealed Universal MATE-N-LOK Connectors (Continued)

### Connector Seals

#### Product Facts

- Economical splash proof/immersible sealed connector system
- No design changes to existing Universal MATE-N-LOK product
- Existing applications utilizing Universal MATE-N-LOK connectors can be upgraded to a splash proof system
- Utilizes two wire seals and one interface seal
- Wire AWG range is .5 - 2.0 mm [#20 - #14] with insulation diameter range 1.52 - 3.30 mm [.060 - .130 in.]
- 2.79 - 3.30 mm [.110 - .130 in.] insulation diameter passed European IP sealing level #5/7 (swirling dust/immersion to 1 meter for 30 minutes)
- 1.52 - 2.79 mm [.060 - .110 in.] insulation diameter passed European IP sealing level #5/6 (swirling dust/heavy seas)
- Universal MATE-N-LOK II keying plug can be used to seal unused circuits
- Primary application is for wire-to-wire, wire-to-board application must use a closed bottom header

#### Material:

Silicone rubber, blue color

#### Technical Documents:

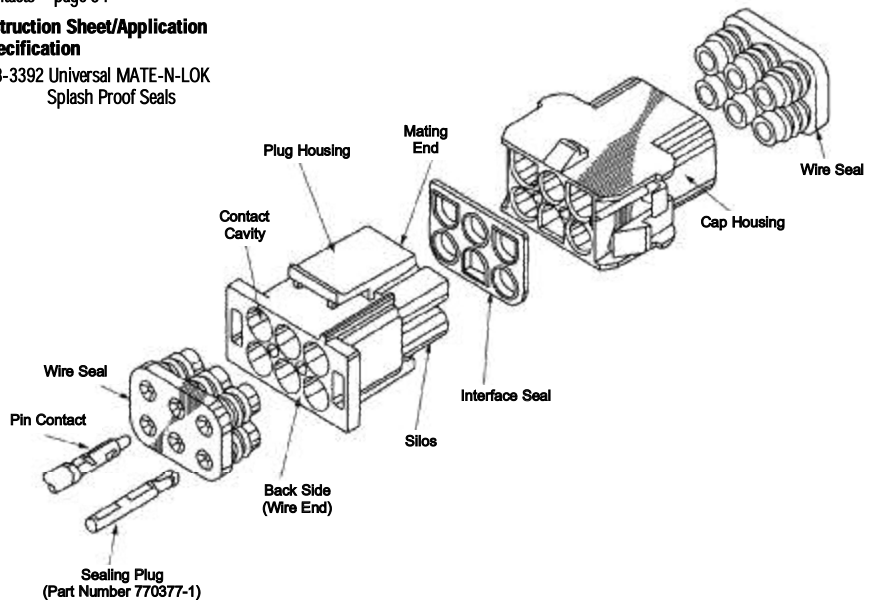
##### Product Specification

108-1031-1 Splash Proof Seal, Universal MATE-N-LOK Connectors

Contacts—page 54

##### Instruction Sheet/Application Specification

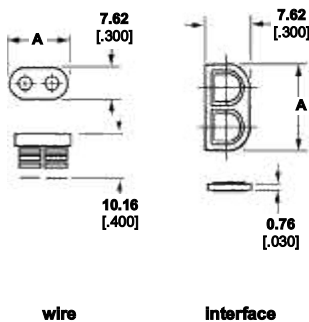
408-3392 Universal MATE-N-LOK Splash Proof Seals



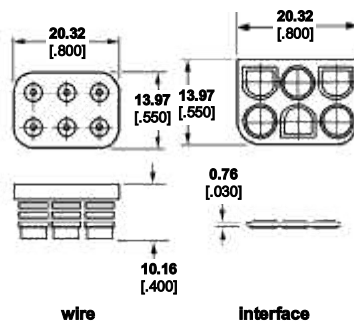
Number of Circuits	A Dim.	Interface Seal Part Numbers	Wire Seal Part Number
2	14.0 [.550]	794269-1	794270-1
3	20.3 [.800]	794271-1	794272-1
4	26.7 [1.050]	794273-1	794274-1
6	—	794275-1	794276-1
9	20.3 [.800]	794277-1	794278-1
12	26.7 [1.050]	794279-1	794280-1
15	26.7 [1.300]	794281-1	794282-1

Note: One interface seal and two wire seals required per mated assembly.

