

PLM

The Leading Coupler in the Mining Industry

A History

PLM products began in 1951 as a supplier of cable accessories for high voltage cables. Although Cable Couplers had been used in the mining industry, it was not until 1957 when requirements began to develop for voltages higher than 5kV and Amperages greater than 200 Ampere that the first 7.5kV 500 AMP Coupler was developed by PLM Products.

Published test values backed by a high voltage laboratory and continuous innovations have kept PLM Products, now known as Adalet, as a world leader of cable couplers.

Design

From the beginning, PLM designed Couplers to standards subsequently incorporated into mine safety codes in the United States. All PLM Couplers are completely metal enclosed with the outer shell grounded to the ground wires in the cable. Couplers are designed so that the first contact to make and last to break is the ground contact. With ground check circuits the Coupler ground check circuit is the last to make and first to break. The ground contact is also grounded to the housing assuring the operator that the Coupler is grounded.

Use

Couplers have been utilized in underground, strip, and pit operations on every continent in the world, and for coal and hard rock mining operations of every type. Adalet Cable Couplers provide safe, convenient means for connecting portable cable rated up to 15,000 volt and up to 500 Amperes, copper or aluminum conductor to mining equipment, electric shovels, draglines, loaders, barges, tunneling machines, portable substations, portable junction boxes, or for joining lengths of high voltage cables.

Housings are of rugged, corrosion resistant cast aluminum providing high strength with light weight. Thorough gasketing makes the coupler entirely watertight. Tight fitting covers for plug and socket, protect contacts and insulators from moisture when disconnected.

Positive thread engagement of the metal housing prevents accidental disconnecting and insures proper opening and closing sequence. For further safeguard, optional electrical and mechanical (key type) systems are available.

Other Available Couplers

Male/Female assemblies are interchangeable within housings. Specify PF or SM or consult factory. All additional options are available for the above coupler.

Portable Cable Systems Couplers/ Plugs-Receptacles

Cable Couplers Identification & Application

Basic nomenclature identifies the metallic shell (Plug or Socket) first, the type of contact (Male or Female) second. For switchgear or other non-cable mounted units, the letter G suffix designation is added. Example of the PLM Catalog number system is as listed:

PMG 415A - Plug, male contacts, switchgear mount, with ground check contact.

PML 415A - Plug, male contacts, line mount, with ground check contact.

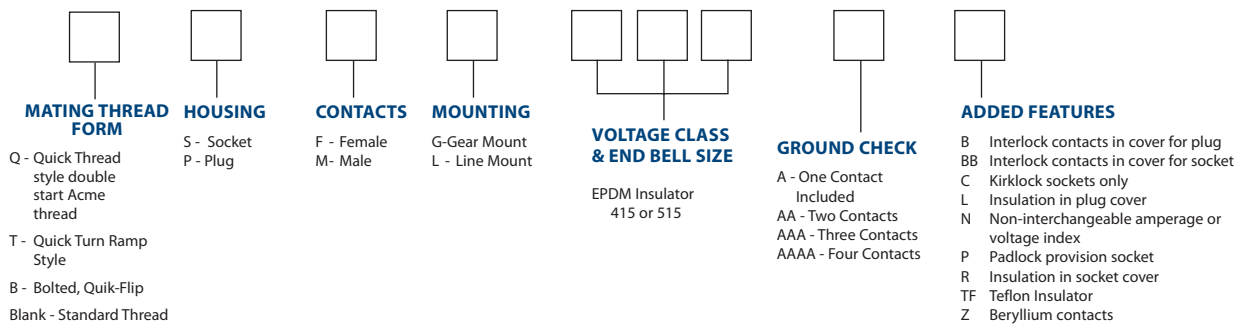
SFL 415A - Socket, female contacts, line mount, with ground check contact.

SFG 415A - Socket, female contacts, switchgear mount, with ground check contact.

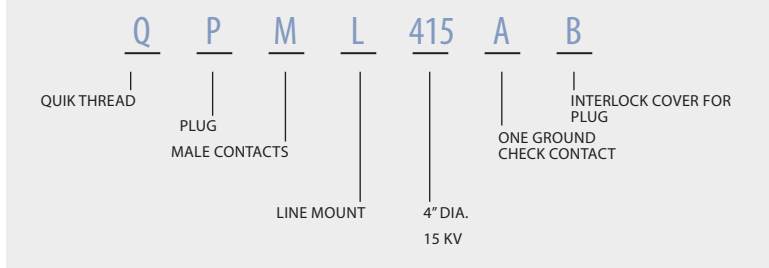
- Other added options available for the coupler and catalog number identification are listed.
- Spare part requirements are minimized by widely interchangeable components.
- Suggested application of cable couplers is a plug on one end of a cable and a socket on the other end.

Common usage has the socket being on the source end and the plug on the load end.

