Highland™ Rings – Vinyl Insulated

Product Number	Wire Range	Stud or Tab Size	UPC (054007-)	Terminals/Bag	Bags/Case
RV10-6L	12-10	6	49893	50	5
RV10-8L	12-10	8	70328	50	5
RV10-8Q	12-10	8	70476	25	10
RV10-10L	12-10	10	70329	50	5
RV10-10Q	12-10	10	70477	25	10
RV10-14L	12-10	1/4	70330	50	5
RV10-14Q	12-10	1/4	70478	25	10
RV10-38L	16-14	3/8	70331	50	5
RV10-38Q	16-14	3/8	70479	25	10
RV10-516Q	16-14	5/16	49562	25	10
RV14-4C	16-14	4	49897	100	5
RV14-6C	16-14	6	70241	100	5
RV14-6L	16-14	6	70332	50	10
RV14-8C	16-14	8	70242	100	5
RV14-8L	16-14	8	70333	50	10
RV14-10C	16-14	10	70243	100	5
RV14-10L	16-14	10	70334	50	10
RV14-14C	16-14	1/4	70244	100	5
RV14-14L	16-14	1/4	70335	50	10
RV14-516L	16-14	5/16	49560	50	10
RV18-4C	22-18	4	49903	100	5
RV18-6C	22-18	6	70245	100	5
RV18-6L	22-18	6	70336	50	10
RV18-8C	22-18	8	70246	100	5
RV18-8L	22-18	8	70337	50	10
RV18-10C	22-18	10	70247	100	5
RV18-10L	22-18	10	70338	50	10
RV18-14C	22-18	1/4	70248	100	5
RV18-14L	22-18	1/4	70339	50	10
RV18-516L	22-18	5/16	49561	50	10

Highland Standard Forks – Non-Insulated

Product Number	Wire Range	Stud or Tab Size	UPC (054007-)	Terminals/Bag	Bags/Case
F10-8L	12-10	8	70269	50	5
F10-8Q	12-10	8	70454	25	10
F10-10L	12-10	10	70270	50	5
F10-10Q	12-10	10	70455	25	10
F14-6C	16-14	6	70211	100	5
F14-6L	16-14	6	70271	50	10
F14-8C	16-14	8	70212	100	5
F14-8L	16-14	8	70272	100	5
F14-10C	16-14	10	70213	100	5
F14-10L	16-14	10	70273	50	10

3M
Terminals, Kits and Tools

For more than 30 years, 3M has been a leading supplier of Scotchlok™ terminals, disconnects, connectors and tools for high performance use in the assembly and maintenance of electrical systems. Thousands of satisfied customers know our products for:

- Effective and reliable performance, UL Listed and CSA Certified where appropriate.
- Variety of types, sizes and materials meeting a broad application range, including the demands of temperature and weather.
- Design features assuring easy installation of 3M products–positive and easy wire insertion, elimination of strand hang-ups and wire twisting, and easy insulation entry.

These are a few of the characteristics that make the installer's job easier.

24

? Frequently Asked Questions

What does the insulation grip do?

The insulation grip provides a "second" crimp on the wire insulation providing additional wire strain relief. It's excellent for high vibration applications.

Which 3M tools can I use with 3M terminals?

The handy reference guide on pages 122-126 gives you a variety of choices of tools to use with 3M terminals.

What's the difference between insulated and fully insulated disconnects?

Insulated disconnects have barrel insulation only and fully insulated disconnects are insulated from the barrel to the receptacle/tab.

What temperatures do 3M terminals withstand?

Non-insulated 3M terminals withstand temperatures up to 347°F (175°C). Insulated 3M terminals withstand temperatures up to 221°F (105°C).

Standard Terminal Construction

1
2 3
4 Vinyl Insulated
6 5
8 7
9
10

1
2 3
4 Nylon Insulated with Insulation Grip
6 5
8 7
9
10
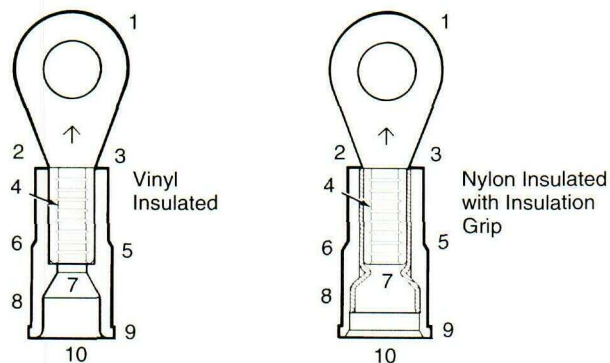
3M Terminals provide a variety of design features assuring consistently effective, reliable performance and easy installation.

