FTTH DISTRIBUTION BOX

# MCO-P2

## Manual

GK-U1266.00.000-02 IM/ENG

The MCO-P2 is a distribution terminal closure used as a small capacity optical distribution box for the installation an outdoor, indoor application fiber optic cable.

The box is intended for branching of optical fibers, complying with the ITU-T Recommendation G. 657, and for fiber termination.

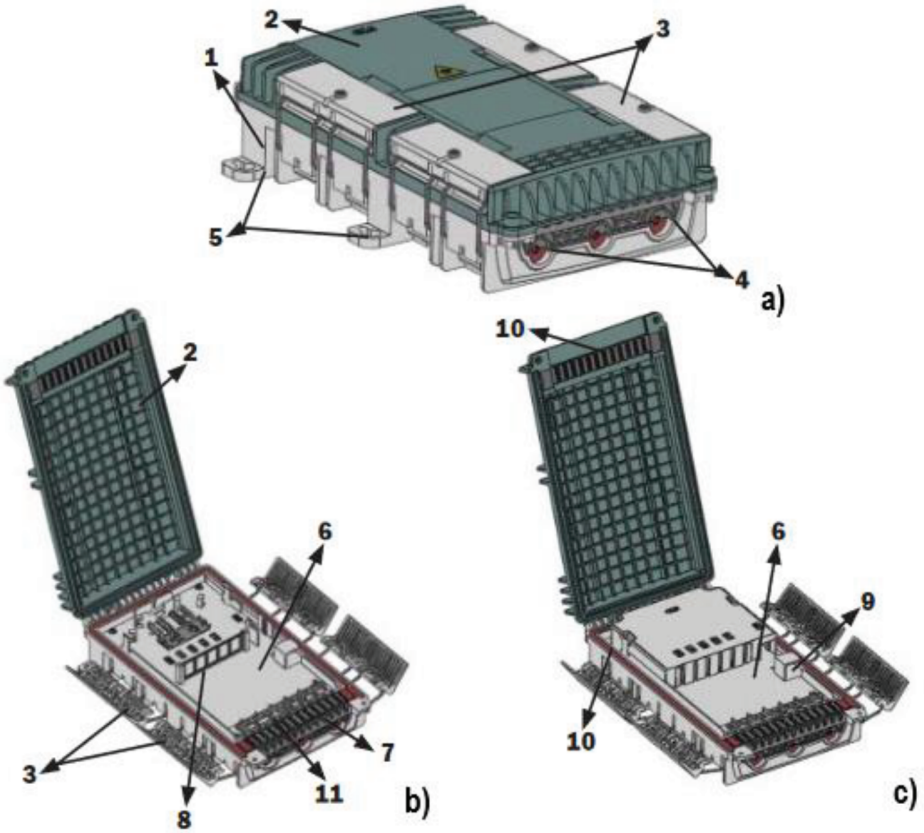
The terminal provides connection between fibers of feeder cable and preconnected subscriber (one core) drop-cables with 2-3 mm diameter directly or through a PLC splitter.

The closure consists of a body, kits for cable entry and a removable hinged organizer plate.

The construction provides:

- enter and anchor three dielectric feeder cables with 6 - 16 mm sheath diameter;
- guide a "transit" loop of uncut cable buffer tubes;

Fig.1




**1 – Closure body with sealing gasket**
**2- Closure cover with sealing gasket**
**3 – hinge latch 4 pcs**
**4 – cable entry opening 3 pcs**
**5 – lug for on wall or bracket installation**
**6 – organizer plate**
**7 – gel sealing comb**
**8 – adapter plate for 10 SC adapters**
**9 - adapter plate for 2 SC adapters**
**10 –sealing gasket**
**11 – drop-cables anchor bar**

- installation up to 2 pcs PLC 1x4 splitters or 1 pc PLC 1x8 splitter with a nominal case size 60x7x4 mm (LxWxH mm);
- installation of 1 pc 1x4 universal cased splitter module M3 type;
- installation KT-3645 splice tray (1 pc.) for accommodation of sleeves 4525 fusion splice sleeves (45 mm long and 2.5 mm in diameter after shrinkage; maximum 36 pcs.), used to protect the spliced joints of optical fibers;
- installation of up to 10 SC type optical connectors (adapters) on adapter plate for connection drop-cables or splitter output leads ;
- installation up to 2 SC type connectors on adapter plate for splitter input leads connection.
- enter and fasten up to 12 subscriber drop-cables.

