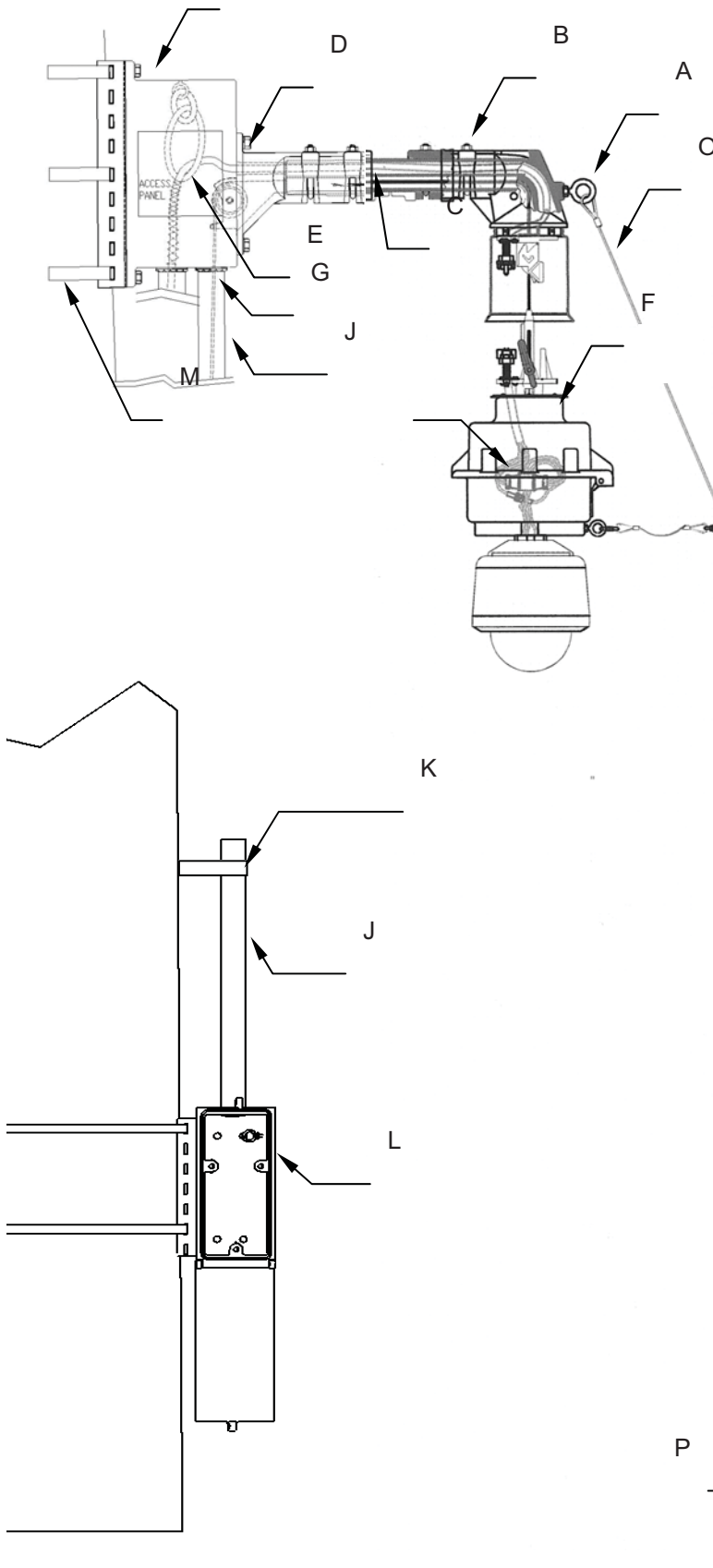


# Design **CEPM-16HD<sup>x</sup>**

## Arm and Disconnect Unit for Wall/Pole/Tower

x = Type of Signal Cable. Details at end of Specification



**A. ELECTRICAL AND SIGNAL DISCONNECT UNIT WITH UP TO 16 CONTACTS CONNECTOR, GUIDE EYE BOLT.**

**B. HEAVY DUTY ALUM DISCONNECT UNIT FITTER WITH PULLEY AND U-BOLT MOUNTING.**

**C. 1/4" THICK DIVIDED PIPE ARM: 2-3/8 IN. O.D. SEPARATES CONTROL CABLE AND ELECTRICAL/SIGNAL WIRES.**

**D. POLE MOUNTED FITTER WITH LARGE PULLEY HOUSING AND MOUNTING BRACKET FOR STRAP MOUNTING TO POLE (STRAPS BY OTHERS).**

**E. COMPOSITE CABLE STRAIN RELIEF.**

**F. CAMERA CONNECTION BOX PROVIDED WITH STABILIZING WEIGHTS. EASY OPEN SWING DOWN DESIGN PERMITS QUICK ACCESS TO SIGNAL WIRES FROM CAMERA ASSEMBLY. FEATURES UNIVERSAL MOUNTING FOR ALL CAMERA TYPES AND PAN/TILT UNITS.**

**G. CONTROL CABLE CONSTRUCTED OF 5/32 INCH DIA. 316 STAINLESS STEEL 7X19 CABLE.**

**H. ELECTRICAL/SIGNAL WIRES (CAMERA CONNECTOR BY OTHERS). 1 PCE ELECT/SIGNAL CABLE FROM DISCONNECT UNIT TO CABINET, PROVIDED BY CLS.**

**J. 1 1/2" CONDUIT (BY OTHERS).**

**K. CONDUIT BRACKET WITH CLAMPS ATTACHING CONDUIT TO POLE (OPTIONAL).**

**L. HEAVY DUTY ALUMINUM SECURITY LOCKING BOX FOR USE WITH PORTABLE LOWERING TOOL. BOX DOOR HINGES DOWN TO ALLOWING BOX TO BE MOUNTED TO THE RIGHT OR LEFT OF POLE. OPERATES 90 DEGREES FROM CAMERA ARM. (PADLOCK BY OTHERS).**

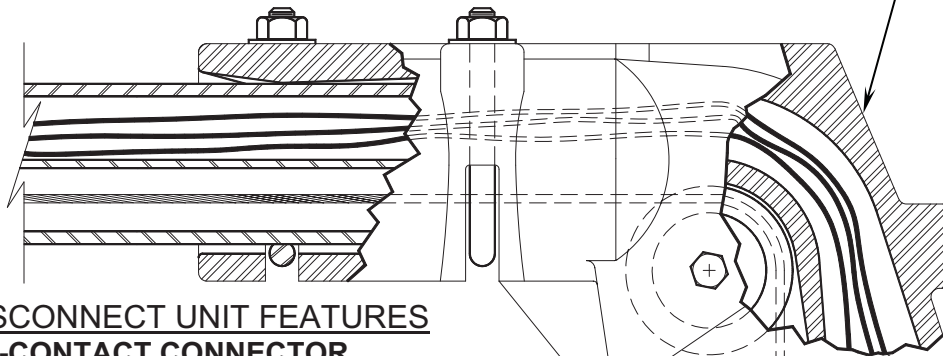
**M. POLE-BELTS (BY OTHERS) AS PER REQUIREMENTS.**

**N. HEAVY DUTY CAST ALUMINUM HOUSING WITH LARGE ACCESS PANEL.**

**O. CAMERA GUIDE CABLE, 5/32" STAINLESS STEEL ALLOWING CAMERA TO SAFELY FOLLOW GUIDE TO GROUND (OPTIONAL).**

**P. GUIDE CABLE ANCHOR IN GROUND (By Others).**

# SPECIFICATIONS FOR 16HD ELECTRICAL DISCONNECT UNIT



**MOUNTING FITTERS**  
Cast aluminum alloy. Completely isolates the moving control cable from the signal cable. Molybdenum filled nylon pulley has sintered bronze permanently lubricated bearing for maintenance free life. This insures their use for dirty atmosphere and corrosive environments.

**Outdoor Model:** (Shown)  
For 2-3/8" O.D. Galv. pipe. Retrofit, pole, & wall mtg.

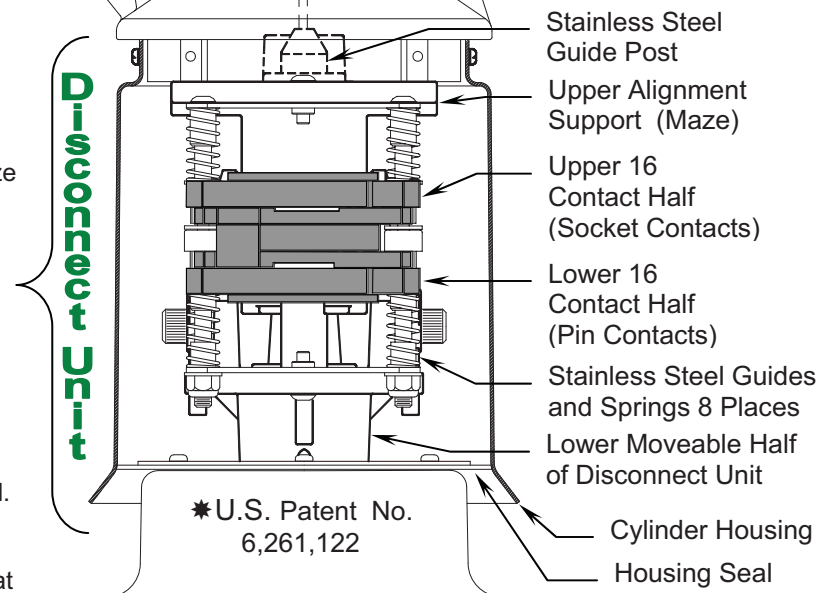
**Indoor Model:** Has upper flange for surface mtg.

## DISCONNECT UNIT FEATURES

### \*MULTI-CONTACT CONNECTOR

Precision mating upper (socket half of connector) and lower (pin half of connector) portions aided with stainless steel spring assisted guides. Connector provides up to 16 electrical and signal contacts to handle the wide variety of cameras and components in today's marketplace. Both halves of connector are spring assisted to minimize environmental vibrations and provide continuous resistant forces to maintain connector closure and help in ejecting of connector halves during the unlocking sequence of the disconnect unit. Connector halves designed as separate modules for easier removal and replacement should changes be needed for camera and component equipment upgrades. Connector is self-aligning and self-adjusting and is environmentally sealed. All contacts are copper with MIL SPEC **nickel plating** and 30 microinch **gold plating** over nickel. The gold plating passes the Industrial Mixed Flowing Gas test designated fo create corrosion. Socket contacts have beryllium copper springs that assure constant contact with pins.

