



Section 7

Advanced Technologies

TerraDyne®

Electrolytic Grounding System

Introduction

One of the most important investments a company makes is in its selection of sensitive electronic equipment. As this equipment becomes more sophisticated and electrically susceptible, the need for an exceptionally low-resistance grounding system becomes more crucial. It is in response to this requirement that ALLTEC developed the TerraDyne® Electrolytic Grounding System.

TerraDyne® Electrolytic Grounding System (EGS)

The TerraDyne® EGS is a multipurpose grounding system. It has been designed to provide long term protection from lightning, electrical transients, static discharges, electromagnetic interference and other electrical hazards. The system may be used for virtually any application where the protection of machinery, electronics, and personnel is important.

The TerraDyne® EGS was designed for use in any type of soil condition. Some of the many applications where it is commonly used include: cellular, radio and television broadcasting sites, computer facilities, power substations, communication centers, medical facilities and industrial plants.

Protecting your expensive equipment is essential. The TerraDyne® EGS enhances the performance of your electronics, stabilizes signal references and reduces the risk of injuries. The end result is a stable grounding system that provides undisturbed long-term performance while maintaining cost efficiency.



Principles of Operation

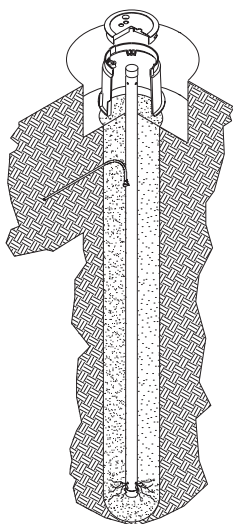
The TerraDyne® EGS effectively utilizes a hygroscopic process to acquire moisture from the atmosphere. The moisture and the nontoxic chemicals inside the electrode react and create an electrolytic solution. This electrolytic solution leaches into the surrounding soil through ports that have been positioned in the electrode. This process improves the soil conductivity and dramatically reduces electrical resistance between the electrode and the earth.

The TerraDyne® also takes advantage of another benefit. The hole bored for the installation is back-filled with TerraFill®, which also assists in substantially lowering the earth's resistance by creating a direct, low resistance, electrical connection between the electrode and the earth. The use of TerraFill® will reduce impedance by increasing the effective contact area of the electrode to the soil. TerraFill® is an easily applied product manufactured from environmentally safe and stable products. Each kit includes TerraFill® as the backfill material.

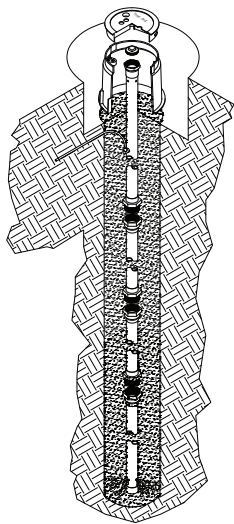
TerraDyne® Innovations

Through extensive research and development of the electrolytic grounding concept, our engineers have designed the TerraDyne® to enhance the overall performance of any grounding application. The TerraDyne® EGS may be utilized on any project with complete confidence that it will meet or exceed any existing grounding specification.

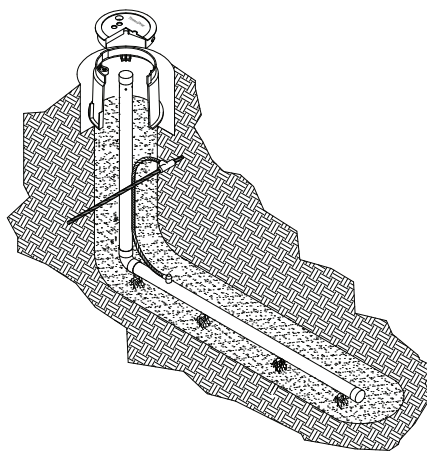
The TerraDyne® Electrolytic Grounding Systems are guaranteed for 30 years, with an expected life of at least 50 years. The systems are available in vertical or horizontal models. Vertical electrodes are usually installed using an augur or other drilling equipment. Horizontal electrodes are installed in trenches and utilized where the soil is rocky or excavation conditions are poor. The electrodes vary in length from 8 to 300 feet. Custom lengths, accessories and design options are available.



TerraDyne®
Vertical Model



TerraDyne®
"Deep Series" Model

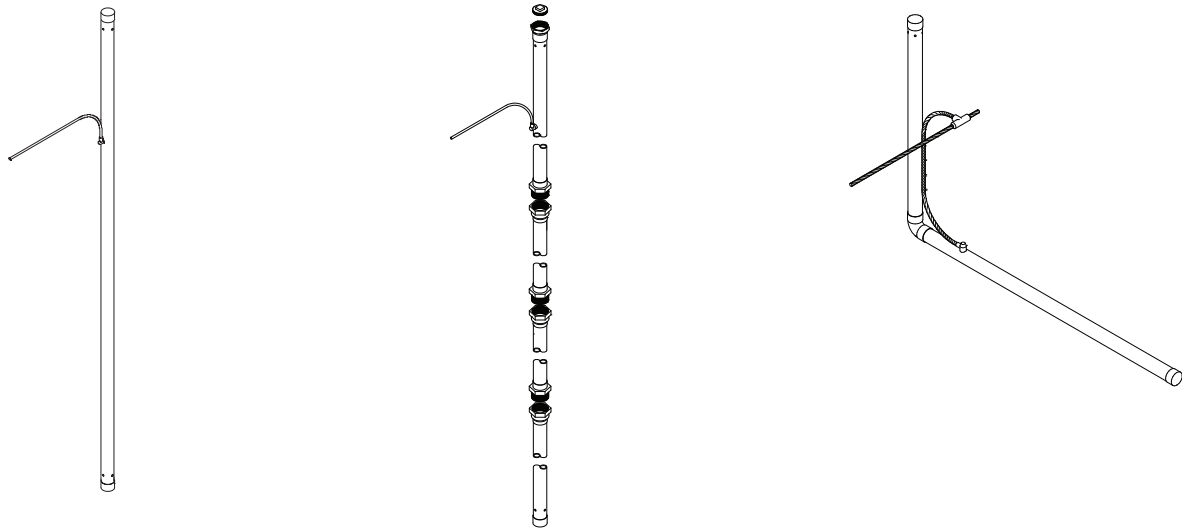


TerraDyne®
Horizontal Model

TerraDyne® Electrolytic Grounding System

TerraDyne® Models

There are three models to choose from.



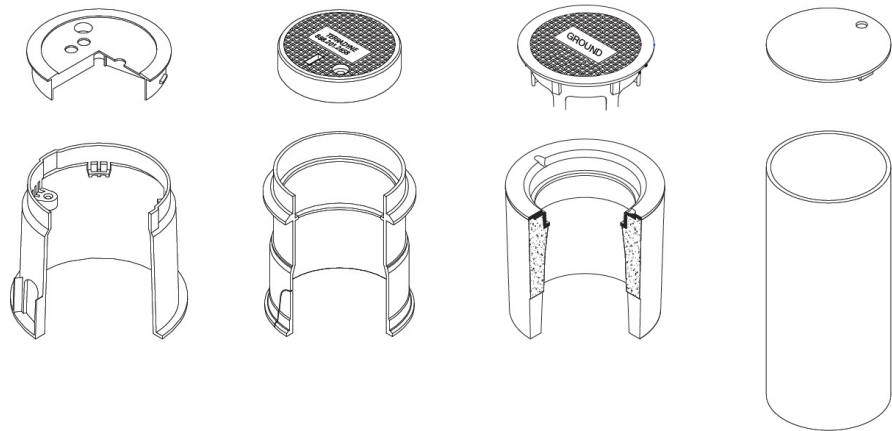
TerraFill® Ground Enhancing Backfill

There are four types to choose from. For more information see pages: 87-88.



Inspection/Test Wells

There are four models to choose from. For more information see pages: 89-90.



TerraDyne® Part Numbering System

To order, simply follow the steps below to specify the type and size of the unit.

Example: TG-8S-2T-36-2F-FL (Vertical Model)

TerraDyne® Vertical Model 8' Shaft with 36" of 2T Conductor, 2 bags of TerraFill®, and Fiberlyte Test Well

TG - **8S** - **2T** - **36** - **2F** - **FL**
 (1) (2) (4) (5) (6) (7)

Example: TG-20L-H36-4/019T-36-4F-P (Horizontal Model)

TerraDyne® Horizontal Model 20' Shaft with 36" Riser, 36" of 4/0-19T Conductor, 6 bags of TerraFill®, and Poly Plastic Test Well

TG - **20L** - **H36** - **4/019T** - **36** - **6F** - **P**
 (1) (2) (3) (4) (5) (6) (7)

(1) Type	TG = TerraDyne®
(2) Length	8 = 8', 10 = 10', 20 = 20', 40 = 40' For Deep Series Model: 100 = 100', 200 = 200', or 300 = 300' *Additional Lengths are available upon request. (Note: TG-xxL = Horizontal; TG-xxS = Straight/Vertical)
(3) Riser Height**	H = Horizontal Model **For Horizontal Model only, please choose the riser height. 24 = 24", 36 = 36", etc... (Additional heights are available upon request.)
(4) Conductor Size***	2T = No. 2 AWG Solid Tinned, 2/019 = 2/0 AWG 19 Strand, 4/019 = 4/0 AWG 19 Strand, 2/019T = 2/0 AWG 19 Strand Tinned, 4/019T = 4/0 AWG 19 Strand Tinned, etc... ***Additional conductor sizes are available upon request.
(5) Conductor Length (inch)	24 = 24", 36 = 36", etc... (Additional lengths are available upon request.)
(6) Backfill Qty. and Type	xF = # of bags of TerraFill® Backfill (TF-50) xxD = # of bags of TerraFill® Deep Series Backfill (TF-50DS)
(7) Test Well Type	P = WELL-P (Poly Plastic Test Well) FL = WELL-FL (Fiberlyte Test Well) C = WELL-C (Concrete Test Well)

NOTE:

- All TerraDynes are constructed using Type "K" Copper 2" I.D. Tube
- Refer to [page 25](#) for conductors.