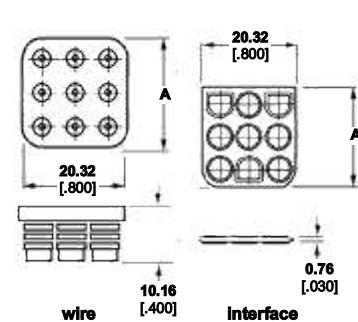
#### 2, 3, 4 Circuit, In-Line



#### 6 Circuit, Matrix



#### 9, 12, and 15 Circuit, Matrix



## Splash Proof/Sealed Universal MATE-N-LOK Connectors (Continued)

### Contacts Used With Splash Proof Seals

Solid pin diameter 2.13 [.084]

Split pin diameter 2.18 [.086]

Stock thickness .305 [.012] unless otherwise specified

These contacts can be used in either Universal MATE-N-LOK Plug or Cap housings only

### Related Product Data:

#### Product Specification

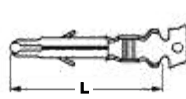
108-1031 Universal MATE-N-LOK Connectors

#### Application Specification

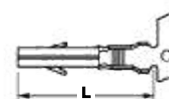
114-1010 Universal MATE-N-LOK Contacts



Solid Pin



Split Pin



Solid Socket



Grounding Pin

2.54 [.100] longer than standard pin  
(Mate first, break last, not for interrupting current)

Wire Size Range AWG/mm <sup>2</sup>	Ins. Dia. Range	L Dim.		Material & Finish	Style	Contact Part Numbers				HDM Applicator Part No.	Hand Tool Part No.
		Pin	Socket			Pin		Socket			
						Strip Form	Loose Form	Strip Form	Loose Form		
.2-.8 24-18	1.52-2.54 .060-.100	20.06 .790	19.30 .760	Brass, Pre-tin	Solid	350561-1	350690-1	350851-1 350570-14	350689-14	466320-13 466320-23 466320-43	90300-2
				Brass, Gold <sup>1</sup>		350561-2	350690-2	350851-2 350570-24	640347-2 350689-24		
				Brass, Select Gold <sup>2</sup>		350561-7	350690-7	350851-7 350570-74	350689-74		
				Phos. Brz., Pre-tin Phos. Brz., Select Gold <sup>2</sup>		350561-3	350690-3	350570-34	350689-34		
.2-.8 24-18	1.52-2.54 .060-.100	20.06 .790	—	Brass, Pre-tin	Split	350699-1	350706-1	—	—	466320-13 466320-23 466320-43	90300-2
				Brass, Gold <sup>1</sup>		350699-2	350706-2	—	—		
				Brass, Select Gold <sup>2</sup>		350699-7	350706-7	—	—		
.2-.8 24-18	1.52-3.30 .060-.130	22.60 .890	—	Brass, Pre-tin	Ground	770210-1	—	—	—	567216-23 567216-33	—
				Brass, Pre-tin Brass, Gold <sup>1</sup> Brass, Select Gold <sup>2</sup>		350218-1 350218-2 350218-7	350547-1 350547-2 350547-7	350536-1 350536-2 350536-7	350550-1 350550-2 350550-7		
.5-2.0 20-14	1.52-3.30 .060-.130	20.06 .790	19.30 .760	Phos. Brz., Pre-tin Phos. Brz., Select Gold <sup>2</sup>	Solid	350218-3	350547-3	350536-3	350550-3	687763-13 687763-23 687763-63	90296-2
				Brass, Pre-tin		350687-1	350705-1	—	—		
				Brass, Gold <sup>1</sup>		350687-2	350705-2	—	—		
				Brass, Select Gold <sup>2</sup>		350687-7	350705-7	—	—		
		22.60 .890	—	Brass, Pre-tin	Ground	350684-1	350669-1	—	—		

