



Tree Equipment



#22 - Copper Cable. 14 Strands of 17 gauge smooth twist conductor cable. 1/4" dia. miniature no. 6 size. Wt. 90 lbs. per 1,000 feet.



#32S- Copper Cable. 32 strands of 17 gauge smooth twist conductor cable. 15/32" dia. standard no. 2 size. Wt. 215 lbs. per 1,000 feet.



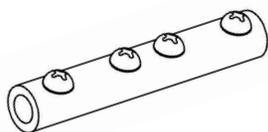
#M194 BT - Blunt Tip Air Terminal Point for standard #32S conductor cable. Wt. .20 lb. ea.

#M195 BT - Blunt Tip Air Terminal Point for miniature #22 conductor cable. Wt. .12 lb. ea.

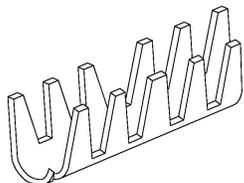


#190 - Tree Drive Fastener for standard #32S conductor cable. Wt. .10 lb. ea.

#190A - Tree Drive Fastener for miniature #22 conductor cable. Wt. .08 lb. ea.



#M3X - Straight Splicer for miniature #22 conductor cable. Wt. .10 lb. ea.



#33L- End to End Straight Splicer made of pressed copper. 3 3/4 in length for standard #32S cable. Wt. .10 lb. ea.

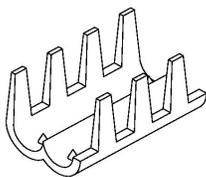


Independent Protection Co., Inc.
1607 South Main St.
Goshen, IN 46526
Website: www.ipclp.com

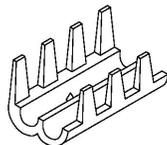
Email: info@ipclp.com
Ph: 574.533.4116
800.860.8388
Fax: 574.534.3719



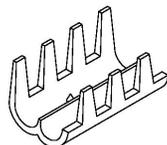
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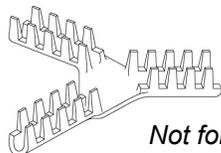
#193A - Side by Side Splicer made of cast copper/bronze for two standard #32S cables. 2" in length. Wt. .22 lb. ea.



#193X22 - Side by Side Splicer made of cast copper/bronze for two miniature #22 cables. Wt. .06 lb. ea.

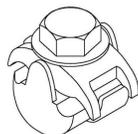


#193X - Side by Side Splicer made of cast copper/bronze for one standard #32S cable and one miniature #22 cable or for two miniature #22 cables. Wt. .06 lb. ea.

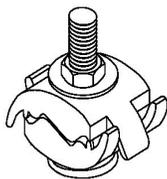


*Not for use
with #22 Cable*

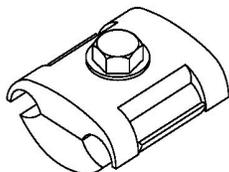
#198 - Fork Type Ground Connector. "Y" type connector is made of cast copper/bronze and is compatible with #32S cable. Wt. .38 lb. ea.



#297 - Secondary 1/2" Multi-Purpose Clamp
Cast bronze crimp splicer 3/4" length. For one primary and one secondary cable. Wt. .22 lbs. each.



#25G - Bronze Small 1" All Purpose Connector with bolt, nut and washer for connecting two cables through 1/2" dia. Adjusts to various size cables. Wt. .28 lb. ea.



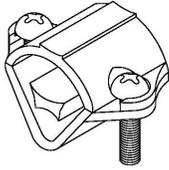
#297A - Bronze Large Many Purpose Clamp heavy duty, for clamping two standard cables through 1/2" and/or 1/2" and 5/8" rods. 2" long. Wt. .38 lb. ea.



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Fax: 574.534.3719

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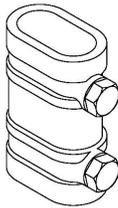


#306 - Bronze Perfection Pipe Clamp. Clamp type cable fastener, fits all standard cables through 2/0 and provides 1 1/2" contact with water pipes, rods television masts, etc. Fits 1/2", 3/4" and 1" iron water pipes, also 1/4", 1/2", 5/8", 3/4" and 1" copper water pipes. Wt. .48 lb. ea.

#306X - Bronze Medium Perfection Pipe Clamp, similar to above clamp, Fits 1 1/4" and 1 1/2" iron water pipes. (Max 2" O.D.). Wt. .82 lb. ea.



#306A - Bronze Large Perfection Pipe Clamp with clamp type cable fastener that swivels 360°. Fits 1 1/2" and 2" iron water pipes. (Max. 2 1/2" O.D.). Lower casting may be inverted to fit smaller diameter pipes and rods. Tinned to prevent corrosion. Wt. 1.04 lb. ea.



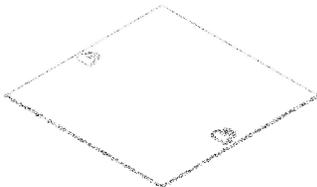
#50A - Standard Ground Rod Clamp made of copper bronze 1/2" clamp. Fits standard cable through 2/0. Wt. .24 lb. ea.