Typical TerraFill® Quantity Requirements

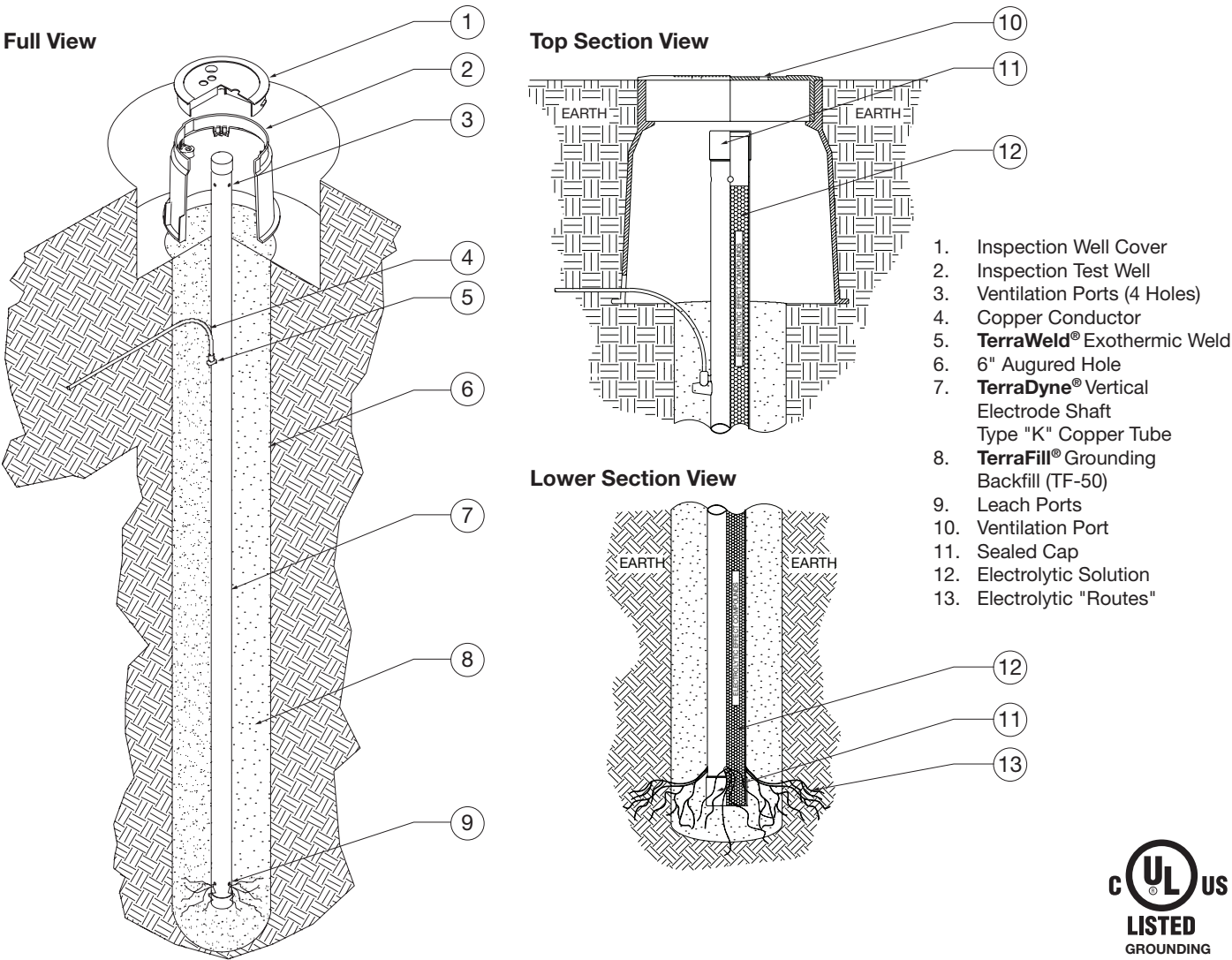
Vertical Models		Horizontal Models		Deep Series Models	
Length	TF-50 (Qty.)	Length and Riser Length	TF-50 (Qty.)	Length	TF-50DS (Qty.)
8' TerraDyne®	2	10' TerraDyne® and 24" Riser	3	100' TerraDyne®	25
10' TerraDyne®	2	10' TerraDyne® and 36" Riser	3	200' TerraDyne®	50
20' TerraDyne®	4	20' TerraDyne® and 24" Riser	6	300' TerraDyne®	75
40' TerraDyne®	8	20' TerraDyne® and 36" Riser	6		

NOTE

- Backfill quantities are based upon 6" diameter hole.
- TerraDyne® Vertical Model: Two (2) bags of TerraFill® Backfill are included with each 10' unit.
- TerraDyne® Horizontal Model: Three (3) bags of TerraFill® Backfill are included with each 10' unit.
- TerraDyne® Deep Series Model: Six (6) bags of TerraFill® Deep Series Backfill are included with each 20' length.

TerraDyne® Vertical Models

Part Number	Description	Approximate Weight
TG-8S-4/019-36-2F-P	TerraDyne®, Copper, 2" Type K, 8', Vertical, 4/019 w/36" Pigtail, 2 bags TerraFill®, Poly Test Well w/Cover	127 lb. (57.61 kg)
TG-10S-4/019-36-2F-P	TerraDyne®, Copper, 2" Type K, 10', Vertical, 4/019 w/36" Pigtail, 2 bags TerraFill®, Poly Test Well w/Cover	133 lb. (60.33 kg)
TG-20S-4/019-36-4F-P	TerraDyne®, Copper, 2" Type K, 20', Vertical, 4/019 w/36" Pigtail, 4 bags TerraFill®, Poly Test Well w/Cover	261 lb. (118.39 kg)
TG-40S-4/019-36-8F-P	TerraDyne®, Copper, 2" Type K, 40', Vertical, 4/019 w/36" Pigtail, 8 bags TerraFill®, Poly Test Well w/Cover	519 lb. (235.41 kg)



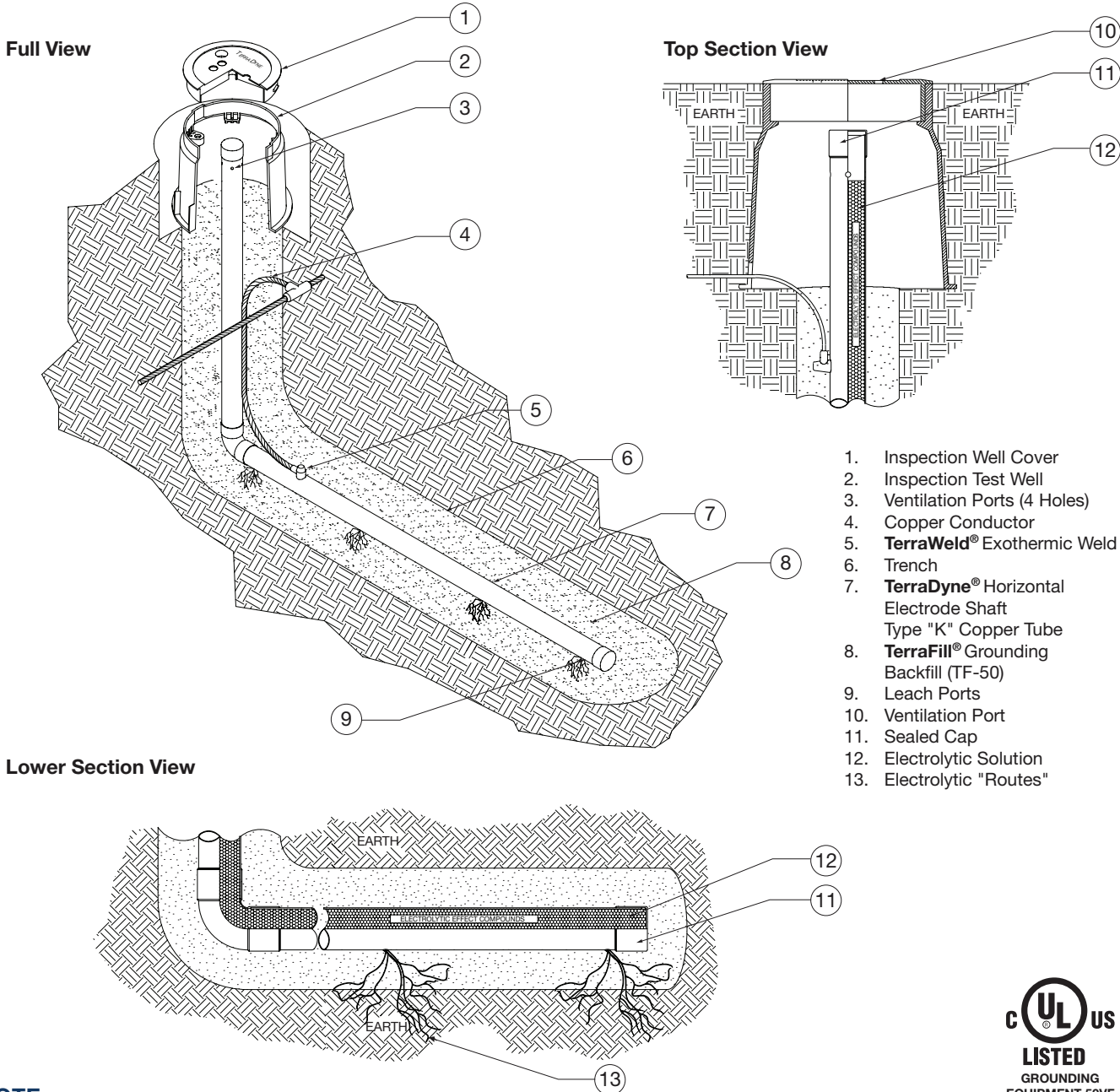
NOTE

- All Shafts are made of type "K" Copper 2" I.D. Tube.
- Custom conductor sizes and configurations are available upon request.
- All TerraDyne® models are available in a modular construction for easy export shipping.



