



KILLARK®

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INSTALLATION, OPERATION & MAINTENANCE DATA FORM NO. K1192 VersaMATE®, 100 AMP SERIES: PIN AND SLEEVE TYPE PLUGS, RECEPTACLES & CONNECTORS

“VP” PLUGS, “VR” RECEPTACLES & “VPR” CABLE CONNECTORS comply with UL 1686 dimensional requirements and are interchangeable with other UL 1686 compatible devices. “VP” PLUGS can be used in HAZARDOUS LOCATIONS, CLASS I, GROUPS B, C, D, CLASS II, GROUPS F† & G. Enclosure Types 3, 4 & 4X (*see Chart 1).

All Installations Must Comply With Applicable Local, National Electric Codes and/or Canadian Electrical Code.

† To prevent ignition of hazardous atmospheres do not use in Class II, Group F locations that contain electrically conductive dusts.

APPLICATIONS

- Designed to apply secondary power to both fixed and portable electrical equipment.
- Designed to provide for quick disconnect from the power source.
- Designed for use in locations where weatherproof, oil tight & hosedown watertight enclosures and devices are required.

FEATURES

Octagonal Body Style. The octagonal shape Plug and Cable Connector bodies provide for a firm grip when separating.

Interchangeable. VersaMATE® Devices are interchangeable with other UL Rated 1686 devices (*see Chart 2).

Plug Locking Ring. Neoprene gasketed plugs thread onto receptacle & cable connector with locking ring providing a Type 3, 4 & 4X union.

Type 3, 4 & 4X Rated. The exclusive patent pending breech lock design provides sealing ability for the lift lid on the receptacle and cable connector providing a Type 3, 4 & 4X rating when the lift lid is in the closed position. Devices are gasketed to provide a weatherproof, oil tight & hosedown watertight seal when mated with devices having the same type rating.

Positive Cable Clamp. Plugs & cable connectors supplied with a neoprene onion skin grommet and clamp guide assembly provide a firm fit over a wide range of cable diameters. Captive locking set screw prevents clamp guide assembly from backing out.

Insulators & Terminals. Insulators provide high mechanical and dielectric strength with low “arc tracking”. Designed with “increased safety” type box terminals providing secure clamping around conductors. **Funnel chambers** designed to accommodate easy insertion of all conductors at one time. The exposed portion of the conductors will be within the funnels when properly stripped (see Figure 4).

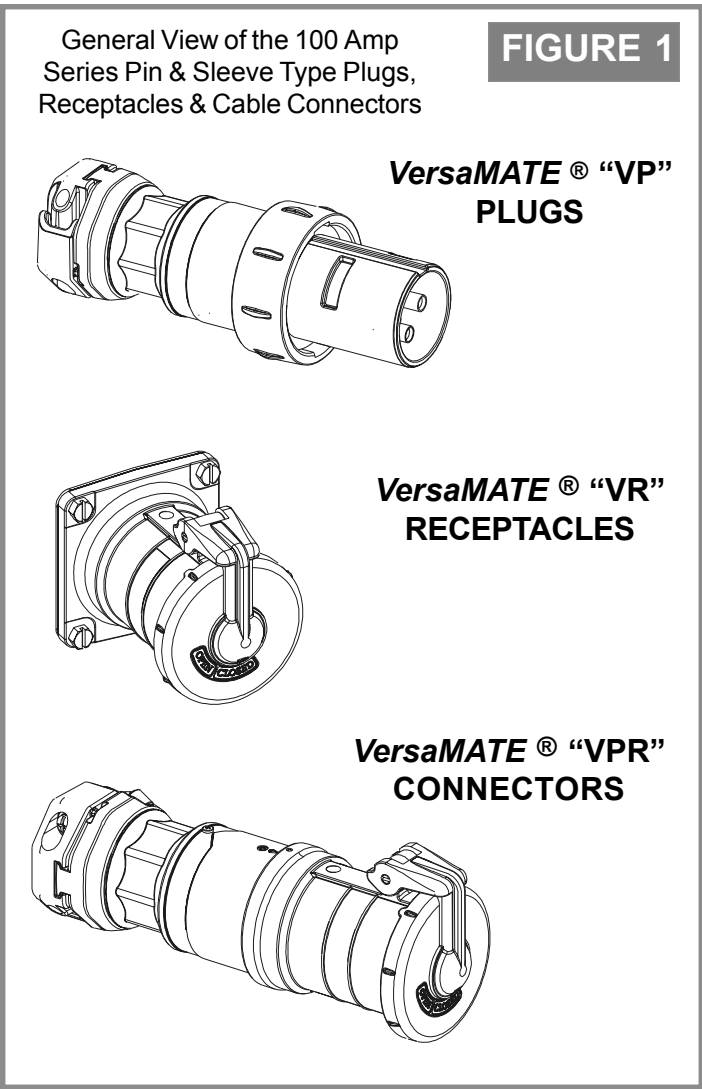
Two Grounding Styles. Style 1 plugs, receptacles & cable connectors ground through shell only. Copper grounding jumpers in Style 2 plugs, receptacles & cable connectors ground through shell and extra pole.

