Super bright LED lamp or incandescent lamp illumination

Rectangular and square body control units

- Compatible with both LED and incandescent lamps.
- Super LED improves visibility and saves energy.
- Removable contact blocks promote easy PC board mounting.
- Snap-action switching contacts.
- Slow-action and maintained types are also available.
- The solder terminal accepts quick connect receptacles enhancing safety and enabling easy wiring.
- Illumination face division: Full to 4-way split (MC3D) or 2-way split (MC2D)
- Lens and color screens can be changed easily without the need for removal of power, because contacts are not operated when the lens is first inserted into the housing.
- UL and c-UL recognized, EN compliant

| Applicable Standards | Mark | File No. or Organization | | |
|--------------------------|----------------|--|--|--|
| UL508 CSA C22.2 No.14 | c FL us | UL File No. E55996 | | |
| EN60947-1 EN60947-5-1 | \triangle | TÜV Rheinland J9550803 | | |
| EN60947-1 EN60947-1 | CE | EU Low Voltage Directive | | |
| GB14048.5 | | CCC2006010305180952 (MC2D) 2006010305180954 (MC3D) (except pilot lights) | | |



MC Series

| Item | MC3D (Re | MC2D (Square) | | | | |
|------------------------|--|---|-------------------------------|--|--|--|
| | Horizontal Barrier | Flange | | | | |
| Illumination Face Size | 18.8 × 26.6 mm | | $18.8 \times 18.8 \text{ mm}$ | | | |
| Face Division | LED: Full to 4-way split Incandescent: Full only | LED: Full to 4-way split Incandescent: Full only | | | | |
| No. of Lamps | Full illumination: 2 (LED or incandes) Vertical 2-way split: 2 (LED) Horizontal | Full illumination: 2 (LED or incandescent) Vertical 2-way split; 2 (LED) Horizontal 2-way, 3-way, 4-way split; 4 (LED) | | | | |
| Illumination Color | Amber, Green, Pure White, Red, Blue, V | Vhite, Yellow | | | | |
| Contact Material | Silver or gold contact microswitch | | | | | |
| No. of Contacts | SPDT, DPDT, 3PDT | SPDT, DPDT, 3PDT | | | | |
| Operation | Momentary (snap action or slow action), maintained, pilot light | | | | | |
| Terminal Style | Solder tab terminal #110 (compatible with | older tab terminal #110 (compatible with quick connect receptacles), PC board terminal | | | | |
| Housing Color | Black, gray | | | | | |

Specifications

| Operating Temperature | -25 to +40°C (no freezing) |
|-----------------------|---|
| Storage Temperature | -30 to +60°C (no freezing) |
| Operating Humidity | 35 to 90% RH (no condensation) |
| Insulation Resistance | Between live and dead metal parts: 100 M Ω (500V DC megger) Between terminals of different poles: 100 M Ω (500V DC megger) |
| Dielectric Strength | Between live and dead metal parts: 2000V, 1 minute Between live parts of different poles: 2000V, 1 minute Between terminals of the same pole: 1000V, 1 minute |
| Contact Resistance | 50 m Ω maximum (initial value) |
| Vibration Resistance | Operating extremes: 5 to 55 Hz, amplitude 0.5 mm Damage limits: 5 to 55 Hz, amplitude 0.5 mm (2 hours each in 3 axes) |
| Shock Resistance | Operating extremes: 200 m/s ² Damage limits: 500 m/s ² |
| Mechanical Life | Momentary: 1,000,000 operations minimum Maintained: 250,000 operations minimum Slow action: 1,000,000 operations minimum |
| Electrical Life | 50,000 operations minimum (rated operating current: specification 1) 100,000 operations minimum (rated operating current: specification 2) * 50,000 operations minimum when using silver contacts at 125V/5A resistance load (UL rating) |
| Operating Frequency | Momentary: 1,800 operations/hour Maintained: 900 operations/hour Slow action: 1,800 operations/hour |
| Degree of Protection | IP40 (operator) (IEC 60529) |

Contact Ratings

Silver Contact (switch base: gray)

| Rated In: | 250V | | | | | |
|-----------|-------------------------|---------------|----------------|------|-------|------|
| Rated O | Rated Operating Voltage | | | | 125V | 250V |
| | | AC | Resistive load | — | 5A | 5A |
| | Specifi- | 50/60Hz | Inductive load | _ | ЗA | 1.5A |
| | cation 1* | DC | Resistive load | 5A | 1.1A | — |
| Rated | | 00 | Inductive load | 2.5A | 0.55A | _ |
| Current | Specifi- cation 2* | AC 50/60Hz | Resistive load | _ | 5A | ЗA |
| - Curronn | | | Inductive load | - | ЗA | 1.5A |
| | | | Resistive load | ЗA | 0.6A | _ |
| | | | Inductive load | 1A | 0.22A | _ |
| Rated Th | Rated Thermal Current | | | | | |
| Contact I | Contact Material | | | | | |

AC inductive load: PF=0.6 to 0.7 DC inductive load: L/R=7 ms max.
 * See Specifications for electrical life.

