

Figure 1. Typical CMPH Enclosure, Dome On and Dome Off Views

- Installation Instructions - CMPH-75XX Cross-Connect Series of Charles Multi-Purpose Housing (CMPH™) Enclosures

1. GENERAL

1.1 Document Purpose

This document provides installation instructions for the CMPH-75XX Cross-Connect Series of Charles Multi-Purpose Housing (CMPH™) enclosures, which provide a quick and easy way to cross-connect up to 1200 feed and distribution wire pairs using high-density terminal blocks in a single, above-ground enclosure. See Figure 1 for a typical CMPH-75XX Cross-Connect series model, see Table 6 for ordering information on all products in this series, and call Charles Industries (see Part 3) to request more information.

- NOTE -

Hereafter the Charles Multi-Purpose Housing will be referred to as the "CMPH" or "enclosure."

1.2 Document Status

Whenever this document is updated, the reason will be stated in this paragraph.

1.3 Product Purpose and Description

The CMPH-75XX Cross Connect Series is designed to provide quick, flexible, high-density, cross connections between feeder and distribution cables. The enclosure's internal framework and large swing-out panels hold up to 24, 50-pair, cross-connect terminal blocks. These pre-stubbed terminal blocks, which contain factory-wired 25-pair or 50-pair wire-bundles that are terminated with 710 or MS2 connectors, can be installed initially, or easily added

at a later date without disruption of existing circuits. The swing-out panels facilitate cable storage in the base prior to cable splicing and installer connections. This center-fed, cross-connect, interface system accommodates from 300 to 1200 pairs.

1.4 Exterior components. The CMPH enclosure offers easy installation, superior structural strength, 360° technician access, and generous internal connection capacity. The green light-weight base and dome are made of a durable material which minimizes condensation and protects against corrosion, floods, fire, weather, dirt, insects, intrusion, dents and impact. The top piece of the CMPH is the dome, designed to overlap the base for a flood-protective bell-jar effect. The base has an open top, corrugated ribbed walls, internal, dual-purpose, molded-in, channel grooves (which accept most metallic stakes as well as the vertical channels of the internal framework, see Figure 2), and an open bottom. Easy replacement installations and easy underground cable access is provided via this open base bottom.

1.5 Interior components. At the center of the cross-connect CMPH is an internal metallic framework that supports two, large, hinged, heavy-duty, wind-latchable, side panels, both of which are factory-equipped with either 25-pair or 50-pair terminal blocks (see Table 6 for the specific type of terminal block used). Up to 24 50-pair terminal blocks can be equipped in a single high-density CMPH. Factory-prewired at the back of each terminal block is a 5-foot-long wire-bundle stub that is terminated with either a 710 connector or an MS2 splice connector (per the specific model ordered). New or existing *pre-connectorized* feed and distribution cables (wire gauge size of 22-26 AWG), which also are terminated with either 710 or MS2 connectors, enter the bottom of the CMPH from a trench or vault and are mated with the connectors at the end of the terminal blocks' wire-bundle stubs. After the cable connections are made inside the CMPH base (lower connections), the installer performs all wire jumper connections (upper connections). Wire race-ways are provided for protection of all cable and jumper pairs as they are installed. The hinged, side-access style, terminal block panels enable the installer to create very short, easily traceable, jumper runs. The installer routes and connects jumpers between the proper toggle of the correct terminal block in one door panel (feeder side) and the proper toggle of the correct terminal block in the other door panel (distribution side).

For models equipped with MS2 splice connectors, the MS2 connector has a two part block which contains U-contacts, wire channels, and cut-off blades. The body of the MS2 splice cover module assembly and base are crimped together to terminate Feeder or Distribution pairs. Binder groups may be identified on the module mouth and pairs can be identified on tagging cable labels.

Also included with each CMPH is a test kit, a jumper wire spool holder, pair identification labels, wire race-ways, splice bars, a ground bar, and other accessories (see Table 6).

1.6 Product Mounting Type and Location

The CMPH is an above-grade enclosure, the base of which is typically installed in a trench or hole in the ground up to the base's ground line indicator, either in new or rehab-type installations around existing cables. The base also can be mounted directly to a concrete pad using a special bracket, as well as stake mounted. Molded channel grooves, located at the center of each interior side wall, enable stake mounting using 30", 36" or 42" stakes. These grooves accept most new and existing enclosures' mounting stakes. The ribbed or corrugated base walls provide excellent stability in most soil types. The dome mounts on the base and protects all equipment installed or mounted inside the CMPH.