The box has a dust- and splash-proof dome design (cable input and output are one bottom side), made of plastic.

The box has compact rectangular body equipped with a hinged cover with a sealing gasket between the body and cover. The cover is fastened to the body with four plastic hinge and latches with metal spring loaded levers.

Sealing of distribution and drop cable in the closure is provided along the outer sheath using a gel sealing comb.

Feeder cables are fastened to the closure with clamps. Drop-cable are fastened with the plastic cable ties.

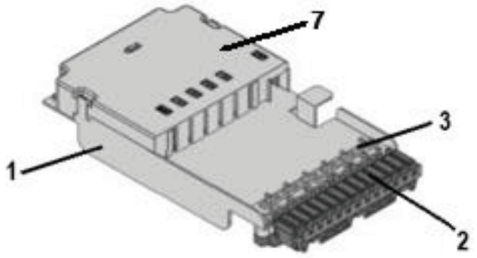
The fiber bending radius, provided by the splice tray and organizer plate, is not less than 30 mm.

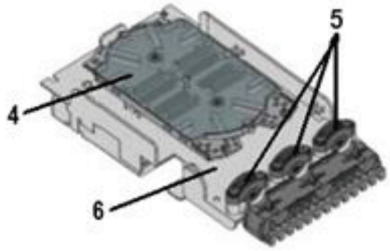
The closure external view is shown in Figure 1.

In the operating position, the organizer plate is fixed to the closure body with screws.

Figure 2a and 2b show a general view of the organizer plate from the front side (with a protective cover) and from the rear side (with splice tray), respectively.

Fig.2




**1- Organizer plate**
**2- Gel sealing comb**
**3- drop-cables anchor bar**
4- **Splice tray with cover**
**5- Clamps for feeder cables**
6- **Buffer tube storage area**
7- **Protective cover**

Table 1

| Terminal closure modification | Number and type of installed splitters | Number of SC/APC adapters | Pigtails number |
|---|---|---|---|
| MCO-P2/A-12SC | - | - | - |
| MCO-P2/A-12SC-10SC/APC-10SC/APC | - | 10 | 10 |
| MCO-P2/A-12SC-12SC/APC-12SC/APC | - | 12 | 12 |
| MCO-P2/S09-2/4SC-1PLC4-SC/APC-12SC-10SC/APC-2SC/APC | 1 pc, 1x4 | 10 | 2 |
| MCO-P2/S09-2/4SC-2PLC4-SC/APC-12SC-10SC/APC-2SC/APC | 2 pcs, 1x4 | 10 | 2 |
| MCO-P2/S09-2/4SC-1PLC8-SC/APC-12SC-10SC/APC-2SC/APC | 1 pc, 1x8 | 10 | 2 |
| MCO-P2/SM3-2/2SC-2SC-2SC/APC-2SC/APC | - | 2 | 2 |

Available for order closure modifications are shown in Table 1.

It is recommended to use MPO-P2 brackets for pole/wall installations available on additional request.

## Closure installation

Installation of the closure and connections of cable should be carried out according with design documentation.

The instructions describe the closure installation in accordance with the diagram:

- enter of "transit" uncut cable with strength member made of aramid yarns without an inner sheath;
- branching eight fibers from one buffer tube:

1 fiber to splitter input;

1 fiber is backup fiber;

6 fibers to drop-cables from subscriber equipment;

- one PLC 1x4 splitter is installed in the closure;
- splicing of fibers form branching buffer tube with pigtails;
- connection of pigtail with an input lead of splitter;
- connection of drop -cables from subscriber equipment.

The reliability of dust and splash protection of the closure is ensured in the case of strict adherence to the instructions.

The surfaces of cables, cords and the sealing gasket of the terminal must be free of dust.