TerraDyne® Horizontal Models

Part Number	Description	Approximate Weight
TG-10L-H24-4/019-24-3F-P	TerraDyne®, Copper, 2" Type K, 10', Horizontal/24", 4/019 w/24" Pigtail, 3 bags TerraFill®, Poly Test Well w/Cover	188 lb. (85.28 kg)
TG-20L-H24-4/019-24-6F-P	TerraDyne®, Copper, 2" Type K, 20', Horizontal/24", 4/019 w/24" Pigtail, 6 bags TerraFill®, Poly Test Well w/Cover	367 lb. (166.47 kg)
TG-10L-H36-4/019-36-3F-P	TerraDyne®, Copper, 2" Type K, 10', Horizontal/36", 4/019 w/36" Pigtail, 3 bags TerraFill®, Poly Test Well w/Cover	191 lb. (86.64 kg)
TG-20L-H36-4/019-36-6F-P	TerraDyne®, Copper, 2" Type K, 20', Horizontal/36", 4/019 w/36" Pigtail, 6 bags TerraFill®, Poly Test Well w/Cover	369 lb. (167.38 kg)



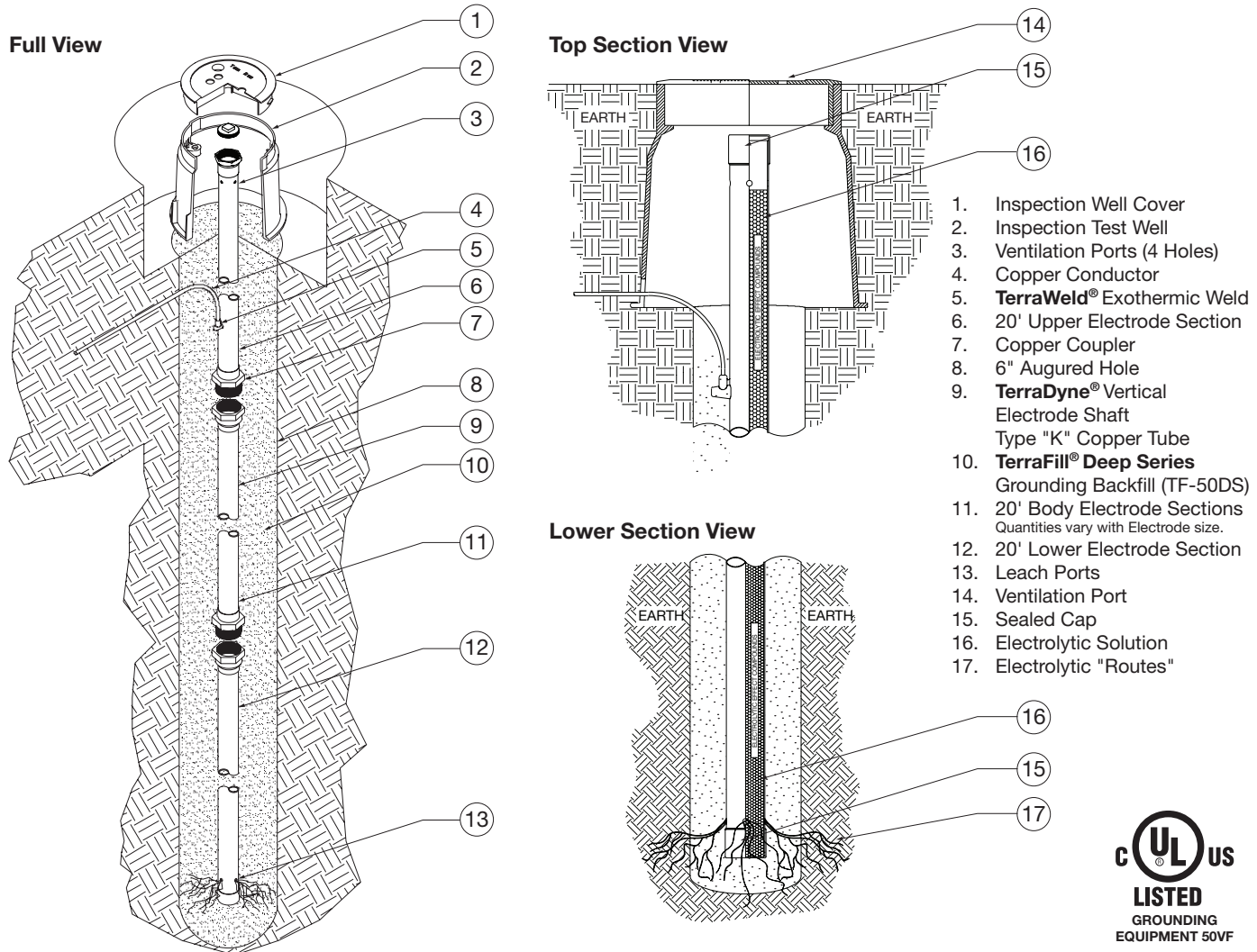
NOTE

- All TerraDyne® models are available in a modular construction for easy export shipping.



TerraDyne® Deep Series Models

Part Number	Description	Approximate Weight
TG-100S-4/019-36-25D-P	TerraDyne®, Copper, 2" Type K, 100', Vertical, 4/019 w/36" Pigtail, 25 bags TerraFill® DS "Deep Series", Poly Test Well w/Cover	1537 lb. (470.38 kg)
TG-200S-4/019-36-50D-P	TerraDyne®, Copper, 2" Type K, 200', Vertical, 4/019 w/36" Pigtail, 50 bags TerraFill® DS "Deep Series", Poly Test Well w/Cover	3070 lb. (938.94 kg)
TG-300S-4/019-36-74D-P	TerraDyne®, Copper, 2" Type K, 300', Vertical, 4/019 w/36" Pigtail, 74 bags TerraFill® DS "Deep Series", Poly Test Well w/Cover	5002 lb. (1407.04 kg)



The TerraDyne® Deep Series Electrolytic Grounding System is a cost effective alternative to water well grounds and other expensive grounding systems used where real estate is limited. TerraFill® "Deep Series" (TF-50DS) is used to backfill around the TerraDyne® Deep Series electrodes during installation. TF-50DS is a natural volcanic clay that has been engineered to maintain electrical and ionic conductivity, which enhances the performance of the grounding system. 14 gal (53 L) of water is mixed with each 50 lb. (22.7 kg) bag and then pumped or poured around the electrode during installation.

TerraDyne® Deep Series Benefits:

- Designed Specifically for Deep Grounding Applications
- Enhanced and Stable Grounding Performance

NOTE

- All TerraDyne® models are available in a modular construction for easy transportation.



Ground Enhancing Backfill

Low Resistivity Grounding Backfill

TerraFill® (Low Resistivity Grounding Backfill) provides a simple method of substantially lowering the earth resistance of grounding systems. When used with copper grounding equipment, contact resistance to earth is lowered by up to 63%. TerraFill® produces lower steady state and stable grounding impedance, resulting in a reliable, low resistance, electrical connection between the grounding system and the earth.

Features & Benefits

- Easily applied
- Produces lower stable grounding impedance, and lower surge impedance resulting in faster transient dissipation
- Excellent shelf life with long-term performance
- Manufactured to be compatible with copper grounding systems and standard field application methods
- Can be used in connection with grounding grids to minimize step and touch potentials
- Produces acceptable grounding impedance in high-resistivity soils, within a reasonably sized area
- Versatile – Applying TerraFill® to lower the ground resistance of grounding equipment allows for a variety of earthing designs which might otherwise be impractical
- Self-compacting – comes in easily transportable 50 lb. (22.68 kg) bags, easily installed by one person
- Complies to MOTOROLA R56 Standard
- Electrically Conductive

Permanent

- Will not dissolve or decay with time
- Requires no maintenance
- Maintains constant resistance for the life of the system

Environmentally Friendly

- Does not affect soil or ground water
- Carbon based, Non-corrosive, & Hygroscopic
- Meets all EPA requirements for landfill
- Material Safety Data Sheet (MSDS) available on request
- Restriction of Hazardous Substances (RoHS) compliant
- Motorola R56 compliant

Use TerraFill® Backfill with TerraDyne® Electrolytic Grounding Systems for 30 years of ultra-stable, maintenance free grounding.

TerraFill®

Part Number	Description	Weight
TF-50	TerraFill® Grounding Backfill, 50 LB. Bag	50 lb. (22.68 kg)

TerraFill® Horizontal and Vertical Installations

Horizontal Installation (Trench)

Estimated length of ground connector covered with each bag of TerraFill®				
Trench Width	TerraFill® Thickness			
	1" (2.5cm)	2" (5.1cm)	3" (7.6cm)	4" (10.2cm)
4" (10.2cm)	28' (8.5m)	14' (4.2m)	9' (2.7m)	7' (2.1m)
6" (15.2cm)	18' (5.4m)	9' (2.7m)	6' (1.8m)	4' (1.2m)
8" (20.3cm)	14' (4.2m)	7' (2.1m)	4' (1.2m)	3' (0.9m)
10" (25.4cm)	11' (3.3m)	5' (1.5m)	3' (0.9m)	2' (0.6m)
12" (30.5cm)	9' (2.7m)	4' (1.2m)	3' (0.9m)	2' (0.6m)

Refer to installation instructions and local electrical codes for proper trench size in your area.

Try our online tool to see how much TerraFill your project requires: alltecglobal.com/terrafill-calculator/



Vertical Installation (Hole)

Estimated bags of TerraFill® backfill around ground rods 1/2" to 3/4"						
Hole Diameter	Depth of Hole					
	6' (1.8m)	8' (2.4m)	10' (3.0m)	12' (3.6m)	17' (5.2m)	20' (6.1m)
3" (7.5cm)	1	1	1	2	2	2
4" (10.0cm)	1	2	2	2	3	3
5" (12.5cm)	2	2	3	4	5	5
6" (15.0cm)	2	3	4	4	7	8
7" (17.5cm)	3	4	5	6	9	10
8" (20.0cm)	4	6	7	8	11	13
9" (22.5cm)	5	7	8	10	14	16
10" (25.0cm)	6	8	9	12	17	20

Refer to installation instructions and local electrical codes for proper hole size in your area.

Enhanced Composite Backfill

ALLTEC's TerraFill® XT is a superior conductive material that improves grounding effectiveness, especially in abnormal soil conditions, such as acidic or extremely wet environments. When mixed with 2 1/2 gallons (9.5 liter) of water, one 50 lb. (22.68 kg) bag of TerraFill® XT yields approximately 1,040 cubic inches of cement type backfill material. TerraFill® XT mixed as above yields a 7 1/4" slump when tested per ASTM C143.

Features

- Effective: results in a typical resistivity of less than 160 Ohm-cm
- Dependable: maintains stable resistance for the life of the ground system
- Performance: does not dissolve, decompose or leak away
- Flexible: can be installed using Trench (Horizontal) or Ground Rod (Vertical) Backfill methods
- Secure: excellent solution for prevention of copper theft
- Simple: easily installed in a slurry form
- Environmentally Friendly: meets EPA requirements for landfill
- Functional: performs in all soil conditions, even during dry periods
- Handy: provided in convenient 50 lb. (22.68 kg) Bags
- Useful: aids in small footprint grounding system implementations and other special applications

TerraFill® XT

Part Number	Description	Weight
TF-50XT	TerraFill® Grounding Backfill, 50 LB. Bag "XT"	50 lb. (22.68 kg)

"Deep Series" Grounding Backfill

TerraFill® "Deep Series" (TF-50DS) is used to backfill around the TerraDyne® Deep Series electrodes during installation. TF-50DS is a natural volcanic clay that has been engineered to maintain electrical and ionic conductivity, which enhances the performance of the grounding system. 14 gal (53 L) of water is mixed with each 50 lb. (22.7 kg) bag and then pumped or poured around the electrode during installation.