1.7 Features

- Side-access terminal blocks on swing-out panels facilitate cable storage before splicing and provide greater room for spliced connections
- Weather-resistant, gel-filled, Tyco Dat@ Term terminal blocks provide application flexibility, rapid, pair-at-a-time, toolless, no-strip wire connections
- 50-pair terminal blocks equipped with 5' stubs which are terminated with 3M MS2 splice terminals
- Plastic base provides ease of cabinet installation over existing cables and facilitates cabinet rehabilitation
- Single cabinet mounting footprint for 300-1200 wire pairs
- Durable, light-weight, plastic, impact-resistant material provides long life
- Base with overlapping dome provides flood proof "bell jar" effect, to minimize condensation and provide outstanding weather protection
- Designed to meet Telcordia specification GR-3115-CORE

2. INSTALLATION

See Table 1 to perform a new CMPH enclosure installation. Table 2 describes a new CMPH installation with stakes, and Table 3 describes an installation to replace an existing enclosure (rehabilitation installation). Table 4 describes how to make installer connections to the terminal blocks on the hinged interior panels.

- CABLE DAMAGE WARNINGS -

Be careful not to damage any buried cables or service wires while digging either to expose cables or to prepare a hole or trench, or while driving stakes.

- NOTE -

Never grasp or use the flap-latches as handles to lift the dome off the base; latch breakage and possible enclosure intrusion could result.

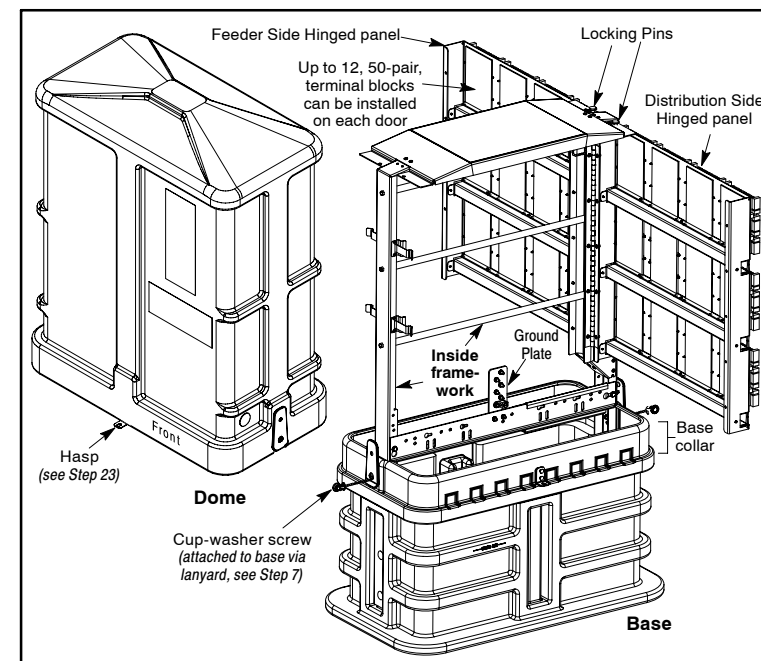


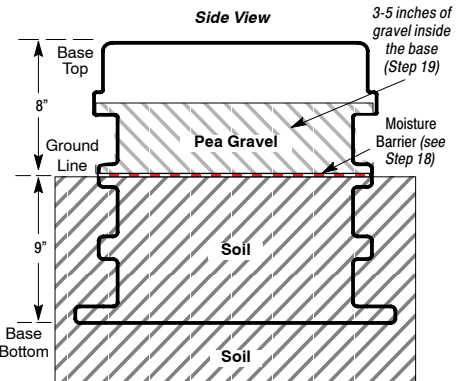
Figure 2. Typical CMPH Enclosure, Dome Removed, Panels Open

- GROUNDING WARNINGS -

Always follow local codes and company practices for performing proper cable and site bonding and grounding, and perform all bonding and grounding prior to other electrical and communications connections.