\*U.S. Patent No. 6,261,122



Stainless Steel Guide Post  
Upper Alignment Support (Maze)  
Upper 16 Contact Half (Socket Contacts)  
Lower 16 Contact Half (Pin Contacts)  
Stainless Steel Guides and Springs 8 Places  
Lower Moveable Half of Disconnect Unit  
Cylinder Housing  
Housing Seal

\*U.S. Patent No. 6,261,122

### STRUCTURAL COMPONENTS

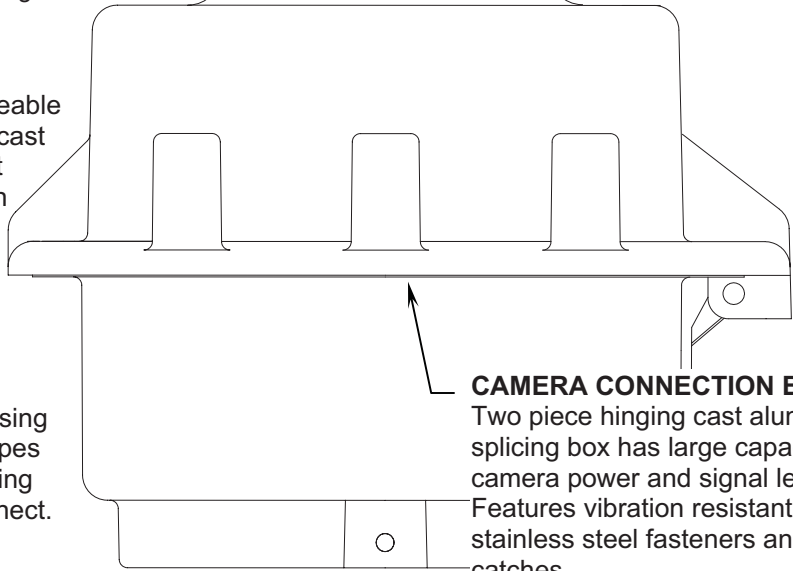
Upper alignment support and lower moveable half of disconnect unit are high strength cast aluminum alloy 356-T6. Main guide post and structural support arms are precision cast stainless steel.

### CYLINDER HOUSING

Standard housing is hydrospun heavy gauge stainless steel. Painted finish is optional.

### HOUSING SEAL

Flexible environmental seal at lower housing opening is standard neoprene. Seal swipes and conforms to interior of cylinder housing during all operating stages of the disconnect unit.



### CAMERA CONNECTION BOX

Two piece hinging cast aluminum splicing box has large capacity for camera power and signal leads. Features vibration resistant 1/4 turn stainless steel fasteners and safety catches.

# ELECTRICAL DISCONNECT UNIT FOR MULTI-FUNCTION CAMERAS

## OPERATION OF THE MULTI-CONTACT CONNECTOR

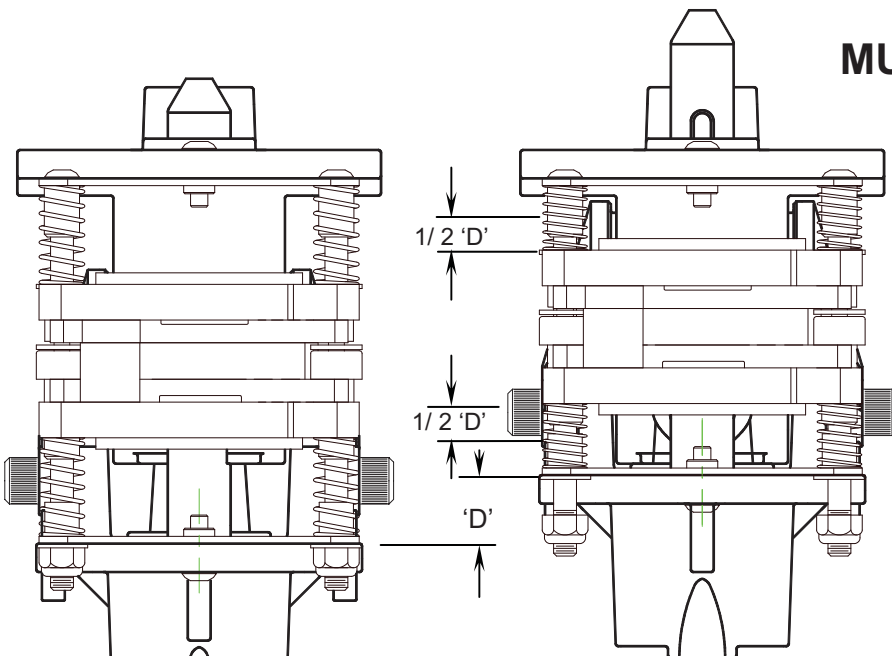
Distance 'D' is the total distance that the disconnect unit must travel to lock and unlock. This unique design (patented) by Camera Lowering Systems provides spring assisted upper and lower portions of the connector that splits the total travel distance in half, thereby equalizing the retaining forces required to assure a uniform seal. Because the upper half (socket contacts), and the lower half (pin contacts) float within the disconnect unit, the connector is isolated from vibrations that would affect signal discontinuity.

### LOCKED POSITION

When the disconnect unit is in the locked position, the multi-contact connector has all contacts engaged. Springs are slightly compressed to provide equal and constant pressure against the two halves to maintain an environmental seal.

### LOCKING POSITION & UNLOCKING POSITION

During the operation to lock or unlock the disconnect unit, the springs of both halves of the connector compress in equal proportions and stainless steel

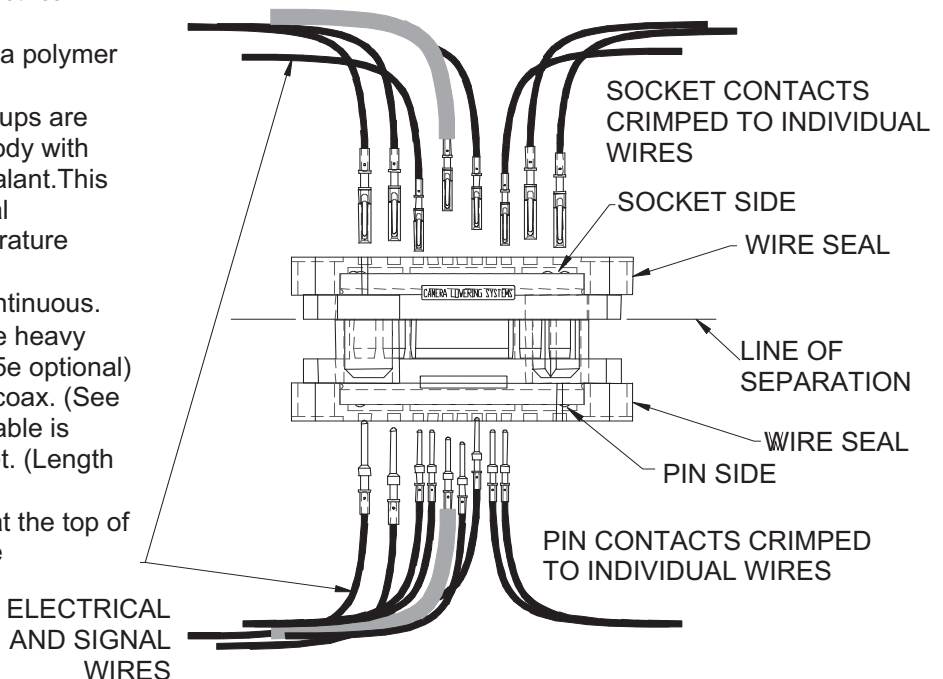


**MULTI-CONTACT CONNECTOR SHOWN IN LOCKED POSITION**

**MULTI-CONTACT CONNECTOR SHOWN IN LOCKING OR UNLOCKING POSITION**

### CONTACTS AND WIRES

- Twin connectors provide 16 Heavy Duty size 12 gold plated over nickel, pure copper electrical contacts.
- Contacts are securely contained within a polymer body.
- Upper socket and lower pin contact groups are permanently sealed to the connector body with 'Superflex' silicone adhesive rubber sealant. This provides a tough waterproof rubber seal formulated to withstand extreme temperature cycling and severe weather conditions.
- Signal shielding and drain wires are continuous.
- Wires are up to 16 conductor composite heavy gauge electrical and signal wires (CAT5e optional) with high quality RG59 (RG6 optional) coax. (See cable specs). A one piece composite cable is provided from disconnect unit to cabinet. (Length to be specified)
- No additional connectors are required at the top of the pole, or anywhere else between the disconnect unit and the cabinet.



# 16HD DISCONNECT UNIT FOR MULTI-FUNCTION CAMERAS

## OPERATION OF THE MULTI-CONTACT CONNECTOR

guide posts move through linear bearings as the support arms of the disconnect unit move into the proper position within the tracking guide. Electrical and signal contacts remain fully engaged and the camera is still operational.

### RAISING POSITION

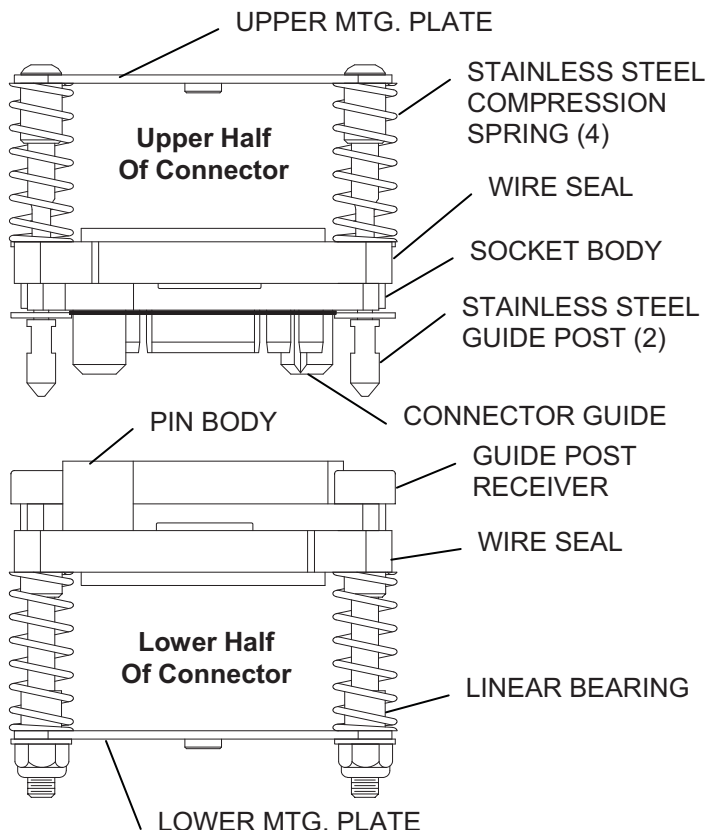
The connector assembly utilizes precision machined 4 stainless steel guides to align the two halves of the connector. These guide pins are longer than the communication pins and must engage first and disengage last. These pins are connected to the disconnect unit causing the unit to be grounded per U.L./CSA ratings of the product. In addition to these pins, a 3-way guide is also used for alignment. A set of alignment posts built into the connector halves serve as the final guides to assure that all pin and socket contacts are perfectly aligned before engagement.