PLM Cable Coupler Selection Guide



Example



Portable Cable Systems Couplers/ Plugs-Receptacles

Cable Couplers Identification & Application

APPLICATIONS

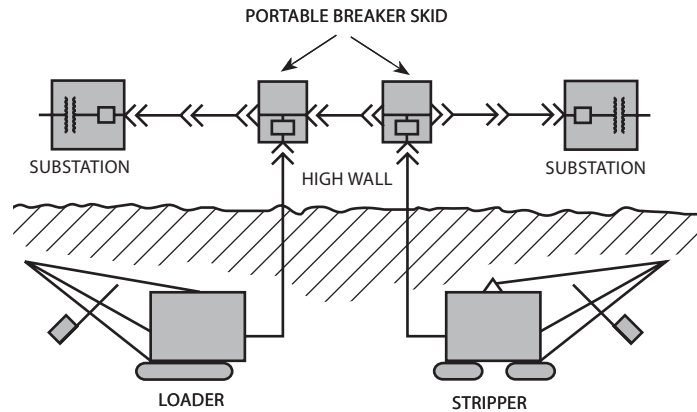
- Extending Portable Cables
- Mine Power Centers
- Electric Shovels, Drills, Draglines
- Tunneling Machines
- Transformer Connections
- Barge, Ship-Dock Applications
- Turbine Generators
- Motor Disconnect 600V-15kV to 500-Amp.

FEATURES

- Corrosion-Resistant Aluminum
- Electrically Tested Insulator
- Silver-Plated Copper Contacts
- Ground Check System
- Portable Cable Connections
- Switchgear or Equipment Mounting
- Standard Cover Included
- FSD Terminations Included
- Interlock Covers Available
- Filling Compounds

BENEFITS

- Physical, Electrical Protection
- Quick, Connect-Disconnect
- Provides Proper Phase Alignment
- Longer Cable Life
- Entirely Watertight
- Easy Installation
- Interlock Covers Available
- Filling Compounds



Typical Surface Mine

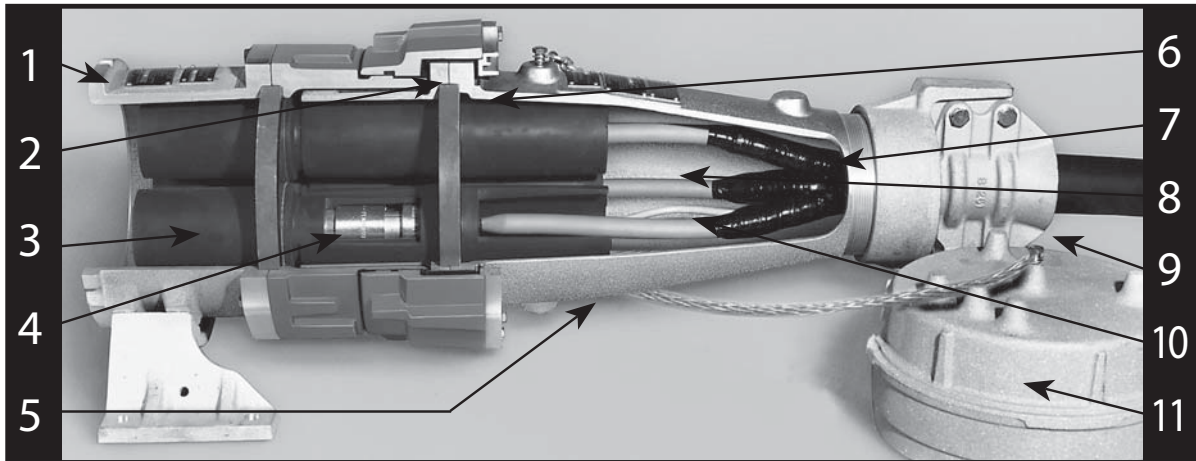
1. Female sockets on source side of substations, line, and portable skids.
2. Male plugs on load side of skids, loader and stripper.

To Order, Provide:

1. Catalog numbers.
2. Voltage requirements.
3. Conductor sizes of phase, ground wires, and ground check wire.
4. Overall cable diameter.

Portable High Voltage Cable Couplers: 415/515 Series

Features & Electrical Characteristics



FEATURES (Common to most PLM Couplers)

1. Heavy duty Ecoalube coated aluminum castings for high strength and corrosion protection.
2. Completely metal enclosed insulators, O-ring sealed.
3. Rigid non-breakable EP insulator tubes eliminate mating problems. Light color provides easy check of cleanliness.
4. Close tolerance, silver plated contacts provide reliable connections and assured conductivity.
5. Smooth profile end bell resists snags.
6. Solid one piece flame retardant flange with O-rings on both sides insures against the entrance of moisture.
7. FSD stress relief pads provide fast, safe, dependable cable terminations within coupler housing.
8. Easy access chamber for COLDDPOUR® filling compound when required.
9. Rugged cable entrance clamp and thick neoprene gasket for excellent moisture seal at cable entrance.
10. Ground check circuit contact is included. Additional contacts available.
11. Captive metal covers to keep insulators clean and dry when disconnected.

ELECTRICAL CHARACTERISTICS

Description	No Compound	With Compound
Maximum Voltage Phase-to-Ground	5.5 KV rms	8.7 KV rms
1 Minute Dry Withstand AC	35.0 KV rms	45.0 KV rms
6 Hour Dry Withstand AC	25.0 KV rms	35.0 KV rms
15 Minute Dry Withstand DC	65.0 KV	75.0 KV
Corona Extinction Level	7.5 KV rms	11.0 KV rms
Basic Impulse Level	75.0 KV crest	95.0 KV crest

*All tests per IEEE Standard 48-1990

Compound is not included and is not required up to 7,500 volts. Above 7,500 Volts and when compound is required, use COLDDPOUR® Compound. Do not use asphalt compound. COLDDPOUR® Compound recommended for 15kv.