Table 1. Installing a New CMPH Enclosure	
Step #	Instruction
1. □	<p>Obtain tools, materials and equipment. Gather the following equipment to perform the CMPH installation.</p> <ul style="list-style-type: none"> □ 216 tool or can wrench □ Charles CMPH model □ Scissors, knife or snips □ Level □ Measuring tape □ Soil tamping tool(s) □ Soil for backfill □ Site cleanup tools □ Trenching and digging equipment and tools □ Cable grounding materials and tools □ Cable opening and management equipment □ Clean, dry, pea gravel (3/8"-5/8" diameter) □ Conduit and conduit caps (optional) □ Wrenches or socket set □ Insulated work gloves (optional, to handle metallic stakes)
2. □	<p>Prepare trench. Do not damage any buried cables or wires while digging. Dig and prepare the cable trench, per company practice.</p>
3. □	<p>Place cables (or conduit or innerduct) in trench. Follow company practice to lay, place, and cut any cables and innerduct or conduit.</p>
4. □	<p>Unpack and inspect equipment. Without damaging the CMPH exterior, remove the CMPH from its packaging. Inspect the unit upon delivery; if damaged in transit, report the damage to the shipping company.</p>
5. □	<p>Unlock the CMPH. Unlock the CMPH using a 216 tool or can wrench at the two cup-washer screws (one at each side of the CMPH); turn the cup-washer screws counter-clockwise until they freely hang from their lanyard. When locked, the cup-washer screws prevent movement of the flap-latches.</p>
6. □	<p>Disengage the flap-latches. Each limited-flexibility flap-latch contains a hole in it which accepts the round standoff protruding from the side of the base collar. Each latch must be pulled out or away from base side wall just enough to clear the length of the protruding standoff. Maintain the flexed or pulled-out latch position by temporarily inserting the cup-washer screw or an item of similar diameter or thickness under each latch (between the latch and the side wall). Do not pry or flex the latches too far, only enough to clear the standoff. Never grasp or use the flap-latches as handles to lift the dome off the base; latch breakage and possible enclosure intrusion could result.</p>
7. □	<p>Remove the dome. While the flap-latches are properly disengaged from the base standoffs, grasp the ribs at each side of the dome and lift up to remove the dome from the base. The cup-washer screws remain attached to the base via the lanyard (or chain). Set aside the dome for later use.</p>

8.	□	Find and remove red plastic bag. Remove the red bag labeled "moisture barrier" hanging on one of the frame's splice bars or brackets. Set it aside for later use.
9.	□	Optional - Replacement or rehabilitation mountings only. For applications to replace old enclosures, continue with the steps in Table 3.
10.	□	Determine and mark base installation location. To determine exactly where to place the base in the trench, use the base itself as a positioning template by placing it up over the top of the conduit, innerduct, or cables (<i>route the cables through the base</i>) and lowering the base to the ground. Analyze the site and position the base at its proposed final orientation and horizontal positioning in the trench or hole and adjust accordingly. Mark this proposed final spot by removing a shallow layer of top soil from around the outside perimeter of the base about 2-4 inches wider than the base. Remove the base and set it aside.
11.	□	Dig a hole for the base. Caution: Avoid damaging buried cables, wires, inner- duct, conduit or ground equipment whenever digging. At and within the marked perimeter boundary, dig <i>straight</i> down to a depth of 9 inches. Do not dig too deep.
12.	□	Optional - Stake mountings only. For stake mounting applications, continue with the steps in Table 2.
13.	□	Put base in hole or trench and route cable(s) through base. Route the cables and conduit or innerduct up through the bottom of the base, then put the base in the prepared hole or trench.
14.	□	Verify proper base depth. Before backfilling, verify the base is at the proper depth, approximately 9 inches deep. Rest the base on solid or well-tamped soil when measuring this distance. Verify the base ground line indicator is at the same level as the final-grade ground line. Remove, add, or tamp more soil as necessary.
15.	□	Level the base. Verify the level (or plumb) of the base. Check the level at either the top surface of the base, or against one of the interior vertical channels of the metal frame. Check the level in both dimensions; front to back, and side to side. Make any needed base-bottom soil adjustments to get a good or true level or plumb line.
16.	□	Prepare earth ground. Always follow local codes and company practice when preparing earth ground and when grounding cables or equipment. If an earth ground is not present at the CMPH site and local code or practice requires an earth ground, prepare one now. Attach the earth ground to the CMPH's ground lug on the ground plate (Step 3) using a ground wire of proper gauge, per company practice.
17.	□	<p>Backfill and tamp outside the base. With the base in place, backfill the trench or hole outside of the base. While backfilling, tamp the soil or fill and check the base level once or twice. Continue to add and tamp the soil until the soil is at the base ground-line mark.</p> <p>Backfill soil inside the base and tamp. First plug, cap, or cover all channel, conduit, or innerduct openings. Then per company practice, backfill soil <i>inside</i> the base, tamping soil periodically, to the ground line mark. This adds stability and prevents any company-approved gravel (Step 19) from falling or slipping under the base sides when it is added.</p>