Gold Contact (Switch Base: Blue)

| Rated Insulation Voltage | 250V | | | |
|---|------------------------------------|---------|--|--|
| Rated Operating Voltage | 30V DC | 125V AC | | |
| Rated Operating Current (resistive load) | 0.1A 0.1A | | | |
| Rated Thermal Current | 3A | | | |
| Contact Material | Gold-clad silver cross-bar contact | | | |

Minimum applicable load (reference value): 5V AC/DC, 1 mA

LED / Incandescent Lamps

LFTD LED Lamp

| Part No. | | LFTD-5* | LFTD-6* LFTD-1* | | | LFTD-2* | | |
|-----------------------|----|---|---|----------|----------------------|---|--|--|
| Lamp Base | | | SX6S/8×5.4 | | | | | |
| Operating Voltage | | 5V DC±5% | 6V AC/DC | C±10% | 12V AC/DC±10% | 24V AC/DC±10% | | |
| Rated Voltage | | 5V DC | 6V AC/ | /DC | 12V AC/DC | 24V AC/DC | | |
| | | A, G, PW, R, S, W, Y | A, R, W, Y | G, PW, S | A, G, PW, R, S, W, Y | A, G, PW, R, S, W, Y | | |
| Current Draw | AC | — | 9 mA | 10 mA | 9 mA | 9 mA | | |
| | DC | 8 mA | 7 mA | 7 mA | 8 mA | 8 mA | | |
| Color Code | | Specify a color code in place of A (amber), G (green), PW (pu | of * in the Part No. pure white), R (red), S (blue), W (white), Y (yellow) | | | | | |
| Lamp Base Color | | Same as illumination color | | | | | | |
| Voltage Marking | | Die stamped on the lamp base | | | | | | |
| Life (reference value | e) | Approx. 50,000 hours (When used on complete DC, the luminance is reduced to 50% of the initial intensity.) | | | | | | |
| Internal Circuit | | | o | | | LED Chip Protection Diode Zener Diode Resistor | | |

•Required Quantity of LED Lamps

MC3D — Full and horizontal 2-way split: 2 lamps; Horizontal 2-way, 3-way, and 4-way split: 4 lamps MC2D — Full: 1 lamp; Horizontal 2-way split: 2 lamps

LH Incandescent Lamp (0.5W)

| Part No. | LH-06 | LH-14 | LH-28 | | |
|------------------------|--|-----------|-----------|--|--|
| Lamp Base | SX6S/8×5.4 | | | | |
| Operating Voltage | 5V AC/DC | 12V AC/DC | 24V AC/DC | | |
| Rated Voltage | 6V AC/DC | 14V AC/DC | 28V AC/DC | | |
| Rated Current | 0.1A | 0.05A | 0.025A | | |
| Life (reference value) | Approx. 2,000 hours (average at the rated value) | | | | |

• Required Quantity of Incandescent Lamps MC3D — Full: 2 lamps MC2D — Full: 1 lamp

Illumination Faces for LED and Incandescent Lamps

| | Series | Face Type | LED | Incandescent | |
|---|--------|------------|-----|--------------|--|
| | MC3 | A, C | 2 | 2 | |
| | WC3 | B, D, E, F | 4 | — | |
| | MC2 | Α | 1 | 1 | |
| | IVIO2 | В | 2 | — | |
| A | В | С | D E | F | |
| | | | | | |



Face Division

| А | В | С | D | E | F |
|---|---|---|---|---|---|
| | | | | | |

MC3





MC2



| Horizontal 2-way Split |
|------------------------|
| |



MC Series Illuminated Control Units

Illumination Unit Structure



Illumination Face Division & Illumination Color

| Used For | MC3D | | | | | | MC2D | |
|-----------------------------------|-----------------------------------|-----------------------------|----------------------------|----------------------------|---------------------------|----------------|-----------------------------------|-----------------------------|
| Part No. | MC9Z-PA3*PN05 | MC9Z-3DB | MC9Z-3DC | MC9Z-3DD | MC9Z-3DE | MC9Z-3DF | MC9Z-PA2*PN05 | MC9Z-2DB |
| Face Division | | | | | | | | |
| Illumination Color and Size | * * * * *: Color Code | R GD A C Y S | R C GD Y A S | RGDACYSRGDYASLight Barrier | RCGDYASGDYASLight Barrier | RRGDGDAACCYYSS | * * * * *: Color Code | R GD A C Y S |
| Quantity | Same color 5 pcs/set | 6 pcs/set | 6 pcs/set | 12 pcs/set | 12 pcs/set | 12 pcs/set | Same color 5 pcs/set | 6 pcs/set |

* Color Code: A (amber), C (clear), GD (green for LED), GL (green for incandescent), R (red), S (blue), Y (yellow)

 \ast Use clear (C) color screen for white and pure white illumination.

