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|------------------------------------------------------|-------------------|
| ANALOG BACKUP STATION (front configurable) | MODEL MXAB |
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BEFORE USE

Thank you for choosing us. 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 our sales office or representatives.

■ PACKAGE INCLUDES:

Analog backup station (body + base socket).....(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 and Installation Category II (transient voltage 2500V). Basic insulation (signal input to output to power input: 300V) is maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel.
- Insert a noise filter for the power source connected to the unit. TDK-Lambda Noise Filter Model RSAN-2006 or equivalent is recommended.
- 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.
- Install lightning surge protectors for those wires connected to remote locations.

■ 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 – 66 Hz, approx. 10VA
 12 – 24V DC rating: 10.8 – 26.4V, approx. 3.5W
 110V DC rating: 85 – 150V, approx. 3.5W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient 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.

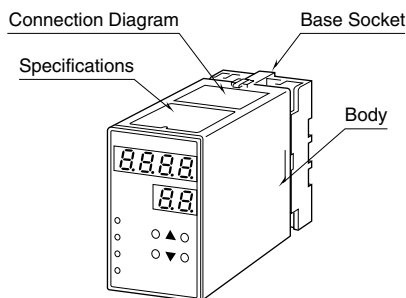
■ WIRING

- Do not install cables close to noise sources (relay drive cable, 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 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

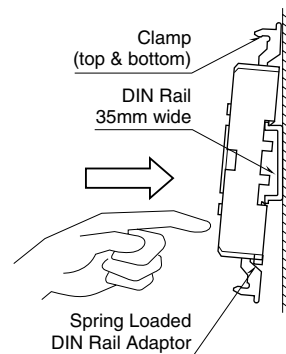


INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit to separate the body from the base socket.

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Position the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



■ WALL MOUNTING

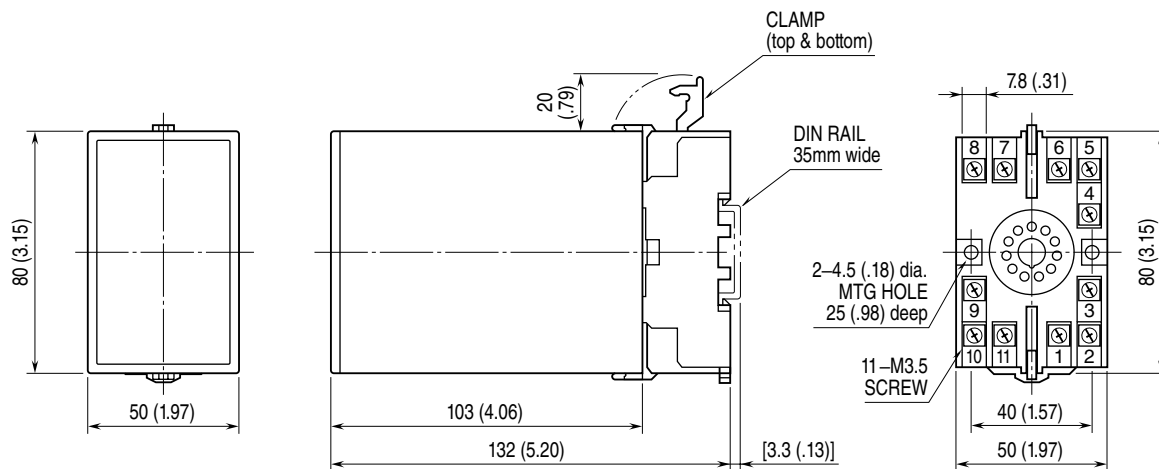
Refer to "EXTERNAL DIMENSIONS."

Shape and size of the base socket are slightly different with various socket types.

