INFORMATION HANDOUT

For Contract No. 11-416004
At 11-SD,Imp-5, 7, 8, 15, 52, etc.-Var

Identified by
Project ID 1113000046

MATERIALS INFORMATION

Modify count station

Modify communication hub

Modify highway advisory radio system

Modify photovoltaic system

Modify closed circuit television camera

Modify Signal

Modify air conditioning

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MATERIAL INFORMATION FOR 1113000046

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Preface

The pictures shown in this information handout were taken between 2014 and 2015. There are additional pictures available at http://arcg.is/1AkDrv8 . There are additional information when left clicking the icon on the map. Some locations have as-built plans for informational use only.

You must use the most current web browser when accessing the website.

You must refer to the specification to correlate the information shown in the appendices.

The products shown in the appendices were used to verify the availability of the product in the market and are not endorse by the Department unless the specification identifies a specific product to be installed. For products not specifically identified in a specification, you may use the products shown in the appendices or equal. All products to be installed must meet the specification and must be approved prior to purchase.

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SECTION 1
MODIFY
COUNT STATION

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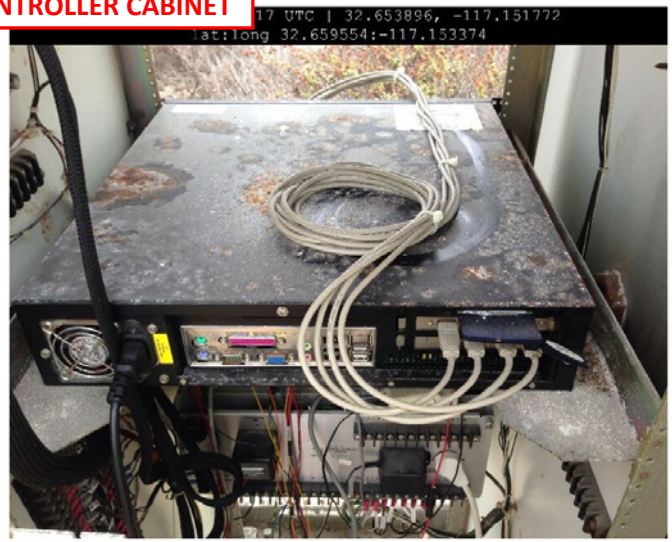
LOCATION 01 - COUNT STATION 717

SERVICE EQUIPMENT ENCLOSURE

COUNT STATION CONTROLLER CABINET



LOCATION 01 - COUNT STATION 717

LOCATION 02 - COUNT STATION 814

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 03 - COUNT STATION 821

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 04 - COUNT STATION 972

SERVICE EQUIPMENT ENCLOSURE

COUNT STATION CONTROLLER CABINET

LOCATION 05 - COUNT STATION 730

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 06 - COUNT STATION 734

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

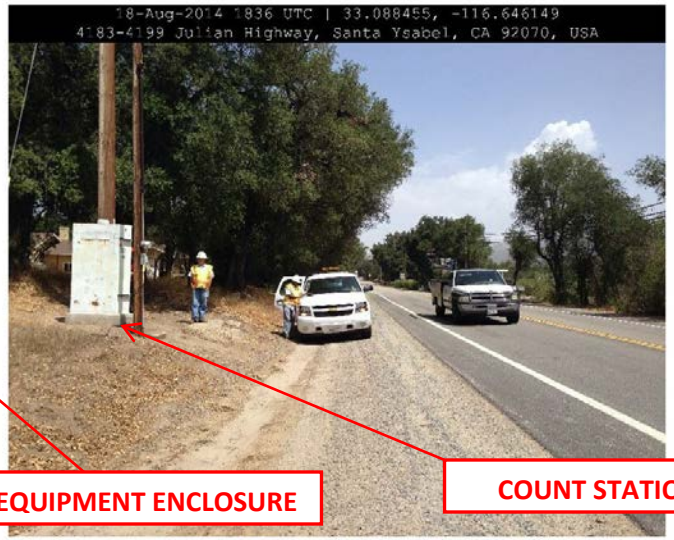
LOCATION 07 - COUNT STATION 759

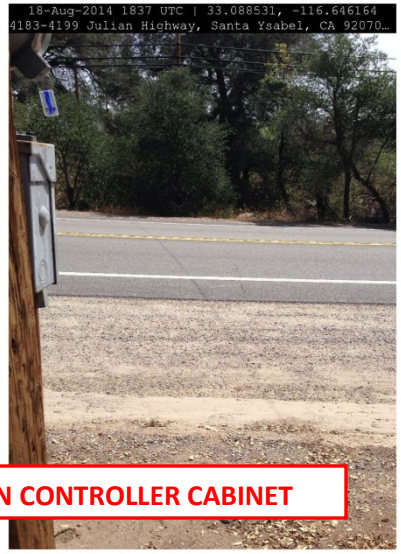
LOCATION 08 - COUNT STATION 754

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 09 – COUNT STATION 968





SERVICE EQUIPMENT ENCLOSURE

COUNT STATION CONTROLLER CABINET

LOCATION 10 – COUNT STATION 831

LOCATION 11 – COUNT STATION719

SERVICE EQUIPMENT ENCLOSURE

COUNT STATION CONTROLLER CABINET

LOCATION 12 - COUNT STATION 402

COUNT STATION CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

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SECTION 2
MODIFY COMMUNICATION HUB

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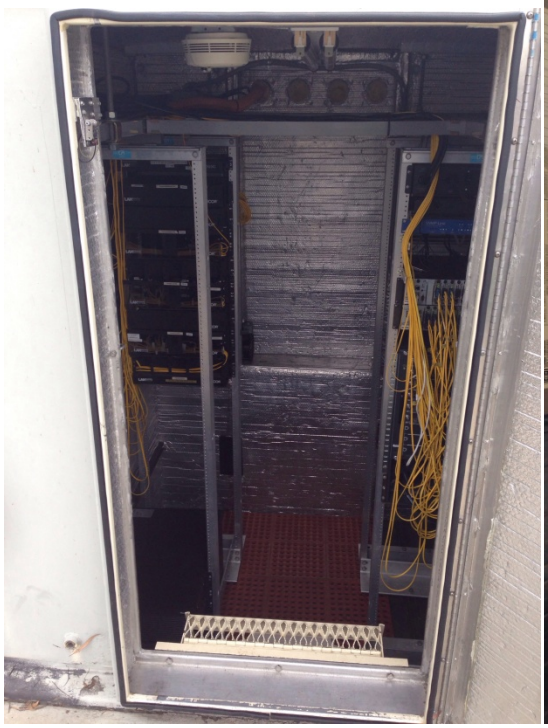
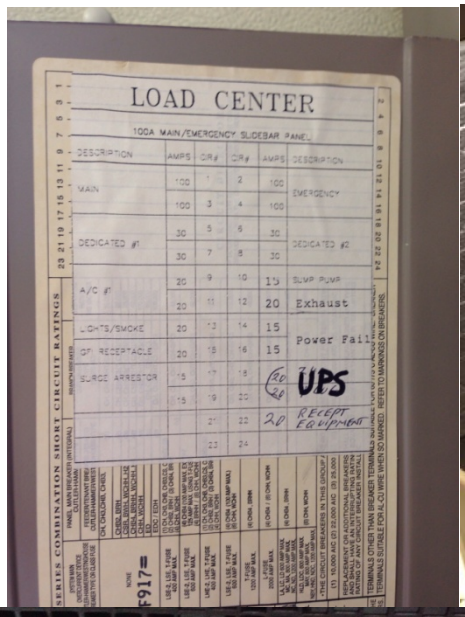
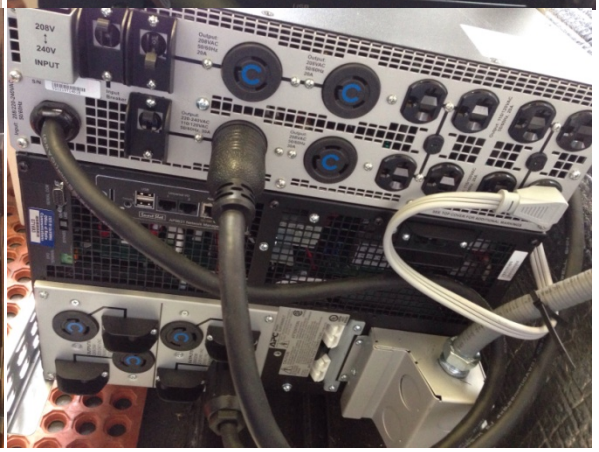
LOCATION 13 - COMMUNICATION HUB 2



LOCATION 13 - COMMUNICATION HUB 2



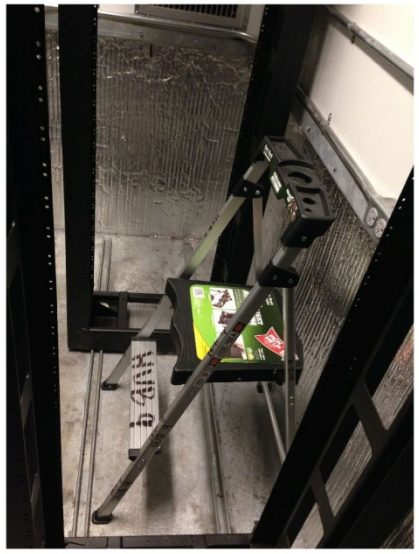


LOCATION 13 - COMMUNICATION HUB 2

LOCATION 14 - COMMUNICATION HUB 9

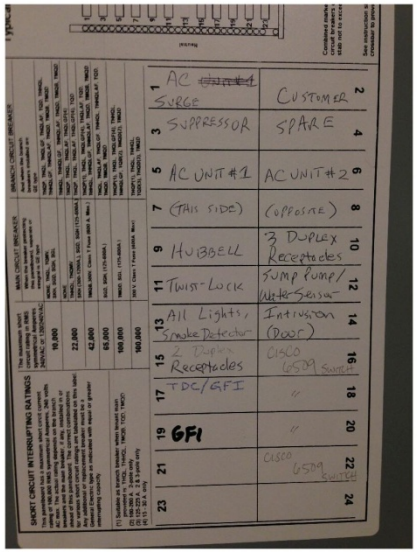
LOCATION 14 - COMMUNICATION HUB 9

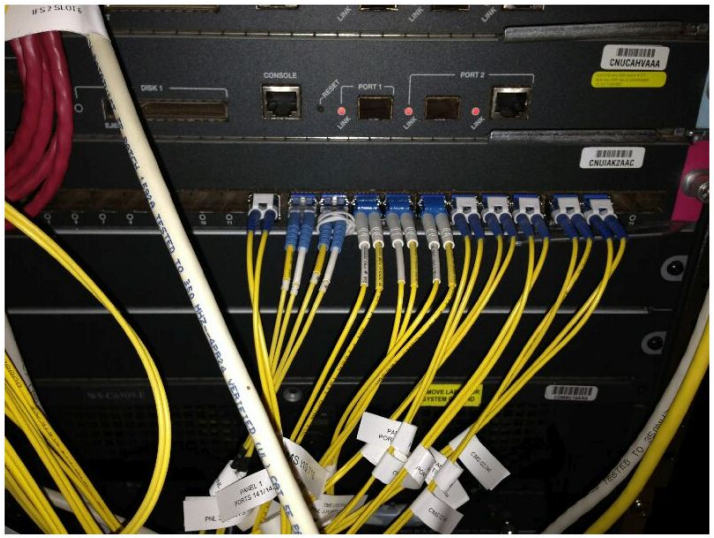
LOCATION 14 - COMMUNICATION HUB 9

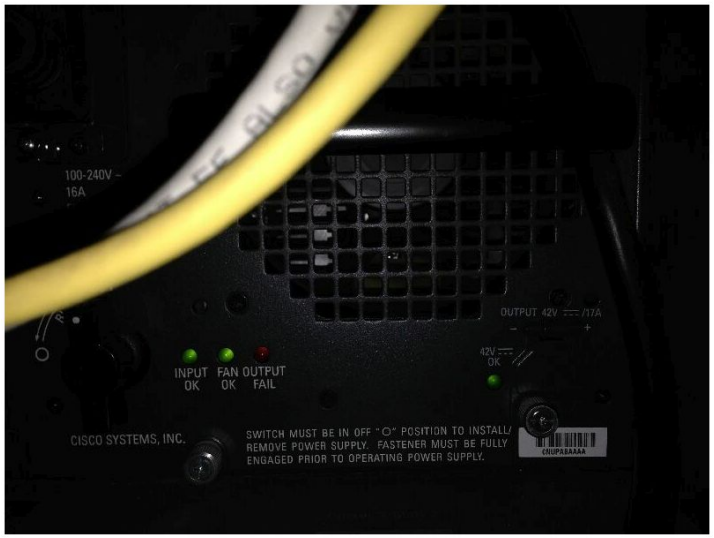


LOCATION 14 - COMMUNICATION HUB 9

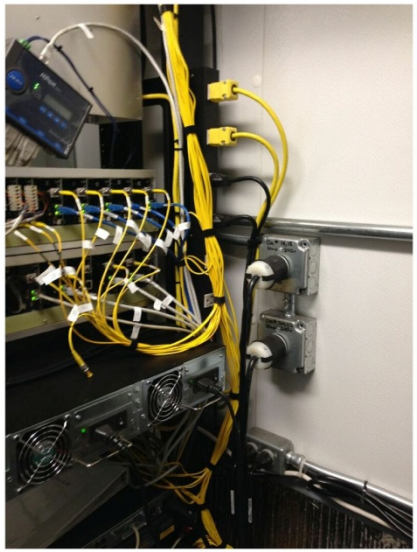
LOCATION 14 - COMMUNICATION HUB 9

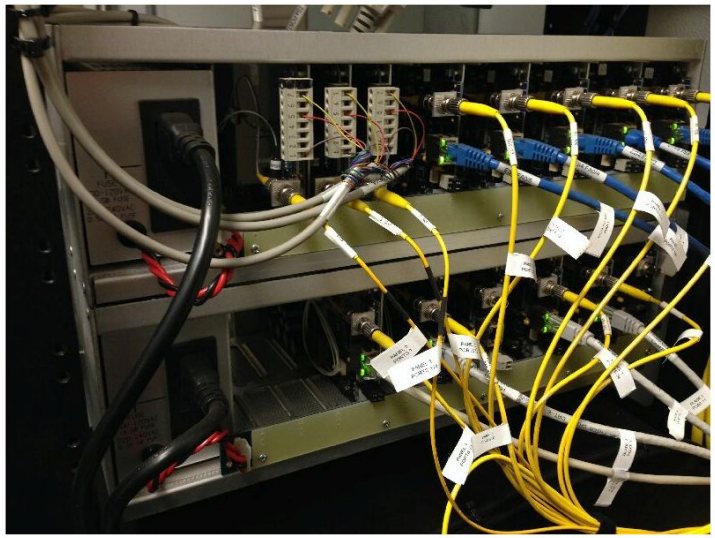






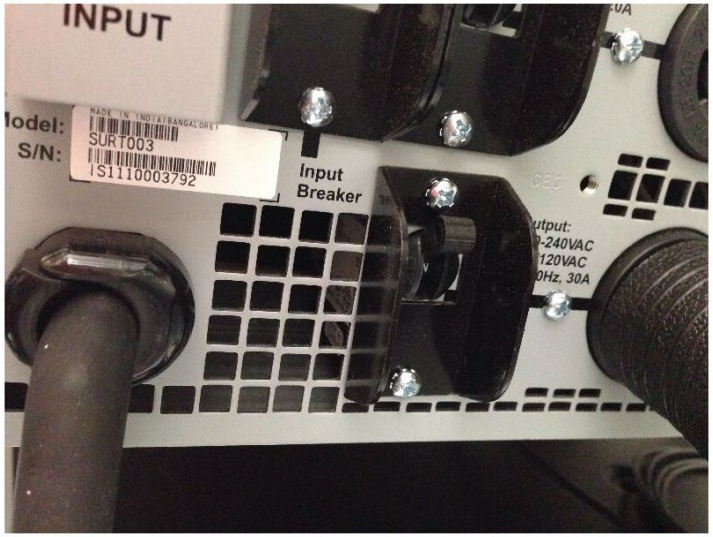
LOCATION 14 - COMMUNICATION HUB 9





LOCATION 15 - COMMUNICATION HUB 11

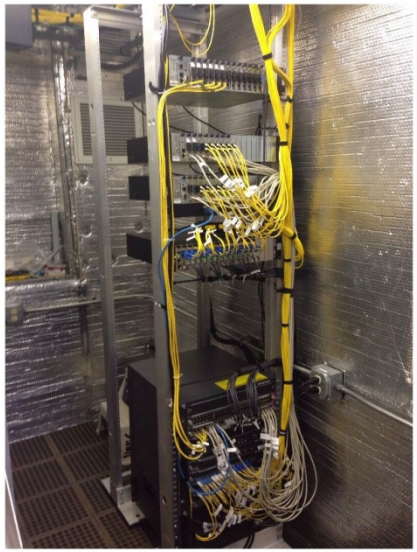
LOCATION 15 - COMMUNICATION HUB 11



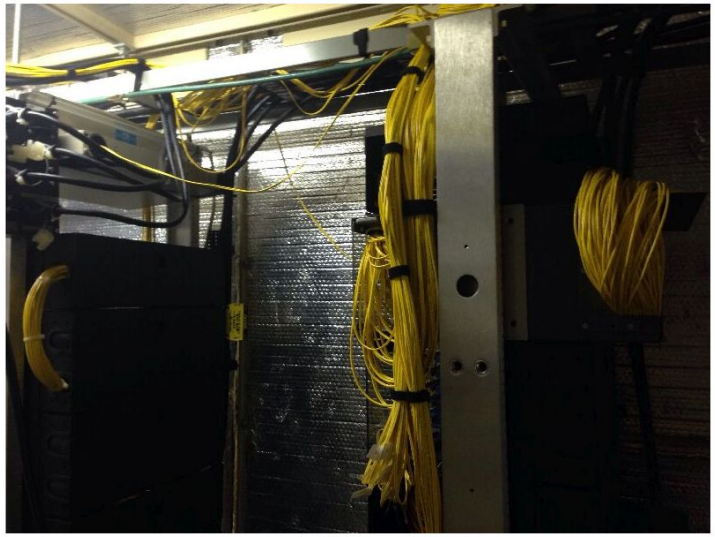
LOCATION 15 - COMMUNICATION HUB 11

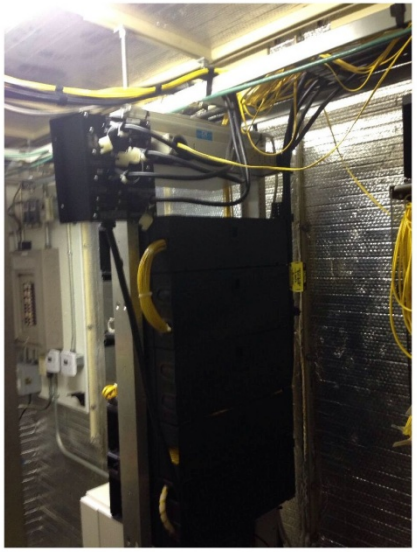
Marvair

LOCATION 16 - COMMUNICATION HUB 6

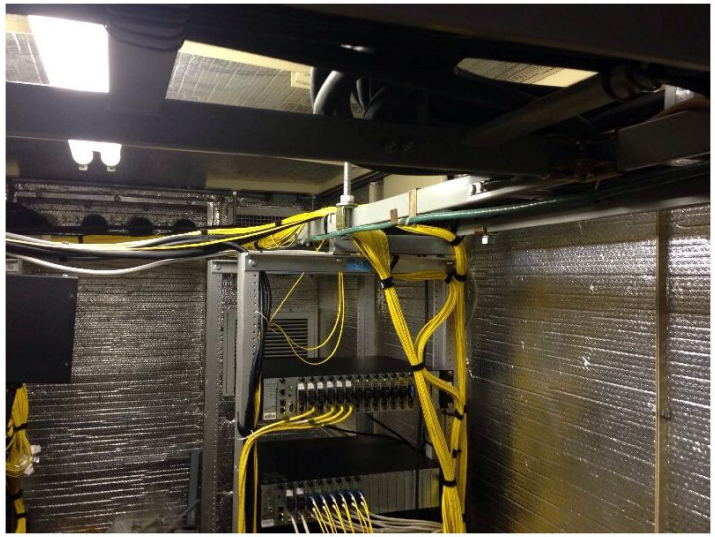


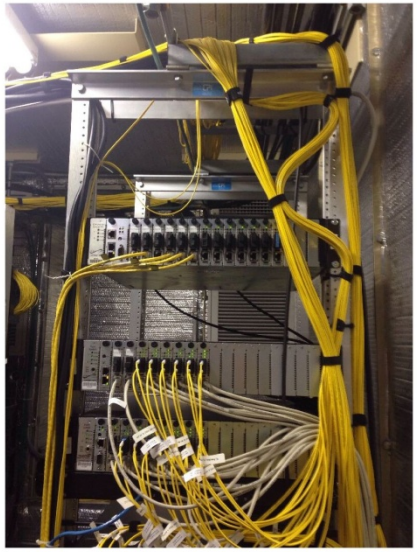
LOCATION 16 - COMMUNICATION HUB 6





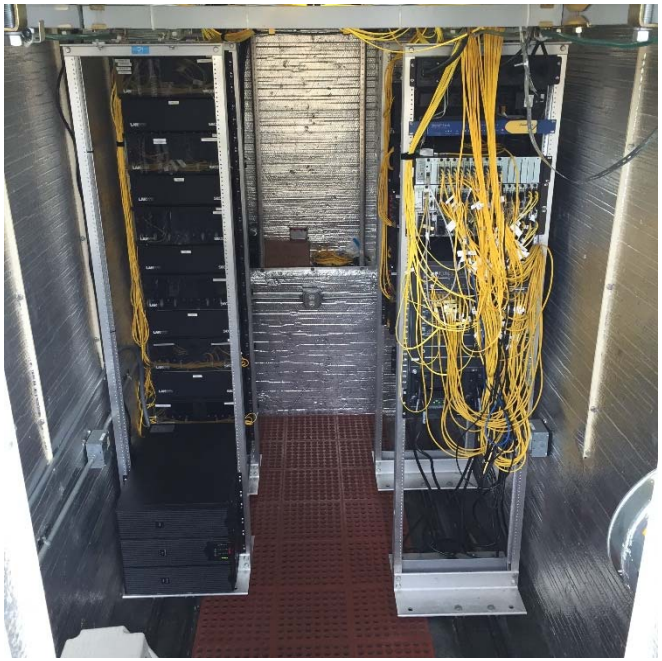
LOCATION 16 - COMMUNICATION HUB 6



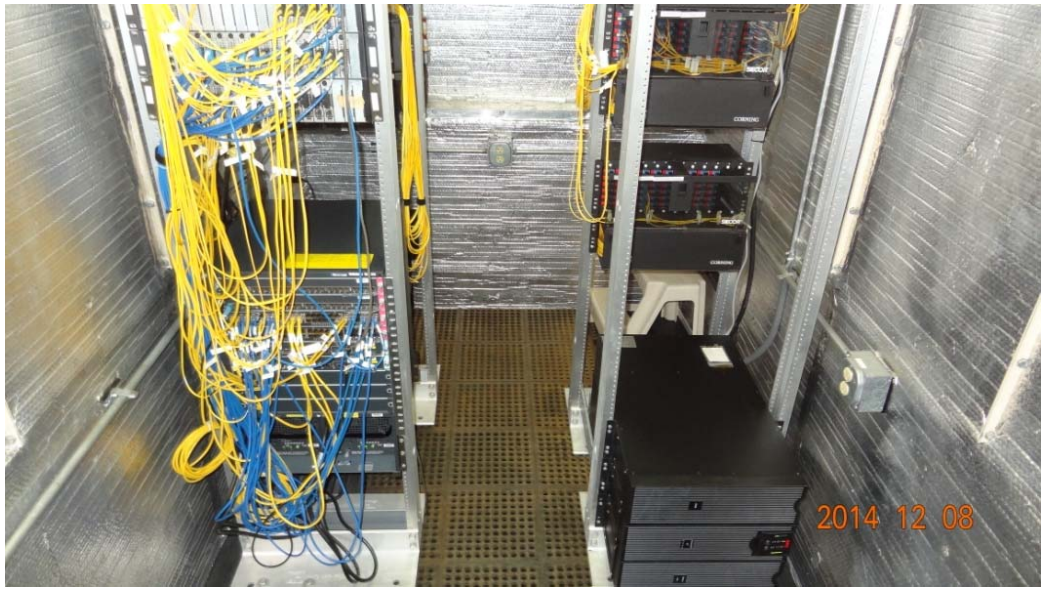


LOCATION 16 - COMMUNICATION HUB 6

LOCATION 17 - COMMUNICATION HUB 3

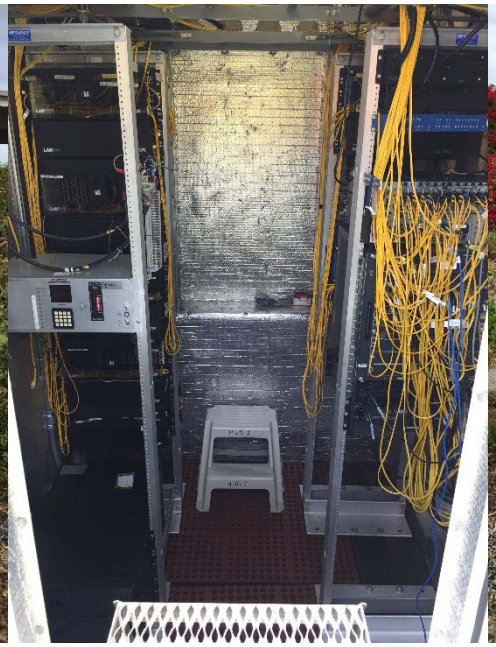


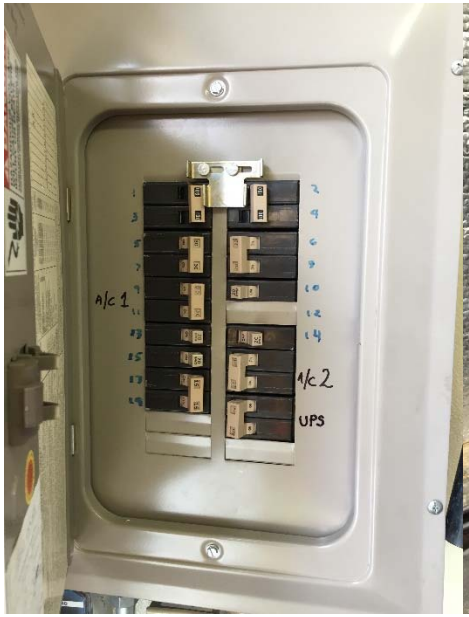
LOCATION 18 - COMMUNICATION HUB 4



LOCATION 18 - COMMUNICATION HUB 4

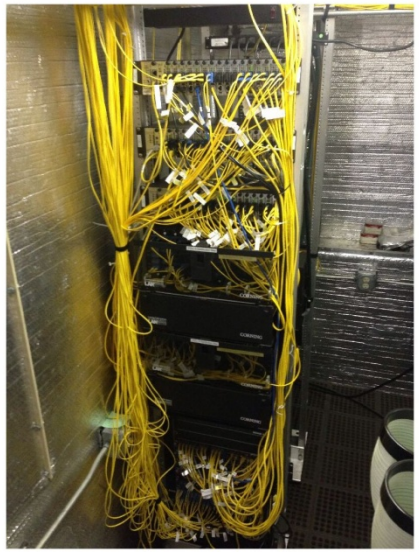
LOCATION 19 - COMMUNICATION HUB 1

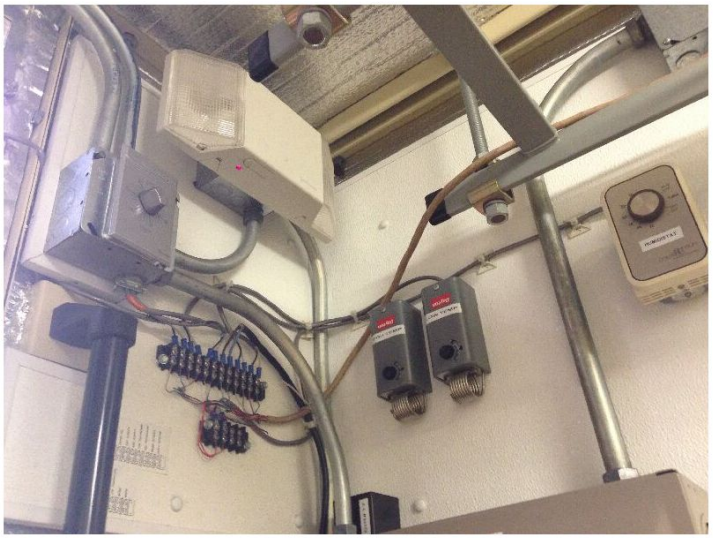


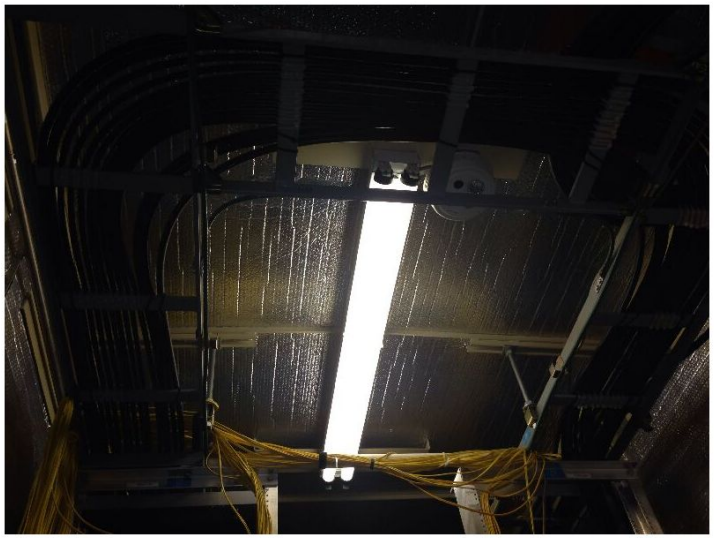


LOCATION 20 - COMMUNICATION HUB 5

LOCATION 20 - COMMUNICATION HUB 5

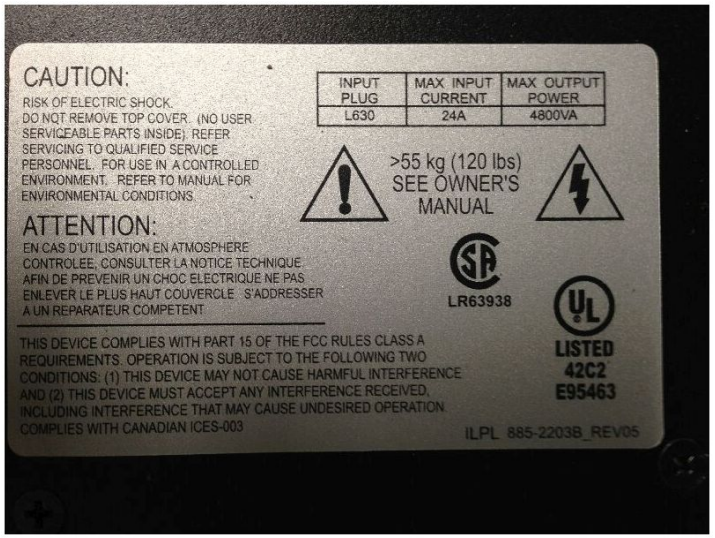




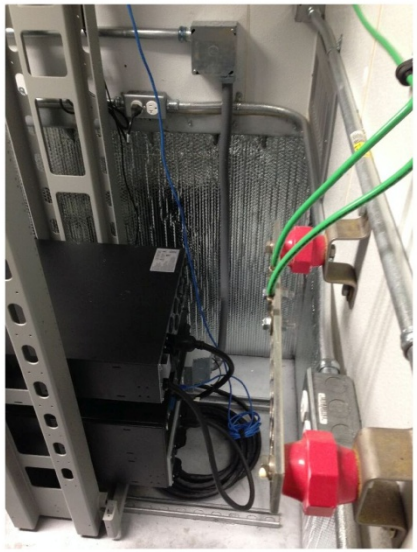


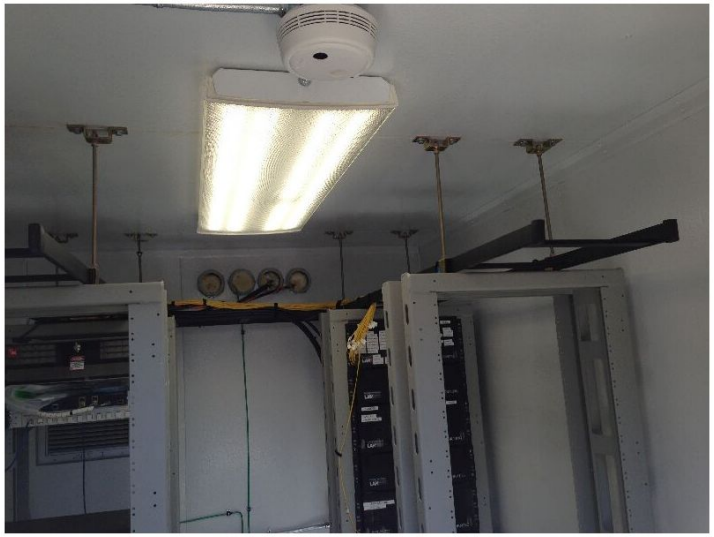
LOCATION 21 - COMMUNICATION HUB 13

LOCATION 21 - COMMUNICATION HUB 13

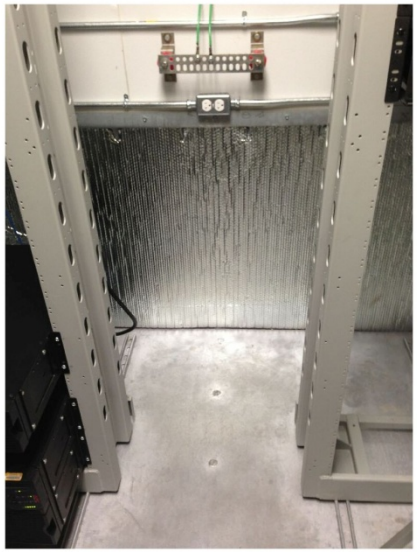


LOCATION 21 - COMMUNICATION HUB 13





LOCATION 21 - COMMUNICATION HUB 13



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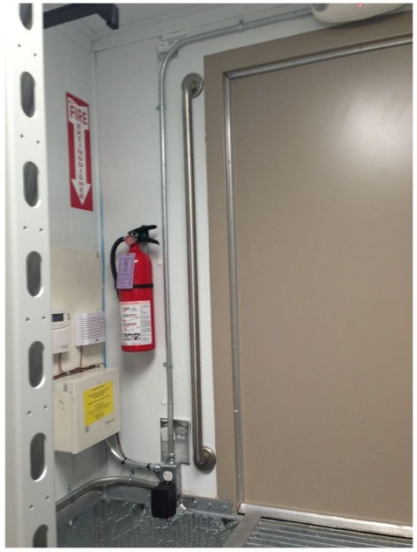
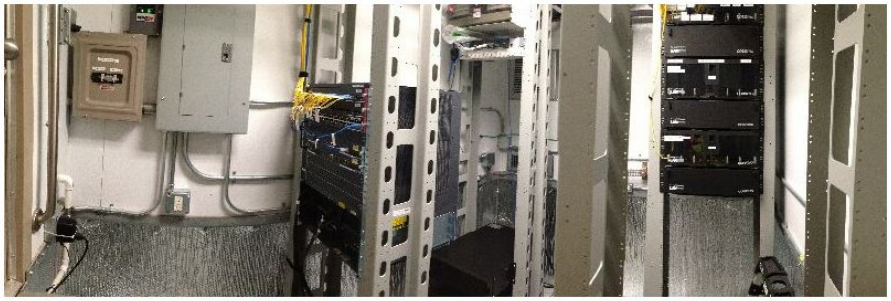


LOCATION 21 - COMMUNICATION HUB 13



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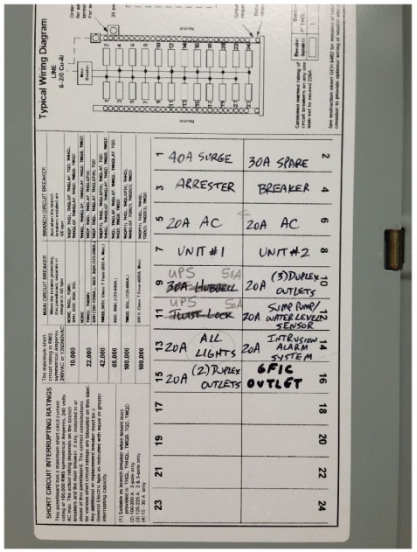

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SECTION 3
MODIFY HIGHWAY ADVISORY RADIO SYSTEM

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LOCATION 22 - NB Rte 5, SOUTH OF CHINQUAPIN Ave OVERCROSSING

LOCATION 24 - EB Rte 78, WEST OF EL CAMINO REAL OFF-RAMP

LOCATION 25 - WB Rte 78, WEST OF MELROSE Dr

LOCATION 26 - EB Rte 78, WEST OF MELROSE Dr

LOCATION 27 - NB Rte 15, SOUTH OF WEST VALLEY Pkwy, JUST OFF THE MBGR

LOCATION 28 - SB Rte 15, SB ON-RAMP NEAR THE ON-RAMP OF WEST EL NORTE Pkwy

LOCATION 29 - EB Rte 78, WEST OF MISSION Rd

LOCATION 30 - WB Rte 78, WEST OF BROADWAY, BEHIND THE DITCH

LOCATION 30 - WB Rte 78, WEST OF BROADWAY, BEHIND THE DITCH

LOCATION 31 - NB Rte 805, SOUTH OF THE Rte 805 AND Rte 5 SEPARATION

INSTALL HAR SIGN HERE

LOCATION 31 - NB Rte 805, SOUTH OF THE Rte 805 AND Rte 5 SEPARATION

INSTALL HAR SIGN HERE

LOCATION 32 - SB Rte 805, NORTH OF MAIN St

REMOVE EXISTING HAR SIGN WITH EQUIPMENT AND INSTALL NEW HAR SIGN WITH EQUIPMENT NORTH OF MAIN St

LOCATION 32 - SB Rte 805, NORTH OF MAIN St

LOCATION 33 - EB Rte 905, EAST OF HOWARD Ave

LOCATION 33 - EB Rte 905, EAST OF HOWARD Ave

LOCATION 34 - EB Rte 905, ON THE MEDIAN EAST OF BEYER Blvd

REMOVE EXISTING HAR SIGN WITH EQUIPMENT AND INSTALL NEW HAR SIGN WITH EQUIPMENT

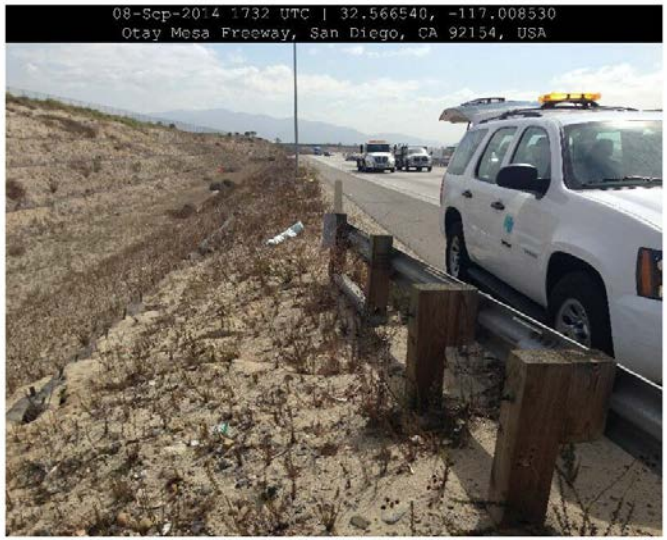
LOCATION 34 - EB Rte 905, ON THE MEDIAN EAST OF BEYER Blvd

LOCATION 34 - EB Rte 905, ON THE MEDIAN EAST OF BEYER Blvd

LOCATION 35 - WB Rte 905, WEST OF PICADOR Blvd

LOCATION 36 - WB Rte 905, EAST OF CALIENTE Ave

LOCATION 36 - WB Rte 905, EAST OF CALIENTE Ave



LOCTION 37 - SB Rte 5, SOUTH OF PALM Ave

REMOVE EXISTING HAR SIGN WITH EQUIPMENT AND INSTALL NEW HAR SIGN WITH EQUIPMENT

LOCTION 37 - SB Rte 5, SOUTH OF PALM Ave

SECTION 4
MODIFY PHOTOVOLTAIC SYSTEM

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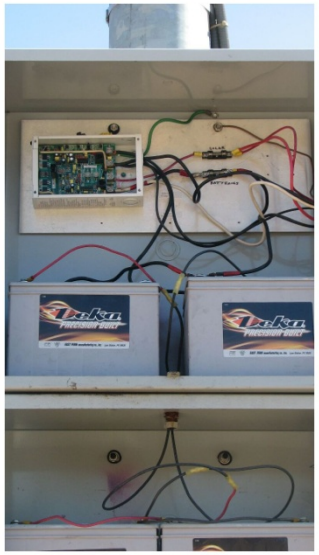
LOCATION 38 - EB Rte 8, 0.75 MILES WEST OF LOS COCHES Rd



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SECTION 5
MODIFY
CLOSED CIRCUIT
TELEVISION
CAMERA

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LOCATION 23 - NB Rte 5, SOUTH OF ROSELLE St

LOCATION 39 - WB Rte 56, JUST WEST OF Rte 15

CCTV CONTROLLER CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 40 - WB Rte 56, 0.35 MILES EAST OF RANCHO SANTA FE FARMS Rd