Portable High Voltage Cable Couplers: 415/515

EPDM Insulators-Dura-TubeSM

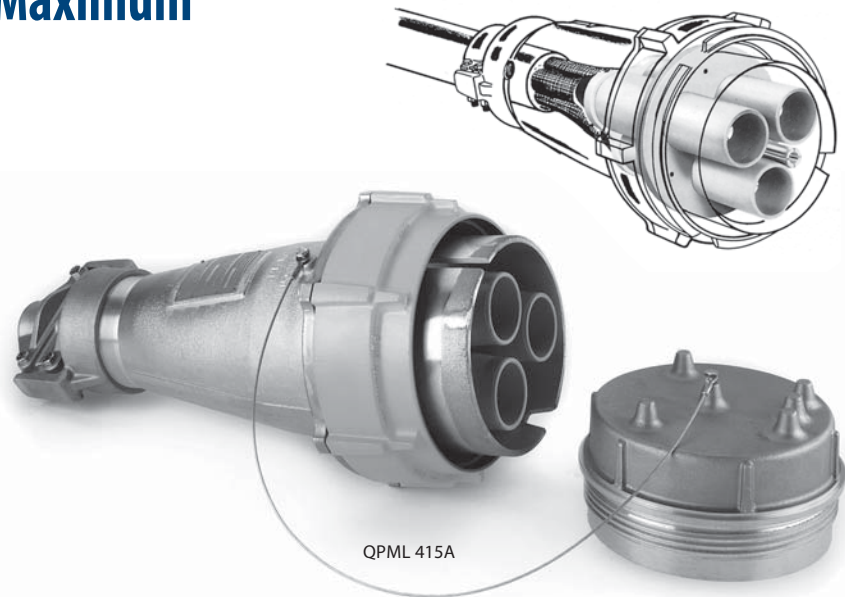
500 Amperes • 15,000 Volts Maximum

FEATURES

- Corrosion-resistant aluminum
- Rigid, non-breakable EPDM insulators
- 500 Amp contacts
- Portable cable mounting
- Switchgear or equipment mounting
- Standard cover, stress control kit, instructions included

BENEFITS

- Superior electrical and physical protection
- Fewer mating problems
- Quicker installation
- Quick connect-disconnect
- Versatile application



Catalog Number Standard Threads	Catalog Number Acme Quik Thread	Catalog Number Quik Turn	Description	Ship Weight (lbs.)
Equipment-mounted couplers				
SFG 415 A	QSFG 415A	TSFG 415A	Socket, Female Contacts	34
PMG 415 A	QPMG 415A	TPMG 415A	Plug, Male Contacts	34
Line-mounted couplers 1.50-3.50 O.D. Cables				
SFL 415 A	QSFL 415A	TSFL 415A	Socket, Female Contacts	51
PML 415 A	QPML 415A	TPML 415A	Plug, Male Contacts	51
Line-mounted couplers 3.50-4.50 O.D. Cables				
SFL 515 A	QSFL 515A	TSFL 515A	Socket, Female Contacts	53
PML 515 A	QPML 515A	TPML 515A	Plug, Male Contacts	53

- NOTES**
1. Male/Female insulator and contact assemblies are interchangeable within coupler housings.
 2. Specify PF or SM in catalog selection or consult factory.
 3. On initial orders, one coupling wrench and one contact wrench will be required.

Certification

Pennsylvania Bureau of Deep Mine Safety

Portable High Voltage Cable Couplers: 415/515 Connection Options

Quik-Thread

Quik-Thread Connections are recommended for all existing installations where abusive conditions cause thread damage or suggested for new applications where maximum convenience and speed is required.

FEATURES

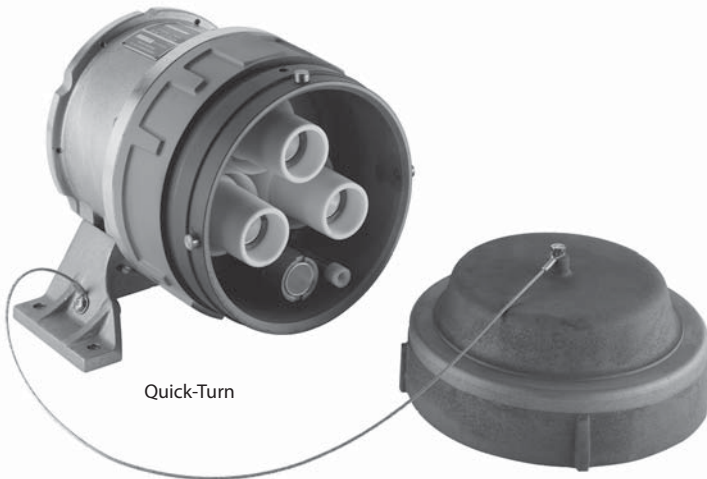
- Quik-Thread style double start ACME thread
- 2-1/2 turn engagement
- Color coded green for high visibility identification
- Fully interchangeable with other ACME thread couplers

Quik-Turn

Quik-Turn Connections are recommended for all existing installations where abusive conditions cause thread damage or suggested for new applications where maximum convenience and speed is required.