TERMINAL CONNECTIONS

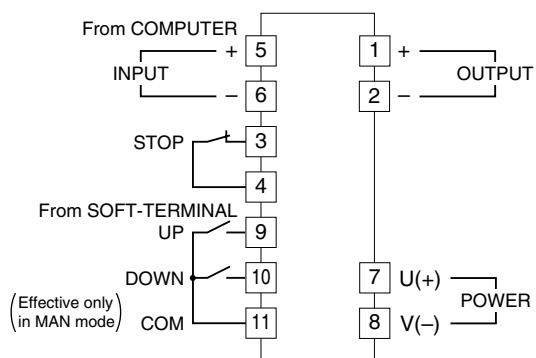
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

EXTERNAL DIMENSIONS unit: mm (inch)



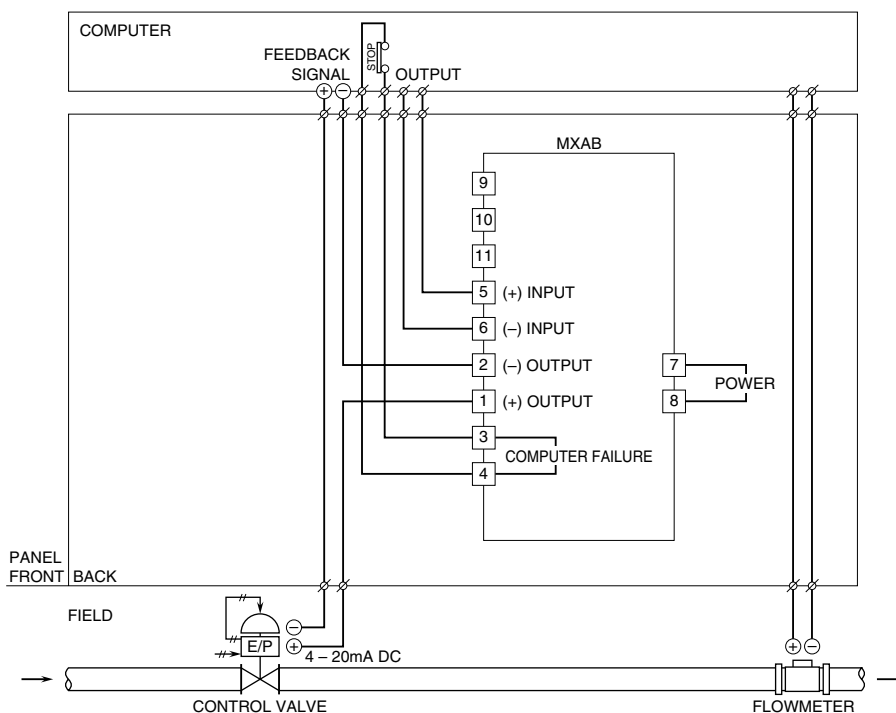
• When mounting, no extra space is needed between units.

