**R49 & R24 SERIES**

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PRODUCT OVERVIEW

DESCRIPTION & DESIGN FEATURES

Applications
R49 & R24 series connectors can be used wherever high amperage connection of AC or DC power is required. Typical applications are the connection of power from generator sets to Switchgear or SCR houses. Traction motors, mud pumps, drawworks, rotary tables, cement pumps and top drives.

Electrical Integrity
R49 & R24 series connectors are designed to run at full rated load and complement the latest drilling cable electrical ratings.

Operator Safety
The inherent design of the connectors is such that the electrical contacts are shrouded by the Rubber insulations and the male (power side) has a dead front end to protect operators from shock hazard. Connectors are rated @1000 VAC or DC current with the ability to withstand intermittent surges up to 1300 amps.

Phase Identification
Connectors are color coded to provide easy circuit identification. Colored insulations for both AC and DC circuit. Color coding prevents reverse phasing or cross polarization of DC circuits. Receptacle housings are also color coded to further assist the identification of phases.

AMPACITY RATINGS IN 40°C AMBIENT

<table>
<thead>
<tr>
<th>Cable Size</th>
<th>90°C</th>
<th>125°C</th>
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<tbody>
<tr>
<td>4/0 AWG (107mm²)</td>
<td>364 Amps</td>
<td>451 Amps</td>
</tr>
<tr>
<td>313 MCM (159mm²)</td>
<td>513 Amps</td>
<td>636 Amps</td>
</tr>
<tr>
<td>373 MCM (189mm²)</td>
<td>548 Amps</td>
<td>669 Amps</td>
</tr>
<tr>
<td>444 MCM (225mm²)</td>
<td>642 Amps</td>
<td>796 Amps</td>
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<tr>
<td>535 MCM (271mm²)</td>
<td>724 Amps</td>
<td>898 Amps</td>
</tr>
<tr>
<td>646 MCM (327mm²)</td>
<td>814 Amps</td>
<td>1009 Amps</td>
</tr>
<tr>
<td>777 MCM (394mm²)</td>
<td>916 Amps</td>
<td>1135 Amps</td>
</tr>
</tbody>
</table>

INGRESS PROTECTION
Connectors are designed to provide weathertight service in a variety of demanding environments. The insulations are resistant to oil, mud, sea water and petroleum products found in the drilling industry. Correctly assembled, the connectors provide safe, trouble free operation in the most extreme working conditions. Certified by CSA.

CONFIGURATIONS

R49 & R24 series connectors are available in all configurations male and female connectors. Typical configurations are shown below:

<table>
<thead>
<tr>
<th>Power Side</th>
<th>Equipment Side</th>
<th>Use</th>
</tr>
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<tbody>
<tr>
<td>Male Receptacle Panel Mount</td>
<td>Female Plug</td>
<td>AC or DC Output side of panel</td>
</tr>
<tr>
<td>Inline Male Receptacle</td>
<td>Female Plug</td>
<td>Inline cable to cable connections</td>
</tr>
<tr>
<td>Male Plug Cable Mounted</td>
<td>Female Panel Mount Receptacle</td>
<td>AC power to switch-gear</td>
</tr>
</tbody>
</table>

Termination
Termination method is crimp on cable mounted plugs and receptacles and bus bar termination is provided on panel mounted receptacles. The rubber insulations can be bonded to the cables by vulcanization. Vulcanizers are available on request.

Type P Cables
R49 & R24 series connectors are designed to work in conjunction with the latest generation of Type P drilling cables, per IEEE 45. Cable accommodations are 4/0 AWG (107mm²) to 777 MCM (394mm²)

Mounting Data
R49 & R24 Series connectors are designed specifically with the requirements of the drilling industry in mind. A space saving design allows the mounting of receptacles in very close proximity to each other. This allows operators to reduce the overall space requirement on switch gear and SCR drives. See ‘Assembly Instructions’ for mounting dimensions.

Temperature Ratings
The connectors are designed to operate in both extremes of cold and high temperature applications. The Insulations are designed to withstand the very low temperatures found in Artic conditions, in addition to being able to run at full rated load in high ambient temperatures.

Installation
The simple design of the R49 & R24 series, allows the connectors to be mated and unmated without the use of tools.