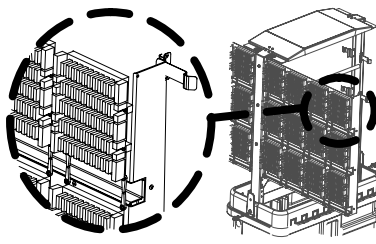
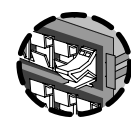
18.	□	Place the red-plastic bag or sheet. Retrieve the provided, red-plastic, vapor-barrier bag previously set aside, cut it open on all but one long edge to make one large plastic sheet, verify it does not have any large holes in it (if it does, seal them with duct tape), and place it into the base on top of the soil fill. Completely cover the soil. Fit the bag around and encircle the cables, conduit, or innerduct, <u>spread it outward from the center, and press all sheet edges downward where they make contact with the base walls.</u> Alternately, cut a hole or "X" in the center of the sheet, drop the sheet down over the centered cables or conduit group, bring it all the way down to the tamped soil or fill, fit the sheet's inner hole edges snugly around the cables or conduit, and spread it out as underlined above. When installed properly, this sheet acts as a vapor barrier and aids moisture run-off into the soil. Failure to use the plastic moisture-barrier bag on top of the soil significantly increases the risk of condensation inside the enclosure.
19.	□	Add gravel inside the base. Pour 3-5 vertical inches of company-approved gravel (gravel minimizes condensation and drains well) into the base (about to the top base rib, or 1" below any innerduct or conduit opening) on top of the soil. Use 5/8" (or less) diameter pea gravel, or clean, dry, non-porous, gravel rock only (cut stone retains more moisture). Five 18-pound bags work well. Spread out and level the gravel.
20.	□	End of base installation - determine next procedure. If cable and wire connections will now be performed, follow the steps in Table 4 and also follow local practices and equipment manufacturer instructions for the proper procedures. If further cable work will NOT be performed at this time, close the CMPH enclosure as described in the following steps.
21.	□	<p>Install dome. Locate the dome and lift it up and over the interior framework and equipment. Lower the dome until it overlaps and self-latches to the base. Verify the standoffs protrude through the holes in the latches (self-latch feature).</p>
22.	□	<p>Lock the CMPH. Lock the CMPH by re-inserting and turning the cup-washer screws clockwise into the threaded holes provided for them in the standoffs. Tighten the cup-washer screws with a 216 tool or can wrench.</p>
23.	□	<p>(Optional) Padlock the CMPH. For models equipped with an optional hasp, the CMPH also can be locked by inserting a padlock through the holes in the hasp provided at the front of the enclosure.</p>
24.	□	End of CMPH placement. Clean up site. If no more equipment or cable work will be performed at this time, clean up the site, fill and tamp any trenches, replace any removed sod, restore the landscape to it's original condition, pick up all equipment, and optionally leave this document inside the CMPH for future reference.