CONNECTION DIAGRAM

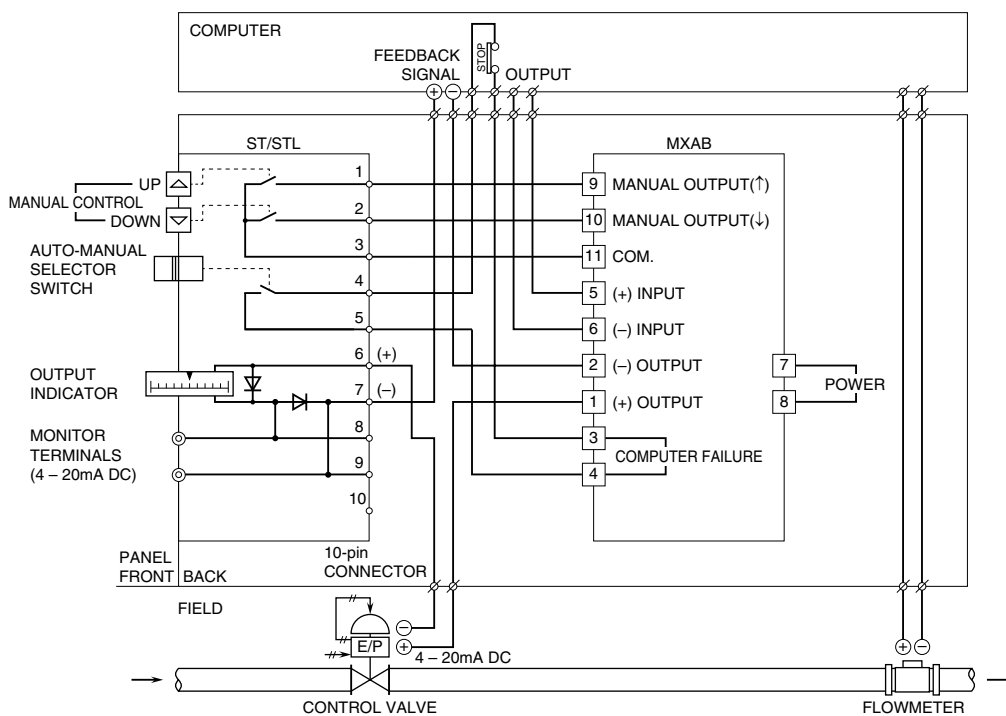


CONNECTION EXAMPLES

■ Used Independently



■ Used in Combination with ST/STL

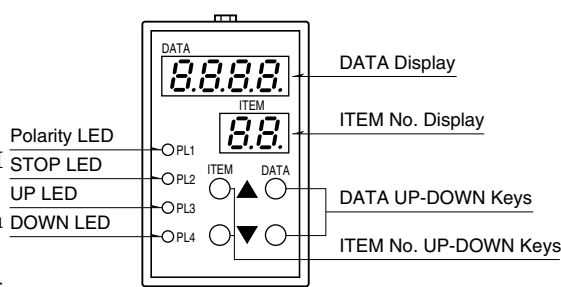


FRONT VIEW & PROGRAMMING

PROGRAMMING PROCEDURE

- 1) Press ITEM UP or DOWN key until ITEM display indicates "01".
- 2) Press DATA UP or DOWN key and choose "2" on DATA display.
 - 1: Data indication only.
 - 2: All parameters are modifiable.
- 3) Press ITEM UP or DOWN key until ITEM display shows the ITEM No. you need to change.
- 4) Press DATA UP or DOWN key and choose a DATA No. or value you need on DATA display.
- 5) Repeat above 3 and 4. (Entered data is stored 1 sec. after the operation has been complete.)
- 6) Press ITEM UP or DOWN key until ITEM display indicates "01".
- 7) Press DATA UP or DOWN key and choose "1" on the display.
- 8) Press ITEM UP or DOWN key until ITEM display indicates "P". DATA display shows process input. You can now check data setting by choosing ITEM No.

Note : DO NOT press UP and DOWN keys simultaneously.



| ITEM | MDF. CODE | DATA | CONTENTS | DEFAULT |
|------|-----------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| P | N/A | -9999 – 9999 | Input display in engineering unit (as set in ITEM 08/09) | — |
| 01 | | 1, 2, 3 | Modification code 1 : Data indication only. 2 : All parameters are modifiable. 3 : Only ITEM 33 is modifiable. | 1 |
| 02 | N/A | 0, 1, 10, 20 | Status indication ("0" is normally indicated.) 0 : Normal 1 : E ² PROM error 10 : PV overrange (out of -9999 to 9999) 20 : Output overrange (out of -15 to 115% or between item 31 and 32) | — |
| 03/L | 2 | -15.0 – 115.0 | Input indicated in % with ITEM 01 DATA 1 (of the range set in ITEM 27/28) Loop test output with ITEM 01 DATA 2 ('L' is indicated as ITEM No.) (Use DATA UP/DOWN key to set the output signal.) | — |
| 04 | 2 | -99.99 – 99.99 | Input zero adjustment (%) (fine adj. of the value set in ITEM 27) | 0.00 |
| 05 | 2 | -99.99 – 99.99 | Input span adjustment (%) (fine adj. of the value set in ITEM 28) | 0.00 |
| 06 | 2 | -99.99 – 99.99 | Output zero adjustment (%) (fine adj. of the value set in ITEM 29) | 0.00 |
| 07 | 2 | -99.99 – 99.99 | Output span adjustment (%) (fine adj. of the value set in ITEM 30) | 0.00 |
| 08 | 2 | -9999 – 9999 | Display range scaling 0% *1 | 0.0 |
| 09 | 2 | -9999 – 9999 | Display range scaling 100% *1 | 100.0 |
| 10 | 2 | 0, 1, 2, 3 | Decimal point position 0 : _ _ _ _ 1 : _ _ . _ 2 : _ . _ _ 3 : _ . _ _ _ | 1 |
| 11 | 2 | 0, 1, 2, 3, 4, 5 | Moving average (sampling cycle: 10 msec.) 0: No 1: 5 samples 2: 8 samples 3: 12 samples 4: 20 samples 5: 36 samples | 1 |
| 12 | 2 | 0 – 12 | Response time 12 : Approx. 100 sec. 0 → 90% 11 : Approx. 50 sec. 0 → 90% 10 : Approx. 25 sec. 0 → 90% 9 : Approx. 12.5 sec. 0 → 90% 8 : Approx. 6.3 sec. 0 → 90% 7 : Approx. 3.2 sec. 0 → 90% 6 : Approx. 1.6 sec. 0 → 90% 5 : Approx. 0.8 sec. 0 → 90% Decreasing DATA by 1 increment cuts the response time by half. Approx. 0.5 sec. when setting to 0 to 4. | 1 |
| 13 | 2 | 0, 1 | MANUAL control mode 0 : Trace back mode; Goes back the preset 'trace-back time' 1 : Fixed value mode; Holds the preset 'initial value in MANUAL mode' | 0 |
| 14 | 2 | -15.0 – 115.0 | Initial value in MANUAL mode | -15.0 |
| 15 | 2 | 0 – 20 | Trace-back time (sec.) | 0 |
| 16 | 2 | 0, 1 – 100 | Transition speed (%/sec.) (For tracking the new input when switched from MANUAL to AUTO mode) 0 : CAS operation is restored without going through the transition response when MAN command is OFF. | 0 |

