

ANALOG BACKUP STATION (with bargraph/digital indicator)

MODEL **ABF3**

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:

Analog 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

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
100–240VAC rating: 85–264V, 50/60 Hz, approx. 4–6VA
24V DC rating: 24V ±10%, approx. 3.5W
(for / T approx. 5 – 7VA)

■ 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 30 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 cover.
- 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.

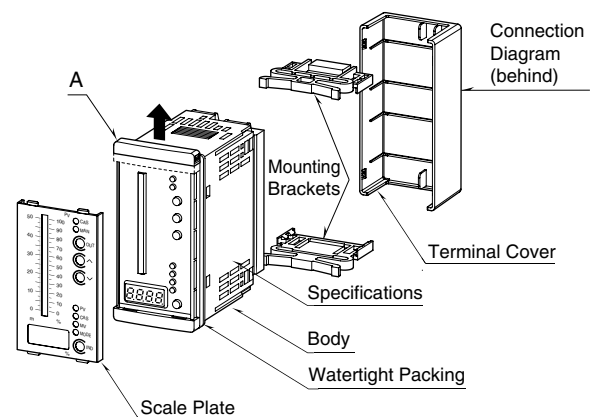
■ WIRING

- 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

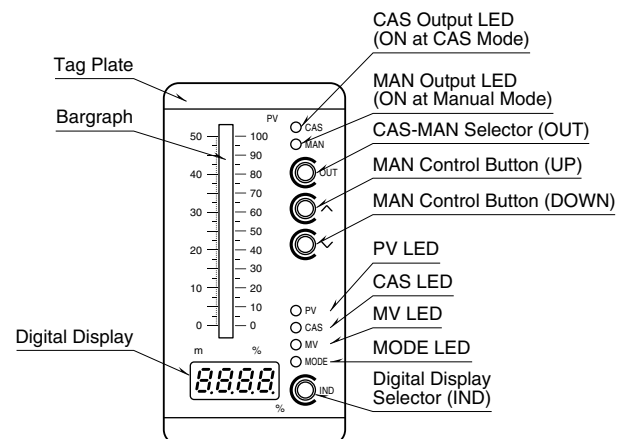
- The unit is designed to function as soon as power is supplied, however, a warm up for 20 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



Pull up the part 'A' when replacing the scale plate.

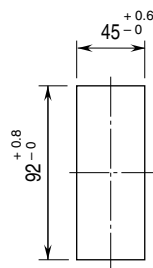
■ FRONT PANEL CONFIGURATION



INSTALLATION

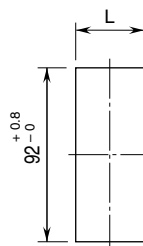
■ PANEL CUTOUT unit: mm

- Single Mounting
(Conform to degree of protection IP65)



Panel thickness: 1.6 – 8.0 mm

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



Panel thickness: 1.6 – 8.0 mm

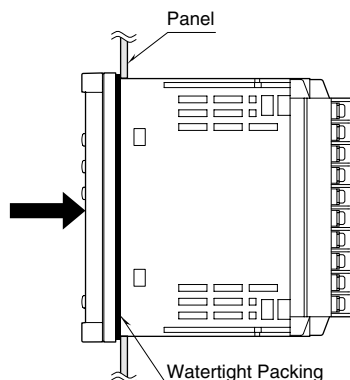
$$L = (45.5 + 48 \times (N - 1))^{+1}_{-0}$$

(N : number of units)

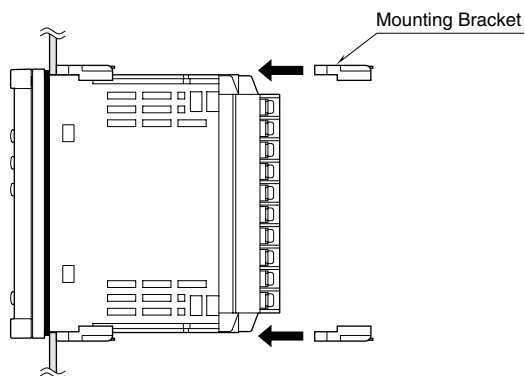
Observe at the minimum of 3 cm above and below the units for heat dissipation.

■ 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).



