



Grounding and Utility Enclosure

UE-1P

UE-1P-INS Revision 1



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Outdoor Utility Enclosure

The **DXE-UE-1P** is a weather-resistant, high impact thermoplastic enclosure which is ideal for outdoor mounting of all types of lightning suppressors and other equipment. Its weather-tight design protects the inside components against rain and directed water spray. The thermoplastic housing and wire entrance grommet materials used in the enclosure are fire retardant, UV stabilized and resists degradation from environmental contaminants, chemical fertilizers and insecticide sprays. The housing can be painted with latex or oil base paints.

Included with the **DXE-UE-1P**:

- Weather-tight 12 ¼" x 12" x 5 ¼" Enclosure
- Plated #8 x 1 ½ Wood Screws (3)
- Four plastic mounting plate spacers
- 8" x 9.5" 6061-T6 Aluminum Mounting Plate with Stainless mounting screws
- Four weather-tight coax feed through couplers
- Drilling Template

Because this enclosure has many potential applications, no holes have been drilled in the enclosure or the aluminum mounting plate. The drilling template should be used to drill the mounting holes in the aluminum plate to match the corner mounting bosses in the enclosure. Four Stainless self-tapping screws are included to secure the mounting plate to the enclosure.



Figure 1: Utility Enclosure shown with Optional Equipment

A typical application is shown in **Figure 1**. Two coaxial lightning suppressors and one telephone line protector are mounted to the aluminum mounting plate. A copper ground strap is bonded to the plate and runs to the Single Point Ground system.

Installation

The UE-1P can be mounted on exterior walls covered with wood, aluminum or vinyl siding or in the mortar joints of a brick or block wall. Use the three point mounting points with the plated 1 1/2 inch Philips screws. If you are mounting to masonry, install masonry anchors in the mortar joints and use the appropriate screws. Toggle bolts or other specialty anchors may be needed depending on the mounting surface. If necessary, the enclosure can be mounted on a pipe or post with strap clamps. DX Engineering has Stainless clamps in a variety of sizes. See **Figure 2**.

Because of the wide variety of applications and configurations, it would be prudent to layout the equipment that will be mounted on the aluminum plate before final mounting of the enclosure. The template on the last page indicates the location of unused mounting piers in the enclosure that may interfere with equipment mounting. These are noted by circles with gray shading with an X through them.