Reverse Service. (3) screws secure the insulator assembly in the devices. Removing the screws and the ground screw permits easy “field” conversion to reverse service.

Positive Ground. Grounding straps assure maintained ground contact. Longer ground pin in Style 2 receptacle “makes first, breaks last”.

ELECTRICAL RATING

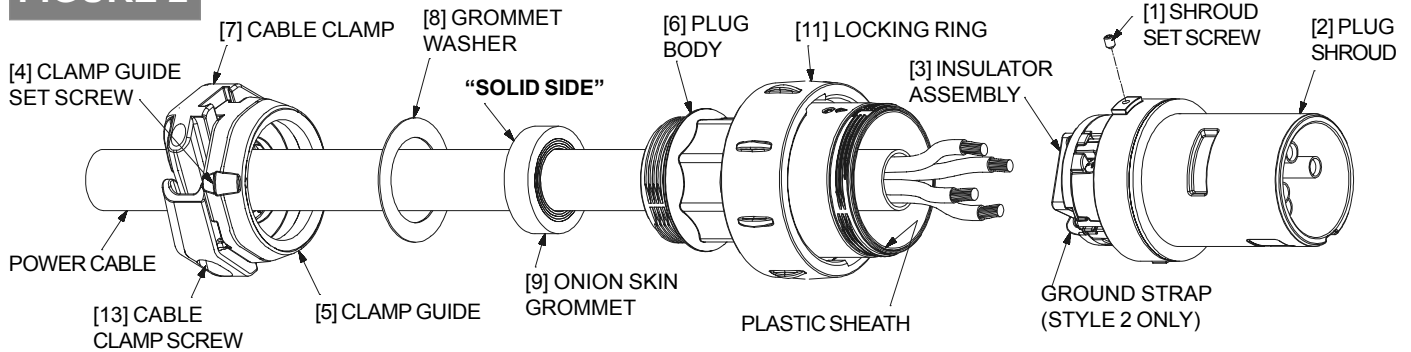
Maximum Voltages: 600 VAC @ 50-400Hz, 250VDC;
Maximum continuous current: 100 Amperes.
Horsepower: See Catalog Data or contact factory.



Arcing Confined. Contacts are made or broken in insulator chambers. In emergency, plugs can be withdrawn under full rated loads. Positive polarization prevents mismatching plugs.
Positive Contact. Brass contacts have **integral patented springs** for positive maintained electrical contact.

INSTALLATION INSTRUCTIONS FOR VersaMATE® “VP” PLUGS: 100 AMP SERIES

FIGURE 2



WARNING

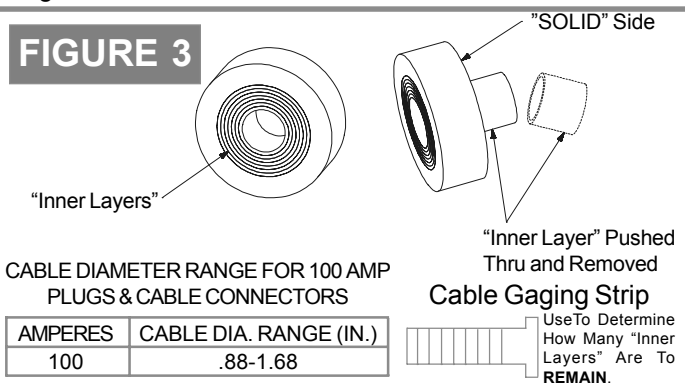
Electrical power supply **MUST BE OFF** before and during installation and maintenance. **DISCONNECT** primary power source and **LOCK OUT**. Installation and maintenance procedure must be performed by a trained and competent electrician.

Always verify that the devices' ampere & voltage rating, style & number of poles are suitable in the area of use.

- 1 Disassemble plug as shown in FIGURE 2. Remove shroud set screw [1] and turn shroud assembly [2] to remove from plug body [6]. It is not necessary to separate the shroud & insulator assembly [3]. **Do not disassemble the insulator assembly.** Loosen clamp guide setscrew [4] and turn clamp guide assembly [5] to remove from plug body [6].
- 2 Reference TABLE “A” to strip the cable jacket and individual wires. Refer to National Electrical Code Table 400-5 or Canadian Electrical Code Table 12 when selecting the conductor size.
- 3 Slide clamp guide assembly [5], with cable clamp [7] properly assembled, and the grommet washer [8] over the power cable being used.