SECTION 6
MODIFY SIGNAL

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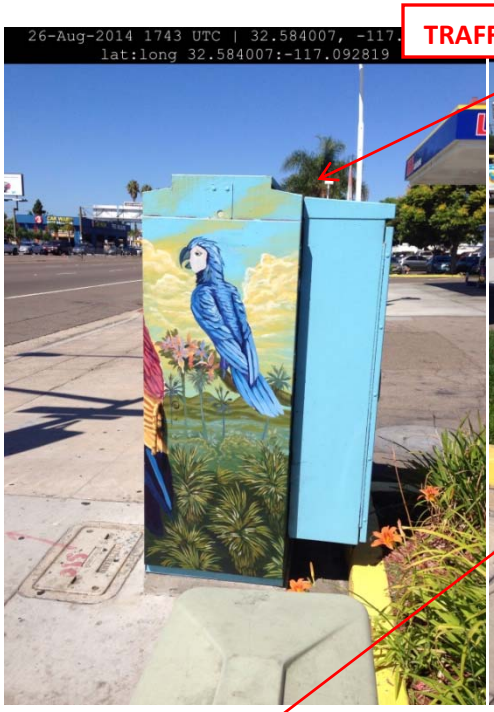
LOCATION 41 - AT SATURN Ave

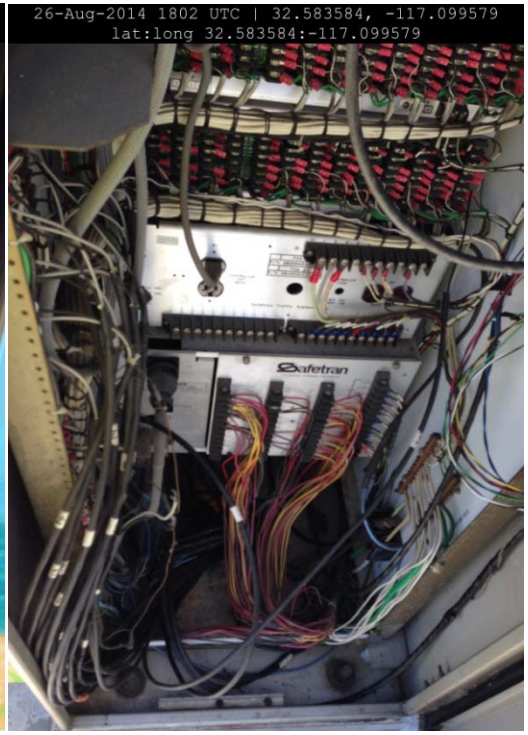


TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 42 - Rte 75 AT 16TH STREET

SERVICE EQUIPMENT ENCLOSURE

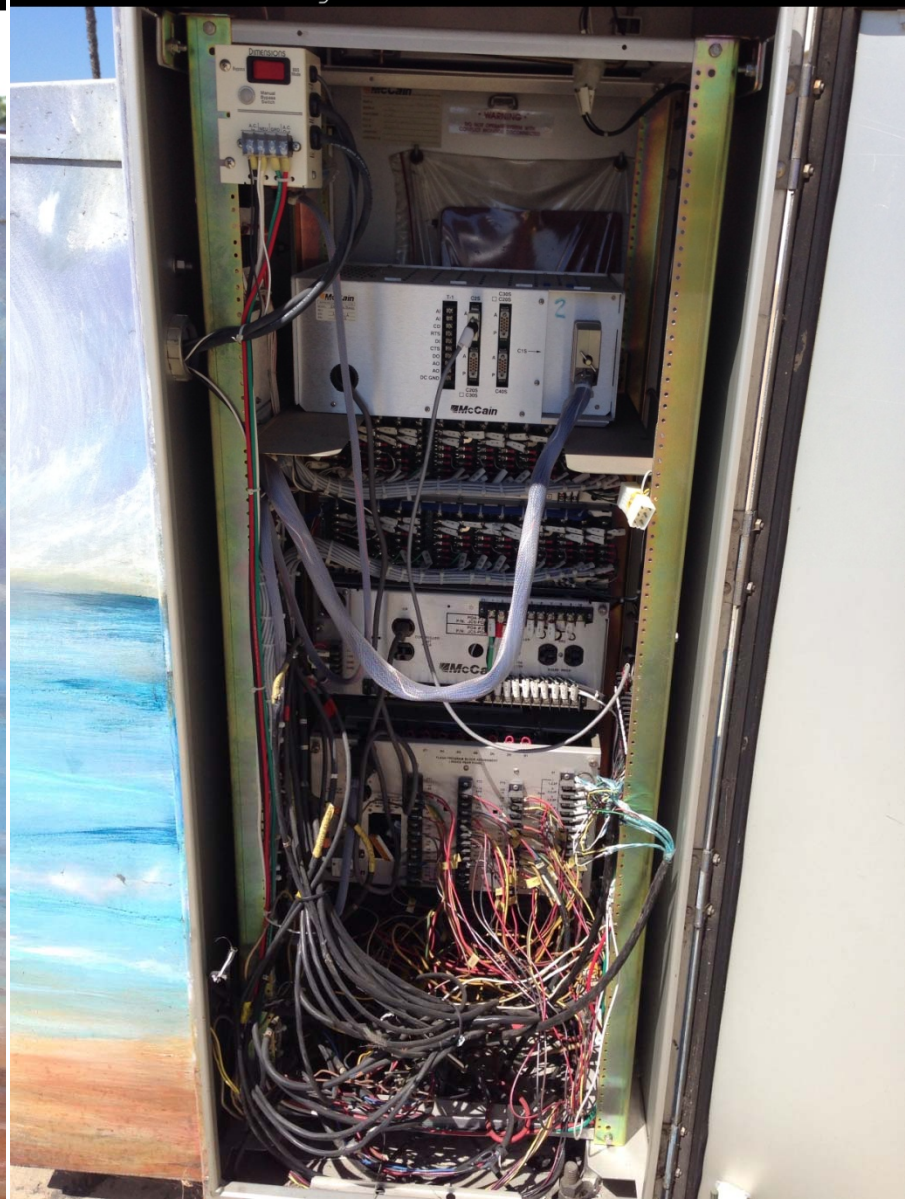


TRAFFIC SIGNAL CABINET

LOCATION 43 - Rte 75 AT 13TH STREET

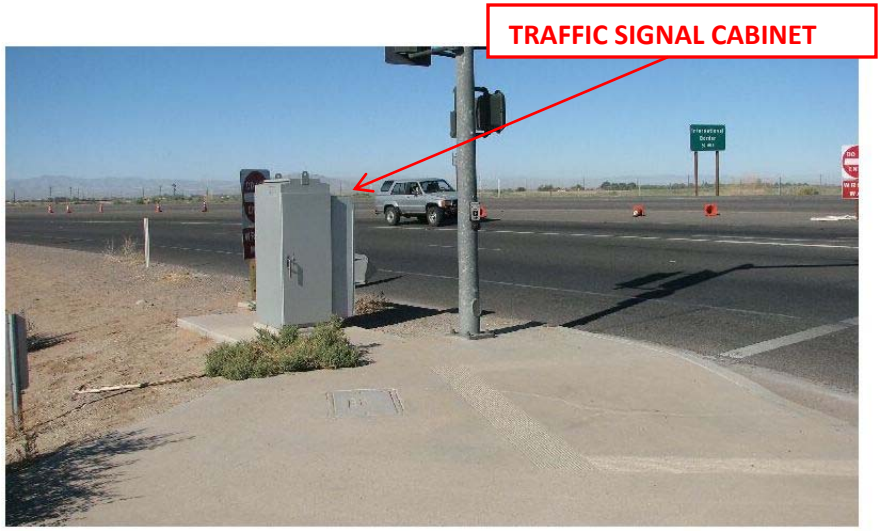
26-Aug-2014 1810 UTC | 32.584019, -117.105934
lat:long 32.584019:-117.105934

26-Aug-2014 1809 UTC | 32.583469, -117.105408
lat:long 32.583469:-117.105408



LOCATION 44 - EB HOME Ave AT FEDERAL Blvd

LOCATION 45 - Imp Rte 7 AT MENVIELLE Rd

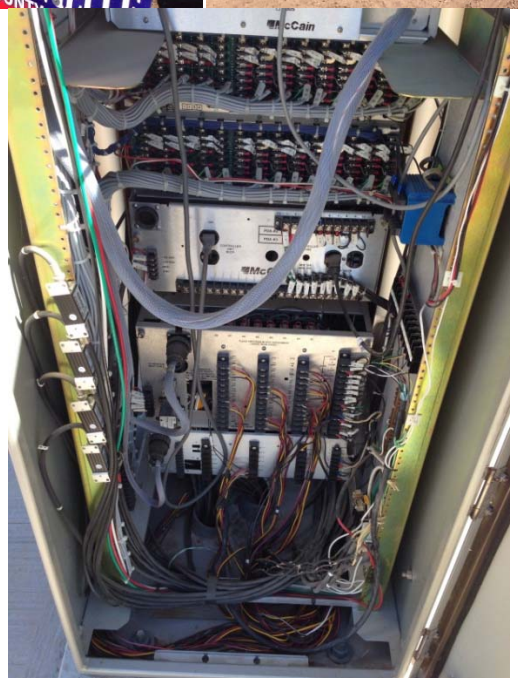


LOCATION 46 - Imp Rte 8 EB AT 4TH STREET

TRAFFIC SIGNAL CABINET

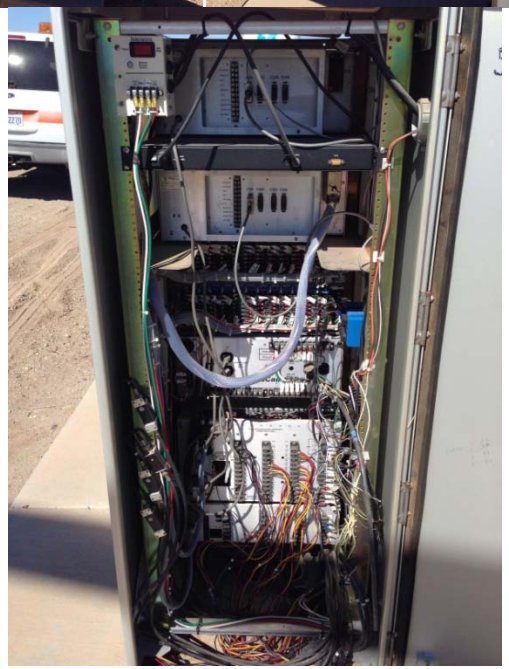
SERVICE EQUIPMENT ENCLOSURE

LOCATION 47 - WB Rte 78 AT OLD 111



SERVICE EQUIPMENT ENCLOSURE

LOCATION 48 - SHANK RD AND EB Rte 78



TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

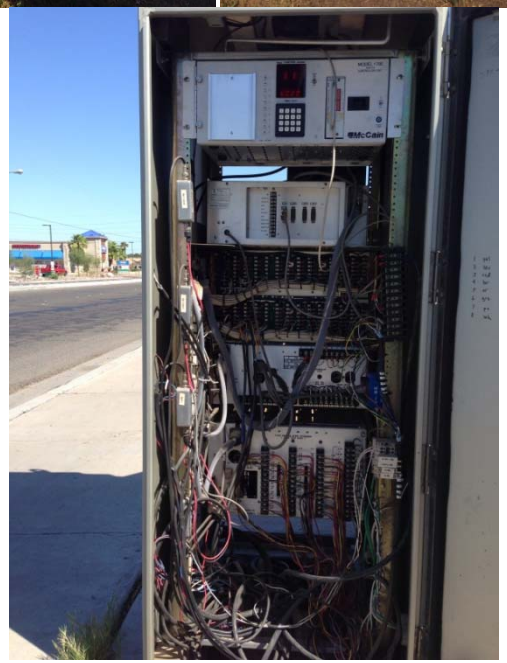
LOCATION 49 - Rte 111 AT THE JUNCTION 0F 78

TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 50 - Rte 86 AT WAKE Ave

TRAFFIC SIGNAL CABINET

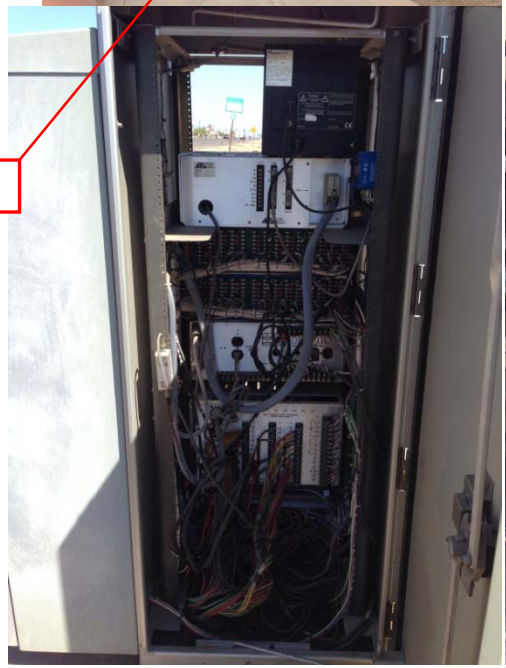


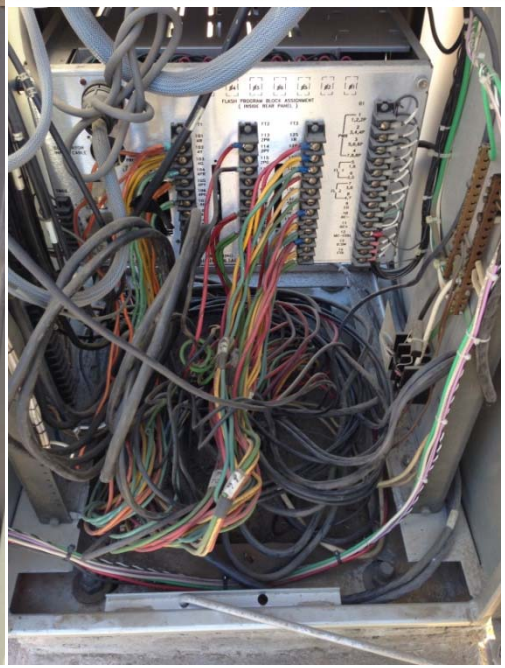
SERVICE EQUIPMENT ENCLOSURE

LOCATION 51 - Rte 86 AT PICO Ave

TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

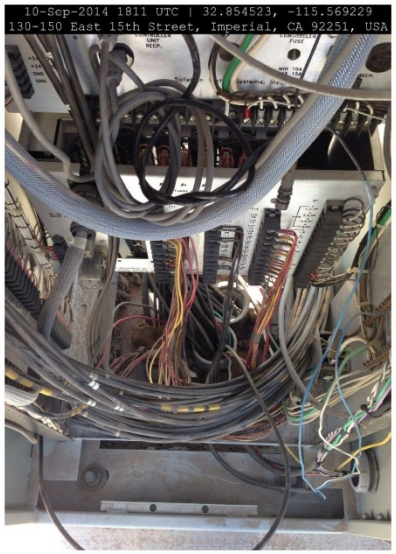




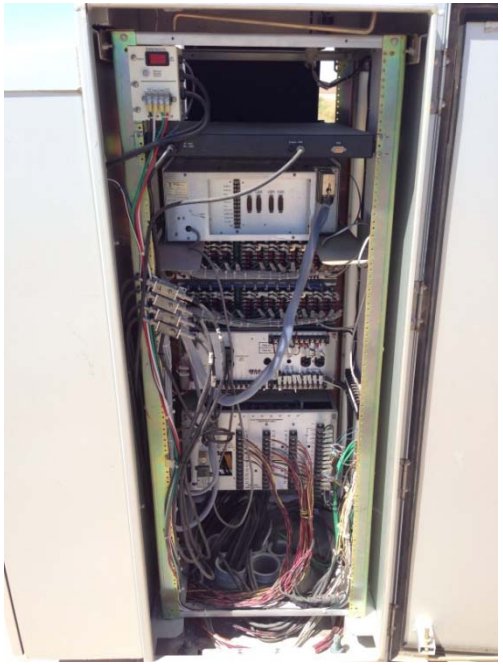
LOCATION 52 - Rte 86 AT 15TH STREET

SERVICE EQUIPMENT ENCLOSURE

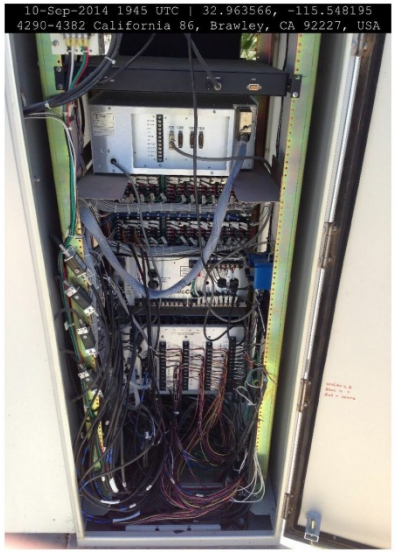
TRAFFIC SIGNAL CABINET



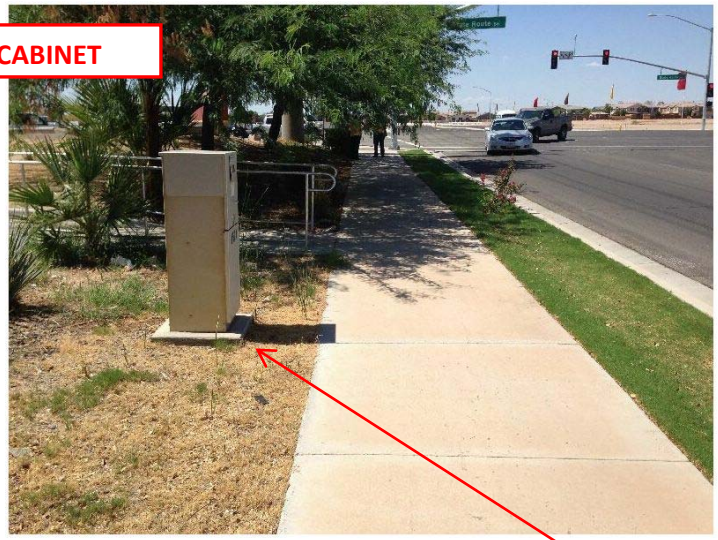
LOCATION 53 - Rte 86 AT KEYSTONE ROAD



LOCATION 54 - Rte 86 AT WILDCAT Dr

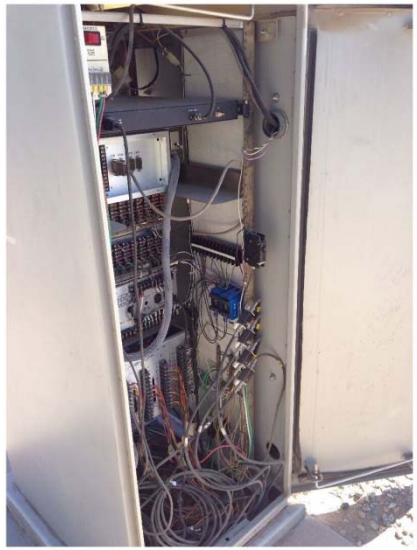


TRAFFIC SIGNAL CABINET



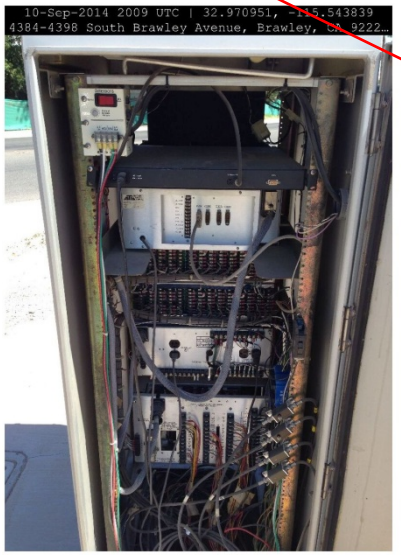
SERVICE EQUIPMENT ENCLOSURE

LOCATION 55 - Rte 86 AT MALAN STREET

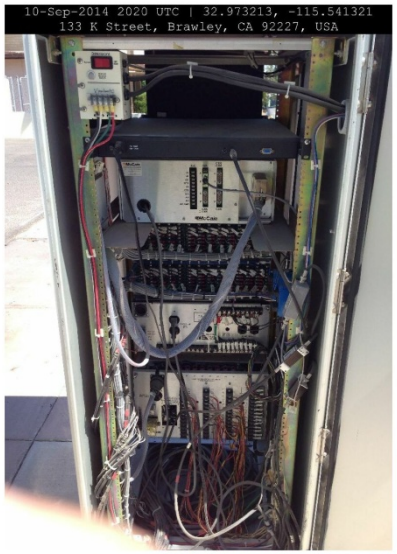


TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE



LOCATION 56 - Rte 86 AT K STREET



SERVICE EQUIPMENT ENCLOSURE

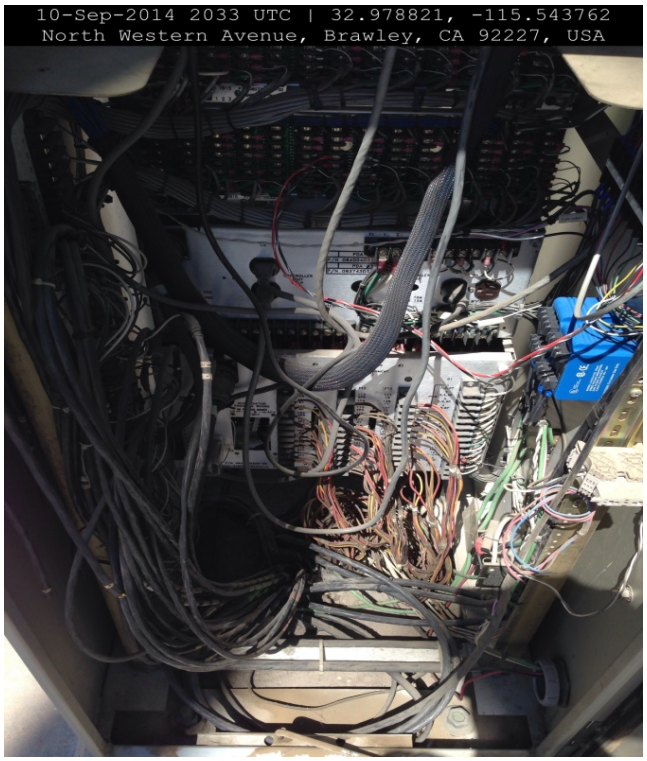
TRAFFIC SIGNAL CABINET

LOCATION 57 - Rte 86 AT RIO VISTA Rd

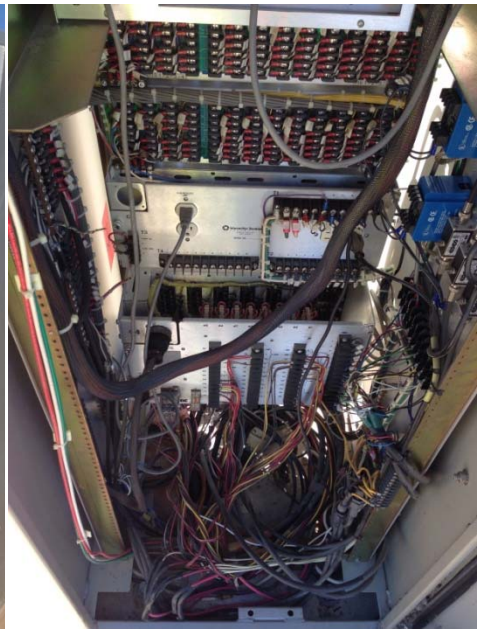
TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 58 - Rte 86 AT WESTERN Ave



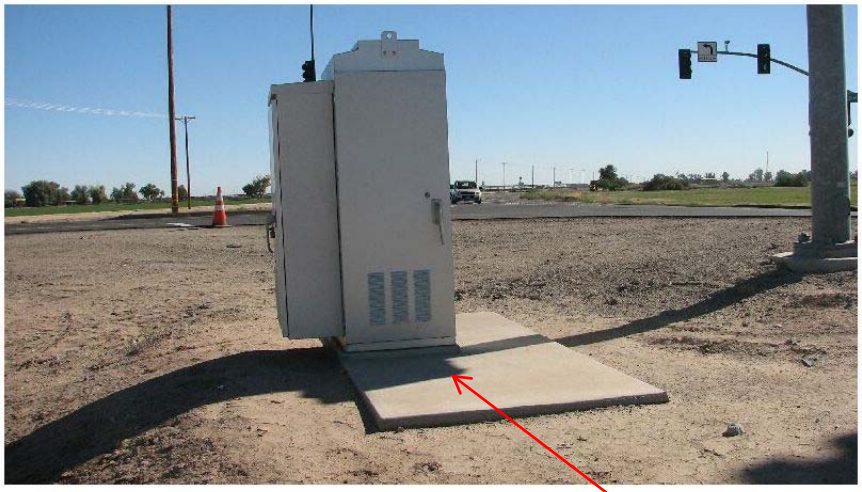
LOCATION 59 - Rte 98 AT EAST RIVERA Dr



SERVICE EQUIPMENT ENCLOSURE

TRAFFIC SIGNAL CABINET

LOCATION 60 - Rte 98 AT COLE Rd



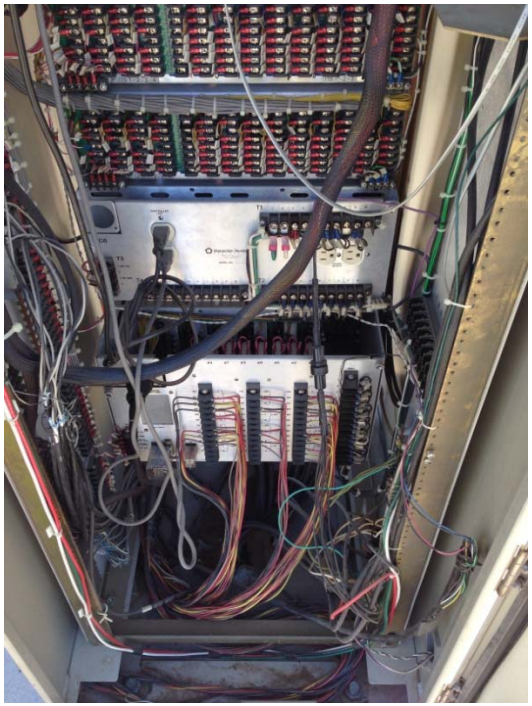
SERVICE EQUIPMENT ENCLOSURE

TRAFFIC SIGNAL CABINET

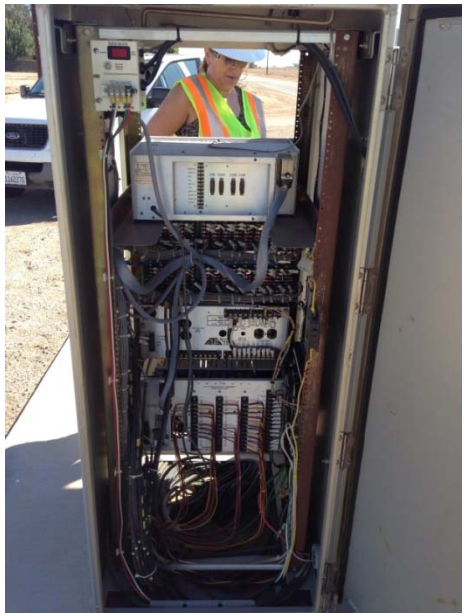
LOCATION 61 - Rte 111 AT JASPER Rd

TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE



LOCATION 62 - Rte 111 AT ROSS Rd



TRAFFIC SIGNAL CABINET

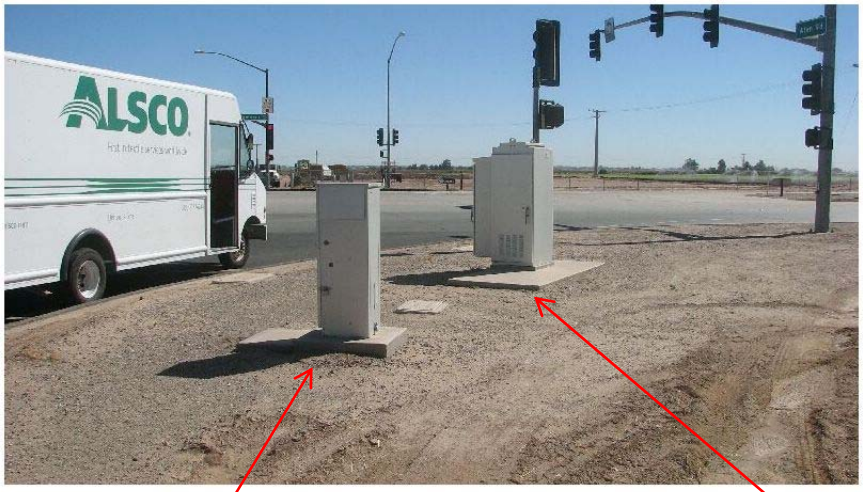
SERVICE EQUIPMENT ENCLOSURE

LOCATION 63 - Rte 111 AT EVAN HEWES Hwy

TRAFFIC SIGNAL CABINET

SERVICE EQUIPMENT ENCLOSURE

LOCATION 64 - Rte 111 AT ATENS Rd



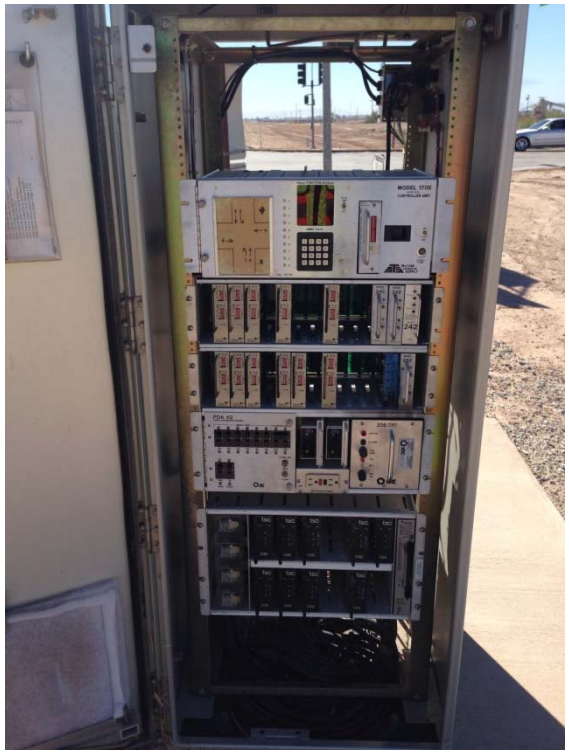
SERVICE EQUIPMENT ENCLOSURE

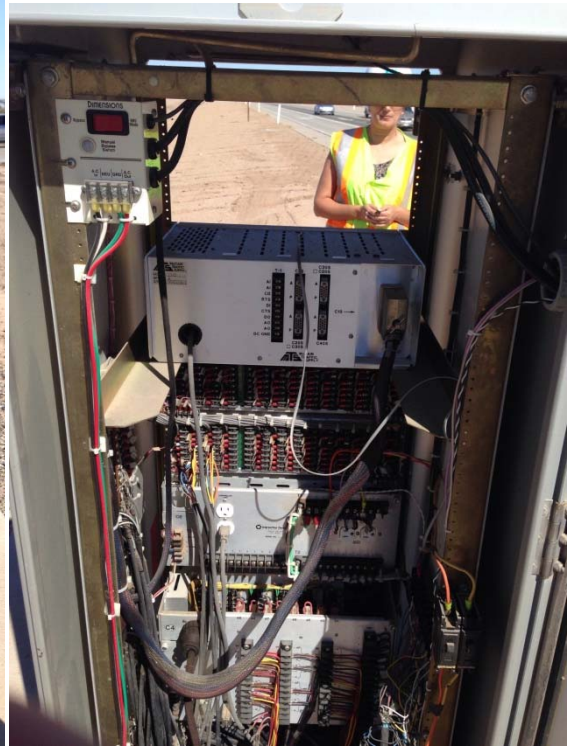
TRAFFIC SIGNAL CABINET

LOCATION 65 - Rte 111 AT KEYSTONE Rd

TRAFFIC SIGNAL CABINET

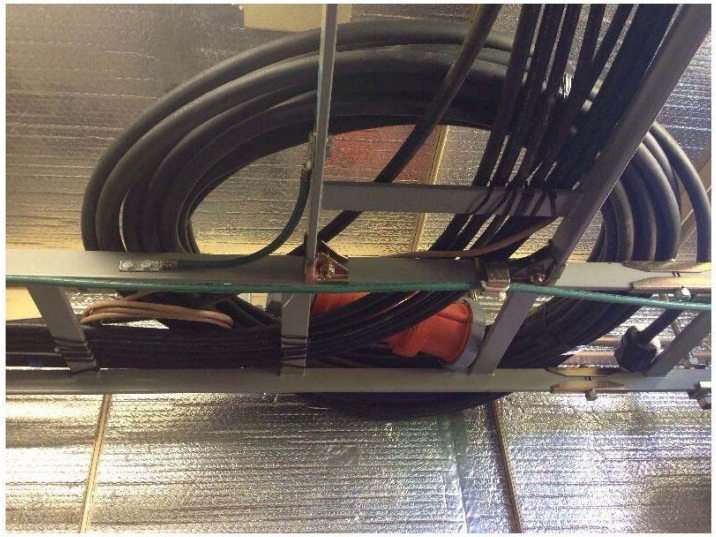
SERVICE EQUIPMENT ENCLOSURE

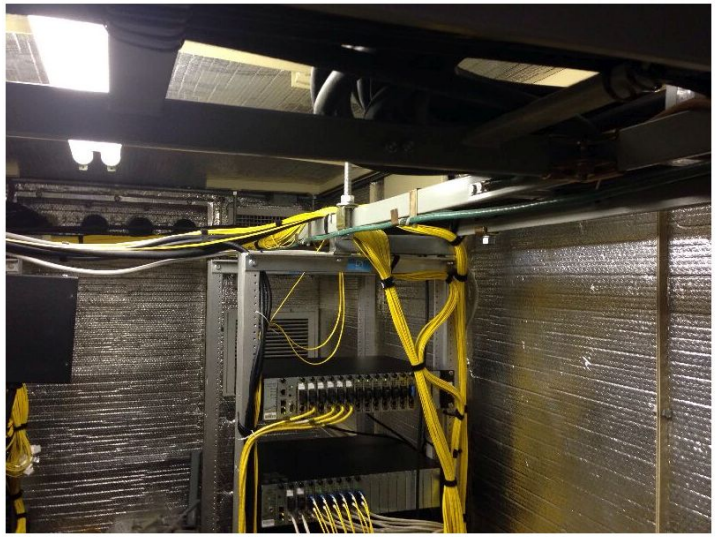




SECTION 7
MODIFY
AIR
CONDITIONING

LOCATION 16 - COMMUNICATION HUB 6

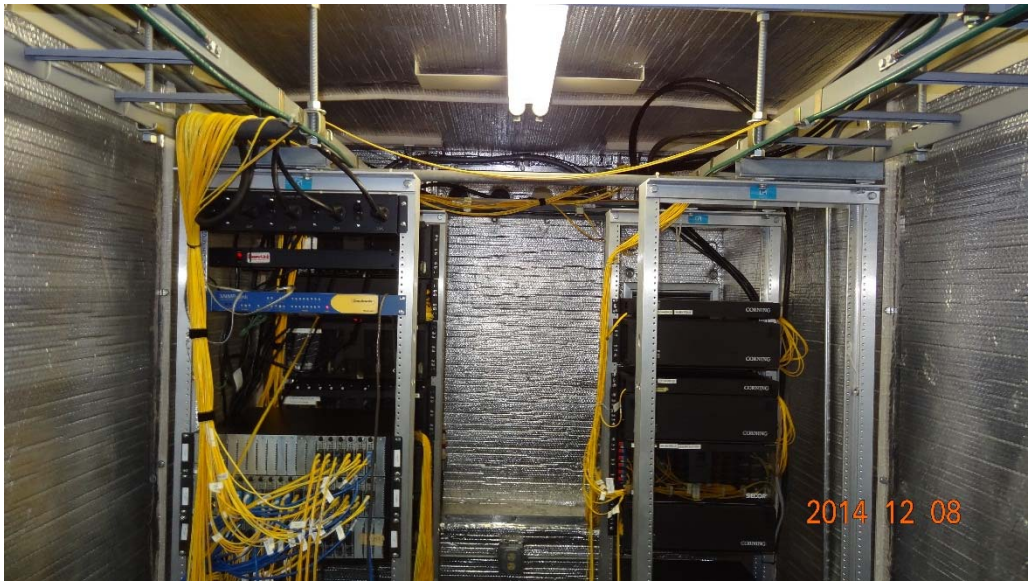




LOCATION 16 - COMMUNICATION HUB 6

LOCATION 17 - COMMUNICATION HUB 3

LOCATION 18 - COMMUNICATION HUB 4



LOCATION 20 - COMMUNICATION HUB 5

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APPENDIX A
CABLE LACING

LACING CONDUCTORS

Conductors within equipment must be kept in place to present a neat appearance and aid in tracing the conductors when alterations or repairs are required. This is done by LACING the conductors into wire bundles called cables. An example of lacing is shown in figure 2-39. When conductors are properly laced, they support each other and form a neat, single cable.

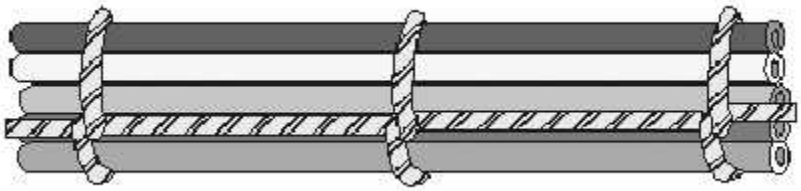


Figure 2-39.—Conductor lacing.

A narrow, flat tape should be used wherever possible for lacing and tying. This tape is not an adhesive type of tape. Round cord may also be used, but its use is not preferred because cord has a tendency to cut into wire insulation. Use cotton, linen, nylon, or glass fiber cord or tape, according to the temperature requirements. Cotton or linen cord or tape must be prewaxed to make it moisture and fungus resistant. Nylon cord or tape may be waxed or unwaxed; glass fiber cord or tape is usually not waxed.

The amount of flat tape or cord required to single lace a group of conductors is about two and one- half times the length of the longest conductor in the group. Twice this amount is required if the conductors are to be double laced.

Before lacing, lay the conductors out straight and parallel to each other. Do not twist them together because twisting makes conductor lacing and wire tracing difficult during troubleshooting.

A lacing shuttle on which the cord can be wound keeps the cord from fouling during the lacing operation. A shuttle similar to the one shown in figure 2-40 can easily be made from aluminum, brass, fiber, or plastic scrap. Rough edges of the material used for the shuttle should be filed smooth to prevent injury to the operator and damage to the cord. To fill the shuttle for a single lace, measure the cord, cut it, and wind it on the shuttle. For double lace, proceed as before, except double the length of the cord before you wind it on the shuttle. For double lace, start both ends of the cord or tape on the shuttle in order to leave a loop for starting the lace. This procedure is explained later in the chapter.

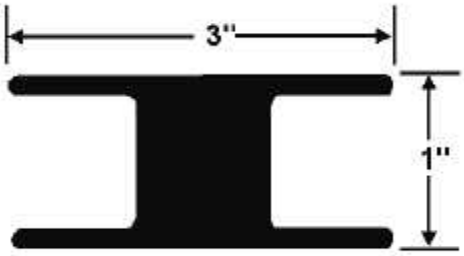


Figure 2-40.—Lacing shuttle.

Some equipment requires the use of twisted wires. One example is the use of "twisted pairs" for the ac filament leads of certain electron tube amplifiers to minimize radiation of their magnetic field. This prevents an annoying hum in the amplifier output. You should duplicate the original layout when relacing any wiring harness.

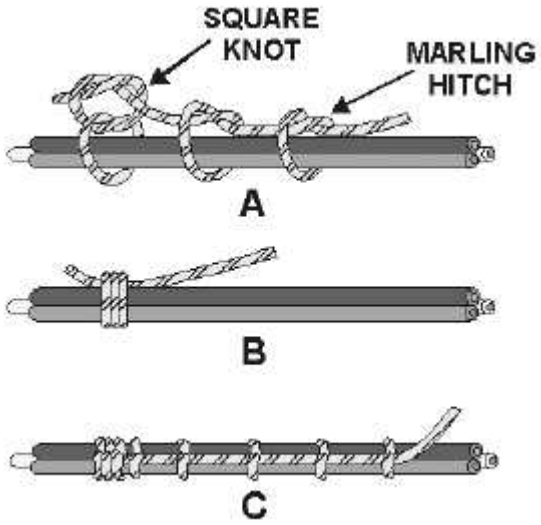
Lace or tie bundles tightly enough to prevent slipping, but not so tightly that the cord or tape cuts into or deforms the insulation. Be especially careful when lacing or tying coaxial cable. Coaxial cable is a conductor used primarily for radio-frequency transmission. It consists of a center conductor separated from an outer conductor (usually called a shield) by an insulating dielectric. The dielectric maintains a constant capacitance between the two conductors, which is very important in radio transmission. The dielectric is soft and deforms easily if tied too tightly or with the wrong type of tape.

CAUTION

Do not use round cord for lacing or tying coaxial cable or bundles that contain coaxial cable. Use only the approved military specification tape to lace or tie coaxial cables or bundles containing coaxial cables.

SINGLE LACE

Single lace can be started with a square knot and at least two marling hitches drawn tightly. Details of the square knot and marling hitch are shown in figure 2-41. Do not confuse the marling hitch with a half hitch. In the marling hitch, the end is passed over and under the strand, as shown in view A of the figure. After forming the marling hitches, draw them tightly against the square knot, as shown in view B. The lace consists of a series of marling hitches evenly spaced at 1/2-inch to 1-inch intervals along the length of the group of conductors, as shown in view C of the figure.