TerraFill® DS

Part Number	Description	Weight
TF-50DS	TerraFill® Grounding Backfill, 50 LB. Bag "Deep Series"	50 lb. (22.68 kg)

Low Dust TerraFill

TerraFill® LD is a superior conductive material similar to the traditional TF-50, but the flake is larger, reducing the amount of dust produced upon application.

Part Number	Description	Weight
TF-25LD	TerraFill® Grounding Backfill, 25 LB. Bag "Low Dust"	25 lb. (11.34 kg)

Inspection/Test Wells

Poly Plastic Test Well

Part Number	Description	Weight
WELL-P	Test Well, Poly-Plastic, with Cover	4.5 lb. (2.0 kg)

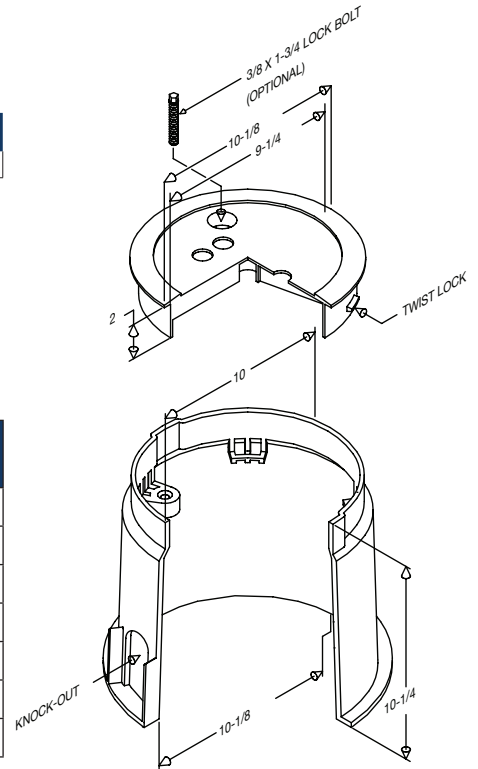
Static Vertical Load Rating

Body with HDPE Cover = 350 PSI

NOTE

- For use in non-vehicular traffic installations ONLY.

PROPERTIES OF UNFOAMED RESIN	ASTM TEST METHOD	HDPE
Tensile Strength	D-638	3,100 - 5,500 PSI
Flexural Modulus	D-790	160,000 - 210,000 PSI
Notched Izod Impact Strength	D-256	5-15 ft. lb./in.
Deflection Temperature	D-648	165° to 180°F (74°C to 82 °C)
Density	D-792	Minimum .955
Chemical Resistance	-----	Excellent
Water Absorption	-----	Nil



Fibrelyte® Test Well

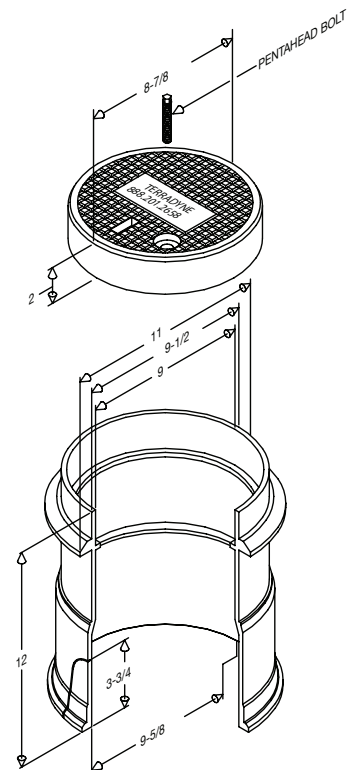
Fibrelyte is a proven polyester pre-mix with calcium carbonate and polyester resins interlaced with fiberglass and ultra violet inhibitors. Fibrelyte is a durable, state and utility approved, noncombustible material.

Part Number	Description	Weight
WELL-FL	Test Well, Fibrelyte, with Fibrelyte-Cover	9 lb. (4.1 kg)

- Super lightweight means easier installation and servicing.
- Stronger than precast concrete. Exceeds WUC 3.6 recommendations for 10,000 lb. (4.5 t) wheel loading.
- Durable and inert: resistant to heat, cold, and chemicals.
- Won't crack or break during handling, which eliminates loss due to breakage.

Specifications

- Flexural Strength: 6,000 PSI
- Tensile Strength: 6,000 PSI
- Compressive Strength: 20,000 PSI

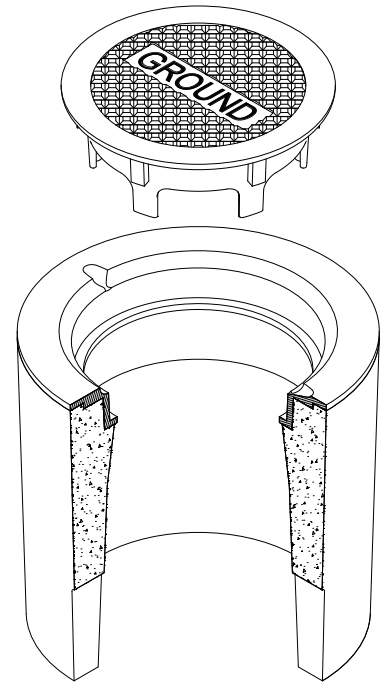


Concrete Test Well with Cast Iron Cover

Precast concrete body that is reinforced with non-settling shoulders to maintain grade and facilitate back filling with a cast iron receptacle for cover.

Concrete Compressive Strength = 4500 PSI.

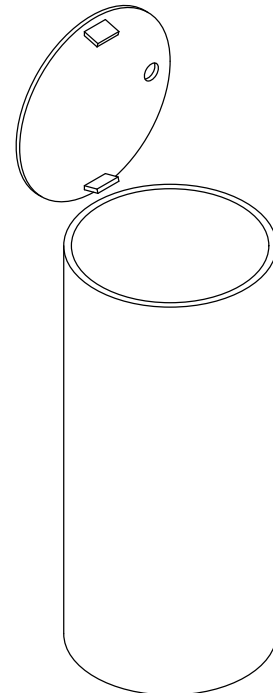
Part Number	Description	Weight
WELL-C	Test Well, Concrete, with Cast Iron-Cover	66 lb. (22.9 kg)



PVC Inspection Wells with Galvanized Steel Cover

Schedule 40 PVC sleeve with galvanized steel cover. Used for permanent ground inspection locations.

Part Number	Description	Weight
WELL-PVC-10-12	Well, Inspection, PVC Schedule 40, 10" Dia. x 12" w/ Galvanized Steel Cover	29.2 lb. (13.24 kg)
WELL-PVC-10-18	Well, Inspection, PVC Schedule 40, 10" Dia. x 18" w/ Galvanized Steel Cover	33.4 lb. (15.15 kg)
WELL-PVC-10-24	Well, Inspection, PVC Schedule 40, 10" Dia. x 24" w/ Galvanized Steel Cover	37.2 lb. (16.87 kg)
WELL-PVC-10-36	Well, Inspection, PVC Schedule 40, 10" Dia. x 36" w/ Galvanized Steel Cover	44.8 lb. (20.32 kg)
WELL-PVC-12-12	Well, Inspection, PVC Schedule 40, 12" Dia. x 12" w/ Galvanized Steel Cover	38.83 lb. (17.61 kg)
WELL-PVC-12-18	Well, Inspection, PVC Schedule 40, 12" Dia. x 18" w/ Galvanized Steel Cover	42.2 lb. (19.14 kg)
WELL-PVC-12-24	Well, Inspection, PVC Schedule 40, 12" Dia. x 24" w/ Galvanized Steel Cover	47.5 lb. (21.55 kg)
WELL-PVC-12-36	Well, Inspection, PVC Schedule 40, 12" Dia. x 36" w/ Galvanized Steel Cover	55 lb. (24.95 kg)





Section 8

Traditional Grounding / Bonding Products

Ground Rods & Accessories

Copper Clad Steel Ground Rods - 250 micron Cu

Made with Hot Rod (HR) steel core and a copper clad exterior to provide increased conductivity and corrosion resistance. Standard and sectional (threaded)

Part Number	Description	Weight
5000	Ground Rod, Copper Clad Steel, 5/8" x 8 Foot	7.00 lb. (3.16 kg)
5001	Ground Rod, Copper Clad Steel, 5/8" x 10 Foot	9.50 lb. (4.31 kg)
5021	Ground Rod, Copper Clad Steel, 3/4" x 10 Foot	12.00 lb. (5.44 kg)

* Add 'S' to part numbers for threaded option.

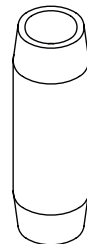
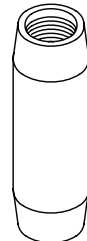
Ground Rod Coupling - Threaded

Used for connecting sectional ground rods.

Part Number	Description	Weight
5231	Coupling, Copper, 5/8, Threaded, for Ground Rod	4.0 oz. (113.4 g)
5241	Coupling, Copper, 3/4, Threaded, for Ground Rod	5.4 oz. (153.1 g)

Ground Rod Coupling - Threadless

Part Number	Description	Weight
5232	Coupling, Copper, 5/8, Compression, for Ground Rod	4.0 oz. (113.4 g)
5242	Coupling, Copper, 3/4, Compression, for Ground Rod	5.4 oz. (153.1 g)

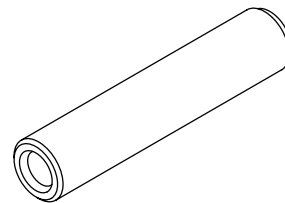


Ground Rod Driving Sleeves

Ground rod driving sleeves are placed over the top of a ground rod while driving it into the ground.

This prevents the top from mushrooming or flaring out. Ground rod driving sleeves come in sizes to fit all standard unthreaded ground rods.

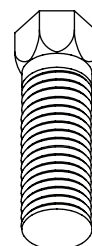
Part Number	Description	Weight
5252	Tool, Sleeve, 5/8, for Ground Rod Sections	1.50 lb. (0.68 kg)
5253	Tool, Sleeve, 3/4, for Ground Rod Sections	2.00 lb. (0.91 kg)



Ground Rod Driving Studs

Made of high carbon steel, used for driving threaded sectional copper clad ground rods.