### LOWERING POSITION

As the disconnect unit begins to unlock, the springs expand and the guide posts begin to separate. The last parts of the connector to disengage are the electrical and signal contacts. Any ground wires or shielding use a longer pin contact to assure that they are the very last to disengage before the camera is lowered for servicing.

## ELECTRICAL DISCONNECT UNIT (EDU) SPECIFICATION GUIDE

- ❖ The coaxial and electrical disconnect unit shall meet or exceed sine vibration tests of 3.5 g's within the frequency range of 5-60 Hz in all three axes for minimum of six 5-minute cycle each axes. It shall meet or exceed random vibration tests of frequency range 60-1000 HZ at .025 g2/Hz applied for 30 minutes in each of the three axes. It shall have results to exhibit no signal or electrical discontinuities greater than 10 microseconds. Tests applicable to Electrical Disconnect Unit and attached components.
- ❖ The EDU shall have a 3-way tracking guide and support. It shall be constructed of precision cast high strength aluminum alloy 356-T6. A permanently fixed position piece incorporating a special tracking guide system permits the moveable portion of the *Disconnect Unit* to align in the same position every time the system is operated, thereby eliminating the need to re-orientate the camera. The Electrical Disconnect Unit shall have twin high strength notches securing the load of the *Lower Contact Assembly* and camera.
- ❖ The MULTI-CONTACT Connector assembly shall be modular for easy installation and retrofit requirements. All pin and socket contacts shall be insertable and removable. The connector shall have 16 copper alloy C14500, size 12 contacts (.102" Dia.) rated at 35 Amps with gold plating over nickel per MIL-G-45204.
- ❖ All hardware shall be corrosion resistant stainless steel. It shall have a self-aligning and self-adjusting mechanical system comprised of two principal assemblies:  
*Two UPPER CONTACT HALVES* shall house the socket contacts. It shall incorporate spring assisted polymer contact body with precision-machined guideposts. The socket contact body shall have integral guideposts for precise contact alignment.  
*Two LOWER CONTACT HALVES* shall house the pin contacts comprised of spring assisted polymer contact body with precision-machined guidepost receivers. The pin contact body aligns with guideposts of integral socket body guideposts.
- ❖ The cover shall be a one-piece hydro-spun heavy gauge stainless st or Alum. The cylinder must utilize stainless steel mounting hardware with O-Ring imbedded washers. The unit must exceed the ingress protection rating of IP55.
- ❖ The unit shall have a guidepost constructed of precision cast high strength stainless steel. It shall utilize a cast-in-place guide bar for precise alignment of *Lower Contact Assembly* with the fixed portion of the *EDU*.
- ❖ **LOAD CAPACITY OF DISCONNECT UNIT**  
CAPACITY: 400 LBS (182kgs) with a safety factor of 5:1



**SPECIFICATIONS FOR OTHER COMPONENTS  
FOR CEPM**

❖ A DISCONNECT UNIT FITTER shall be provided made of heavy duty cast aluminum alloy to fit a 2-3/8 inch (60.3mm) outside diameter *Divided Pipe Arm*. Two U-bolt pipe clamps shall be used to rigidly hold the *Divided Pipe Arm*. The fitter is designed to completely isolate the moving *Control Cable* from the electrical and signal wires. It shall contain a molybdenum impregnated nylon pulley providing high strength and low resistance for the moving *Control Cable*, thereby increasing the life of the cable. The pulley shall have a permanently lubricated bearing.

❖ The system shall have a CABINET MOUNTED FITTER made of heavy duty cast aluminum alloy to fit 2-3/8 inch (60.3mm) O.D. *Divided Pipe Arm*. It shall utilize a cast-in-place cable stop to prevent cable connections from entering pulley. It shall contain a molybdenum impregnated nylon pulley with a permanently lubricated bearing. Two U-bolt pipe clamps shall be used to rigidly hold the *Divided Pipe Arm*. The fitter shall be designed to bolt directly to a 4" (101.6mm) Diameter pole top. The system shall have a horizontal divided pipe arm that fits inside and connects the Disconnect Unit Fitter with the Pole Mounted Fitter. It shall be made of 2-3/8 inch (60.3mm) O.D. with 1/4" (6.4mm) wall thickness steel pipe with galvanized finish standard (polyester powder coat painted finish optional). The pipe shall be divided entire length to keep *Control Cable* and electrical/signal wires separate. Arm shall be position aligned non-rotating type incorporating interlocking positioning keys.

❖ The system shall have a POLE MOUNT CABINET made of heavy duty cast aluminum. The cabinet shall have a side utility door. The cabinet shall be secured to the pole using stainless steel or galv. steel bracket. The connection box shall have a cast aluminum cover retained by stainless steel set screws. The box shall incorporate bosses for direct mounting of cord strain relief brackets and cord grips. It shall also be used to connect cable splices (not required). If preferred, the Signal Cable can be a one piece from disconnect unit to pole base or cabinet to eliminate need of a connector in the upper Pole Mount Cabinet.

❖ The system shall utilize a CONTROL CABLE (mechanical raising and lowering cable) made of type 316 Stainless Steel 5/32 inch (4.0mm) diameter 7 x 19 construction cable. The cable should be manufactured so as not to unwind or become unraveled during the raising and lowering operation. Minimum breaking strength shall be 2000 lbs. One end of the cable shall have a heavy-duty Stainless Steel connecting link. The

control cable shall be the only cable that moves when the camera is raised and lowered.

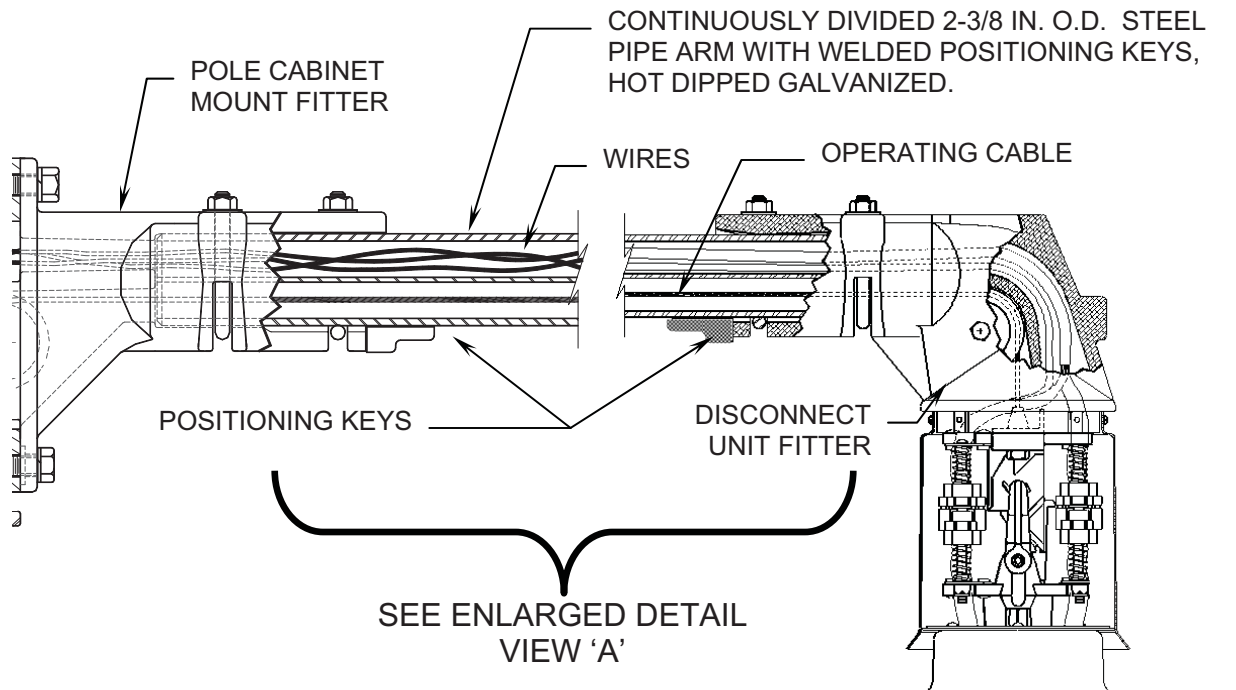
❖ The system shall also have a CAMERA CONNECTION BOX. It shall be a two piece design for easy camera mounting. Both sections shall be made of corrosion resistant cast aluminum. The top half shall be mounted and gasketed to the bottom of the disconnect unit. Inside the top half, it shall have provision to mount additional weights for lightweight cameras or other equipment. All parts shall be made of extra heavy construction. The Camera Connection Box shall be adaptable to all brands of cameras. The two piece construction shall feature a lower box that hinges down for easy access to wiring. It shall contain a large capacity-splicing compartment for camera power, signal leads, and connectors. All hardware shall be made of stainless steel. The box shall also have a cable loop allowing the box and camera to follow the cable guide down to the ground.

❖ SECURITY LOCK BOX shall be a 14"x5"x6" heavy duty cast aluminum cabinet with a drop down hinged door. The Security box shall have a heavy duty corrosion resistant mounting bracket to attach the box to the side of the pole.

❖ An LT-4-XX LOWERING TOOL shall be supplied with each order. It is a portable lowering tool consisting of the gearbox, disc brake, frame, and lowering cable. The gearbox shall be of heavy-duty design. It shall incorporate solid steel heated treated gears for maximum durability and strength. The gearbox shall be equipped with a special automatically actuated disc brake for load holding ability and the prevention the load from freewheeling. This is essential for all lifting operations. The winch has a 3:1 Gear reduction to reduce the effort required to raise and lower the camera assembly. The frame shall be of a heavy-duty design with brackets making the unit stable when mounted to the Security Lock Box. The frame shall have a pulley with a permanently lubricated bearing. The raising and lowering (control) cable shall be made of stainless steel 1/8-inch (3.2mm) diameter 7 x 19 construction. Minimum breaking strength shall be 1760lbs. It shall come with a heavy-duty stainless steel swivel.

❖ CAMERA GUIDE CABLE shall be 5/32" aircraft cable that guides the camera to the ground. It shall be attached to the Disconnect Unit Fitter at the top and a spring loaded bolt in the ground (by others). It shall be equipped with a corrosion resistance turnbuckle allowing adjustment of the cable length.

