

POSITIONER BACKUP STATION

(with bargraph/digital indicator)

MODEL **ABM2**

BEFORE USE

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Positioner backup station (body + scale plate + mounting bracket × 2 + watertight packing).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2, Installation Category II (transient voltage 2500V) and Measurement Category II (positioning output and MAN status output, transient voltage 2500V). Reinforced insulation (remote output switch command or CAS input or PV input to positioning output to MAN status output to power input: 300V) and reinforced insulation (MV output to positioning output or MAN status output or power input: 300V) are maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- The equipment must be mounted on a panel surface. Once mounted on a panel, take appropriate precautions to prevent operators to be exposed to the terminal block.
- Altitude up to 2000 meters.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-2 and properly indicate it.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
 100 – 240V AC rating: 85 – 264V, 47 – 66Hz,
 approx. 4.5VA at 100V AC
 approx. 5.5VA at 200V AC
 approx. 6.5VA at 264V AC
 24V DC rating: 24V ±10%, approx. 2W

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input signal for safety.
- Be sure to put the terminal cover on while the power is supplied.

■ ENVIRONMENT

- Indoor use.
- If the unit's environmental protection IP65 is compromised (e.g. when multiple units are to be mounted side by side) when heavy dust or metal particles are present in the air, install them inside an enclosure with a proper ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.

■ REQUIREMENTS TO ENSURE IP65

- Observe the designated panel cutout size (45 × 92 mm).
- Single mounting only. IP65 is not ensured when the units are clustered side by side.
- The watertight packing included in the product package must be placed behind the front panel.
- Both mounting brackets must be fastened tightly until they hit the panel.
- Confirm visually that the packing is not contorted or excessively run off the edge after installation.

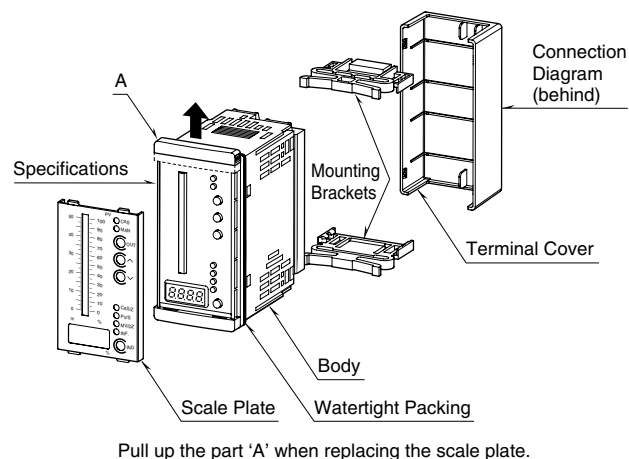
■ WIRING

- Do not install cables close to noise sources (high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

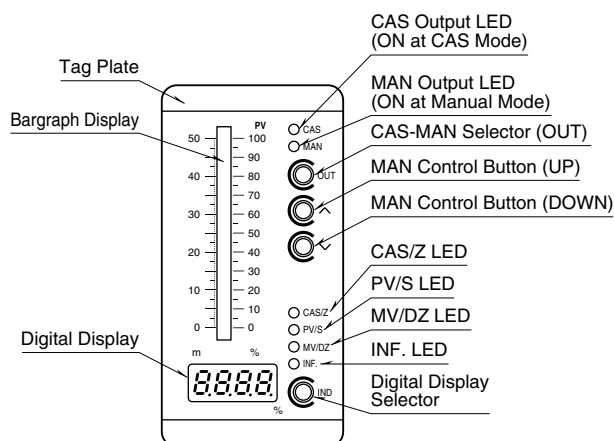
■ AND

- The unit is designed to function as soon as power is supplied, however, a warm up for 20 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



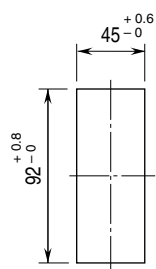
FRONT PANEL CONFIGURATION



INSTALLATION

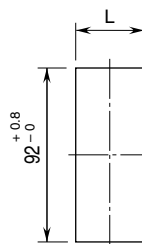
PANEL CUTOUT unit: mm

- Single Mounting
(Conform to degree of protection IP65)



Panel thickness: 1.6 – 8.0 mm

- Clustered Mounting
(Not conform to degree of protection IP65)



- When mounting, no extra space is needed between units.