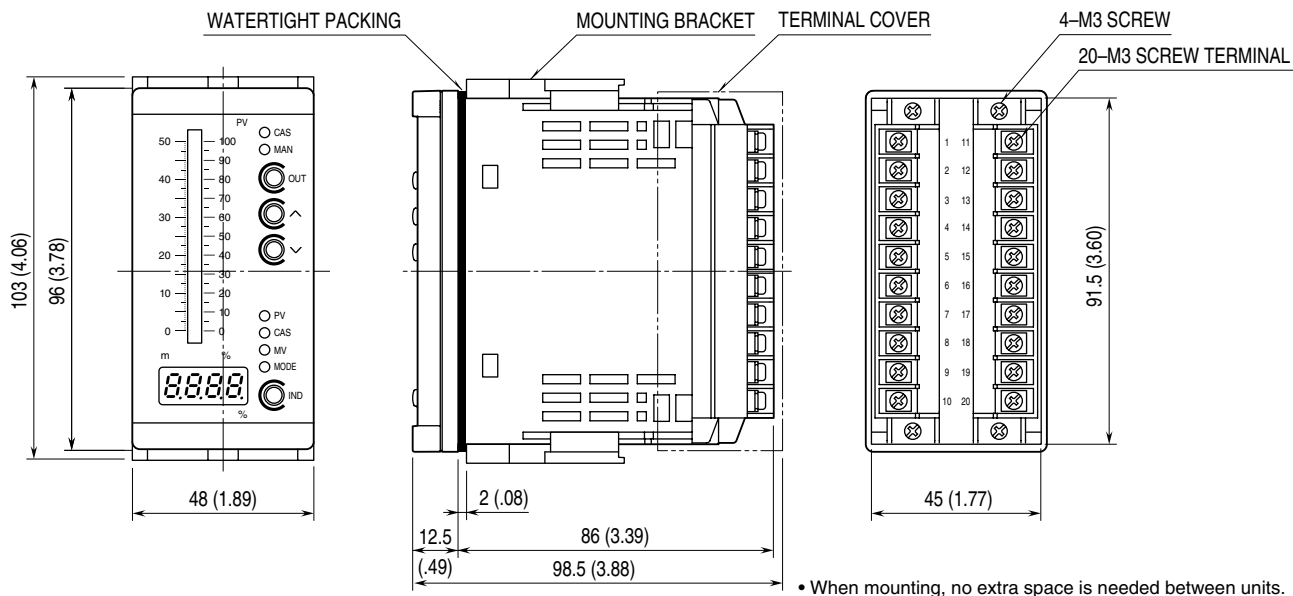
- 3) Push the mounting brackets into the grooves on top and bottom of the rear module, until they hit the panel's rear side.



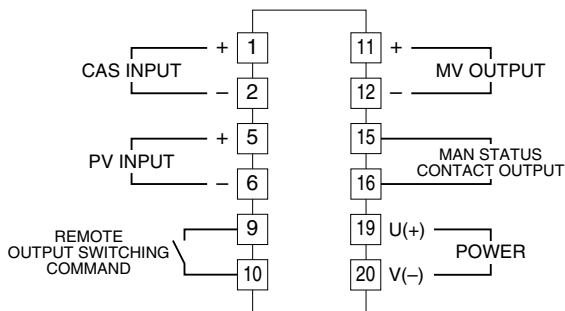
TERMINAL CONNECTIONS

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

EXTERNAL DIMENSIONS unit: mm (inch)



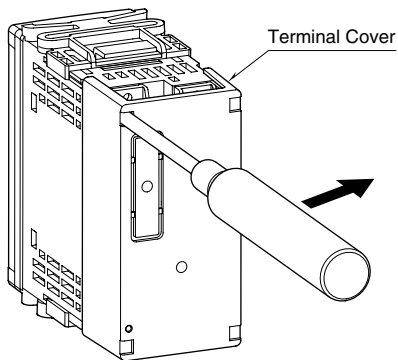
CONNECTION DIAGRAM



TERMINAL BLOCK

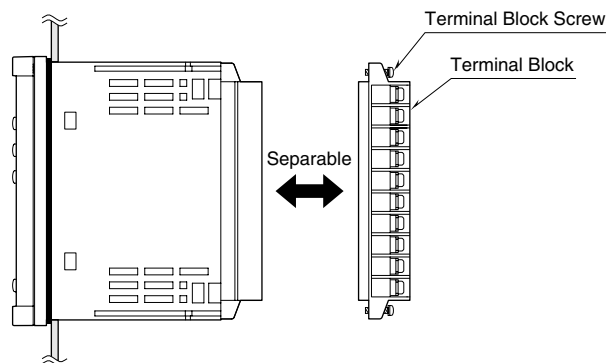
How to remove the terminal cover

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.