Please refer to the illustrations at the numbered locations for the attributes described below.

1. One-piece, burr-free construction provides maximum electrical conductivity. Electrical bright-tin plating gives maximum corrosion resistance. Annealing relieves stress points and assures maximum installed strength.

2. Barrel-to-pad transition design minimizes flexing and bending.

3. Open-end design permits visual inspection of wire location before and after crimping.

4. Maximum hold on wire comes from multiple "V" grooves in #26–4 AWG parts resulting in excellent holding power.

5. Injection molded insulations on terminals are the highest quality in the industry.
- 221°F (105°C) rated, tough, resistant electrical grade materials
- Molding ensures consistent wall thickness for maximum reliability after crimping
- Molding allows funnel barrel construction for easier installation
- Molding offers the crimp ridge and non-slip ridge

6. Crimp ridge designed for positive location of tool on terminal barrel, resulting in few miscrimps.

7. Funnel barrel construction provides:
- Positive, easy wire insertion
- No hang-ups of wire strands
- Wire twisting not necessary

8. Nylon-insulated terminals with grip feature a brass sleeve. Sleeve provides optimum grip on insulation, strain relief and vibration protection. Brass sleeve is recessed which provides excellent flash-over protection.

9. Non-slip ridge so tool slides to correct position for a proper crimp and better workmanship.

10. Beveled leading edge for easy wire insulation entry.

Barrel Styles

Non-insulated butted seam

The most economical terminal— used where special performance or installation characteristics are not needed. Beveled mouth facilitates wire insertion. Maximum temperature for bare terminals: 347°F (175°C).
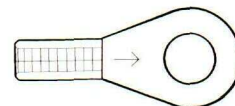

Non-insulated brazed seam

Beveled mouth facilitates wire insertion. Can be crimped anywhere on barrel surface. Silver brazed seam will not open under crimping pressure or operating stresses. Unlike butted seam parts, stranded wire cannot escape barrel confines during or after crimping. Maximum temperature for bare terminals: 347°F (175°C).
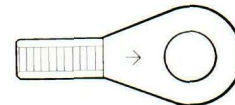
Vinyl insulated brazed and butted seams

Used where insulated barrel is necessary and desirable. Terminal consists of brazed or butted part with flared, rigid molded polyvinyl chloride sleeve securely attached and funneled for easy wire entry. Wire insulation positions itself against funnel portion of vinyl sleeve thus eliminating strand hang-up. Crimping barrel and flared portion of sleeve provide excellent electrical contact plus mechanical stress relief at junction of insulation and barrel. Insulation has a non-slip ridge for ease of positioning crimping tool.
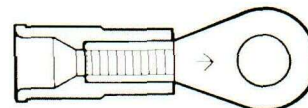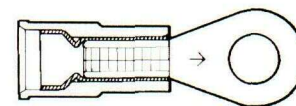

Industry standard color coding indicates wire range. Insulators are rated at a continuous operating temperature range from -40°F to 221°F (-40°C to 105°C).

UL Listed and CSA Certified for 600V building wire and 1000V signs and lighting fixtures (luminaries).

Nylon insulated butted seam with insulation grip

Used where insulated barrel and positive insulation grip are necessary or desirable. Terminal consists of butted seam part with flared, seamless brass sleeve securely attached and covered with flared, molded nylon sleeve. Wire insulation positions itself against funnel portion of brass sleeve. Crimping barrel and flared portion of sleeve provide excellent electrical contact plus mechanical stress relief at junction of insulation and barrel. Positioning crimp tool is nearly mistake proof due to a "step" in nylon insulation.


Industry standard color coding indicates wire range. Insulators are rated at a continuous operating temperature range from -40°F to 221°F (-40°C to 105°C).