- 4 Use the cable gaging strip provided to determine how many “inner layers” of the onion skin grommet [9] are to **REMAIN** or simply remove the “inner layers” until the grommet slips over the power cable. Remove the “inner layers” as needed from the grommet, **one layer at a time**, by pushing through to solid side and tearing off. See FIGURE 3.
- 5 Place the onion skin grommet [9] over the power cable with the “**SOLID**” side facing the clamp guide assembly and slide plug body [6] over power cable. Slip locking ring [11] over upper part of plug body [6].
- 6 Loosen the box terminal screws [10] (see FIGURE 4) in the insulator assembly [3] until screws start to tighten against the insulator wall. Insert conductors into the proper “Increased Safety” box terminals according to the established facility wiring pattern. Tighten box terminal screws [10] to 40 in.-lbs. torque. **Style 1 only** - tighten the ground box terminal screw to 30 in.-lbs. torque. Conductors must be fully inserted into the box terminals and, if properly stripped (see Table A), the conductor insulation should be well within the funnel of the insulator assembly [3].
- 7 Screw plug body into shroud [2] & insulator assembly [3] until pressure is applied to the o-ring. Continue turning until set screw hole in shroud lines up with the set screw & arrow profile on the plug body. Replace and tighten shroud set screw [1] to 10 to 15 in.-lbs. of torque.
- 8 Slide onion skin grommet [9] down power cable into plug body [6]. Force power cable into plug body to provide a minimum 1/8” strain relief in the wire between clamp and insulator. Place grommet washer [8] in clamp guide assembly [5]. Screw clamp guide onto plug body. Tighten clamp guide set screw [4] to 15 to 20 in.-lbs. of torque.
- 9 Tighten cable clamp screws [13] around power cable to 50 in.-lbs. minimum torque, alternating sides as needed to prevent binding.

FIGURE 3



CABLE DIAMETER RANGE FOR 100 AMP
PLUGS & CABLE CONNECTORS

AMPERES	CABLE DIA. RANGE (IN.)
100	.88-1.68

Use To Determine
How Many “Inner
Layers” Are To
REMAIN.

CAUTION

Use cable with diameters within the specified range given in FIGURE 3. Failure to do so may result in overstressed wire terminations which could cause the conductors to pull out of the box terminals and cause serious or fatal personal injury and/or equipment damage.

ELECTRICAL TEST BEFORE ENERGIZING

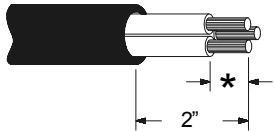
Do not connect to power before conducting the following electrical tests:

- Test continuity of wiring and assembly to verify correct polarity, phasing and grounding connections.
- Measure insulation resistance to be sure the system does not have any short circuits or unwanted grounds.

CAUTION: Use 75°C rated conductors (minimum). **DO NOT** cut into or damage the individual conductor insulation when removing the outer jacket. **DO NOT** cut or damage the conductors when stripping the individual wire insulation.

TABLE A

TERMINAL WIRE RANGE AND STRIPPING GUIDE



* Strip gage on insulator:
Small gage: #4 (3/4")
Large gage: #2 (1")

**TERMINAL WIRE SIZE AND ELECTRICAL RATINGS
PLUG AND CABLE CONNECTOR RATINGS**

AMPERES	MAX. VOLTAGE	WIRE RANGE
100	600 VAC @ 50-400 Hz, 250 VDC	BUILDING #4 #2 EXTRA FLEX #4 #2

Rated for use with TYPE P, G, W, S, SO, STO portable cords or equivalent, with COPPER conductors only, of the sizes listed (75°C rated (minimum)).

NOTE

In Hazardous Locations, **PLUGS** are to be used with Type P, G, W, S, SO, STO or equivalent "extra hard usage" portable cable with copper conductors, per National Electrical Code, Articles 400, 501-11 & 502-12 and/or Canadian Electrical Code, Sections 4-010, 18-120, 18-172, 18-218 & 18-276.

WARNING - POLARITY

A wire pattern **MUST** be established so that the same color wire is put into the same identified funnel in all plugs, receptacles & cable connectors in the area of use. Funnels are distinctly identified on the rear of the insulator. In style 2 units only, the funnel with the conductor strap marked with a "G" is for ground conductors. This requirement provides correct polarity for the area of use and reduces possible cause of serious or fatal personal injury and/or equipment damage.

CAUTION

Receptacles connected to circuits having different voltages, or types of current (AC or DC) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

FIGURE 4

NOTE: Style 2 - Includes separate grounding contact with attached ground strap; ground strap is marked with "G".

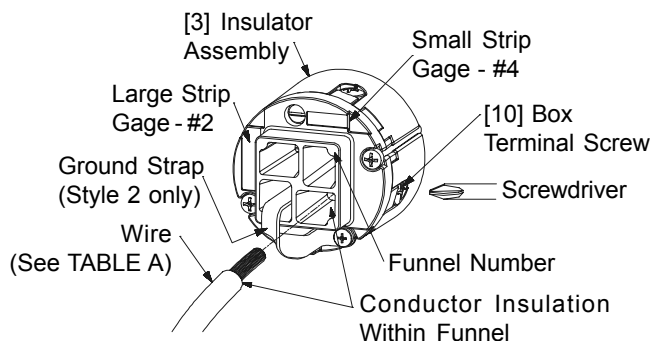
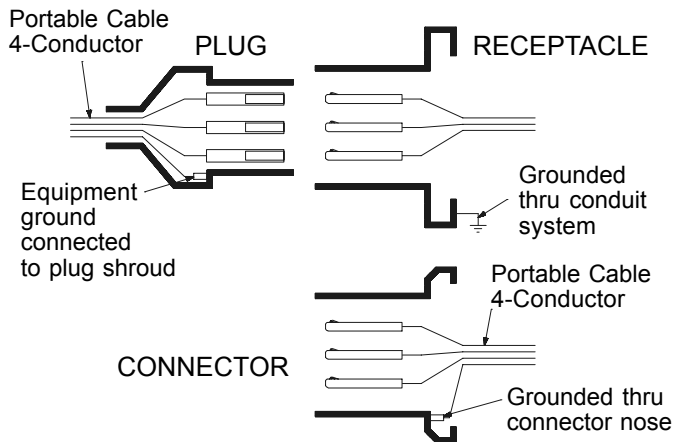