Panel thickness: 1.6 – 8.0 mm

$$L = (45.5 + 48 \times (N - 1))^{+1}_{-0}$$

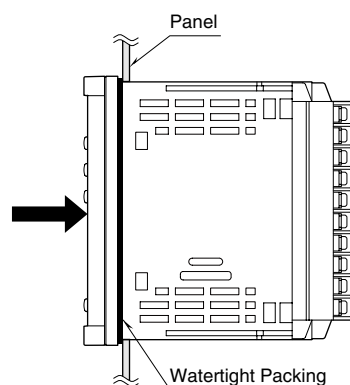
(N : number of units)

Note 1: Observe at the minimum of 3 cm above and below the units for heat dissipation.

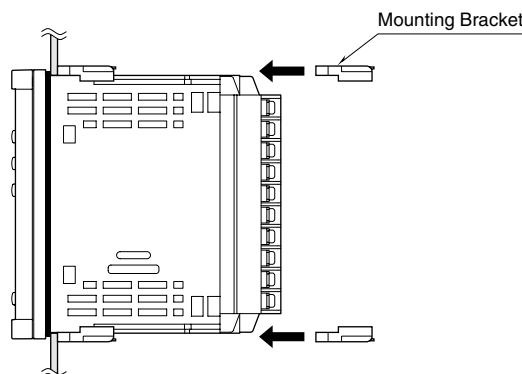
Note 2: When replacing ABM, confirm that panel cutout size is the same as shown above.

HOW TO MOUNT THE UNIT ON A PANEL

- 1) Insert the unit into the panel cutout. The watertight packing must be in place to hold the unit. Do not remove it.
- 2) The IP65 protection is effective only with single mounting, with the designated cutout size (45 × 92 mm).



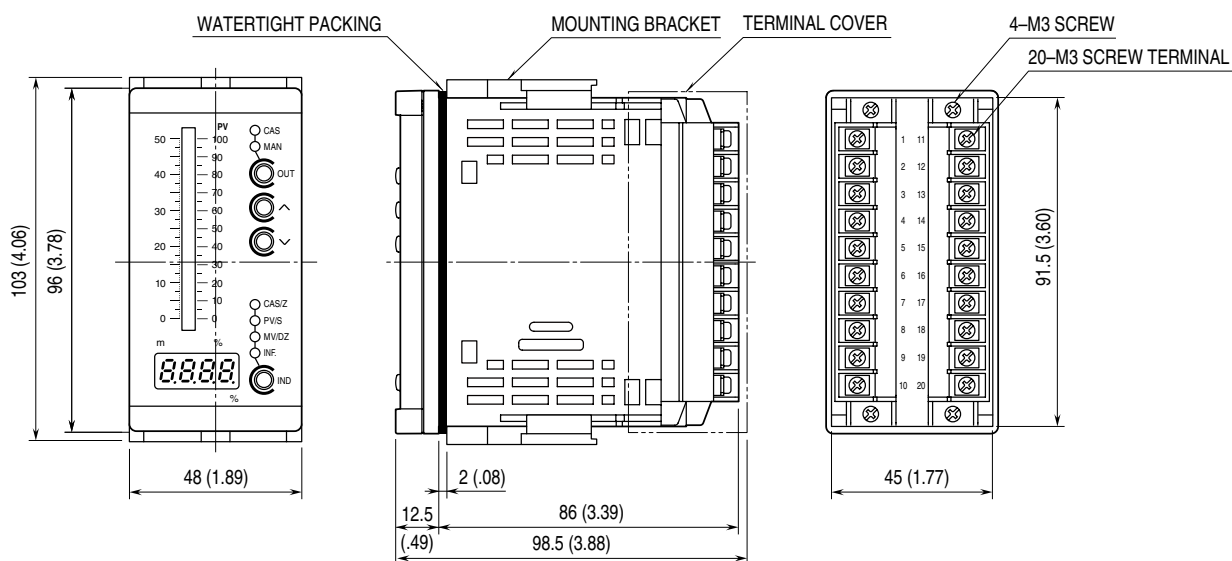
- 3) Push the mounting brackets into the grooves on top and bottom of the rear module, until they hit the panel's rear side.