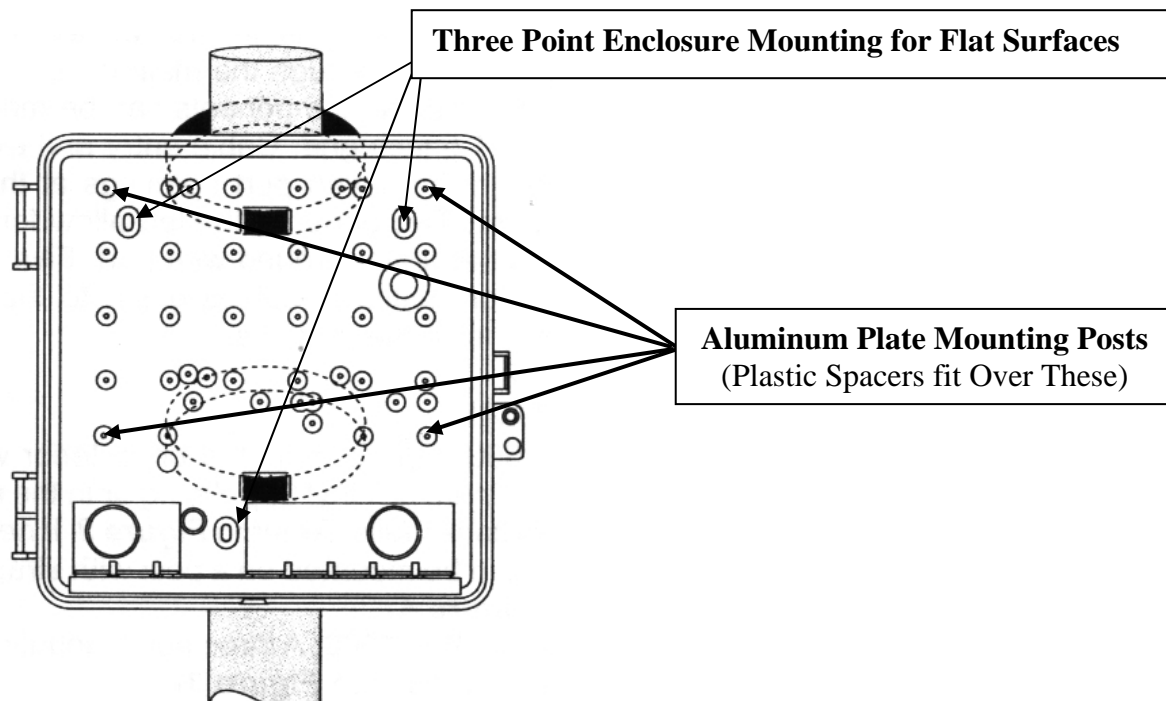


Figure 2: Enclosure Mounting Options

Preparing the Aluminum Mounting Plate

Place the plate on a flat surface. Lay the template on the plate. Using a center punch, carefully mark the center of the corner mounting posts as indicated by the circle with the + inside. **Note:** *The holes are not symmetrical. Once drilled, the plate will only mount in the enclosure one way.* Drill four 5/32 inch size holes to accommodate the Stainless self tapping screws. Do a trial-fit with the plate in the enclosure before drilling the mounting holes for the suppressors. Take the four plastic spacers, place them over each corner mounting post, lay the plate down on top of the spacers, align the screws and tighten them to 20 in/lbs maximum. You might want to mark the plate to indicate the proper orientation. This will ensure whatever you mount on the plate will fit once the plate is re-mounted in the enclosure.

Remove the plate from the enclosure and lay it on a flat surface. Position the suppressors on the plate where they will be mounted. The coax will come into the bottom of the enclosure, through the built-in gasket, to the antenna side of the suppressor. The equipment side coax will run from the suppressor out the top of the enclosure, through the water-tight couplers. In **Figure 1**, note the alignment of the coax, suppressors and access holes are in a fairly straight line. Some types of coax are not very flexible and sharp bends should be avoided.

Mark the location of the suppressor mounting holes using a sharp felt tip marker. You can draw an outline of the suppressor on the plate to help locate it after drilling. A 3/16 inch drill bit makes the correct size hole to mount most PolyPhaser suppressors.

***Note:** Before mounting any suppressor, clean the aluminum plate and the mounting tab on the suppressor. The PolyPhaser Copper Cleaning kit (part number **PPC-CCK**) is highly recommended. It includes cleaning pads and copper joint compound which should be used between the suppressor mounting tab and the plate. This will assure a long-lasting corrosion-free joint. You could also use Penetrox A. (part number **DXE-P8A**) Do not use star or other washers between the suppressor and the plate.*

If you use the coax weather-tight couplers, use a 7/8 inch hole saw, available at most home supply stores, to make the proper size hole in the enclosure. Check the hole alignment with the bottom access holes to make sure the coax or wiring will run in a straight line from bottom to top. The center of the coupler mounting hole should be 1-3/16 inches below the edge of the enclosure with the lid open to avoid interference with the mounting plate or the cover when it is closed. See **Figure 3**. Insert the coax or other wiring through the top couplers and bottom gaskets before installing connectors.