UL Listed and CSA Certified for 600V building wire and 1000V signs and lighting fixtures (luminaries).
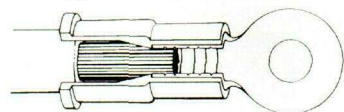
Installation Procedure

Funnel Barrel Feature provides an excellent electrical and mechanical connection.
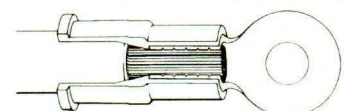
- Funnel design guides wire into position.
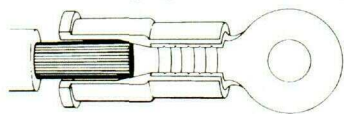
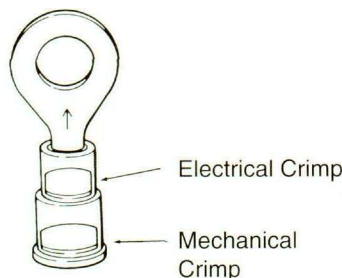- No wire strand hang-up as the wire is inserted, giving a fast, positive installation.

- Wire is in place, ready for crimping.

For maximum crimping performance, barrel of connector must be properly indexed in the crimp tool station.
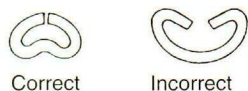
Correct crimping is important to assure a strong connection

Insulated Terminals and Connectors:

Electrical Crimp

Mechanical Crimp

Non-Insulated Terminals and Connectors:
Indent should be opposite the barrel seam.

Correct   Incorrect

Heat Shrink Terminals, Connectors and Disconnects

3M Heat Shrink pre-insulated terminals, connectors and disconnects protect against the most challenging of environments, making the best moisture protection available. They offer several advantages over conventional unsealed products.

Corrosion Resistance – The adhesive-lined heat shrink material, when properly crimped and shrunk, provides a seal resistant to water, salt, steam and other related contaminants.

Improved Mechanical Performance – The adhesive-lined heat shrink tubing adheres, when shrunk, to both the connector and the wire insulation providing improved pullout strength and strain relief.

Durable Heat Shrink Tubing – Tough heat shrink tubing effectively resists abrasion, scoring, cut-through, and the effects of long term aging.

Versatile and Easy to Use – 3M heat shrink terminals, splices and disconnects are available in wire sizes 22–10 AWG and can be installed easily with a recommended tool and heat source. The connectors are color-coded for wire range identification and the transparent tubing allows for visual inspection.

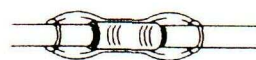**Application Procedure for Heat Shrink Products:**

1. Strip wires to appropriate length as indicated on package label.

2. Insert wire into terminal and crimp with correct station of a recommended tool.
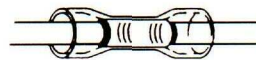
3. Apply heat with a recommended heat source.

High Temperature Terminals and Connectors

3M high temperature terminals and connectors are constructed of steel with a nickel plating. Their temperature rating for continuous use at 900°F (482°C) makes them perfect for use in ovens, motors, light fixtures and other applications where other connectors would corrode or melt.

There is no applicable UL or CSA standard for high temperature steel parts.

## Standard Crimp Terminal and Connector Specifications

Materials

Crimp terminals and connectors are to be burr-free, annealed and bright-tin plated ETP copper. Barrels shall be 0.25" long with brazed seams where specified. Insulation grip sleeves are to be tin-plated brass and attached securely to the barrel. Terminal insulators are to be **molded** polyvinyl chloride or nylon, UL Listed and CSA Certified for 600V in building wire and 1000V in signs and lighting fixtures (luminaries). Connector insulators are to be **extruded** polyvinyl chloride or nylon with a temperature rating of 221°F (105°C).

Construction

All insulated terminals are to have funnel entry construction to prevent strand hang-up and a crimp ridge for proper tool location. Nylon insulated terminals and connectors are to have butted seam barrels with insulation grip sleeves. All terminal barrels are to have multiple "V" grooves for maximum conductor retention.

Dimension Key

Length "L"
Stud Size
Barrel I.D.
Width "W"
Maximum Insulation Diameter
Clearance "C"
Barrel Length "E"
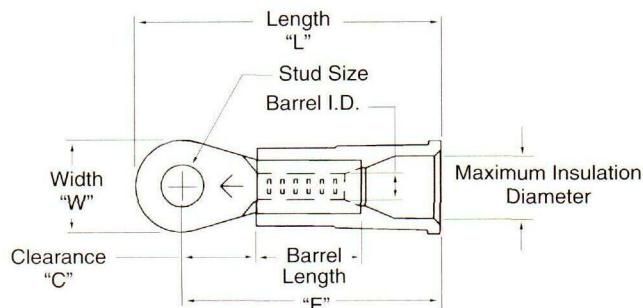
Note: All dimensions are measured in inches.