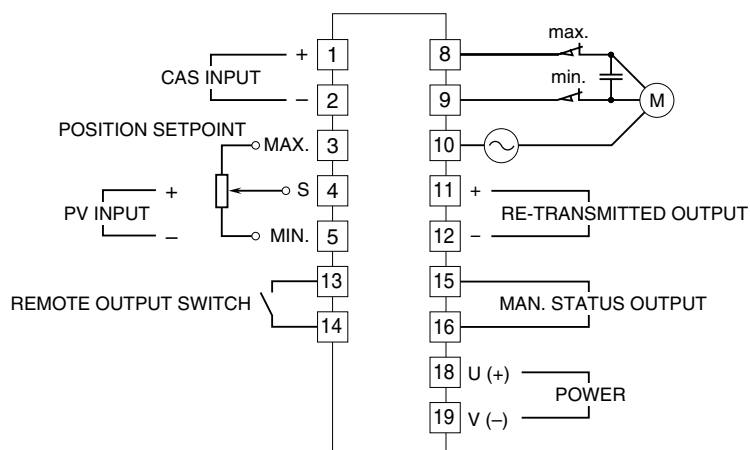
TERMINAL CONNECTIONS

Connect the unit as in the diagram below or refer to the connection diagram on the terminal cover.

EXTERNAL DIMENSIONS unit: mm (inch)



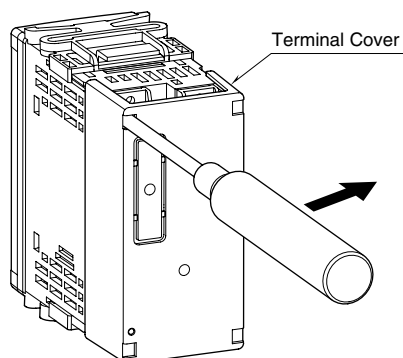
CONNECTION DIAGRAM



TERMINAL BLOCK

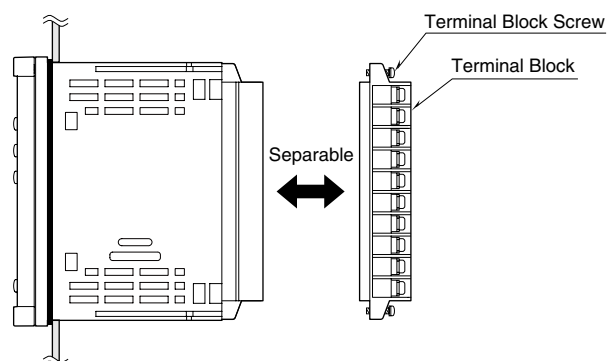
How to remove the terminal cover

Insert the minus tip of a screwdriver into each hole at the four corners of the cover and pull it to the direction as indicated below to separate the terminal cover.



How to remove the terminal block

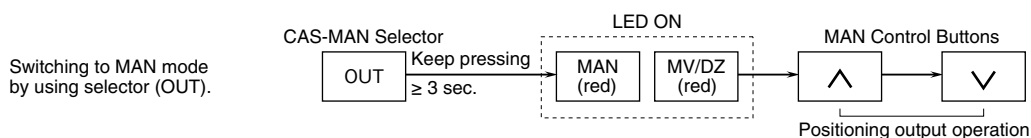
The terminal block is separable in two pieces. Loosen two screws on top and bottom of the terminal block to separate. Be sure to turn off the power supply, input signal and power supply to the output relays before separating the terminal block.