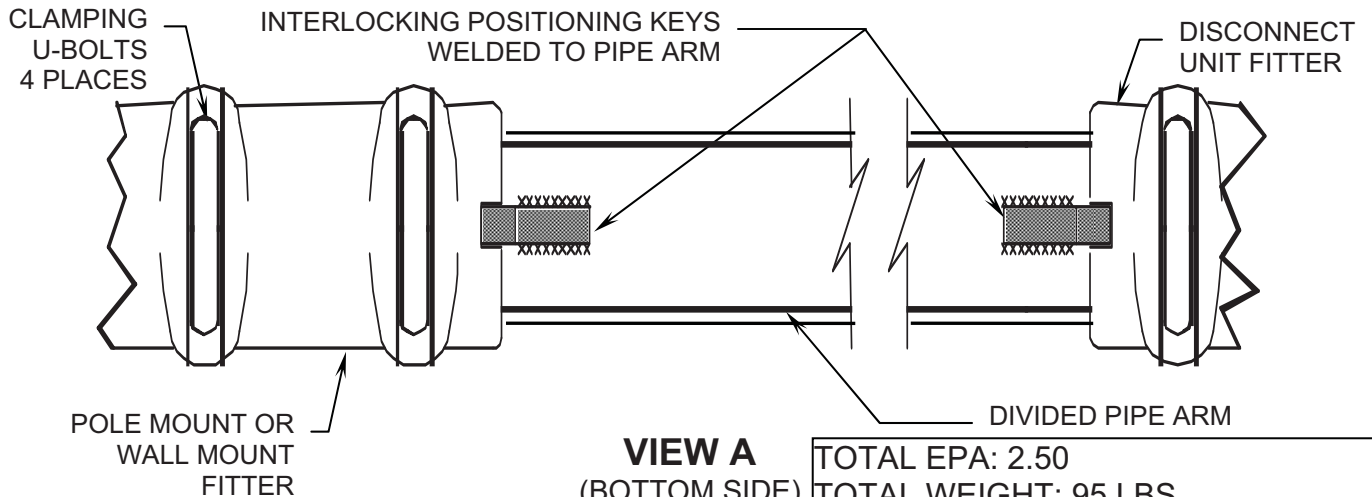
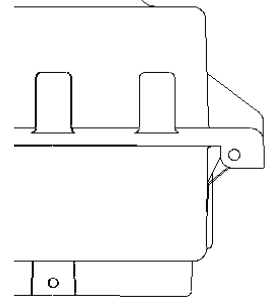
**INTERLOCKING ARM & FITTERS**  
PROVIDES POSITIVE NON-ROTATING POSITIONING  
OF PIPE ARM FOR ALL OUTDOOR  
POLE AND WALL MOUNTED LOWERING SYSTEMS



**FEATURES**

Specially shaped steel keys are welded to divided pipe arm before arm is galvanized. Precise alignment of keys with corresponding notches in the pole/wall fitter and the disconnect unit fitter provide positive positioning and prevents rotating of components about the divided pipe arm during extreme environmental conditions.

Pipe arm has full length divider separating the wires from the movement of the control cable. Separate chambers within the fitters for electrical wires and the control cable assures complete protection to the wires during the operation of the system.

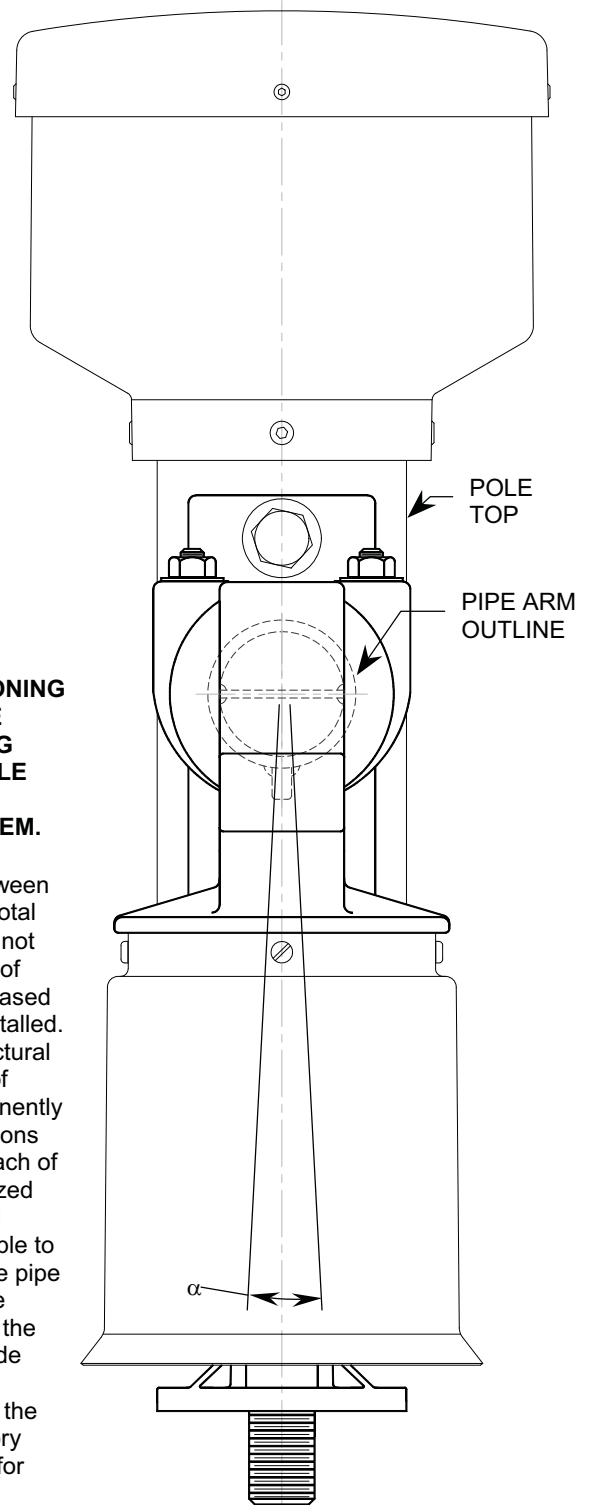
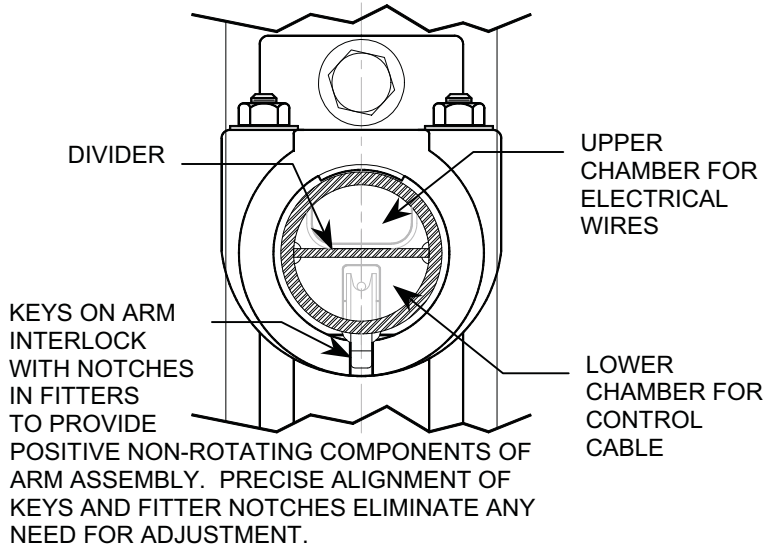


**VIEW A**  
(BOTTOM SIDE)

TOTAL EPA: 2.50  
TOTAL WEIGHT: 95 LBS  
(includes arm, disconnect unit, camera junction boxes, & camera)

**INTERLOCKING ARM & FITTERS**  
PROVIDES POSITIVE NON-ROTATING POSITIONING  
OF PIPE ARM FOR ALL OUTDOOR  
POLE AND WALL MOUNTED LOWERING SYSTEMS

**ARM CROSS SECTION**



**END VIEW**

**DETAILS OF FEATURES**

**NOTE:** WHEN THE INTERLOCKING POSITIONING KEYS OF THE ARM ASSEMBLY ARE MATED WITH THE CORRESPONDING NOTCHES IN THE FITTERS, THE POLE SHAFT MUST BE PLUMB FOR THE PROPER OPERATION OF THE SYSTEM.

**ANGLE  $\alpha$ :** The angle  $\alpha$  shown in the END VIEW is based on mechanical tolerances between mating parts and should not exceed a total of  $1/2^\circ$ . This deviation from plumb will not affect the operation of the components of the arm assembly. All tolerances are based on the pole shaft being plumb when installed.

**PIPE ARM:** (See Fig. 1) Constructed of 2 inch structural steel pipe having an outside diameter of 2-3/8 inch. Positioning keys are permanently welded to the pipe arm at precise positions that align with notches in the ends of each of the fitters. Arm finish is hot dip galvanized after all welding is completed. Optional finishes over the galvanizing are available to match the color of the pole. Ends of the pipe arm bottom out against the inside of the fitters a small fraction of an inch before the keys bottom out in the notches to provide a secure fit.

The pipe arm is installed complete with the rest of the arm components at the factory and is pre-wired to eliminate any need for adjustment in the field.