Table 2. Installing the CMPH with New Charles Stakes	
Step #	Instructions
<p><i>Charles offers some CMPH models which include two mounting stakes (either 30", 36", or 42" long). All stakes have identical hole patterns. This table describes how to install these models.</i></p>	
1.	<p>□ Prepare the CMPH, trench, and cable. Perform Steps 1-11 of Table 1 to open the enclosure and prepare the hole or trench and the cables or conduit. Verify the base installation site is ready and suitable for metallic stakes.</p>
2.	<p>□ Remove stakes from CMPH framework. Two mounting stakes are packed with the CMPH and attached to the frame with cable ties. Detach the stakes from the frame and remove the packing used for shipping purposes.</p>
3.	<p>□ Determine which grooves to use for stakes. The base contains a molded-in dual-purpose groove at the center of each wall to accept the U-shaped mounting stakes (as well as the U-shaped vertical channels of the frame). Per local company practice and site conditions, select two wall grooves that are appropriate for stake attachment purposes (the grooves on the narrow walls are typically used).</p>
4.	<p>□ Attach stakes to grooves in base. Set the base on the ground or a raised surface to access the grooves through the base bottom. On the inside of the base, remove the nuts and washers from the bolts (which are 4" apart) that secure the frame channels in place. On the mounting stake, the distance between the first and third hole down from the top of the stake is 4". Insert the top of the stake into the base, rotate the stake so it will fit properly into the base groove (so the perimeter contours match), align the stake holes with the bolts in the base, and set the stake in place in the groove. Attach the lock washers and nuts that were removed to secure both the mounting stake and frame channel in place. Repeat for the other stake.</p>

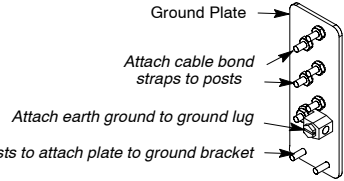
5.	□	Verify hole or trench accommodates stake length. Lift the base and attempt to place it back in place in the trench or hole. If the trench is deep enough to accommodate the length of stake protruding from the bottom of the base, skip the rest of this step. If the hole or trench is not deep enough to accept the stakes, and the weight of the base is not enough to drive the stakes the length needed to allow the base to rest at its proper depth, then once again use the base as a template to mark the exact stake locations in the ground where more soil must be removed. Remove the base from the hole, and at the stake-hole indentations, dig down just enough to accommodate the length of the stake.
6.	□	Set base in place, bring cables into base. When the hole is deep enough for the stakes, again lift the base by its walls or ribs and set it back into the hole, being sure to enclose or encompass within the base all cables, innerduct, conduit or equipment present at the site and intended for storage inside the enclosure.
7.	□	Finish the installation. Perform Steps 14 through 24 in Table 1 to finish the installation. Be sure to backfill and firmly tamp soil <i>into</i> the stake holes when backfilling.

Table 3. Installing Replacement or Rehabilitation Enclosures	
Step #	Instructions
<p><i>The Charles CMPH has the same footprint as the UPC 1200 series. These instructions describe how to replace a UPC 1200 with a Charles CMPH. To replace enclosures with smaller footprints, remove the smaller enclosure and dig a wider hole, as described in Step 10 of Table 1.</i></p>	
1.	<p>□ Prepare the base, trench, and cables. Locate the old or existing enclosure (such as the UPC 1200 series) to be replaced. Perform Steps 1-8 of Table 1 to prepare the new Charles CMPH enclosure, the hole or trench, and the cables or conduit (skip Steps 2-3 if trenching and new cable placement is not required).</p>
2.	<p>□ Dig around existing enclosure. Remove the dirt from around the existing enclosure. Dig deep enough to allow the enclosure to be lifted and removed.</p>
3.	<p>□ Prepare existing enclosure for removal. Remove the bottom panels of the UPC 1200. Locate the mounting stakes and remove the nuts and bolts from them. Remove all attachments to the enclosure, including cable supports and tie wraps, bonding connections, and grounding connections.</p>
4.	<p>□ Remove the old enclosure. Completely remove the existing enclosure.</p>
5.	<p>□ Protect cables and connections. Per company practice, wrap the existing splice as tightly as possible without damaging the connections.</p>
6.	<p>□ Analyze condition of existing mounting stakes. Inspect the existing mounting stakes for possible re-use. If they are deteriorated, bent, out of alignment, or have a hole pattern that will not work with the Charles CMPH base, carefully remove the stakes and install new ones per company practice (consult Table 2 if desired).</p>
7.	<p>□ Optional - remove the CMPH's horizontal splice bars and/or ground bracket. Analyze whether or not it will be necessary to temporarily remove any of the CMPH's internal, horizontal, supportive splice bars or brackets in order to fit the existing cabling, connections, splices, and equipment into the CMPH during the base installation. After base installation, re-attach the bars and brackets (Step 10).</p>