FEATURES

- ¼ turn engagement for fast connection.
- Stainless steel pin and sleeve for corrosion resistance.
- Color coded orange for high visibility identification.
- Fully interchangeable with other threadless couplers.
- Spare parts common to PLM 8 pitch and Quik-Thread coupler designs.



Quik-Turn

Certification

Pennsylvania Bureau of Deep Mine Safety

Standard Options

OPTIONS	
Description	Suffix
Ground check circuit contact (1) included	-A
Two ground check circuit contacts	-AA
Cover interlock for plug	-B
Cover interlock for socket	-BB
Kirk interlock (key type)-sockets only	-C
Electrolytic copper contacts-female	-E
Cover/insulator assembly for plug	-L
Non-interchangeable amperage or voltage index	-N
Padlock provision-socket	-P
Cover/insulator assembly for socket	-R
Beryllium contacts-male	-Z

Portable High Voltage Cable Couplers: 415TF/515TF

Teflon® Insulators

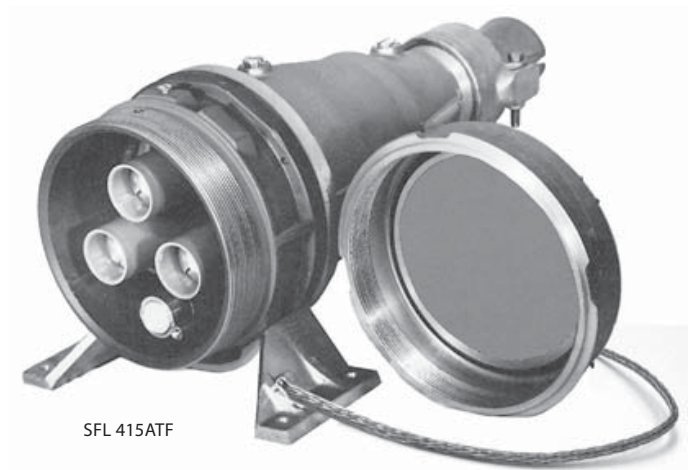
500 Amperes • 15,000 Volts Maximum

FEATURES

- Corrosion-Resistant Aluminum
- O-Ring seal between male and female insulator tubes
- Rigid, Non-Breakable TEFLON® Insulators
- 500 Amp Contacts
- Portable Cable Mounting
- Switchgear or Equipment Mounting
- Standard Cover, Stress Control Kit, Instructions Included
- Solid Polyester Fiberglass Flange
- Teflon Tubes O-ring Sealed to Flange
- Poly Lock Nuts for Positive Seal

BENEFITS

- Non-tracking, easy-to-clean hydrophobic material
- Superior electrical and physical protection
- Fewer mating problems
- Quicker installation
- Quick connect-disconnect
- Versatile application



SFL 415ATF

Catalog Number Standard Threads	Catalog Number Acme Quik Thread	Catalog Number Quik Turn	Description	Ship Weight (lbs.)
SFG 415 ATF	QSFG 415ATF	TSFG 415ATF	Equipment-mounted couplers Socket, Female Contacts	34
PMG 415 ATF	QPMG 415ATF	TPMG 415ATF	Plug, Male Contacts	34
SFL 415 ATF	QSFL 415ATF	TSFL 415ATF	Line-mounted couplers 1.50-3.50 O.D. Cables Socket, Female Contacts	51
PML 415 ATF	QPML 415ATF	TPML 415ATF	Plug, Male Contacts	51
SFL 515 ATF	QSFL 515ATF	TSFL 515ATF	Line-mounted couplers 3.50-4.50 O.D. Cables Socket, Female Contacts	53
PML 515 ATF	QPML 515ATF	TPML 515ATF	Plug, Male Contacts	53

Teflon® is a registered trademark of E.I. DuPont de Nemours and Company

- NOTES**
1. Male/Female insulator and contact assemblies are interchangeable within coupler housings.
 2. Specify PF or SM in catalog selection or consult factory.
 3. On initial orders, one coupling wrench and one contact wrench will be required.

Portable High Voltage Cable Couplers: 415TF/515TF

Teflon® Insulators

Electrical Characteristics & Options

OPTIONS	
Description	Suffix
Ground check circuit contact (1) included	-A
Two ground check circuit contacts	-AA
Cover interlock for plug	-B
Cover interlock for socket	-BB
Kirk interlock (key type)-sockets only	-C
Electrolytic copper contacts-female	-E
Cover/insulator assembly for plug	-L
Non-interchangeable amperage or voltage index	-N
Padlock provision-socket	-P
Cover/insulator assembly for socket	-R
Beryllium contacts-male	-Z

ELECTRICAL CHARACTERISTICS		
Description	No Compound	With Compound
Maximum Voltage Phase-to-Ground	5.5 KV rms	8.7 KV rms
1 Minute Dry Withstand AC	35.0 KV rms	45.0 KV rms
6 Hour Dry Withstand AC	25.0 KV rms	35.0 KV rms
15 Minute Dry Withstand DC	65.0 KV	75.0 KV
Corona Extinction Level	7.5 KV rms	11.0 KV rms
Basic Impulse Level	75.0 KV crest	95.0 KV crest

*All tests per IEEE Standard 48-1990

Compound is not included and is not required up to 7,500 volts. Above 7,500 Volts and when compound is required, use COLDPOUR® Compound. Do not use asphalt compound. COLDPOUR® Compound recommended for 15kv.