<sup>1</sup>Gold Finish—Plated with 0.000762 [.000030] min. gold in mating area and inside wire barrel over 0.00127 [.000050] min. nickel underplate on entire contact.  
<sup>2</sup>Select Gold Finish—Plated with 0.000762 [.000030] min. gold in mating area and inside wire barrel over 0.00127 [.000050] min. nickel underplate on entire contact.  
<sup>3</sup>HDM Applicator part number ending in -1, is used on AMPOMATOR CLS Machine with T or G Terminators, -2 is used on AMP-O-ELECTRIC Model K Machine, -4 & -6 are used on AMP-O-ELECTRIC Model G Machine. See pages 72-73 for further information.  
<sup>4</sup>Socket Contact—0.254 [.010] stock thickness

#### Notes:

- AMP recommends split pins be used in housings having 6, 8, 12 and 15 circuits to reduce mating force.
- Phosphor bronze material contacts are available for use in high temperature/humidity cycling applications, consult AMP.

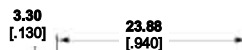
### UMNL II Keying Plug/ Splash Proof Sealing Plug

#### Related Product Data:

Housings—page 55

Instruction Sheets

408-3392



Part Number 770377-1  
UL 94V-0 Nylon material



Seal Latch Tool  
Part No. 794381-1  
IS 408-3392



Contact Extraction Tool  
Part No. 318851-1  
IS 408-4370



Contact Insertion Tool (For inserting contacts applied to small diameter wire)  
Part No. 91002-1  
IS 408-7347

## Splash Proof/Sealed Universal MATE-N-LOK Connectors (Continued)

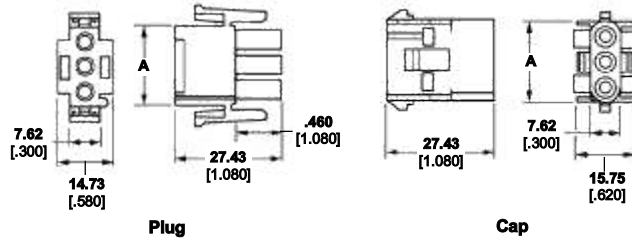
### Housings

#### Free Hanging or Panel Mount

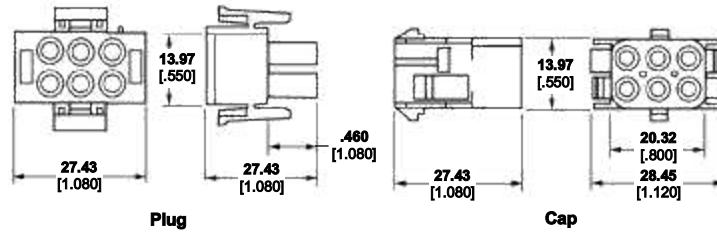
.250 [6.35] Centerline spacing

Plugs and caps can accept pin or socket contacts

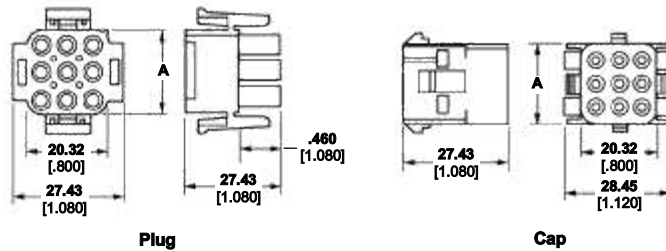
#### 2, 3, 4, 5, 6, 8 and 10 Circuit, In-Line



#### 6 Circuit, Matrix



#### 9, 12 and 15 Circuit, Matrix



Number of Circuits	A Dim.	Housing Part Numbers			
		UL 94V-2 Nylon, Natural Color		UL 94V-0 Nylon	
		Plug	Cap	Plug	Cap
2	13.97 .550	1-480698-01	1-480699-01	350777-11	350778-11
3	20.32 .800	1-480700-01	1-480701-01	350766-11	350767-11
4	26.67 1.050	1-480702-01	1-480703-01	350779-11	350780-11
6	—	1-480704-0	1-480705-0	350715-1	350781-1
9	20.32 .800	1-480706-0	1-480707-0	350720-1	350782-1
12	26.67 1.050	1-480708-0	1-480709-0	350735-1	350783-1
15	33.02 1.300	1-480710-0	1-480711-0	350736-1	350784-1

<sup>1</sup>In-Line style.