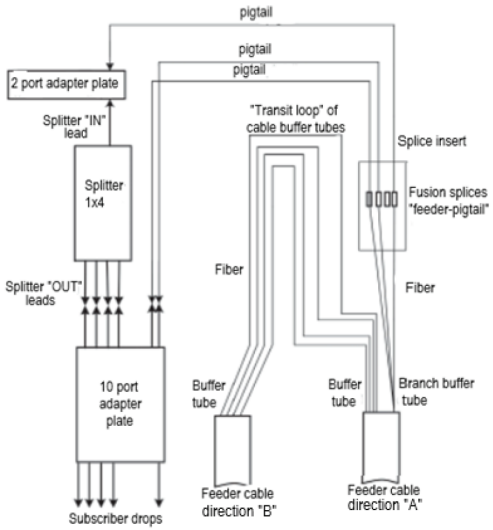
*Note: All pictures in the instructions are for a completely assembled terminal closure.*

**1.** Check the compliance of the terminal box delivery scope with the operating documents.

Note:, the splitter / splitters are installed in the L2-SP insert (front side) upon delivery. Splitter input leads are routed in opposite directions.

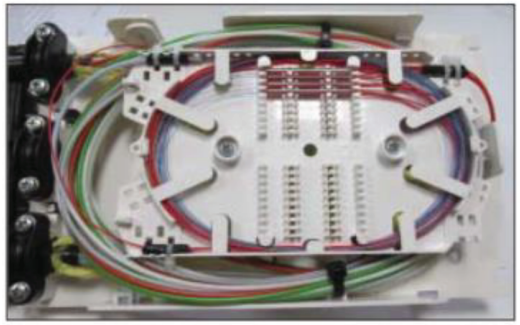
**2.** Figure 3 shows the connection diagram of the cable and fiber in the closure for "transit loop" input of the cable buffer tube.

Fig. 3






*Take in account the numbering of the fibers and the splice insert slots, in accordance with the instructions for fibers splicing in the KT-3645 splice tray.*

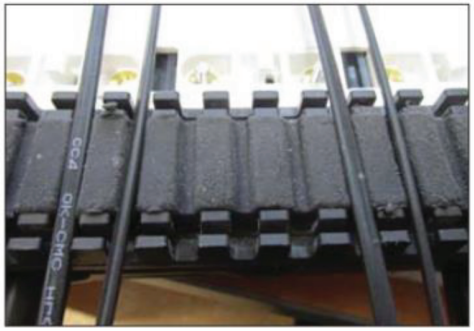


**18.** Place the organizer plate in its original place in the closure housing. Secure the organizer plate with screws.

**19.** Insert and connect required number of subscriber drop cables to the 10-port adapter plate (according with the project).

**19.1.** Remove the dust cap from the adapter with the splitter output lead connected on the 10-port adapter plate (front side of organizer plate).

**19.2.** Insert the subscriber drop-cable into the closure. Connect it to the appropriate adapter on the 10-ports adapter plate. Pass the cable through the groves of the gel sealing comb and fasten with cable ties to the anchor bar.



**19.3.** Perform one by one sections 19.1. and 19.2. for all subscriber drop-cables.

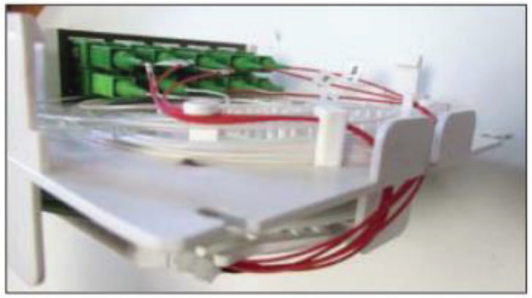
**20.** Close the closure housing with the hinge cover.

**21.** Secure the cover to the closure body with hinge latches. If necessary, fill in a sticker with the required information and stick to the regular place on the cover.

**22.** For pole/wall installations it is recommended to use MCO-P2 brackets.

Wipe the connector face ends and the inner surfaces of the adapters before the first connection and after each disconnection connectors and adapters using cleaning sponges for optical adapters (for example, swabs with a diameter of 1.25 mm NFC-SWABS-1.25MM FLUKE), lint-free wipes and isopropyl alcohol.