| MC3D | MC3D-**0R (Rectangular Horizontal / Barrier) | | | | | | | | |
|------------------|--|------|-------------------------|------------------------|-------------------------|------------------------|-------------|--------------|---------------------|
| | | | | | | | | | |
| c A) us 🛕 | | | Full | | 2-way Split | : | 3-way Split | | 4-way Split |
| (🤅 🎯 |) | | | | | | | | |
| (except pilo | t light) | | | | | | | | Package Quantity: 1 |
| | | | Part No. | | | | | | |
| Operation | on Contact | | Solder/Ta | ab Terminal PC Board | | I Terminal Marking | | Color Sereen | Light Source |
| Operation | | | Housing Color: Black | Housing Color: Gray | Housing Color: Black | Housing Color: Gray | Plate | | Light Course |
| | | SPDT | MC3D-M10RB | MC3D-M10RN | | | | | |
| | Silver | DPDT | MC3D-M20RB | MC3D-M20RN | - | _ | | | Applicable LED Lamp |
| (Span | | 3PDT | MC3D-M30RB | MC3D-M30RN | | | | | |
| (Shap Action) | | SPDT | MC3D-M50RB | MC3D-M50RN | MC3D-M50VRB | MC3D-M50VRN | White | Amber | 24V AC/DC: LFTD-2* |
| / totion) | Gold | DPDT | MC3D-M60RB | MC3D-M60RN | MC3D-M60VRB | MC3D-M60VRN | VVIIILE | Clear | 6V AC/DC: LFTD-6* |
| | | 3PDT | MC3D-M70RB | MC3D-M70RN | MC3D-M70VRB | MC3D-M70VRN | Size: | Green | 5V DC: LFTD-5* |
| | | SPDT | MC3D-S10RB | MC3D-S10RN | | | 24.8 x 17 x | Rea | |
| | Silver | DPDT | MC3D-S20RB | MC3D-S20RN | . — | — | 1 mm | Yellow | Applicable |
| Momentary | | 3PDT | MC3D-S30RB | MC3D-S30RN | | | | Tellow | Incandescent Lamp |
| (Slow Action) | | SPDT | MC3D-S50RB | MC3D-S50RN | MC3D-S50VRB | MC3D-S50VRN | Material: | Material: | 28V: LH-28 |
| | Gold | DPDT | MC3D-S60RB | MC3D-S60RN | MC3D-S60VRB | MC3D-S60VRN | Acrylic | Acrylic | 6V: 1H-06 |
| | | 3PDT | MC3D-S70RB | MC3D-S70RN | MC3D-S70VRB | MC3D-S70VRN | | | |
| | | SPDT | MC3D-A10RB | MC3D-A10RN | | | | | |
| | Silver | DPDT | MC3D-A20RB | MC3D-A20RN | . – | _ | | | |
| Maintained | | 3PDT | MC3D-A30RB | MC3D-A30RN | | | | | |
| Mannamed | | SPDT | MC3D-A50RB | MC3D-A50RN | MC3D-A50VRB | MC3D-A50VRN | | Order | Order |
| | Gold | DPDT | MC3D-A60RB | MC3D-A60RN | MC3D-A60VRB | MC3D-A60VRN | Supplied | Separately | Separately |
| | | 3PDT | MC3D-A70RB | MC3D-A70RN | MC3D-A70VRB | MC3D-A70VRN |] | | Copulately |
| Pilot Light | — | | MC3D-P00RB | MC3D-P00RN | MC3D-P00VRB | MC3D-P00VRN | | | |

Note 1: Specify a color code in place of * in the LED lamp Part No.: A (amber), G (green), PW (pure white), R (red), S (blue), W (white), Y (yellow) Note 2: For white and pure white illumination, use a clear (C) color screen.



Internal Connection (Bottom View)





- Because terminals X2 through X5 are connected together internally, external jumper wiring is not needed for full illumination.
- When using split illumination, cut out the internal jumper using the jumper cutter (MC9Z-J1). See page 36.
- LED or incandescent lamps are not supplied and must be ordered separately.
- For incandescent illumination (full only), use only 2 lamps.
- For split illumination, use LED lamps.

Internal Connection (Bottom View)



When using LFTD-5 X1 (COM): Negative X2 to X5: Positive

- SPDT contact type has lamp terminals and contact terminals in the middle only.
- DPDT contact type has lamp terminals and contact terminals on both sides (not in the middle).
- Pilot light has lamp terminals only.

MC Series Illuminated Pushbuttons / Pilot Lights

| MC3D | MC3D-**0F (Rectangular Horizontal / Flange) | | | | | | | | |
|------------------|---|------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|------------------|--------------|---------------------|
| | | | | | | | | | |
| c RJ us 🛕 | | | Full | | 2-way Split | ; | 3-way Split | | 4-way Split |
| ((🖤 |) | | | | | | | | |
| (except pild | ot light) | | | | | | | | Package Quantity: 1 |
| | on Contact | | Part No. | | | | | | |
| Operation | | | Solder/Ta Housing Color: Black | b Terminal Housing Color: Gray | PC Board Housing Color: Black | l Terminal Housing Color: Gray | Marking Plate | Color Screen | Light Source |
| | | SPDT | MC3D-M10FB | MC3D-M10FN | | | | | |
| | Silver | DPDT | MC3D-M20FB | MC3D-M20FN | i _ | _ | | | |
| Momentary | | 3PDT | MC3D-M30FB | MC3D-M30FN | | | | | Applicable LED Lamp |
| (Shap | | SPDT | MC3D-M50FB | MC3D-M50FN | MC3D-M50VFB | MC3D-M50VFN | White | Amber | 24V AC/DC: LFTD-2* |
| | Gold | DPDT | MC3D-M60FB | MC3D-M60FN | MC3D-M60VFB | MC3D-M60VFN | vvnite | Green | 6V AC/DC: LFTD-1* |
| | | 3PDT | MC3D-M70FB | MC3D-M70FN | MC3D-M70VFB | MC3D-M70VFN | Size: | Red | 5V DC: LFTD-5* |
| | | SPDT | MC3D-S10FB | MC3D-S10FN | | | 24.8 x 17 x | Blue | |
| | Silver | DPDT | MC3D-S20FB | MC3D-S20FN |] — | — | 1 mm | Yellow | Applicable |
| Momentary | | 3PDT | MC3D-S30FB | MC3D-S30FN | | | | | Incandescent Lamp |
| (Slow Action) | | SPDT | MC3D-S50FB | MC3D-S50FN | MC3D-S50VFB | MC3D-S50VFN | Material: | Material: | 28V: LH-28 |
| | Gold | DPDT | MC3D-S60FB | MC3D-S60FN | MC3D-S60VFB | MC3D-S60VFN | Acrylic | Acrylic | 14V: LH-14 |
| | | 3PDT | MC3D-S70FB | MC3D-S70FN | MC3D-S70VFB | MC3D-S70VFN |] | | 0V. LH-00 |
| | | SPDT | MC3D-A10FB | MC3D-A10FN | | |] | | |
| | Silver | DPDT | MC3D-A20FB | MC3D-A20FN | _ | — | | | |
| Maintained | | 3PDT | MC3D-A30FB | MC3D-A30FN | | | | | |
| Waintaineu | | SPDT | MC3D-A50FB | MC3D-A50FN | MC3D-A50VFB | MC3D-A50VFN |] | Order | Order |
| | Gold | DPDT | MC3D-A60FB | MC3D-A60FN | MC3D-A60VFB | MC3D-A60VFN | Supplied | Separately | Separately |
| | | 3PDT | MC3D-A70FB | MC3D-A70FN | MC3D-A70VFB | MC3D-A70VFN |] | | Oeparatery |
| Pilot Light | — | — | MC3D-P00FB | MC3D-P00FN | MC3D-P00VFB | MC3D-P00VFN |] | | |