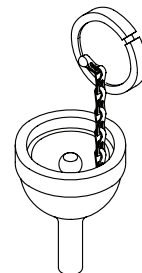
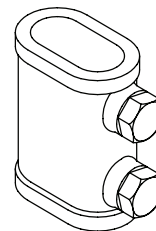
Part Number	Description	Weight
5271	Tool, Driving Stud, 5/8, for Ground Rod Sections	3.0 oz. (85.0 g)
5281	Tool, Driving Stud, 3/4, for Ground Rod Sections	5.0 oz. (141.7 g)



Ground Rod Cable Clamps

Uses two 5/16" bolts for optimal connection.

Part Number	Description	Weight
5296	Clamp, Copper, 5/8, Ground Rod	4.7 oz. (133.2 g)
5297	Clamp, Copper, 3/4, Ground Rod	7.1 oz. (201.3 g)



Aircraft Type Ground Receptacle

Part Number	Description	Weight
5201	Receptacle, Bronze, Grounding, Aircraft Type	2.00 lb. (0.90 kg)

NOTE

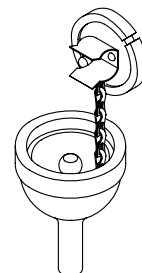
- Please specify ground rod size when ordering.

Aircraft Type Ground Receptacle with Spring

Part Number	Description	Weight
5211	Receptacle, Bronze, Grounding, Aircraft Type, w/Spring	2.00 lb. (0.90 kg)

NOTE

- Please specify ground rod size when ordering.



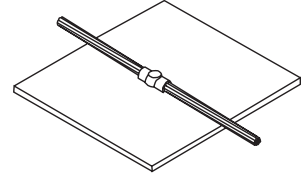
Copper Ground Plate Assemblies

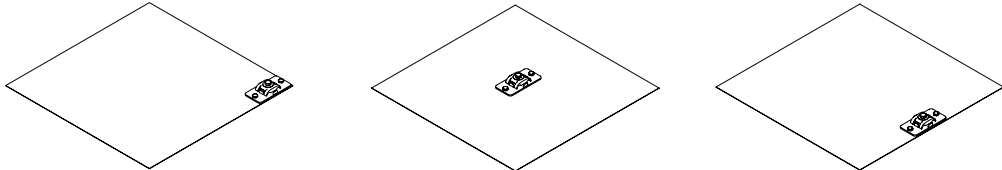
To order, simply follow the steps below to specify the type and size of ground plate. Please contact your representative for custom sizes, prices and questions.

Example: GP-12-1/8-WM-2T-24-1F

12" X 12" .125" (1/8") Solid Copper Ground Plate with 24" of 2T conductor exothermically welded to the middle of the plate, and 1 bag of TerraFill®.

GP - **12** - **1/8** - **WM** - **2T** - **24** - **1F**
 (1) - (2) - (3) - (4) - (5) - (6) - (7)



(1) Type of Component	GP = Ground Plate	
(2) Size (XY)	12 = 12" X 12", 18 = 18" X 18", 24 = 24" X 24", 36 = 36" X 36", etc...	
(3) Thickness	20 = 20 gauge, 1/8 = .125", or 1/4 = .250"	
(4) Attachment & Location	Mechanical Clamp Connection MC = Mechanical Clamp at the Corner MM = Mechanical Clamp at the Middle ME = Mechanical Clamp at the Edge (Hardware will be supplied with Mechanical Clamp)	TerraWeld® Exothermic Weld Connection WC = Welded Exothermic Connection at the Corner WM = Welded Exothermic Connection at the Middle WE = Welded Exothermic Connection at the Edge
	(Example of locations: Mechanical Clamp Connection Shown) C = Corner M = Middle E = Edge 	
(5) Conductor Size	2T = NO.2 AWG Solid Tinned, 2/0-19 = 2/0 AWG 19 strand, 4/0-19 = 4/0 AWG 19 strand, 4/0-19T = 4/0 AWG 19 strand Tinned, etc... For additional conductor sizes, please contact your representative.	
(6) Conductor Length (Inch)	24 = 24", 36 = 36", 48 = 48", 72 = 72", etc... (Conductor length equals two times the plate width. Custom length upon request.)	
(7) TerraFill® (Qty.)	1F = 1 bag, 2F = 2 bags, 3F = 3 bags, etc... For more information on TerraFill®, please see page 88.	



.125" (1/8") Copper Ground Plates

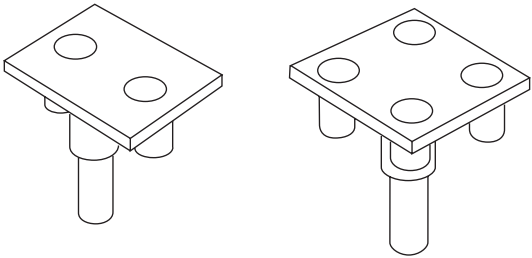
Part Number	Description	Weight
5150	Ground Plate, Copper, 12"x12", 1/8"	5.80 lb. (2.63 kg)
5155	Ground Plate, Copper, 18"x18", 1/8"	13.00 lb. (5.89 kg)
5165	Ground Plate, Copper, 36"x36", 1/8"	52.20 lb. (23.67 kg)

.250" (1/4") Copper Ground Plates

Part Number	Description	Weight
5151	Ground Plate, Copper, 12"x12", 1/4"	11.60 lb. (5.26 kg)
5156	Ground Plate, Copper, 18"x18", 1/4"	26.00 lb. (11.79 kg)
5166	Ground Plate, Copper, 36"x36", 1/4"	104.40 lb. (47.35 kg)

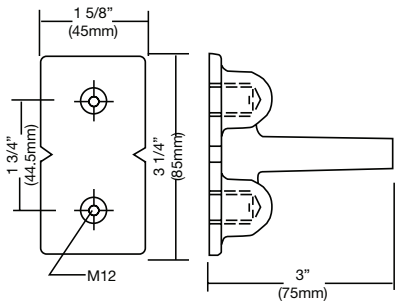
Concrete Bonding Plates

High Quality Cast alloy bonding plates provide a convenient method of providing predetermined ground connection points in buildings structure. These plates can be installed in concrete structures (i.e. walls, floors etc.). Machinery and other equipment can be easily attached to these plates after concrete work is completed. Bonding plates are available in 2 hole and 4 hole configurations. Both types can be supplied with 4/0 or 500 kc mil stud ready for connection to wire, rebar or ground rods. All holes are threaded 3/8"-16, 1/2" deep.

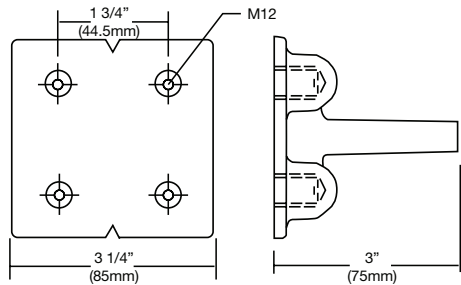


Part Number	Description	Weight
5212	Plate, Bronze, 2 Hole, for Concrete	14 oz. (396 g)
5213	Plate, Bronze, 4 Hole, for Concrete, Small	16 oz. (453 g)
5214	Plate, Bronze, 4 Hole, for Concrete, Large	18 oz. (510 g)

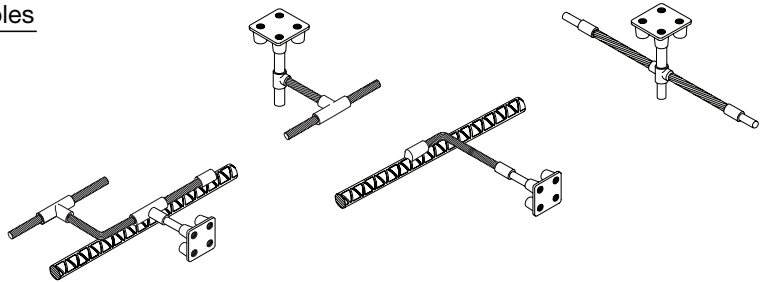
2 Holes



4 Holes



Examples



Grounding Conductors

Prices for grounding conductors change often. Please call for current prices prior to ordering.

Strand Copper Conductors

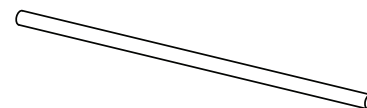


Part Number	Size (AWG)	Strands	CM Area	Standard Reels	Lb./Mft.
2-7	No. 2 AWG	7	66,360	250'	205
1/0-19	1/0 AWG	19	105,600	250'	326
2/0-19	2/0 AWG	19	133,100	250'	411
4/0-19	4/0 AWG	19	211,600	200'	653
250 MCM	250 MCM	37	250,000	-	772

NOTE

- Tinned (add suffix "T") and Green Jacket (add suffix "G") are available upon request.
- Length above or below standard reel size requires a cut charge.

Solid Copper Conductors

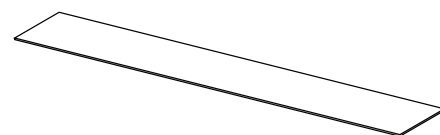


Part Number	Size (AWG)	Diameter	CM Area	Standard Reels	Lb./Mft.
2	No. 2 AWG	0.257	66,360	250'	201
4	No. 4 AWG	0.204	41,470	500'	126
6	No. 6 AWG	0.162	26,240	500'	80

NOTE:

- Tinned (add suffix "T") and Green Jacket (add suffix "G") are available upon request.
- Length above or below standard reel size requires a cut charge.

Bonding Strap Copper Conductors



Part Number	Width (in.)	Thickness (in.)	Actual Gauge	Strand Coil	Weight/Roll (lb.)
CS132	1"	.032"	20	100'	12.4 (5.6 kg)
CS164	1"	.064"	14	100'	24.8 (11.2 kg)
CS1125	1"	.125"	8	100'	48.3 (21.9 kg)
CS1516	1.5"	.016"	26	100'	9.25 (4.89 kg)
CS1532	1.5"	.032"	20	100'	18.5 (8.18 kg)
CS216	2"	.016"	26	100'	12.4 (5.6 kg)
CS232	2"	.032"	20	100'	24.8 (11.2 kg)
CS264	2"	.064"	14	100'	49.6 (22.5 kg)
CS416	4"	.016"	26	100'	24.8 (11.2 kg)
CS432	4"	.032"	20	100'	49.6 (22.5 kg)
CS616	6"	.016"	26	100'	37.1 (16.8 kg)

NOTE

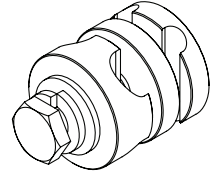
- All Copper Strap Conductor is sold in 100' rolls. Other custom sizes available by special order.