| ITEM | MDF. CODE | DATA | CONTENTS | DEFAULT |
|------|-----------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 17 | 2 | 0, 1 | Output stored at the loss of power 0 : Disable 1 : Enable | 1 |
| 18 | 2 | -15.0 – 115.0 | Initial value at start-up (Effective when 'Output stored at the loss of power' is disabled.) | -15.0 |
| 19 | 2 | 1 – 999 | UP-DOWN key response time (0 – 100%, sec.) | 20 |
| 20 | 2 | 0, 1 | Transition response time 0 : Disable; Response is determined only by UP/DOWN key response time setting. 1 : Enable; Response increases gradually from 0% to the UP-DOWN key response time setting. | 0 |
| 21 | 2 | 0, 1 – 60 | Power-saving mode 0 : Continuous display 1 – 60 : Time before display turned off (minutes) | 10 |
| 24 | 2 | 0, 1 | DOWN input logic 0 : True at LOW or Shortcircuit 1 : True at HIGH or Opencircuit | 0 *2 |
| 25 | 2 | 0, 1 | UP input logic 0 : True at LOW or Shortcircuit 1 : True at HIGH or Opencircuit | 0 *2 |
| 26 | 2 | 0 – 3 | STOP input logic 0 : AUTO mode at LOW or Shortcircuit (Input updating halted at STOP) 1 : AUTO mode at HIGH or Opencircuit (Input updating halted at STOP) 2 : AUTO mode at LOW or Shortcircuit 3 : AUTO mode at HIGH or Opencircuit | 2 *2 |
| 27 | 2 | -1.00 – 1.00 | Input code S1 0% input voltage (V) *3 100% input voltage (V) *3 | -1.00 |
| 28 | 2 | -1.00 – 1.00 | | 1.00 |
| 27 | 2 | -10.0 – 10.0 | Input code S2 0% input voltage (V) *3 100% input voltage (V) *3 | -10.0 |
| 28 | 2 | -10.0 – 10.0 | | 10.0 |
| 27 | 2 | -30.0 – 30.0 | Input code S3 0% input voltage (V) *3 100% input voltage (V) *3 | -30.0 |
| 28 | 2 | -30.0 – 30.0 | | 30.0 |
| 29 | 2 | -1.00 – 1.00 | Output code V1 0% output voltage (V) *4 100% output voltage (V) *4 | -1.00 |
| 30 | 2 | -1.00 – 1.00 | | 1.00 |
| 29 | 2 | -10.0 – 10.0 | Output code V2 0% output voltage (V) *4 100% output voltage (V) *4 | -10.0 |
| 30 | 2 | -10.0 – 10.0 | | 10.0 |
| 29 | 2 | 0.0 – 20.0 | Output code Z1 0% output current (mA) *4 100% output current (mA) *4 | 4.0 |
| 30 | 2 | 0.0 – 20.0 | | 20.0 |
| 31 | 2 | -15.0 – 114.9 | Lower output limit | -15.0 |
| 32 | 2 | -14.9 – 115.0 | Upper output limit | 115.0 |
| 33 | 3 | 0, 1 | Reset all settings *5 | 0 |
| 34 | N/A | --- | ROM version | --- |

*1. Of the range set in ITEM 04/05. ITEM 08 < ITEM 09.