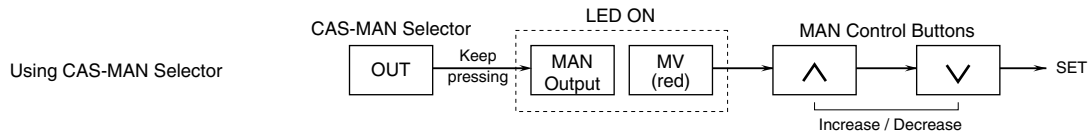


SETTING/CANCELING MANUAL OUTPUT

■ SETTING MANUAL OUTPUT (CAS to MAN mode)*1

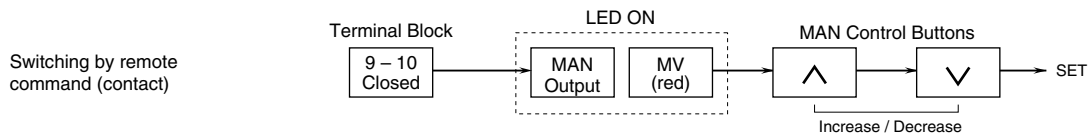
• Using CAS-MAN Selector (OUT)

- 1) Hold down OUT button until MAN (red) and MV (red) LED turn on (MAN mode).
- 2) Press ▲▼ buttons until the digital display shows a desired value.



• Switching by remote command (contact)

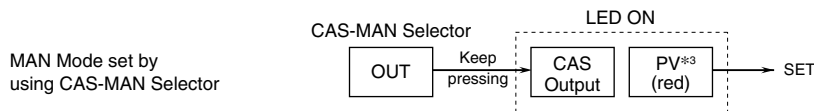
- 1) Short across the terminals 9 – 10. The MAN (red) and MV (red) LED turn on (MAN mode).
- 2) Press ▲▼ buttons until the digital display shows a desired value.



■ CANCELING MANUAL OUTPUT (MAN to CAS mode)*1, *2

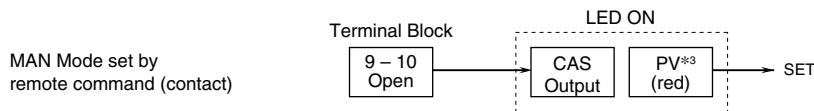
• If you have set MAN mode by using CAS-MAN Selector (OUT)

- 1) Hold down OUT button until CAS (red) and PV*3 (red) LED turn on (CAS mode).



• If you have set MAN mode by remote command (contact)

- 1) Open across the terminals 9 – 10. The CAS (red) and PV*3 (red) LED turn on (CAS mode).



*1. OUT Switch cannot be controlled when PV, CAS, MV or MODE LED shows green.

*2. Setting and canceling MAN Mode may be executed using the different method.

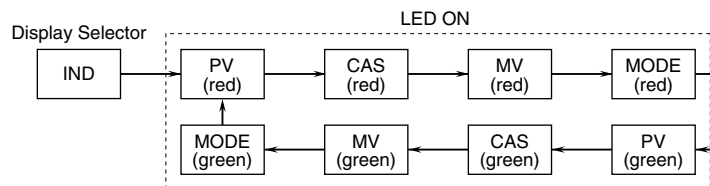
For example, if you have set MAN Mode by using OUT Switch, you cannot cancel it by the remote command.

*3. The LED returns to the state prior to the moment of switching from CAS to MAN when the MAN mode is canceled.

SWITCHING DIGITAL DISPLAY

The unit switches between digital display contents and setting items when every time pressing Digital Display Selector (IND).