**13.9.7.** Guide the excess length of the pigtails bundle from the adapters between adapter plate and splice tray insert:
- along the guiding elements of the front side of the organizer plate ;
- through the slot on organizer plate to the back side of the organizer plate (don't stow the pigtail cord length reserve);
- in the middle of the splice insert (don't stow the pigtail cord reserve in the splice tray) from the opposite side to the feeder cable.



**13.9.8.** Place a dark color mark on the buffer coating of each pigtail at the place where the pigtails are supposed to be spliced with the feeder fibers and at the point where they are inserted into the splice tray. Cut off the excess pigtail lengths along the marks. Disconnect the pigtails from the adapters and remove them from the organizer plate. Place the dust caps on the adapters and pigtail connectors.

**14.** According to your local technology, start fusion splicing the feeder fiber(s) and pigtail(s) connected to the input of the splitter(s):
- push the sleeve fusion splice sleeve onto one of the fibers;
- prepare the fibers for splicing in accordance with the instructions supplied with the fusion splicing machine. To remove the protective sheath from the fiber, use an FO103S or No-Nik stripper. To prepare the fiber end-face, use a precision cleaving tool.
- splice the fibers in accordance with the operating instructions for the fusion splicing machine;
- protect the fused joints with sleeve fusion splice sleeve.

Install the fiber splice sleeve into the slot of the splice insert. Guide the excess length of fiber between the guiding elements of the splice tray. Use an optical reflectometer and normalizing coil connected to test the splicing of the cable and pigtail fibers.

**IT IS FORBIDDEN TO USE ONE SPLICE SLEEVE FOR PROTECTION MORE THAN ONE FIBER SPLICE.**

*Note: use the standard operating modes of the fusion splicing machine, taking into account the size of the fusion sleeve, or the mode indicated on the sleeves package.*

*Leakage of hot melt glue along the ends of the sleeve is not allowed.*

**15.** Place the pigtail excess length in the splice tray guides according to section 13.9.3. in the direction from the splice insert. Remove the dust cap from the adapter with the input splitter lead connected; connect the pigtail to the specified adapter.

**16.** Remove the excess lengths of other fibers (except for the spare fiber) of buffer tube from the splice tray.

**17.** Perform operations in accordance with section 14. for other fibers of direction "A" cable. Install the splice sleeves into the slots of the splice tray insert.

Perform sequentially for each pigtail:
- guide a pigtail excess length in the splice tray conduits in accordance with section 13.9.7. in the direction from the splice;
- remove the dustproof cap in accordance with section 13.9.5.;
- connect the pigtail to the appropriate adapter.

Place the cover on the splice tray. Place the cover on the organizer plate.

*Note: Splicing of fibers, protection with sleeves and installation in the slots of the splice insert should be carried out sequentially.*



**3.** Clean a cable sheath from dust on 3.5 m length.

**4.** Install the cable on the organizer plate (Fig. 2), outside the closure in a place convenient for work (on a work table). After pressing the hinges, open and fold the closure cover.

**5.** Remove the organizer plate from the closure housing:
- loosen the tightening of the organizer with the upper screws, unscrew the lower screws;
- remove the organizer from the engagement with screws by pulling it towards you;
- place the organizer on a flat, horizontal surface

*Note: The back side of the organizer plate is used:*
*- to install a modular splitter (splitters) type M3;*
*- for jointing branching fibers (cable module of direction "A", CO side);*
*- for installation of branched fibers, buffer tubes and transit buffer tubes of feeder cable;*

*The front side of the organizer plate is used:*
*- for jointing the fiber of the feeder cable with the pigtail and with the input lead of the splitter;*
*- for jointing of splitter output leads with the drop cable plugs from the subscribers.*

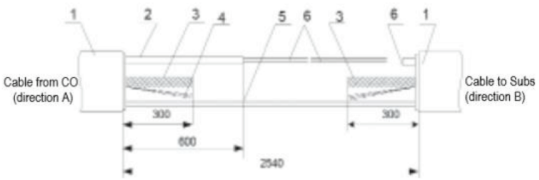
**6.** Remove the protective cover from the front side of the organizer plate:
- squeeze the tabs of the cover latches;
- pull the cover up, disengage it from the organizer;
- remove the cover.

Place the protective cover aside.