*3. ITEM 27 < ITEM 28.

*5. Press DATA UP key and choose DATA 1. Double-click DATA DOWN key. The display shows DATA 0 after the initialization is complete.

*2. Use the default setting when combining with the ST/STL.

*4. ITEM 29 < ITEM 30.

■ SELECTING INPUT RANGE

[E.G.] -5.0 to 5.0V DC

1) Program Mode

Set ITEM 01 – DATA 2 to turn the unit into Program Mode.

2) 0% Input Voltage

Choose ITEM 27 – DATA -5.0.

3) 100% Input Voltage

Choose ITEM 28 – DATA 5.0.

4) Monitor Mode

Set ITEM 01 – DATA 1 to turn the unit into Monitor Mode.

5) PV Indication

Press ITEM UP or DOWN key until ITEM display indicates "P".

■ SELECTING OUTPUT RANGE

[E.G.] -10.0 to 0.0V DC

1) Turn the unit into Program Mode.

2) 0% Output Voltage

Choose ITEM 29 – DATA -10.0.

3) 100% Output Voltage

Choose ITEM 30 – DATA 0.0.

4) Turn the unit into Monitor Mode.

5) Set to ITEM P.

■ DISPLAY RANGE SCALING

[E.G.] PV display range -10.0 to 10.0 modified to show -6500 to 350

1) Turn the unit into Program Mode.

2) Decimal Point Position

Choose ITEM 10 – DATA 0.

3) 0% Scaling Value

Choose ITEM 08 – DATA -6500.

(Negative [-] range is identified with the PL1 turned on.)

4) 100% Scaling Value

Choose ITEM 09 – DATA 350.

5) Turn the unit into Monitor Mode.

6) Set to ITEM P.

■ RESET ALL SETTINGS

Returning the unit into the default settings.

1) Turn the unit into Reset Mode. Choose ITEM 01 - DATA 3.

2) Call up the Reset menu.

Choose ITEM 33 – DATA 1. (Press DATA UP key.)

3) Resetting Enable

Double-click DATA DOWN key. DATA 0 is displayed after the initialization is complete.

4) Turn the unit into Monitor Mode.

If necessary, go to Moving Average and other adjustments.

Set the unit to Monitor Mode other than for programming.

FUNCTIONS

■ Basic Operation (operation in default setting)

In normal operating mode, the MXAB responds proportionally to its input (the computer output) in the response time of less than 0.5 seconds.

If the computer fails, this will be detected as a “STOP” command and output will be held at the value prior to the breakdown. You can increase the output signal by closing across the terminals 9 – 11, and decrease it by closing 10 – 11. The output responds in the preset ramp rate.

| COMMAND | | TERM. | SIGNAL STATUS | | | | | | | |
|--------------------|-----------|---------|---------------|---|---|---|---|---|---|---|
| Computer | DC Signal | 5 – 6 | ↑ ↓ | | | | | | | |
| | STOP | 3 – 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ST/STL | UP | 9 – 11 | – | – | – | – | 1 | 0 | 0 | 1 |
| | DOWN | 10 – 11 | – | – | – | – | 0 | 1 | 0 | 1 |
| Output of the MXAB | | 1 – 2 | ↑ | ↓ | H | H | ↑ | ↓ | H | H |

[Keys] 1 : ON 0 : OFF – : ON or OFF
 H : Hold ↑ : Increase ↓ : Decrease

■ Output after the Switching from AUTO Mode to MANUAL Mode

The output changes according to the ITEM 13.

When the ITEM 13 is 0, the output is the value retroactive to the preset time period in the ITEM 15.

When the ITEM 13 is 1, the output is the value preset in the ITEM 14.

■ Output Stored at the Loss of Power

When the ITEM 17 is 0, the output value at the loss of power is stored.

When the ITEM 15 is other than 0, the output value retroactive to the preset time period in the ITEM 15 is stored.

When the Stop signal is in MANUAL mode at power recovery, the output is the stored value.