When dividing conductors to form two or more branches, follow the procedure illustrated in figure 2-42. Bind the conductors with at least six turns between two marling hitches, and continue the lacing along one of the branches, as shown in view A. Start a new lacing along the other branch. To keep the bends in place, form them in the conductors before lacing. Always add an extra marling hitch just prior to a breakout as shown in view B.

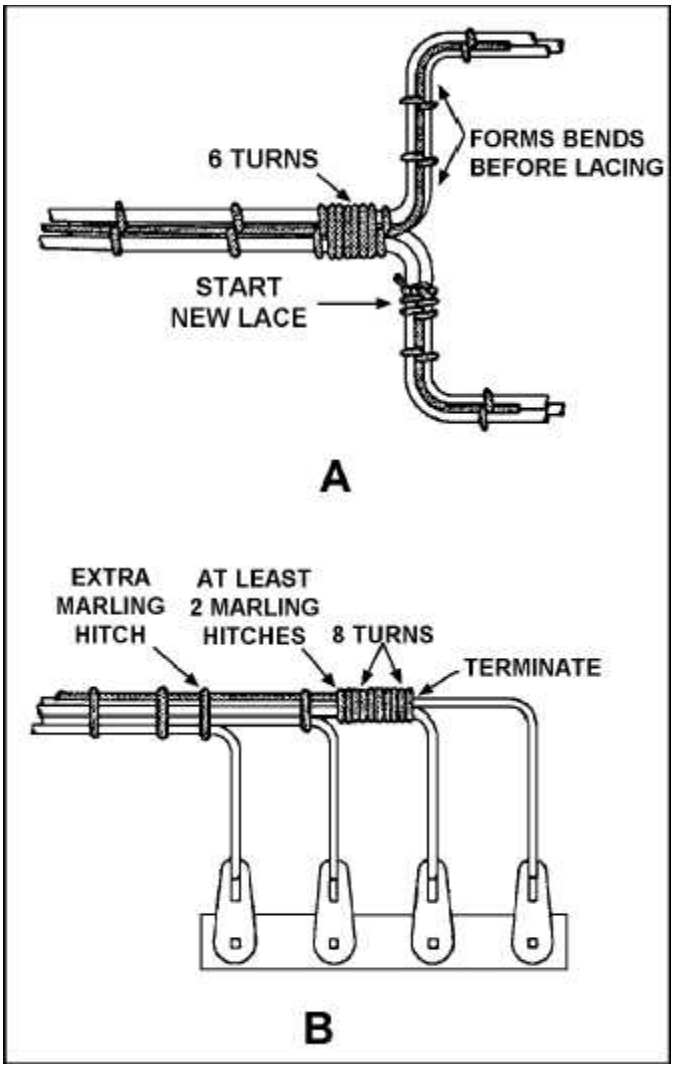


Figure 2-42.—Lacing branches and breakouts.

Double lace should be used on groups of conductors that are 1 inch or larger in total diameter. Either a single lace or a double lace may be used on groups of less than 1 inch.

DOUBLE LACE

Double lace is applied in a manner similar to single lace, except that it is started with a telephone hitch and is double throughout the length of the lacing (figure 2-43). Both double and single lace may be ended by forming a loop from a separate length of cord and using it to pull the end of the lacing back underneath a serving of approximately eight turns (figure 2-44). An alternate method of ending the lacing is illustrated in figure 2-45. This method can also be used for either single- or double-cord lacing. Another method is by using a marling hitch as a lock stitch (figure 2-46) to prevent slippage. This procedure will also prevent unraveling should a break occur to the lacing.

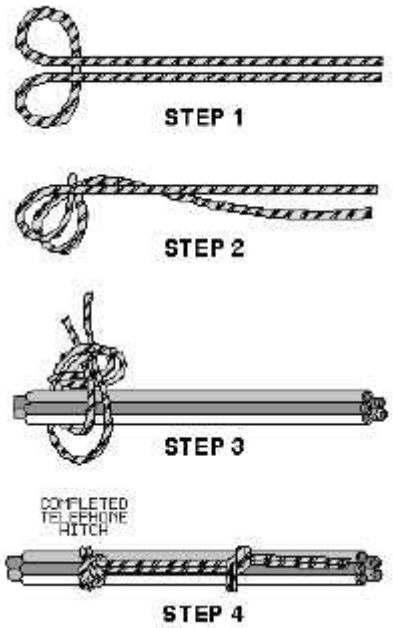


Figure 2-43.—Starting double lace.

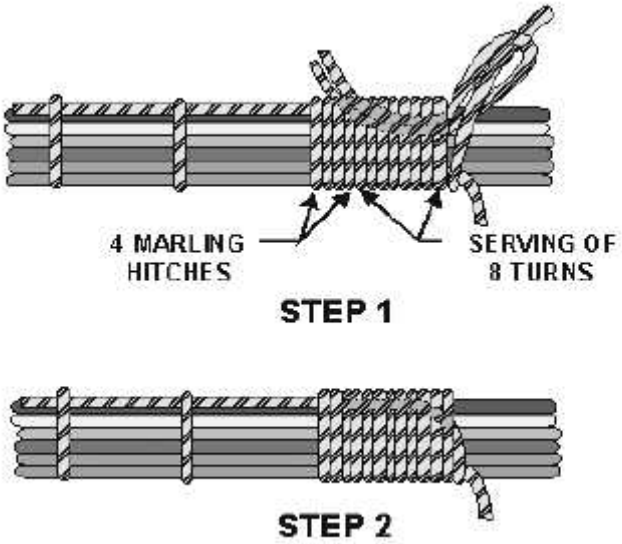


Figure 2-44.—Terminating double lace.

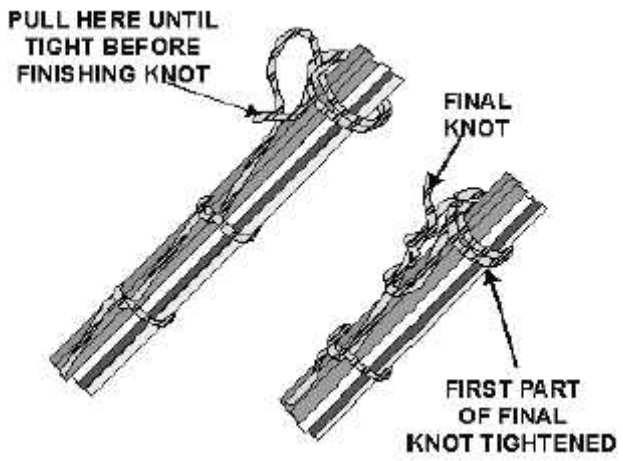


Figure 2-45.—Alternate method of terminating the lace.

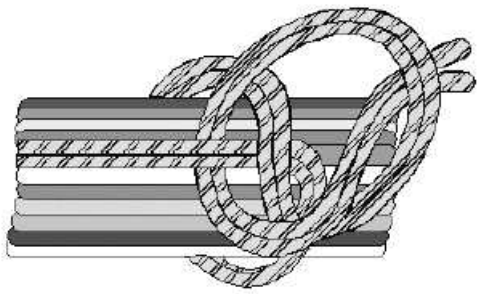


Figure 2-46.—Marling hitch as a lock stitch

The spare conductors of a multiconductor cable should be laced separately, and then tied to active conductors of the cable with a few telephone hitches. When two or more cables enter an enclosure, each cable group should be laced separately. When groups are parallel to each other, they should be bound together at intervals with telephone hitches (figure 2-47).

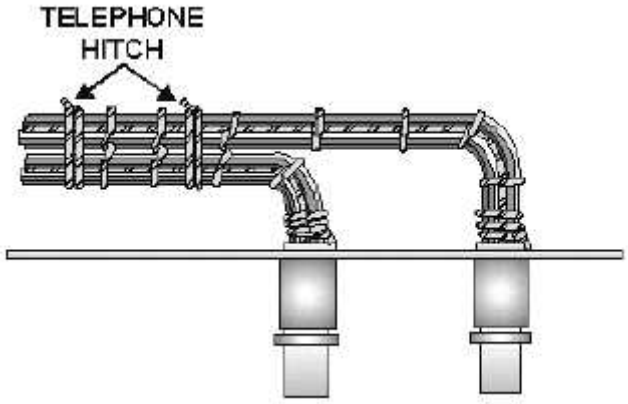


Figure 2-47.—Spot tying cable groups.

SPOT TYING

When cable supports are used in equipment as shown in figure 2-48, spot ties are used to secure the conductor groups if the supports are more than 12 inches apart. The spot ties are made by wrapping the cord around the group as shown in figure 2-49. To finish the tie, use a clove hitch followed by a square knot with an extra loop. The free ends of the cord are then trimmed to a minimum of 3/8 inch.

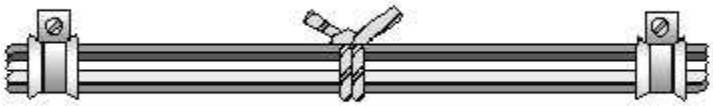


Figure 2-48.—Use of spot ties.

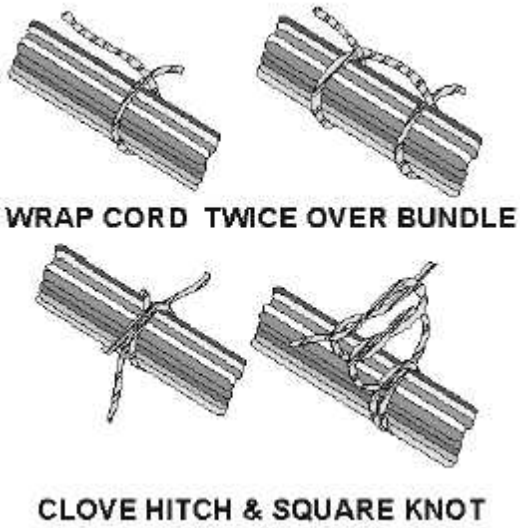


Figure 2-49.—Making spot ties.

SELF-CLINCHING CABLE STRAPS

Self-clinching cable straps are adjustable, lightweight, flat nylon straps. They have molded ribs or serrations on the inside surface to grip the wire. They may be used instead of individual cord ties for securing wire groups or bundles quickly. The straps are of two types: a plain cable strap and one that has a flat surface for identifying the cables.

CAUTION

Do not use nylon cable straps over wire bundles containing coaxial cable. Do not use straps in areas where failure of the strap would allow the strap to fall into movable parts.

Installing self-clinching cable straps is done with a Military Standard hand tool, as shown in figure 2- 50. An illustration of the working parts of the tool is shown in figure 2-51. To use the tool, follow the manufacturer's instructions.

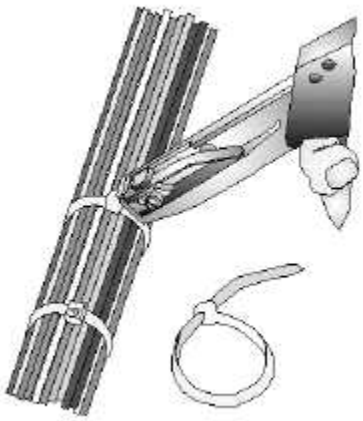


Figure 2-50.—Installing self-clinching cable straps.

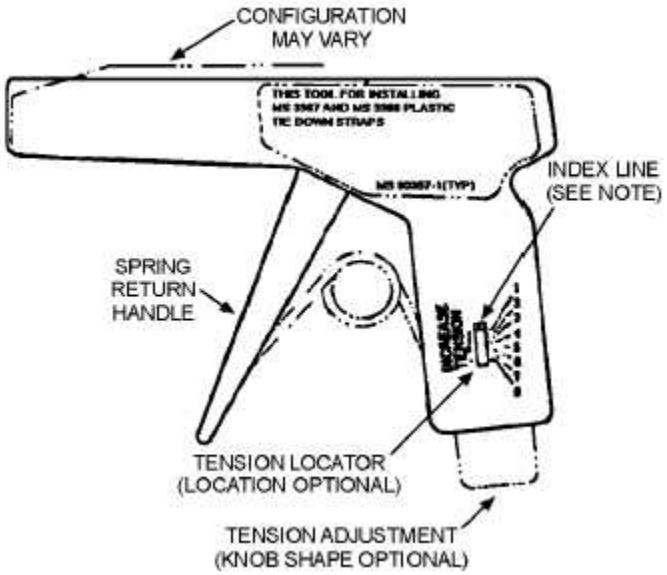


Figure 2-51.—Military Standard hand tool for self-clinching cable straps.

WARNING

Use proper tools and make sure the strap is cut flush with the eye of the strap. This prevents painful cuts and scratches caused by protruding strap ends. Do not use plastic cable straps in high-temperature areas (above 250º F).

HIGH-TEMPERATURE PRESSURE-SENSITIVE TAPE LACING

High-temperature, pressure-sensitive tape must be used to tie wire bundles in areas where the temperature may exceed 250º F. Install the tape as follows (figure 2-52):

1. Wrap the tape around the wire bundle three times, with a two-thirds overlap for each turn.

2. Heat-seal the loose tape end with the side of a soldering iron tip.

APPENDIX B
MATERIAL
FOR
HAR

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Polycrystalline Photovoltaic Module

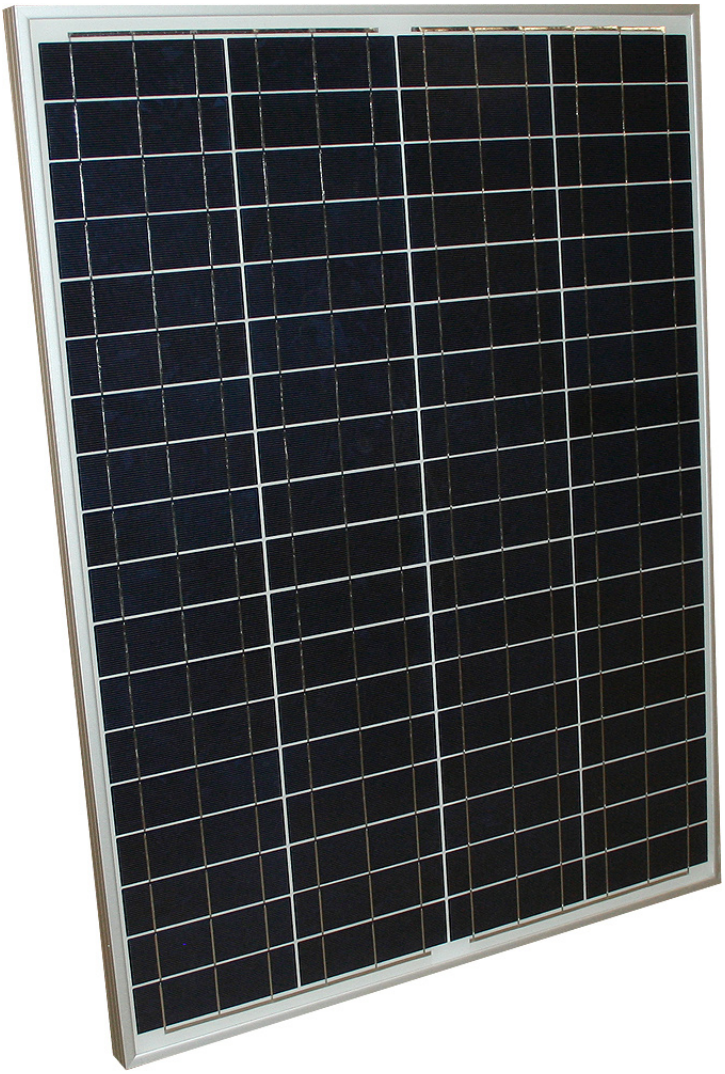
altE
making renewable do-able™

DESIGNED FOR OFF-GRID APPLICATIONS

altE solar modules are designed specifically for use in off grid applications. Manufactured in accordance to ISO9001 standards and certified by IEC61215 and CSA/US to assure electrical safety compliance.

ALT80-12P

80 WATTS, 12 VOLTS



APPLICATIONS

- Off-grid Power for Cabins and Vacation Homes
- Solar Water Pumping
- Solar Powered Refrigerators
- Remote WiFi and Wireless Repeaters
- Power for RVs and Campers
- Electrification of Remote Villages
- Hobbyist Projects Needing Remote or Mobile Power
- Power for Remote Monitoring Systems

CERTIFICATIONS

WARRANTY INFO

altE modules offer 3 year workmanship / 25 year performance warranty.

All the data on this sheet are subject to change without notice.
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Polycrystalline Photovoltaic Module

altE
making renewable do-able™

ELECTRICAL SPECIFICATIONS

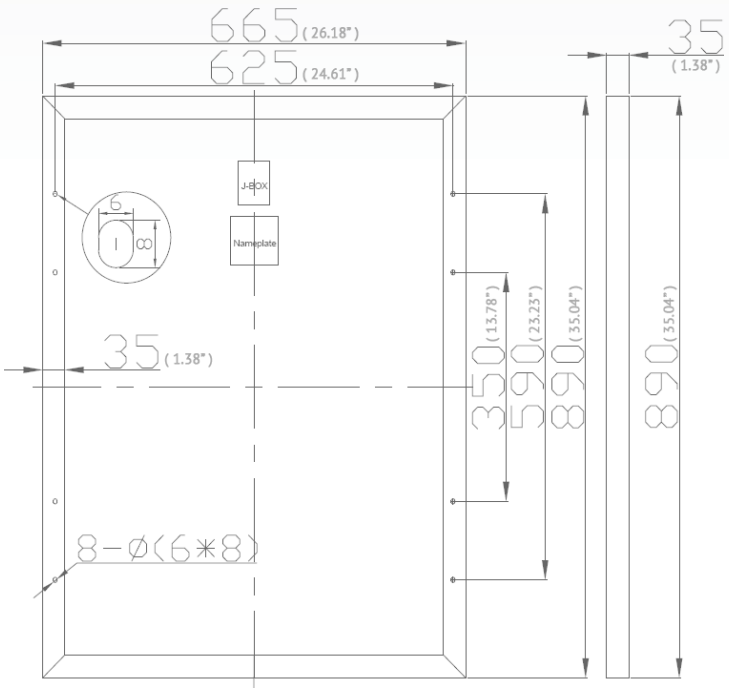
Open-Circuit Voltage (Voc)	22.3V
Optimum Operating Voltage (Vmp)	18.0V
Short-Circuit Current (Isc)	4.85A
Optimum Operating Current (Imp)	4.44A
Maximum Power at STC* (Pmax)	80Wp
Operating Temperature	-45°C to 85°C
Power Tolerance	±5%
Nominal Voltage	12V
Maximum Series Fuse Rating	10A
Maximum System Voltage	600V
Module Efficiency	13.5%

TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	48 ± 3°C
Temperature Coefficient of Pmax	-0.43%/°C
Temperature Coefficient of Voc	-0.36%/°C
Temperature Coefficient of Isc	+0.06%/°C

MODULE CHARACTERISTICS

Module Dimensions	890 x 665 x 35mm 35" x 26.2" x 1.4"
Weight	7.1kg 15.7lbs



SOLAR CELLS: Polycrystalline solar cells

LAMINATE: Glass /EVA / TPT (tedlar/pet/tedlar) or TPE

FRONT SIDE: High-transmission 3.2mm tempered glass

BACK SIDE: TPT /TPE

FRAME: Clear anodized aluminum frame

OUTPUT: Junction box
(+/red terminal on right and -/black terminal on left)

CERTIFICATIONS

All the data on this sheet are subject to change without notice.
© altE Store, Inc.

Panel Enclosures
Type 3R Large Continuous Hinge Cover
Data Sheet and Catalog Number

Application
- Used as wiring boxes, junction and pull boxes
- Protects against falling rain, sleet and external ice formation

Standards
- UL 50 listed, Type 3R
- CSA C22.2 No. 40 certified, Type 3R
- Conforms to NEMA standard for Type 3R

Construction
- Enclosure and door are fabricated from code gauge galvaneal steel, (see below)
- Enclosure standard without knockouts
- Door is secured to the body with a continuous hinge and stainless steel pin on one side and captive screws on the opposite side
- Door has padlock hasp with sealing hole provision
- .375-16 collar studs are furnished for mounting optional panel
- External mounting feet are provided for secure wall mounting

Finish
- Wash and phosphate undercoat
- ANSI 61 gray polyester powder finish

Accessories
- Panels
- Touch-up paint
- See Accessories section

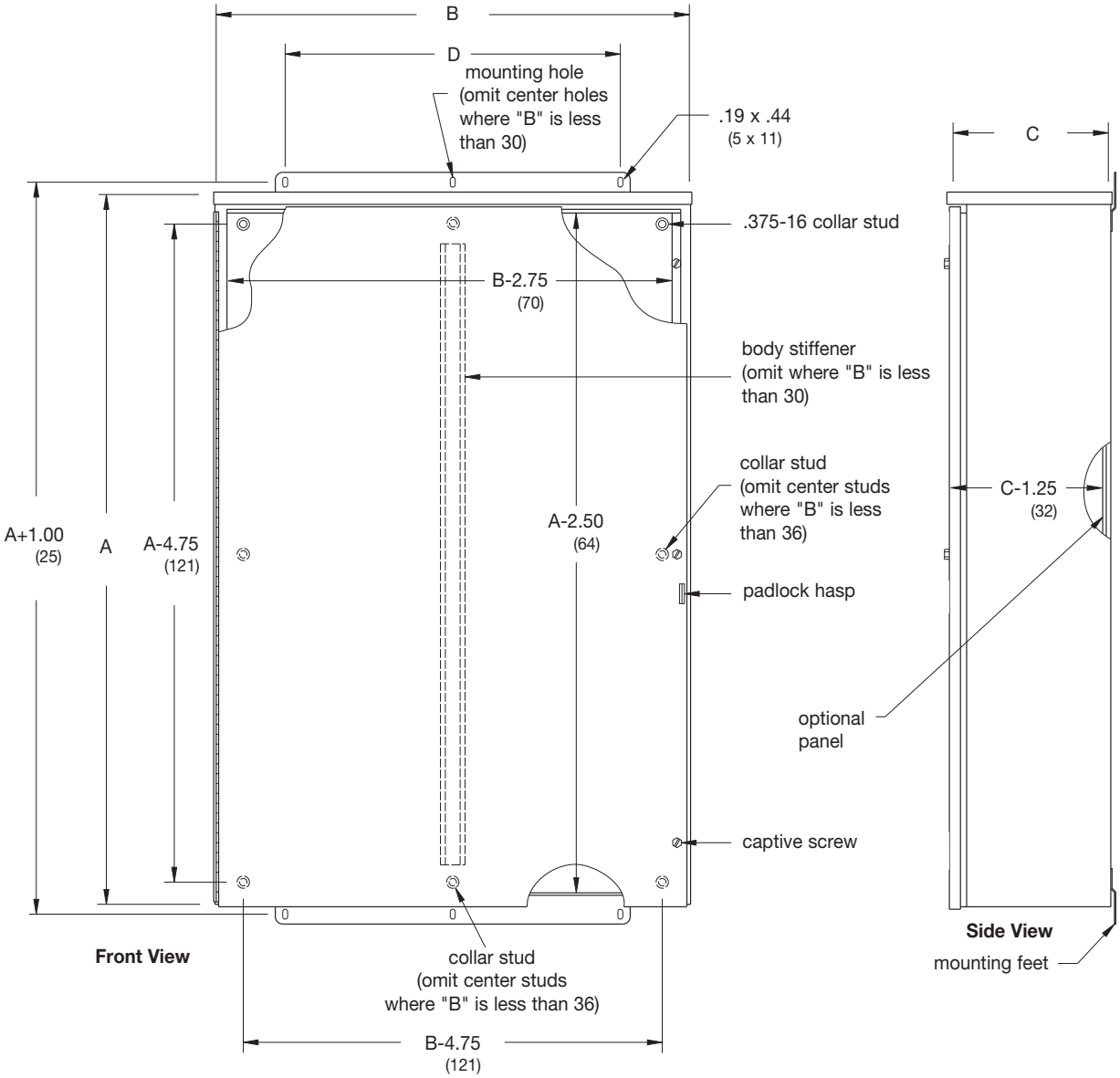
Discount Schedule: A2

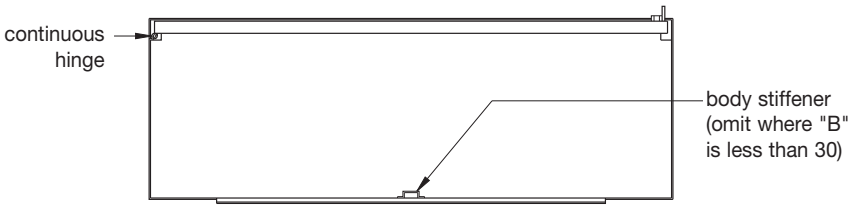
Subclass: AU0

Enclosure Catalog Number	Enclosure Size Height x Width x Depth A x B x C in.	mm	D in.	mm	Gauge	Panel Catalog Number	Panel Size Height x Width in.	mm
16126RHC	16.00 x 12.00 x 6.00	406 x 305 x 152	5.00	127	16	N1612P	13.00 x 9.00	330 x 229
16166RHC	16.00 x 16.00 x 6.00	406 x 406 x 152	9.00	229	16	N1616P	13.00 x 13.00	330 x 330
18186RHC	18.00 x 18.00 x 6.00	457 x 457 x 152	13.00	330	16	N1818P	15.00 x 15.00	381 x 381
181810RHC	18.00 x 18.00 x 10.00	457 x 457 x 254	13.00	330	16	N1818P	15.00 x 15.00	381 x 381
20166RHC	20.00 x 16.00 x 6.00	508 x 406 x 152	9.00	229	16	N2016P	17.00 x 13.00	432 x 330
20208RHC	20.00 x 20.00 x 8.00	508 x 508 x 203	13.00	330	16	N2020P	17.00 x 17.00	432 x 432
24208RHC	24.00 x 20.00 x 8.00	610 x 508 x 203	13.00	330	16	N2420P	20.87 x 16.87	530 x 428
24248RHC	24.00 x 24.00 x 8.00	610 x 610 x 203	17.00	432	14	N2424P	20.87 x 20.87	530 x 530
242410RHC	24.00 x 24.00 x 10.00	610 x 610 x 254	17.00	432	14	N2424P	20.87 x 20.87	530 x 530
30248RHC	30.00 x 24.00 x 8.00	762 x 610 x 203	17.00	432	14	N3024P	26.87 x 20.87	682 x 530
302410RHC	30.00 x 24.00 x 10.00	762 x 610 x 254	17.00	432	14	N3024P	26.87 x 20.87	682 x 530
30308RHC	30.00 x 30.00 x 8.00	762 x 762 x 203	17.00	432	14	N3030P	26.87 x 26.87	682 x 682
303012RHC	30.00 x 30.00 x 12.00	762 x 762 x 305	27.00	432	14	N3030P	26.87 x 26.87	682 x 682
303016RHC	30.00 x 30.00 x 16.00	762 x 762 x 406	27.00	432	14	N3030P	26.87 x 26.87	682 x 682
362412RHC	36.00 x 24.00 x 12.00	914 x 610 x 305	17.00	432	14	N3624P	32.87 x 20.87	835 x 530
363012RHC	36.00 x 30.00 x 12.00	914 x 762 x 305	27.00	432	14	N3630P	32.87 x 26.87	835 x 682
363610RHC	36.00 x 36.00 x 10.00	914 x 914 x 254	27.00	432	14	N3636P	32.87 x 32.87	835 x 835
363612RHC	36.00 x 36.00 x 12.00	914 x 914 x 305	27.00	432	14	N3636P	32.87 x 32.87	835 x 835
423012RHC	42.00 x 30.00 x 12.00	1067 x 762 x 305	27.00	432	14	N4230P	38.87 x 26.87	987 x 682
423612RHC	42.00 x 36.00 x 12.00	1067 x 914 x 305	27.00	432	14	N4236P	38.87 x 32.87	987 x 835
483612RHC	48.00 x 36.00 x 12.00	1219 x 914 x 305	27.00	432	14	N4836P	44.87 x 32.87	1140 x 835
483616RHC	48.00 x 36.00 x 16.00	1219 x 914 x 406	27.00	432	14	N4836P	44.87 x 32.87	1140 x 835
603612RHC	60.00 x 36.00 x 12.00	1524 x 914 x 305	27.00	432	14	N6036P	56.87 x 32.87	1444 x 835

Notes: Cooper B-Line can provide special sizes, finishes and other modifications. Consult the factory for your special requirements. Dimensions are in inches. Millimeters shown are for reference only. Data subject to change without notice.

Panel Enclosures
Type 3R Large Continuous Hinge Cover
Illustration Sheet





Bottom View

Notes: Dimensions are in inches. Millimeters shown are for reference only. Data subject to change without notice.

Fiberglass Enclosures
Xtra Deep Series

Eaton's Crouse-Hinds Xtra Deep Series offers a solution for applications requiring an extra deep enclosure. The deep, durable enclosure has nearly equal capacity in both the cover and the base, giving you ample room for your cover or mounting plate components. The fiberglass reinforced polyester enclosure with flange mount base, stainless steel hardware and poured polyurethane seamless gasket provides exceptional corrosion and chemical resistance in a water-tight and dust-tight environmental seal. The Xtra Deep Series will hold up under the most extreme applications and provide protection and reliability in high-end electronics applications, harsh corrosive environments, and industrial applications both indoors and out.

CP

Features & Benefits:

- Memory retaining continuous polyurethane gasket
- Integral mounting flange
- Molded in panel mounting inserts
- Chemical resistant fiberglass reinforced polyester
- Non-corrosive design
- Full length stainless steel hinge
- Water-tight, dust-tight
- Non-conductive, impact resistant, UV resistant
- Material cuts, drills, punches, and saws with ease and accuracy
- Rounded edges, minimal protrusions or exposed pocket areas for assembly of dust and debris
- Smooth surface, no color variations, swirls or color pockets, no voids

Certification & Compliances:

- UL/cUL 50, Types 1, 3, 4X, 12
- UL File Number E57656
- CSA Std C22.2 - File 244248 Types 1, 3, 4X, 12
- NEMA Standard 250 - Types 1, 3, 4X, 12
- Temperature Range - (-76°F to +250°F) (-60°C to +120°C)
- Flammability Rating - UL94-5V
- Non-flame propagating

Materials and Finishes:

- Hot compression molded fiberglass reinforced thermoset polyester
- Poured polyurethane seamless gasket provides water-tight dust-tight environmental seal
- 304 stainless steel used on all external hardware
- Molded in mounting flange
- Panel mounting capability for fixed rear panel
- Bosses utilize threaded brass inserts accepting 10-32 screws

Ordering Information

Inside H x W x D	**Padlockable Twist Latch**	**Mounting Plate***
7.73 x 5.74 x 8.82	**FXDJ080608**	**FMP0806**
7.73 x 7.73 x 9.18	**FXDJ080808**	**FMP0808**
9.73 x 7.73 x 7.84	**FXDJ100808**	**FMP1008**
11.79 x 9.80 x 9.81	**FXDJ121010**	**FMP1210**
11.70 x 11.70 x 12.12	**FXDJ121212**	**FMP1212**
13.50 x 11.55 x 11.81	**FXDJ141212**	**FMP1412**
15.63 x 13.60 x 11.81	**FXDJ161412**	**FMP1614**
17.69 x 15.69 x 16.81	**FXDJ181617**	**FMP1816**
19.71 x 15.71 x 16.81	**FXDJ201617**	**FMP2016**

* Available in: Aluminum (SA), Fiberglass (FG), Carbon Steel (C), and Stainless Steel (SS)
To order, add the suffix to the end of the part number

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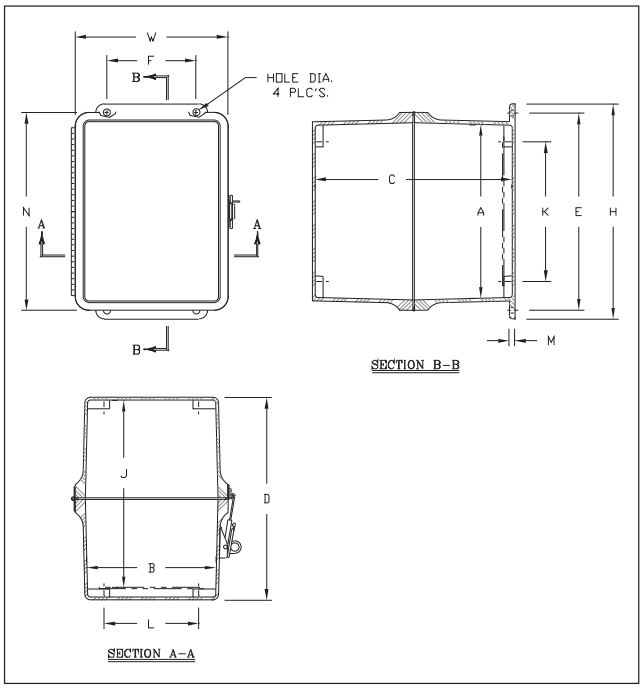
Fiberglass Enclosures
Xtra Deep Series

Dimensional Drawings



Configuration Dimensions In Inches (mm)

Catalog Number	Overall H x W x D	Inside A x B x C	Mounting E x F	J	K	L	M	N	Hole Dia.	Weight
FXDJ080608	9.62 x 6.84 x 9.07 (244 x 174 x 230)	7.73 x 5.74 x 8.82 (196 x 146 x 224)	8.88 x 4.00 (225 x 101)	8.37 (213)	6.25 (159)	4.25 (108)	0.25 (6)	8.87 (225)	0.31 (8)	4 lbs.
FXDJ080808	9.56 x 8.84 x 9.43 (243 x 224 x 239)	7.73 x 7.73 x 9.18 (196 x 196 x 233)	8.75 x 6.00 (222 x 152)	8.60 (219)	6.25 (159)	6.25 (159)	0.25 (6)	8.84 (224)	0.31 (8)	5 lbs.
FXDJ100808	11.62 x 8.81 x 8.09 (295 x 224 x 206)	9.73 x 7.73 x 7.84 (247 x 196 x 199)	10.75 x 6.00 (273 x 152)	7.39 (188)	8.25 (209)	6.25 (159)	0.25 (6)	10.86 (276)	0.31 (8)	6 lbs.
FXDJ121010	13.56 x 10.83 x 10.06 (344 x 275 x 256)	11.79 x 9.80 x 9.81 (299 x 249 x 249)	12.75 x 8.00 (324 x 203)	9.36 (238)	10.25 (260)	8.25 (209)	0.25 (6)	12.95 (329)	0.31 (8)	8 lbs.
FXDJ121212	13.56 x 12.84 x 12.37 (344 x 326 x 314)	11.70 x 11.70 x 12.12 (297 x 297 x 308)	12.75 x 10.00 (324 x 254)	11.54 (293)	10.25 (260)	10.25 (260)	0.25 (6)	12.84 (326)	0.31 (8)	9 lbs.
FXDJ141212	15.50 x 12.83 x 12.06 (394 x 326 x 306)	13.50 x 11.55 x11.81 (343 x 293 x 300)	14.62 x 10.00 (371 x 254)	11.23 (285)	12.25 (311)	10.25 (260)	0.25 (6)	14.88 (378)	0.31 (8)	12 lbs.
FXDJ161412	17.53 x 14.88 x 12.05 (445 x 378 x 306)	17.53 x 14.88 x 12.05 (445 x 378 x 306)	16.75 x 12.00 (425 x 305)	11.23 (285)	14.25 (362)	12.25 (311)	0.25 (6)	16.95 (431)	0.31 (8)	14 lbs.
FXDJ181617	19.62 x 16.91 x 17.19 (498 x 429 x 436)	17.69 x 15.69 x 16.81 (449 x 398 x 427)	18.88 x 12.00 (479 x 305)	16.36 (415)	16.25 (413)	14.25 (362)	0.25 (6)	18.91 (480)	0.31 (8)	22 lbs.
FXDJ201617	22.00 x 17.00 x 17.21 (558 x 431 x 437)	19.71 x 15.71 x 16.81 (501 x 399 x 427)	21.25 x 10.00 (540 x 254)	16.36 (415)	18.25 (464)	14.25 (362)	14.25 (362)	21.00 (533)	0.31 (8)	25 lbs.

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MORNINGSTAR corporation

Product shown with optional meter.

Morningstar's ***ProStar*** is the world's leading mid-range solar controller for both professional and consumer applications. This second generation ProStar:

- Adds new features and protections using highly advanced technology
- Provides longer battery life and improved system performance
- Sets new standards for reliability and self-diagnostics

Standard Features:

- Versions available: 15 or 30 amp
  12 / 24 or 48 volt
  negative or positive ground
- Estimated 15 year life
- PWM series battery charging (not shunt)
- 3-position battery select: gel, sealed or flooded
- Very accurate control and measurement
- Jumper to eliminate telecom noise
- Parallel for up to 300 amps
- Temperature compensation
- Tropicalization: conformal coating, stainless-steel fasteners & anodized aluminum heat sink
- No switching or measurement in the grounded leg
- 100% solid state
- Very low voltage drops
- Current compensated low voltage disconnect (LVD)
- LED's indicate battery status and faults
- Capable of 25% overloads
- Remote battery voltage sense terminals

Electronic Protections:

- Short-circuit — solar and load
- Overload — solar and load
- Reverse polarity
- Reverse current at night
- High voltage disconnect
- High temperature disconnect
- Lightning and transient surge protection
- Loads protected from voltage spikes
- Automatic recovery with all protections

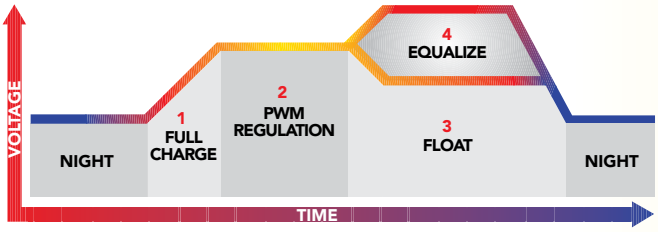
PROSTAR™ TECHNICAL SPECIFICATIONS

ProStar Options:

- Digital meter
  - Highly accurate voltage and current display
  - Low self-consumption (1 mA)
  - Includes manual disconnect button
  - Displays 5 different protection functions and disconnect conditions
  - Self-diagnostics (self-test) provides a comprehensive test of the ProStar —
    - Displays 9 different controller status parameters, including temperature
    - Displays detected faults
- Positive ground
- Remote temperature probe

Optimized Battery Charging:

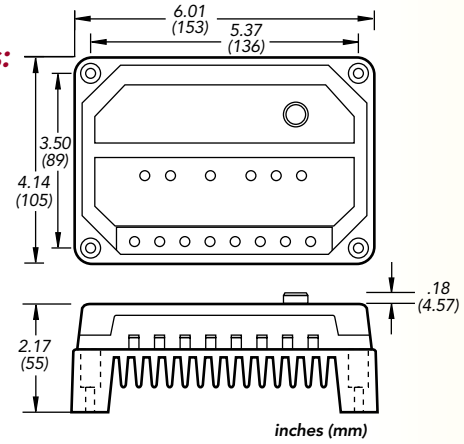
The ProStar has 4 stages of charging to provide increased battery capacity and life.



Mechanical Specifications:

Weight:
12 oz
(0.34 kg)

Wire Size:
#6 AWG
(16 mm²)



ProStar Versions:

	PS-15	~~PS-30~~	~~PS15M-48V~~
Rated Solar Current	15A	~~30A~~	~~15A~~
Rated Load Current	15A	~~30A~~	~~15A~~
System Voltage	12/24V	~~12/24V~~	~~48V~~
Options:			
Digital Meter	yes	~~yes~~	~~standard~~
Positive Ground	no	~~yes~~	~~yes~~
Remote Temp. Probe	yes	~~yes~~	~~yes~~

Battery Voltage Setpoints*

	Gel	Sealed	Flooded
Regulation Voltage	14.0	14.15	14.4
Float	13.7	13.7	13.7
Equalization	n/a	14.35	14.9/15.1
Load Disconnect	11.4	11.4	11.4
Load Reconnect	12.6	12.6	12.6

Note: values are for 12V. Use 2X for 24V and 4X for 48V.

Electrical Specifications:

	12V	24V	48V
Temp. Comp. (mV/˚C)*	– 30mV	– 60mV	– 120mV
Accuracy	40mV	60mV	80mV
Min. voltage to operate	8V	8V	15V
Self-consumption	22mA	25mA	28mA
LVD current coefficient**	– 20mV	– 40mV	– 80mV
Charge algorithm	PWM, constant voltage		
Operating temperature	– 40˚C to + 60˚C		
Digital Display:			
Operating temperature	– 30˚C to + 85˚C		
Voltage accuracy	0.5%		
Current accuracy	2.0%		
Self-consumption	1 mA		

* 25˚C reference
** per amp of load

WARRANTY: ***Five year warranty period. Contact Morningstar or your authorized distributor for complete terms.***

AUTHORIZED MORNINGSTAR DISTRIBUTOR:

MORNINGSTAR corporation

8 Pheasant Run
Newtown, PA 18940 USA
Tel: +1 215-321-4457 Fax: +1 215-321-4458
E-mail: info@morningstarcorp.com
Website: www.morningstarcorp.com

CE

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8A31

Valve-Regulated, Absorbed Glass Mat Technology

SPECIFICATIONS

Nominal Voltage (V)	12V
Capacity at C/100	116.2Ah
Weight	69 (31.3 kg)
Plate Alloy	Lead Calcium
Posts	Forged terminals & bushings
Container/Cover	Polypropylene
Operating Temperature Range	-40°F (-40°C) – 140°F (60°C)
Charge Voltage @ 68°F (20°C)	
Cycle	2.40 - 2.43 VPC
Float	2.25 - 2.30 VPC
Vent	Self-sealing (2 PSI operation)
Resistance	3.0 Milliohms (full charge)
Terminal	T876

Rated non-spillable by ICAO, IATA and DOT
Approved by CEC

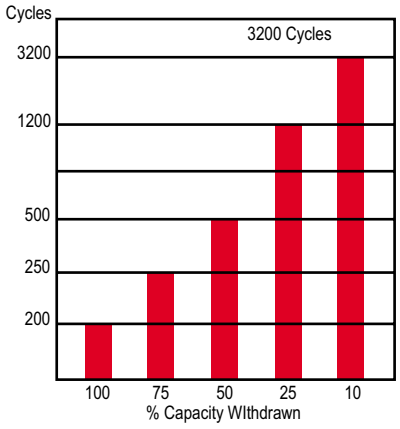
Made in the U.S.A by East Penn Manufacturing

Distributed by:

DIMENSIONS

Length (mm)	**12.94 (329 mm)**
Width (mm)	**6.75 (171 mm)**
Height (mm)	**9.88 (251 mm)**

Cycling Ability



Number of cycles vs. depth of discharge at +20°C
discharge with 20 hour rate

MK Battery
1645 South Sinclair Street • Anaheim, California 92806
Toll Free: 800-372-9253 • Fax: 714-937-0818 • E-Mail: sales@mkbattery.com

Laird TECHNOLOGIES®

Innovative **Technology** for a **Connected** World

Phantom Elite®
Dual-Band Antennas

DUALBAND PHANTOM ELITE® ANTENNA IS IDEAL FOR CELLULAR AND PCS APPLICATIONS

Laird Technologies' unique patented Phantom Elite® dual-band cellular antenna operates simultaneously on Cellular 821-896 MHz and PCE 1850-1990 MHz and is a tough antenna for outdoor or indoor applications. Suitable for outdoor and indoor applications, the revolutionary design measures only 2.7" and features field diversity with both vertical and horizontal polarization. This gives the antenna diversity, frequency agility, low visibility, wide bandwidth and a low angle radiation pattern that is superior to traditional gain antennas in most applications.