Grounding Accessories

Fence Fabric Ground Clamp

Whether it is connected to an object that is parallel, perpendicular or any degree in between, the conductor maintains a direct path to the ground without interruption. Exclusive in design, the clamp can form durable connections at almost any angle. Common uses include connection to both barbed wire and fence fabric. Can be used with almost all metallic surfaces, including galvanized metal. Contact ALLTEC for information on other sizes and/or materials.

Part Number	Description	Weight
5180	Clamp, Stainless Steel, Fence Fabric	2.5 oz. (70.9 g)



Cold Galvanizing Compound

Part Number	Description	Weight
GALV-16	Cold Galvanic Compound, 16 oz., Spray	16.0 oz. (453.5 g)



Oxide Inhibitor

For use with all copper conductors

Part Number	Description	Weight
NO-OX-ID	Oxide Inhibitor, 12 oz., Tube	12.0 oz. (226.8 g)



Bonding Straps & Bypass Conductors

Bonding Straps

Allows for bonding to hinged or sliding metal doors. The copper bonding strap has a 3/4" X 10" body made of 480 strand 30 gauge wire. Lugs on each end allows for 3/8" diameter bolt fasteners. Custom lengths upon request.

Part Number	Description	Weight
5175	Strap, Copper, 10"x 3/4", 3/8" Hole in Lugs	3.0 oz. (85.0 g)
5176	Strap, Copper, 10"x 3/4", 2 3/8" Holes in Lugs	3.0 oz. (85.0 g)



Primary Bypass Conductors

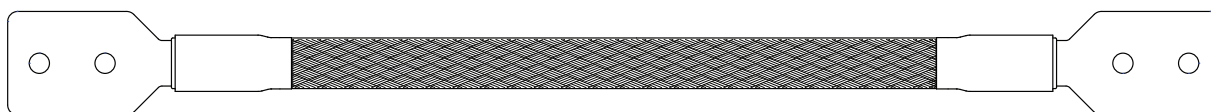
Lightning Protection Bonding for External Floating Roof, Internal Floating Roof & Aluminum Dome Tanks

Part Number	Description	Weight
BPS-C/SS-P-02	Primary Bypass Conductor, Copper & Stainless Steel, 2' (0.61 m)	1.1 lb. (0.50 kg)
BPS-C/SS-P-03	Primary Bypass Conductor, Copper & Stainless Steel, 3' (0.91 m)	1.41 lb. (0.64 kg)
BPS-C/SS-P-04	Primary Bypass Conductor, Copper & Stainless Steel, 4' (1.22 m)	1.73 lb. (0.78 kg)
BPS-C/SS-P-20	Primary Bypass Conductor, Copper & Stainless Steel, 20' (6.10 m)	6.8 lb. (3.08 kg)
BPS-C/SS-P-40	Primary Bypass Conductor, Copper & Stainless Steel, 40' (12.19 m)	13.13 lb. (5.96 kg)
BPS-C/SS-P-50	Primary Bypass Conductor, Copper & Stainless Steel, 50' (15.24 m)	16.29 lb. (7.39 kg)
BPS-C/SS-P-60	Primary Bypass Conductor, Copper & Stainless Steel, 60' (18.29 m)	19.46 lb. (8.83 kg)
BPS-C/SS-P-70	Primary Bypass Conductor, Copper & Stainless Steel, 70' (21.34 m)	22.63 lb. (10.26 kg)

Secondary Bypass Conductors

Lightning Protection Bonding for External Floating Roof, Internal Floating Roof & Aluminum Dome Tanks

Part Number	Description	Weight
BPS-C/SS-S-02	Secondary Bypass Conductor, Copper & Stainless Steel, 2' (0.61 m)	1.1 lb. (0.50 kg)
BPS-C/SS-S-03	Secondary Bypass Conductor, Copper & Stainless Steel, 3' (0.91 m)	1.41 lb. (0.64 kg)
BPS-C/SS-S-04	Secondary Bypass Conductor, Copper & Stainless Steel, 4' (1.22 m)	1.73 lb. (0.78 kg)
BPS-C/SS-S-20	Secondary Bypass Conductor, Copper & Stainless Steel, 20' (6.10 m)	6.8 lb. (3.08 kg)
BPS-C/SS-S-40	Secondary Bypass Conductor, Copper & Stainless Steel, 40' (12.19 m)	13.13 lb. (5.96 kg)
BPS-C/SS-S-50	Secondary Bypass Conductor, Copper & Stainless Steel, 50' (15.24 m)	16.29 lb. (7.39 kg)
BPS-C/SS-S-60	Secondary Bypass Conductor, Copper & Stainless Steel, 60' (18.29 m)	19.46 lb. (8.83 kg)
BPS-C/SS-S-70	Secondary Bypass Conductor, Copper & Stainless Steel, 70' (21.34 m)	22.63 lb. (10.26 kg)



Terminal Lugs

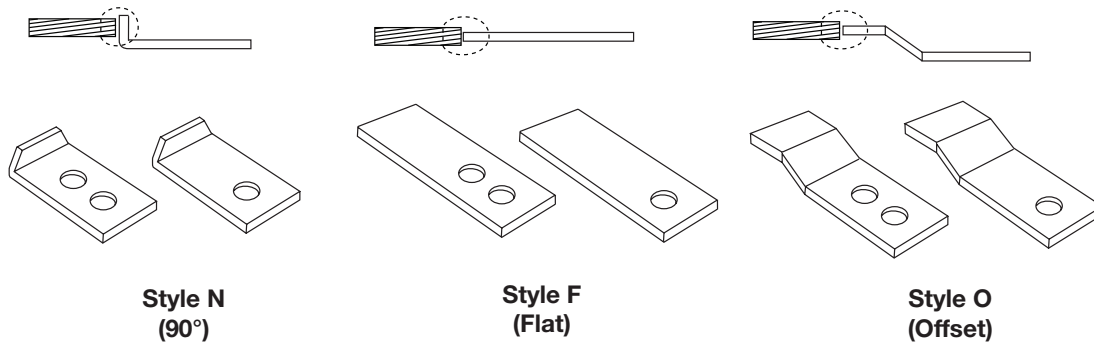
For use in conjunction with TerraWeld® P Series welding molds.

Part Number	Description
TLUG-CT-11/8-1-1/4-F	Lug, Tinned Copper, 1 1/8" to 1 1/4"

NOTE

For more information on the P Series welding, refer to the TerraWeld® Exothermic Welding Equipment Catalog.

Installation Examples:



Example: TLUG-C-11/8-1-1/4-F

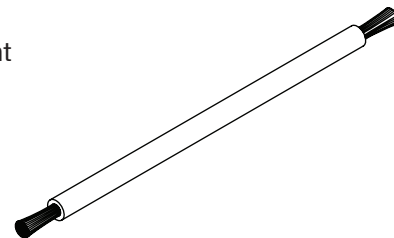
TLUG - **CT** - **11/8** - **1** - **1/4** - **F**
 (1) - (2) - (3) - (4) - (5) - (6)

(1) Component	TLUG = Terminal Lug
(2) Material	C = Copper CT = Tinned Copper
(3) Width	11/8 = 1 1/8"
(4) Holes	1 = 1 hole or 2 = 2 holes
(5) Hole Diameter	1/4 = 1/4 in.
(6) Style	N = 90° F = Flat O = Offset

Bonding Jumpers

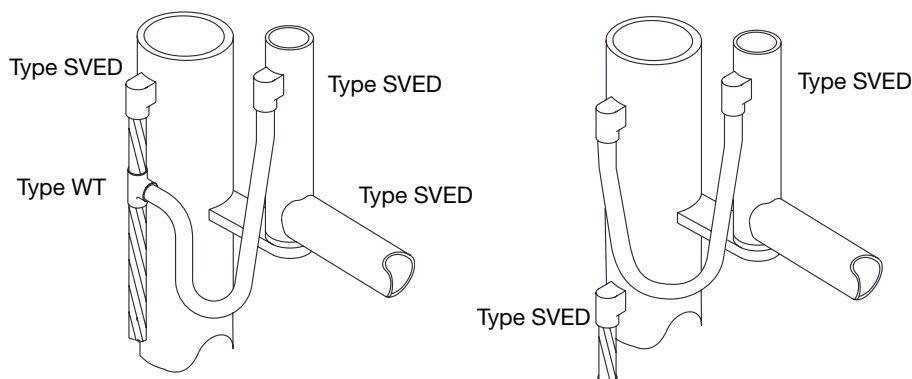
Flexible Bonding Jumpers

Used where movement and vibration are present, flexible jumpers are an important component of any bonding application. These prefabricated jumpers are made from high quality welding cable to provide both flexibility and cross sectional protection. The ends of the cables are prepared and sleeved to fit standard TerraWeld® molds. The connections are made with TerraWeld® Exothermic connections to the fence posts. Available in standard 12" to 24" lengths.



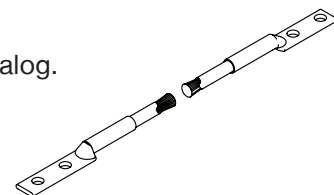
Part Number	Description	Weight
5300-12	Jumper, Copper, 12", #2	4.4 oz. (124.7 g)
5300-18	Jumper, Copper, 18", #2	6.6 oz. (187.1 g)
5300-24	Jumper, Copper, 24", #2	8.8 oz. (249.4 g)
5320-12	Jumper, Copper, 12", 2/0	8.2 oz. (232.5 g)
5320-18	Jumper, Copper, 18", 2/0	12.3 oz. (348.7 g)
5320-24	Jumper, Copper, 24", 2/0	16.4 oz. (464.9 g)
5340-12	Jumper, Copper, 12", 4/0	13.0 oz. (368.5 g)
5340-18	Jumper, Copper, 18", 4/0	19.5 oz. (555.8 g)
5340-24	Jumper, Copper, 24", 4/0	26.0 oz. (737.1 g)

Installation Examples:



NOTE

- For further information, refer to the TerraWeld® Exothermic Welding Equipment Catalog.