- 8. □ **Set base in place.** Lift the base over the existing cabling and equipment, and route the wrapped splice and all equipment up through the base bottom while lowering the base to the bottom of the hole. If the existing stakes were used, verify they are *inside* the base. If new stakes were attached to the base, insure the hole accommodates them. Perform Steps 14-15 of Table 1 for the proper base depth and level.
- 9. □ **Attach base to re-used stakes.** Remove the nuts and washers from the 4 bolts located inside the CMPH base that secure the frame channels in place (2 bolts on each side, 4" apart). Manipulate the base and/or stake tops so the re-used stakes fit into the preformed stake grooves in the base walls. Align the base bolts with the stake holes, and re-attach the washers and nuts onto the bolts. Firmly tighten nuts.
- 10. □ **Attach cables to bars and brackets.** If the splice bars or brackets were removed, re-install them now in the best positions to support (and ground) the equipment. Per company practice, attach or mount all cables and equipment to the internal framework (bars, brackets) of the CMPH. Re-attach any grounding, bonding, and cable connections previously unattached to remove the old enclosure.
- 11. □ **Close the CMPH, clean the site.** Perform Steps 19-24 in Table 1 to close the CMPH and restore the site to its previous condition.

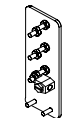
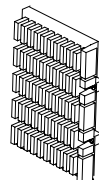
- 6. □ **Mount jumper wire spool.** Mount the field-provided jumper wire spool on the provided jumper wire spool holder located inside the enclosure.
- 7. □ **Locate proper toggles for first wire pair.** Locate or identify the correct toggle in the correct *feeder* terminal block for the first wire pair to be placed in service. Also locate the correct toggle in the correct *distribution* block. 
- 8. □ **Pull jumper wire from spool.** Pull the jumper wire from the spool toward the identified first toggle in the *feeder* terminal block.
- 9. □ **Prepare wires of first wire pair.** Straighten the last 1-2" of the conductor pair wires to be installed and placed in service. Trim the conductor wire ends evenly, but do not strip the insulation.
- 10. □ **Open feeder terminal block toggle and insert wires into toggle ports.** Pinch and pull back the toggle. Insert the pair into the ports, one wire per port (two port holes per toggle). Note that ports are labeled "T" for tip and "R" for ring. Wires should be inserted about 3/8" before bottoming out. 
- 11. □ **Close toggle.** While holding the conductor wires in the toggle ports with one hand, with the other hand push the toggle closed until it locks shut. Tug gently on each individual wire to verify a good connection was made. If a good connection was not made (wire is loose), disconnect and remove the pair by pinching and pulling back the toggle, remove the wire pair, then repeat Steps 9 and 10 until a good connection is made. *Note: Trim away the scored insulation area of wire prior to reconnection.*
- 12. □ **Route and dress jumper wire toward distribution block.** Unwind enough jumper wire from the spool to reach the identified toggle in the distribution terminal block. Dress the jumper wire down toward the bottom of the toggle, then route it sideways along the bottom of the row of toggles toward the side of the block. Route the jumper down the block, then over to the side, toward the hinge side of the door panel, then on towards the panel on the opposite side. Slip the jumper wire through any installed cable management rings and behind the race-ways and run guides provided in the CMPH. *Do not run wires across the front face of the terminal blocks.*
- 13. □ **Cut jumper wire to proper length.** Per company practice, extend the wire toward the targeted distribution block's correct toggle, allow ample wire slack, and then cut the jumper wire to the proper length.
- 14. □ **Connect wire pair to correct toggle of distribution terminal block.** Repeat Steps 9-11 for the proper toggle of the targeted *distribution* terminal block.