The industry standard NMO mounting socket mates with all Laird Technologies' magnetic, trunk lid, and hole mounts. A threaded permanent stud mount model is also available for vandal resistant mounting on brackets, panels, ceilings or any other kind of housing.

FEATURES ✓RoHS

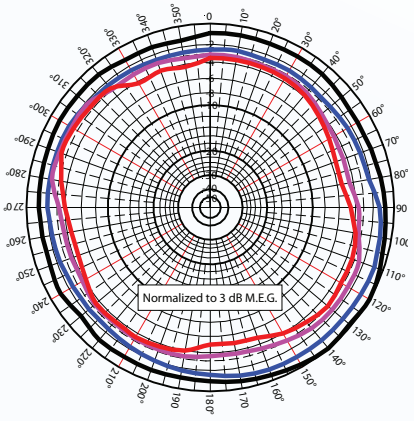
- True Field Diversity design ensures uninterrupted transmissions in urban canyons and rural drop off areas
- Phantom® outperforms a 3dB whip in many applications
- U.S. Patent Nos. 5,977,931 – 6,292,156 and 7,209,096

MARKETS

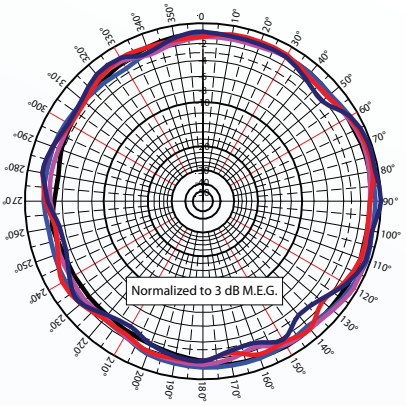
- Public safety
- Transportation
- Utility
- Military mobile
- Fixed radio applications

ANTENNA PATTERNS

Vertical-to-Vertical Polarization
Azimuthal Pattern (Y, Z, or E-plane)



Cellular: 821-896 MHz



PCS: 1850-1990 MHz

global solutions: local support™

Americas: +1.847 839.6907
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Laird TECHNOLOGIES®

Innovative **Technology** for a **Connected** World

Phantom Elite®
Dual-Band Antennas

SPECIFICATIONS

ELECTRICAL	
Frequency Range	821-896 MHz 1850-1990 MHz
Frequency Bandwidth (low)	75 MHz@VSRW < 2:1
Frequency Bandwidth (high)	140 MHz@VSRW < 2:1
VSWR	< 2.1
Return Loss	-10dB max
Nominal Gain	3 dB-M.E.G.
Maximum Power	100 W
Nominal Impedance	50 Ω
Polarization	Vertical & Horizontal
Pattern	Patented Field Diversity (Omni-directional)
Half-Power Beamwidth (Elevation° x Azimuth°)	130° x 360°
Cable & Mount	MB195 (Sold Separately)
Terminations	NMO or P Mount w/N Female Connector
Tuning:	None

MECHANICAL	
Material	High Heat ABS
Operating Temperature	-40° C to 85°C

MODEL AND ORDERING INFORMATION

MODEL	DESCRIPTION	COLOR	RADOME HEIGHT	WEIGHT CONNECTOR
ETRAB821/18503	Dual Band Phantom® Elite	Black	2.70"	.15 lbs NMO
ETRAB821/18503P	Dual Band Phantom® Elite	Black	2.70"	.25 lbs N Female
ETRA821/18503	Dual Band Phantom® Elite	White	2.70"	.15 lbs NMO
ETRA821/18503P	Dual Band Phantom® Elite	White	2.70"	.25 lbs N Female

Addition of "P" to the model numbers indicates Permanent Mount.

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Mobile Devices & Accessories > Mobile Antennas & Amplifiers > Mobile Antenna Mounts > Motorola Style, Permanent Hole > SKU# 85449

PCTEL Maxrad - 5/8" Hole Thick Mount, Female N connector

TESSCO SKU :85449 **Mfg Part #:**MTPM800 **Qty/UOM :**1 EACH **UPC:**729198854492

The PCTEL Maxrad MTPM800 vehicle roof mount antenna installation hardware kit is a special application NMO mount for Motorola-style mobile antennas 0-2900 MHz in thick surfaces. This permanent mount is for a 5/8 inch hole in mounting surfaces. It can be used with thick mounting plates.

The PCTEL mobile antenna mount requires cable and connector. Thread size is 1 1/8 inch - 18.

List: $33.55

Your Price: $16.55

Qty: 1

Add

Technical Specs

GSA	**Contract:** GS-35F-0548P	**Schedule:** 70 - Information Technology
Product Narrative	Requires a 5/8" hole. Can be used with thick mounting plates. For use with Motorola style antennas.	
Description	Maxrad 5/8" hole mount for surfaces up to 1" thick. For use with Motorola style antennas. Mount only. N-Female connector.	
Thread Size	1 1/8"-18	
Frequency	0-2900 MHz	
Cable Length	N/A	
Cable Type	No cable supplied	
Connector	N Female	
Advise Customer		
Mfg. Warranty	2 Years	

Similar Products:

- Wklfn#Vxuidfh#Prxqwv#0 82;%# Krdh
- Prwrurod#Vwdh/#Pdjqhwlf
- Prwrurod#Vwdh/#Wuxqn#Olg
- Prwrurod#Vwdh/#Pluuru

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Times Microwave - Bulkhead Arrestor, N/M-N/F

TESSCO SKU :577678 **Mfg Part #:** LP-BTRW-NMP **Qty/UOM :** 1 EACH **UPC:** 729198152345

TIMES MICROWAVE 20-1000 MHz general coverage bulkhead mnt. protector. 10KA surge. <200uJ throughput energy. N/M on protected side. IP67 weatherized.

List: $72.00

Your Price: $58.50

Qty: 1

Add

Technical Specs

Product Narrative	Bulkhead or Flange mount by rotating bracket 90 degrees in any direction. Bulkhead mounting coaxial protector attaches through a maximum 1/4" thickness panel. Flange mount to any flat surface. DC blocked to minimize throughput energy. Turn-on voltage 600V ± 20%. Turn-on time 2.5nS for 2kV/nS voltage rise time. Will withstand multiple strikes at 10kA (8x20µS wave-form). Insertion loss is <0.1 dB, VSWR <1.1:1, Return loss <-26dB. Protector cannot be used where there is voltage for tower mounted electronics on the center conductor. Brass body with white bronze plating.
Freq. Range	20-1000 MHz
Maximum Power (Watts)	
Throughput Energy*	200 uJ
Conn. Equip. Side	N Male
Conn. Ant. Side	N Female
Maximum Power @ Frequency	20-220@375W, 220-700@125W, 700-1000@50W
Videos	
Mfg. Warranty	10 Years

Similar Products:

- Jhqhudd#Fryhudjh#Dgdswdeoh#Prxqw
- Frd{#Surwhfwlrq/#QHPS
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907-655.02.19.2 -- Cellular Control Subsystem

Sixnet

INDUSTRIAL & COMMERCIAL CONNECTIVITY

DATASHEET

Sixnet IndustrialPro™ M2M Gateways

Compact Cellular Routers for Secure Cost-Effective Remote Site Access

PRODUCT HIGHLIGHTS

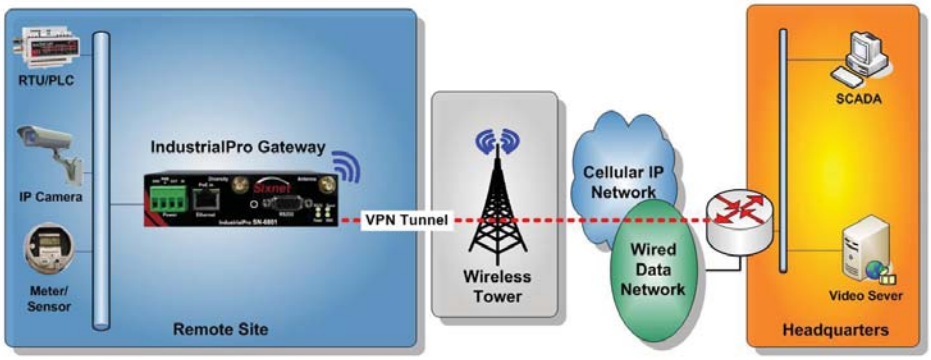
- Remote site access lowers total cost of ownership
- Simplified deployment and configuration provides ease of use
- Facilitate connectivity in space-constrained locations
- Built-in security provides infrastructure protection
- Rugged, reliable design supports the toughest applications

APPLICATIONS

- Power & Energy
- Oil & Gas
- Water/Wastewater
- Transportation
- Video & Security

Sixnet's IndustrialPro™ M2M Gateways offer high-speed, secure wireless TCP/IP connectivity to critical assets and devices at remote sites. As a compact cellular gateway, the IndustrialPro provides real-time data access, monitoring and control regardless of location.

With Ethernet and Serial interfaces, our rugged industrial gateways cost-effectively connect RTUs, meters, sensors and other remote devices to a central site or SCADA server. When used as a back-up application, the IndustrialPro delivers high-speed connectivity to reliably ensure business continuity.



FEATURES & BENEFITS

Ubiquitous Cellular Connectivity

- **Costs less per month than traditional landlines**
- **Provides comprehensive coverage without dedicated infrastructure**
  - 2G/2.5G (GSM GPRS/EDGE and CDMA 1XRTT)
  - 3G (GSM WCDMA/HSDPA/HSUPA or EVDO Rev A)

Built-In Security

- **Protects against unwanted intrusion**
- **Provides ultra-reliable "always on" cellular connection**
  - VPN tunnel: IP SEC, SSL
  - Access Control List (ACL)

Rugged, Compact Design

- **Deploys easily in space-constrained locations**
- **Requires less cabling and power supplies**
  - -40 to +75°C operating temperature
  - DIN-rail mounting
  - Power over Ethernet (PoE) options

Total Cost of Ownership Advantages

- **Eliminates visits to remote sites**
- **Reduces infrastructure complexity**
  - Connect multiple devices to single WAN link
  - Remote TCP/IP based capabilities
  - Multiple interfaces: 1 or 5 Ethernet ports, USB and serial

FLEXIBLE. RELIABLE. POWERFUL.

Sixnet IndustrialPro M2M Gateways

Compact Cellular Routers for Secure Cost-Effective Remote Site Access

SPECIFICATIONS

Ethernet Interface
- 1xRJ45 Ethernet 10/100 auto-sensing (BT-6x00, BT-6x01, BT-6x01EB)
- 5x RJ45 Ethernet 10/100 auto-sensing (BT-6x21)

Serial Interface
- 1x RS-232 Serial DB9 115200bps

USB Interface
- 1x USB2.0 mini device port

LED Status Indicators
- Power, WAN, Signal, RS232, Ethernet Link and Activity

Inuts & Outputs
- 1x reset button
- 1x digital output
- 1x digital input

Dimensions
- BT-6x0x: Steel 120 x 96 x 32 mm (4.7" x 3.77" x 1.25"), 453g (1 lb)
- BT-6x21: Steel 120 x 96 x 51 mm (4.7" x 3.77" x 2.0"), 500g (1.1 lbs)

Power Input
- 8 - 30 Vdc (12Vdc nominal)

Environmental
- Operating Temp: -40 to +75°C
- Shock: IEC60068-2-27,
- Vibration: IEC60068-2-6
- Humidity: 5 to 95% non-condensing

Certification
- EMC:FCC, part 15 and Industry Canada, ICES-003
- Hazardous Locations: Class I, Div. 2, Groups A,B,C,D, UL1604
- Electrical Safety: UL508/CSA22.2/14 (CUL)

SELECTION GUIDE

Model	Cellular Technology	Ethernet	RS-232	USB	PoE
~~BT-6401~~	~~EDGE~~	~~1~~	~~1~~	~~1~~	~~-~~
~~BT-6401EB~~	~~EDGE~~	~~1~~	~~1~~	~~1~~	~~1~~
~~BT-6421~~	~~EDGE~~	~~5~~	~~1~~	~~1~~	~~-~~
BT-6601-xx*	EVDO	1	1	1	-
~~BT-6601EB-xx*~~	~~EVDO~~	~~1~~	~~1~~	~~1~~	~~1~~
~~BT-6621-xx*~~	~~EVDO~~	~~5~~	~~1~~	~~1~~	~~-~~
~~BT6801~~	~~HSPA~~	~~1~~	~~1~~	~~1~~	~~-~~
~~BT-6801EB~~	~~HSPA~~	~~1~~	~~1~~	~~1~~	~~1~~
~~BT-6821~~	~~HSPA~~	~~5~~	~~1~~	~~1~~	~~1~~

* "xx" is the EVDO (CDMA) cellular provider: VZ (Verizon), SP (Sprint) and AL (Alltel) in U.S.; BM (Bell Mobility), TE (Telus Mobility), ST (Sasktel Mobility) and MT (MTS Allstream) in Canada; cellular provider for HSPA is AT&T

Model Draw in mA (at 24VDC)	Power Consumption		
	Standby	Tranmitting	Peaks
BT-660x	58	106	222
~~BT-6621~~	~~125~~	~~175~~	~~290~~
~~BT-680x~~	~~58~~	~~160~~	~~400~~
~~BT-6821~~	~~125~~	~~225~~	~~470~~
~~BT-6401~~	~~58~~	~~123~~	~~208~~
~~BT-6421~~	~~115~~	~~180~~	~~265~~

ABOUT SIXNET

For more than three decades, Sixnet has been providing leading industrial and commercial machine-to-machine (M2M) connectivity to customers and markets worldwide. Sixnet's flexible solutions enable organizations to cost-effectively increase business productivity. By integrating powerful enterprise-class features with rugged reliability, Sixnet meets the standards of the most demanding industrial and commercial applications in industries such as power & energy, banking & retail, transportation, video & security, utilities, military, mobile data, maritime and more. Based in Ballston Lake, NY, the company has offices across North America, Asia and Europe.

For more information, visit www.sixnet.com, email sales@sixnet.com or call +1 518 877 5173

FLEXIBLE. RELIABLE. POWERFUL.

Sixnet

Sixnet, LLC Corporate Headquarters
331 Ushers Road, Ballston Lake, NY 12019

T +1 518 877 5173 F +1 518 877 8346

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Extract from the online catalog

PLC-RSC- 12DC/21

Order No.: 2966906

The illustration shows the version PLC-RSC-24DC/21

http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=2966906

PLC relay, consisting of base terminal block PLC-BSC.../21 with screw connection and pluggable miniature relay with power contact, for assembly on DIN rail NS 35/7.5, 1 PDT, input voltage 12 V DC

Commercial data	
GTIN (EAN)	4 017918 159580
sales group	G220
Pack	10 pcs.
Customs tariff	85364190
Catalog page information	Page 82 (IF-2011)

Product notes

WEEE/RoHS-compliant since: 01/23/2006

http://www.download.phoenixcontact.com Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Technical data

Coil side

Nominal input voltage U_N	12 V DC
Nominal input current at U_{IN}	15.3 mA
Typical response time	5 ms

Typical release time	8 ms
Operating voltage display	Yellow LED
Protective circuit	Protection against polarity reversal Polarity protection diode
	Free-wheeling diode Damping diode

Contact side

Contact type	Single contact, 1-PDT
Contact material	AgSnO
Maximum switching voltage	250 V AC/DC (The separating plate PLC-ATP should be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or ...FBST 500...)
Minimum switching voltage	5 V (at 100 mA)
Maximum inrush current	(on request)
Min. switching current	10 mA (at 12 V)
Limiting continuous current	6 A
Interrupting rating (ohmic load) max.	140 W (at 24 V DC)
	20 W (for 48 V DC)
	18 W (for 60 V DC)
	23 W (for 110 V DC)
	40 W (for 220 V DC)
	1500 VA (for 250 V AC)

General data

Width	6.2 mm
Height	80 mm
Depth	94 mm
Test voltage relay winding/relay contact	4 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)	-40 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Operating mode	100% operating factor
Mechanical service life	2×10^7 cycles
Inflammability class according to UL 94	V0
Name	Standards/regulations
Standards/regulations	IEC 60664
	EN 50178
	IEC 62103

Pollution degree	3
Surge voltage category	III
Mounting position	Any
Assembly instructions	In rows with zero spacing

Connection data

Connection method	Screw connection
Conductor cross section solid min.	0.14 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section stranded min.	0.14 mm²
Conductor cross section stranded max.	2.5 mm²
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max	14
Stripping length	8 mm
Screw thread	M3

Certificates / Approvals

Certification	CUL, CUL Listed, GL, GOST, UL, UL Listed

Accessories

Item	Designation	Description
Assembly		
0801762	NS 35/ 7,5 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, height 7.5 mm, width 35 mm, length: 2 m
0801733	NS 35/ 7,5 PERF 2000MM	DIN rail, material: steel galvanized and passivated with a thick layer, perforated, height 7.5 mm, width 35 mm, length: 2000 mm
0801681	NS 35/ 7,5 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 7.5 mm, width 35 mm, length: 2 m
0801377	NS 35/ 7,5 V2A UNPERF 2000MM	DIN rail, Width: 35 mm, Height: 7.5 mm, Length: 2000 mm, Color: silver
1201756	NS 35/15 AL UNPERF 2000MM	DIN rail, deep drawn, high profile, unperforated, 1.5 mm thick, material: aluminum, height 15 mm, width 35 mm, length 2000 mm

1201895	NS 35/15 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, 1.5 mm thick, height 15 mm, width 35 mm, length: 2 m
1201730	NS 35/15 PERF 2000MM	DIN rail, material: steel galvanized and passivated with a thick layer, perforated, height 15 mm, width 35 mm, length: 2000 mm
1201714	NS 35/15 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 15 mm, width 35 mm, length: 2 m
1201798	NS 35/15-2,3 UNPERF 2000MM	DIN rail, material: Steel, unperforated, 2.3 mm thick, height 15 mm, width 35 mm, length: 2 m
2966841	PLC-ATP BK	Separating plate, 2 mm thick, required at the start and end of a PLC terminal strip. Furthermore, it is used for: visual separation of groups, safe isolation of different voltages of neighboring PLC relays in acc. with DIN VDE 0106-101, isolation

Bridges

2966812	FBST 6-PLC BU	Single plug-in bridge, Length: 6 mm, Number of positions: 2, Color: blue
2966825	FBST 6-PLC GY	Single plug-in bridge, Length: 6 mm, Number of positions: 2, Color: gray
2966236	FBST 6-PLC RD	Single plug-in bridge, Length: 6 mm, Number of positions: 2, Color: red
2967688	FBST 8-PLC GY	Single plug-in bridge, Length: 8 mm, Number of positions: 2, Color: gray
2966692	FBST 500-PLC BU	Continuous plug-in bridge, Length: 500 mm, Color: blue
2966838	FBST 500-PLC GY	Continuous plug-in bridge, Length: 500 mm, Color: gray
2966786	FBST 500-PLC RD	Continuous plug-in bridge, Length: 500 mm, Color: red

General

2966896	PLC-BSC- 12DC/21	6.2 mm PLC basic terminal blocks with screw connection method, input voltage 12 V DC(without relay or optocoupler)
2966508	PLC-ESK GY	Power terminal block, for the input of up to four potentials, for mounting on NS 35/7.5

Marking

1051016	ZB 6,LGS:FORTL.ZAHLEN	Zack marker strip, 10-section, printed horizontally: with the numbers 1 - 10, 11 - 20 and so on up to 491 - 500, color: white
5060935	ZB 6/WH-100:UNBEDRUCKT	Zack strip, unprinted: For individual labeling with M-PEN, ZB-T or CMS system, large batch, sufficient for labeling 1000 terminal blocks, for a terminal width of 6.2 mm, color: White
1051003	ZB 6:UNBEDRUCKT	Zack strip, unprinted, strips with 10 labels for individual labeling with M-PEN or CMS system, for terminal block width: 6.2 mm, color: white

Relay

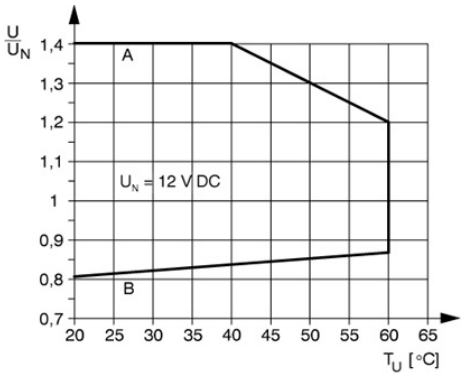
2961150	REL-MR- 12DC/21	Pluggable miniature relays, with power contact, 1 PDT, input voltage 12 V DC

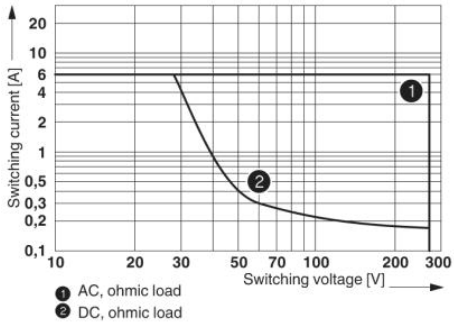
Tools

1204517	SZF 1-0,6X3,5	Actuation tool, for ST terminal blocks, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip

Diagrams/Drawings

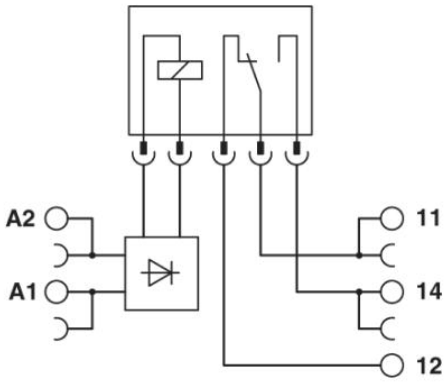
Diagram





Interrupting rating

Circuit diagram



Address

PHOENIX CONTACT Inc., USA
586 Fulling Mill Road
Middletown, PA 17057,USA
Phone (800) 888-7388
Fax (717) 944-1625
http://www.phoenixcon.com

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Traffic Signal Housing

8″ Diameter
12″ Diameter
Aluminum
Polycarbonate

1-section shown in Federal yellow

3-section shown in Federal yellow

Overview

McCain's Traffic Signal Housings, available in eight and twelve inch varieties, provide a durable and low-maintenance housing for standard LED modules as well as McCain incandescent optical assemblies. Manufactured from polycarbonate or aluminum, the housings are compliant with multiple agency standards including the Institute of Transportation Engineers (ITE), Caltrans, and most state Departments of Transportation (DOTs). An industry leader in signal manufacturing and supply, McCain offers an extensive range of materials, configurations, and accessories, including backplates, visors, and signal assemblies, to meet your traffic signal requirements.

Benefits

- Modular design promotes flexible configuration options: one to five sections, vertical, horizontal, and doghouse (5-section cluster)
- Fabricated from aluminum or polycarbonate with 10% fiberglass reinforcement (available without fiberglass reinforcement)
- 8″ or 12″ diameter
- Weathertight doors
- Custom hardware and terminal block location available

Product Description

The McCain Traffic Signal Housings are modular in design, allowing a multitude of signal housing configurations for standard LEDs as well as McCain incandescent optical assemblies.

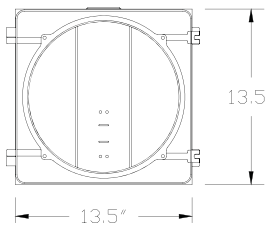
Available in polycarbonate and aluminum, each section is injection molded or cast in one piece. Reinforcement ribs and serrated ports, both top and bottom, provide strength and positive locking with other sections and mounting hardware. Positive latching of doors is achieved with stainless steel eyebolts and wing nut assemblies, and the doors feature four metal threaded inserts for visor attachment. A positive seal is assured with an E.P.D.M. rubber gasket creating a moisture-free and dust-tight atmosphere.

Traffic Signal Housings are compatible with McCain backplates and visors, available in both aluminum and ABS. The top and bottom ports allow installation into many framework mounting assemblies.

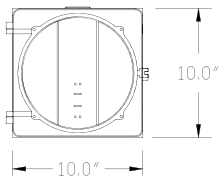
Traffic Signal Housing

Front

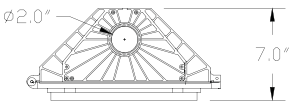
12" housing



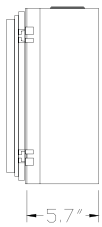
8" housing



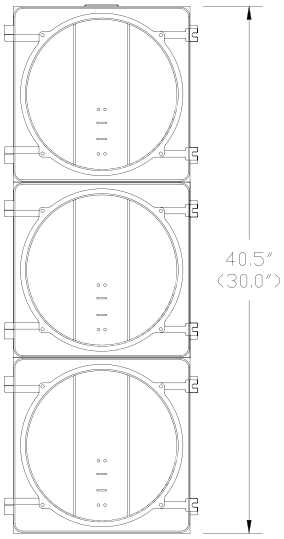
Top



Side



3-Section



Dimensions are approximate and may vary.

3-section 12" housing shown as an example configuration. 3-section 8" housing height dimensions is listed in parentheses.

Depth for the 8" and 12" housings are approximately the same.

Minor differences between the 8" and 12" may not be shown.

Standard Features

- Modular sections, one-piece, injection molded or cast
- 72-tooth serrated boss and reinforcing ribs, top and bottom
- Brass threaded inserts for visor attachment (4)
- Housings have a cast boss for mounting a 5 or 6-position terminal block; one side of terminal block with fast-on terminals, the other side with screw terminals
- The words red, amber, and green are cast next to each boss to identify light source lead wires
- 5 or 6-position terminal block installed in center section (1) (alternate mounting is available)
- Stainless steel door roll pins and eye bolt/wing nut assemblies
- Integral lugs on the housing and doors with stainless steel roll pins provide effective door hinges
- Weathertight E.P.D.M. rubber door gasket
- Aluminum and polycarbonate, and 8" and 12" housings can be mixed in one signal head

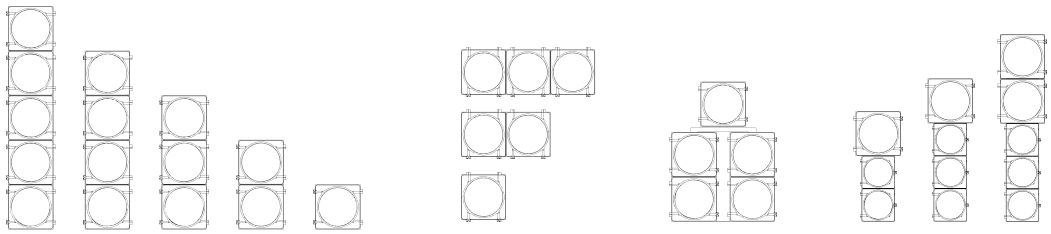
General Specifications

Dimensions: (1-section)	8": 10.0" H x 10.0" W x 7.0" D 12": 13.5" H x 13.5" W x 7.0" D		
Material:	Polycarbonate: Ultraviolet and heat stabilized, flame retardant, permanently colored, 10% fiber-glass reinforcement Aluminum: Type 360, reduced corrosion, increased powder coat adhesion		
Finish(es):	Polycarbonate: Colored resins integral to housing Aluminum: Powder coated		
Color(s):	Federal yellow, signal green, black, or custom colors		
Mounting:	2.0" hole top and bottom fits 1.5" NPT fittings		
Environmental:	Operating temperature: -37° C to +74° C Humidity: 0 to 95% (non-condensing)		
Shipping Weight: (empty, 1-section)	Polycarbonate:	8" - 2.1 lbs	12" - 4.2 lbs
	Aluminum:	8" - 4.0 lbs	12" - 7.8 lbs

Options

- Fiberglass-free polycarbonate
- Location, quantity, and type of terminal blocks
- Door mounting hardware: Push pin (removable) or roll pin (permanent)
- Visors
- Backplates
- Mounting: Various framework, orientation, and configurations
- Light Source: LED or incandescent
- High-performance (highly directional) signal version

Typical configurations



Vertical *Horizontal* *Doghouse* *Mixed Sizes*

To learn more about McCain's Integrated Traffic Solutions, please contact ***info@mccain-inc.com*** *or call* ***(760) 727-8100***

McCain®

2365 OAK RIDGE WAY // VISTA, CALIFORNIA 92081 // USA // WWW.MCCAIN-INC.COM

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Signal Visors

Aluminum
Polycarbonate

45° Angle
Cap
Full Circle
Scoop
Tunnel

Overview

McCain's Signal Visors increase signal visibility in sunlight while still allowing an unobstructed view for multiple lanes of approaching drivers and pedestrians. McCain produces a range of standard and angled visors including tunnel, full circle, and cap, that offer a variety of signal viewing angles. Whether you are looking for aluminum or polycarbonate, Federal yellow, signal green, black, or custom colors, McCain has the visors to meet your needs.

Benefits

- Increases signal visibility in sunlight
- Available in a variety of materials, sizes, styles, and angles to meet your specific requirements
- Twist-on tabs facilitate ease of installation
- One-piece construction (except Scoop Visor)

Product Description

McCain's Signal Visors, molded polycarbonate or stamped and formed aluminum, are available in eight inch and 12 inch signal configurations. Integrally formed, twist-on mounting tabs make installation and maintenance a snap, and a standard three degree downward tilt facilitates signal visibility.

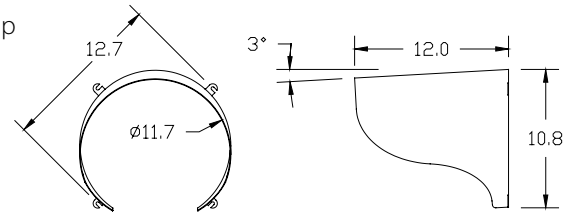
Specialty visors include the 45° Angle Visor and the Scoop Visor. The 45° Angle Visor comes in two standard lengths, 18" and 27" and in right and left versions. It is designed to narrow visibility for locations such as an angled intersection.

The Scoop Visor is designed to resist snow build-up on signal lenses in colder climates. A louvered vent on top and an open bottom contribute to the increased vertical movement of air across the face of the signal lens thereby increasing resistance to the deposit of snow.

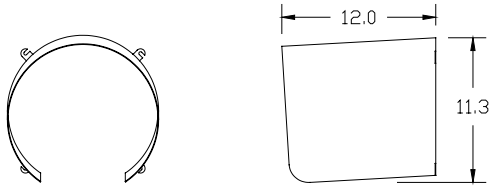
Signal Visors

Front Side

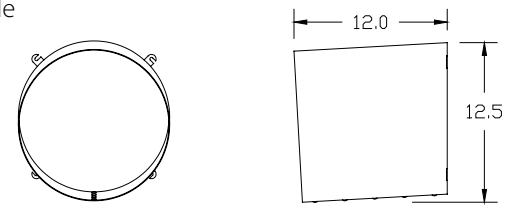
Cap



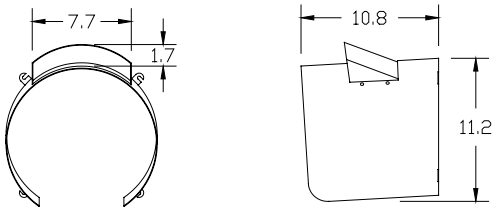
Tunnel



Full Circle



Scoop



Standard Features

- One-piece construction (except Scoop)
- Twist-on mounting tabs
- 3° downward tilt

General Specifications

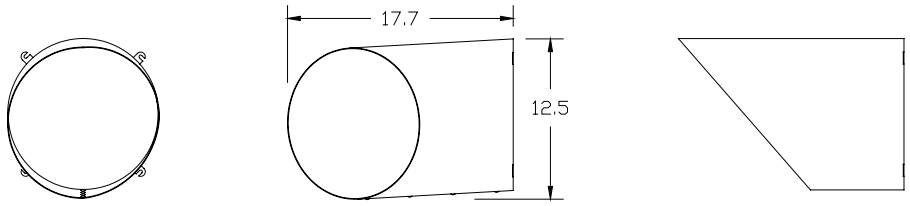
		Diameter	Depth
Dimensions:	Standard Visors:	8″	8″
		12″	12″
	45° Angle Visors:	8″	18″
		12″	18″
		12″	27″

Degree of Tilt:	3° (down)
Material:	Aluminum: Type 3003, very good corrosion resistance, 0.050″ thick Polycarbonate (standard visors only): Ultraviolet and heat stabilized, flame retardant, permanently colored, 0.10″ nominal thickness
Finish(es):	Aluminum: Powder coated Polycarbonate (standard visors only): Colored resins integral to visor
Color(s):	Exterior: Federal yellow, signal green, black, or custom Interior: Flat black
Mounting:	Twist-on tabs
Shipping Weight:	1 - 4 lbs., varies based on material, size, and style

Options

- Other lengths available
- Degree of tilt

45° (18″ right angle version) Top



Dimensions rounded to the nearest 0.1″
All visors shown are 12″ signal versions
Dimensions shown in Cap front view and degree of tilt shown in side view are typical of all 12″ visors

To learn more about McCain's Integrated Traffic Solutions, please contact ***info@mccain-inc.com*** *or call* ***(760) 727-8100***

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ELTEC Traffic and Solar Products

FS-2 FLASHER

In 1998 ELTEC introduced the FS-2 Flasher for solar powered flashing beacon systems. It uses solid state circuitry with a multiplicity of programmable options. It is entirely microprocessor controlled which gives it tremendous versatility with minimal power consumption. The FS-2 is intended for use in solar power applications, or in any applications where there is a ready source of 11.4 V-30V DC.

STANDARD FEATURES

- Versatile Programmable DC Flasher
- Multiple Flasher Rates
- Provides for 1 or 2 Circuit Flashing
- Duty Cycle of 40% ON/ 60% OFF (1 LED)
- Duty Cycle of 50% ON/OFF (2 LED's)
- Night Run Only Feature
- Optional Night Dimming (with photo cell)
- May Be Used With LED or Halogen Lamps

FS-2 SPECIFICATIONS

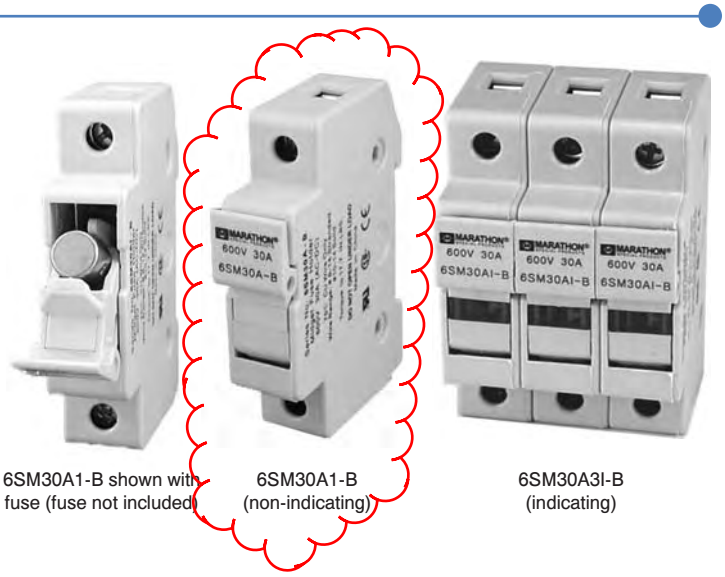
Dimensions……..…….....1.64”H x 5 ½ ”L x 2.625” W
Input Voltage Range……..…...…….....11.4V DC to 30V DC
Maximum Load Power….....40 Watts per Output Circuit (11-4-30V DC)
Temperatures Range…….…….....…….....-20° C to + 75° C
Flash Rate…….....Programmable from 35-70 flashes per minute
Flash Circuits…….....…….....1 or 2 circuits
Night Dimming…….....Automatic via photocell (may be disabled)
Night Run Only…….....Enabled/disabled via Internal Jumper
Lamp Type…….....……..LED or Halogen

ELECTROTECHNICS CORPORATION
1310 Commerce Street
Marshall, TX 75672
800-227-1734 903-938-1901 Fax 903-938-1901
www.ELTECCORP.com
Sales@elteccorp.com

Midget Enclosed Fuse Holders - 600 Volt+

Specifications:

- Tested and Approved for 100,000 RMS Symmetrical Amps Withstand Rating and Short Circuit Current Ratings (SCCR)
- Touchsafe Design IEC Type IP20
- DIN Rail Mount (35mm)
- Blown Fuse Indication Available
- Handle Allows Quick Easy Fuse Change
- AC & DC Rated
- Indication light AC and DC - 80 Volts Minimum
- UL Recognized File No. IZLT2.E35113
- CSA Certified File No. LR21455
- CE
- RoHS Compliant



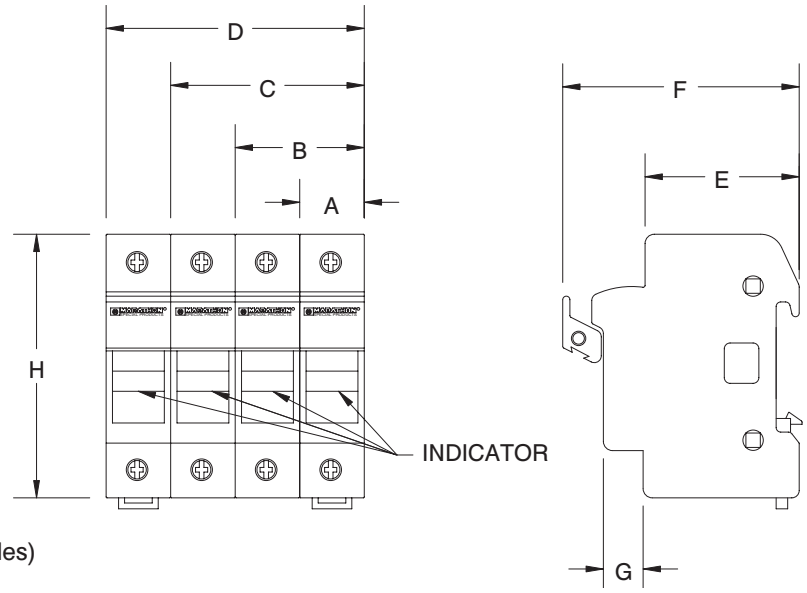
6SM30A1-B shown with fuse (fuse not included)

6SM30A1-B (non-indicating)

6SM30A3I-B (indicating)

Catalog #	Indicating	Poles	Amps	Base Materials	Wire Range	Fuse Size	Fuses
6SM30A1-B	No	1	30	Thermoplastic	#6-#14 AWG CU	13/32" DIA BY 1 1/2"	A13X-2, A25Z-2, A60Q-2, A6Y-2B, AGU, ATM, ATQ, BAF, BAN, BLF, BLN, BLS, FLA, FLM, FLQ, FNM, FNQ, GFN, GGO, KLK, KLKD, KLQ, KTK, OTM, TRM
6SM30A2-B		2					
6SM30A3-B		3					
6SM30A4-B		4					
6SM30A1I-B	Yes	1					
6SM30A2I-B		2					
6SM30A3I-B		3					
6SM30A4I-B		4					

Dimensions	mm	Inches
A	17.8	0.70
B	35.6	1.40
C	53.3	2.10
D	71.1	2.80
E	43.2	1.70
F	59.7	2.35
G	12.2	0.48
H	77.2	3.04



Pin Kit (used for ganging multiple poles)

Catalog Description:
EFH-MCCK

*Includes 10 handle pins and 20 body clips
*Use one handle pin and two body clips per pole

TECHNICAL MANUAL

OPERATION AND INSTALLATION INSTRUCTIONS

V147-CL2 ANTENNA

Document No: VTM-04-006B

Valcom Manufacturing Group, Inc.
175 Southgate Drive, P.O.Box 603, Guelph, Ontario, Canada N1H 6L3 Tel: 519-824-3220 Fax: 519-824-3411
Web Site: www.valcom-guelph.com Email: enquiries@valcom-guelph.com

REVISION SHEET

Revision	Description	Date	User
-	Original Issue	November 11, 2004	-
A	Amended Maintenance Section	August 2007	J.Soper
B	Wind speed typo, pg2	October 17, 2008	J.Soper

TABLE OF CONTENTS

Section **Page**

1.0 GENERAL INFORMATION 1
1.1 Introduction 1
1.2 Technical Reference Data 1

2.0 FUNCTIONAL DESCRIPTION 3
2.1 General 3
2.2 Electrical Description 3
2.3 Mechanical Description 3

3.0 MAINTENANCE 4
3.1 Scheduled Maintenance 4
3.2 Corrective Maintenance 4

4.0 INSTALLATION 5
4.1 Unpacking 5
4.2 New Site Preparation 5
4.3 Assembly and Installation 5
4.4 Electrical Installation 6

5.0 PARTS LIST 8
5.1 General 8

6.0 QUICK REFERENCE DATA 9
6.1 General 9
6.2 Manufacturer's Address 9

LIST OF TABLES AND FIGURES

Table 1.1 - Electrical properties of the V147-CL2 Antenna 1
Table 1.2 - Mechanical properties of the V147-CL2 Antenna 2
Table 5.1 - List of Parts for the V147-CL2 Antenna 8
Figure 4.1 - Gin Pole Arrangement 7
Figure 6.1 - Quick Reference Data - V147-CL2 Antenna 10
Figure 6.2 - Foundation Details For VHB-17 Hinge Plate or VTGS-20BH Steel Tower 11
Figure 6.3 - Quick Reference Data - VHB-17 Hinge Plate 12
Figure 6.4 - Quick Reference Data - VTGS-20BH Steel Tower 13
Figure 6.5 - Quick Reference Data - VGS-36100 Ground Screen 14
Figure 6.6 - Quick Reference Data - VGS-36100 Ground Screen Installation Instructions 15

1.0 GENERAL INFORMATION

1.1 Introduction

This manual describes the electrical and mechanical properties of the V147-CL2 antenna. It also provides the information necessary to install, operate and maintain the antenna system.