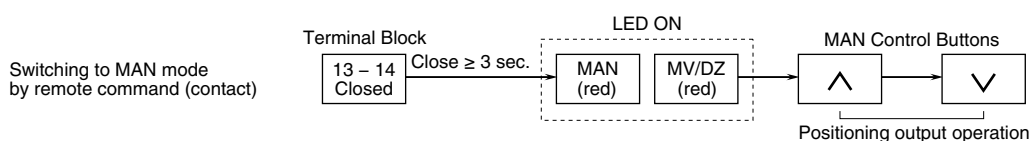
SWITCHING BETWEEN MAN/CAS

■ SWITCHING TO MANUAL (CAS Mode to MAN Mode)

- When the unit is turned on with 13 – 14 terminal opened, CAS and CAS/Z LED is ON. (Digital display shows CAS input value.)
- Setting with selector (OUT)
 - Pressing and holding OUT button more than 3 seconds enables to turn on MV/DZ LED (red) and MAN LED (red) and then enter to MAN mode.
 - Operate positioning output by using ▲▼ button.



- Switching by remote command (contact)
 - ON between terminal 13 – 14 enables to turn on MV/DZ LED (red) and MAN LED (red) and then enter to MAN mode.
 - Operate positioning output by using ▲▼ button.

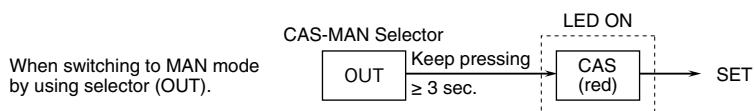


Note 1: When moving from MAN mode to CAS mode, digital display returns to the display previous to MAN output.

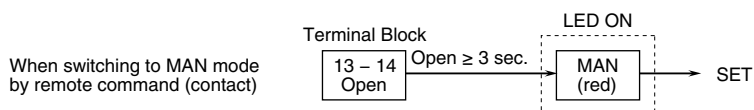
Note 2: Switching between MAN/CAS is available when each LED CAS/Z, PV/S, MV/DZ, and INF turns on in red.

■ CANCELLING MANUAL OUTPUT (MAN Mode to CAS Mode)

- When switching to MAN Mode with selector (OUT).
Pressing and holding OUT button more than 3 seconds enables to turn on CAS LED (red) and return to CAS Mode.



- When switching to MAN Mode by remote command (contact).
OFF between terminal 13 – 14 enables to turn on CAS LED (red) and return to CAS Mode.



Note 3: When closing terminal 13 – 14 of the unit and moving to MAN mode, pressing and holding OUT button does not enable to return to CAS Mode.

Note 4: When performing CAS mode, be sure that open state of terminal 13 – 14.

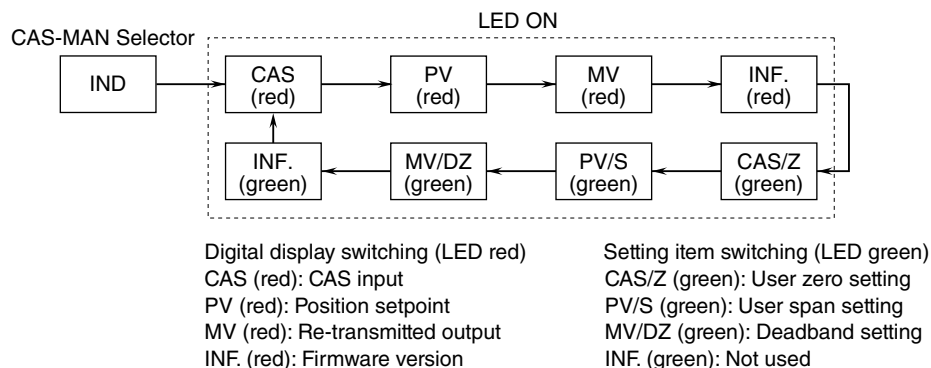
■ SWITCHING BETWEEN MAN MODE AND CAS MODE

REMOTE COMMAND	INDICATOR LED	
	CAS LED (RED)	MAN LED (RED)
ON	MAN Mode	MAN Mode
OFF	CAS Mode	MAN Mode

SWITCHING DIGITAL DISPLAY

For the unit, setting item is changed every time IND button is pressed. Setting item is identified by LED.

■ SWITCHING OF DIGITAL DISPLAY (LED RED) AND SETTING ITEM (LED GREEN)



USER ZERO/USER SPAN/DEADBAND

■ USER ZERO SETTING, USER SPAN SETTING

It is available to change Zero and Span of PV input according to user's environment in use. (Factory default: 0%, 100%, Zero setting: 0.0 to 49.9%, Span setting: 50.0 to 100.0%)

E.g.1. When the unit with input range 1 to 5V is used as 2V for Zero and 4V for Span.