■ Output at Start-up of the MXAB

The following shows the output value at start-up of the MXAB and after switching of mode of the Stop.

• Output when Stop-mode is AUTO at Start-up of the MXAB

| MANUAL control mode (ITEM 13) | Trace-back time (ITEM 15) | Output stored at loss of power (ITEM 17) | Before switching of Stop-mode (AUTO) | Output after switching of the Stop-mode from AUTO to MANUAL | |
|-------------------------------|---------------------------|------------------------------------------|--------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|
| | | | | Before Trace-back time passes | After Trace-back time passed |
| 1 (Fixed value mode) | No effect | 1: Enable | Proportional to input value | Fixed value preset in the ITEM 14 | |
| | | 0: Disable | | The value at the time of the Stop-mode switched | |
| 0 (Trace-back mode) | Other than 0 | 1: Enable | | The value stored at the loss of power | The value retroactive to the preset time period in the ITEM 15 |
| | | 0: Disable | | The value preset in the ITEM 18 | |

• Output when Stop-mode is MANUAL at Start-up of the MXAB

| MANUAL control mode (ITEM 13) | Trace-back time (ITEM 15) | Output stored at loss of power (ITEM 17) | Before switching of Stop-mode (MANUAL) | Output after the Stop-mode is switched back from AUTO to MANUAL | |
|-------------------------------|---------------------------|------------------------------------------|----------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------|
| | | | | Before Trace-back time passes | After trace-back time passed |
| 1 (Fixed value mode) | Don't care | 1: Enable | The value stored at the loss of power | Fixed value preset in the ITEM 14 | |
| | | 0: Disable | The value preset in the ITEM 18 | | |
| 0 (Trace-back mode) | 0 | 1: Enable | The value stored at the loss of power | The value at the time of the Stop-mode switched | |
| | | 0: Disable | The value preset in the ITEM 18 | | |
| | Other than 0 | 1: Enable | The value stored at the loss of power | The value stored at the loss of power | The value retroactive to the preset time period in the ITEM 15 |
| | | 0: Disable | The value preset in the ITEM 18 | The value preset in the ITEM 18 | |

■ MXAB Used in Combination with ST/STL

In normal operating mode, the MXAB responds proportionally to its input (the computer output) in the response time of less than 0.5 seconds.

If the computer fails, the “STOP” command will override computer output and put the unit in the manual operation mode by the ST/STL. Using the top-mounted UP or DOWN key, output can be increased or decreased in the preset ramp rate. Output signal value can be read on the top-mounted indicator. For more precise control, use the monitor terminals.

Also the computer input can be overridden with the AUTO-MANUAL selector on the Soft-Terminal.

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 7 – 8 with a multimeter.
- 3) Input: Check that the input signal is within 0 – 100% of the full-scale.
- 4) Output at STOP signal OFF: The output does not track the input signal.
- 5) Output: Check that the load resistance meets the described specifications.

ADJUSTMENT PROCEDURE

This unit is calibrated at the factory to meet the ordered specifications, therefore you usually do not need any calibration.

For matching the signal to a receiving instrument or in case of regular calibration, adjust the output as explained in the following.

■ HOW TO CALIBRATE THE OUTPUT SIGNAL

Use a signal source and measuring instruments of sufficient accuracy level. Turn the power supply on and warm up for more than 10 minutes.

- 1) Reset all setting.
- 2) Turn the unit into Program mode.
- 3) Simulate 0% input and adjust the PV display to show 0.0 (ITEM 04).
- 4) Simulate 100% input and adjust the PV display to show 100.0 (ITEM 05).
- 5) Simulate 0% input again and check the PV display.
- 6) When the PV value is changed, repeat the above procedure 3) – 5).
- 7) Simulate 0% input and adjust the output to 0% (ITEM 06).
- 8) Simulate 100% input and adjust the output to 100% (ITEM 07).
- 9) Simulate 0% input again and check the output.
- 10) When the output value is changed, repeat the above procedure 7) – 8).
- 11) Return the unit into Monitor mode.

MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION

Warm up the unit for at least 10 minutes. Apply 0%, 25%, 50%, 75% and 100% input signal. Check that the output signal for the respective input signal remains within accuracy described in the data sheet. When the output is out of tolerance, recalibrate the unit according to the “ADJUSTMENT PROCEDURE” explained earlier.

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.