1.2 Technical Reference Data

Table 1.1 - Electrical properties of the V147-CL2 Antenna

Electrical Properties	
Frequency Range	100 kHz to 30 MHz (with capacity of the antenna tuner)
Resonant Frequency	100 kHz to 5000 kHz (as specified by customer)
Power Rating	1 kW PEP
Dry Withstanding Voltage	25 kV
Electrical Length	Varies with Loading Coil Section

Table 1.2 - Mechanical properties of the V147-CL2 Antenna

Mechanical Properties	
3th Section Length	13.0 feet (3.9 meter)
Loading Coil (2nd) Section Length	18.5 feet (5.6 meter)
Bottom Section Length	17.5 feet (5.3 meter)
Typical Assembly Length (including Valcosphere)	49 feet (14.9 meter)
Weight	Approximately 400 lbs (181 kg)
Material	Copper wire and strips embedded in the fiberglass and thermo-setting epoxy resin composite
Finish	Epoxy polyamide paint
Mounting Position	Vertical
Base Diameter	17.5 inches (44.45 cm)
Mounting Hole Diameter	0.718 inches (1.82 cm)
Mounting Holes Dimensions	12 places equally spaced on a 14.625 inch (37.15 cm) diameter bolt circle
Operating Temperature	-76°F to +140°F (-50°C to +65°C)
Wind Loading Test	Up to 180 mph (290 km/hr)
Abrasion Resistance	Very Good
Water Absorption	After 24 hours immersed: 0.2% After 48 hours immersed: 0.6% After 168 hours immersed: 2.0%
Optional Accessories	Top-Hat Whiskers Side-feed or Feed-through base VHB-17 Steel Hinge Plate or VTGS-20BH Steel Tower VGP-17 Gin Pole VGS-36100 Ground Screen

2.0 FUNCTIONAL DESCRIPTION

2.1 General

The V147-CL2 is intended to be used as part of an overall communication system which consists of a transmitter (or receiver or transceiver), an antenna coupler and the antenna. It is used around the world in many applications with requirements in the 100 kHz to 5000 kHz bands for marine and aeronautical radio beacon and, with Top-Hat radials, as a Traveler Information Service (TIS) communication systems.

2.2 Electrical Description

The Valcom, Model V147-CL2 is a field proven, coil loaded, 49-foot antenna. The second section is inductively loaded to a resonant frequency slightly higher than the operating frequency specified by the customer.

2.3 Mechanical Description

Third Section. This is a hollow tapered cylinder made of circumferentially and longitudinally wound fibreglass filaments using a thermosetting epoxy resin matrix. Embedded in the composite are multiple beryllium copper strips laid in a single-turn spiral and secured at the top end to a threaded female ferrule into which the Valcosphere is secured. Depending on the options chosen, there may be up to eight whiskers that thread into the Valcosphere ferrule to form the Top-Hat structure. The surface of the section is smoothed, primed and painted with a polyamide epoxy surface coating.

Coil Loaded Section (Second Section) The coil loaded section is constructed in the same manner as the Third section. The coil is wound using enamel copper wire and is also embedded in the fiberglass. The ends of the coil are braised to the respective ferrules.

Bottom Section. The construction and finish are the same as for the other sections except that the diameter expands out to meet the mounting base. The ferrule is threaded to fit into the bottom of the Coil Loaded section. Multiple parallel conductors are connected to the ferrule at the top and to a conducting ring near the bottom. The feed terminal extends from the bottom ring to the surface of the antenna approximately 18.0 inches from the bottom of the base flange. The base can withstand a flash-over voltage of 25 kV.

NOTE: The sections of the antenna cannot be interchanged with other antennas due to the unique locations of the locking screw holes.

3.0 MAINTENANCE

3.1 Scheduled Maintenance

The antenna is virtually maintenance free. The external finish is an epoxy polyamide two part compound paint. The minimum finish life before showing signs of deterioration should be at least six years under normal climate condition.

When used in salt-water environments, it is recommended to wash the antenna base with fresh water to remove any build-up of dried salt residue. This should be performed on a monthly basis or after prolonged exposure to sea-spray.

Use a small wire brush to clear any debris from the drain groove found in the bottom of the antenna base.

3.2 Corrective Maintenance

Generally, no corrective maintenance is possible or required. If one section is severely damaged, it must be replaced by a new section. Workshops having experience in handling epoxy fibreglass composite structures may attempt the repair of minor surface damage if practicable.

NOTE

DO NOT USE LEAD BASE PAINT TO TOUCH-UP OR
REPAINT THE ANTENNA. USE ONLY EPOXY BASE PAINT.

4.0 INSTALLATION

4.1 Unpacking

Open the shipping crates and remove the antenna sections. Remove all packing material including the male ferrule protectors on the antenna sections. The V147-CL2 antenna as shipped consists of the items listed in Table 5.1. Check that all of the items are present and in good condition.

4.2 New Site Preparation

(1) Check to see that the underside of the steel base plate at the site is free of cables and other obstructions.

(2) Excavate and pour a concrete pad to where the antenna is to be installed (recommended foundation details can be found at the end of this manual).

(3) Install Ground Screen (recommended ground screen can be found at the end of this manual).

4.3 Assembly and Installation of Antenna on the site

The following steps should be followed to assemble the V147-CL2 antenna (see Figure 4.1).

(1) Remove retainer pin on the hinge plate and open top plate to 90 , mount the bottom plate of the hinge plate on the anchor bolts. Secure with hardware (flat washer, lockwasher, and nut) on each bolt.

(2) Obtain four to six saw horses or other supports that will hold the complete antenna horizontally at a convenient working height and place them in the assembly area. The assembly area must be a cleared working space approximately 55 feet long and 20 feet wide.

(3) Support the base section (item 1, Table 5.1) on two of the saw horses.

(4) Align mounting holes in the plate with holes of the antenna flange and gin pole adapter, secure base section to the plate with hardware, fed through from underside.

(5) Tie a rope (1/2" diameter polypropylene) to the eye of the gin pole, then slide the

gin pole into the pipe attachment and secure.

(6) Support the second section (item 2, Table 5.1) on two other saw horses so that the two sections lie in the same straight line.

(7) Make sure the threads of the male ferrule on the base section are clear of foreign material and free of burrs.

(8) Assemble the second antenna section onto the base section and tighten to align the arrows at the joint using the strap wrench supplied (item 6, Table 5.1). Install the setscrews and seal with the sealant provided (items 7 and 8, Table 5.1).

(9) Assemble the third section (item 3, Table 5.1) to the second section by repeating steps 6 to 8.

(10) After all sections are assembled, assemble the Valcosphere (item 4, Table 5.1) to the top of the third section. Install the setscrews provided (item 8, Table 5.1).

(11) If the antenna was ordered with a Top-Hat, install and tighten the 8 Whiskers (item 5, Table 5.1) into the threaded holes found below the Valcosphere.

(12) The antenna now is ready to raise to its final position.

(13) Tie the rope (from gin pole eye) to a point about halfway up the second section (see Figure 4.1). A timber hitch knot is recommended.

(14) Erect antenna by applying a gradual and constant pull on the rope referred to as the “Pulling Force” (a winch or vehicle is recommended).

(15) Once the antenna is in the vertical position, insert retainer pin back into hinge plate, secure with tension pin. Use bolts (supplied) to secure upper and lower plates of the hinge plate together.

(16) Remove the gin pole. Electrical connections can now be made.

4.4 Electrical Installation

Very carefully secure the lead from the transmitter, transceiver or coupler to the antenna feedpoint. Depending on the options chosen during purchase, the feedpoint may be an acorn screw and lock-washer located approximately 18 inches up from the base or it may be a threaded post out the bottom of the antenna.

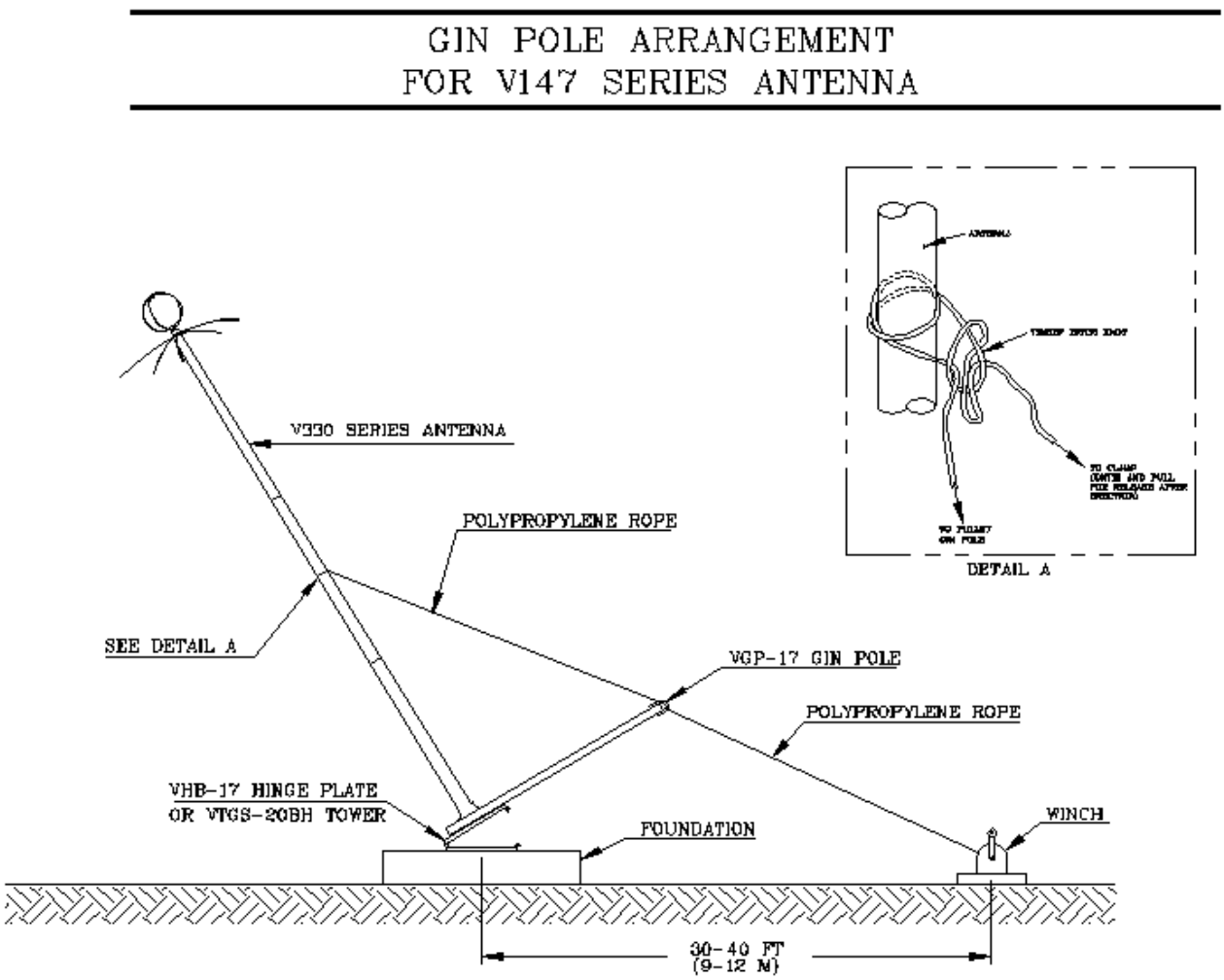

GIN POLE ARRANGEMENT
FOR V147 SERIES ANTENNA
V330 SERIES ANTENNA
POLYPROPYLENE ROPE
SEE DETAIL A
VGP-17 GIN POLE
POLYPROPYLENE ROPE
VHB-17 HINGE PLATE
OR VTGS-20BH TOWER
FOUNDATION
WINCH
30-40 FT
(9-12 M)
DETAIL A

Figure 4.1

5.0 PARTS LIST

5.1 General

A list of parts shipped with the V147-CL2 antenna appears in Table 5.1.

Table 5.1 - List of Parts for the V147-CL2 Antenna

Item No.	Part Number	Description	Qty	Notes
1	VD-00-00264	Base Section	1	
2	VD-00-00265	Section 2 (Coil Loaded)	1	
3	VD-00-00266	Section 3 (Strap Only)	1	
4	VD-77-00132	Valcosphere	1	
5	VC-84-00024	Top-Hat Whiskers	8	Optional
6		Strap Wrench	1 ea	
7		Silicone Sealant	1	
8		Hardware Package (Lockwasher, Hex-socket setscrews)	1 set	

6.0 QUICK REFERENCE DATA

6.1 General

Quick reference engineering data for use during planning and installation activities for the V147-CL2 antenna is presented on the following page.

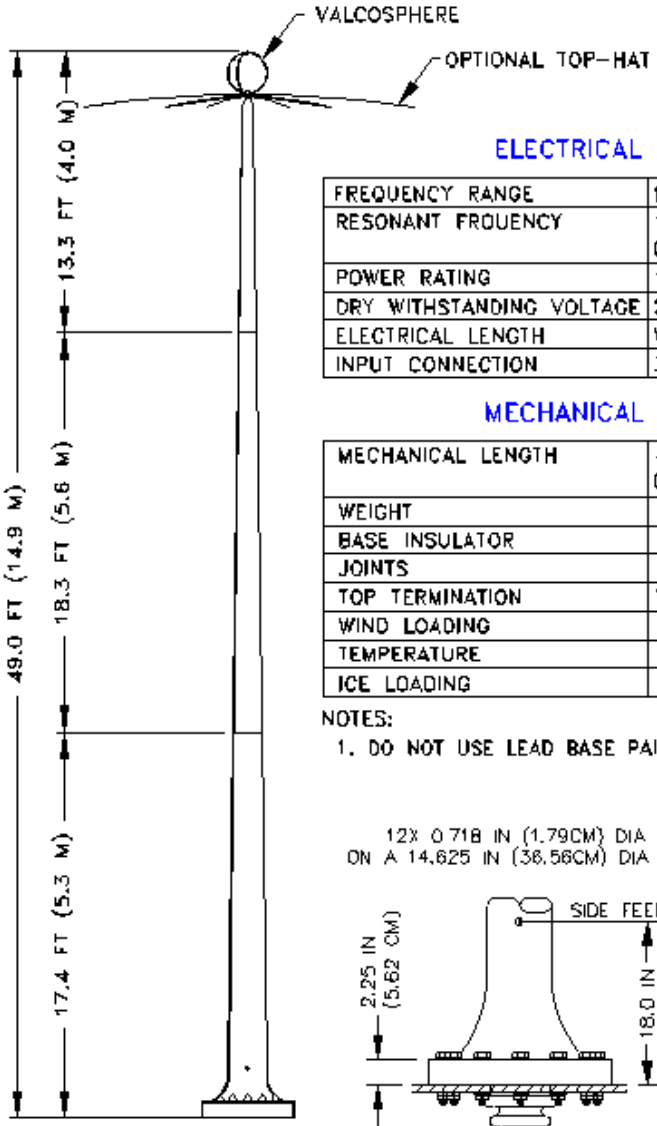
Quick Reference Data - V147-CL2 Antenna
Foundation Details For VHB-17 Hinge Plate or VTGS-20BH Steel Tower
Quick Reference Data - VHB-17 Hinge Plate
Quick Reference Data - VTGS-20BH Steel Tower

6.2 Manufacturer's Address

Postal address:
Valcom Manufacturing Group, Inc. P.O. Box 603 Guelph, Ontario Canada N1H 6L3

Shipping address:
Valcom Manufacturing Group, Inc. 175 Southgate Drive Hanlon Industrial Park Guelph, Ontario Canada N1G 3M5

QUICK REFERENCE DATA
V-147-CL2-TH



ELECTRICAL CHARACTERISTICS

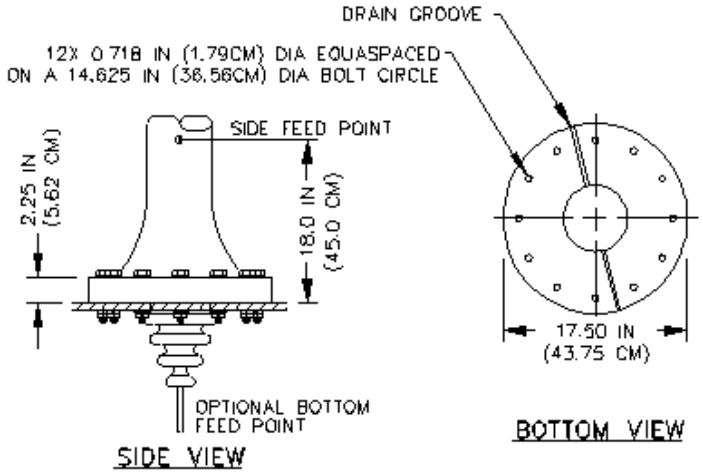
FREQUENCY RANGE	100 KHZ TO 30 MHZ- WITH TUNER
RESONANT FROUENCY	100 KHZ TO 4.5 MHZ (AS SPECIFIED BY CUSTOMER)
POWER RATING	1.0 KW AVERAGE 4.0 KW PEP
DRY WITHSTANDING VOLTAGE	25 KV
ELECTRICAL LENGTH	VARIES WITH LOADING SECTION
INPUT CONNECTION	3/8-24 BOLT (SIDE OR BOTTOM)

MECHANICAL CHARACTERISITICS

MECHANICAL LENGTH	49 FT (14.9 M) TYPICAL (OTHER HEIGHTS AVAILABLE UPON REQUEST)
WEIGHT	400 LBS (181.4 KG)
BASE INSULATOR	EPOXY FIBREGLASS
JOINTS	BRONZE THREADS WITH LOCKING PINS
TOP TERMINATION	VALCOSPHERE AND TOP-HAT
WIND LOADING	180 MPH (288 KM/HR)
TEMPERATURE	-60°F to 150°F (-50°C to 65°C)
ICE LOADING	0.75 IN (1.9 CM) ICE AT 100 MPH (160 KM/H)

NOTES:

1. DO NOT USE LEAD BASE PAINT TO TOUCH-UP OR REPAINT ANTENNA



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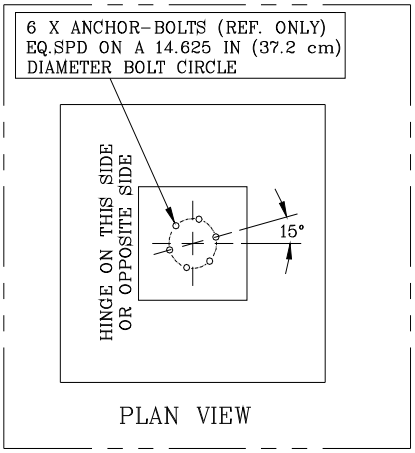
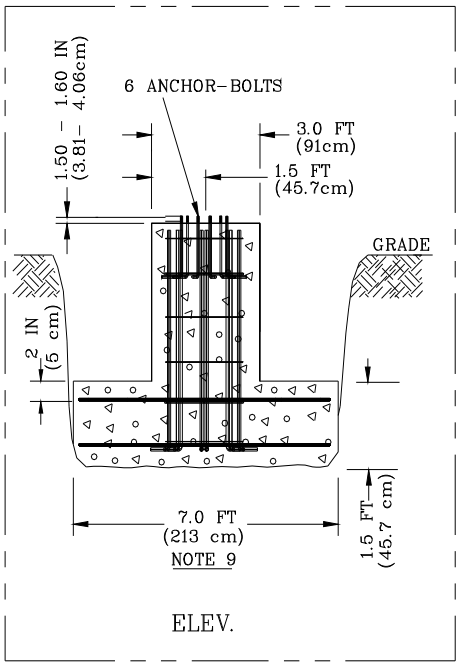
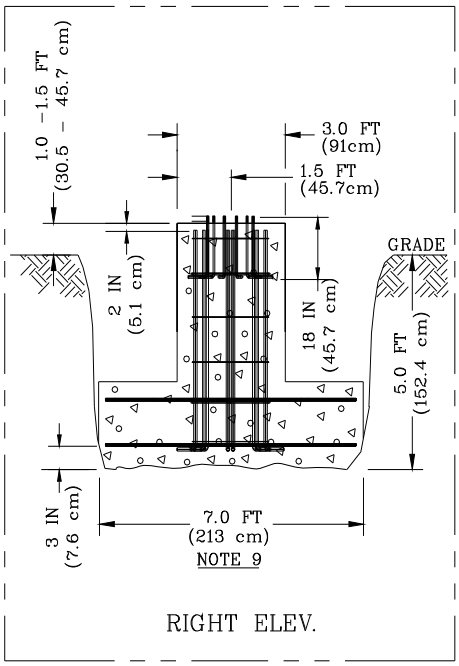
FOUNDATION DETAILS FOR VHB-17 HINGE PLATE OR VTGS-20BH STEEL TOWER



NOTES:

1. FOUNDATION BASE TO BE ON UNDISTURBED SOIL.
2. FOUNDATION EXCAVATION MUST BE FREE OF WATER BEFORE PLACEMENT OF CONCRETE.
3. DURING PLACEMENT OF CONCRETE, MAXIMUM FREE FALL DISTANCE SHALL NOT EXCEED FOUR FEET (120cm)
4. ALL CONCRETE PLACED DURING FREEZING TEMPERATURES SHALL BE PRE-HEATED AND PROPERLY PROTECTED DURING CURING. ALL HANDLING AND PLACEMENT TO BE IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE.
5. MINIMUM 28 DAY COMPRESSIVE STRENGTH-3,000 PSI
6. AIR ENTRAINED CONCRETE 6% ± 1
7. SLUMP RANGE OF CONCRETE DURING PLACEMENT, 1.5 TO 4.5 INCHES (3.7 TO 11.2cm).
8. BACKFILL MATERIAL SHALL BE FREE FROM DEBRIS OF ANY KIND INCLUDING ICE, SNOW OR FROZEN MATERIAL.
9. THIS DIMENSION IS THE MINIMUM VALUE USED WITH THE 74 FT ANTENNA, FOR THE 112 FT ANTENNA THE MINIMUM DIMENSION WOULD BE 8 FT.
10. WHERE THE SOIL CONDITIONS WARRANT, THEN SULPHUR RESISTANCE CONCRETE SHOULD BE USED.
11. RECOMMEND THE USE OF PLYWOOD AS A TEMPLATE FOR 6 ANCHOR-BOLTS BEFORE PLACEMENT OF CONCRETE.



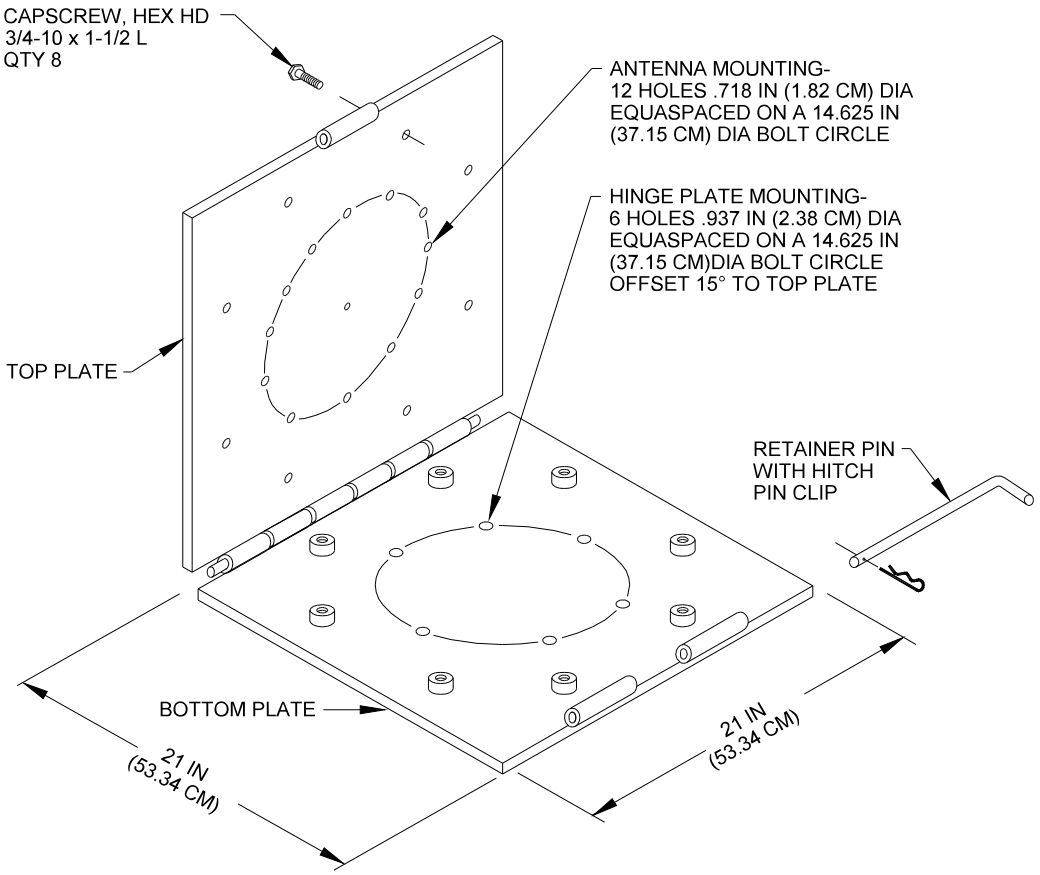


SP115
REV: C

SHEET 1 OF 2

Figure 6.2

VHB-17 HINGE PLATE
QUICK REFERENCE DATA



THE FOLLOWING ARE SUPPLIED AS LOOSE ITEMS:

1. CAPSCREW, HEX HD, 5/8-11 X 4 L, ZINC/PL STEEL, QTY 12
2. FLATWASHER, 5/8 NOM, ZINC/PL STEEL, QTY 24
3. WASHER, LOCK-SPRING, HELICAL, 5/8 NOM, ZINC/PL STEEL, QTY 12
4. NUT, HEX, 5/8-11, ZINC/PL STEEL, QTY 12

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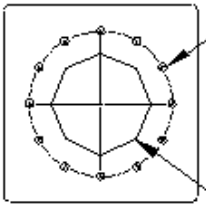
Figure 6.3

VTGS-20BH
QUICK REFERENCE DATA

VTGS-20BH IS THE STANDARD MODEL NUMBER FOR VALCOM'S HEAVY DUTY STEEL HINGED TOWER. THE ANTENNA MOUNTING PLATE COMES IN FOUR DIFFERENT CONFIGURATIONS AS SHOWN BELOW. SUBSTITUTE "X" IN THE MODEL NUMBER FOR THE MOUNTING PLATE THAT IS REQUIRED. SUBSTITUTE "Y" IN THE MODEL NUMBER FOR THE HEIGHT OF TOWER REQUIRED IN 2 FOOT INCREMENTS. UNLESS OTHERWISE SPECIFIED THE STANDARD NOMINAL HEIGHT IS EIGHT FEET (2.44 M)

VT	GS	– 20	BH	– X	– Y
VALCOM TOWER	GALVANIZED STEEL	EACH SIDE LENGTH	BOTTOM HINGED	MOUNTING PATTERN	TOWER HEIGHT IN FEET

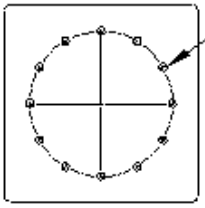
1



.718 IN (1.82 CM) DIA
12 HOLES EQUASPACED
ON A 14.625 IN
(37.15 CM) DIA
BOLT CIRCLE

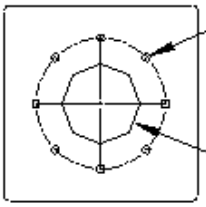
10 IN (25.4 CM) DIA
FLAMECUT

2



.718 IN (1.82 CM) DIA
12 HOLES EQUASPACED
ON A 14.625 IN
(37.15 CM) DIA
BOLT CIRCLE

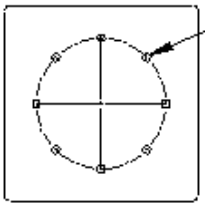
3



.718 IN (1.82 CM) DIA
8 HOLES EQUASPACED
ON A 10.750 IN
(27.30 CM) DIA
BOLT CIRCLE

7 IN (17.8 CM) DIA
FLAMECUT

4



.718 IN (1.82 CM) DIA
8 HOLES EQUASPACED
ON A 10.750 IN
(27.30 CM) DIA
BOLT CIRCLE

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Figure 6.4

VGS-36100 GROUND SCREEN
QUICK REFERENCE DATA

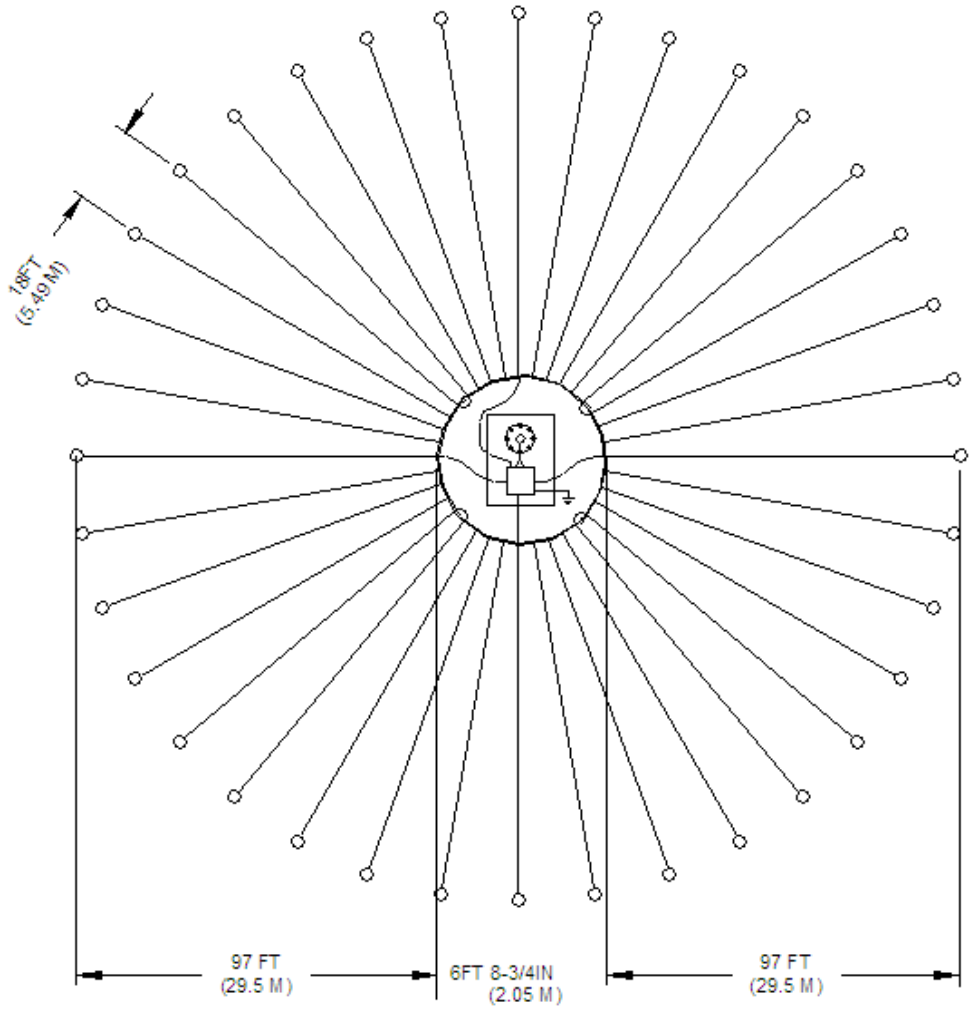

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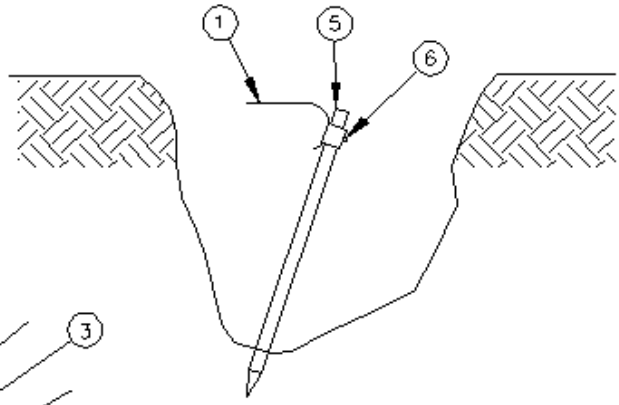
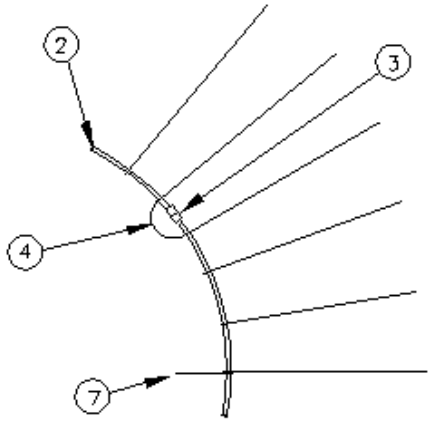
Figure 6.5

VGS-36100 GROUND SCREEN INSTALLATION INSTRUCTIONS

PARTS LIST

1. GROUND RADIAL
2. CENTRE RING
3. COMPRESSION UNION
4. JUMPER WIRE
5. GROUND ROD
6. GROUND ROD CONNECTOR
7. CONNECTING WIRE





VIEW A

ASSEMBLY AND INSTALLATION INSTRUCTIONS

1. DIG AN 18 INCH DEEP TRENCH CENTRALLY AROUND THE ANTENNA PAD WITH A DIAMETER OF APPROXIMATELY 7 FEET.
2. DIG 4 TRENCHES 18 INCHES DEEP FROM THE CENTRE RING TO THE ANTENNA PAD 90° APART.
3. DIG 36 STRAIGHT TRENCHES 18 INCHES DEEP, 97 FEET LONG RADIALLY FROM THE CENTRE RING. THE RADIALS SHOULD BE EQUALLY SPACED 18 FEET APART AT THE OUTER ENDS
4. FILL ALL THE TRENCHES WITH 6 INCHES OF ROCK FREE SOIL.
5. ENCIRCLE ANTENNA WITH FOUR SECTORS OF THE CENTRE RING. FLEXIBLE TUBING SHOULD BE FORMED SO THAT THE ANTENNA IS APPROXIMATELY AT THE CENTRE OF THE RING.
6. JOIN THE FOUR SEGMENTS OF THE CENTRE RING WITH THE COMPRESSION UNIONS. CONNECT THE 12 INCH JUMPER WIRES ACROSS THE UNIONS AND BRAZE THE FREE END ONTO THE COPPER CENTRE RING TUBING.
7. DEPLOY THE 36 GROUND RADIALS IN THE TRENCHES AND SECURE TO THE GROUND RODS WITH THE GROUND ROD CONNECTORS. USING A SLEDGE HAMMER, DRIVE THE RODS INTO THE GROUND.
8. CUT THE FOUR CONNECTING WIRES TO LENGTH AND TERMINATE AT GROUND STUDS ON TUNER. IF A SUPPORT TOWER IS USED, TERMINATE WIRES TO MOUNTING STUDS ON CONCRETE PAD.
9. COVER THE CONNECTING WIRE, CENTRE RING AND GROUND RADIALS WITH 6 INCHES OF ROCK FREE SOIL. BACKFILL REMAINDER OF TRENCH WITH THE REMOVED SOIL.

Figure 6.6

SP130

APPENDIX C
MATERIAL
FOR
COMMUNICATION
HUB

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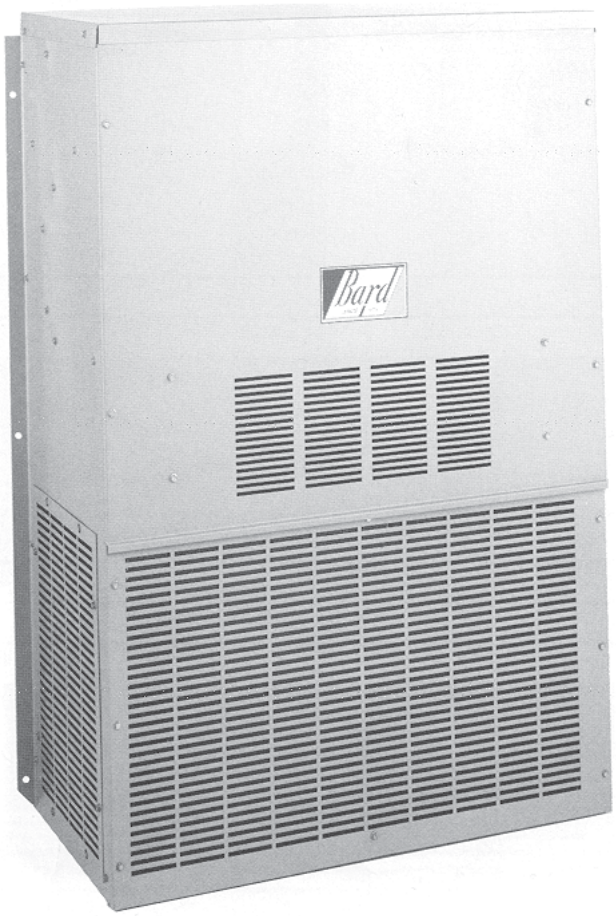
THE WALL-MOUNT™ ONE TON AIR CONDITIONER

CLIMATE CONTROL SOLUTIONS

W12A1 **60Hz**
10,800 Btuh 9.00 EER
Right Side Control Panel

GREEN REFRIGERANT
R-410A

The Bard Wall-Mount One Ton Air Conditioner is a self contained energy efficient heating and cooling system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. The One Ton is the ideal product for versatile applications such as: new construction, modular offices, school modernization, telecommunication structures, portable structures or correctional facilities. Factory or field installed accessories are available to meet specific job requirements.



Engineered Features

Aluminum Finned Copper Coils
Grooved tubing (evaporator coil only) and enhanced louvered fin for maximum heat transfer and energy efficiency.

Quiet Twin Blowers:
Designed to accept full ducted system or for non-ducted free blow installations.

High Efficiency Rotary Compressor

R-410A Refrigerant:
Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements.

Liquid Line Filter Drier:
Standard on all units. Protects system against moisture.

Galvanized 20 Gauge Zinc Coated Steel Cabinet:
Cleaned, rinsed, sealed and dried before the polyurethane primer is applied. The cabinet is handsomely finished with a baked on textured enamel, which allows it to withstand 1000 hours of salt spray tests per ASTM B117-03.

Electrical Components:
Are easily accessible for routine inspection and maintenance through a right side, service panel opening.

One Inch, Disposable Air Filter:
Easily removed for replacement from the outside. Optional two-inch pleated filter, factory or field installed.

Top Rain Flashing:
Standard feature on all models.

Slope Top:
Standard feature for water run-off.

Compressor Control Module:
Standard on all units. Built-in off-delay timer adjustable from 30 seconds to 5-minutes. 2-minute on-delay if power interrupt. 120-second bypass for low pressure control, and both soft and manual lockouts for high and low pressure controls. Alarm output for alarm relay.

High & Low Pressure Switches are Auto-Reset:
Standard on all units. Built-in lockout circuit resets from the room thermostat. Provides commercial quality protection to the compressor.

Barometric Fresh Air Damper:
Allows up to 100 CFM of fresh air.

Automatic Condensate Disposal System:
Eliminates the need to provide a separate condensate drain. The drain valve closes at temperatures above 40° and opens when the temperature drops below 40°. Built-in slinger ring fan blade.

***Full Length Mounting Flanges*:**
Built into cabinet for improved appearance and easy installation.

Optional Product Features

Alarm Relay:
Dry contacts for remote alarm on high or low pressure lockouts.

Low Ambient Control:
Permits operation down to 0°F outdoor ambient. Can be factory or field installed.

Fully Modulating Economizer:
Can be factory or field installed.

Commercial Room Ventilator:
Can be factory or field installed.

- Complies with efficiency requirements of ANSI/ASHRAE/IESNA 90.1-2007.
- Certified to ANSI/ARI Standard 390-2003 for SPVU (Single Package Vertical Units).
- Intertek ETL Listed to Standard for Safety Heating and Cooling Equipment ANSI/UL 1995/CSA 22.2 No. 236-05, Third Edition.
- Commercial Product - Not intended for Residential application.

Capacity and Efficiency Ratings

Models	Volts	Phase	Heat Strip	Cooling Cap. BTUH ①	EER ②
W12A1-A00	230/208	1	NONE	10,800	9.0
W12A1-A03	230/208	1	3.6 KW	10,800	9.0
W12A1-A05	230/208	1	5.0 KW	10,800	9.0
W12A1-K00	115	1	NONE	10,800	9.0
W12A1-K02	115	1	2.2 KW	10,800	9.0

① Capacity is certified in accordance with ANSI/ARI Standard 390-2003.
② EER = Energy Efficiency Ratio and is certified in accordance with ANSI/ARI Standard 390-2003.
All ratings based on fresh air intake being 100% closed (no outside air introduction).