Note 1: Specify a color code in place of * in the LED lamp Part No.: A (amber), G (green), PW (pure white), R (red), S (blue), W (white), Y (yellow) Note 2: For white and pure white illumination, use a clear (C) color screen.

• The rectangular flange unit can be mounted vertically. Replace the leaf springs with optional vertical mounting leaf springs (MC9Z-T3).



• For panel cut-out, see page 33.

Internal Connection (Bottom View)



- Because terminals X2 through X5 are connected together internally, external jumper wiring is not needed for full illumination.
 When using split illumination, cut out the internal jumper using the jumper
- When using split illumination, cut out the internal jumper using the jumper cutter (MC9Z-J1). See page 36.
 LED or incondensate lamps are not supplied and must be ordered cond.
- LED or incandescent lamps are not supplied and must be ordered separately.
- · For incandescent illumination (full only), use only 2 lamps.
- For split illumination, use LED lamps.

Terminal Arrangement (Bottom View)



When using LFTD-5 X1 (COM): Negative X2 to X5: Positive

- SPDT contact type has lamp terminals and contact terminals in the middle only.
- DPDT contact type has lamp terminals and contact terminals on both sides (not in the middle).
- Pilot light has lamp terminals only.

MC2D-**0 (Square / Flange)





2-way Split

| (except pilot light) | | | | | | | | | Package Quantity: 1 |
|----------------------|---------|------|----------------|---------------------|----------------|-------------------|----------------------------------|--------------|---------------------|
| | Contact | | | Part No. | | | | | |
| Operation | | | Solder/Tal | D Terminal PC Board | | PC Board Terminal | | Color Screen | Light Source |
| operation | | naor | Housing Color: | Housing Color: | Housing Color: | Housing Color: | Plate | | Light Obdice |
| | | | Black | Gray | Black | Gray | | | |
| | Silver | SPDT | MC2D-M10B | MC2D-M10N | | | | | |
| Momentary | Silver | DPDT | MC2D-M20B | MC2D-M20N | | _ | White | Amber | Applicable LED Lamp |
| (Shap Action) | Cald | SPDT | MC2D-M50B | MC2D-M50N | MC2D-M50VB | MC2D-M50VN | | Clear | 24V AC/DC: LFTD-2* |
| Action | Gold | DPDT | MC2D-M60B | MC2D-M60N | MC2D-M60VB | MC2D-M60VN | Size: | Green | 12V AC/DC: LFTD-1* |
| - | Silver | SPDT | MC2D-S10B | MC2D-S10N | _ | | T/XT/XT Heu mm Blue Yellow | Blue | 5V DC: LFTD-5* |
| Momentary | | DPDT | MC2D-S20B | MC2D-S20N | | _ | | | |
| (Slow Action) | Cald | SPDT | MC2D-S50B | MC2D-S50N | MC2D-S50VB | MC2D-S50VN | | Applicable | |
| | Gold | DPDT | MC2D-S60B | MC2D-S60N | MC2D-S60VB | MC2D-S60VN | Acrylic | Material: | Incandescent Lamp |
| | 0:1 | SPDT | MC2D-A10B | MC2D-A10N | | | | Acrylic | 14V: 1 H-14 |
| Maintained | Silver | DPDT | MC2D-A20B | MC2D-A20N | | _ | | | 6V: LH-06 |
| wamaneu | Cold | SPDT | MC2D-A50B | MC2D-A50N | MC2D-A50VB | MC2D-A50VN | Supplied | Order | Order |
| | Gold | DPDT | MC2D-A60B | MC2D-A60N | MC2D-A60VB | MC2D-A60VN | | Separately | Separately |
| Pilot Light | | — | MC2D-P00B | MC2D-P00N | MC2D-P00VB | MC2D-P00VN | | | |

Note 1: Specify a color code in place of * in the LED lamp Part No.: A (amber), G (green), PW (pure white), R (red), S (blue), W (white), Y (yellow) Note 2: For white and pure white illumination, use a clear (C) color screen.