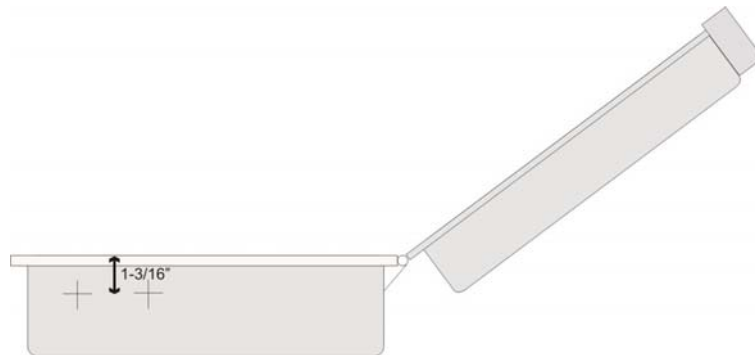


Figure 3: Coax Coupler Drilling Dimension

If you intend to use a copper strap to bond the aluminum plate to your Single Point Ground as shown in **Figure 1**, a bonding strap can be fashioned from a piece of copper bar or heavy strap, available from most home supply stores. Cut the bar or strap wide enough so the mounting holes are on either side of the strap. Drill the appropriate mounting holes in the plate. You can use self-tapping screws to hold the clamp and strap to the plate. You must clean the surfaces and use copper joint compound or Penetrox A between the copper and the aluminum to ensure a long lasting, quality bond between the two dissimilar metals. A slot for the copper strap to go through the enclosure could be made on the bottom, in the plain space between the larger and smaller pre-made openings.

PolyPhaser Lightning Protectors

There are several ways in which your equipment can be damaged via the power line. One is a strike elsewhere on the power line, inducing a surge that travels to your equipment. A strike to your tower or a coupled surge to the phone line can also damage equipment since the power line can provide an alternate path to ground.

To ensure survival, all inputs and outputs (I/O's) must not only be protected, but must be bonded together via a common low inductance conductor to a common earth ground. All grounds should be bonded to a single point ground (SPG) system.

Whether you are protecting power mains, amateur radio equipment, a CCTV security camera, high-end audio or your new HDTV monitor, PolyPhaser has the correct protectors to suit your application and budget. Using multiple surge suppression technologies, PolyPhaser's patented designs offer superb protection in sturdy and functional designs.

Broadband Coaxial Lightning Protectors, DC Blocked

DX Engineering sells the PolyPhaser B50 series of broadband, DC blocked, coaxial lightning protectors for general radio use. PolyPhaser Corp. is the world's leading supplier of coaxial lightning protectors. These broadband protectors are for general, single transmitter use. The lightning protectors are either bulkhead or flange (flange) mount. The units use a DC blocked gas tube design that has no DC continuity between the center pins. The protectors appear as a DC open between surge and protected ports and offer the best protection in the industry.

Features:

- Lowest throughput specifications available
- Multi-strike capability
- Low strike throughput energy
- Very low 0.1 dB insertion loss



Model	Connectors:		Frequency Range	RF Power
	Female	Mounting		
PPC-IS-50UX-C0	UHF	Flange	1.5 to 400 MHz	HF: 2 kW, VHF: 375 W, UHF: 125 W
PPC-IS-50NX-C0	Type N	Flange	1.5 to 400 MHz	HF: 2 kW, VHF: 375 W, UHF: 125 W
PPC-IS-B50LU-C0	UHF	Bulkhead	1.5 to 400 MHz	HF: 2 kW, VHF: 375 W, UHF: 125 W
PPC-IS-B50LU-C1	UHF	Bulkhead	50 to 700 MHz	VHF: 375 W, UHF: 125 W
PPC-IS-B50LN-C0	Type N	Bulkhead	1.5 to 400 MHz	HF: 2 kW, VHF: 375 W, UHF: 125 W
PPC-IS-B50LN-C1	Type N	Bulkhead	50 to 700 MHz	VHF: 375 W, UHF: 125 W
PPC-IS-B50HU-C0	UHF	Bulkhead	1.5 to 400 MHz	HF: 3 kW, VHF: 500 W, UHF: 250 W
PPC-IS-B50HU-C1	UHF	Bulkhead	50 to 700 MHz	VHF: 500 W, UHF: 250 W

Visit www.DXEngineering.com for complete specifications.