Electrical Specifications

Models	Rated Volts and Phase	Operating Voltage Range	No. Field Power Ckts.	Minimum Circuit③ Ampacity	Maximum External Fuse① or Circuit Breaker	Field Power ② Wire Size	Ground ② Wire Size
W12A1-A00	230/208-1	197-253	1	9	15	14	14
A03			1	20	20	12	12
A05			1	28	30	10	10
W12A1-K00	115-1	104-126	1	20	30	10	10
K02			1	29	30	10	10

① Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.
② Based on 75°C copper wire. All wiring must conform to NEC and all local codes.
③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical Code (latest revision), article 310 for power conductor sizing.

CAUTION! When more than one field power conductor circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of table 310 regarding Ampacity Adjustment Factors when more than 3 conductors are in a raceway.

Specifications

Models	Electrical Rating - 60 HZ	Compressor RLA	Compressor LRA	Outdoor Fan Motor HP-RPM-SP	Outdoor Fan Motor FLA	Indoor Blower Motor HP-RPM-SP	Indoor Blower Motor FLA	CFM/ESP (Rated-WET Coil)	Shipping Weight
W12A1-A	230/208-1	5.5/4.8	32.5	1/10-1075-1	.70	1/8-1650-2	.85	400/.10	160 lbs.
W12A1-K	115-1	11.6	63.0	1/10-1075-1	1.40	1/8-1650-2	1.60	400/.10	160 lbs.

Electric Heat Table

Models	W12A1-A 240V-1		W12A1-A 208V-1		W12A1-K 120V-1	
KW	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH
3.0	15.0	12,285	13.0	9,230	-	-
5.0	20.8	17,065	18.1	12,800	-	-
2.0	-	-	-	-	18.3	7,510

Indoor Blower Performance - CFM at 230

E.S.P. IN H_20	High Speed Dry/Wet Coil	Low Speed Dry/Wet Coil
.0	530/500	465/425
.1	485/460	415/400
.2	440/425	365/350
.3	390/375	315/300
.4	325/300	300/285

Cooling Application Data - Outdoor Temperature °F ①

Models	D.B./W.B.②	Cooling Capacity	75°	80°	85°	90°	95°	100°	105°	110°	115°	120°
W12A1	75/	Total Cooling	11,400	11,000	10,500	10,000	9,400	9,000	8,300	7,800	7,100	6,400
	62	Sensible Cooling	9,100	8,900	8,800	8,600	8,400	8,100	7,800	7,500	7,100	6,600
	80/	Total Cooling	12,100	11,900	11,600	11,300	10,800	10,400	9,800	9,200	8,500	7,700
	67	Sensible Cooling	8,800	8,700	8,700	8,600	8,400	8,200	8,000	7,700	7,300	6,900
	85/	Total Cooling	14,500	14,000	13,400	12,800	12,000	11,400	10,600	9,800	9,000	8,000
	72	Sensible Cooling	9,100	8,900	8,800	8,600	8,300	8,000	7,700	7,300	6,800	6,300

① Below 55°F, unit requires a factory or field installed low ambient control.
② Return air temp. °F.

CAPACITY MULTIPLIER FACTORS			
% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.0	1.02
Sensible BTUH	0.950	1.0	1.05

Ventilation System Packages

Bard Wall-Mounts are designed to provide optional ventilation packages to meet all of your ventilation and indoor air quality requirements. All units are equipped with a barometric fresh air damper as the standard ventilation package. All ventilation packages can be built-in at the factory or field-installed at a later date.

Barometric Fresh Air Damper

BAROMETRIC FRESH AIR DAMPER - BFAD-1 — STANDARD

The barometric fresh air damper is a standard feature on all models. It is installed on the inside of the service door and allows outside ventilation air, up to 25% of the total airflow rating of the unit, to be introduced through the air inlet openings and to be mixed with the conditioned air. The damper opens during blower operation and closes when the blower is off. Adjustable blade stops allow different amounts of outside air to be introduced into the building and can be easily locked closed if required.

NOTE: The above vent systems are intake only without built-in exhaust capability. Building will likely require separate field installed barometric relief or mechanical exhaust elsewhere within the conditioned space. Balancing dampers in the return air grille may be required to achieve specified amount of outdoor air intake.

BLANK OFF PLATE - BOP-1A — OPTIONAL

A blank off plate is installed on the inside of the service door. It covers the air inlet openings, which restricts any outside air from entering the unit. The blank off plate should be utilized in applications where outside air is not required to be mixed with the conditioned air.

Commercial Room Ventilator

COMMERCIAL ROOM VENTILATOR - CRVS-1 — OPTIONAL

The built-in commercial room ventilator is internally mounted behind the service door and allows outside ventilation air, up to 50% of the total airflow rating of the unit, to be introduced through the air inlet openings.

The commercial room ventilator (CRV) is a simple and innovative approach to improving the indoor air quality by providing fresh air intake and exhaust capability through the CRV. The damper can be easily adjusted to control the amount of fresh air supplied into the building. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy. Two versions available (except on 1.5 and 2-Ton models). The CRV and CRVS are power open - spring return on power loss, and CRVP is power open and power close. Complies with ANSI/ASHRAE Standard 62.1 “Ventilation for Acceptable Indoor Air Quality”.

Economizer

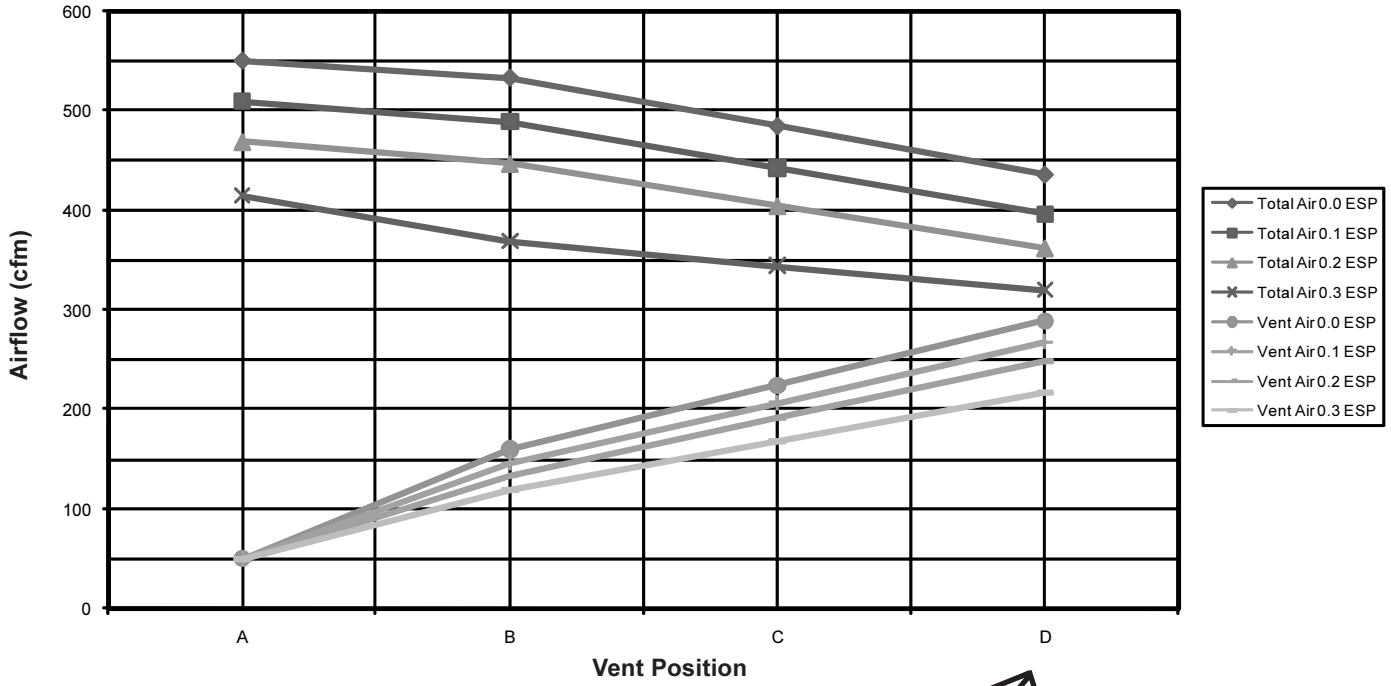
ECONOMIZER - EIFM-1B — OPTIONAL

The built-in economizer system is internally mounted behind the service door and allows outdoor air to be introduced through the air inlet openings. The amount of outdoor air varies in response to the system controls and settings defined by the end user. It includes a built-in exhaust air damper. The economizer is designed to provide “free cooling” when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This in turn provides lower operating costs, while extending the life of the compressor.

Standard Features:

- One Piece Construction - Easy to install with no mechanical linkage adjustment required.
- Exhaust Air Damper - Built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.
- Actuator Motor - 24 volt, power open, spring return with built in torque limiting switch.
- Proportioning Type Control - for maximum “free cooling” economy and comfort.
- Moisture Eliminator & Prefilter - permanent, washable aluminum construction.
- Enthalpy Control - adjustable to monitor outdoor temperature and humidity.
- Minimum Position Potentiometer - adjustable to control minimum damper blade position for ventilation purposes.
- Mixed Air Sensor - to monitor outside and return air to automatically modulate damper position.

CRVS-1 TOTAL AND VENTILATION AIRFLOW



Brown/white wire must be switched from terminal X to terminal D on damper motor to attain "D" position. This will bypass potentiometer function and go to "full open" when energized.

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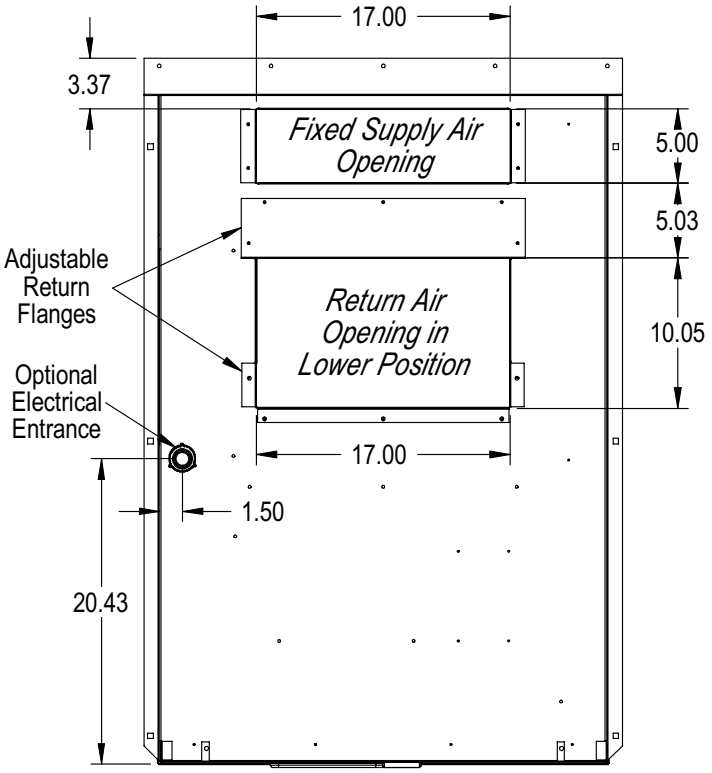
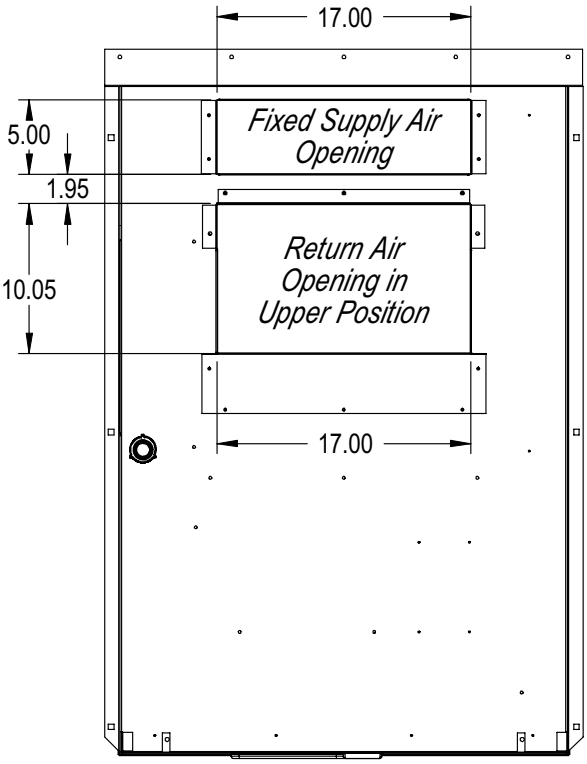
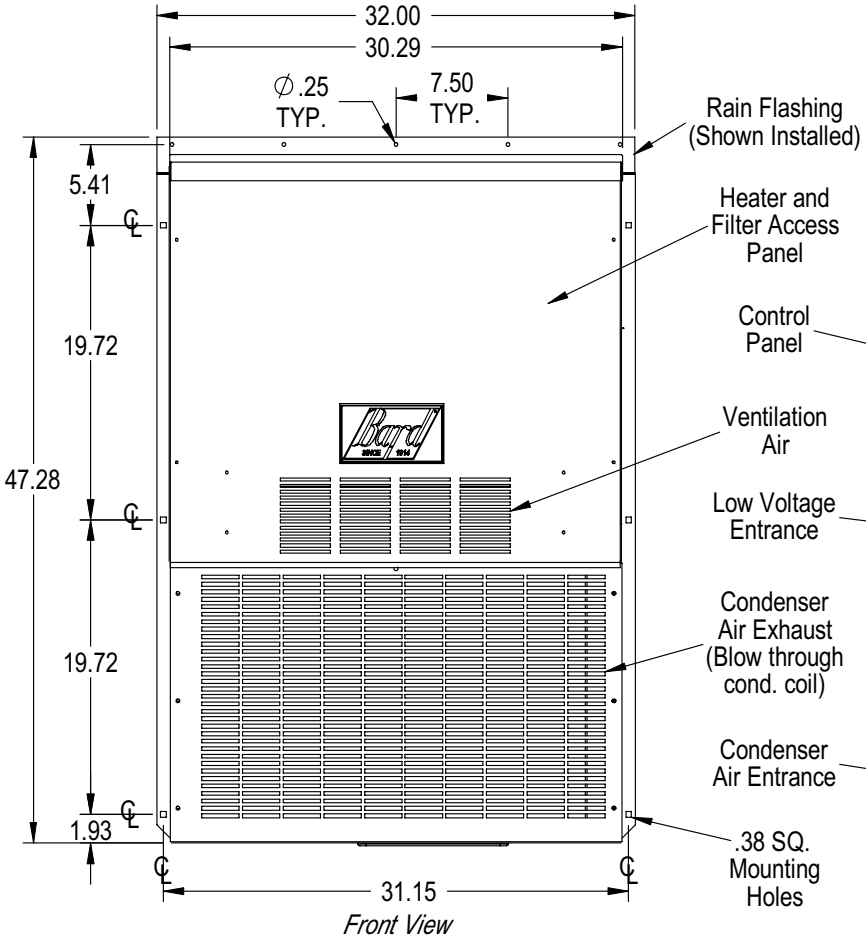
Dimensions of Basic Unit for Architectural and Installation Requirements (Nominal)



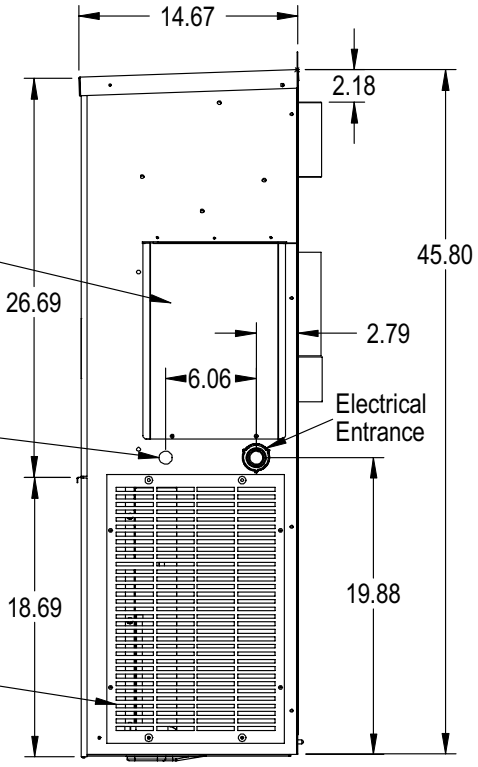
Back View (Lower Return)



Back View (Upper Return)



Front View



Right Side View

MIS-2738

Air Conditioning Model Nomenclature

W 12 A 1 — A 00 X X X X X J

MODEL NUMBER (W)

CAPACITY (12)
12 - 1 Ton

AIR CONDITIONER (A)

REVISION (1)

VOLTS & PHASE (A)
A - 230/208/60/1
K - 115/60/1

KW (00)
00 - No KW
02 - 2.2 KW
03 - 3.6 KW
05 - 5.0 KW

VENTILATION OPTIONS (X)
(See Vent Options Below.)

FILTER OPTIONS (X)
X - 1-Inch Throwaway - 10 x 20 x 1
W - 1-Inch Washable - 10 x 20 x 1
P - 2-Inch Pleated - 10 x 20 x 2

COLOR OPTIONS (X)
X - Beige (Standard)
1 - White
4 - Buckeye Gray
5 - Desert Brown
8 - Dark Bronze

OUTLET OPTIONS (X)
X - Front (Standard)

COIL OPTIONS (X)
X - Standard
1 - Phenolic Coated Evaporator
2 - Phenolic Coated Condenser
3 - Phenolic Coated Evaporator and Condenser

CONTROL MODULES (J)
(See chart below)

Clearances Required for Service Access and Adequate Condenser Inlet Airflow

MODEL	LEFT SIDE	RIGHT SIDE
W12A	15"	20"

NOTE: For side by side installation of two (2) W**A models there must be 20" between units.

Minimum Clearances Required to Combustible Materials

MODEL	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
W12A	0"	0"

Ventilation Options

Model	W12A1	
Description	Factory Installed Code No.	Field Installed Part No.
Barometric Fresh Air Damper - Standard	X	BFAD-1
Blank-Off Plate	B	BOP-1A
Commercial Ventilator - Spring Return w/Exhaust	V	CRVS-1
Economizer - Fully Modulating ①	E	EIFM-1B

① Low ambient control is required with economizer for low temperature compressor operation.

Air Conditioning Control Modules

HPC ①	LPC ②	CCM ③	LAC ④	ALR ⑤	All Models Except As Noted: Factory Installed Code	All Models Except As Noted: Field Installed Part
STD	STD	STD			X	N/A
STD	STD	STD	●		E	CMA-28
STD	STD	STD	●	●	J	Factory Only

STD = Standard equipment for these specified models.

① HPC High pressure control is auto reset. Always used with compressor control module (CCM) which is included. See note ③.

② LPC Low pressure control is auto reset. Always used with compressor control module (CCM) which is included. See note ③.

③ CCM Compressor control module has adjustable 30-second to 5-minute delay-on-break timer. On initial power-up, or any time the power is interrupted, the delay-on-make will be 2 minutes plus 10% of the delay-on-break setting. There is no delay-on-make during routine operation of the unit. The module also provides the lockout feature (with 1 retry) for high and/or low-pressure controls, and a 2-minute timed bypass for low-pressure control.

④ LAC Low ambient control permits cooling operation down to 0°F.

⑤ ALR The alarm relay has a set of normally open and normally closed dry contacts to provide the ability to signal a condition of shutdown on either high or low pressure controls.

Bard SINCE 1914
CLIMATE CONTROL SOLUTIONS

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manufactured under U.S. Patent Nos. 5,301,744; 5,002,116
Other Patents pending.

Due to our continuous product improvement policy, all specifications subject to change without notice.

Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.

Form No. S3401
May, 2010

Supersedes S3401-1109

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Smart-UPS On-Line

APC Smart-UPS RT 8000VA 208V

More Images

APC Smart-UPS On-Line,6400 Watts /8000 VA,Input 208V /Output 208V, Interface Port DB-9 RS-232, RJ-45 10/100 Base-T, Smart-Slot, Extended runtime model, Rack Height 6 U

Includes: CD with software, Service Manual, Smart UPS signalling RS-232 cable, User Manual, Web/SNMP Management Card

Standard Lead Time: Usually in Stock

Be the first to write a review

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SURT8000XLT

Price * : $5,125.00

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Protect the Edge of Your Network

Product Category

- Computer and Peripheral (2)
- Network and Server
  - > Smart-UPS
  - > **Smart-UPS On-Line**
  - > Symmetra
- Data Center and Facility 3 Phase (11)
- Special Applications (5)
- UPS Management (7)
- UPS Replacement Batteries (1)

Return to Uninterruptible Power Supply (UPS)

Technical Specifications | Product Overview | Documentation | Software & Firmware | Options | Ratings and Reviews

Output

Output Power Capacity	6400 Watts / 8000 VA
Max Configurable Power	6400 Watts / 8000 VA
Nominal Output Voltage	208V
Output Voltage Note	Configurable for 208 or 240 nominal output voltage
Output Voltage Distortion	Less than 3%
Output Frequency (sync to mains)	50/60 Hz +/- 3 Hz user adjustable +/- 0.1
Other Output Voltages	240
Crest Factor	3 : 1
Topology	Double Conversion Online
Waveform Type	Sine wave
Output Connections	(1) Hard Wire 3-wire (2PH + G) (2) NEMA L6-20R (2) NEMA L6-30R
Bypass	Internal Bypass (Automatic and Manual)

Input

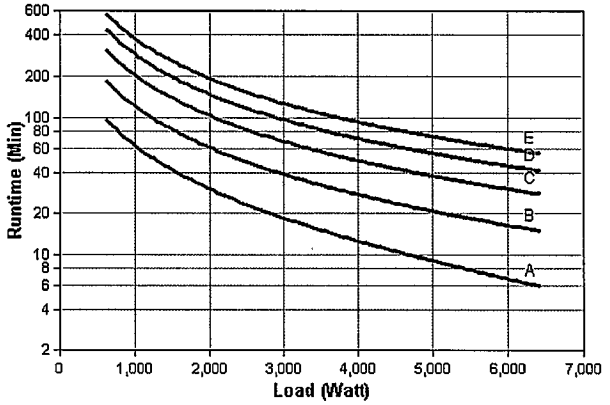
Nominal Input Voltage	208V
Input Frequency	50/60 Hz +/- 5 Hz (auto sensing)
Input Connections	Hard Wire 3-wire (2PH + G)
Input voltage range for main operations	160 - 280V
Other Input Voltages	240
Input Total Harmonic Distortion	Less than 7% for full load

Batteries & Runtime

Battery Type	Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leakproof
Included Battery Modules	4
Typical recharge time	2.20 hour(s)
Replacement Battery	RBC44

RBC™ Quantity	2
Extended Run Options	APC Smart-UPS RT 8000VA 208V
Runtime Graph	

Curve	Part Number(s)
A	SURT8000XLT
B	SURT8000XLT + (1) SURT192XLBP
C	SURT8000XLT + (2) SURT192XLBP
D	SURT8000XLT + (3) SURT192XLBP
E	SURT8000XLT + (4) SURT192XLBP



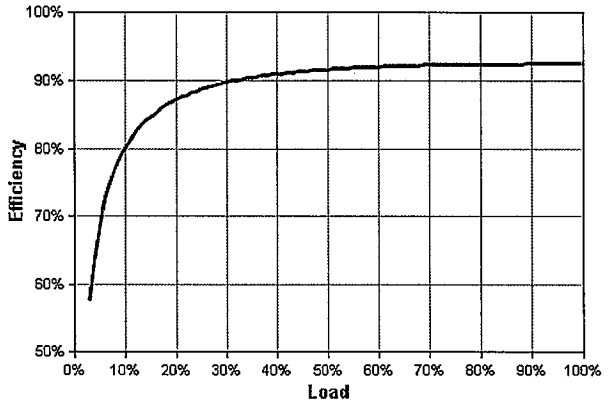
Hover over the line on the graph above to view the runtime at any desired load

Curve fit to measured runtime data. All measurements taken with new, fully charged batteries, at typical environmental conditions, with no electrical input and balanced resistive load (PF = 1.0) output.

View Enlarged Graph View Runtime Chart

Energy Use/Efficiency

Load	Efficiency
25%	88.8%
50%	91.7%
75%	92.4%
100%	92.5%



Hover over the line on the graph above to view the efficiency at any desired load

Curve fit to measured efficiency data. All measurements taken in normal operating mode, at typical environmental conditions, with nominal electrical input and balanced resistive load (PF = 1.0) output.

View Enlarged Graph

Communications & Management

Interface Port(s)	DB-9 RS-232, RJ-45 10/100 Base-T, Smart-Slot
Pre-Installed SmartSlot™ Cards	AP9631
Control panel	LED status display with load and battery bar-graphs and On Line : On Battery : Replace Battery : Overload and Bypass Indicators
Audible Alarm	Alarm when on battery : distinctive low battery alarm : overload continuous tone alarm
Emergency Power Off (EPO)	Yes

Surge Protection and Filtering

Surge energy rating	1265J Joules
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449

Physical

Maximum Height	17.00 inches (432 mm)
Maximum Width	10.35 inches (263 mm)
Maximum Depth	28.98 inches (736 mm)
Rack Height	6U

Net Weight	244.00 lbs. (110.91 kg)
Shipping Weight	284.00 lbs. (129.09 kg)
Shipping Height	21.75 inches (552 mm)
Shipping Width	23.50 inches (597 mm)
Shipping Depth	39.00 inches (991 mm)
Color	Black
Units per Pallet	2.00

Environmental

Operating Environment	32 - 104 °F (0 - 40 °C)
Operating Relative Humidity	0 - 95% no%
Operating Elevation	0-10000 feet (0-3000 meters)
Storage Temperature	5 - 113 °F (-15 - 45 °C)
Storage Relative Humidity	0 - 95% no%
Storage Elevation	0-50000 feet (0-15000 meters)
Audible noise at 1 meter from surface of unit	55.00 dBA
Online Thermal Dissipation	1739.00 BTU/hr
Protection Class	IP 20

Conformance

Regulatory Approvals	CSA, FCC Part 15 Class A, UL 1778
Standard Warranty	2 years repair or replace

Sustainable Offer Status

*Except where noted, all prices are Estimated Resale Price (ERP) - Without Tax/VAT. Pricing in other locations and sites may vary.

**The time to recharge to 90% of full battery capacity following a discharge to shutdown using a load rated for 1/2 the full load rating of the UPS.

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Product Category

Computer and Peripheral (3)
Network and Server (3)
Data Center and Facility 3 Phase (11)
Special Applications (5)
UPS Management
> PowerChute Personal Edition
> PowerChute Business Edition
> PowerChute Network Shutdown
> UPS Network Management Cards
> Additional Management Cards and Options
> Interface Cables
> Battery Management
UPS Replacement Batteries (1)

Return to Uninterruptible Power Supply (UPS)

UPS Network Management Cards

UPS Network Management Card 2 with Environmental Monitoring

More Images

Remote monitoring and control of an individual UPS by connecting it directly to the network.

Includes: CD with software, Temperature Sensor, User Manual

Standard Lead Time: Usually in Stock

Average Customer Review 3.3

2 of **3** (67%) reviewers would recommend this product to a friend.

Read all reviews | Write a review

Share this Product:

AP9631
Price * : $469.00
Add to Cart

Email Technical Specifications
Printer Friendly

Technical Specifications | Product Overview | Documentation | Software & Firmware | Options | Ratings and Reviews

Communications & Management	
Protocols	HTTP, HTTPS, IPv4, IPv6, NTP, SMTP, SNMP v1, SNMP v2c, SNMP v3, SSH V1, SSH V2, SSL, TCP/IP, Telnet
Network Interface Connections	RJ-45 10/100 Base-T
Authentication	Radius
Physical	
Net Weight	0.20 lbs. (0.09 kg)
Maximum Height	1.50 inches (38 mm)
Maximum Width	4.75 inches (121 mm)
Maximum Depth	4.50 inches (114 mm)
Shipping Weight	0.75 lbs. (0.34 kg)
Shipping Height	2.00 inches (51 mm)
Shipping Width	9.25 inches (235 mm)
Shipping Depth	6.25 inches (159 mm)
Color	Black
Environmental	
Operating Environment	32 - 113 °F (0 - 45 °C)
Storage Temperature	23 - 113 °F (-5 - 45 °C)
Operating Relative Humidity	0 - 95%
Storage Relative Humidity	0 - 95%
Operating Elevation	0-10000 feet (0-3000 meters)
Storage Elevation	0-50000 feet (0-15000 meters)
Conformance	
Regulatory Approvals	AS/NZS 3548 (C-Tick) Class A, EN 55022 Class A, EN 55024, FCC Part 15 Class A, GOST, ICES-003, VCCI Class A
Standard Warranty	2 years repair or replace
Sustainable Offer Status	
RoHS	Compliant
REACH	REACH: Contains No SVHCs
PEP	Available in Documentation tab
EOLI	Available in Documentation tab
Battery Directive	Compliant

APPENDIX D
MATERIAL
FOR
CLOSED CIRCUIT
TELEVISION
CAMERA

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MIC IP starlight 7000 HD

www.boschsecurity.com

BOSCH
Invented for life

- Exceptional strength and ruggedness for any outdoor, industrial, or commercial surveillance application
- Starlight (720p50/60) camera technology with high-performance 30x lens for scenes with limited or non-uniform illumination
- Optional, field-installable combo illuminator (IR/ White light) provides detection of objects up to 175 m (575 ft) away
- Simple installation with new hinged DCA mounting accessory and new cable design
- ONVIF conformant; provides interoperability with other conformant systems.

The MIC IP starlight 7000 HD camera has an advanced PTZ platform that was designed using Bosch's domain expertise in material engineering, mechanical design, intelligent imaging, and video streaming.
The camera complies to some of the toughest industry standards such as IP68, NEMA 6P, and IK10 for extreme mechanical strength and durability.
The camera is designed using the latest technology in intelligent imaging and video streaming. Thanks to the intelligent coding and Content-Based Imaging Technology (CBIT), the HD module delivers high-resolution video even under challenging light conditions at very low bit rates.

Functions

Ruggedized design for extreme applications
The camera is designed to last in surveillance applications that are beyond the mechanical capabilities of normal PTZ domes or conventional positioning systems. The complete metal body has been engineered to withstand high-impact or continuous low-frequency vibration. The camera models comply to IK10 rating for impact resistance and to the IEC 60068 standards applicable to vibration and shock.
The camera is designed specifically for use in extreme environments around the world. Standard models can operate in a temperature range of -40 °C to +60 °C (-40 °F to +140 °F) . Models for extreme low temperature can operate in a temperature range of -60 °C to +50 °C (-76 °F to +122 °F).
The camera benefits from Bosch Automotive domain knowledge in material engineering and coatings. As a result, the superior metallurgy and the finish of the camera provide unprecedented protection against corrosion, meeting the ASTM B117 standard for corrosion resistance.

Anti-fog
With the anti-fog mode feature, visibility can be improved significantly when viewing foggy or other low-contrast scenes. Users can configure the mode to be active continuously, or to activate automatically

when the video analytics in the camera detect fog and add light to the video image (and then deactivate when the fog clears or the scene changes).

Integrated wiper
Regardless of the weather, the MIC camera is able to capture the highest possible quality image all year long, thanks to its integrated, long-life silicone wiper.

Window-defrosting function
In addition, the camera incorporates an internal long-life blower that directs warm air towards the inside of the front window of the camera, providing an effective window-defrosting function.

High-performance imaging platforms
Image control and quality are integral aspects of any PTZ camera, and the MIC IP starlight 7000 HD camera delivers outstanding clarity and image detail.
The camera has a professional-grade imaging platform capable of delivering 720p50/60 HD resolution in environments with ambient light extremes. The camera also has a 30x optical zoom lens (12x digital zoom) and flexible mounting options (upright, inverted, or canted) to achieve the perfect field of view.
Day/night capabilities and outstanding sensitivity make the camera an exceptional performer in all lighting conditions. In low light, the camera automatically switches from color to monochrome by removing the IR filter to boost sensitivity, while maintaining superior image quality. For operation in the darkest conditions, automatic control of shutter speeds increases sensitivity by more than 50 times.
Starlight models have a 720p50/60 HD imaging platform with starlight technology. The camera produces detailed video images in scenes with limited ambient lighting, without any motion blur associated with cameras that use slow shutters. The camera has been tuned to deliver high-quality HD video in both day and night operation.

Sodium vapor lamp white balance
The camera is an exceptional performer when capturing video under a sodium vapor lamp (a street lamp or tunnel lamp, for example). Uncorrected images under these conditions have a yellowish tint, which can make identification difficult. In the Sodium Vapor White Balance mode, the camera automatically compensates for the light from a sodium vapor lamp to restore objects to their original color.

Dual-mode Illumination
The field-installable MIC illuminator accessory (sold separately) enables Detection of objects 175 m (575 ft) away using IR light. Unique 3D Diffuser technology ensures even illumination across the entire scene. Ensuring long-term reliability, the patented, integrated Constant Light technology automatically controls and adjusts output to deliver a consistent level of illumination performance throughout the life of the product, even when operating in fluctuating temperatures. The illuminator accessory consists of both IR and White light LEDs .Operators can switch between the two light sources with a single click.

Five (5) pre-programmed user modes
Five pre-programmed but configurable user modes, optimized with the best settings for a variety of typical applications, make on-site programming easy and user-friendly. Users select from the menu the mode that best defines the environment in which the camera is installed:

- General – Default mode. Suitable for most applications.
- Low light – Optimized performance for scenes with low light level.
- Motion – Optimized to minimize motion artifacts, such as when monitoring traffic or fast-moving objects.
- Vibrant – Provides enhanced contrast, color reproduction, and sharpness.
- Illuminator – Optimized performance when using the MIC illuminator accessory.

Users have the ability to customize these modes, if necessary, for the specific requirements of the site.

Image Stabilization
As PTZ cameras continue to increase their optical zoom capabilities, image stabilization becomes critical to eliminate movement caused by unstable camera mounts. Minor movement of the camera mount can shift the field of view by a large distance when the camera is zoomed to a high value. This can render images unusable. The camera incorporates an Image Stabilization algorithm that allows the camera to detect continuous vibration. If it detects vibration, the camera dynamically corrects the shaky video in both the vertical and horizontal axis, resulting in exceptional image clarity and a stable field of view on the monitor.

Superior privacy masking
The camera allows for a total of 24 individual privacy masks, with up to eight displayed in the same scene. These can be programmed with four corners each. Each mask changes size and shape smoothly and quickly, ensuring that the covered object cannot be seen.

Sophisticated alarm responses
The camera supports advanced alarm control that uses sophisticated rules-based logic to determine how to manage alarms. In its most basic form, a “rule” could define which input(s) should activate which output(s). In a more complex form, inputs and outputs can be combined with pre-defined or user-specified commands to perform advanced camera functions.

PTZ drive and mechanism
With a full 360º continuous rotation pan and 290º tilt control (on upright models without illuminators) and super-quick pan (120°/second) and tilt (60°/second) for exceptional viewing capability, the camera outperforms other cameras in its class. Small

increment pan speeds from just 0.2º/second to 120º/second gives the user precise control. This speed control is especially important when used with video analytic systems, particularly for tracking subjects when fully zoomed in.
The AutoScaling (proportional zoom) and AutoPivot (automatically rotates the camera) features ensure optimal control.
The camera supports 256 pre-positions and four separate Guard Tours. A standard preset tour has capability for up to 256 pre-positions, with a configurable dwell time between pre-positions. A custom preset tour has capability for up to 64 pre-positions that can be programmed in any order with a configurable dwell time between pre-positions. Two record/playback tours allow recording of the camera movements that an operator makes, including pan, tilt, and zoom, and can be played back in a continuous manner. The total duration of record/playback tours can be up to a maximum of 30 minutes. The duration varies depending on the amount of commands sent to the camera during recording.

Content-Based Imaging Technology
Content-Based Imaging Technology (C-BIT) is used to radically improve image quality in all lighting conditions and to identify areas for enhanced processing. The camera examines the scene using intelligent video analytics and provides feedback to re-tune the image processing. This provides better detail in the areas that matter and better all-round performance. The intelligent, automatic anti fog technology, for example, allows you to view video clearly through a foggy scene or can improve contrast in dark areas of a scene.

Noise reduction features reduce bandwidth and storage requirements
The camera uses advanced noise reduction algorithms to analyze the scene and reduce noise artifacts.
The low-noise image and the efficient H.264 compression technology combine to provide clear images while reducing bandwidth and storage compared to other H.264 cameras. This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio.

Intelligence
With built-in Intelligent Video Analysis (IVA), the camera reinforces the concept of Intelligence at the Edge. IVA is Bosch's state-of-the-art intelligent video content analysis technology. With IVA, the camera reliably detects and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. IVA also allows the camera to detect multiple object behaviors including idle and removed objects, loitering, multiple line crossing, and trajectories. IVA supports BEV (Bird's-Eye-View) People Counter and Assisted Self-Calibration. Configurable detection filters improve reliability and reduce operator work load.

Intelligent Tracking
The camera utilizes the built-in Intelligent Video Analytics (IVA) to follow an individual or an object continuously. Objects detected by IVA when the camera is in a stationary position activate the Intelligent Tracking feature, which controls the pan/tilt/zoom actions of the camera to keep the tracked object in the scene.
The new Intelligent Tracking is based on robust flow detection algorithms which can reliably track moving objects even under challenging scenes.
The tracking and detection reliability can be enhanced further with virtual masking for scenes with a lot of background motion such as trees or other objects creating constant motion in the scene.
The camera supports three modes for Intelligent Tracking:

- Auto mode: When configured in this mode, the camera actively analyzes the video to detect any moving object. If it detects movement, it begins to track the object. This mode is most useful for scenarios where no motion is expected in the scene.
- Click mode: In this mode, users can click an object moving in the live video image to enable the camera to track the movement of the selected object. This mode is most useful for scenarios where normal scene activity is expected.
- IVA-triggered mode: In this mode, the camera continuously analyzes the scene for IVA alarms or IVA rule violations. If an IVA rule is violated, it triggers the advanced tracking feature of the camera to start following the object / person that triggered the alarm. This unique combination of robust IVA and Intelligent Tracking allows the camera to track moving objects of interest without getting distracted by other moving objects in the scene.

Virtual masking
The camera offers Virtual Masking, which gives users flexibility to mask parts of the scene which should not be considered for flow analysis to trigger Intelligent Tracking. This allows users to mask from IVA/Tracking any background motion (moving trees, pulsating lights, and busy roads) in the scene without blocking the motion from the video.

Common product platform (CPP4)
The camera has an advanced, efficient H.264 encoder (CPP4) embedded for high quality HD streaming video and very efficient streaming and network capabilities. The new platform supports simultaneous streaming of individually configurable HD streams, and allows a choice of HD resolution in combination of SD resolutions.

Advanced streaming
The camera offers advanced streaming capabilities so that you can configure the camera to take advantage of the latest network technology.

The camera is designed on the most efficient and powerful H.264 encoding platform capable of delivering high-quality HD video with very low network load. The new intelligent encoding capabilities drops the bandwidth consumption to extremely low levels if the camera detects no motion in the scene.
The camera is capable of quad streaming which allows the camera to be configured to deliver independent, configurable streams for live viewing, recording, or remote monitoring on constrained bandwidths.

ONVIF conformant
The camera conforms to the ONVIF (Open Network Video Interface Forum) specification which guarantees interoperability between network video products regardless of manufacturer. The ONVIF Profile S specification allows easy integration with the conformant devices and VMS. ONVIF conformant devices are able to exchange live video, audio, metadata, and control information, and ensure that they are automatically discovered and connected to network applications such as video management systems.

Ease of installation
The camera has been designed for quick and easy installation, a key feature from Bosch CCTV products. The camera supports mounting in upright, inverted, or canted orientation. The field-selectable canting option allows the upper section of the camera to be tilted down at a 45° angle. This is very useful for installations that require a view of the scene directly under the camera. No matter the installation position, the camera will provide the perfect field of view.
The MIC Series has a wide range of mounting accessories, including a new *Hinged* DCA mount, a wall mount, a corner mount, and a pole mount. In addition, a sunshield is available for camera installations in hot, sunny locations.
The MIC Hinged DCA (MIC-DCA-Hx) provides a convenient mounting point for a MIC camera.
The hinge feature allows installers to “hang” the MIC7000 camera temporarily during installation for easier connection of cables/wiring before final bolts are installed.
Made from cast aluminum, the hinged DCA is deeper than the standard MIC-DCA in order to easily accommodate the connections from the base of the camera, and has two M25 holes (or 3/4 in. NPT holes using the conduit adapter (male M25 to female 3/4" NPT) (Available in specific regions only.)) to accept weatherproof conduit or cable glands. An O-ring provides an IP68-rated seal between the base of the camera and the top of the DCA.
For installations in locations that require additional protection for the camera’s electrical connectors, a special weatherproof kit is available. The kit includes IP67-rated watertight glands that seal the connectors to prevent damage from high humidity or moisture condensation.

Bosch offers several power/control accessories, including a high-capacity 24 VAC power supply, and an inexpensive ‘alarm/washer’ interface accessory unit to connect external alarm signals and control optional external washer pump devices.
If a more sophisticated installation is required, connect the camera to the advanced accessory named VIDEOJET connect, which includes an integrated HPoE network connection, two standard network interfaces, integrated Bosch transcoder technology, Compact Flash-based local storage, a built-in network switch, alarm/washer control interfaces, audio I/O, and two sockets for SFP-based network fiber optic modules.