• 2-way split unit can be mounted vertically. Replace the leaf springs with optional vertical mounting leaf springs (MC9Z-T3).

Dimensions



PC Board Drilling Layout (PC Board Terminal)



(Bottom View)

• See Single Board Mounting on page 37 for details about PC boards.

All dimensions in mm.

• For panel cut-out, see page 33.

Internal Connection (Bottom View)



Terminal Arrangement (Bottom View)



When using LFTD-5 X1 (COM): Negative X2 to X5: Positive

SPDT contact has lamp terminals and contact terminals on the right only.
Pilot light has lamp terminals only.

- LED or incandescent lamps are not supplied and must be ordered separately.
 For incandescent illumination (full only), use only 1 lamp.
- For horizontal 2-way split illumination, use LED lamps.

MC Series Accessories

Accessories

| Name & Shane | For Llos On | Specific | ationa | Port No. | Ordering No. | Package | Bomorko | | |
|--|--|--|---------|-----------|---------------|---------------|---|--|--|
| | For Use On | Specino | allons | Part No. | Ordening No. | Quantity | Remarks | | |
| | All Series | - | - | MCM-T001 | MCM-T001 | 1 | Used to remove the lamp holder from the housing. Material: Stainless Steel | | |
| Jumper Cutter | МСЗД | _ | | MC9Z-J1 | MC9Z-J1 | 1 | Used to cut the built-in jumper when changing the MC3D for 2-way, 3-way, or 4-way split illumination. See page 36. Material: Metal | | |
| Switch Guard with Lens | MC2D | Horizonta | al type | MC9Z-KF3 | MC9Z-KF3 | 1 | Used in place of the standard lens to protect the operator, and can be installed in the same | | |
| and the second sec | MCSD | Vertical t | уре | МС9Z-КТЗ | MC9Z-KT3 | 1 | manner as the standard lens.When guard barriers are installed, the lens switch guard | | |
| Alter I | MC2D | Horizonta | al type | MC9Z-KF2 | MC9Z-KF2 | 1 | cannot be used.Material: Polycarbonate | | |
| Barrier | MC3D | End | Black | MC9Z-BF1B | MC9Z-BF1BPN10 | 10 | The barrier is used to separate | | |
| | Horizontal | barrier | Gray | MC9Z-BF1N | MC9Z-BF1NPN10 | 10 | adjoining operators of flange type MC3D/2D units to prevent | | |
| | MC2D | Spacer | Black | MC9Z-BF2B | MC9Z-BF2BPN10 | 10 | inadvertent operation and to | | |
| | | | Gray | MC9Z-BF2N | MC9Z-BF2NPN10 | | • See page 33 for panel cut-out. | | |
| | 14000 | End barrier | Grav | MC9Z-BTTB | MC9Z-BT1BPN10 | 10 | Material: Polycarbonate | | |
| Find Doming Conserve Doming | MC3D Vertical Flange | Vertical Flange | Spagar | Black | MC9Z-BT2B | MC9Z-BT7RPN10 | | | |
| End Barrier Spacer Barrier | | barrier | Gray | MC9Z-BT2N | MC9Z-BT2NPN10 | 10 | | | |
| Guard Barrier | | End | Black | MCM-BF3B | MCM-BF3BPN10 | 10 | • The guard barrier is used to surround the operator of flange | | |
| | MC3D Horizontal Flange MC2D Horizontal | barrier | Gray | MCM-BF3N | MCM-BF3NPN10 | | type MC3D/2D units for prevent- ing inadvertent operation. The guard barrier cannot be | | |
| | | Spacer guard | Black | MCM-BF4B | MCM-BF4BPN10 | 10 | used on barrier type or vertical flange type MC3D units. • See page 33 for panel cut-out. | | |
| Barrier Barrier | | barrier | Gray | MCM-BF4N | MCM-BF4NPN10 | | Material: Polyamide | | |
| Terminal Socket | MC3D | With solder terminals With PC board terminals | | MC9Z-C3 | MC9Z-C3 | 1 | Material: Polyamide | | |
| STELL S | MC3D | | | MC9Z-C3V | MC9Z-C3V | 1 | | | |
| | MC2D | With solder terminals | | MC9Z-C2 | MC9Z-C2 | 1 | | | |
| | | With PC board terminals | | MC9Z-C2V | MC9Z-C2V | 1 | | | |
| Terminal Cover | MC3D | _ | | MC9Z-VL23 | MC9Z-VL23 | 5 | • When wiring, insert lead wires through terminal cover holes before soldering the lead wires to the MC3D/2D terminals. | | |
| and the second | MC2D | - | _ | MC9Z-VL22 | MC9Z-VL22 | 5 | • White • Material: PBT | | |
| Dustproof Cover | MC3D | Flange (horizont vertical) | al/ | MCM-D3 | MCM-D3 | 1 | The dustproof cover is not waterproof. See page 33 for panel cut-out. Material | | |
| | MC2D | Flange | | MCM-D2 | MCM-D2 | 1 | Base: Polypropylene Cover: PVC elastomer | | |
| Vertical Mounting Leaf Spring | MC3D MC2D | _ | - | MC9Z-T3 | MC9Z-T3PN10 | 10 | Leaf springs for mounting the flange type MC3D vertically. When using the vertical mount- ing leaf springs, remove the existing leaf springs from the MC3D and install the vertical mounting leaf springs. See page 35. Material: Stainless Steel | | |