Broadband Coaxial Lightning Protectors, Baseband, DC Passing

Use PolyPhaser IS-75FB/18 to protect your 75 Ω receive only antennas like the DX Engineering RBS-1P and RFS-1. The unit is designed to pass DC as well as RF signals. The IS-75FB/18 was chosen to compliment DX Engineering's line of receive only antennas. It has type F CATV connectors and passes 18 Vdc for control/power at the antenna units.

Features:

- Lowest throughput specifications available
- Multi-strike capability
- Low strike throughput energy
- 0.3 dB insertion loss
- 75 Ω impedance



Model	Connectors:		Frequency Range	RF Power
	Female	Mounting		
PPC-IS-75FB/18	Type F	Flange	DC to 30 MHz	Receive only

Visit www.DXEngineering.com for complete specifications.

Data/Phone Line Lightning Protectors

The typical amateur's ham shack has more avenues for lightning damage than just the coax cable from the antenna. With most shacks now having a computer with internet access, lightning protection needs to be added to the telephone lines as well. Telephone line protectors supplied by the phone company are a first line of defense, but are not always connected to a high current capacity or a fast transient response ground system. PolyPhaser offers a series of data and Telco protectors when a higher level of protection is required.

Features of the PPC-IS-SPTL lightning protector for 2-wire telephone trunks:

- Application: Telco Trunks
- Max Operating Current: 2 Adc
- Turn-On Time: 2 ns for 2 kV/ns
- Resistance: 20 Ω
- -3 dB Bandwidth: 250 kHz
- Turn-On Voltage: +/-200 Vdc
- Max Surge Current: 40 kA, 8/20ns Waveform
- Let Through Voltage: +/-300 Volts
- Capacitance: 2400 pF
- Surge Energy: 550J

Model	Description
PPC-IS-SPTL	Protector, Twisted Pair, Telco Trunks, 200 Vdc, 2-wire



AC/DC Power Protectors

Protecting your equipment from incoming lightning surge energy is accomplished at two levels. Both levels require a single point ground (SPG) system.

First: install an AC power shunt protector on the incoming power mains. It is important that the AC shunt protector is located at the SPG entry point.

Second: have the equipment connected to an AC series protector, which is also tied to the SPG. Keeping all equipment plugged into the same outlet and grounded to the same point allows them to rise and fall in potential at the same time with no other paths to a lower potential.

AC Shunt

For residential applications, you should use PolyPhaser's IS-PM240-BP AC shunt protector at the AC main box. This works on AC main installations that consist of two hot, a neutral and a ground coming from a single, center-tapped transformer, typical of most U.S. residential installations.

The AC shunt protector takes the surge energy on each hot lead to ground rather than the neutral line. Each hot lead is protected and includes a resettable circuit breaker on the path to ground. The AC shunt protector also includes a dry contact alarm indicator.

Features:

- Surge energy is shunted to ground, not to neutral
- Protectors on their own circuit breakers—won't interrupt load power
- Protection blocks/circuit breakers are replaceable if needed
- Remote/local status dry contacts

Technical Specifications:

- Max Surge Current: 40 kA
- Turn-on Voltage: 205 Volts
- Turn-on Time: 25 ns
- Operating Voltage: 120/208 Volts
- Phase Quantity: 2
- Voltage Configuration: Bi-phase
- Operating Temperature: +5 to +40 C
- Local Status Indicator: Yes
- Remote Status Capable: Yes

AC Series

Use the PLDO line of protectors in line to protect sensitive equipment. The unit has a master on/off switch and circuit breaker for added protection. It is capable of handling multiple strikes. Mount the housing on the PPC-CU-SPGP grounding plate and tie the plate to your single point ground.

Features:

- Power line extension protector
- Multi-strike capability
- Master on/off switch
- NRTL UL 1449 listed NRTL/C LR# 106164-3
- Circuit breaker included for added protection



Specifications:

- Let Through Voltage: 400 Vpk
- Max Surge Current: 20 kA
- Turn-On Voltage: 200 Volts
- Max Operating Current: 15 A
- Operating Voltage: 120 Volts
- Operating Temperature: -40 to +40 C
- Phase Quantity: 1
- Remote Status Capable: NO
- Local Status Indicator: NO
- NRTL UL 1449 listed NRTL/C LR# 106164-3

Grounding Parts and Accessories

Single Point Grounding (SPG) is the most important aspect of a grounding scheme and is the key when protecting your equipment from EMP surge and lightning damage. A properly grounded tower installation, including the antenna feedlines, will also go a long way to protecting your investment and giving you peace of mind.