Unscrew the screws securing the splice tray. Remove the splice tray from the organizer plate, put it aside

**7.** Prepare cable for jointing according to the connection diagram

*Note: 1. Prepare fibers intended for splicing after cable is anchored into the closure.*

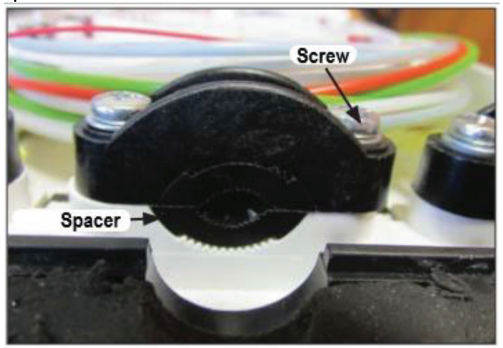



1- **Outer cable sheath**
2- **Branched buffer tube**
3- **Central strength member (CSM)**
4- **Aramid yarns**
5- **Transit buffer tube**
6- **Cut of direction "B" cable**

2. Trim the of CSM and aramid yarns at the attachment point length.

3 If there is an inner sheath in the cable structure, cut it at 5 mm distance from the cut of the outer sheath.

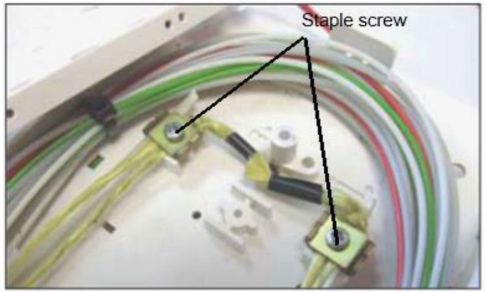
**8.** Unscrew the screws indicated by arrows and remove the cable clamps. To adjust the introduced cable diameter to clamp devices additional spacers are available.




**9.** Temporarily insert cables into the clamps, do not tight. Adjust cable diameter to clamps diameter with corresponding spacer.

**10.** Loosen the screws of the cable CSM clamps. Insert the cable CSM between the bracket and the bar. Insert bundles of aramid yarns between the staple and organizer on opposite sides of the staple screw parallel to each other. Pull the bundles of aramid yarns and tighten with a staple screw.

Tie the bundles of aramid yarns into several successive tight knots and tighten the staple screw.

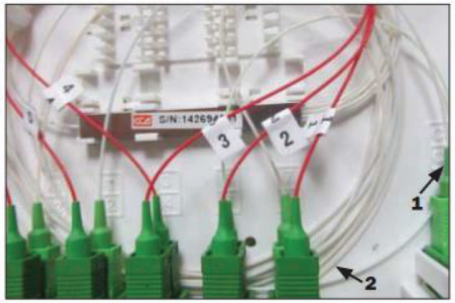



Trim the excess lengths of aramid yarns, wrap the ends of the aramid bundles with PVC tape.

**11.** Finally tighten the cables in the cable clamps.

## 12. Installation and connection of the splitter

**12.1** Install the splitter in the L2-SP insert of the organizer plate on the front side if not installed earlier. Guide the splitter input lead and plug into the adapter installed in the C1 or C2 socket




1- **Input splitter lead**
2- **Output splitter leads**

from the opposite side to the cable entry into the closure.

**12.2.** Guide the output splitter leads on the front side of the organizer plate. Connect the output splitter leads to the corresponding adapters of the lower row of the patch panel.

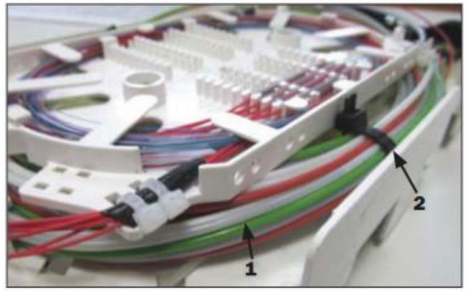
## 13. Installation of buffer tube and fiber

**13.1.** Place the splice tray in its original place in organizer plate and fix it with screws.

**13.2.** Separate branched buffer tubes intended for connection to subscribers from the "transit" buffer tube loops of the "A - B" direction. Cut off the buffer tube at a distance of 5-10 mm from the cut of outer sheath direction "B".