Terminal Numbering System

Features

3M Identity	Code/Barrel Style	Wire Size Code (AWG)	*	Stud, Tab, or Bullet Size	Tongue Code	Product Availability**

M	No Code = Bare Brazed
	A = No Barrel (adapter)
	H = Heat Shrink
	I = Double Wall w/interlock
	N = Nylon Brazed
	NG = Nylon w/Grip
	NHU = Nylon/Butted w/Heat Shrink over top
	NU = Nylon/Butted
	U = Bare/Butted
	V = Vinyl/Brazed
	VA = Vinyl Adapter
	VU = Vinyl/Butted
		24 = 26–24 (yellow)
		
		20 = 26–20 (yellow)
		
		18 = 22–18 (red)
		
		14 = 16–14 (blue)
		
		10 = 12–10 (yellow)
		
		8 = 8 (red)
		
		6 = 6 (blue)
		
		4 = 4 (yellow)
			—	(STUD)
				0 = 0
				2 = 2
				4 = 4
				6 = 6
				8 = 8
				10 = 10
				12 = 1/2"
				14 = 1/4"
				38 = 3/8"
				516 = 5/16"
				610 = 6, 8 10
				
				(TAB)
				110 = 0.110" x 0.020"
				110/32 = 0.110" x 0.032"
				187 = 0.187" x 0.020"
				250 = 0.250" x 0.032"
				375 = 0.375" x 0.050"
				
				(BULLET)
				156 = 0.156" Dia.
				180 = 0.180" Dia.
					F = Fork
					FB = Fork, Block
					FBHT = Fork, Block, High Temp.
					FFB = Fork, Flanged, Block
					FHT = Fork, High Temp.
					FL = Fork, Locking
					R = Ring
					RHD = Ring, Heavy Duty
					RHT = Ring, High Temp.
					/S = Short or Small
					/L = Large or Long
					R/Flag = Ring, Flag
					BC = Butt Connector
					CEC = Closed End Connector
					PC = Parallel Connector
					BCM = Butt Connector Moisture Res.
					CEC/ST = Closed End Connector, Steel Insert
					Disconnect
					  DF = Female
					  DFHT = Female, High Temp.
					  DFI = Female, Fully Insulated
					  DM = Male
					  DMF = Male, Female
					  DMHT = Male, High Temp.
					  DMI = Male, Fully Insulated
					  DF/Flag = Female Flag
					Adapter
					  D = Disconnects
					  F = Female
					  FFI = Double Female, Fully Insulated
					  M = Male
					  MMI = Double Male, Fully Insulated
					  MMF = Double Male, Female
					  MFM = Male, Female, Male, Stacking
					  RR = Ring Rectangular Tongue
					  Fuse = Fuse Adapter Clip
						All BOX (X) package terminals in this catalog are available (in the packaging quantity indicated) from local distributor stocks. All BULK (K) packaged terminals are available in full cartons only, and may require a three to five week order lead time from the factory.

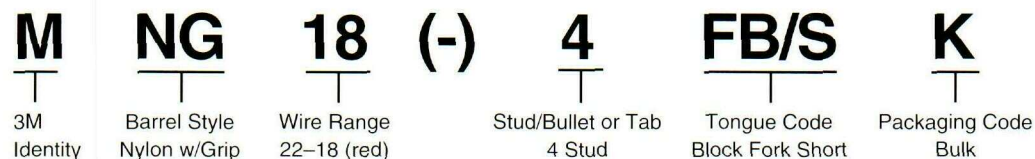* A dash (–) separates the wire size code from the stud, tab or bullet size code.
** **Denotes Product Packaging** – Packaging of Scotchlok™ terminals should be specified by using the appropriate terminal part number.
Suffix letters are indicated within each product number (see "Product Number" heading in ordering information charts).
Note: Contact your local distributor or 3M sales office for price and delivery information.

Map of Numbering System

Example:

Catalog Number: MNG18-4 FB/SK

M	NG	18	(-)	4	FB/S	K
3M Identity	Barrel Style Nylon w/Grip	Wire Range 22–18 (red)		Stud/Bullet or Tab 4 Stud	Tongue Code Block Fork Short	Packaging Code Bulk

Insulator Color Coding

- Yellow (26-24 AWG)
- Red (22-18 AWG)
- Blue (16-14 AWG)
- Yellow (12-10 AWG)

- Red (8 AWG)
- Blue (6 AWG)
- Yellow (4 AWG)