Constructing a ground system may require bonding dissimilar materials. For example, often we need to bond copper strapping from a tower ground system or ground rod to a galvanized or aluminum tower. In many cases, the only solution is to use a thermally welded connection, which is expensive and inconvenient. The PolyPhaser clamping system provides a non-corrosive, quality bonding connection to dissimilar materials. Clamps are available to transition between copper, tin, aluminum and galvanized steel.

Copper strap has a larger surface area and lower inductance per foot than equivalent cross-section circular wire.

Bonding clamps transition from galvanized tower legs to a copper strap-style ground system, eliminating the dissimilar metals reaction. They also eliminate the need for exothermic welding at the tower. The copper strap clamps connect the strap to various wire sizes and copper ground rods. The multi-clamp is used to bond copper straps to each other.

Proper cleaning and preparation of the copper straps is mandatory to ensure a continuous low inductance connection. The PPC-CCK copper cleaning kit includes a non-abrasive scrub pad, copper joint compound and step-by-step instructions.

Bonding Clamps for Copper Strap

All of the strap clamps are faster and easier than preparing the joint for exothermic welding and provide good low inductance connections. Proper preparation of the copper materials is essential to ensure a reliable, low resistance connection. The CCK cleaning kit has everything needed for good connections to copper.

Note: Copper strap wider than 1 1/2" requires holes to be punched into strap for the mounting hardware.

Copper Strap to Tower

The PolyPhaser TK clamp series has a stainless steel plate to go between the copper strap and galvanized tower leg to prevent corrosion due to dissimilar metals. Use for tower leg diameters of 5/8" to 3 1/4".

- PPC-TK-1 Strap to Tower Leg Ground Clamp, 5/8 to 1 1/4 inches.....
- PPC-TK-2 Strap to Tower Leg Ground Clamp, 1 1/4 to 2 1/4 inches.....
- PPC-TK-3 Strap to Tower Leg Ground Clamp, 2 1/4 to 3 3/4 inches.....
- PPC-TK-4 Strap to Tower Leg Ground Clamp, 3 1/2 to 5 inches.....

Copper Strap to Copper Ground Rod Clamp

This clamp bonds a 5/8" ground rod to copper strap. 18-8 stainless steel hardware included.

- PPC-58R-112S Strap to Copper Ground Rod Clamp.....

Ground Wire to Copper Ground Rods

The PolyPhaser J series clamps are used to connect ground wire to copper ground rods sized from 1/2" to 2 1/4". They accept wire ranging from #2 stranded to #10 solid. These clamps are made of cast bronze and include 18-8 stainless steel hardware.

- PPC-J-1 Wire to Rod Transition Clamp, 1/2 to 1 1/3 inches.....
- PPC-J-2 Wire to Rod Transition Clamp, 1 1/2 to 2 1/4 inches.....

Copper Strap

Use copper strap to achieve a low inductance ground system. Copper strap has a larger surface area and lower inductance per foot than equivalent cross-section wire. Use ground strap to tie equipment back to a common ground point. Copper strap should also be used to make a non-resonant counterpoise for towers mounted on mountaintops or other rocky terrain. All copper strap is 2" wide and 0.011" thick.

- DXE-CS2-25 Copper Strap, 2" by 25 ft.....
- DXE CS2-50 Copper Strap, 2" by 50 ft.....
- DXE CS2-25 Copper Strap, 2" by 100 ft.....

Copper Strap to Copper Strap Clamp

If you need to bond two copper straps together, for extending an existing run or to add drops to equipment, the PolyPhaser MSC-3 bonding clamp is ideal. The MSC-3 accepts ground straps from 1 1/2 to 3 inches and includes 18-8 stainless steel hardware.