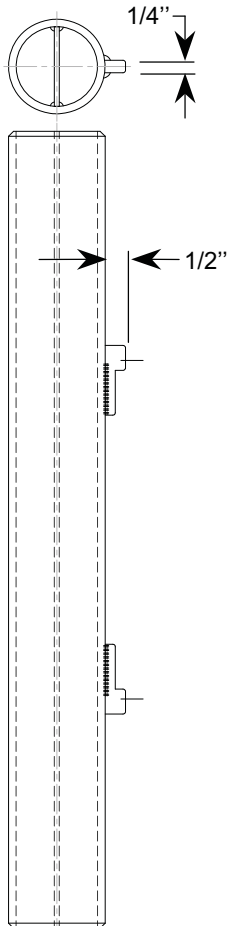
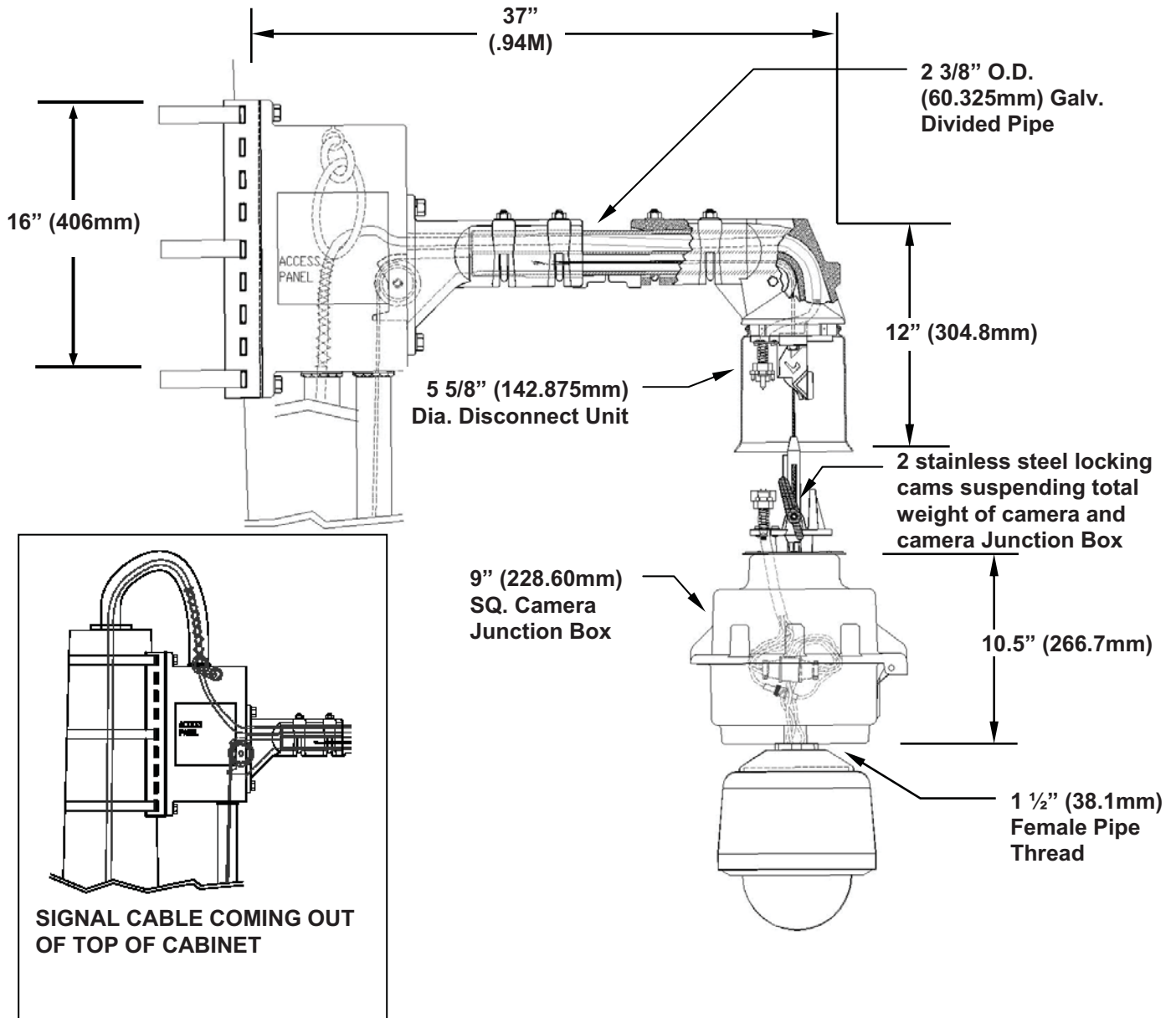


Fig. 1

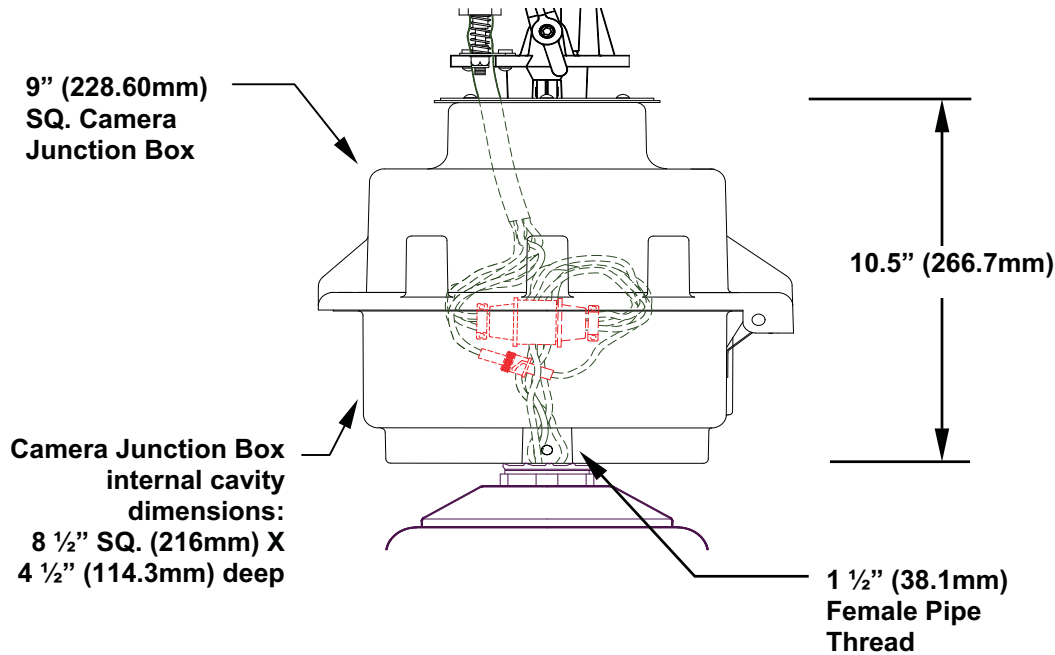
Design **CEPM** SERIES  
**Pole Mounting Disconnect Unit  
Measurements**



**Wind load Rating:** 120mph (195kmph) w/1.3 Gust with 1.65 safety factor.  
**Load Capacity:** 200lbs (91kgs) with safety factor of 10  
**Total EPA:** 3.00  
**Total Weight:** 95 lbs  
 (includes arm, disconnect unit, camera junction box, pole top junction box, and camera)



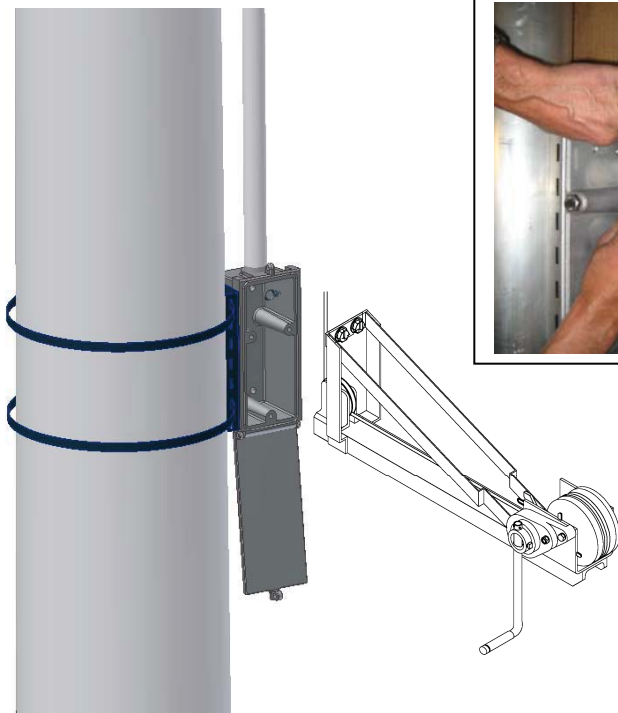
Design **CEPM-16HD SERIES**  
**Camera Junction Box Specifications**



The Camera Junction Box shall be a two piece design for easy camera mounting.

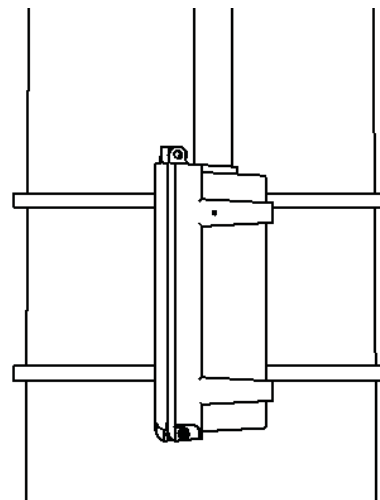
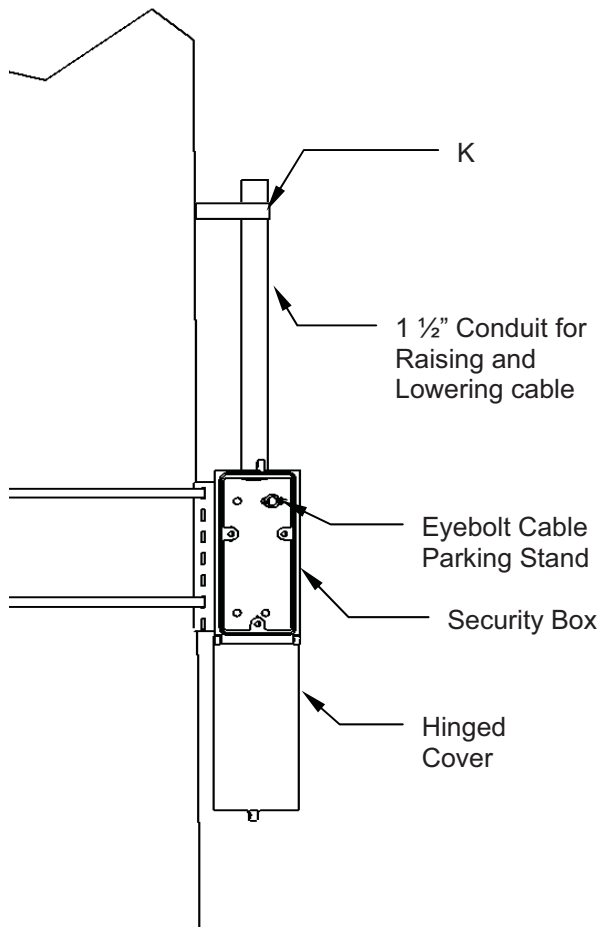
- Both sections shall be made of corrosion resistant cast aluminum.
- The top half shall be mounted and gasketed to the bottom of the disconnect unit. It shall extend into the cylinder of the disconnect unit and designed to repel water
- Inside the top half, it shall have provision to mount additional weights for lightweight cameras or other equipment.
- All parts shall be made of extra heavy construction.
- The Camera Connection Box shall be adaptable to all brands of cameras.
- The two piece construction shall feature a lower box that hinges down for easy access to wiring. It shall contain a large capacity-splicing compartment for camera power, signal leads, and connectors.
- All hardware shall be made of stainless steel.