- 15. □ **Test connection.** To test the wire pair connections, insert the provided Dat@Term terminal block test clip into the toggle locations. Make sure the test clip alignment guide is on the hinge side of the toggle. Attach test set to test clip and test per company practice.
- 16. □ **Complete the label.** Per company practice, fill out the provided label to identify the line placed in service.
- 17. □ **Repeat for all lines.** Repeat above steps for all lines to be placed in service.
- 18. □ **Replacing toggles.** In the unlikely event a toggle is damaged, toggle removal and replacement is accomplished as described herein. Tyco Dat@ Terminals have rotating wire terminating toggles that can be removed and replaced if needed. **To replace a damaged toggle:** 1. Open damaged toggle to normal open position. 2. Push toggle out of it's block cell by rotating it past it's normal open position. This will cause it to break free of the holding mechanism in the block without damaging the block. 3. Once free, remove toggle from block and discard. 4. Insert new toggle. 5. Rotate toggle into cell, using care to make sure the toggle axle is mated with the bearing surface in the block. 6. Rotate toggle until it closes and the toggle latch locks. Toggle is now replaced. 7. Close any corresponding opened toggles.
- 19. □ **Perform cable management.** Verify all equipment and cabling is organized and will not contact the interior walls of the dome when installed (keep items at least 1" from the vertical plane of the base collar). This assures safe and smooth dome placement.

Step #	Instructions
1. □	Route cables into CMPH enclosure. Per company practice and local codes, bring the feed and distribution cables into the CMPH enclosure through the open base bottom. Secure and stabilize the cables per company practice.
2. □	Open cables. Per company practice, perform all cable opening procedures.
3. □	Bond and strain-relief the cables. Ground or bond the cable(s) to the ground posts provided on the ground plate. Perform cable strain relief and bonding per company practice. 
4. □	Splice cables to terminal block stubs. Per company practice, perform cable splicing and connection procedures to connect the feeder and distribution cables to the appropriate terminal block wire-bundle stubs inside the CMPH enclosure. Perform cable management techniques per company practice.
5. □	Perform labelling. Fill out and complete the label provided on the top of the internal CMPH framework to facilitate pair identification. Each toggle port of each terminal block is labelled by the terminal block manufacturer.

Feature	U.S.	Metric
Height, overall	47 in.	119.4 cm
Height, base only, incl. collar	17 in.	43.2 cm
Height, dome only	33 in.	83.8 cm
Height, internal framework	30 in.	76.2 cm
Height, base bottom to ground line	9 in.	22.9
Depth, base (at wider footprint)	17 in.	43.2 cm
Depth, dome	14.5 in.	36.8 cm
Width, base (at wider footprint)	29.5 in.	75 cm
Width, dome	27 in.	68.6 cm
Weight, dome	21 lbs.	9.5 Kg
Weight, base	22 lbs.	10 Kg
Weight, base w/brackets and terminal blocks	100 lbs.	45 Kg
Weight, two 30" stakes	5 lbs.	2.2 Kg
Weight, two 36" stakes	6 lbs.	2.7 Kg
Weight, two 42" stakes	7 lbs.	3.2 Kg

NOTE: All dimensions and weights are approximate.

Model #	Description
CMPH-7512CC-EMT	1200 Pair Cross Connect CMPH With Tyco Blocks
CMPH-7509CC-EMT	900 Pair Cross Connect CMPH With Tyco Blocks
CMPH-7506CC-EMT	600 Pair Cross Connect CMPH With Tyco Blocks
CMPH-7503CC-EMT	300 Pair Cross Connect CMPH With Tyco Blocks
Optional Equipment for Use with CMPH Cross Connect	
CMPH-BOND10	Package of 10 ground plates, each plate contains a ground lug and 6 bond posts. Attaches to internal, horizontal, ground bracket. 
19-300545-0	100 pair Tyco Data Term Terminal Block, 5 ft. cable, 3M MS2 connectors 
UMS30-STD	Universal Mounting Stake - 30 inches
UMS36-STD	Universal Mounting Stake - 36 inches
UMS42-STD	Universal Mounting Stake - 42 inches

Various replacement and optional parts are available, including bracket kits for vault-mounting. Contact Charles Industries for more information.

3. CUSTOMER TECHNICAL SERVICE

If technical assistance or customer service is required, contact Charles Industries by calling or using one of the following options:

- 847-806-8500 (Technical Service local)
- 847-806-6300 (Customer Service)
- 800-607-8500 (Technical Service toll-free)
- 847-806-6653 (Customer Service FAX)
- 847-806-8556 (Technical Service FAX)
- mktserv@charlesindustries.com (email)
- techserv@charlesindustries.com (email)
- www.charlesindustries.com (website)