FIGURE 5 **GROUNDING STYLES**

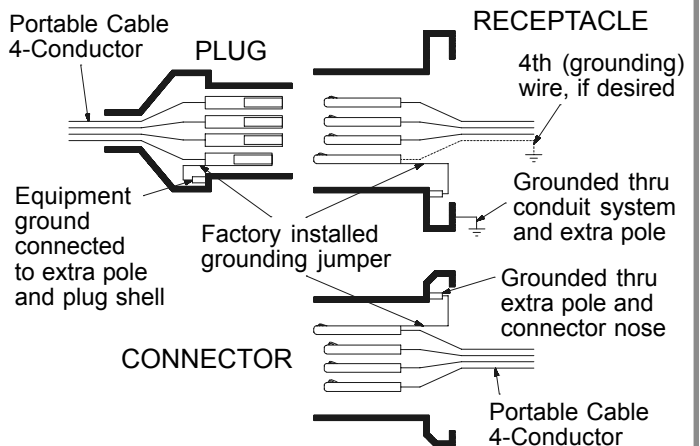
STYLE 1 - Shell Only Grounding



Style 1 Plug - Equipment grounding conductor is wired directly to the ground terminal which is connected to the ground stand-off and shroud. This, in turn, grounds the entire plug assembly housing. All contacts are "current carrying".

Style 1 Receptacle - Two ground straps engage the grounded plug shroud on plug insertion (plug shroud makes contact with receptacle ground straps before "line" and "load" poles engage). Grounding path is maintained until after current-carrying contacts disengage. All contacts are "current carrying". The receptacle is grounded by virtue of its being an integral part of the conduit system.

STYLE 2 - Shell and Extra Pole Ground



Style 2 Plug - Equipment grounding conductor is wired to the extra grounding contact which provides a parallel ground circuit thru the extra ground pole and plug shroud. The ground stand-off and shroud are grounded to a copper alloy ground jumper installed on the extra ground pole. This, in turn, grounds the entire plug assembly housing.

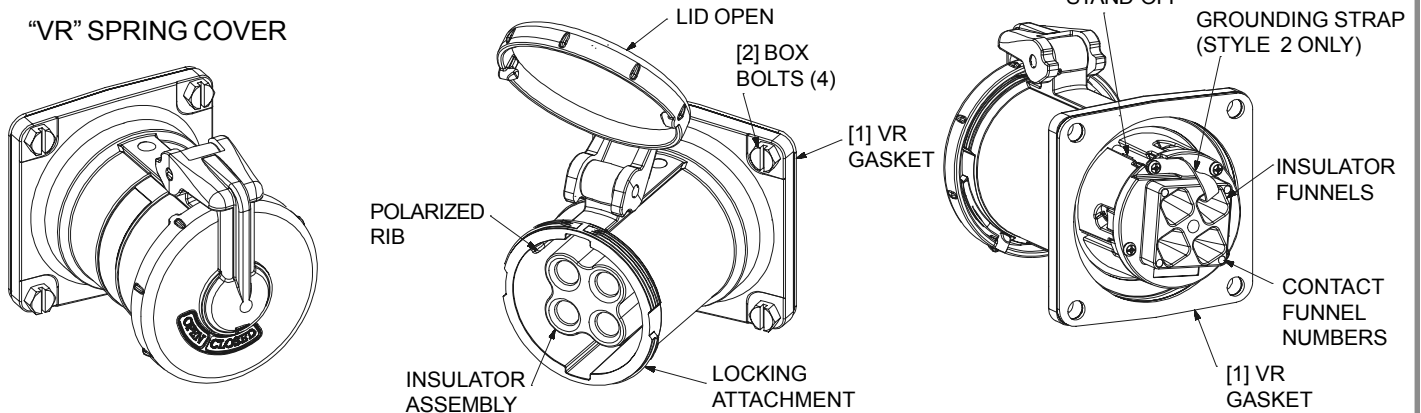
Style 2 Receptacle - Two ground straps engage the grounded plug shroud on plug insertion (shell grounding). A copper alloy ground jumper installed on the extra ground pole is screwed on the ground stand-off and grounded to the receptacle body (extra pole grounding). The longer grounding pole "makes first and breaks last".