#51A - Standard Ground Rod Clamp made of copper bronze 5/8" clamp. Fits standard cable through 2/0. Wt. .30 lb. ea.



#137 - Ground Rod 1/2" x 8' copper clad ground rod. Wt. 6.30 lb. ea.

#139 - Ground Rod 5/8" x 8' copper clad ground rod. Wt. 6.68 lb. ea.

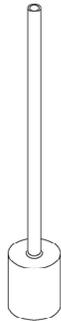


#589 - Copper Sheet Ground Plate made of 20 gauge copper sheet stock. 18" x 18". Wt. 3.125 lb. ea.

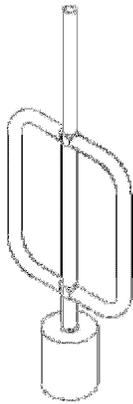
Tools & Testing Equipment



#354 - Collapsible Cable Stand. Our stand is made entirely of steel but still is light, sturdy and durable. The stand is a big aid for small and large jobs as cable is unwound from the spool. The stand will work with all cable sizes. The weight of the stand is approximately 9 lbs.



#365 - Ground Rod Driver. Cost effective driver designed for as a safer method over sledge hammer for driving ground rods. Handle is a hollow pipe and slides up and down the rod. Driver is approximately 25" in length and weighs approximately 19 lbs.



#365DH - Dual Handle Ground Rod Driver. This enhanced ground rod driver adds another element of safety over the basic #365 model. This driver is approximately 30" in length and weighs about 23# .



#357 - Cable Cutters. Cable cutter especially for copper and aluminum cables. Cutters are approximately 9" in length.



Extech 382252 - Ground Resistance Tester. Tester is used for measuring the resistance of ground rod electrode. Tester provides user with a three point fall of potential ground resistance field test for projects where a reading is required. Unit is battery powered, compact and comes with a convenient carrying case. Complete instructions are provided by the unit's manufacturer.



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Fax: 574.534.3719



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info@ipclp.com • www.ipclp.com

WHOLESALE PRICE LIST FOR TREE EQUIPMENT

NOTE: Parts highlighted below are basic materials used in ANSI A300 installation.

COPPER CONDUCTOR CABLE

32S	32 Strand x 17 ga. Smooth Twist Copper Std. Tree Conductor (250' spools)	Ft.	\$ 2.10	
32S	32 Strand x 17 ga. Smooth Twist Copper Std. Tree Conductor (500' spools)	Ft.	\$ 2.05	
22	14 Strand x 17ga. Miniature Tree Conductor (500' spools)	Ft.	\$ 0.96	ANSI

Cut Length Charges:

32S - \$.05 per foot other than 250' or 500' Spools, 22 \$.05 per foot under 100'

POINTS

M194 BT	Blunt Tip Tree Point for Standard Conductor for Main Trunk	Ea.	\$ 10.55	
M195 BT	Blunt Tip Tree Point for Miniature Conductor for Branches	Ea.	\$ 7.50	ANSI

CONDUCTOR ATTACHMENTS

190	Drive Fastener for Standard Conductor	Ea.	\$ 3.30	
190A	Drive Fastener for Miniature Conductor	Ea.	\$ 3.25	ANSI
143	4d Copper Nails - 1 1/2" long (157 per lb.)	Lb.	\$ 20.20	(\$.15 Ea.)

SPLICERS AND CONNECTORS

193X	Parallel Finger Type for Standard to Miniature Conductor Cable	Ea.	\$ 3.15	
193X22	Parallel Finger Type for Two Miniature Conductor Cable	Ea.	\$ 3.50	ANSI
193A	Parallel Finger Type for Standard to Standard Conductor Cable	Ea.	\$ 3.25	
33L	Standard Straight Splicer for Standard Conductor Cable (End to End)	Ea.	\$ 2.85	
M3X	Miniature Straight Splicer for Miniature Conductor Conductor (End to End)	Ea.	\$ 5.80	ANSI
198	Fork Type Ground Connector for Standard Copper (ONLY FOR 32S, NOT 22)	Ea.	\$ 10.85	
25G	Small 1" Many-Purpose Clamp (Brace to mini-cable or two mini-cables)	Ea.	\$ 7.10	ANSI
297A	Large Many-Purpose Clamp (Rod to Std. Cable or two std. Cables)	Ea.	\$ 9.35	ANSI

GROUNDING EQUIPMENT

50A	Cable to 1/2" Ground Rod Clamp (replaced #50)	Ea.	\$ 12.65	ANSI	
51A	Cable to 5/8" Ground Rod Clamp (replaces #51)	Ea.	\$ 12.50	ANSI	
119	Standard Cable & Ground Rod Cross Run Clamp (for multiple grounds)	Ea.	\$ 14.55		
306	Perfection Pipe Clamp for 1" Maximum IPS Pipe	Ea.	\$ 19.90	ANSI	
306X	Medium Perfection Pipe Clamp for 1 1/2" Maximum IPS Pipe	Ea.	\$ 26.15	ANSI	
306A	Large Pipe Clamp for 2 1/2" OD Pipe	Ea.	\$ 39.15	ANSI	
137	1/2" x 8' Copperweld Ground Rod	NET	Ea.	\$ 10.60	ANSI
139	5/8" x 8' Copperweld Ground Rod	NET	Ea.	\$ 12.50	ANSI
141CC	1/2" Compression Coupler for Ground Rods	Ea.	\$ 14.20		
589	18" X 18" Copper Ground Plate	Ea.	\$ 56.90	ANSI	