*Design* **SLB-3 for CEPM-16HDx**  
**External Pole/Tower Mount with Security Locking Box**  
**for Portable Lowering Tool**

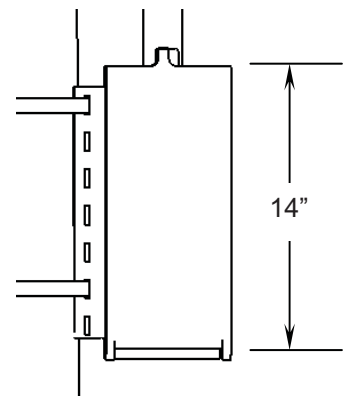


**HEAVY DUTY SECURITY LOCKING BOX**

- ❖ **MATERIAL:** CORROSION FREE CAST ALUMINUM
- ❖ **FINISH:** ALUMINUM. OPTIONAL-POWDER COAT PAINTED FINISH
- ❖ **DOOR:** CAST ALUMINUM HINGED DOOR, HINGING DOWNWARD, WITH TOOLLESS S.S. HARDWARE.
- ❖ **MOUNTING:** BOX IS SIDE MOUNTED TO POLE, ALLOWING THE OPENING TO BE LOCATED 90° FROM LOWERING ARM. THIS PREVENTS OPERATOR FROM STANDING UNDERNEATH THE CAMERA WHILE IT IS RAISED AND LOWERED.
- ❖ **OPTIONAL MOUNTING:** BOX CAN BE MOUNTED FROM THE REAR OF THE BOX, TO A WALL.
- ❖ **LOWERING TOOL:** TO BE USED WITH A LT-4-XX PORTABLE LOWERING TOOL.
- ❖ **CONDUIT OPENING:** OPENING IN TOP OF BOX FOR 1 1/2" CONDUIT (CONDUIT BY OTHERS).
- ❖ **GASKET:** NEOPRENE O-RING GASKET AROUND DOOR, PREVENTING WATER FROM PENETRATING.
- ❖ **MOISTURE DRAIN:** SCREENED WEEP HOLE IN BASE OF BOX FOR MOISTURE RELEASE.
- ❖ **LOCK:** PAD LOCKABLE DOOR TO BOX CAST OPENING. PADLOCK BY OTHERS.
- ❖ **OPENING:** LARGE OPENING ALLOWS TOOL TO BE ATTACHED TO THE BOX, WITH ROOM FOR SERVICING THE RAISING AND LOWERING CABLE.
- ❖ **EYEBOLT:** STAINLESS STEEL EYEBOLT FOR RAISING AND LOWERING CABLE PARKING STAND LOCATED INSIDE OF BOX.
- ❖ **MOUNTING BRACKET:** HEAVY DUTY STAINLESS STEEL MOUNTING BRACKET WITH SLOTS, TO ATTACH TO POLE WITH STAINLESS STEEL BANDS (BANDS BY OTHERS).
- ❖ **DIMENSIONS:** HEIGHT OF 14" x 6" WIDE x 5" DEEP ALLOWS PLENTY OF ACCESS INTO THE BOX.



**SIDE VIEW**

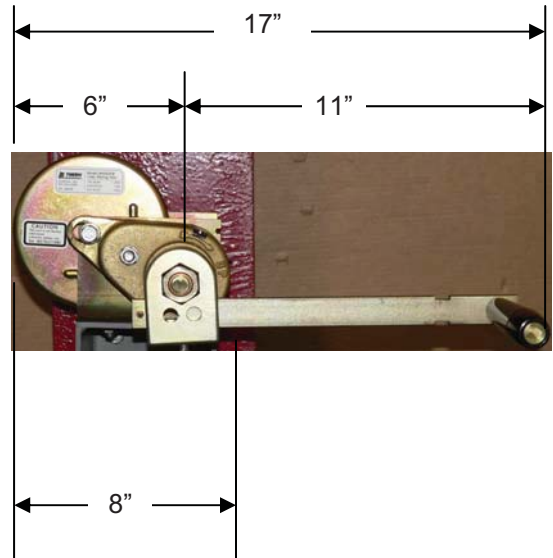


**FRONTAL VIEW**

All gear boxes and lowering tools are of heavy duty design to provide reliability, long life, and ease of operation. They incorporate heat treated gears for maximum durability and strength. All are equipped with a special automatically actuated disc brake for better load holding ability and the prevention of the load free wheeling. The gear box assembly also has corrosion resistant plating. The systems are available for permanent installation or portable use indoors or outdoors for wall mounting or pole mounting. Each system is custom tailored to work with required load and operation for the raising/lowering specifications. The mounting bracket is made of heavy duty steel with a powder coated finish. The frame mounts to the Security Locking box utilizing 3 bolts.

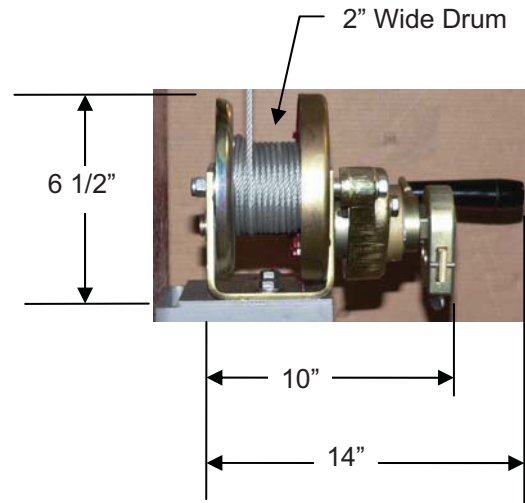


**CATALOG # LT-4**  
PORTABLE LOCKING BOX  
MOUNTED LOWERING TOOL  
FOR FIXTURES UP TO 400 LBS.



**Specifications on Lowering Tool**

- Tool mounts on Security Locking Box
- Fabricated from heavy gauge steel w/black powder coat finish.
- The winch has a primer base coat followed by an enamel finish coat. Excellent resistance to corrosion.
- Oil impregnated bronze bushings and sealed ball bearings.
- All hardware is made out of stainless steel.
- The winch has a 3:1 Gear reduction to reduce the effort required to raise and lower the assembly.
- Winch comes with heavy-duty disk brake to afford greater load holding ability. This provides a positive locking mechanism to secure cable and keep from freewheeling.
- **Drum Capacity:** 75 ft. **Optional 4" Drum** for up to 150' of cable.
- **Cable:** Equipped 1/8" 7x19 stainless steel aircraft cable.
- **Dimensions:** 29"L.x8"W. With handle, 12"W.
- **Weight:**34LBS.

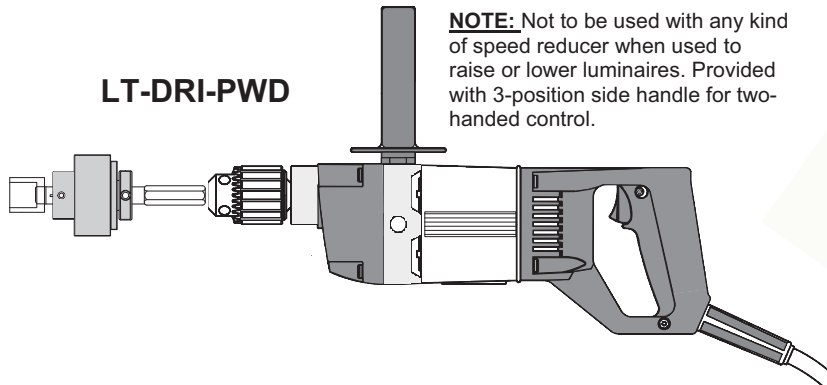


# LT-DRI-PWD Drill Motor with Clutch and adapters

## LOWERING CABLE

Stainless Steel winch cable

Drills are of heavy-duty design to provide reliability, long life, and ease of operation. They incorporate solid steel heat-treated gears for maximum durability and strength. Drill should be operated at a 300 RPM or slower speed. Operation of drill with our winch at a higher speed will reduce the longevity of the winch break system.



**NOTE:** Not to be used with any kind of speed reducer when used to raise or lower luminaires. Provided with 3-position side handle for two-handed control.



### Drill Motor Specifications

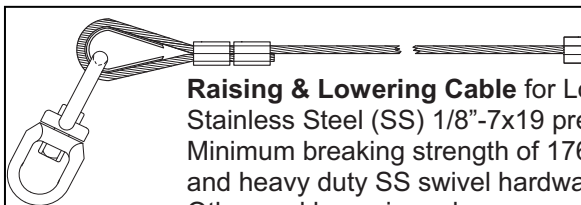
- Drill is 1/2" double insulated, heavy duty, reversible, variable speeds, with 'D' handle.
- Chuck size is 1/2" key chuck with key.
- Electrical-Nom. 5 amp universal motor 115v.AC
- Torque-Develops nominal 170 lbs.-in.
- Speed/HP-.5 H.P.
- Powerful 7 Amp
- Variable speed 0-600 RPM, Reversible
- Gear Train: Triple
- (Note: drill should be operated at a maximum of 300RPM to prevent damage to the winch)
- Overall length is 15-1/8"
- Weight: Approx. 7lbs. 6oz.

### Overload Clutch Specifications

- Lubricated ball indent-totally enclosed-adjustable torque limiting.
- Coil spring type. Varied quantities depending on torque range. Torque range: 60 to 300 lb./in.
- Dimensions of clutch: 1 1/2"Dia., 1 5/8"L. Overall, 8 1/2"L
- Open-end wrench type torque-adjusting nut.
- Snap ring tool included with clutch.
- Clutch weight: 2 lbs.

### Winch/Clutch/Drill Adapter

- Winch drive is 1-1/8" hex socket with 1/2" sq. drive.
- Hub shaft: 3/8" sq. w/spring loaded pin (clutch end).
- Socket shaft: 3/8" sq. w/spring loaded retaining pin.



**Raising & Lowering Cable** for Lowering Tool. Made of Stainless Steel (SS) 1/8"-7x19 preformed aircraft cable. Minimum breaking strength of 1760 lbs. Comes with loop and heavy duty SS swivel hardware cable attachment. Other end has crimped on copper stop.

\* Specifications subject to change without notice.

CABLE ASSEMBLIES



LETTER	PART #	DEFINITION
D	663-242-CAT6-UTP	CAT6 WITH UTP FILLED
E	663-213-RG6-08	8 CONDUCTOR CABLE RG6
J	663-234-14	CABLE 14/5 COND. TRAY 600V
K	663-235-20	RG59 BELDEN 8281
N	663-227-00	CABLE 14/3 COND. TRAY 600V
P	663-241-CAT5E	CAT5E ETHERNET CABLE EXTEME COND
DE		CAT6 WITH 8 COND RG6 ANALOG CABLE
DN		CAT6 WITH 3 COND 14AWG POWER CABLE
EJ		8 COND RG6 WITH 5 COND 14AWG AUX CBLE
EP		CAT5E WITH 8 COND RG6 ANALOG CABLE
NP		CAT5E WITH 3 COND 14AWG POWER CABLE
P	663-241-CAT5E	CAT5E ETHERNET CABLE EXTEME COND

COMMENTS:

All cables are of High Performance, with outdoor rated jackets

The "E" cable is an 8 conductor cable and takes the place of the former "A", "B", "C", and "L". If additional conductors are needed, it can be paired with the "J" or "N" cables.

The "D" is an outdoor rated, high performance CAT6 cable.

The "P" is an outdoor rated, high performance CAT 5e cable.

Combination of different cables also available.

Specials are still available.