Flexible Bonding Jumpers - With Lugs Installed

Part Number	Description	Weight
5300-12-L	Jumper, Copper, 12", #2, w/ 2 Hole Bonding Lugs	5.8 oz. (164.4 g)
5300-18-L	Jumper, Copper, 18", #2, w/ 2 Hole Bonding Lugs	8.0 oz. (226.8 g)
5300-24-L	Jumper, Copper, 24", #2, w/ 2 Hole Bonding Lugs	10.2 oz. (289.2 g)
5320-12-L	Jumper, Copper, 12", 2/0, w/ 2 Hole Bonding Lugs	12.2 oz. (345.9 g)
5320-18-L	Jumper, Copper, 18", 2/0, w/ 2 Hole Bonding Lugs	1.02 lb. (0.46 kg)
5320-24-L	Jumper, Copper, 24", 2/0, w/ 2 Hole Bonding Lugs	1.27 lb. (0.57 kg)
5340-12-L	Jumper, Copper, 12", 4/0, w/ 2 Hole Bonding Lugs	1.31 lb. (0.59 kg)
5340-18-L	Jumper, Copper, 18", 4/0, w/ 2 Hole Bonding Lugs	1.41 lb. (0.64 kg)
5340-24-L	Jumper, Copper, 24", 4/0, w/ 2 Hole Bonding Lugs	2.12 lb. (0.96 kg)

NOTE

- Please contact your representative for additional sizes.



Section 9

Grounding Bars & Accessories

TerraBar

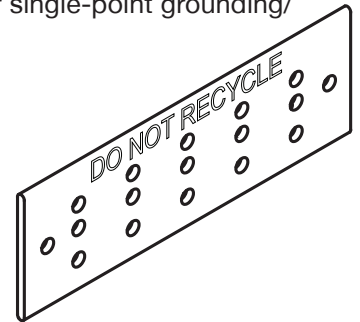
TerraBar Grounding Bars

ALLTEC is the originating Engineering firm supporting the telecom majors for proper single-point grounding/ earthing busbar designs.

Models

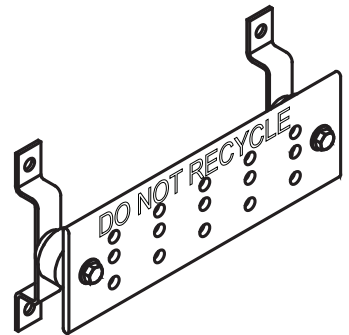
Ground bar

For custom ground bars, see the part numbering system table (1) - (6) on [page 103](#).
Anti-theft steel ground bar shown. Custom “Property of” engraving available.



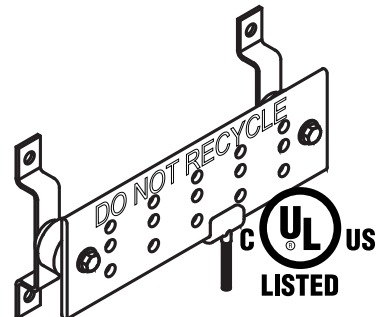
Ground bar with wall mounting brackets and insulators

For custom ground bars, see the part numbering system table (1) - (7) on [page 103](#).
Anti-theft steel ground bar shown. Custom “Property of” engraving available.



Ground bar with wall mounting brackets, insulators, and a ground conductor

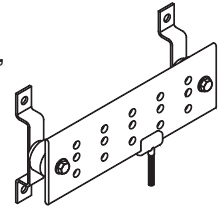
For custom ground bars, see the part numbering system table (1) - (8) on [page 103](#).
Anti-theft steel ground bar shown. Custom “Property of” engraving available.



Part Numbering System

To order, simply follow the steps below to specify the type and size of the ground bar. The example below shows how to order a ground bar with wall mounting brackets, insulators, and an exothermically welded ground conductor.

The ground bar is 1/4" thick, 4" wide, and 24" in length. It has a "02" hole pattern and a 40" of 4/0 AWG 19T strand tinned copper ground conductor tail.



Example: TB-CT-4-24-02-S-4/019T-40

TB - **CT** - **4** - **24** - **02** - **S** - **4/019T** - **40**
 (1) - (2) - (3) - (4) - (5) - (6) - (7) - (8)

(1) Type	TB = TerraBar Plain ground bar
(2) Material & Finish	C = Copper, CT = Copper Tinned, GS = Galvanized Steel
(3) Width	1 = 1", 2 = 2", 4 = 4", 6 = 6"
(4) Length	6 = 6", 9 = 9", 12 = 12", 18 = 18", 24 = 24"
(5) Hole Pattern	See the following pages for available standard hole patterns.
(6) Insulation & Bracket	Insulator: S = Small, M = Medium, L = Large, X = Extra Large Bracket : P = Small Round (Pipe), R = Large Round, C = Clamp
(7) Conductor Size	2T = No.2 AWG Solid Tinned, 2/019 = 2/0 AWG 19 strand, 4/019 = 4/0 AWG strand, 4/019T = 4/0 AWG 19 strand Tinned, etc... For additional conductor sizes, please contact your representative.
(8) Conductor Length & Location	24 = 24", 36 = 36", 40 = 40", 48 = 48", 72 = 72", etc... (Custom length upon request.)
(9) Option	Acrylic cover (See page 112)

NOTE

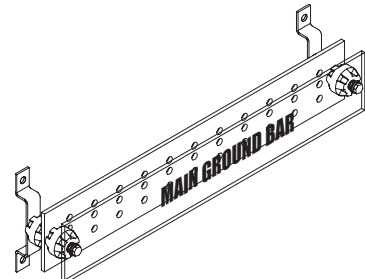
Tin plating available. Other special plating available upon request. Plating, special hole sizes, patterns and ground leads are all available by special request.

Option - Acrylic Cover

A full line of acrylic covers are available. Acrylic cover over the Ground Bar (TerraBar) with Bus Bar Brackets and Insulators is shown.

NOTE

See [page 112](#) for details.

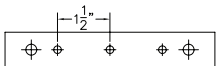


1" and 2" Bars

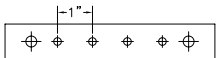
1" X 6"



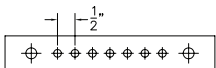
Pattern 21



Pattern 22



Pattern 23

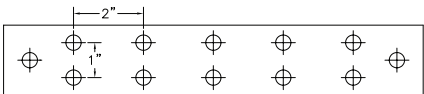


Pattern 24

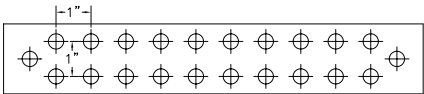
2" X 12"



Pattern 00



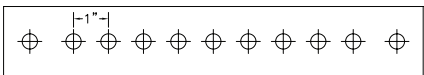
Pattern 03



Pattern 04



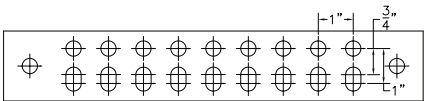
Pattern 05



Pattern 06



Pattern 07



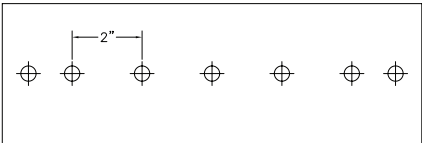
Pattern 15

Standard 4" Bars

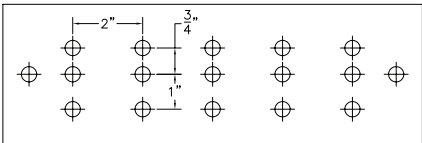
4" X 12"



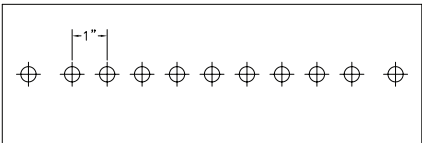
Pattern 00



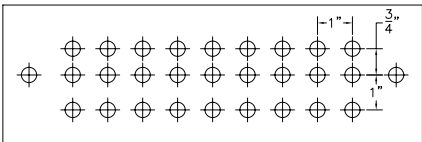
Pattern 05



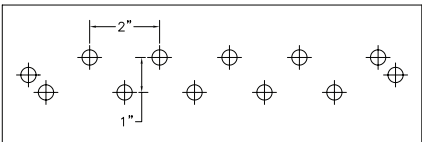
Pattern 01



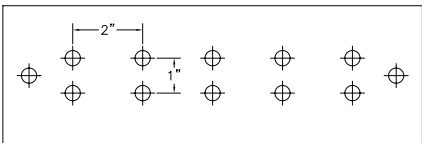
Pattern 06



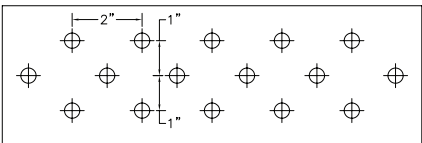
Pattern 02



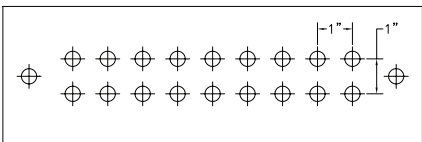
Pattern 07



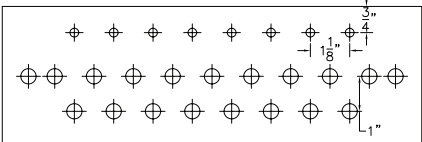
Pattern 03



Pattern 08



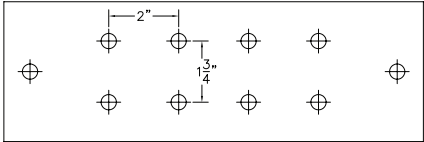
Pattern 04



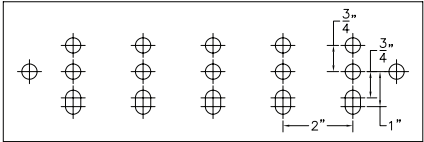
Pattern 09

Standard 4" Bars

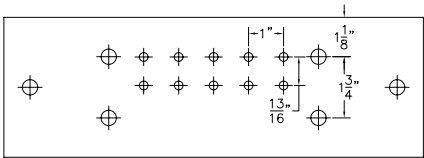
4" X 12"