MATERIALS
Receptacle Housings: Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating over copper-free aluminum alloy
Contacts: Tin-plated copper alloy
Insulations: Synthetic Rubber
R49 & R24 SERIES
FEATURES SPOTLIGHT

All Rubber Insulators
- Made from industry leading Toso-CSM
- Color coded for quick phase identification
- Resistant to oil, mud, sea water and petroleum products
- Excellent durability against UV and Ozone exposure
- Provide weatherproof service in a variety of demanding environments
- Rubber has “Self-Lubricating” technology
- Low propensity to chalk
- Molded axial air release grooves

Cable Mount Insulators
- Supplied with stainless steel hose clips
- Hard anodized retention ring

Busbar Contacts
- Can be supplied with either one or two bolt holes

Male & Female Contact
- Dead front Delrin® Ring

Crimp Contacts
- Heavy duty stainless steel spring locking band with six locking times
- Crimp buckets to accept 4/0 AWG to 777 MCM cable

All Contact
- Tin Plated Copper
- Dual flat/bright plating to reduce galling and decrease mating force
- R24’s feature RADSOK® contacts for high conductivity, excellent heat dissipation, and low mating force

NEW Enhanced Strain Relief (ESR)
R49 & R24 incorporate a extension of the retention ring enabling the use of basketweave strain relief system (patent pending). More info on page 7

Cable Mount Insulators
- Supplied with stainless steel hose clips
- Hard anodized retention ring

Panel Mount Housing
- Four alignment keyways in flange allow busbar to be set at 45 degree intervals
- Retained hasp set at 45 degrees

All Housings
- TGIC Polyester Powder coated aluminum alloy
- Color coded for quick phase identification
- Resistant to oil, mud, sea water and petroleum products
- Excellent durability against UV and Ozone exposure
- Stainless steel hasp and retention mechanism
- Retained hasp
- Snap action to retain hasp in either engaged or disengaged position
- Hasp bracket has hole to accommodate standard OSHA compliant lock
- Set screw for locking plug in position

Coupling Housing
- To connect two ‘inline’ Cable Mount Plugs
- OD. Groove to accept ‘U’ bolt for mounting

Bulkhead Housing
- To connect two ‘inline’ Cable Mount Plugs through a bulkhead

Delrin® is a registered trademark of DuPont
R49/24 CODE LOGIC

Complete Connector Includes:
Shell; Dust Cover; Contact; Cable Clamp / Gasket, as required.

1 LOCATION
CM  Cable Mounted
PM  Panel Mounted
BM  Bulkhead Mounted

2 LOCATION
P  Plug
R  Receptacle

3 STRAIN RELIEF
K  Enhanced Strain Relief
Omit for no ESR

4 WIRE/CONTACT CODE
Panel Mounted
1  Single Bolt Hole
2  Two Bolt Holes

Cable Mounted
4/0  4/0 AWG (107mm²)
3  313 MCM (159mm²)
373  373 MCM (189mm²)
4  444 MCM (227mm²)
5  535 MCM (273mm²)
6  646 MCM (326mm²)
7  777 MCM (394mm²)

5 CONTACT GENDER
M  Male Pin
F  Female Socket

6 COLOR CODE
R  Red
BK  Black
W  White
G  Green
Y  Yellow
OR  Orange
BL  Blue
BR  Brown
GY  Gray
P  Purple
Omit for no color
ENHANCED STRAIN RELIEF (ESR) SYSTEM
FOR R49 & R24 SERIES

The heart of the ESR system lies with the newly redesigned plug retention ring. The basketweave grip secures directly with the cable and plug by locking on the retention ring. Once the hasp is engaged, the ESR distributes strain along the entire assembly, from cable to panel.

This comprehensive solution combats the extreme weight and environmental demands that modern equipment require. The redesigned ESR plug is 100% compatible with traditional R49 and R24 receptacles.

The R49 & R24 series now feature a unique enhanced strain relief system (ESR) previously not available on any other rubber connector.

Enhanced Strain Relief
The new integrated retention ring and basketweave grip.

Plug Retention Ring Profile
The new profile allows the ESR unit to lock directly to the plug.

Plug Design
The retention ring is molded directly into the plug.

Fully Assembled Unit
A completed ESR system ready to be inserted.
R49 PANEL MOUNT RECEPTACLE
FEMALE ASSEMBLY

EXAMPLE PART NUMBER: R49-PMR-XF-XX

CONTACT CODE
COLOR CODE

MATERIALS

Receptacle Housing
Oil, Alkaline, UV, and weather resistant,
Color coded polyester TGIC powder coating over aluminum

Receptacle Body
Oil, Alkaline & UV resistant, flame retarding color coded, self-lubricating synthetic rubber

HASP Assembly
316 Stainless Steel

Hasp Lanyard
Non conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Tin plated copper