- PPC-MS3-3 Multi-Strap Clamp.....

Copper Strap to Copper Wire Clamps

These PolyPhaser wire bonding clamps provide a convenient way to bond heavy gauge copper wire to copper grounding straps. These clamps handle from 6 AWG to 6/0 AWG, depending on the model. 18-8 stainless steel hardware is included.

- PPC-1C-112S Copper Wire to Strap Bonding Clamp, 6 to 1 AWG.....
- PPC-10C-112S Copper Wire to Strap Bonding Clamp, 1/0 to 6/0 AWG.....

Utility Enclosure

This weather resistant, high impact thermoplastic enclosure is perfect for outdoor installations of lightning protectors and other equipment. The enclosure measures 12 1/4 x 12 x 5 1/4 inches and features a removable, self-latching hinged cover. This utility enclosure includes wall mounting hardware, an aluminum plate to mount lightning protectors, plate mounting hardware, two weather-tight coax feedthrough adapters, and drilling template. The coax feedthrough adapters will fit coax sizes from RG8X to LMR400. The enclosure can be mounted to a post, pipe or tower leg using optional element clamps.

- DXE-UE-1P Utility Enclosure Package.....

Coax Shield Ground Kits

These kits provide a low inductance path for proper ground contact between a round member made from copper, brass, aluminum, tin or steel to corresponding copper, brass, aluminum, tin or steel grounding material. For example, grounding the coax shield as the coax leaves the tower or connecting a round tower leg to the ground system. Three kits are available for various combinations of shield material to grounding material and fit coax shield or tower leg diameters from 1/4" to 2 1/8". These kits include a perforated strap, an adjustable angle 24" tall strap, a weatherproofing kit and all stainless steel brackets and hardware.

- PPC-UNI-KIT-2CC Copper to Copper.....
- PPC-UNI-KIT-2CT Copper to Aluminum.....
- PPC-UNI-KIT-2TC Aluminum to Copper.....
- PPC-UNI-KIT-2TT Aluminum to Aluminum.....

Single Point Ground Plates

All lightning protectors need to be tied to a common ground. The PolyPhaser CU-SPGP provides a convenient means to mount multiple lightning protectors and tie them to a common ground. The plate is a copper sheet mounted to painted fiberboard. It should be mounted to wall studs set on 16 inch centers.

- Copper Sheet Dimensions: 15" x 10" x 0.063"
- Mounting Plate: 3/4" painted fiberboard
- Dimensions of Plate: 18" x 12"
- Mounting: 16" center-to-center

- PPC-CU-SPGP Single Point Grounding Plate.....

Copper Cleaning Kit

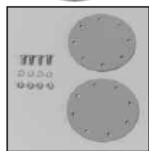
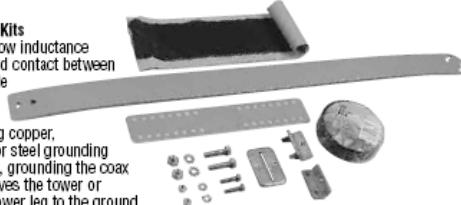
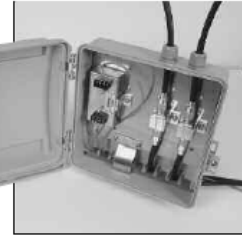
Proper preparation of the copper surfaces and application of copper joint compound prior to bonding is essential to maintain the low resistance properties of the strap connection. The copper cleaning kit has everything needed to establish the bond. Included are a non-abrasive scrub pad, copper joint compound and complete instructions.

- PPC-CCK Copper Cleaning Kit.....

Weatherproofing Kit

Use PolyPhaser's Weatherproofing Kit PPC-WK-1 when mounting lightning protectors or making ground connections outdoors. The kit prevents moisture ingress and easily handles extreme temperatures, the sun's UV rays and salt spray.

- PPC-WK-1 Weatherproofing Kit.....



Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at DXEngineering@DXEngineering.com.

For best service, please take a few minutes to review this manual before you call.