■ SWITCHING DIGITAL DISPLAY CONTENTS (red LED)/SETTING ITEMS (green LED)



Switching digital display contents (red LED)

PV (red): PV input (%)

CAS (red): CAS input (%)

MV (red): MV output (%)

MODE (red): Showing firmware version

Switching setting items (green LED)

PV (green): Manual operation ramp rate

CAS (green): Retroactive time period

MV (green): Transition ramp rate

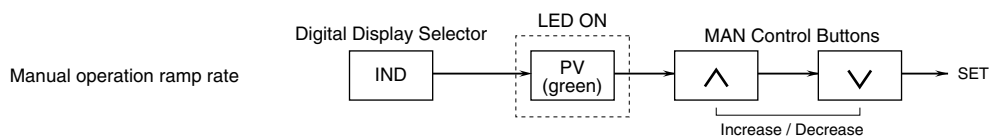
MODE (green): Not in use

OTHER SETTINGS AND CHECKING FIRMWARE VERSION

■ MANUAL OPERATION RAMP RATE*1,*2

Setting response time required for the output goes from 0% to 100% with ▲▼ buttons in MAN mode. Selectable from 1 to 30 seconds in 1 sec. increments. (Factory set to 15 sec.)

- 1) Press IND button until the green LED turns on the PV LED.
- 2) Press ▲▼ buttons until the digital display shows a desired value.

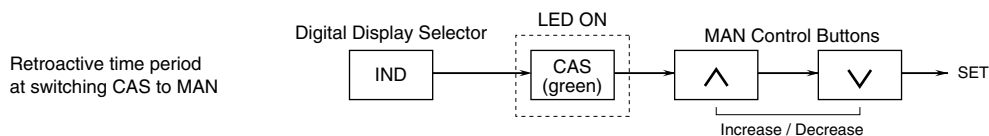


■ RETROACTIVE TIME PERIOD*1

The ABF3 continuously stores the MV output during CAS control. When the loop has been turned to MAN control (contact closure at the terminals 9 – 10), it goes back by the preset time period and holds the output. For example, with the value set to 10 seconds, the ABF3 outputs the MV value 10 seconds before the contact has been closed.

Selectable from 0 to 30 seconds in 1 sec. increments. (Factory set to 0 sec.)

- 1) Press IND button until the green LED turns on the CAS LED.
- 2) Press ▲▼ buttons until the digital display shows a desired value.



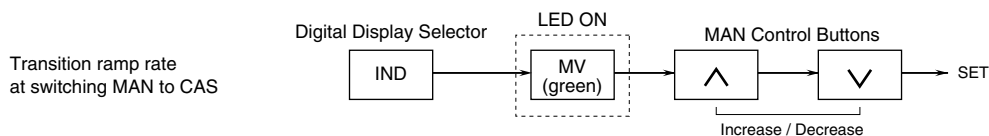
■ TRANSITION RAMP RATE

If the CAS control value at the moment of switching from MAN to CAS mode is greatly deviated from the MV output value in MAN control, the ABF3 adjusts the difference gradually in the preset ramp rate. Receiving MAN command during transition ramp period, the ABF3 turns to MAN mode after transition ramp function is completed.

The ramp rate is set as time required for the output goes from 0% to 100%.

Selectable from 0 to 30 seconds in 1 sec. increments. (Factory set to 1 sec.)

- 1) Press IND button until the green LED turns on the MV LED.
- 2) Press ▲▼ buttons until the digital display shows a desired value.



■ CHECKING THE VERSION INFORMATION

To confirm the version information of the unit, press Digital Display Selector (IND) to turn ON the MODE LED (red).

*1. OUT Switch cannot be controlled when PV, CAS, MV or MODE LED shows green.

*2. Add 0.3 seconds for the total time required to go from 0% to 100%.

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 19 – 20 with a multimeter.
- 3) Input: Check that the input signal is within 0 – 100% of the full-scale.
- 4) Output: Check that the load resistance meets the described specifications.

WIRING INSTRUCTIONS

■ TIGHTENING TORQUE

Separable screw terminal wiring screw: 0.6 N·m

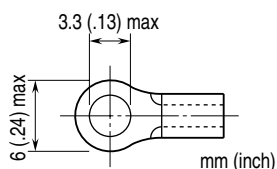
Separable screw terminal fixing screw: 0.6 N·m

■ 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.