User Zero setting (CAS/Z LED ON in green): 25.0 is set.
 (2V corresponds 25.0% at 1 to 5V range)

User Span setting (PV/S LED ON in green) 75.0 is set.
 (4V corresponds 75.0 at 1 to 5V range)

With above setting, 2 to 4V of PV input works as 0 to 100%.

E.g.2. When PV input is a potentiometer input.

- 1) Set User Zero setting (CAS/Z LED ON in green): 0.0, set User Span setting (PV/S LED ON in green): 100.0.
- 2) Switch digital display to PV/S LED (red, PV input).
- 3) Set potentiometer input to the position desired to set to Zero. Make a memo of % value of PV input with that state. (% value is displayed with PV/S LED (red)).
- 4) Set potentiometer input to the position desired to set to Span. Make a memo of % value of PV input with that state. (% value is displayed with PV/S LED (red)).
- 5) Set the value in memo at step 3 to User Zero setting (CAS/Z LED green).
- 6) Set the value in memo at step 4 to User Span setting (PV/S LED green).

E.g.3. When setting User Zero and User Span while confirming re-transmitted output.

- 1) Set User Zero setting (CAS/Z LED ON in green) with applying 0% to input. Adjust by using ▲▼ button so that re-transmitted output become 0%.
- 2) Set User Span setting (PV/S LED ON in green) with applying 100% to input. Adjust by using ▲▼ button so that re-transmitted output become 100%.

■ DEADBAND

- 1) Choose MV/DZ LED (green) with IND.
- 2) Adjust setting value to desired value with ▲▼ button.
 (Factory default: 1.0%, Setting range: 1.0 to 10.0%)

CHECKING

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Power input voltage: Check voltage across the terminal 18 – 19 with a multimeter.
- 3) CAS input: Check that the CAS input signal is correct.
- 4) PV input: Check that the PV input signal is correct.
- 5) Positioning output: Check that the positioning output signal is correct.
- 6) Re-transmitted output: Check that the re-transmitted output signal is correct.
- 7) Check that the load resistance meets the described specifications.

ADJUSTMENT PROCEDURE

■ FULL-CLOSE POSITION

Press IND button to select CAS/Z LED (green) with PV input is 0%. By using ▲▼ button, confirm full-close position while watching re-transmitted output or bargraph display. It is available to set input signal to 0 to 49.9% position (Factory default: 0%). Again check the full-open position, if it is shifted adjust again. After adjustment, be sure to set to digital display.

■ FULL-OPEN POSITION

Press IND button to select PV/S LED (green) with PV input is 100%. By using ▲▼ button, confirm full-open position while watching re-transmitted output or bargraph display. It is available to set input signal to 50 to 100% position (Factory default: 100%). Again check the full-close position, if it is shifted adjust again. After adjustment, be sure to set to digital display.

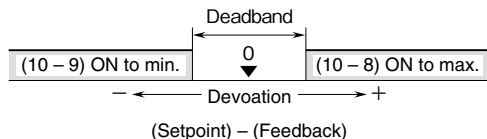
■ DEADBAND

When unit shows hunting, which positioning output vibrates between max. direction and min. direction in CAS mode, adjust deadband value to prevent it. Just after the deviation, which the figure of deadband below shows, enters into deadband, it stops. CAS mode re-starts when it becomes out of deadband.

In order to set, press IND button to select MV/DZ LED (green).

Set the value to desired value by using ▲▼ button. Settable range is 1.0 to 10.0% (Factory default: 1.0%).

• **Output Operation** (terminal No. in parentheses)



WIRING INSTRUCTIONS

■ TIGHTENING TORQUE

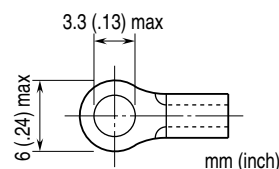
Separable screw terminal wiring screw: 0.6 N·m
Separable screw terminal fixing screw: 0.6 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.

Applicable wire size: 0.25 to 0.75 mm²

Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd., Nichifu Co., Ltd.



LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.