**Features And Benefits**

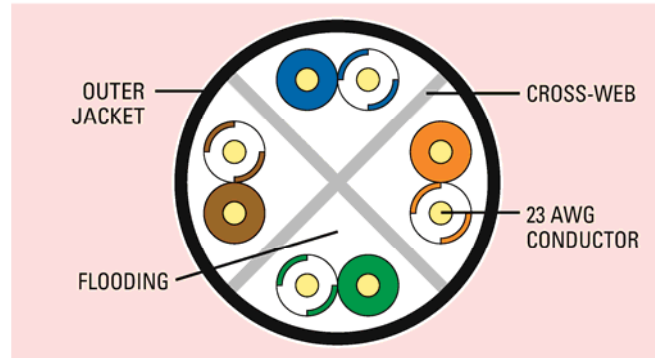
- Innovative cross-web design allowing for maximum pair separation, increasing key electrical performance parameters
- **Gel-filled construction to prevent moisture migration in underground and wet applications**
- Wide temperature range for extreme weather environments
- Made in U.S.A.

**Applications**

- Data transmission rates up to 2.4 Gb/s
- 1000 BASE-T (Gigabit Ethernet)
- 100/10 BASE-T (IEEE 802.3)
- 52/155 Mbps ATM
- Duct and outdoor conduit installations

**Standard Compliances**

- ANSI/TIA 568-C.2
- ISO 11801 (Category 6)
- ICEA S-102-700 (Category 6)
- Telcordia (Bellcore) Specification GR-421-CORE Water Penetration Requirement
- RoHS Compliant Directive 2002/95/EC



**CONSTRUCTION**

**Conductors**

- 23 AWG solid bare annealed copper

**Insulation**

- Polyolefin

**Color Code**

- Pair 1: Blue-White/Blue
- Pair 2: Orange-White/Orange
- Pair 3: Green-White/Green
- Pair 4: Brown-White/Brown

**Separator**

- Cross-web

**Flooding Compound**

- Waterproof gel

**Jacket**

- UV- and Abrasion-Resistant Polyethylenes

**PHYSICAL DATA**

Nominal Cable Diameter (in)	0.250
Nominal Cable Weight (lbs/1000)	25
Minimum Bend Radius (in)	1.0
Maximum Pulling Force (lbs)	32
Temperature Rating (°C)	
Installation:	-30 to +60
Operation:	-45 to +80

**ELECTRICAL CHARACTERISTICS**

<b>DC Resistance (max)</b> Ohms/100 m (328 ft) @ 20°C	8.9
<b>DC Resistance Unbalance</b> (max) Individual Pair %	3.0
<b>Delay Skew (max)</b> ns/100 m	45
<b>Nom. Velocity of Propagation</b> % Speed of Light	69
<b>Characteristic Impedance</b> Frequency (f): 1-250 MHz	Ohms 100 ± 15

**ELECTRICAL PERFORMANCE**

Frequency MHz	PSACR* (min)	ACR* (min)	Insertion Loss (max)	PSNEXT (min)	NEXT (min)	PSACRF (min)	ACRF (min)	Return Loss (min)
1	70.3	72.3	2.0	72.3	74.3	64.8	67.8	20.0
4	59.3	61.5	3.8	63.3	65.3	52.8	55.7	23.0
10	51.3	53.3	6.0	57.3	59.3	44.8	47.8	25.0
16	46.7	48.7	7.6	54.2	56.2	40.7	43.7	25.0
20	44.3	46.3	8.5	52.8	54.8	38.8	41.7	25.0
31.25	39.2	41.2	10.7	49.9	51.9	34.9	37.9	23.6
62.5	29.9	32.0	15.4	45.4	47.4	28.9	31.8	21.5
100	22.5	24.5	19.8	42.3	44.3	24.8	27.8	20.1
200	8.8	10.8	29.0	37.8	39.8	18.8	21.8	18.0
250	3.5	5.5	32.8	36.3	38.3	16.8	19.8	17.3

Note: Values are expressed in dB per 100 m (328 ft.) length @ 20°C.

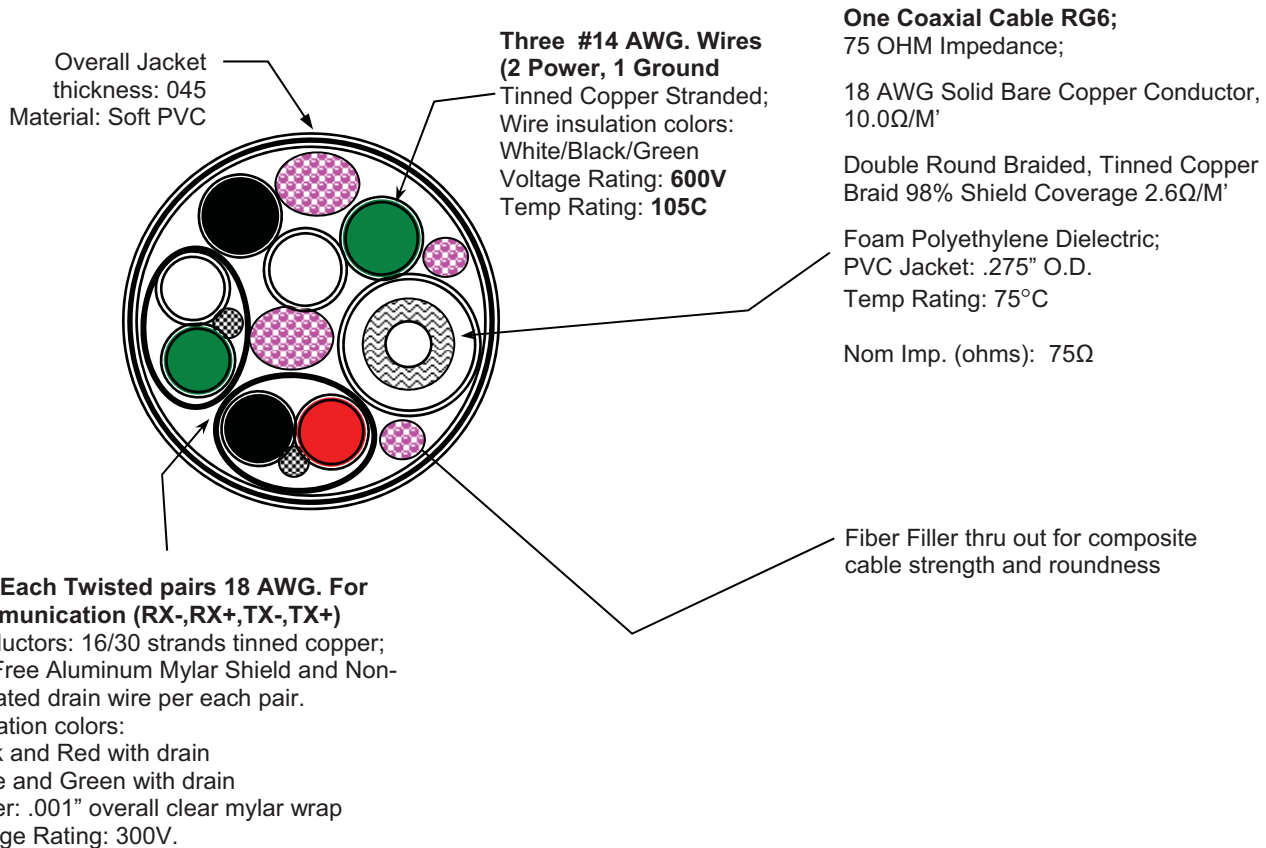
\*PSACR & ACR not specified in ANSI/TIA 568-C.2

Composite Cable for **16HD-E** connector

**"E" Composite Signal Cable (663-213-RG6-08) containing:**

- 1-RG6 COAX with #18 AWG Solid Center Conductor
- 1-#18 AWG TWISTED PAIR WITH DRAIN IN FOIL SHIELD
- 1-#18 AWG TWISTED PAIR WITH DRAIN IN FOIL SHIELD
- 2-#14 AWG POWER CABLES
- 1-#14 AWG GROUND CABLE

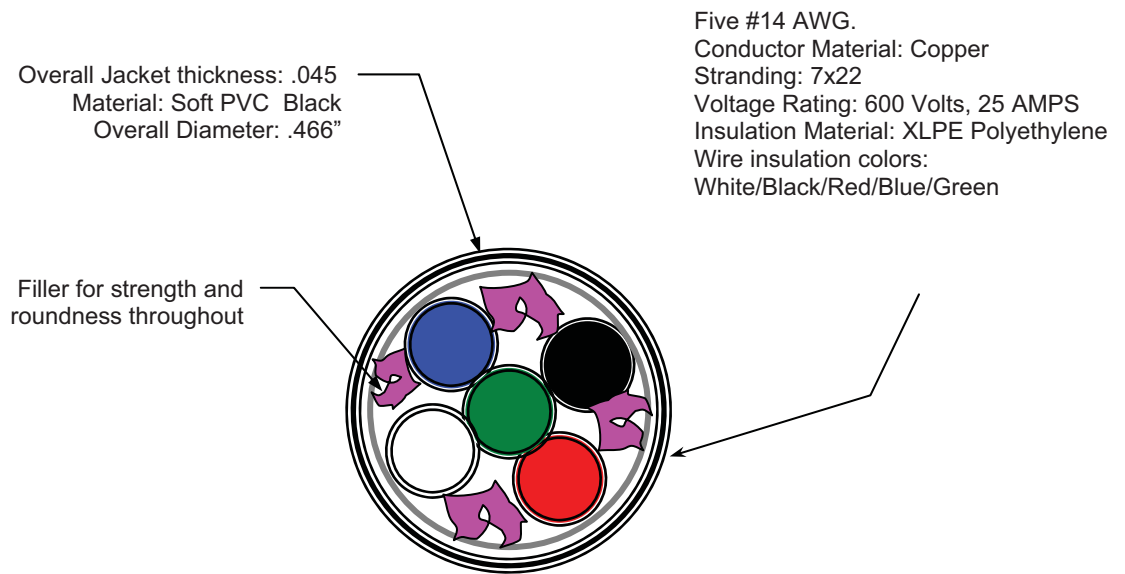
CABLE LENGTH PER ASSEMBLY: **AS REQUESTED**



**ADDITIONAL CABLE SPECS:**

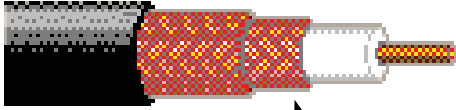
- VOLTAGE RATING FOR 14 AWG WIRE INSULATION: 600 V.
- **UL** and **CSA** approved cable.
- PART NUMBER '663-213-RG6-08', (PRINTED ON OUTSIDE OF JACKET).
- JACKET MATERIAL: .045 thick soft PVC
- FILLERS A MUST AND WRAPS AS REQUIRED.
- OVERALL JACKET DIAMETER OF "B" CABLE: .640"
- TEMPERATURE RATING: 105° C UL 1015





**NOTES**

- VOLTAGE RATING FOR 14 AWG WIRE INSULATION: 600 V.
- TEMPERATURE RATING: 80° C UL 1015



**Coaxial Cable RG-59/U**

**Conductor:**  
20 AWG Stranded Copper

**Braid Shield:** Double round, tinned copper  
1<sup>st</sup> Braid: 36 AWG TC, coverage 98%, Nom: 0.156”  
2<sup>nd</sup> Braid: 36 AWG TC, coverage 98%, Nom: 0.185”

**Insulation:** Foam Polyethylene

**Jacket:** PVC, Wall: 0.033”, Nom: 0.242”, Color: Black

**ADDITIONAL SPECS**

- **TEMPERATURE RATING:** 80° C UL 1015
- **Nom. D.C.R.:** 7.5Ω/M', 24.6 Ω/M'
- **NOMINAL CAPACITANCE:** 17.3 pF/ft (56.7 pF/m)
- **VOLTAGE:** 300 V RMS
- **IMPEDENCE:** 75 OHM

**Description:**

20 AWG solid .031" bare copper conductor, polyethylene insulation, tinned copper/bare copper double braid shield (98% coverage), polyethylene jacket.