Contact Safe Front End
Black Insulator

Gasket
Neoprene, black

Cover
Buna-N rubber

Ø2.40
Cut out for R49-PMR

Ø.41 (4)
Mounting holes for 3/8 bolts

3.50 SQR
1.00 MIN

Ø.65 (4)
For 5/8 Bolts

1.75

4.88

3.40
2.00

.83

1.70
R49 PANEL MOUNT RECEPTACLE
MALE ASSEMBLY

EXAMPLE PART NUMBER: R49-PMR-XM-XX

CONTACT CODE

COLOR CODE

MATERIALS

Receptacle Housing
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating over aluminum

Receptacle Body
Oil, Alkaline & UV resistant, flame retarding color coded, self-lubricating synthetic rubber

HASP Assembly
316 Stainless Steel

Hasp Lanyard
Non conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Tin plated copper

Contact Safe Front End
Black Insulator

Gasket
Neoprene, black

Cover
Buna-N rubber

Ø2.40
Cut out for R49-PMR

Ø.41 (4)
Mounting holes for 3/8 bolts

3.50 SQR
Retension Hasp in disengaged position

4.29 SQR
1.00 MIN

3.40
2.00

1.70
1.75

.83
1.85

For 5/8 Bolts

1000 VOLTS
R49 CABLE MOUNT RECEPTACLE SHELL

EXAMPLE PART NUMBER: R49-CMR-XX
COLOR CODE

MATERIALS

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Coupler Body
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coated

Hasp Assembly
316 Stainless Steel

1/2 Scale View
(When used with cable mounted plug, male R49-CMP-XM-XX)

Retension Hasp in disengaged position

Ø3.97

5.48

2.42
R49 BULKHEAD MOUNT RECEPTACLE SHELL

EXAMPLE PART NUMBER: R49-BMR-XX
COLOR CODE ____________

MATERIALS

Retaining Cord
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Coupler Body
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating

Hasp Assembly
316 Stainless Steel

Gasket
Neoprene, black

1/2 Scale View
(When used with cable mounted plug, male R49-CMP-XM-XX)

Ø3.75 Cut out for Bulkhead Mount Receptacle

Ø13/32 (4) Mounting holes for 3/8 bolts

Ø3.72

Retension Hasp in disengaged position

3.60

5.48

1.00 MIN

3.60 SQR

5.48 SQR
R49 CABLE MOUNTED PLUG

MALE

EXAMPLE PART NUMBER: R49-CMP-XM-XX

CONTACT CODE

COLOR CODE

MATERIALS

Plug Body
Oil, Alkaline & UV resistant, flame retarding color coded synthetic rubber

Cable Clamp
316 Stainless Steel worm gear

Plug Retention Ring
Hardcoated Aluminium

Environment Cover
Oil, Alkaline & UV resistant, flame retarding black synthetic rubber

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Tin (flat) plated copper

CONTACT CODE

COLOR CODE

Ø2.99 Ø2.10

Ø2.20

8.43

3.43

2.64
R49 CABLE MOUNTED PLUG

FEMALE

EXAMPLE PART NUMBER: R49-CMP-XF-XX

CONTACT CODE
COLOR CODE

MATERIALS

Plug Body
Oil, Alkaline & UV resistant, flame retarding color coded synthetic rubber

Cable Clamp
316 Stainless Steel worm gear

Plug Retention Ring
Hardcoated Aluminium

Environment Cover
Oil, Alkaline & UV resistant, flame retarding black synthetic rubber

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Tin (bright) plated copper

DIMENSIONS

Ø 2.10

Ø 2.20

8.43

3.43
R24 PANEL MOUNT RECEPTACLE
FEMALE ASSEMBLY

EXAMPLE PART NUMBER: R24-PMR-XF-XX
CONTACT CODE
COLOR CODE

MATERIALS

Receptacle Housing
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating over aluminum

Receptacle Body
Oil, Alkaline & UV resistant, flame retarding color coded, self-lubricating synthetic rubber

HASP Assembly
316 Stainless Steel

Hasp Lanyard
Non conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Silver plated copper RADSOK® available soon

Contact Safe Front End
Black Insulator

Gasket
Neoprene, black

Cover
Buna-N rubber

Retension Hasp in engaged position

Retension Hasp in disengaged position

2.531 SQR
3.235 SQR

4.418”
R24 PANEL MOUNT RECEPTACLE
MALE ASSEMBLY

EXAMPLE PART NUMBER: R24-PMR-XM-XX

CONTACT CODE
COLOR CODE

MATERIALS

Receptacle Housing
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating over aluminum

Receptacle Body
Oil, Alkaline & UV resistant, flame retarding color coded, self-lubricating synthetic rubber

HASP Assembly
316 Stainless Steel

Hasp Lanyard
Non conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Silver plated copper