Accessories

| Name & Shape | Operating Voltage | Rated Current | Part No. | Ordering No. | Illumination Color Code | Package Quantity | Base |
|--------------|-------------------|---------------|----------|--------------|--|------------------|------------|
| LFTD | | 0 0 | | LFTD-5* | | 1 | |
| LED Lamp | 5V DC±5% | 8 MA | LFID-5* | LFTD-5*PN10 | Specify a color code in place of * in the Order- | | |
| | | 7 | | LFTD-6* | ing Part No. | 1 | |
| • • | 6V AC/DC±5% | 7 MA | LFID-0* | LFTD-6*PN10 | A: amber | 10 | EVEC/OVE A |
| | | 9 m 4 | | LFTD-1* | PW: pure white R: red S: blue W: white Y: vellow | 1 | 3A03/0×3.4 |
| | 12V AC/DC±10% | 0 IIIA | LFID-I* | LFTD-1*PN10 | | 10 | |
| | | | | LFTD-2* | | 1 | |
| | 24V AC/DC±10% | oma | LFID-2* | LFTD-2*PN10 |] | 10 | |

| Name & Shape | Operating Voltage | Rated Voltage | Rated Current | Part No. | Ordering No. | Package Quantity |
|-------------------------|-------------------|---------------|---------------|----------|--------------|------------------|
| LH Incandescent Lamp | 5V AC/DC | 6V | 0.1A | LH-06 | LH-06 | 1 |
| | 12V AC/DC | 14V | 0.05A | LH-14 | LH-14 | 1 |
| | 24V AC/DC | 28V | 0.025A | LH-26 | LH-26 | 1 |

| Name & Shape | For Use On | Specifications | Part No. | Ordering No. | Package Quantity | Remarks |
|--------------|------------|------------------------|-----------|---------------|---------------------|--|
| Color Screen | | Full illumination | MC9Z-PA3* | MC9Z-PA3*PN05 | 1 set (5 pcs) | |
| | | Horizontal 2-way split | MC9Z-3DB | MC9Z-3DB | 1 set | Specify a color code in place of * in the Ordering No. |
| | MC3D | Vertical 2-way split | MC9Z-3DC | MC9Z-3DC | 1 set | A: amber |
| | | Horizontal 3-way split | MC9Z-3DD | MC9Z-3DD | 1 set | GD: green for LED GL: green for incandescent lamps R: red S: blue Y: yellow |
| | | Vertical 3-way split | MC9Z-3DE | MC9Z-3DE | 1 set | |
| | | 4-way split | MC9Z-3DF | MC9Z-3DF | 1 set | |
| | MC2D | Full illumination | MC9Z-PA2* | MC9Z-PA2*PN05 | 1 set (5 pcs) | Use a clear (C) screen for white or pure white illumination. |
| | | Horizontal 2-way split | MC9Z-2DB | MC9Z-2DB | 1 set | |

MC Series Accessories

Accessories (Dimensions)

Lens Switch Guard

For MC3D Horizontal (MC9Z-KF3)









Barrier

When using on MC3D Horizontal Flange



When using on MC2D



Guard Barrier

When using on MC3D Horizontal Flange

When using on MC3D Vertical Flange



When using on MC2D



Terminal Cover For MC3D (MC9Z-VL23)



For MC2D (MC9Z-VL22)



All dimensions in mm.

Accessories (Dimensions)

Socket

For MC3D With solder terminals (MC9Z-C3)



For MC2D With solder terminals (MC9Z-C2)



For MC3D (MCM-D3)

39

Thickness: 1 to 4.5

32

With PC board terminals (MC9Z-C3V)



PC Board Drilling Layout (Bottom View)

With PC board terminals (MC9Z-C2V)





PC Board Drilling Layout (Bottom View)

Dustproof Cover

C



Maintenance Parts

Pa

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| Name & Shape | For Use On | Specifications | Part No. | Ordering No. | Package Quantity | Remarks | |
|---------------|------------|--------------------------------------|----------|--------------|---------------------|--|--|
| Marking Plate | MC3D | $17 \times 24.8 \times 1 \text{ mm}$ | MC9Z-P3W | MC9Z-P3WPN05 | 5 | Color: whiteOne marking plate is supplied | |
| | MC2D | $17 \times 17 \times 1 \text{ mm}$ | MC9Z-P2W | MC9Z-P2WPN05 | 5 | with each MC3D/2D unit. • Material: Acryl | |
| Light Barrier | MC3D | 4-way split | MC9Z-S3 | MC9Z-S3PN05 | 5 | Supplied with split color scroops | |
| | MC2D | 2-way split | MC9Z-S2 | MC9Z-S2PN05 | 5 | screens. Material: PBT | |
| Lens | MC3D | - | MC9Z-L3 | MC9Z-L3PN05 | 5 | • Matarial: Balvaarbanata | |
| | MC2D | _ | MC9Z-L2 | MC9Z-L2PN05 | 5 | · Waterial. Polycarbonate | |