**13.3.** Make a mark at 600 mm distance from the end of the buffer tube on the branch buffer of direction "A" (CO side). Guide one loop around the splice tray and insert the branched buffer tube into it (shown in the figure). Align the cutoff point of the buffer tube with its attachment point in the splice tray. Mark the place where the buffer is attached.

**13.4.** Place the excess length "transit" buffer tubes on the front side of the organizer plate. Insert it under the splice tray and secure with nylon cable ties in the regular places. Be carefull, avoid damaging the buffer tube with fibers.



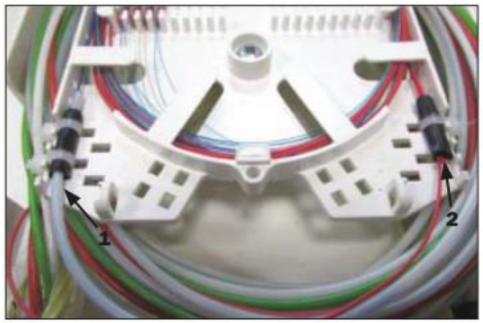

1- **Excess length of transit buffer tubes**
2- **One of the buffer tube anchor points**

**13.5.** Make an annular cut of the buffer tube along the mark (at a distance of 600 mm from the cut of the outer sheath in accordance with the cable preparation diagram).



Remove the cut part of the buffer tube from the fiber beam. Wipe each fiber with a lint-free cloth (Kim-Wipes) moistened with D'Gel (hydrophobic remover) liquid, then with a cloth moistened with isopropyl alcohol, then wipe dry.

**13.6.** Wrap the buffer tube with 2-3 layers of vinyl (insulating) tape according to the fastening marks. Fasten (without tension) the buffer tube on the splice tray at each attachment point with two nylon ties over the bandage applied. Remove excess cable tie lengths.




1- **Branched buffer tube**
2- **Pigtail for jointing the feeder cable fiber to input splitter lead.**

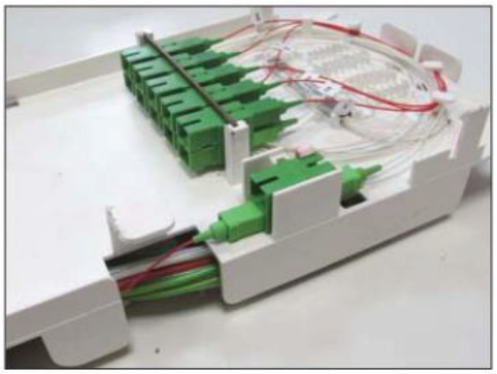
**13.7.** Preliminarily guide the fiber of the branching direction "A" in the splice tray, between the side walls and guiding elements. Insert fiber into the middle slot of the sleeve splice insert. Cut off the fiber in the middle of the splice insert.

**13.8.** Guide the excess length of other fibers of buffer tube in the splice tray.

**13.9.** Start with adapters and drop cables

**13.9.1.** Install (if necessary) the adapters into the holes on adapter plates.

**13.9.2.** Remove the dust cap on CO side from the adapter intended for connection with fiber from feeder cable to input splitter lead (marked as C1 or C2). Connect the pigtail to it.



**13.9.3.** Measure the required length of the pigtail intended for connection to the splitter input. To do this guide pigtail from the adapter to the back side of the organizer plate, then into the splice tray (without stowing the stock of the patchcord) and then to the middle of the splice insert (from the side opposite to the fiber entry of the feeder cable).

**13.9.4.** Place a dark mark on the buffer coating of the pigtail at the place where it is supposed to be spliced with the feeder fiber and at the point where it is inserted into the splice tray. Cut off the excess pigtail length along the mark. Disconnect the pigtail from the adapter and remove it from the organizer plate. Place the dust cap on the adapter and pigtail connector.

**13.9.5.** Remove the dust-proof caps from the adapters on the metal strip (on the front side of the organizer) on the opposite side to the closure cable entry. Mark the pigtails with self-adhesive stickers near the connector butt in accordance with the numbering of the optical ports.
*Note: Recommended port markings are found on the back side of the organizer plate and on the cover of the organizer plate.*

**13.9.6.** Insert pigtail connectors into the corresponding adapters one by one.