Certification

Pennsylvania Bureau of Deep Mine Safety

Portable High Voltage Cable Couplers: 415/515

Quik-Flip Clamp

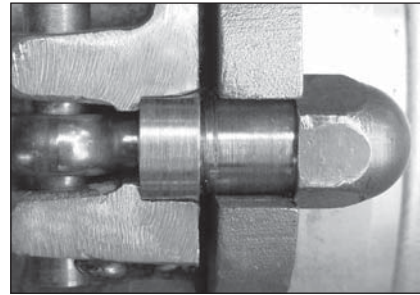
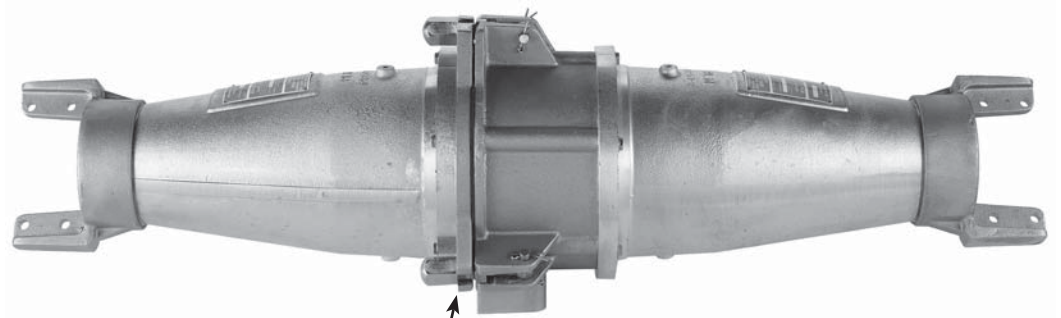
500 Amperes • 15,000 Volts Maximum

FEATURES

- Ensures one (1) second contact delay when opening
- Corrosion Resistant aluminum
- Electrically tested insulator
- Silver-plated contacts
- Ground check contact included
- Switchgear or equipment mounting
- Standard cover included
- FSD terminations included
- O-ring and gasket sealed
- Cold Pour filling compound available

BENEFITS

- Quick connect/disconnect
- Provides proper phase alignment
- Longer cable life
- Easy to install
- Physical and electrical protection



Quick-Flip Bolt Detail

Catalog Number Standard Threads	Description	Ship Weight (lbs.)
Equipment-mounted couplers		
BSFG 415A	Socket, Female Contacts	34
BPMG 415A	Plug, Male Contacts	34
Line-mounted Couplers 1.50-3.50" O.D. Cables		
BSFL 415A	Socket, Female Contacts	51
BPML 415A	Plug, Male Contacts	51
Line-mounted Couplers 3.50-4.50" O.D. Cables		
BSFL 515A	Socket, Female Contacts	53
BPML 515A	Plug, Male Contacts	53

NOTE For Teflon® insulators, add suffix TF

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Compliance

Pennsylvania Bureau of Deep Mine Safety

CONVERSION KITS

Conversion Kits QT

Any cable coupler line mount or gear mount may be converted to Acme double start Quik-Thread style, Quik-Turn style or Quik-Flip style. These style couplers will not mate with standard 8 pitch thread couplers; therefore, it is necessary to change the socket body, lock ring, and covers. Select the correct conversion plug or socket kit from the table below. Kits include only the thread parts which must be changed, plus new screws and gaskets.

Quik-Thread coupler rings are color-coded green to provide positive identification. Quik-Turn coupler rings are color-coded orange. Conversion kits should be applied to all couplers on any single cable system.