Contact Safe Front End
Black Insulator

Gasket
Neoprene, black

Cover
Buna-N rubber

Retension Hasp in engaged position

Retension Hasp in disengaged position

3.235 SQR
2.531 SQR

4.418”
R24 CABLE MOUNT RECEPTACLE SHELL

EXAMPLE PART NUMBER: R24-CMR-XX
COLOR CODE

MATERIALS

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Hasp Assembly
316 Stainless Steel

Coupler Body
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coated

EXAMPLE PART NUMBER: R24-CMR-XX
COLOR CODE
R24 BULKHEAD MOUNT RECEPTACLE SHELL

EXAMPLE PART NUMBER: R24-BMR-XX
COLOR CODE

MATERIALS

Retaining Cord
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Hasp Assembly
316 Stainless Steel

Coupler Body
Oil, Alkaline, UV, and weather resistant, Color coded polyester TGIC powder coating

Gasket
Neoprene, black
R24 CABLE MOUNTED PLUG
MALE

EXAMPLE PART NUMBER: R24-CMP-XM-XX

CONTACT CODE
COLOR CODE

MATERIALS

Plug Body
Oil, Alkaline & UV resistant, flame retarding color coded synthetic rubber

Environment Cover
Oil, Alkaline & UV resistant, flame retarding black synthetic rubber

Cable Clamp
316 Stainless Steel worm gear

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Plug Retention Ring
Hardcoated Aluminium

Contact
Tin (flat) plated copper

PAT.PEND.
R24 SERIES
MADE IN USA
DO NOT DISCONNECT UNDER LOAD
R24 CABLE MOUNTED PLUG
FEMALE

EXAMPLE PART NUMBER: R24-CMP-XF-XX
COLOR CODE

CONTACT CODE

MATERIALS

Plug Body
Oil, Alkaline & UV resistant, flame retarding color coded synthetic rubber

Cable Clamp
316 Stainless Steel worm gear

Plug Retention Ring
Hardcoated Aluminium

Environment Cover
Oil, Alkaline & UV resistant, flame retarding black synthetic rubber

Lanyard
Non-conductive PVC coated stainless steel wire rope, black with zinc plated copper crimps

Contact
Tin (bright) plated copper

7.746"
Application
R49 and R24 Series connectors have been designed to safely distribute 1135 Amps at 1000 Volt AC or DC power. These connectors are rated for 1135 Amps continuous operation at 110°C. Connectors are not designed for disconnection under load.

Male Receptacle, inline Receptacle, or Male Connector are used on power side circuit for connection to portable cable. Female Connector or Receptacle are used on machine or motor side of circuit for connection to portable cable. Male and Female Contacts are sized to match cable size and must be ordered for specific cable size.

Contacts may be attached to cable by crimping dies and equipment, copper cable only.
ASSEMBLY INSTRUCTIONS
FOR R49 & 24 SERIES

Crimp Method
A Cut cable to length
B Strip cable jacket and binders back by 1-7/8” (48mm)
C Attach contact by crimping to cable, making 2 crimps on the undercut portions of the contact. See charts below for the correct sized crimping tools.

Solder Method
A Cut cable to length
B Strip cable jacket and binders back by 1-7/8” (48mm)
C Attach contact by soldering, using Rosin Flux and 40 – 60 solder. Do not use excessive heat or contact will be distorted and protective plating will be damaged

Pin Alignment
Each contact has two contact retention pins. These pins are to be aligned with the ‘U’ slots in the Contact Retention ring inside the insulator.

To aid assembly, the internal ‘U’ slots line up with the two labels on the outside of the insulator. When inserted correctly, the retaining spring locks behind the Contact Retention ring to hold contact in position.

With the contact secure, tighten hose clip to seal the rear of connector.

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**THOMAS & BETTS 13642PF**

<table>
<thead>
<tr>
<th>Cable Size MCM</th>
<th>Hydraulic Die Catalog Number</th>
<th>Head Die Code</th>
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<tbody>
<tr>
<td>4/0 &amp; 313</td>
<td>11744</td>
<td>76H</td>
</tr>
<tr>
<td>444 &amp; 373</td>
<td>11748</td>
<td>99H</td>
</tr>
<tr>
<td>535</td>
<td>11749</td>
<td>106H</td>
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<tr>
<td>646</td>
<td>11753</td>
<td>115H</td>
</tr>
<tr>
<td>777</td>
<td>11753</td>
<td>115H</td>
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**THOMAS & BETTS TBM151** (REPLACES TBM15PF)

<table>
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<td>4/0 &amp; 313</td>
<td>15512</td>
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<td>444 &amp; 373</td>
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<td>106H</td>
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<td>115H</td>
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<tr>
<td>777</td>
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<td>115H</td>
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