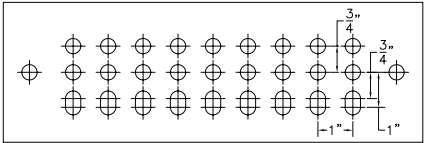
Pattern 10



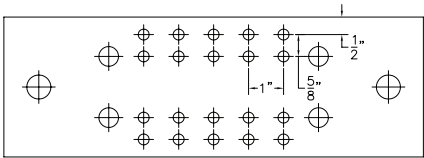
Pattern 18



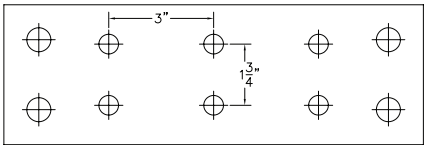
Pattern 11



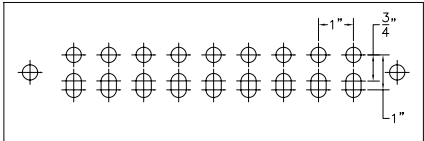
Pattern 19



Pattern 12



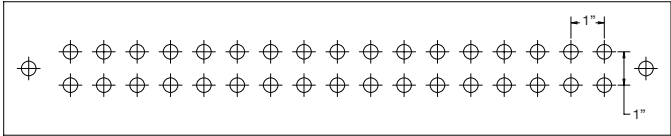
Pattern 14



Pattern 15

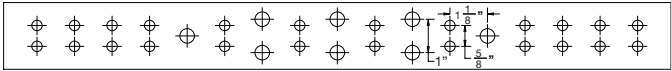
Specialty Bars

4" X 20"



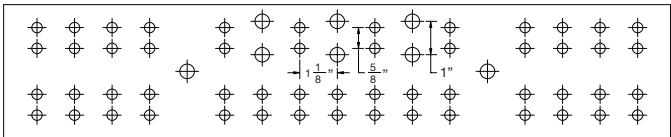
Pattern 04

2" X 20"



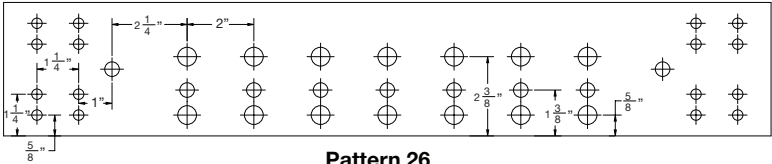
Pattern 28

4" X 20"



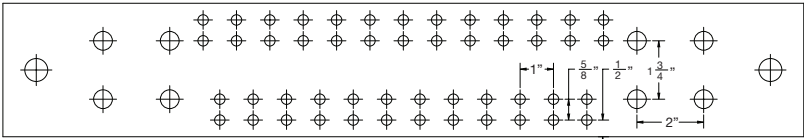
Pattern 29

4" X 23"



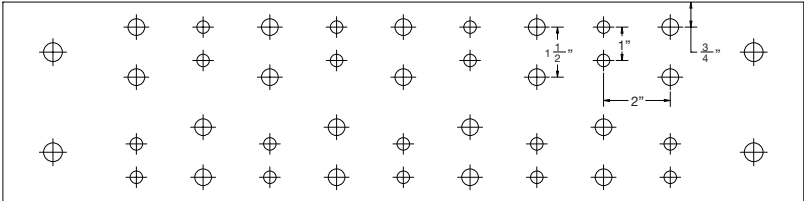
Pattern 26

4" X 24"



Pattern 13

6" X 24"



Pattern 16

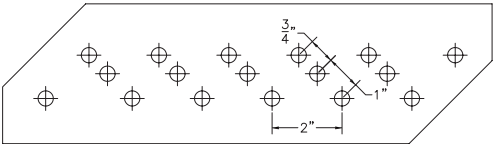
Specialty Bars

2" X 14"



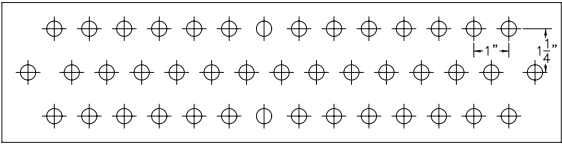
Pattern 27

4" X 14"



Pattern 17

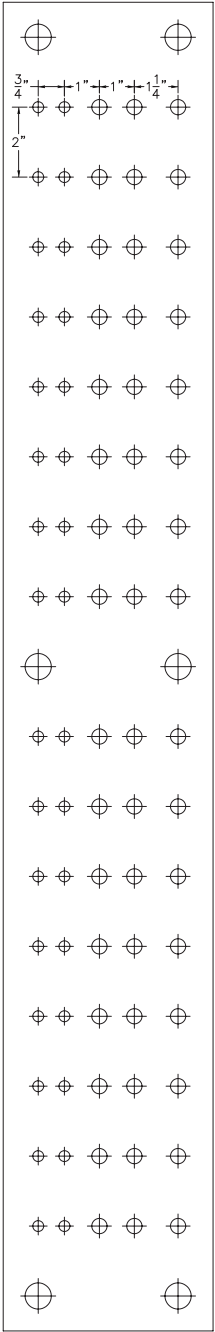
4" X 16"



Pattern 20

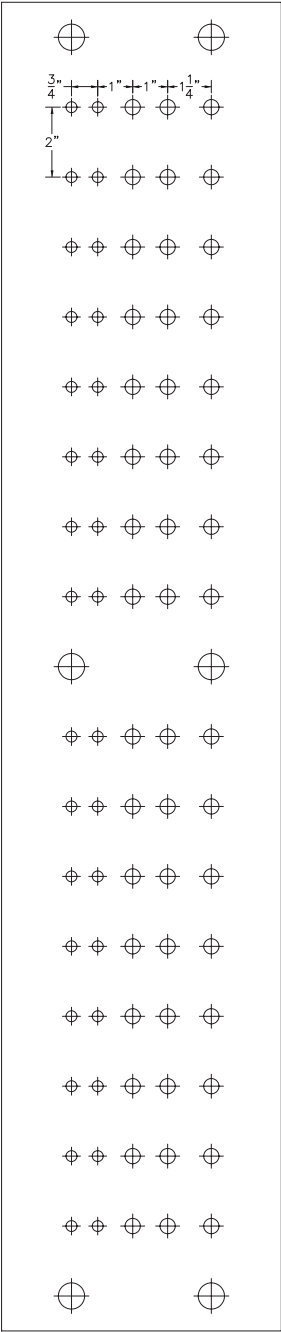
Specialty Bars

6" X 48"



Pattern 25

8" X 48"



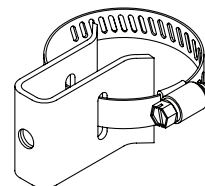
Pattern 25

Bus Bar Accessories

Small Round Member Adaptor

Used to attach bus bars to pipe up to 3" diameter.

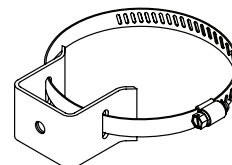
Part Number	Description	Weight
6601	Adaptor, Stainless Steel, 2" to 3" Small Round Member	4.0 oz. (113.4 g)



Large Round Member Adaptor

Used to attach bus bars to pipe 3" to 6" diameter.

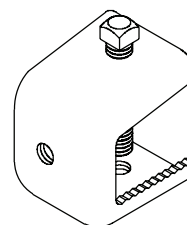
Part Number	Description	Weight
6602	Adaptor, Stainless Steel, 3" to 4" Small Round Member	7.0 oz. (198.4 g)



Stainless Steel Tower Bracket

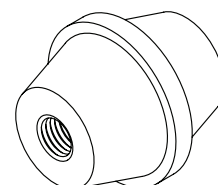
Bracket used to attach bus bars to angle iron on towers.

Part Number	Description	Weight
BKT-CC	Bracket, Stainless Steel, C Clamp Type, for Flat Stock or Corner Angle with 3/8"-16 Thread	8.0 oz. (226.8 g)



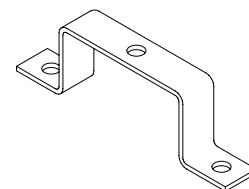
Fiberglass Composite Insulators

Part Number	Description	Weight
7901	Insulator, Fiberglass, 1/4, Small - Suggested voltage rating - 600V 1.25" high x 1" diameter	1.2 oz. (34.0 g)
7906	Insulator, Fiberglass, 3/8, Medium - Suggested voltage rating - 600V 1.375" high x 1.75" diameter	3.6 oz. (102.1 g)
7911	Insulator, Fiberglass, 1/2, Large - Suggested voltage rating - 2700V 2.25" high x 2" diameter	5.5 oz. (155.5 g)
7916	Insulator, Fiberglass, 5/8, Extra Large - Suggested voltage rating - 3400V 2.625" high x 2.5" diameter	10.2 oz. (289.2 g)



Stainless Steel Bus Bar Brackets

Part Number	Description	Weight
7920	Bracket, Stainless Steel, 1" X 4" Face, for Bus Bar	4.0 oz. (113.4 g)
7922	Bracket, Stainless Steel, 1" X 2" Face, for Bus Bar	5.0 oz. (141.7 g)



NOTE

- Other mounting hardware available on request.

Acrylic Covers

A full line of clear acrylic covers are available to fit any bus bar. The covers come with insulators and hardware to match with the pattern on the bus bar. Call with special requirements. Lettering is available up to 2".

Part Number	Description	Weight
COV-ACR-1/4-1-24	Cover, Acrylic, 1/4" X 4" X 24"	20 oz. (567 g)
COV-ACR-1/4-6-24	Cover, Acrylic, 1/4" X 6" X 24"	2.0 lb. (0.90 kg)

NOTE

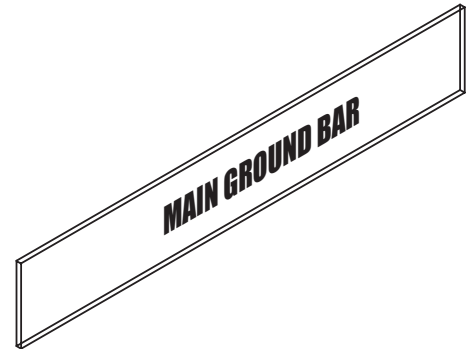
- Other acrylic covers available on request. See below for numbering system.

Part Numbering System

Example: COV-ACR-1/4-4-24-ENG

COV-ACR - **1/4** - **4** - **24** - **ENG**
 (1) - (2) - (3) - (4) - (5)

(1) Type	COV-ACR = TerraBar Acrylic Cover
(2) Thickness	1/4 = 1/4"
(3) Width	1 = 1", 2 = 2", 4 = 4", 6 = 6"
(4) Length	4 = 4", 6 = 6", 9 = 9", 12 = 12", 18 = 18", 24 = 24"
(5) Option	Engraving Letters (include Text & Size in order)



NOTE

- Width and length are per TerraBar specification.