Robust design rated to an industry-leading IP68, Type 6P, IK10
Subjected and certified to rigorous dust and immersion tests (IP68, Type 6P) and impact test (IK10), MIC Series cameras are perfectly suited for installation in even the most unforgiving environments. The cameras’ aluminum housing receives a corrosion protection surface treatment, along with robust, powder coat paint. Reliable O-ring seals completely protect the internal components from the external environment, meaning that there is no need to pressurize the camera. To guarantee the seal, the factory submerges each MIC camera to ensure seal integrity before shipping.

Dual power options
The camera can be powered by a network compliant to High Power-over-Ethernet (Bosch’s version of High PoE) using a Bosch model of High PoE Midspans (sold separately). With this configuration, only a single (Cat5e/Cat6e) cable connection is required to view, to power, and to control the camera.
The camera can also accept a standard 24 VAC power source if a High PoE network interface will not be used. User-supplied wiring must be in compliance with electrical codes (Class 2 power levels).
For maximum reliability, the camera can be connected simultaneously to a High PoE Midspan and a separate 24 VAC power source. If High PoE and 24 VAC are applied simultaneously, the camera usually selects auxiliary input (24 VAC) and will draw minimal power from the High PoE Midspan. If the 24 VAC power source fails, the camera switches power input seamlessly to High PoE. After the 24 VAC power source is restored, the camera switches power input again to 24 VAC.
If connected to both power sources, the camera will operate at 24 VAC if High PoE is not available.
The 60 W midspan (NPD-6001A) can supply power to standard models without an illuminator accessory. The 95 W midspan (NPD-9501A) can supply power to all models of MIC7000, including standard models with the illuminator accessory as well as models for extreme low temperature.
Refer to the table in the Installation/configuration notes section for more information.

Easy upgrade
Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

Unsurpassed reliability
As with all Bosch products, the camera is designed using the industry's best design process and is subjected to the most stringent testing standards such as HALT (highly accelerated life testing).

Camera Diagnostics
The camera has several built-in sensors / advanced diagnostics that display warnings on the camera's OSD about the health of the camera. The diagnostics log records the events such as:

- Low voltage - a drop in incoming power below the level where the camera becomes non-functional
- High temperature - the internal temperature exceeds specifications
- Low temperature - the internal temperature exceeds minimum levels
- High humidity - the internal humidity exceeds 70%
- High vibration - the acceptable level of acceleration forces was exceeded
- Total hours of camera operation
- Illuminator aging history

Certain events also appear on the camera's OSD. These diagnostic records are available for the installation or service technician to review.

Certifications and approvals

HD standards
Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 50 and 60 frames/s

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations, including latest versions of EN 50130-4, EN 55022:2006 inc. AL:2007, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, and EN 50121-4 (Railway applications)
Product Safety	Complies with UL, CE, CSA, EN, and IEC Standards 60950-1 & 22
Ingress Protection Rating / Standard	IP68 (1m submersion for 24 hrs) NEMA 6P
IK Code	IK10
Salt spray	ASTM B117

Installation/configuration notes

CAMERA MODELS	60 W midspan	95 W midspan	VIDEOJET connect	24 VAC PSU
Standard models with illuminator		X	X	X
Standard models without illuminator	X	X	X	X
Extreme low temperature models		X	X	X

Note: The MIC7000 illuminator accessory is not compatible with the extreme low temperature models (including MIC-7130-PB4PB and MIC-7130-PW4PB). The table below identifies the power devices that can be connected simultaneously to the camera.

If power is supplied from:	Camera can receive power simultaneously from:
60 W midspan (NPD-6001A)	24 VAC PSU (VG4-A-PSU1, VG4-A-PSU2)
95 W midspan (NPD-9501A)	
VIDEOJET connect (VJC-7000-90)	

Parts included

One (1) MIC IP starlight 7000 HD Camera (MIC71xx)
One (1) Quick Installation Guide
One (1) Document DVD
One (1) spanner tool [to remove and to attach the yoke caps in order to cant the camera if desired, and to remove the access plug from the camera head when installing the optional illuminator accessory (sold separately)]
One (1) base gasket
One (1) RJ45 coupler
Four (4) MAC address labels
One (1) ground screw

Technical specifications

MIC IP starlight 7000 HD camera [720p60 models]

Imager	1/3-type Exmor CMOS sensor
Effective Picture Elements (Pixels)	1305 x 1049 (1.37 MP)
Lens	30x Zoom 4.3 mm to 129 mm F1.6 to F4.7
Field of View (FOV)	2.1° to 59°

Focus	*Automatic with manual override*
Iris	*Automatic with manual override*
Digital Zoom	*12x*

Sensitivity / Minimum Illumination (typical)	**30 IRE**	**50 IRE**
Day Mode (Color)		
Fixed shutter 1/30, High Sensitivity mode On	0.052 lux	0.166 lux
Fixed shutter 1/30, High Sensitivity mode Off	0.26 lux	0.66 lux
SensUp On (max. ¼), High Sensitivity mode On	0.0082 lux	0.033 lux
Night Mode (Black and white)		
Fixed shutter 1/30, High Sensitivity mode On	0.0103 lux	0.041 lux
Fixed shutter 1/4, High Sensitivity mode On	0.00129 lux	---
SensUp On (max. ¼), High Sensitivity mode On	0.00065 lux	0.00205 lux

Additional Camera Settings

Gain Control	Auto/Manual/Max
Aperture Correction	Horizontal and vertical
Electronic Shutter Speed (AES)	1/1 sec to 1/10000 sec (22 steps)
Dynamic Range	90 dB typical
Signal-to-Noise Ratio (SNR)	>50 dB
Backlight Compensation (BLC)	On/Off
White Balance	2000 K to 10,000 K ATW, AWB Hold, Extended ATW, Manual, Sodium Lamp Auto, Sodium Lamp
Day/Night	Monochrome, Color, Auto
Anti-fog image feature	Improves visibility when viewing foggy or other low-contrast scenes.

Mechanical

Drive Unit	Brushless, integral pan/tilt motor drive
Pan Range	360° continuous rotation
Tilt Angle	Without illuminators (upright orientation): 290° Without illuminators (inverted orientation): 250° With illuminators: 186.6°
Tilt Range	Upright unit: -58° - +90° Canted unit: -90° - +90°
Variable Pan Speed	0.2°/second - 120°/second
Variable Tilt Speed	0.2°/second - 60°/second
Pre-position Speed	120°/second
Preset Accuracy	0.17° (typical)
Proportional Pan / Tilt to Zoom	Yes
Zoom Movement Speed	<5 seconds (optical Wide to optical TELE)
	<7.5 seconds (optical Wide to digital TELE)
Audible Noise	<65dB

Electrical

Input Voltage	21-30 VAC, 50/60 Hz and/or Ethernet High PoE cable connection (56 VDC)
Power Consumption (standard model)	Without illuminator: 40 W maximum With illuminator: 70 W maximum
Power Consumption (Models for extreme low temperature)	60 W maximum

Communications / Software Control

Camera Setup/Control	Via Internet Explorer web browser version 7.0 or later, Bosch Configuration Manager, Bosch Video Management System (BVMS), Bosch Video Client (BVC), or support for third party software
Software Update	Network firmware upload

Network

Standards / Video compression	H.264 (ISO/IEC 14496-10), M-JPEG, JPEG
Streaming	Four (4) streams with individually configurable frame rate and resolution: • Two (2) independently configurable H. 264 recording streams • Two (2) non-recording streams (profiles)
Stream 1 (recording)	Options are: - H.264 MP SD - H.264 MP 720p25/30 Fixed - H.264 MP 1080p25/30 Fixed; - H.264 MP 720p50/60 Fixed

Stream 2 (recording)	Options vary depending on Stream 1 selection. Options with "H.264 MP 1080p25/30 Fixed" selected for Stream 1: - Copy Stream 1; - H.264 MP SD; - H.264 MP 720p8/10 Fixed; - H.264 MP 1080p4/5 Fixed; - H.264 MP upright (cropped); - H.264 MP D1 4:3 (cropped); Options with "H.264 MP 720p25/30 Fixed" selected for Stream 1: - H.264 MP SD; - H.264 MP 720p25/30 Fixed; - H.264 MP upright (cropped); - H.264 MP D1 4:3 (cropped); - H.264 MP 1280x960 (cropped) Option with "H.264 MP SD" selected for Stream 1: H.264 MP SD
Non-recording profiles	Two (2) streams, I-frame only Options are: - HD Image Optimized; - HD Balanced; - HD Bit Rate Optimized; - SD Image Optimized; - SD Balanced; - SD Bit Rate Optimized; - DSL Optimized; - 3G Optimized
Resolution (H x V)	
720p HD	1280 x 720
432p SD	768 x 432
288p SD	512 x 288
144p SD	256 x 144
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (v1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selftHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication
Ethernet	10BASE-T/100BASE-TX, auto-sensing, half/full duplex
Encryption	TLS 1.0, SSL, DES, 3DES, AES
Ethernet connector	RJ45
Connectivity	ONVIF Profile S, Auto-MDIX
GOP Structure	IP, IBP, IBBP
Data Rate	9.6 kbps to 6 Mbps
Overall IP Delay	240 ms

Miscellaneous

Sectors / Titling	16 independent sectors with 20 characters per title
Privacy Masking	24 individually configurable privacy masks
Virtual Masking	24 individually configurable masks to hide parts of the scene (background motion such as moving trees, pulsating lights, busy roads, etc.) which should not be considered for flow analysis to trigger Intelligent Tracking.
Pre-positions	256, each with 20 characters per title
Guard Tours	Two (2) types of tours: • Recorded tours - two (2), maximum total duration 30 minutes (depending on amount of commands sent during recording) • Preset tour - one (1), consisting of up to 256 scenes consecutively, and (1) customized up to 64 scenes
Supported Languages	English, Czech*, Dutch, French, German, Italian, Polish, Portuguese, Russian*, Spanish * Available with separate language upload

User Connections

Power, Network	Without illuminator: RJ45 100BASE-TX Ethernet High PoE midspan - 60 W (NPD-6001A) or 95 W (NPD-9501A) With illuminator: High PoE 95 W midspan (NPD-9501A)*
Power, Camera	24 VAC (power supply)
Video and Control	RJ45 100BASE-TX Ethernet RS-485 Simplex 9600 baud (dedicated for MIC-ALM-WAS-24)
Alarm/Washer	3-wire RS-485

* Must purchase either NPD-9501A or VIDEOJET connect 7000 in order to use the High PoE solution.

Environmental

Note: Unit includes internal heater and fan.

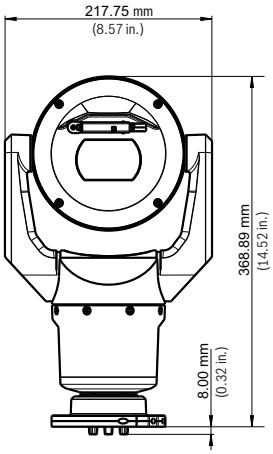
Ingress Protection Rating/ Standard	IP68 NEMA 6P, when using installed MIC-DCA or MIC wall mount IP67 (moisture and dust) rating on connectors in the base of the camera
External Mechanical Impact (IK Code or Impact rating)	IK10
Operating Temperature (standard models)	-40 °C to +60 °C (-40 °F to +140 °F)
Operating Temperature (Models for extreme low temperature)	-60 °C to +50 °C (-76 °F to +122 °F)

Cold Start-up Temperature	(Requires 60-minute warm-up prior to PTZ operations.)
Standard models	-40 °C (-40 °F)
Models for extreme low temperature	-60 °C (-76 °)
Storage Temperature	-60 °C to +70 °C (-76 °F to +158 °F)
Humidity	0-100%
Wind Load	209 km/h (130 mph) (sustained) (Gusts up to 290 km/h (180 mph)) Effective Projected Area (EPA): 0.044m² (0.47 ft²)
Vibration	IEC 60068-2-6, Test Fc: Vibration (sinusoidal), 20m/s² (2.0g) Sinusoidal vibration test IAW MIL-STD-167-1A
Shock	IEC 60068-2-7, Test Ea: Shock, 20g Medium weight Hammer Shock IAW MIL-S-901D

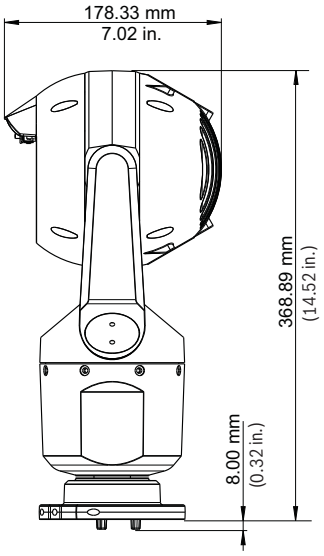
Construction

Dimensions (W x H x D) (Standard models)	Without illuminator accessory or sunshield: *Upright, Inverted:* 217.75 mm x 368.89 mm x 178.33 mm (8.57 in. x 14.52 in. x 7.02 in.) *Canted:* 217.75 mm x 330.96 mm x 239.68 mm (8.57 in. x 13.03 in. x 9.44 in.) Without illuminator accessory, but with sunshield: *Upright, Inverted:* 217.75 mm x 372.20 mm x 178.33 mm (8.57 in. x 14.65 in. x 7.02 in.) *Canted:* 217.75 mm x 334.27 mm x 239.68 mm (8.57 in. x 13.16 in. x 9.44 in.) With illuminator accessory: *Upright, Inverted:* 217.75 mm x 439.91 mm x 178.33 mm (8.57 in. x 17.32 in. x 7.02 in.) *Canted:* 217.75 mm x 401.98 mm x 239.68 mm (8.57 in. x 15.83 in. x 9.44 in.)
Dimensions (W x H x D) (Models for extreme low temperature)	*Upright, Inverted:* 217.75 mm x 372.20 mm x 178.33 mm (8.57 in. x 14.65 in. x 7.02 in.) *Canted:* 217.75 mm x 334.27 mm x 239.68 mm (8.57 in. x 13.16 in. x 9.44 in.)
Weight	6.7 kg (14.7 lb)
Viewing Window	Tempered flat glass
Construction Material	Cast solid aluminum
Standard Colors	Black (RAL 9005), White (RAL 9010), or Grey (RAL 7001, available in specific regions only)
Standard Finish	Corrosion protection surface treatment with powder coat paint, sand finish
Window Wiper	Standard, long-life silicone wiper
Sunshield	Optional; sold separately
Canting	On-site canting functionality

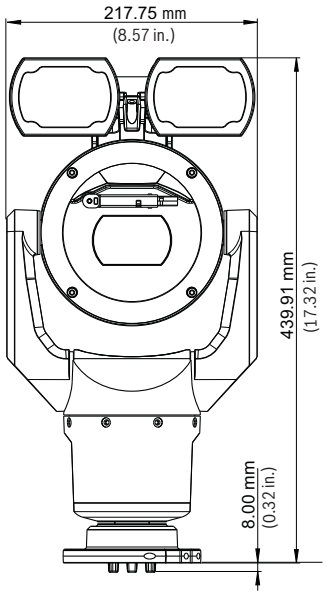
Dimensional Drawings



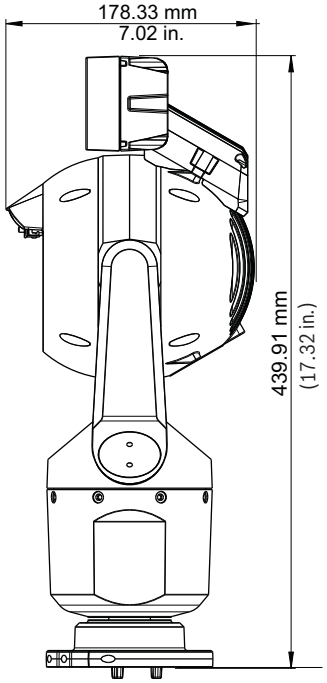
Front view - upright



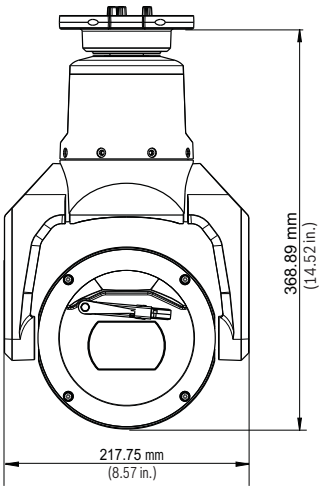
Side view - upright



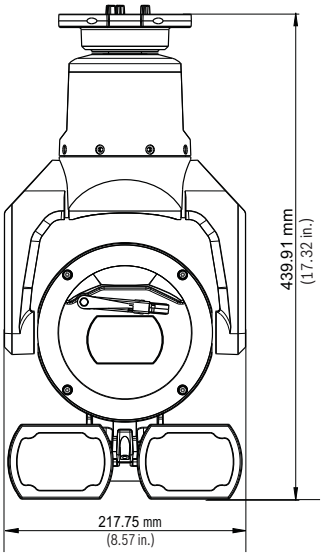
Front view, with illuminator - upright



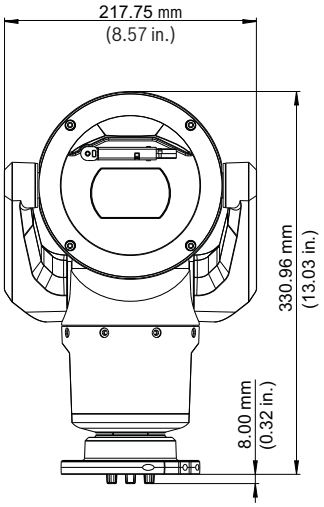
Side view, with illuminator - upright



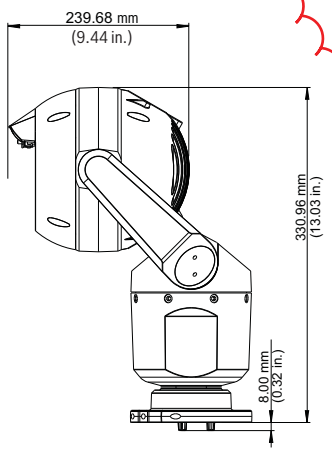
Front view - inverted



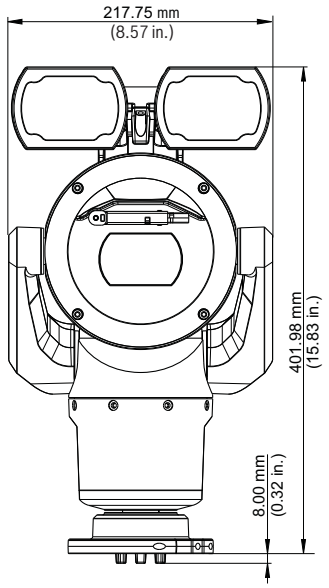
Front view, with illuminator - inverted



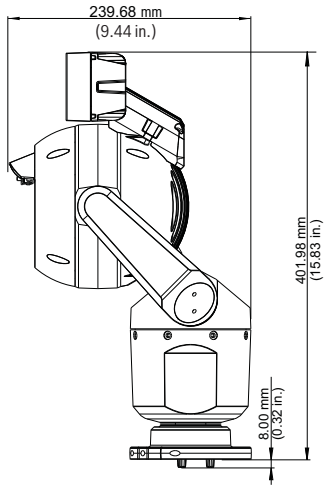
Front view - canted



Side view - canted



Front view, with illuminator - canted



Side view, with illuminator - canted

Ordering information

MIC-7130-PB4 Ruggedized HD Camera
Ruggedized 720p50/60 HD PTZ day/night camera with 30x zoom, excellent low-light imaging, IVA. Easy install with hinged DCA mount (sold separately). Optional illuminator (sold separately).
Black (RAL 9005). Sand finish.
Order number **MIC-7130-PB4**

MIC-7130-PW4 Ruggedized HD Camera
Ruggedized 720p50/60 HD PTZ day/night camera with 30x zoom, excellent low-light imaging, IVA. Easy install with hinged DCA mount (sold separately). Optional illuminator (sold separately).
White (RAL 9010). Sand finish.
Order number **MIC-7130-PW4**

MIC-7130-PG4 Ruggedized HD Camera
Ruggedized 720p50/60 HD PTZ day/night camera with 30x zoom, excellent low-light imaging, IVA. Easy install with hinged DCA mount (sold separately). Optional illuminator (sold separately).
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-7130-PG4**

Accessories

MIC-ILB-100 Illuminator, IR/White light combo, Black
Illuminator accessory for MIC7000 Series.
Combination of IR (850 nm) + White light (6700K) LEDs.
Black (RAL 9005). Sand finish.
Not applicable to models for extreme low temperature.
Order number **MIC-ILB-100**

MIC-ILW-100 Illuminator, IR/White light combo, White
Illuminator accessory for MIC7000 Series.
Combination of IR (850 nm) + White light (6700K) LEDs.
White (RAL 9010). Sand finish.
Not applicable to models for extreme low temperature.
Order number **MIC-ILW-100**

MIC-ILG-100 Illuminator, IR/White light combo, Grey
Illuminator accessory for MIC7000 Series.
Combination of IR (850 nm) + White light (6700K) LEDs.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Not applicable to models for extreme low temperature.
Order number **MIC-ILG-100**

High PoE Midspan, 95 W, single port, AC in
High PoE, 95 W, Single Port Midspan with AC in
Order number **NPD-9501A**

High PoE Midspan, 60 W, single port, AC in
High Power, 60 W Single Port PoE Midspan with AC in
Order number **NPD-6001A**

VG4-A-PSU1 120 VAC Power Supply Unit
Power supply with transformer, 120 VAC input, for an AUTODOME or MIC7000 Series PTZ camera. White, aluminum enclosure with cover, rated IP66 and IK 08. 100 W output. Optional trim skirt (sold separately).
Order number **VG4-A-PSU1**

VG4-A-PSU2 230 VAC Power Supply Unit
Power supply with transformer, 230 VAC input, for an AUTODOME or MIC7000 Series PTZ camera. White, aluminum enclosure with cover, rated IP66 and IK 08. 100 W output. Optional trim skirt (sold separately).
Order number **VG4-A-PSU2**

MIC7000 Alarm/Washer Interface Unit
Interface box for alarms and washer pump connections for MIC7000 cameras, 24 VAC. Impact-resistant polycarbonate enclosure, rated to IP67 and NEMA 4X, with four (4) watertight glands. Grey (RAL 7035).
Gränssnittsruta för larm och anslutningar för rengöringspump för MIC7000 kameror, 24 VAC. Kapsling i stöttåligt polykarbonat (IP76- och NEMA 4X-klassificerat) med fyra (4) vattentäta anslutningar. Grå (RAL 7035).
Order number **MIC-ALM-WAS-24**

MIC-DCA-HB MIC Hinged DCA, Black
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands.
Black (RAL 9005). Sand finish.
Order number **MIC-DCA-HB**

MIC-DCA-HBA MIC Hinged DCA with Adapter, Black
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
Black (RAL 9005). Sand finish.
Order number **MIC-DCA-HBA**

MIC-DCA-HW MIC Hinged DCA, White
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands.
White (RAL 9010). Sand finish.
Order number **MIC-DCA-HW**

MIC-DCA-HWA MIC Hinged DCA with Adapter, White
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
White (RAL 9010). Sand finish.
Order number **MIC-DCA-HWA**

MIC-DCA-HG MIC Hinged DCA, Grey
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-DCA-HG**

MIC-DCA-HGA MIC Hinged DCA with Adapter, Grey
DCA mount for a MIC7000 camera. Hinge allows camera to hang temporarily during installation for easier connection of cables/wiring. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
Grey (RAL 7001). Sand finish.
Order number **MIC-DCA-HGA**

MIC-WMB-BD Wall Mount Bracket, Black
Wall mount bracket, black sand finish (RAL9005)
Order number **MIC-WMB-BD**

MIC-WMB-WD Wall Mount Bracket, White
Wall mount bracket, white sand finish (RAL9010)
Order number **MIC-WMB-WD**

MIC-WMB-MG Wall Mount Bracket, Grey
Wall Mount Bracket.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-WMB-MG**

MIC-PMB Pole Mount Bracket
Pole mount bracket (includes 2 x 455 mm stainless steel banding straps for pole diameters 75 to 145 mm)
Order number **MIC-PMB**

MIC-CMB-BD Corner Mount Bracket, Black
Corner mount bracket, black sand finish (RAL9005)
Order number **MIC-CMB-BD**

MIC-CMB-WD Corner Mount Bracket, White
Corner mount bracket, white sand finish (RAL9010)
Order number **MIC-CMB-WD**

MIC-CMB-MG Corner Mount Bracket, Grey
Corner mount bracket.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-CMB_MG**

MIC-SPR-BD Spreader Plate, Black
Aluminum spreader plate suitable for brickwork surface mounting, black sand finish (RAL9005)
Order number **MIC-SPR-BD**

MIC-SPR-WD Spreader Plate, White
Aluminum spreader plate suitable for brickwork surface mounting, white sand finish (RAL9010)
Order number **MIC-SPR-WD**

MIC-SPR-MG Spreader Plate, Grey
Aluminum spreader plate suitable for brickwork surface mounting.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-SPR-MG**

MIC-SCA-BD Shallow Conduit Adapter, Black
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR, black sand finish (RAL9005)
Order number **MIC-SCA-BD**

MIC-SCA-WD Shallow Conduit Adapter, White
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, white sand finish (RAL9010)
Order number **MIC-SCA-WD**

MIC-SCA-MG Shallow Conduit Adapter, Grey
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-SCA-MG**

MIC-67SUNSHLD
Three-part molded sunshield for MIC7000 cameras – 1 bottom shell, 2 top shells (1 for around the optional illuminator accessory). White.
Order number **MIC-67SUNSHLD**

MIC7000 IP67 Connector Kit, 5Pack
Order number **MIC-IP67-5PK**

MIC-WKT-IR Washer Kit
Washer kit for analog infrared MIC camera models and for MIC7000 camera models only. Includes washer nozzle and mounting brackets for wall or 101.6 mm (4 in.) PCD base. Requires washer pump, purchase separately.
Order number **MIC-WKT-IR**

Represented by:

Americas:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

Europe, Middle East, Africa:
Bosch Security Systems B.V.
P.O. Box 80002
5617 BA Eindhoven, The Netherlands
Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

Asia-Pacific:
Robert Bosch (SEA) Pte Ltd, Security Systems
11 Bishan Street 21
Singapore 573943
Phone: +65 6571 2808
Fax: +65 6571 2699
apr.securitysystems@bosch.com
www.boschsecurity.asia

China:
Bosch (Shanghai) Security Systems Ltd.
201 Building, No. 333 Fuquan Road North IBP
Changning District, Shanghai
200335 China
Phone +86 21 22181111
Fax: +86 21 22182398
www.boschsecurity.com.cn

America Latina:
Robert Bosch Ltda Security Systems Division
Via Anhanguera, Km 98
CEP 13065-900
Campinas, Sao Paulo, Brazil
Phone: +55 19 2103 2860
Fax: +55 19 2103 2862
latam.boschsecurity@bosch.com
www.boschsecurity.com

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9437875723 | en, V3, 24. Nov 2014

APPENDIX E

PIEZOELECTRIC SENSOR CONNECTOR AND DETECTOR ISOLATION

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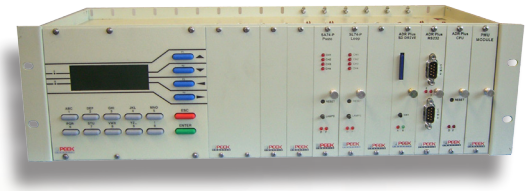
ADR 3000 Plus

Traffic Counter/Clasifier



The Peek ADR-3000 Plus is a high performance traffic counter and classifier designed for permanent installation. With the various options, the ADR-3000 Plus can count up to 64, or classify up to 32 lanes of traffic, including up to 24 WIM sensor inputs.

Several exclusive features have been incorporated into the ADR-3000 Plus. The CPU electronics are fitted with a replaceable socket mounted fuse. Front panel mounted LED's indicate a successful start up of the microprocessor. LEDs also warn of system fault conditions and indicate the communications port activity and status. Additionally, a reset switch mounted on the front panel of the ADR-3000 Plus providing an easy method of restarting a unit during diagnostics, similar to cycling power.

Each unit can perform up to eight studies, plus generate per-vehicle records, with up to 4096 bins of data. This could include, for example, classification by speed, by lane, and volume. The type, configuration, and format of data to be collected can be custom programmed or selected from menu-driven choices. Available data types include per-vehicle records, per-lane data, binned vehicle classification by axle, speed, length, gap, or headway, or almost any combination of these classifications. Vehicles can also be classified according to either a Scheme "F" or a user-defined classification scheme.

Quality Assurance Testing

Each unit is individually tested for correct operation during a computer controlled environmental chamber test cycle, based on the NEMA TS/2 standards. All input circuits have been designed and tested to the NEMA TS/2 standards for surge (lightning) protection.

Features

- Simple to set up and operate
- 2 MB onboard memory (1 MB accessible)
- Multilane operation
- SD memory option for additional storage
- Up to 64 inputs with a variety of sensor options
- Scheme "F" or user-defined classification scheme
- High-speed communications and telemetry
- U.S. standard or metric units
- Optional integrated control panel with LCD readout
- Solar power options
- Battery "sentinel"
- Auto daylight savings timer

Optional Features

The Peek ADR-3000 Plus is an instrument rack-based unit, expandable by function with individual plug-in modules. Available to fit standard EIA 19" or Type 170 enclosures, the Peek ADR-3000 Plus may also be shelf or panel mounted.Electrical connections (external) are via rear mounted terminal strips for sensor inputs. Communications are supported via an RS232-C connector. Plug-in modules can consist of power supply, central processing unit, communications, control panel, memory, loop sensors, piezo sensors, weigh-in-motion sensors, contact closure inputs, analog to digital inputs or a combination of these for a particular application. Individual plug-in modules are Eurocard in size with DIN standard connectors. Typical module width is 1 inch.

Power options include 115 VAC, 6 or 12 VDC, solar power and operational battery-backup as necessary. An internally supported hardware real time clock maintains time and date, regardless of unit power, for up to ten years.

Two Year Limited Warranty

Peek Traffic warrants this product against manufacturing defects in materials and workmanship for two years from date of shipment from Peek Traffic. Specific contracts and regional laws may vary or alter these terms.

Peek Traffic Corporation, a Signal Group Company
2906 Corporate Way Palmetto, FL
34221 (941) 845-1200 | (800) 245-7660 www.peektraffic.com

Specifications

Dimensions	5.25”H x (10” or 19”) W x 9.35”D (135mm x (255-480)mm x 240mm)
Weight	Less than 15 pounds (6.8 kg)
Temperature	-40°F to +165°F (-40°C to +74°C)
Display	20 digits x 4 line liquid crystal display
Inputs	24 sensor inputs of various types allowed, optionally up to 64
Counter rate	Handles 200 counts, per second, per input
Interval	1, 2, 5, 6, 10, 15, 30 and 60 minutes 2, 3, 6, 12 and 24 hours, real time events Four daily peak periods available
Microprocessor	Intel 80C186
Capacity	Approximately 3,280 days of volume data
Communications	Selectable RS-232 serial baud rates between 300 and 19,200 baud (115,200 baud-optional), via a UL and CSA approved female socket, with up to three ports available
Options	Up to 8 sensor input modules or 64 individual inputs, depending on actual configuration, that can be a combination of loop, piezo, WIM or contact closure inputs
	Front panel keypad and display
	SD memory card socket
	Solar power option
	Compatible with the AxleLight® laser sensor

Support Software

A user-friendly Windows™ software package is available to complement the Peek ADR-3000 Plus. This software is the Traffic Operations Processing Software (TOPS) program from Peek Traffic.

The TOPS program provides multi-file processing, stores data files into a single database for easy file sharing among TOPS users, allows for edit and preview of reports before printing, provides for ADR data processing protocols,enables remote or local setup of Peek ADR units and collection of data by direct manual connection or by the added functionality of automatic polling of field sites via modem connection (auto polling and weigh-inmotion support are add-in options). The TOPS program reads all files and generates a suite of daily, weekly and monthly reports. A user definable classification function, within the program, provides the ability to customize classification and to transfer the new scheme to the Peek ADR-3000 Plus. Processed data may be exported to various other software packages.

Peek Traffic Corporation
A Signal Group Company
2906 Corporate Way
Palmetto, FL 34221
(941) 845-1200 | (800) 245-7660
www.peektraffic.com

About Signal Group – covers a broad range of quality turnkey traffic control products and services. Signal Group products have helped to make motorists around the world safer and their travels more pleasant and efficient. This expertise, experience, and breadth of product lines has made Signal Group one of the most respected and recognized leaders in the traffic control marketplace