MC

Panel Cut-Out

| | Model | Front View | Panel Cut-Out | Remarks |
|----------------------|--------------------|----------------|--|---|
| Barrier | MC3D Horizontal | | $\begin{array}{c c} & 30.5^{\pm0.3} \\ \hline \\ & & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\$ | N: No. of MC units mounted Notes: When all four LED lamps are lit continuously, the maximum number of MC3D units that can be mounted is 3 rows by 10 columns. |
| | MC3D Horizontal | | 30.5 ^{±0.3} 32N-1.5 ^{±0.3} ≥ 6 min.* ↓ | When both LED lamps are lit continuously, the maximum number of MC2D units that can be mounted is 10 rows by 10 columns. The panel cut-out dimensions are identical whether the house the panel whether |
| Flange | MC3D Vertical | | 23.5 ⁴³ 25N-1.5 ⁴³ 6 min.* | MC3D/MC2D is mounted with or without a dustproof cover. See page 32. The applicable panel thick- ness is 1 to 5 mm. The strength of the panel must be taken into consideration for collective mounting. |
| | MC2D Horizontal | | 22.5 ^{±0.3} 25N-2.5 ^{±0.3} 6 min.* | |
| | MC3D Horizontal | 38 33N+5 39 | 35.3 ±0.3 33N+2.3 ±0.3 S S S S S S S S S S S S S | |
| Flange with Barriers | MC3D Vertical | | 28.3 × 26N+2.3 × | |
| | MC2D | S 26N+5 | 28.3 *03 26N+2.3 *03 | |
| auard Barriers | MC3D Horizontal | | 33N+2.3 ⁻⁰³ → 33N+2.3 ⁻⁰³ → 6 min.* | |
| Flange with G | MC2D | | 28.3 *03 26N+2.3 *03 6 min.* y 6 min.* y | |

All dimensions in mm.

Ordering Information

Notes for Ordering

• MC3D/2D units are not supplied with LED lamps, incandescent lamps, and color screens. Order these accessories separately. When ordering, specify the Ordering No. and quantity.

[Example]

- MC3D Horizontal Barrier, Momentary Operation (snap action), Silver Contact, SPDT, Black Housing, Full Illumination Part No.: MC3D-M10RB 5 pcs
- LED Lamp (6V AC/DC, Red)

Part No.: LFTD-6RPN10 1 pack (10 pcs/pack)

Safety Precautions

- Turn power off to the MC series before installation, removal, wiring, maintenance, or inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- Use the MC series within the specification values. Exceeding the specification values may cause electrical shocks or fire hazard.

Instructions

Illumination Unit

Removing the Illumination Unit

Use the lamp holder removal tool (MCM-T001) to pull out the illumination unit, nipping the slots on the sides of the lens.

If the cover of the lens with switch quard is pulled, the hinge of the cover may be damaged. Pull out the illumination unit, nipping the lens.

Installation and Replacement of LED/Incandescent Lamps

Insert the LED or incandescent lamp into the lamp receptacle from the rear of the lamp holder, bulb first. Push the lamp in completely.



Replacing the Lens

(Removal)

Remove the illumination unit as described above. Insert a flat screwdriver into the latch between the lens and lens holder, and remove the lens



(Installation)

Put the latches on both sides of the lens onto the latches on the lens holder, and depress the lens surface lightly.



• Color Screen (Full, Red) Part No.: MC9Z-PA3RPN05 1 pack (5 pcs of the same color)

Other Notes

- · Sockets, lens switch guard, barriers, and guard barriers are ordered separately. When ordering these accessories, specify the Ordering Part No. and quantity.
- When using MC3D flange in vertical alignment, order vertical mounting leaf springs (MC9Z-T3) separately, and replace the existing leaf springs on the MC3D vertical flange. See page 35.
- · Use wires of proper size to meet the voltage and current requirements. Solder the wires correctly to the terminals. Incomplete soldering will cause excessive heating and fire hazard.

Mounting Order of Color Screen and Marking Plate

Insert the color screen and marking plate in the order described below.

| Illumination Color (Lamp On) | Display Color (Lamp Off) | Order Insertion |
|---------------------------------|-----------------------------|-----------------|
| Amber, Green, Red | Color | В |
| Blue, Yellow | White | А |
| Pure White, White | White | A or B |



Illumination Color and LED Lamp

Insert the color screen and marking plate in the proper order as described below.

| Illumination Color | Color Screen | LED Lamp | |
|-----------------------|--------------|------------|--|
| Amber | Amber | Amber | Note: |
| Red | Red | Red | Marking plat identical in p |
| Green | Green | Green | thickness |
| Blue | Blue | Blue | Engraving is |
| White | Clear | White | on both mar |
| Yellow | Yellow | Yellow | and screens |
| Pure White | Clear | Pure White |] |

tes are naterial and possible king plates

Using the Light Barrier

A light barrier is supplied with color plates for split illumination. Use the light barrier according to the required split color illumination.

MC3D (Rectangular)

[Full Illumination] Light barrier is not needed.

[2- or 3-way Split] Cut off the unnecessary part using cutting pliers. [4-way Split] Use the light barrier for 4-way split illumination as it is.

MC2D (Square)

[Full Illumination] Light barrier is not needed.

[2-way Split] Install the light barrier for 2-way horizontal split illumination correctly.

Instructions

Handling the Light Barrier (Replacing the Light Barrier) When inserting, note the orientation of the light barrier, illumination unit, and housing.



(Cutting the Light Barrier) Cut off the unnecessary part using cutting pliers.