**Physical Characteristics (Overall)**

Conductor

AWG:

# Coax AWG Stranding Conductor Material Dia. (mm)

1 20 Solid BC - Bare Copper 0.7874

Insulation

Insulation Material:

Insulation Material Dia. (mm)

PE - Polyethylene 5.0292

Outer Shield

Outer Shield Material:

Layer # Type Outer Shield Material Coverage (%)

1 Braid TC - Tinned Copper 98

2 Braid TC - Tinned Copper 98

Outer Jacket  
Outer Jacket Material:  
Outer Jacket Material  
PE - Polyethylene  
Overall Cabling  
Overall Nominal Diameter: 7.747 mm  
**Mechanical Characteristics (Overall)**  
Operating Temperature Range: -55°C To +80°C  
Non-UL Temperature Rating: 80°C  
Bulk Cable Weight: 102.686 Kg/Km  
Max. Recommended Pulling Tension: 515.991 N  
Min. Bend Radius (Install)/Minor Axis: 76.200 mm  
Min. Flexing Radius: 15.240 cm  
**Applicable Specifications and Agency Compliance (Overall)**  
Applicable Standards & Environmental Programs  
EU CE Mark: No  
EU Directive 2000/53/EC (ELV): Yes  
EU Directive 2002/95/EC (RoHS): Yes  
EU RoHS Compliance Date (mm/dd/yyyy): 01/01/2004  
EU Directive 2002/96/EC (WEEE): Yes  
EU Directive 2003/11/EC (BFR): Yes

Detailed Specifications & Technical Data  
METRIC MEASUREMENT VERSION

CA Prop 65 (CJ for Wire & Cable): Yes  
MII Order #39 (China RoHS): Yes  
RG Type: 59/U  
Suitability  
Suitability - Indoor: Yes  
Suitability - Outdoor: Yes  
Suitability - Aerial: Yes - Black only, when supported by a messenger wire  
Plenum/Non-Plenum  
Plenum (Y/N): No  
Plenum Number: 88281

**Electrical Characteristics (Overall)**

Nom. Characteristic Impedance:  
Impedance (Ohm)  
75  
Nom. Inductance:  
Inductance (µH/m)  
0.429811  
Nom. Capacitance Conductor to Shield:  
Capacitance (pF/m)  
68.901  
Nominal Velocity of Propagation:  
VP (%)  
66  
Nominal Delay:  
Delay (ns/m)

5.05274  
Nom. Conductor DC Resistance:  
DCR @ 20°C (Ohm/km)  
32.4819  
Nominal Outer Shield DC Resistance:  
DCR @ 20°C (Ohm/km)  
3.6091  
Nom. Attenuation:  
Freq. (MHz) Attenuation (dB/100m)  
1 0.9843  
3.6 1.6405  
10.0 2.6248  
71.5 6.8901  
135 9.843  
270 14.1083  
360 16.7331  
  
540 20.6703  
720 24.2794  
750 24.9356  
1000 30.1852

**Max. Operating Voltage - Non-UL:**

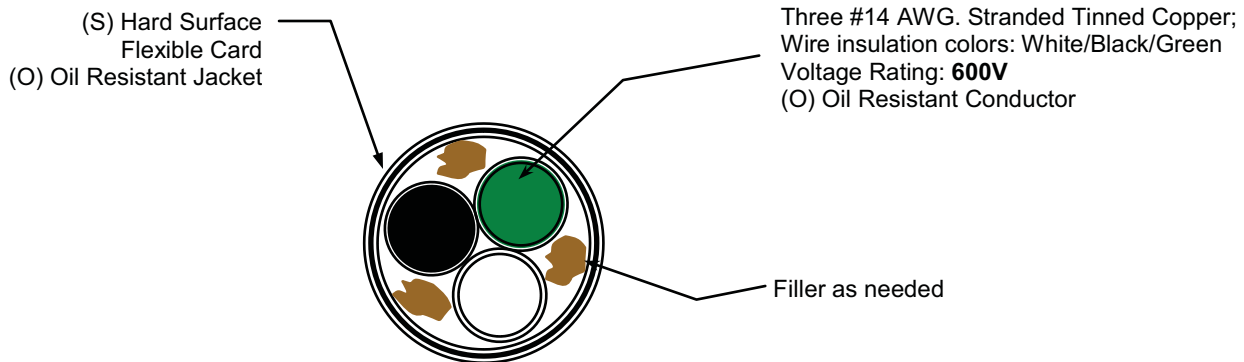
Voltage  
2900 V RMS

**Other Electrical Characteristic 1:** Impedance tested in accordance with ASTM D-4566 paragraph 43.2, option 2 using a 75 Ohm fixed bridge and termination. 75 +/- 1.5 Ohms

**Other Electrical Characteristic 2:** Return Loss tested in accordance with ASTM D-4566 paragraph 45.3, using a 75 Ohm fixed bridge and termination.

Minimum Structural Return Loss:  
Start Freq. (MHz) Stop Freq. (MHz) Min. SRL (dB)  
5 216 27  
217 850 23  
Sweep Test  
Sweep Testing: 100% Sweep tested 5MHz to 850MHz.

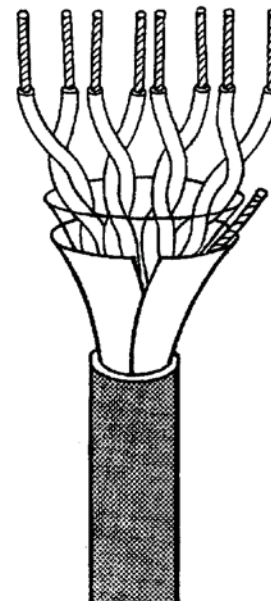
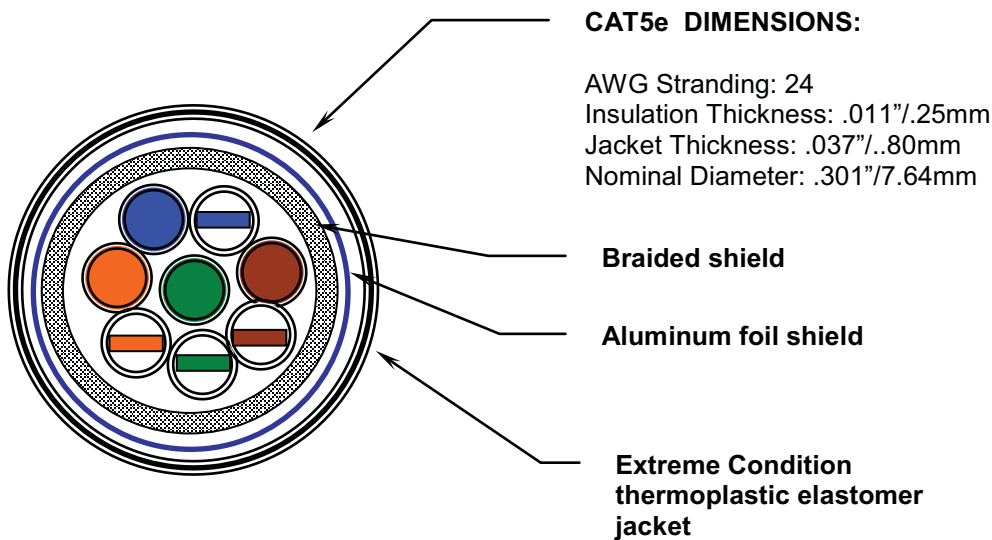
**N-Composite Cord Specifications:**  
3-#14 AWG POWER CABLES (Green, White, Black)  
Voltage Rating: 600V.  
Water & Sunlight Resistant  
Temp. Rating: 105c  
U.L. Ampacity Rating for 14 AWG Flexible Cord: 18



**APPLICATION:**

Shielded (F/UTP) flexible patch/jumper cable for production of durable Category 5e Industrial Ethernet cords with exceptional flex-life. Jacket provides excellent mechanical and chemical resistance, fire, UV, and low temperature performance. May be terminated with encapsulated RJ-45 or cylindrical M12 connectors to achieve IP-67 rating. RoHS compliant

**INDUSTRIAL ETHERNET CABLE  
FR-TPE FOIL SHIELDED CABLE**



**CONSTRUCTION:**

- **CONDUCTOR:** Stranded 24 AWG 7/32 tinned copper
- **INSULATION:** High Density Polyethylene, .011” Nom. Wall Thickness.
- **PAIRS:** Color coded singles twisted into pairs.
- **CABLE:** (4) Twisted Pairs twisted together and wrapped with a Foam Polypropylene Tape to form a Cable core.
- **SHIELDS:** Overall shield of 38 AWG tinned copper Braid (75% Minimum Coverage), shall be applied over the cable core. A second shield of Aluminized Polyester Foil (Foil in, 100% Coverage) shall be applied over the Braid.
- **JACKET:** A pressured flame resistant thermoplastic elastomer, .037” nom. Wall
- **COLOR CODE:** white/blue x blue, white/brown x brown, white/green x green, white/orange x orange
- **OVERALL CABLE DIAMETER:** .301”

**LISTING/RATINGS:**

- Cat 5e plug-to-plug channel Max. 80 meters
- Temperature rating: 75 °C Max., -40 °C Min.
- Nom. Impedance 1 - 100 MHz: 100 +/- 15
- Ohms Mutual Capacitance 13.5 pF/ft Nom. @ 1 MHz
- RoHS Compliant Materials
- Type (UL) C(UL) CMX OUTDOOR - CM, sunlight resistant, 75 °C Article 800