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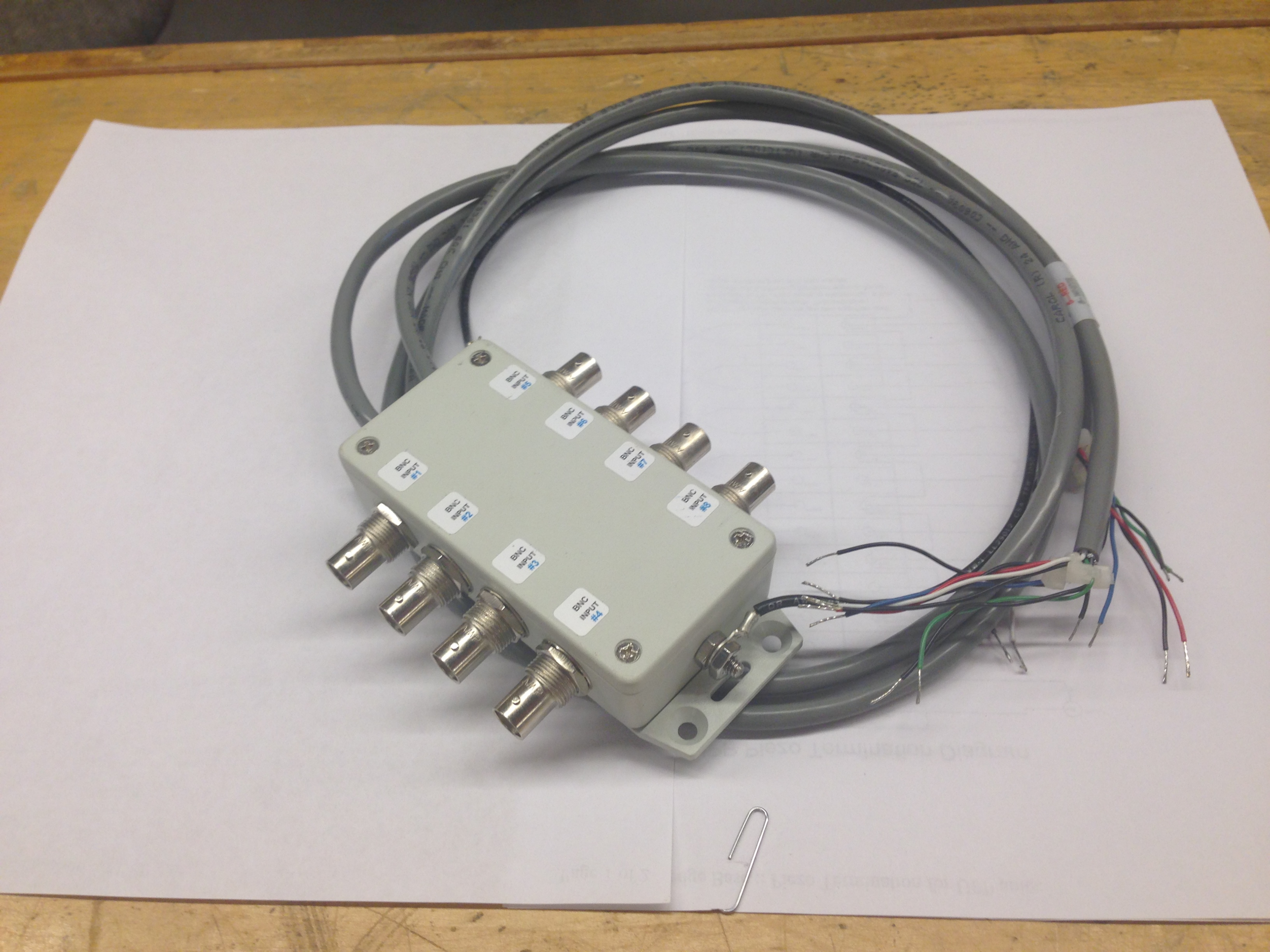
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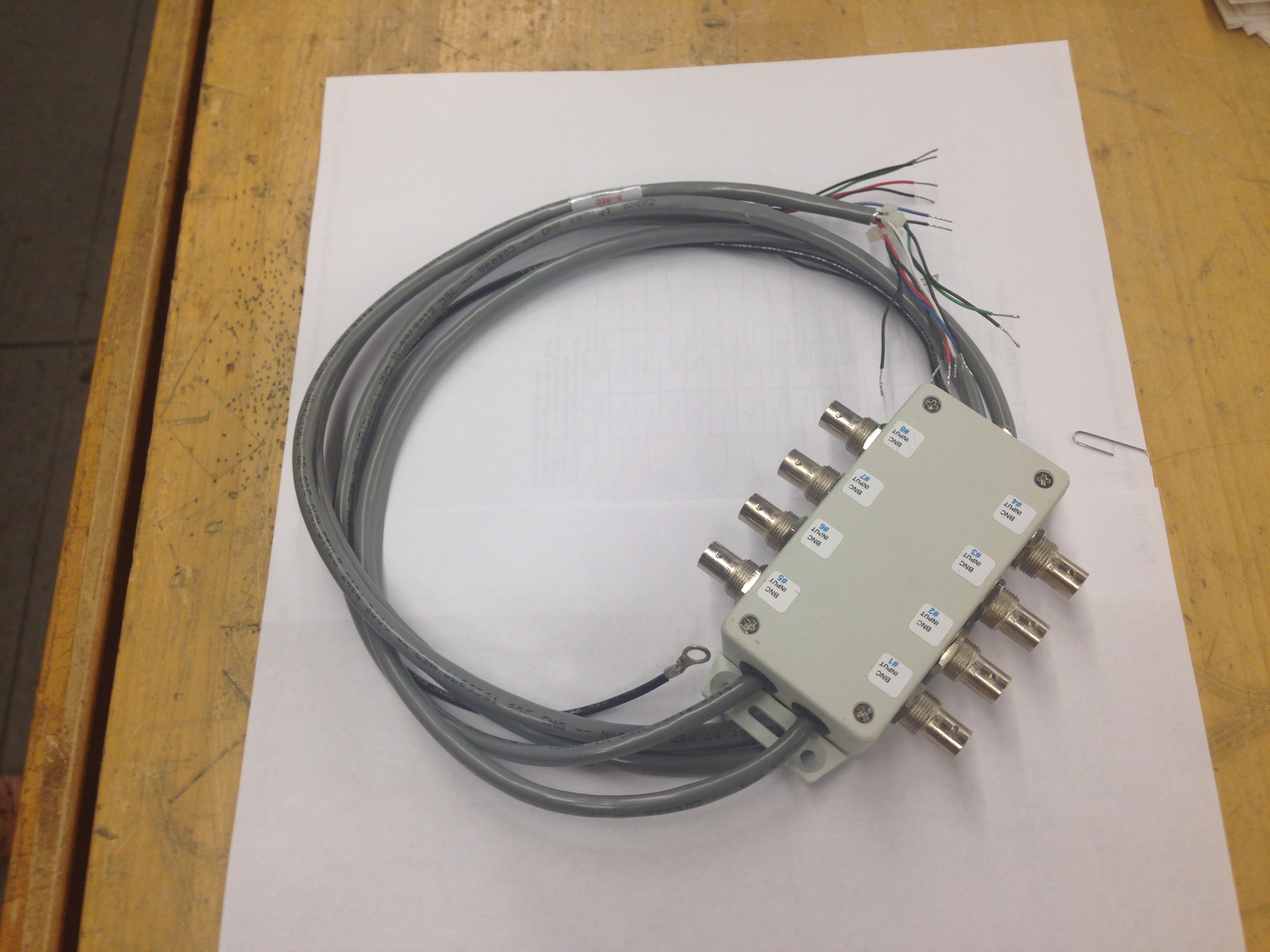
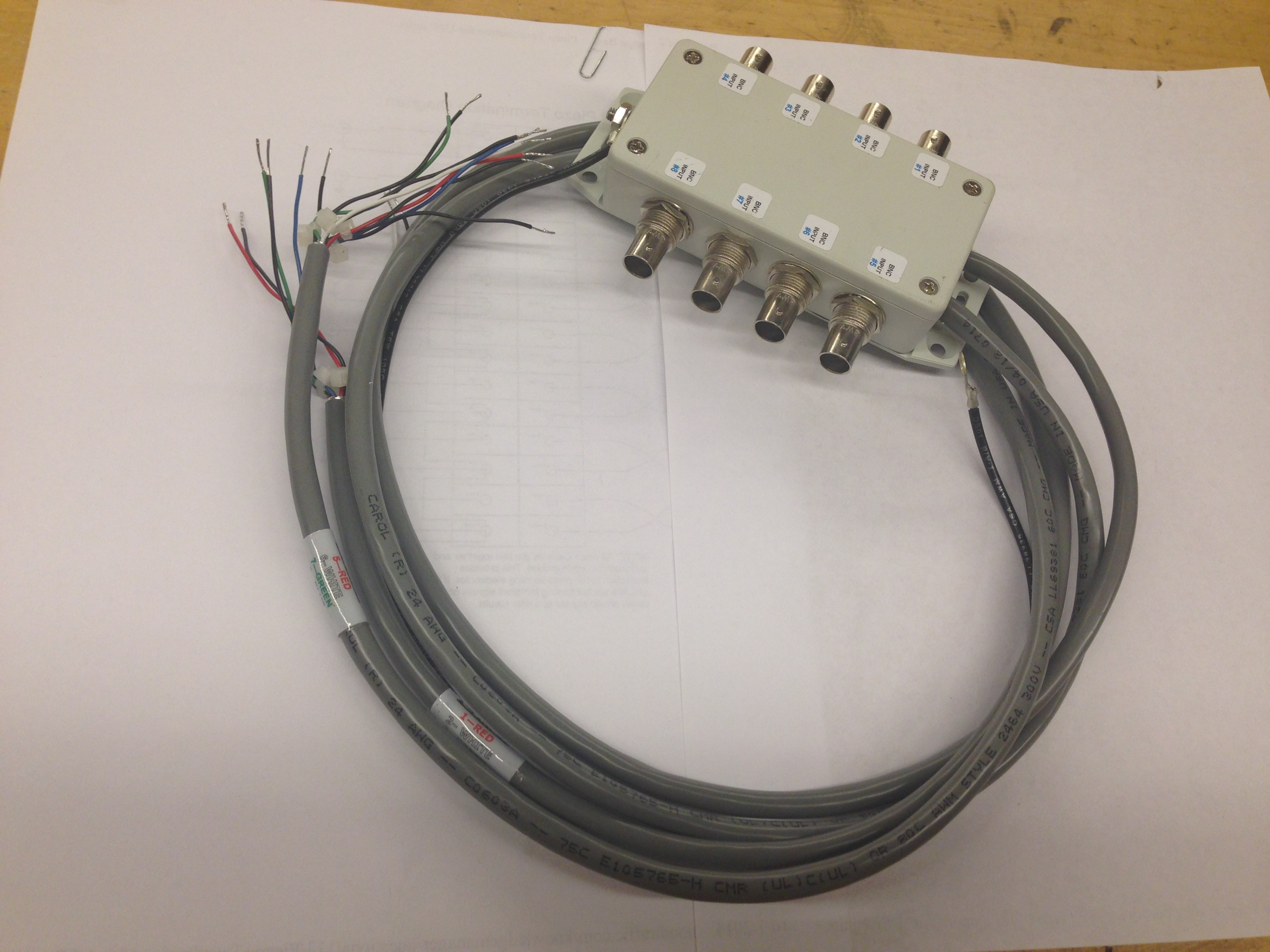
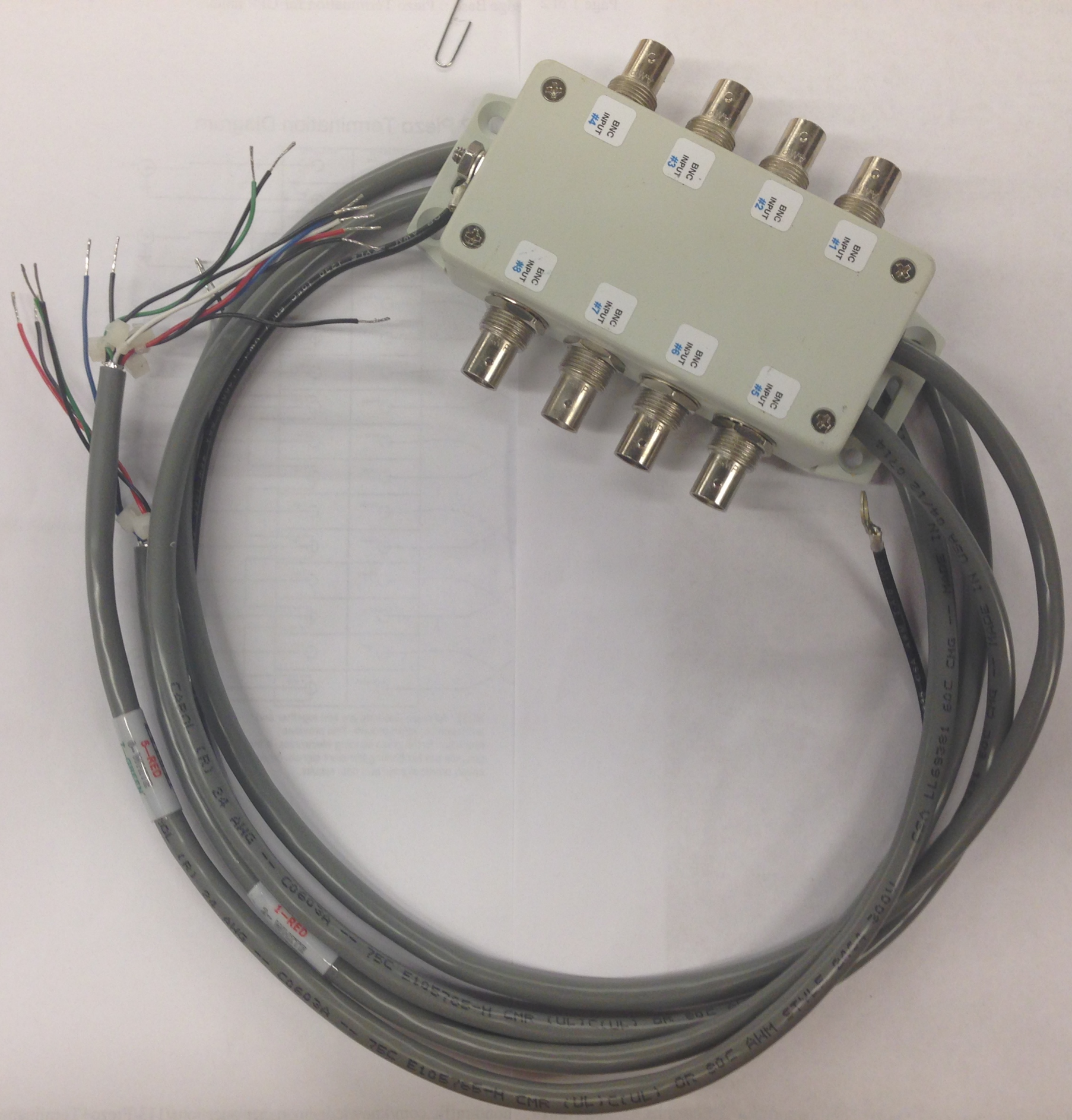
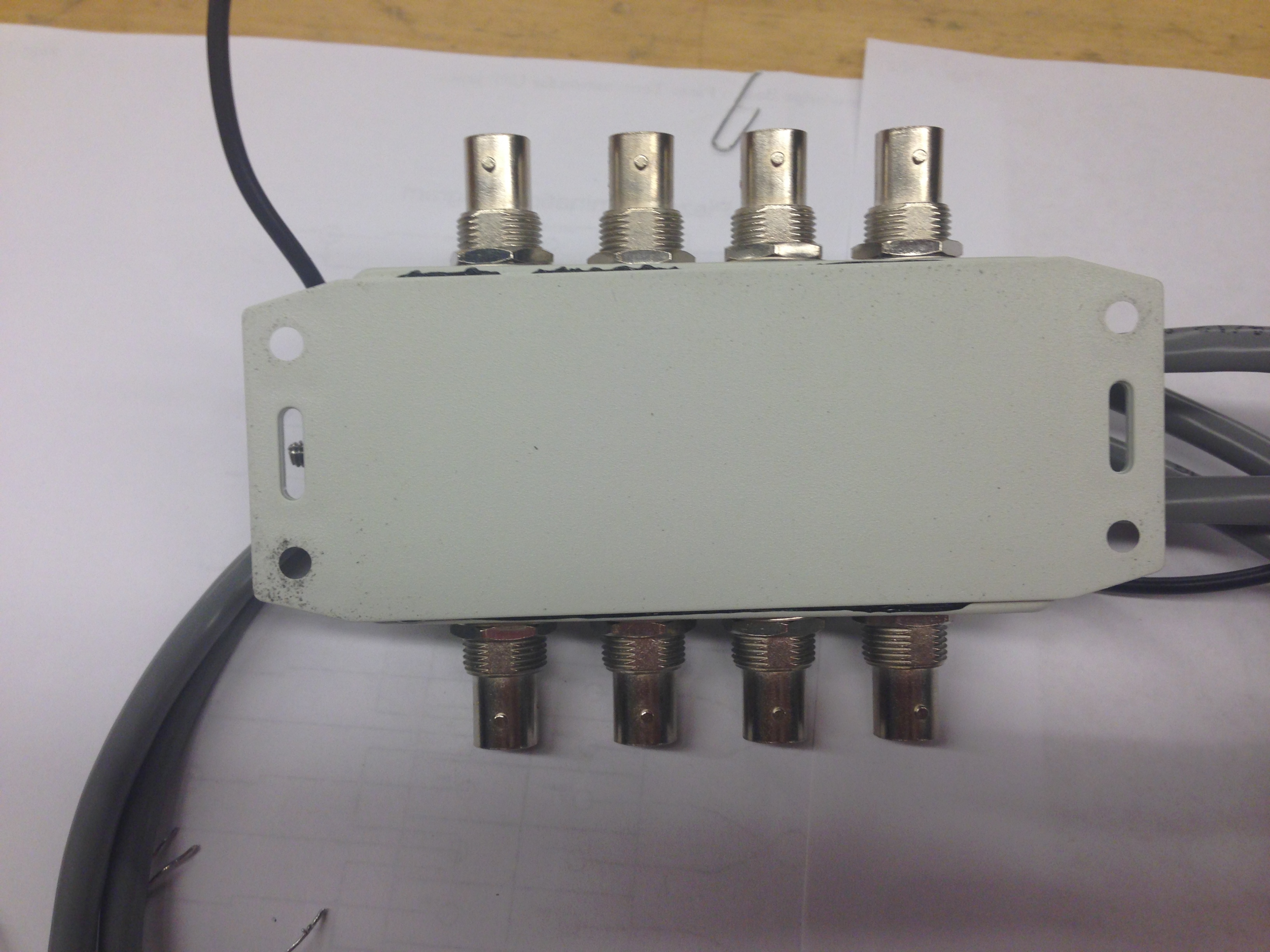
BNC INPUT #2
BNC INPUT #3
BNC INPUT #4
BNC INPUT #5
BNC INPUT #6
BNC INPUT #7
BNC INPUT #8
CAT-5E

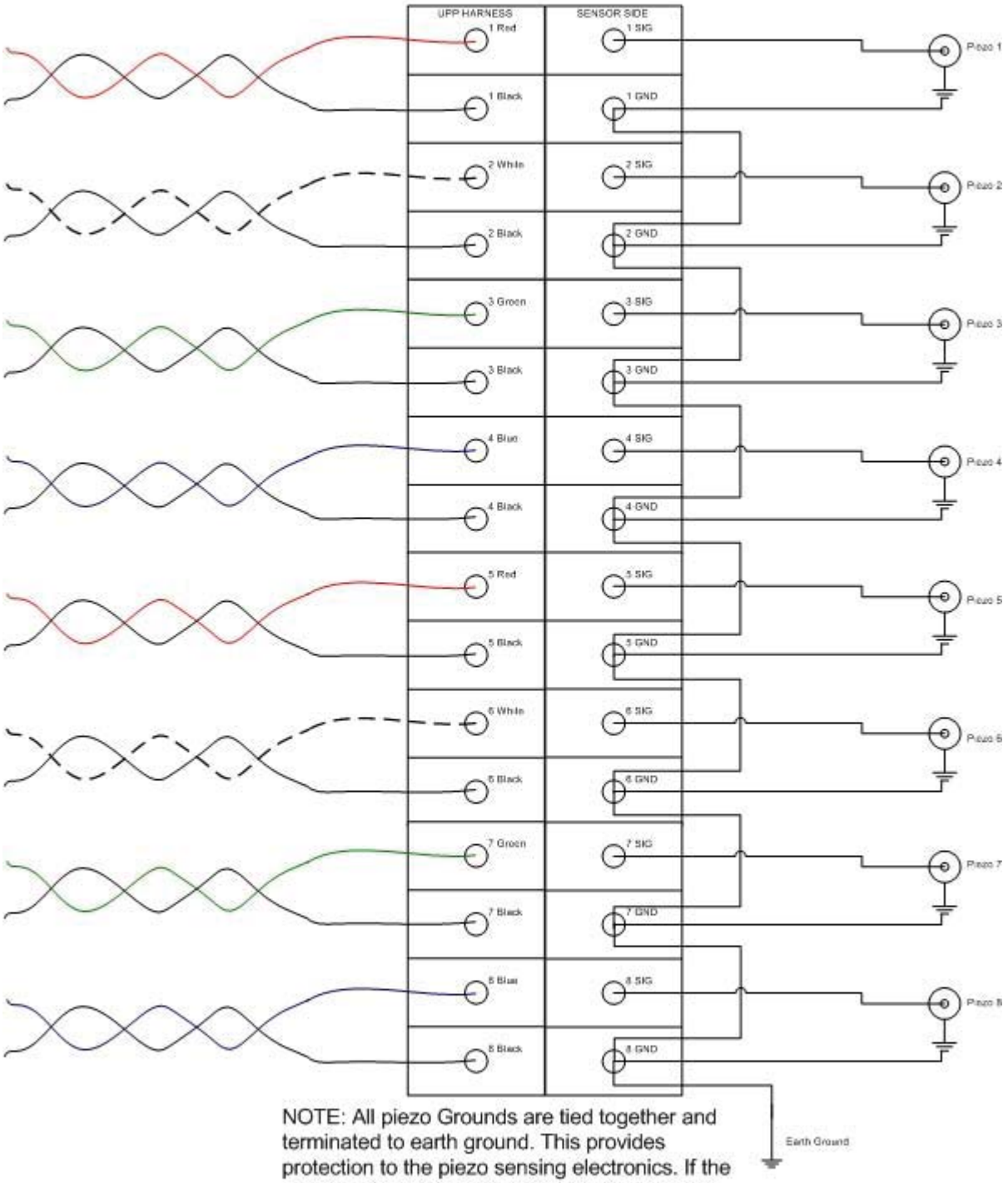

BNC INPUT #9
BNC INPUT #7
BNC INPUT #6
BNC INPUT #5
BNC INPUT #4
BNC INPUT #3
BNC INPUT #2
BNC INPUT #1


BNC INPUT #4
BNC INPUT #3
BNC INPUT #2
BNC INPUT #1
BNC INPUT #8
BNC INPUT #7
BNC INPUT #6
BNC INPUT #5
5—RED
6—WHITE
7—GREEN
1—RED
2—WHITE
CAROL (R) 24 AWG -- C0603A -- 75C E106766-H CMR (UL)C(UL) CR 20C AWM STYLE 2464 300V -- CSA LL89371 60C CMG -- MADE IN USA 04/18 0714

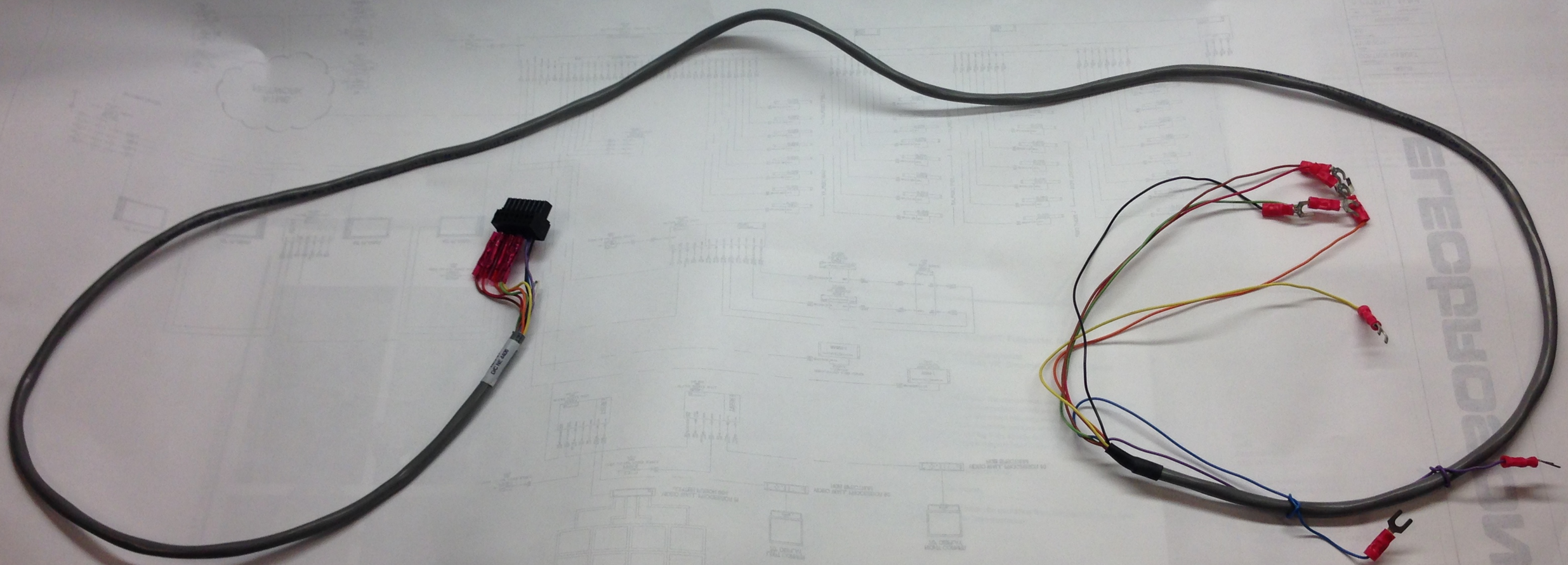

BNC INPUT #4
BNC INPUT #3
BNC INPUT #2
BNC INPUT #1
BNC INPUT #8
BNC INPUT #7
BNC INPUT #6
BNC INPUT #5
8-RED
1-RED

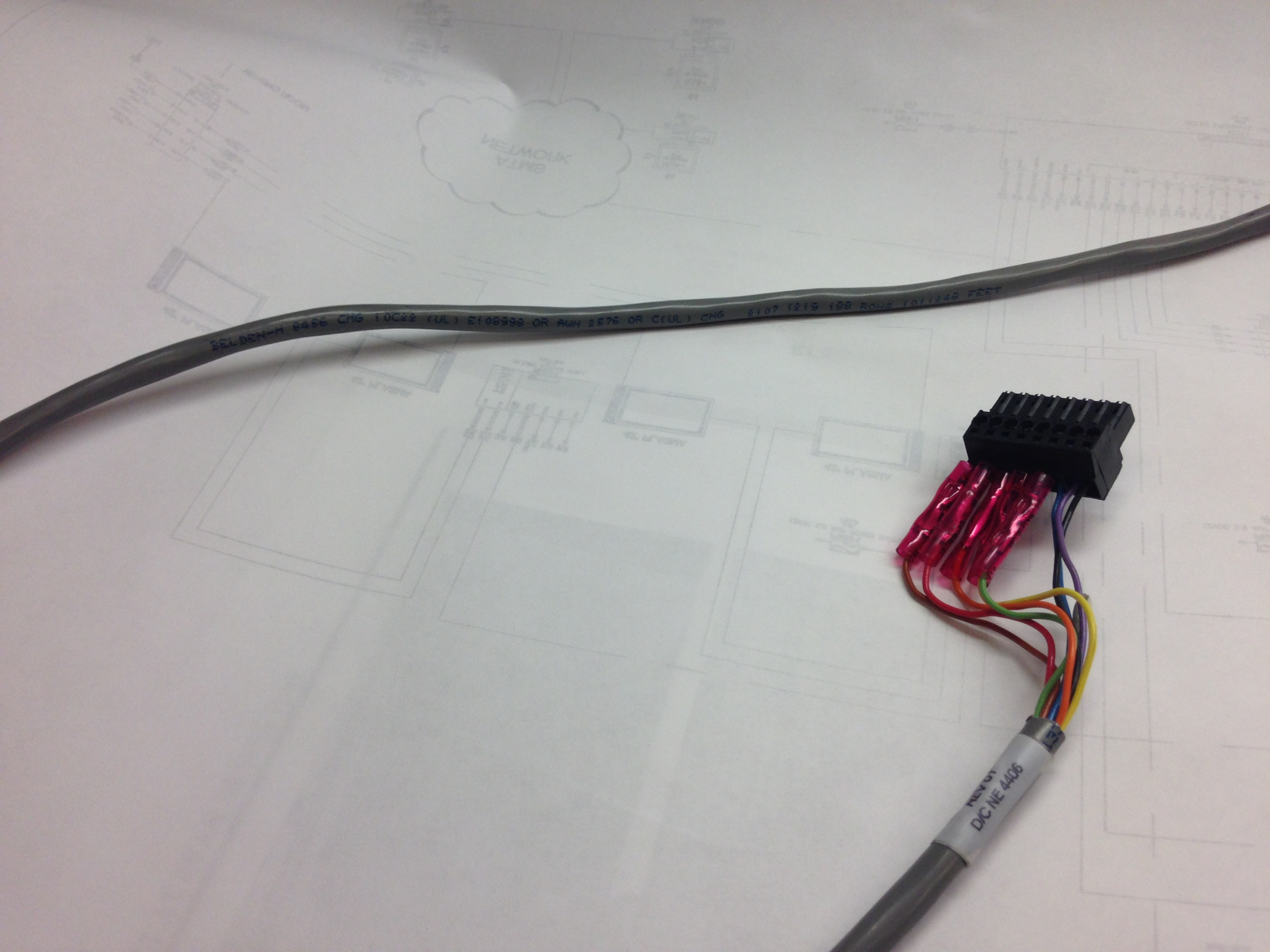

4

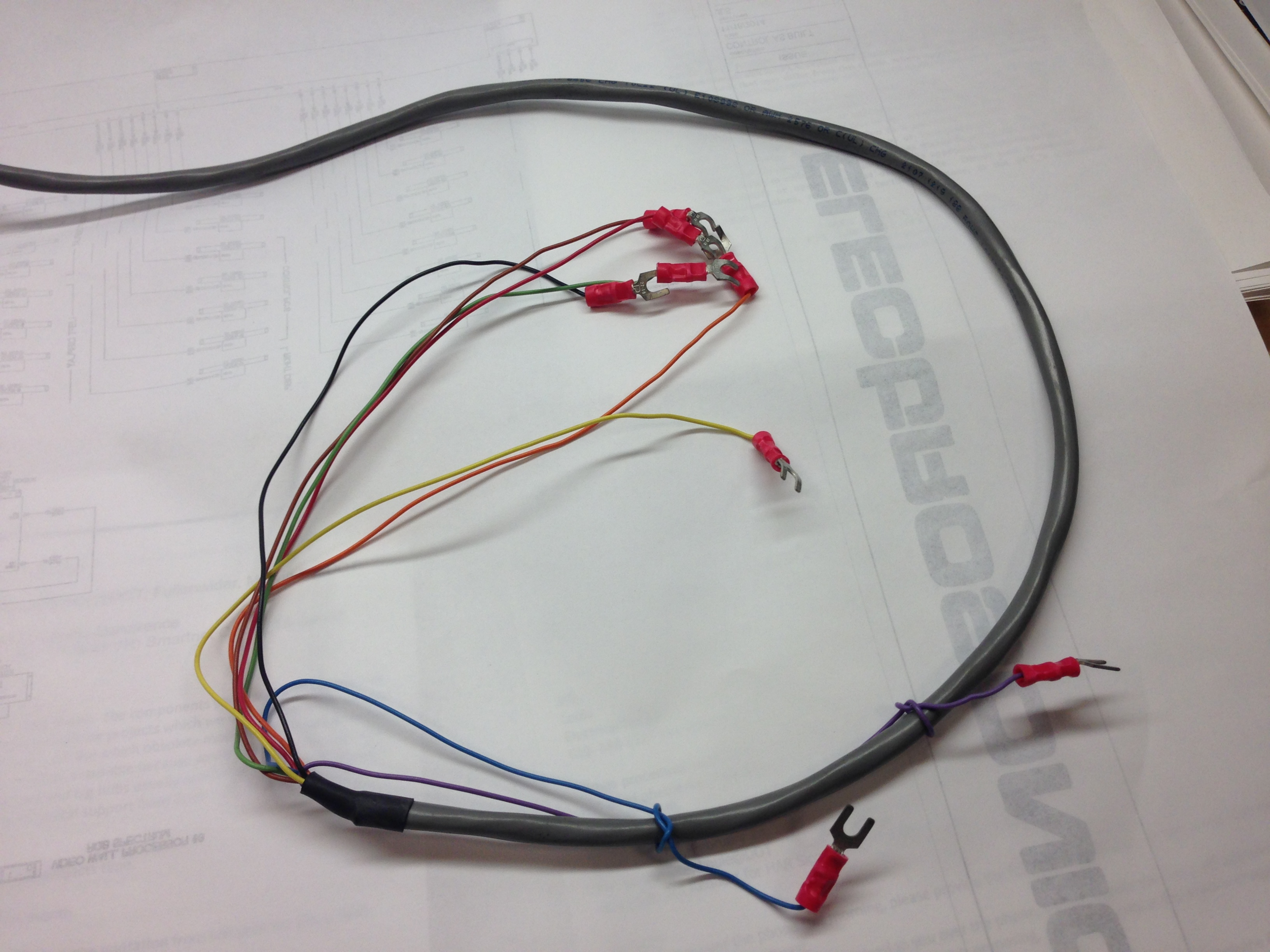
UPP Piezo Termination Diagram

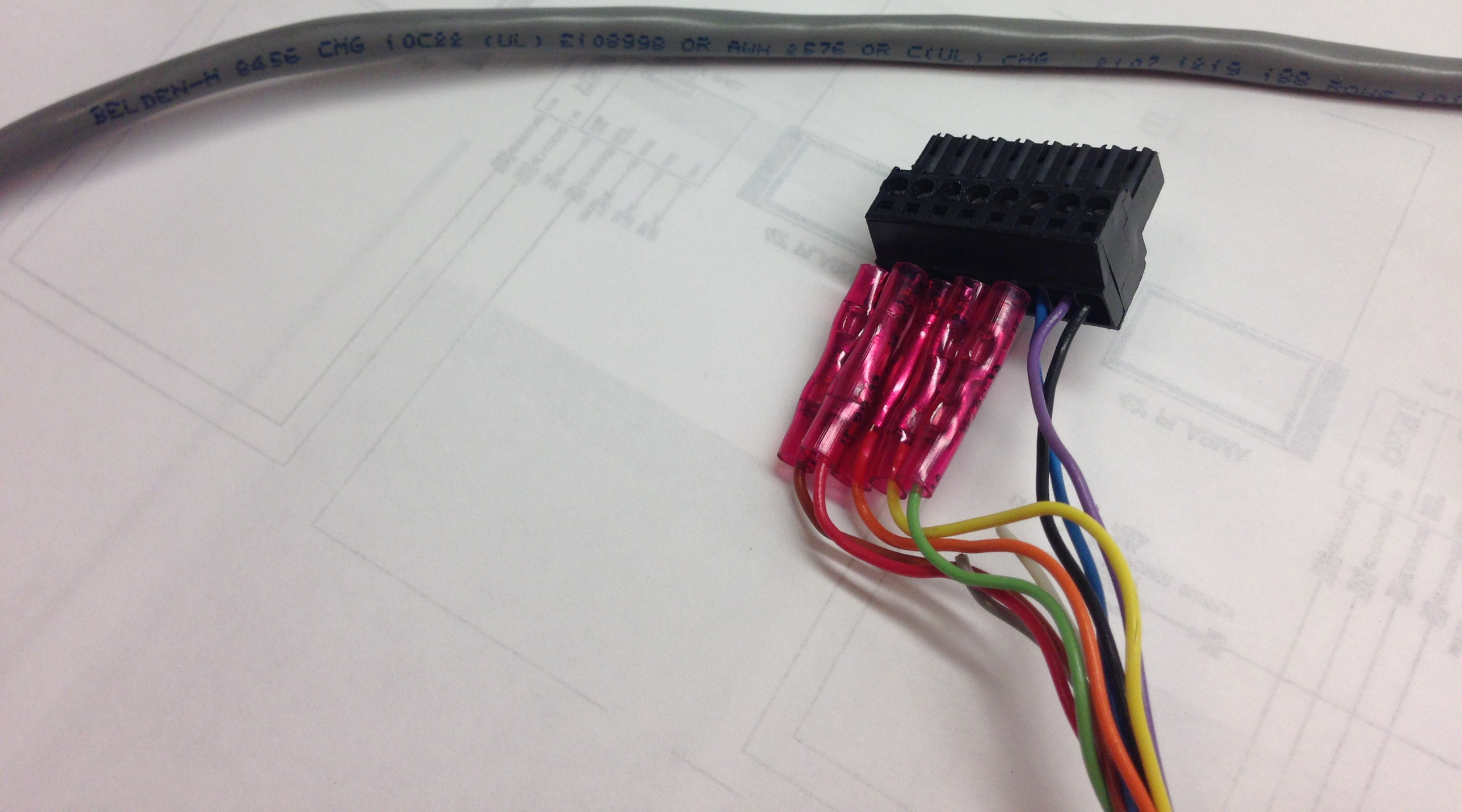


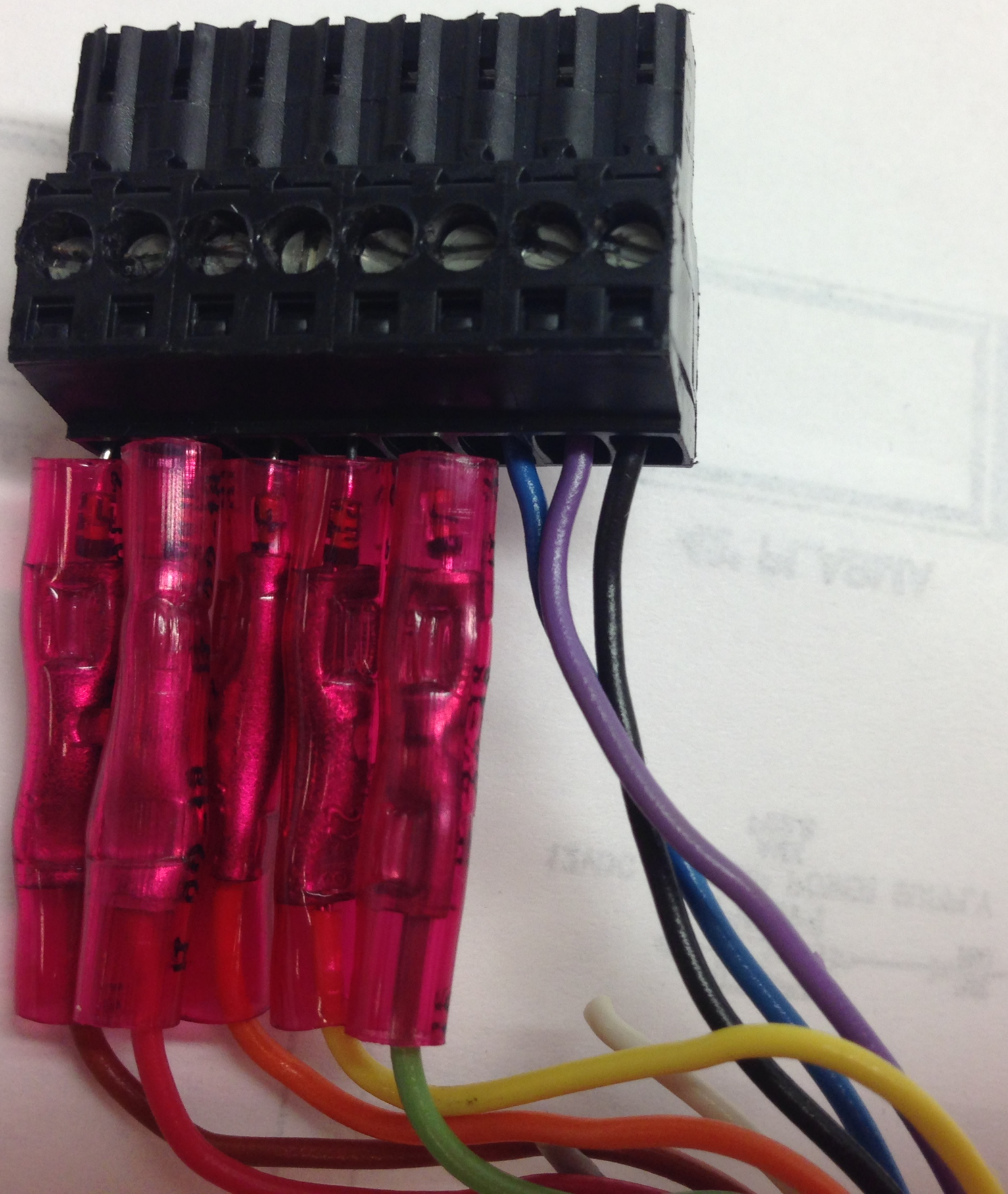
NOTE: All piezo Grounds are tied together and terminated to earth ground. This provides protection to the piezo sensing electronics. If the grounds are left floating transient signals could cause erratic signals and data results.

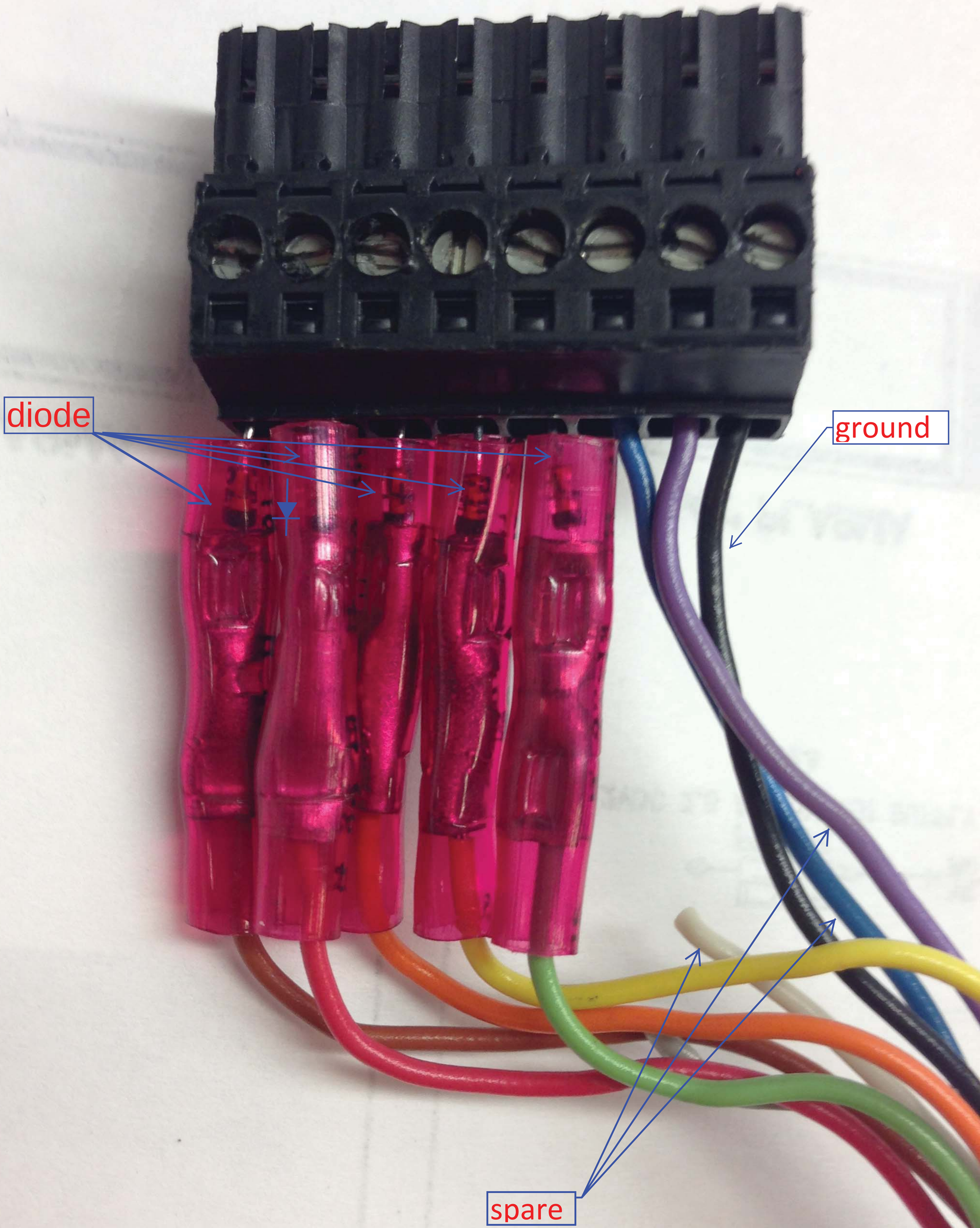



BELDEN-M 8466 CMG 10C22 (UL) E108998 OR AWM 2576 OR C(UL) CMG
DIC NE 4406




BELDEN-H 8456 CMG
(UL)
OR
OR
(UL)
CMG




diode
ground
spare

Small Signal Fast Switching Diodes

FEATURES

- Silicon epitaxial planar diode
- Electrically equivalent diodes: 1N4148 - 1N914

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Extreme fast switches

MECHANICAL DATA

Case: DO-35
Weight: approx. 105 mg
Cathode band color: black
Packaging codes/options:
TR/10K per 13" reel (52 mm tape), 50K/box
TAP/10K per ammopack (52 mm tape), 50K/box

PARTS TABLE

PART	ORDERING CODE	TYPE MARKING	INTERNAL CONSTRUCTION	REMARKS
1N4148	1N4148-TAP or 1N4148TR	V4148	Single diode	Tape and reel/ammopack

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Repetitive peak reverse voltage		V_{RRM}	100	V
Reverse voltage		V_R	75	V
Peak forward surge current	t_p = 1 µs	I_{FSM}	2	A
Repetitive peak forward current		I_{FRM}	500	mA
Forward continuous current		I_F	300	mA
Average forward current	V_R = 0	$I_{F(AV)}$	150	mA
Power dissipation	l = 4 mm, T_L = 45 °C	P_{tot}	440	mW
	l = 4 mm, $T_L \leq$ 25 °C	P_{tot}	500	mW

THERMAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Thermal resistance junction to ambient air	l = 4 mm, T_L = constant	R_{thJA}	350	K/W
Junction temperature		T_j	175	°C
Storage temperature range		T_{stg}	- 65 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 10 mA	V_F			1	V
Reverse current	V_R = 20 V	I_R			25	nA
	V_R = 20 V, T_j = 150 °C	I_R			50	µA
	V_R = 75 V	I_R			5	µA
Breakdown voltage	I_R = 100 µA, t_p/T = 0.01, t_p = 0.3 ms	$V_{(BR)}$	100			V
Diode capacitance	V_R = 0 V, f = 1 MHz, V_{HF} = 50 mV	C_D			4	pF
Rectification effiency	V_{HF} = 2 V, f = 100 MHz	η_r	45			%
Reverse recovery time	$I_F = I_R$ = 10 mA, i_R = 1 mA	t_{rr}			8	ns
	I_F = 10 mA, V_R = 6 V, $i_R = 0.1 \times I_R$, R_L = 100 Ω	t_{rr}			4	ns

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

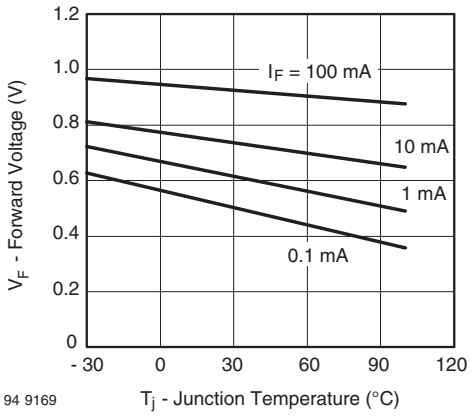


Fig. 1 - Forward Voltage vs. Junction Temperature

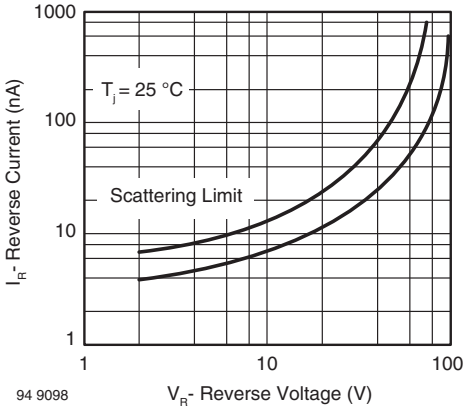


Fig. 3 - Reverse Current vs. Reverse Voltage

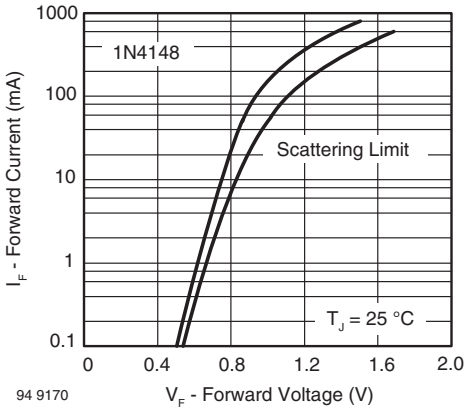
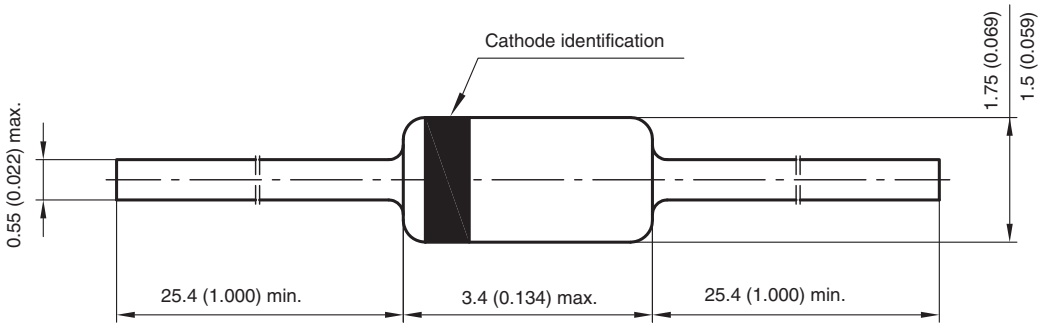


Fig. 2 - Forward Current vs. Forward Voltage


Cathode identification
1.75 (0.069)
1.5 (0.059)
0.55 (0.022) max.
25.4 (1.000) min.
3.4 (0.134) max.
25.4 (1.000) min.