Installing the Illumination Unit into the Housing

The illumination unit has an orientation for insertion into the MC3D/2D housing.

[MC3D]

Place the ▲ mark on the lamp holder in the same direction as the TOP marking on the housing, and insert the illumination unit.



Vertical Mounting

First, insert a small flat-blade screwdriver under the leaf spring on the MC unit, and remove the leaf spring for horizontal mounting.



Place the vertical leaf spring on the MC unit temporarily, and then press the spring until it is secured on the MC unit.



Removing the Contact Block

Removal

Push the yellow lever latch on the top surface of the housing in the direction of arrow using a small screwdriver. The yellow lever latch will rise up. Then turn the lever in the opposite direction indicated with Lock \rightarrow . The contact block is unlocked and can be removed from the operator housing.



Installation

Open the lever as described above, and align the TOP markings on the operator housing and contact block in the same direction. Insert the contact block into the operator housing, and turn the lever in the direction indicated with Lock \rightarrow . The contact block is locked to the operator housing.



Installing Accessories

Installing the Socket or Terminal Cover

Align the TOP markings on the operator housing and socket or terminal cover in the same direction, and press the socket or terminal cover toward the housing.



Installing the Lens with Switch Guard

The lens with switch guard can be installed and removed as with the standard lens. See Installation and Replacement of LED/Incandescent Lamps on page 34.

[Single Mounting]

Put end barriers on both sides of the housing and insert it into the panel cut-out from the front.

[Row Mounting]

Insert an end barrier at one end of the panel cutout, then a unit, a spacer barrier, another unit, and so forth up to the other end of the row. With another end barrier in place, insert the last unit before inserting the last spacer barrier.





Instructions

Cutting the Built-in Jumper

The MC3D has a built-in jumper for full illumination. When using the MC3D for split illumination, cut out the jumper \otimes in the housing, using the jumper cutter (MC9Z-J1). When cutting the built-in jumper, remove the contact block and illumination unit. Place the operator housing upight, insert the jumper cutter, and turn the jumper cutter to cut out the jumper. Remove the cut jumper from the housing. Always use the MC9Z-J1 jumper cutter, otherwise the internal elements may be damaged. Do not touch the lamp contacts, which are easily deformed.







LED Lamp

Wiring Precautions

Run the LED illumination wiring away from other motor lines.

Solder the terminals at 350°C within 3 seconds, using a 60W soldering iron. Sn-Ag-Cu solder is recommended. While soldering, keep the soldering iron as far from the plastic part of the switch as possible. Do not apply excessive force while soldering the terminal.

MC3D

Notes for Operation

When Using LED Lamps When using the MC series for full

illumination, make sure of correct number of lamps.

(Number of Lamps) MC3D: 2 LED lamps MC2D: 1 LED lamp

(Leaage Current)

The LED lamp may light dimly due to a leakage current or induction

current from the solid-state switch or contact protection circuit used for the LED lamp. Take a measure, if necessary.

(Installation Location)

Do not install the LED illuminated MC series where the LED lamps are subjected to infrared rays.

When Using Incandescent Lamps

Use IDEC LH series 0.5W incandescent lamps.

Use two incandescent lamps for the MC3D although the MC3D has four lamp receptacles. Use one incandescent lamp for the MC2D.

Microswitch Contacts

When inductive loads are switched, arcing will increase contact resistance, so it is recommended to connect a contact protection circuit for higher contact reliability.

Slow Action Type

On the momentary slow action 3PDT type, the three microswitches may operate at a slightly different timing.

Connection

Positive-lock connector and easy-lock connectors are applicable to tab terminals.

| Item | Positive-lock C (Tyco Electr | onnector onics) | Easy-lock ((Nichifu C | Connector Co., Ltd) |
|----------|---------------------------------|--------------------|-----------------------------|------------------------|
| Tamainal | 0.2 to 0.5 mm ² | 175412-1 | 0.2 to 0.3 mm ² | OSS-62852F3 |
| reminal | 0.2 to 1.25 mm ² | 174778-1 | 0.5 to 1.25 mm ² | OSS-62815F3 |
| Housing | 174779-1 | | NET1-28-1P | |

Note: Positive-lock is a registered trademark of Tyco Electronics.

E-mail: sales@au.idec.com

Single Board Mounting

Mounting MC series illuminated control units on a PC board offers the following features.



Features

- Reduced installation labor, easy wiring, space saving, and standardization.
- Because the contact blocks on the PC board can be removed easily using a locking lever, the MC series control units are easy to maintain.
- Because the MC series control units require no studs for fastening the control unit to a PC board, special preparation of the control panel is not needed.

Notes for Designing PC Board and Circuit

- Use 1.6-mm-thick glass epoxy PC board with drilled holes.
- Design a circuit so that the MC series control unit can operate within the rated voltage and current range. Make sure that inrush current and voltage do not exceed the rating.
- Minimum applicable load is 5V AC/DC, 1 mA on gold contacts. Applicable range is subject to the operating condition and load.
- Because the 2.8-mm wide terminal touches the PC board as shown on the right, short circuit may occur with pattern lines. Design a circuit carefully to prevent short circuit.



PC Board Drilling Layout (Bottom View)



Note 1: When designing, note the alignment of center lines of the contact blocks and center lines of the operators.

Note 2: The diameter of the terminal hole is 1.2 mm. Drill hole will enable easy operation of the locking lever.

Specifications and other descriptions in this brochure are subject to change without notice



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