INSTALLATION INSTRUCTIONS FOR VersaMATE® “VR” RECEPTACLES: 100 AMP SERIES

FIGURE 6

NOTE: 100A RECEPTACLE COMES WITH BREECH-LOCK LID. CAPABLE OF ACCOMMODATING PLUGS WITH & WITHOUT LOCKING RINGS.

“VR” SPRING COVER



Always verify that the devices’ ampere & voltage rating, style & number of poles are suitable in the area of use.

The 100 Amp Spring Lid Receptacles are threaded to accept the locking ring of the 100 Amp “VP” Style Plugs. This forms a Type 3, 4 & 4X fit when plug is in use and prevents plug fallout. When plug is withdrawn, the lid will spring shut. Turn the lid clockwise to closed position to assure a weatherproof, oil tight and hosedown watertight fit.

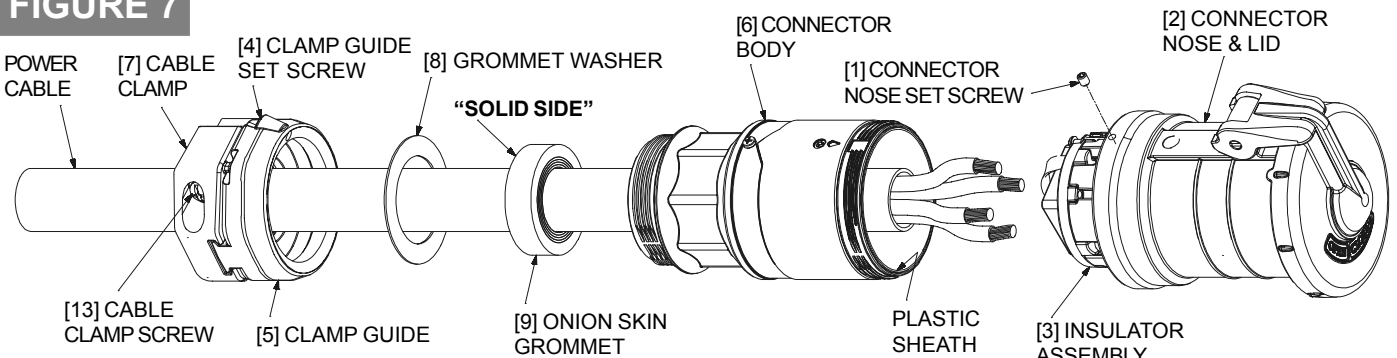
1 Follow instructions “2” & “6” given for “VP” plugs.

2 Mount receptacle, with “VR” Gasket [1] applied, to previously installed back box using box bolts [2] supplied and torque to a minimum of 30 in.-lbs.; to a maximum of 40 in.-lbs. At least one mounting screw must provide electrical continuity between receptacle housing and back box. There must be a tight seal between the receptacle housing and back box to assure a weatherproof, oil tight and hosedown watertight fit. **NOTE:** The included star washers may be used under the bolt heads, as necessary, to assist in achieving ground continuity.

3 Follow the **ELECTRICAL TEST BEFORE ENERGIZING** procedure given for “VP” plugs.

INSTALLATION INSTRUCTIONS FOR VersaMATE® “VPR” CONNECTORS: 100 AMP SERIES

FIGURE 7



Always verify that the devices’ ampere & voltage rating, style & number of poles are suitable in the area of use.

The 100 Amp Spring Lid Cable Connectors have the same features as the 100 Amp Spring Lid Receptacles. The Cable Connectors are for use with “VP” 100 Amp Plugs.

1 Disassemble Cable Connector as shown in FIGURE 7. Remove connector nose set screw [1] and turn connector nose assembly [2] to remove from connector body [6]. It is not necessary to separate the connector nose & insulator assembly. **Do not disassemble the insulator assembly.**

Loosen clamp guide set screw [4] and turn clamp guide assembly [5] to remove from connector body [6].

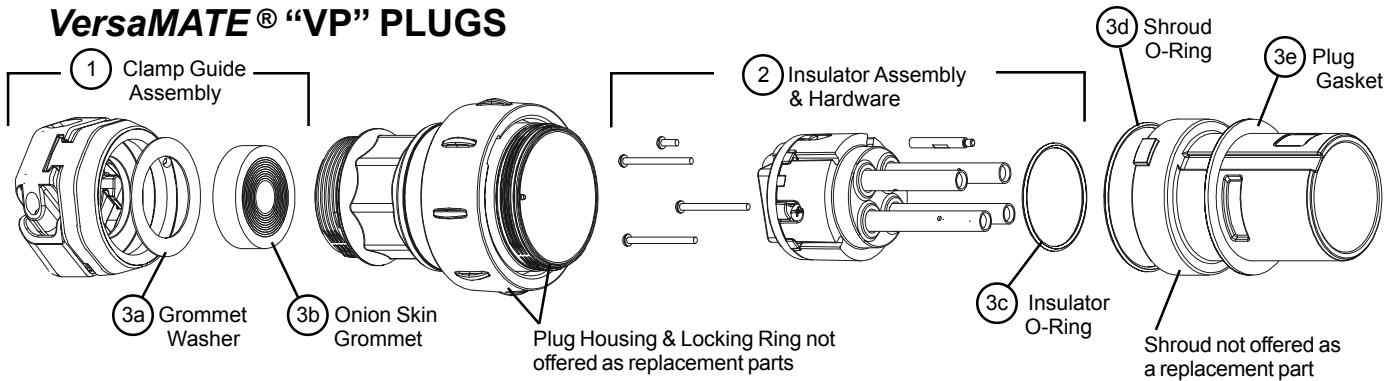
2 Follow instructions “2”, “3”, “4”, “5” & “6” given for “VP” plugs.