QKP-8

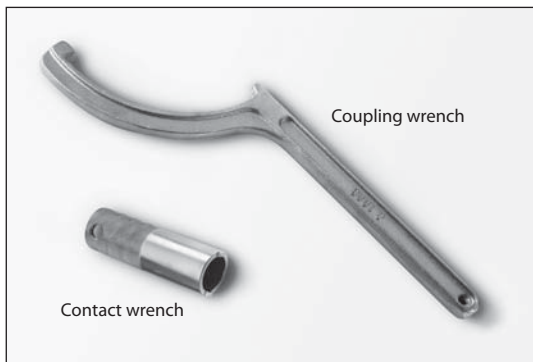
QKS-8

CONVERSION KIT		
Catalog Number	Acme Thread Parts Furnished	Description
QKP-8	Plug cover and lock ring	Replacement for plug-style couplers. Includes plain cover (without drilling for pilot or ground contacts).
TKP-8		
BKP-8	Bolt style plug flange and cover	
QKP-M/F-8	Plug cover (drilled for pilot and ground contacts) and	Replacement for plug-style couplers. Includes cover drilled for ground and pilot contacts (male or female). Customer to use existing contacts.
TKP-M/F-8	lock ring	
QKP-M/F-15	Plug cover (drilled for pilot and ground contacts and for	Replacement for plug-style couplers. Includes cover drilled for ground and TKP- pilot contacts (male or female) and for cover insulator assembly. Customer to use existing contacts and cover insulator assembly.
TKP-M/F-15	cover insulator assembly) and lock ring	
QKS-8	Socket cover ring and socket body	Replacement for socket-style couplers. Includes plain cover (without drilling for pilot or ground contacts).
TKS-8		
BKS-8	Bolt style socket flange and cover	
QKS-M/F-8	Socket cover ring and socket body	Replacement for socket-style couplers. Includes cover ring to be used with existing cover. Customer to use existing contacts.
TKS-M/F-8		
QKS-M/F-15	Socket cover ring and socket body	Replacement for socket-style couplers. Includes cover ring to be used with existing cover and cover insulator assembly. Customer to use existing contacts.
TKS-M/F-15		

Compliance

Mine Safety Health Administration
30 CFR Part 18

Coupler Wrenches



COUPLER WRENCHES

Catalog Number	Description	Ship Weight (lbs.)
WR	Contact wrench for 415, 515 series	1
C-1008	Coupling wrench (Aluminum) for 415, 515 series	1
C-1008-S	Coupling wrench (Steel) for 415, 515 series	3
WR-XP	Contact wrench for X series	3

ColdPour® Compound* CP

Compound filling can prevent condensation and provide added protection in wet locations. Asphaltic compounds cannot be used with EPDM insulations. For those customers who may wish to use compound, ADALET offers a COLDPOUR® compound which does not require heating for installation or removal. Suitable for all couplers. No shrinkage or waste. Approximately 3-hour gel time.



COLDPOUR COMPOUND

Catalog Number	Description	Ship Weight (lbs.)
CP-40	1 ½ gal. 2-part mix for one LINE mount or two GEAR mount couplers, Series 415 coupler.	13
CP-50	1 ⅞-gal. 2-part mix for one 515 LINE mount coupler	14

*Shelf life, 6 mos. Should be installed at normal room temperature.

Coupler Contact Insulation Cleaning Kit

Dirt contamination can cause electrical failures. The mating contact insulators can be efficiently cleaned with the PCK100 Cleaning Kit. Kit consists of 16-oz. spray bottle of non-flammable electrical parts cleaner, bristle brush, two white wiping cloths and polyethylene glove. Ozone-safe spray can contains no fluorocarbons.

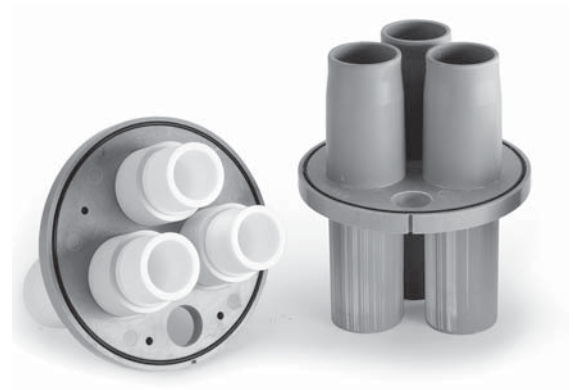


CONTACT CLEANING KIT

Catalog Number	Description	Ship Weight (lbs.)
PCK-100	Cleaning kit	1 ½

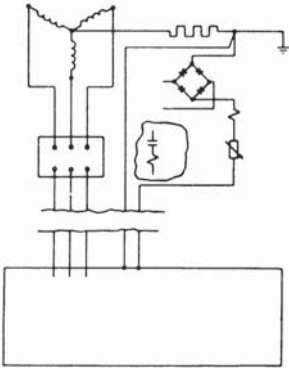
Replacement Coupler Insulators

Insulator kits to replace polyester fiberglass and EDPM style insulators. Complete package includes rigid, unbreakable insulator tubes with flame-retardant flange. Line mount kits include all necessary conductor and insulation shield terminating material except contacts. May be used with existing PLM Couplers. Add COLDPOUR® for 15kV applications.



COUPLER INSULATORS

Catalog Number	Description	Ship Weight (lbs.)
K 415 F	For female line plugs or sockets	10
K 415 M	For male line plugs or sockets	10
K 415 FG	For female gear-mount plugs or sockets	8
K 415 MG	For male gear-mount plugs or sockets	8



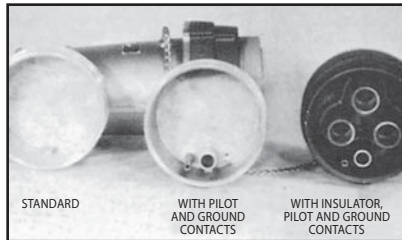
Ground Check and Key Interlock Methods

With a total of four pilot wire contacts available, the Adalet Coupler is adaptable to any presently used ground check system. In addition to the electrical interlock (ground check system), mechanical key type locks may be used to ensure no voltage disconnection of couplers.

Coupler Covers

The Adalet Coupler is furnished with the Standard Cover. This prevents moisture and contamination from coming in contact with the coupler insulator and contacts. When it is desired to have the Cover equipped with a Pilot contact and a Ground contact, add the suffix letter "B" to the catalog number for Plug style coupler and letter "BB" for Socket style coupler. With these contacts installed it is then possible to check the integrity of the Ground Check circuit.