TOOLS

354	Collapsible Cable Stand	\$ 51.45	Ohms Tester - Extech Model 382252	\$315.00
365	Ground Rod Driver	\$ 63.25	357 Cable Cutters	\$34.35
365DH	Dual Handle Ground Rod Driver	\$ 115.00		

Note: Ground Rod Items and Tools are priced NET and not subject to discount.
 PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. OPEN CREDIT TERMS ARE 2% 15 DAYS/NET 30
 WITH APPROVED REFERENCES. 2% DISCOUNT IS NOT APPLICABLE TO CREDIT CARD PAYMENTS.

Installing Your First Tree Lightning Protection System (TLPS) ***(Based on the ANSI A300 Part 4)***

This brief step-by-step overview is intended to guide you through your first tree lightning protection installation. Your first installation could be a little intimidating, so this explanation will give you some added confidence.

#1 The first step is to request an estimate from IPC for the materials required for the tree(s) in question. The estimate will itemize the quantities of cable, air terminals (lightning rods), tree drives, splicers, ground rod, and clamps. This includes all materials required for the installation.

#2 Assess the intended locations for your air terminals. These should be equally positioned throughout the canopy using the tree's main branches and limbs for placement. Spacing should be no more than 35' apart according to ANSI standards. Air terminals are to be positioned as high up in the tree as the arborist feels he/she can climb without sacrificing personal safety. There is no need to be at the extreme top of the tree. Once locations of air terminals are determined, actual system installation begins.

#3 Next, the climber ascends to the upper part of the tree. A grounds person attaches the first air terminal (#M195BT) to the cable (#22) and sends it up to the climber for attachment. As the arborist makes his way down the tree, cable is fastened to the tree with tree drives (#190A) placed every 3 to 6 feet.

#4 After this initial run, the arborist will ascend the tree again and continue installing additional air terminals and runs in the canopy. All runs are interconnected to the main run using parallel connectors (#193X22). If metallic support or bracing cables are present, a bond is made from each brace cable into the tree lightning protection system to equalize grounding differences. This bond eliminates a potential for side flash to occur. IPC parts #25G, #297A and #22 cable are used in making this bond connection.

#5 After the canopy is interconnected, ground work is completed. The next step is to provide a narrow trench in the ground for the download cable. The trench is approximately 8" under grade and a minimum of 10' in length from the trunk. One method is to use an air spade for removal of the soil. Another good method is to use a straight shovel and to work the earth back and forth making a narrow opening for the cable to slip into. Trenching in this manner minimizes the work, will aid with clean-up and general aesthetics.

#6 A ground pit approximately 12" diameter by 12" deep is dug where the ground rod and clamp (#137 and #50A) will be vertically installed into the earth. Either a powered or manual ground rod driver is used for the 8' length ground rod. Tip: If using a manual ground rod driver, place ground rod clamp onto ground rod prior to installing the rod. If the ground is rocky, or if shale is present, an optional method is to use a ground plate (#589). Ideally, this plate is installed 18" below grade. Any metallic utility pipes located within 25' of the tree, need to be interconnected to the TLPS to equalize the ground charge.

ooOoo

The complete ANSI A300 Part 4 Lightning Protection Standard and the ISA Best Management Practices booklet are both available for purchase from TCIA or ISA. The ANSI Standard provides basic installation requirements while the BM Practices provides a more practical how-to-do-it instructions with commentary and illustrations.

IPC has published a companion brochure TR0027 entitled *Installation Tips & Helps for Arborists*. This brochure provides detailed illustrations for installing a tree system.



Web: www.ipclp.com
Toll-free: 800-860-8388
Email: jyoder@ipclp.com



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1607 South Main St.

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574.533.4116 or 1.800.860.8388

Fax: 574.534.3719

info@ipclp.com • www.ipclp.com

Estimate for Tree Lightning Protection System

By providing the information below, IPC will supply you a written estimate for the material required to provide lightning protection in one tree. You may email or fax this information to us and the return response will be very quickly.

- Species of tree _____
- Overall height in feet _____
- Overall canopy, spread or drip line in feet _____
- Diameter at Breast Height (DBH) of trunk in inches _____
- Number of bracing cables or guy wires _____
- Additional Bonding Requirements:
 - If a tree is within 25' of a structure that has a lps installed on it, the tree lps is to be bonded into the structural system.
 - If the tree is within 25' of a metallic pipe, i.e. water, natural gas, etc., the tree lps is to be bonded into the metallic object.

IPC has water pipe and multi-purpose clamps available for these bonding applications. See our equipment list for specifications and details.

If you require any additional information on tree protection, technical or design assistance or any other questions related to lightning protection, please feel free to contact us.

Company Name: _____

Contact: _____

Telephone #: _____

Fax #: _____

E-mail: _____