3 Screw connector body into connector nose [2] & insulator assembly [3] until pressure is applied to the o-ring. Continue turning until setscrew hole in nose lines up with the set screw & arrow profile on the connector body. Replace and tighten connector nose set screw [1] to 10 to 15 in.-lbs. of torque.

4 Follow instructions “8”, “9” & **ELECTRICAL TEST BEFORE ENERGIZING** procedure given for “VP” plugs.

REPLACEMENT PARTS FOR *VersaMATE*® 100 AMP SERIES “VP” PLUGS, “VR” RECEPTACLES & “VPR” CABLE CONNECTORS

VersaMATE® “VP” PLUGS

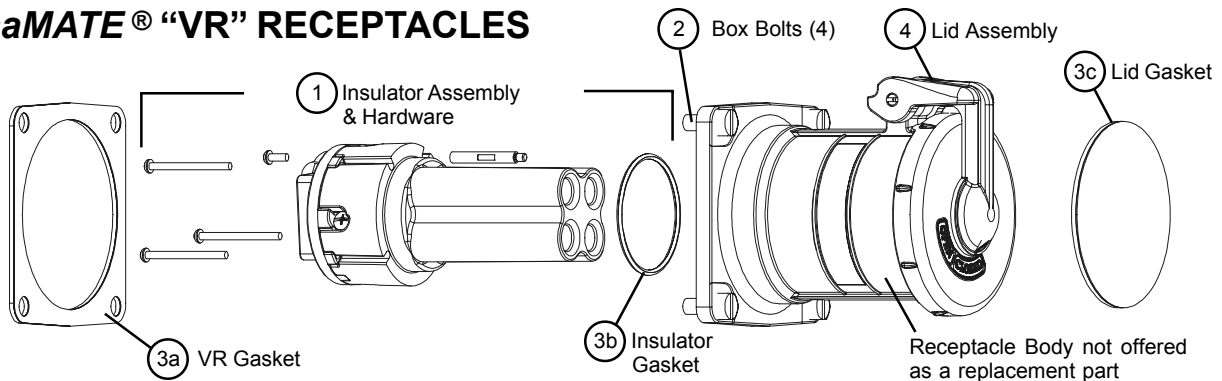


STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3
		CLAMP GUIDE ASSEMBLY	INSULATOR ASSEMBLY	GASKETS & WASHER
1	2W, 2P	RVP101	RVP102772	RVPG1033
1	3W, 3P		RVP103772	RVPG1043
1	4W, 4P		RVP104772	RVPG1043

* Note: Item 3 gaskets are sold as a kit.

STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3
		CLAMP GUIDE ASSEMBLY	INSULATOR ASSEMBLY	GASKETS & WASHER
2	2W, 3P	RVP101	RVP103872	RVPG1033
2	3W, 4P		RVP104872	RVPG1043