Warranty

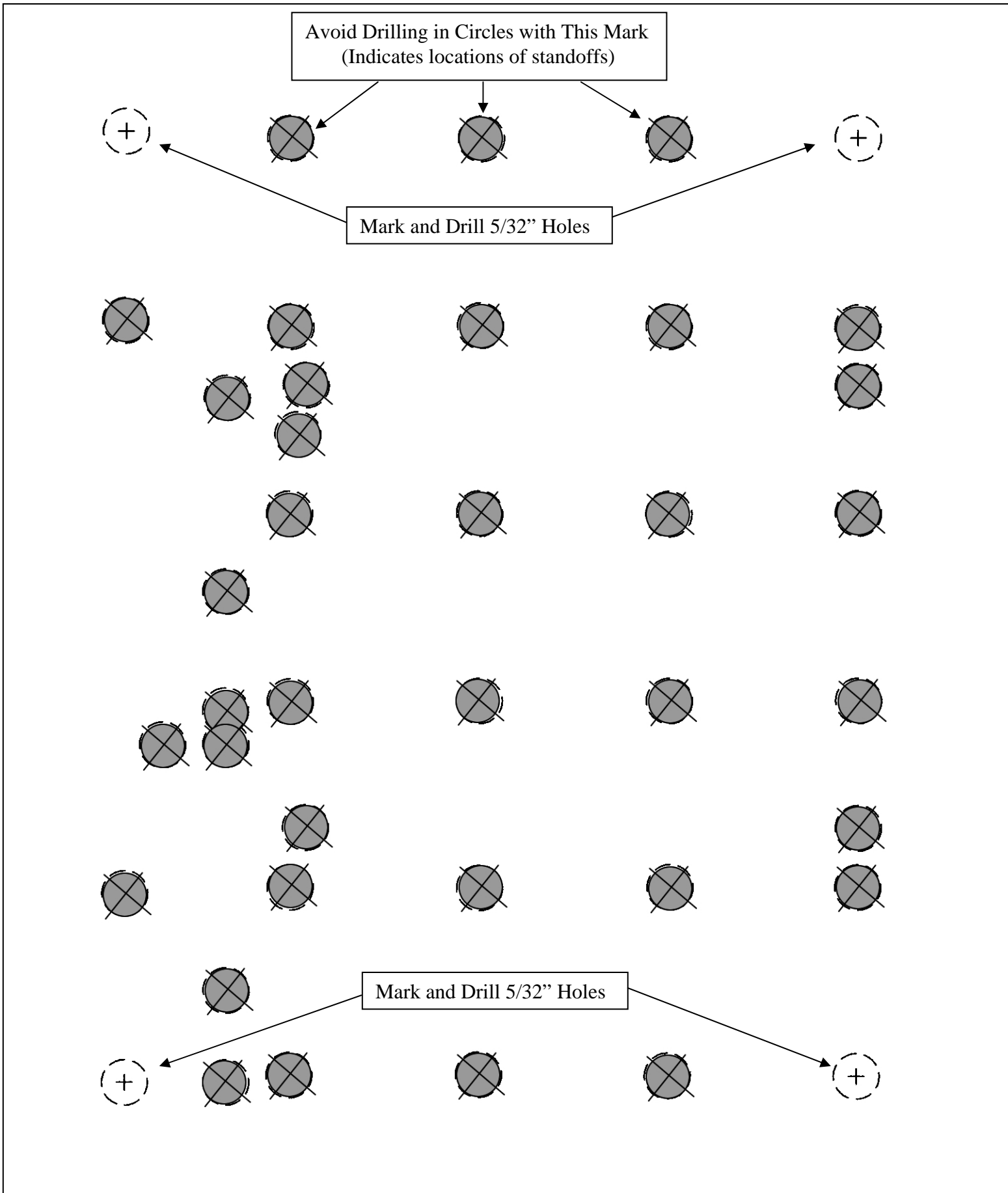
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Aluminum Plate Drilling Template. Cut-out along line and tape to plate.