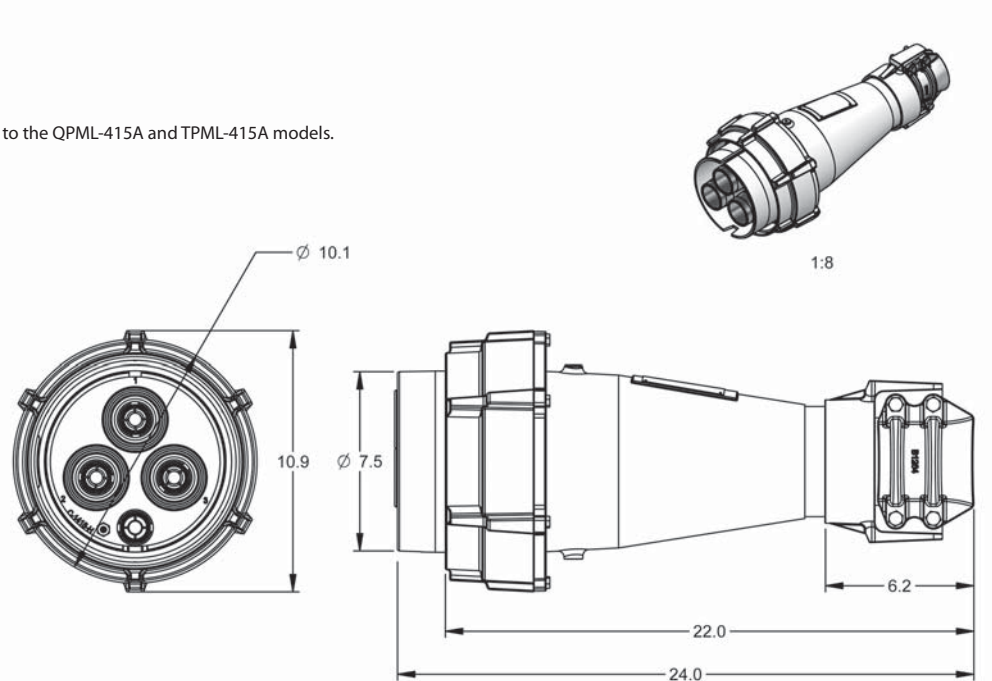
The covers are available with an insulator, pilot contact, and ground contact. It is then possible to energize the cable without the coupler being connected to another coupler. Add the suffix letters "BL" to the catalog number for Plug style coupler and letters "BBR" for Socket style coupler.



Cable Couplers Dimensions - 415 Series

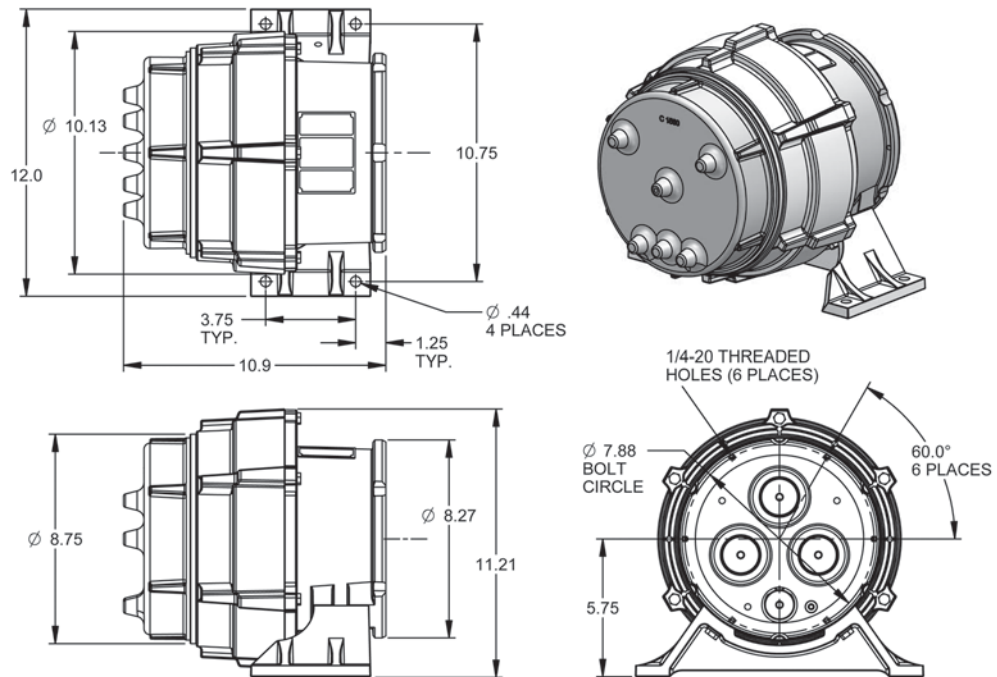
PML415A

Note: This drawing also applies to the QPML-415A and TPML-415A models.