VersaMATE® “VR” RECEPTACLES

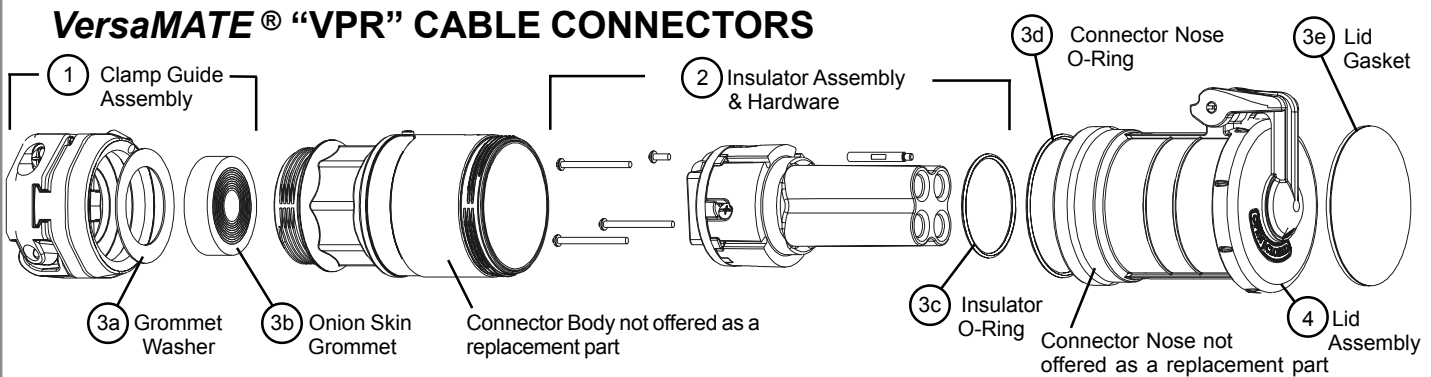


STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3	ITEM 4
		INSULATOR ASSEMBLY	BOX BOLTS QTY. (4)	GASKETS	LID ASSEMBLY
1	2W, 2P	RVR10212	RVRB6101	RVRG1033	RVRL1034
1	3W, 3P	RVR10312		RVRG1043	RVRL1044
1	4W, 4P	RVR10412		RVRG1043	RVRL1044

* Note: Item 3 gaskets are sold as a kit.

STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3	ITEM 4
		INSULATOR ASSEMBLY	BOX BOLTS QTY. (4)	GASKETS	LID ASSEMBLY
2	2W, 3P	RVR10322	RVRB6101	RVRG1033	RVRL1034
2	3W, 4P	RVR10422		RVRG1043	RVRL1044

VersaMATE® “VPR” CABLE CONNECTORS



STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3	ITEM 4
		CLAMP GUIDE ASSEMBLY	INSULATOR ASSEMBLY	GASKETS & WASHER	LID ASSEMBLY
1	2W, 2P	RVP101	RVR10212	RVPRG1033	RVRL1034
1	3W, 3P		RVR10312	RVPRG1043	RVRL1044
1	4W, 4P		RVR10412	RVPRG1043	RVRL1044

* Note: Item 3 gaskets are sold as a kit.

STYLE	DESCRIPTION	ITEM 1	ITEM 2	*ITEM 3	ITEM 4
		CLAMP GUIDE ASSEMBLY	INSULATOR ASSEMBLY	GASKETS & WASHER	LID ASSEMBLY
2	2W, 3P	RVP101	RVR10322	RVPRG1033	RVRL1034
2	3W, 4P		RVR10422	RVPRG1043	RVRL1044

REVERSE SERVICE INSTRUCTIONS FOR VersaMATE® DEVICES: 100 AMP SERIES

- ➊ Remove the (3) screws mounting the insulator assembly to the shroud, receptacle and/or connector nose.
- ➋ Remove the #6-32 screw from the ground stand-off.
(Style 1 shrouds & connector noses - ground terminal & bracket will be removed with the screw).
- ➌ Separate the insulator from the selected parts and replace into the mating parts aligning the stand-off and holes.
- ➍ Replace insulator mounting screws.
- ➎ Replace the #6-32 screw (Style 1 shrouds & connector noses - ground terminal & bracket will also need to be replaced; Style 2 devices - mount the ground straps to ground stand-off with screw).

ELECTRICAL TEST BEFORE ENERGIZING

Do not connect to power before conducting the following electrical tests:

- Test continuity of wiring and assembly to verify correct polarity, phasing and grounding connections.
- Measure insulation resistance to be sure the system does not have any short circuits or unwanted grounds.

CHART 1 - PLUG INTERMATEABILITY WITH HAZARDOUS LOCATION ENCLOSURES: 100 AMP SERIES

“VP” PLUGS for use in HAZARDOUS LOCATIONS, CLASS I, Div. 1 & 2 GROUPS B, C, D
CLASS II, Div. 1 & 2 GROUPS F† & G & Class III.

KILLARK	2W, 3P	3W, 4P
Contact Factory	-	-
CROUSE-HINDS		
EBBR Series CL. I, Div. 1 & 2, GR. C, D CL. II, Div. 1 & 2, GR. F†, G, CL. III.	-	VP10487
APPLETON		
DBR Series CL. II, Div. 1 & 2, GR. F†, G, CL. III.	VP10387	VP10487
EBRH Series CL. I, Div. 1 & 2, GR. B, C, D CL. II, Div. 1 & 2, GR. F†, G, CL. III.	VP10387	VP10487
EBR Series CL. I, Div. 1 & 2, GR. C, D CL. II, Div. 1 & 2, GR. F†, G, CL. III.	VP10387	VP10487

† CAUTION: To reduce the risk of ignition of hazardous atmospheres, do not use plugs or receptacles in CLASS II, GROUP F locations that contain electrically conductive dusts (most coal dusts are *not* electrically conductive).

CHART 1A - INTERMATEABILITY FOR STANDARD LOCATION PLUGS, RECEPTACLES AND CABLE CONNECTORS: 100 AMP SERIES

KILLARK	2W2P	3W3P	4W4P	2W3P	3W4P
PLUGS	VP10277	VP10377	VP10477	VP10387	VP10487
RECEPTACLES	VR1021	VR1031	VR1041	VR1032	VR1042
CABLE CONNECTORS	VPR10257	VPR10357	VPR10457	VPR10367	VPR10467
CROUSE-HINDS					
PLUGS	APJ10277	APJ10377	APJ10477	APJ10387 NPJ10386 NPJ10387	APJ10487 NPJ10486 NPJ10487
RECEPTACLES	AR1021 AR1023 AR1027	AR1031 AR1033 AR1037	AR1041 AR1043 AR1047	AR1032 AR1034 AR1038 NR1032	AR1042 AR1044 AR1048 NR1042
CABLE CONNECTORS	APR10255 APR10257	APR10355 APR10357	APR10455 APR10457	APR10365 APR10367 NPR10366 NPR10367	APR10465 APR10467 APR10466 APR10467
APPLETON					
PLUGS	ACP1022CD	ACP1033CD	ACP1044CD	ACP1023CD	ACP1034CD
RECEPTACLES	ADR1022 ACR1022	ADR1033 ACR1033	ADR1044 ACR1044	ADR1023 ACR1023	ADR1034 ACR1034
CABLE CONNECTORS	ARC1022BC	ARC1033BC	ARC1044BC	ARC1023BC	ARC1034BC

CHART 1B - INTERMATEABILITY FOR STANDARD LOCATION BACK BOXES: 100 AMP SERIES

KILLARK	VJ37 1" HUB VJ47 1-1/4" HUB VJ57 1-1/2" HUB VJ67 2" HUB	VJC37 1" HUB VJC47 1-1/4" HUB VJC57 1-1/2" HUB VJC67 2" HUB	VJA100 Adapter
CROUSE-HINDS	AJ37 1" HUB AJ47 1-1/4" HUB AJ57 1-1/2" HUB AJ67 2" HUB	AJC37 1" HUB AJC47 1-1/4" HUB AJC57 1-1/2" HUB AJC67 2" HUB	AJA6 Adapter
APPLETON *	-- -- -- --	AJA310 1" HUB AJA410 1-1/4" HUB AJA510 1-1/2" HUB AJA610 2" HUB	AJ100

* Appleton receptacle bolt pattern is same as Killark and Crouse-Hinds' patterns. However, adapter to back box and back box to wall bolt hole patterns are incompatible. Page 7

Recommendations contained in this document are based on technical information that Killark believes to be reliable. All the information and advice contained in these documents is intended for use by persons having been trained and possessing the requisite skill and know-how and to be used by such persons only at their own discretion and risk. The nature of these instructions is informative only and does not cover all of the details, variations or combinations in which this equipment may be used; its storage, delivery, installation, check-out, safe operation and maintenance. Since the installation, maintenance and use of the product are outside of the direct surveillance and control of Killark, the purchaser and/or user assumes all risk and liability whatsoever in regards to its use and suitability for his or her intended application.

MAINTENANCE

MAINTENANCE

Electrical and mechanical inspection of all components must be performed regularly. It is recommended that inspection be performed a minimum of once a year.

- Inspect all contact wire box terminals for tightness (**Retorque**). Discoloration due to excessive heat is an indicator of possible problems and should be thoroughly investigated and repaired as necessary.
- Check grounding and bonding for correct installation and secure connection (**Retorque**).

- Check gaskets for deterioration and replace if necessary.
- Clean exterior surfaces making sure nameplates remain legible.
- Inspect clamp guide assembly and cable grip tightness to ensure proper cable gripping.
- Torque all screws as described in instructions before reusing device.
- Inspect housing parts and replace those which are broken or excessively worn.
- Check contacts for signs of excessive arcing or burning and replace if necessary.
- Check **receptacle thread** used for plug locking ring for proper lubrication. Apply Killark's "LUB-G" type lubrication or equivalent to thread surfaces as required to prevent galling between the receptacle and locking ring threads.

WARNING

Electrical power supply **MUST BE OFF** before and during installation and maintenance. **DISCONNECT** primary power source and **LOCK OUT**. Installation and maintenance procedure must be performed by a trained and competent electrician.

WARNING

If any parts of the plug, receptacle or cable connector appear to be missing, broken or show signs of damage; **DISCONTINUE USE IMMEDIATELY!**
Do not modify these devices in any way. Replace with the proper replacement part(s) supplied by Killark before continuing service. Failure to do so could cause serious or fatal personal injury and/or equipment damage.

In addition to these required maintenance procedures, we recommend an Electrical Preventive Maintenance Program as described in the National Fire Protection Association Bulletin NFPA No. 70B.

ELECTRICAL RATING
 Maximum Voltages: 600 VAC @ 50-400Hz, 250VDC;
 Maximum continuous current: 100 Amperes.
 Horsepower: See Catalog Data or contact factory.

MAINTENANCE MANAGER
 Please record the following information for your records.

Complete Catalog No. _____

Installed By _____

Date of Installation _____

RECOMMENDED YEARLY INSPECTION

Date _____ ; Performed By _____

Date _____ ; Performed By _____

Date _____ ; Performed By _____

Date _____ ; Performed By _____

RETAIN THIS INSTRUCTION SHEET

HUBBELL INCORPORATED (Delaware)
 2112 Fenton Logistics Park Blvd
 Fenton, Missouri 63026 USA