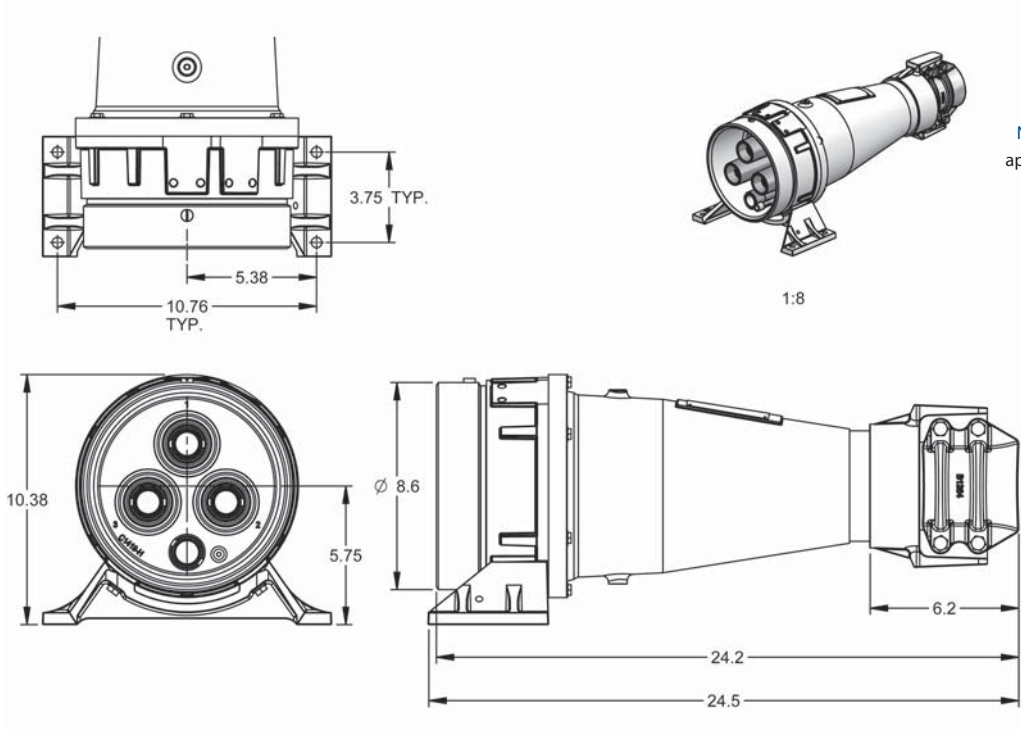
PMG415A

Note: This drawing also applies to the QPMG-415A and TPMG-415A models.



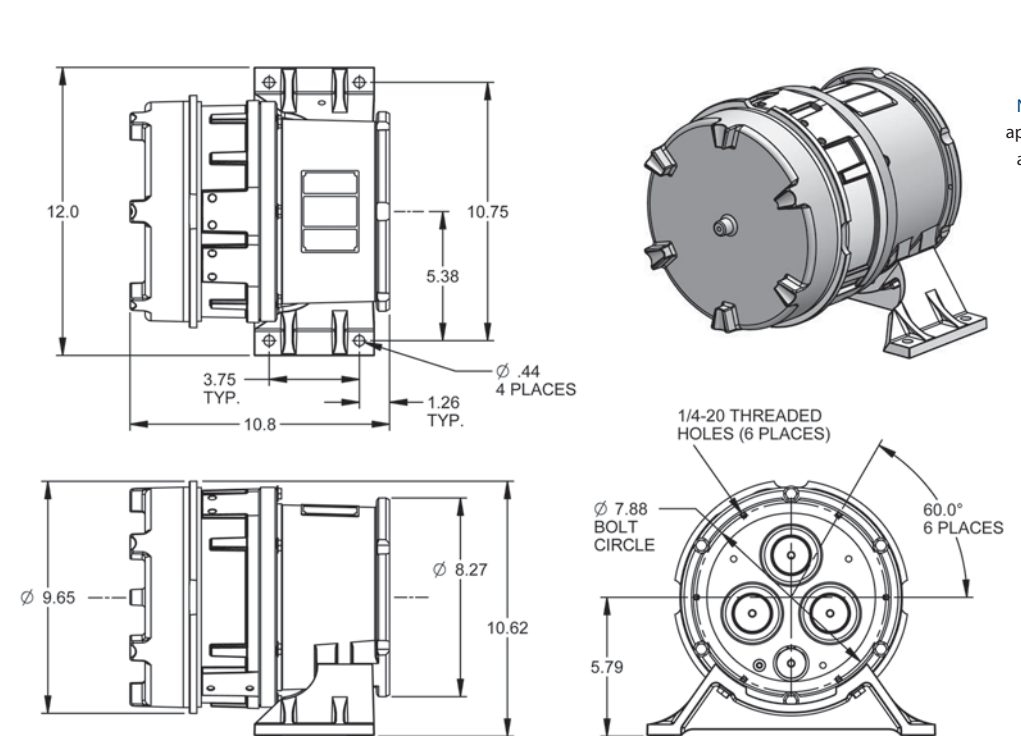
For detailed coupler specifications and drawings, visit www.plmconnects.com

Cable Couplers Dimensions - 415 Series



SFL415A

Note: This drawing also applies to the QSFL-415A and TSFL-415A models.



SFG415A

Note: This drawing also applies to the QSFG-415A and TSFG-415A models.

For detailed coupler specifications and drawings, visit www.plmconnects.com