

# YAMATAKE

THE RN796A101 IS A MOTOR DRIVER WHICH DRIVES THE M904F, M940B, OR M944B MODUTROL MOTORS. IT HAS A  $135\Omega$  FEEDBACK POTENTIOMETER FOR POSITION PROPORTIONING BY AN INPUT SIGNAL OF 4–20 mADC FROM THE SDC100, SDC300, SDC400, OR DCP500 DIGITRONIK LINE, OR THE R7300 OR R7600 DIALATROL LINE. FOR EASY ADJUSTMENTS IN THE FIELD, AN INPUT VALUE INDICATION METER IS PROVIDED.

## SPECIFICATIONS

**INPUT:** 4–20 mADC

**INPUT IMPEDANCE:** 2.5 ohm

**SCALE:** 0–100% indication

**INDICATION ACCURACY:**  $\pm 1\%$ FS

(Setpoint  $\pm 5\%$  under standard conditions)

**OUTPUT:** Relay contacts for connection to a modutrol motor

**OUTPUT RATING:**

120/240 VAC, 125 VA (Motor load)

24 VAC, 40 VA (Motor load)

**CONTROL MODE:** Position proportioning

**ROTATION ANGLE CENTER:**

0–100%FS adjustable (4–20 mA adjustable)

**PROPORTIONAL BAND:**

10–100%FS adjustable (1.6 to 16.0 mA adjustable)

Maximum value set at shipment

**DEAD BAND:**

1–8% of proportional band adjustable

Minimum value set at shipment

**STRAY REJECTION:**

CMR 120 dB (Up to 250 V)

NMR 60 dB (Up to double voltage of span)

**POWER SUPPLY VOLTAGE:**

100 or 200 VAC, 50/60 Hz

**ALLOWABLE VOLTAGE:**

100 V rating; 90–121 V

200 V rating; 180–242 V

**POWER CONSUMPTION:**

5 W max. at rated power supply voltage

**ALLOWABLE AMBIENT TEMPERATURE:**

$-10^{\circ}\text{C}$  to  $50^{\circ}\text{C}$

**STORAGE TEMPERATURE:**

$-20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$

**ALLOWABLE AMBIENT HUMIDITY:**

90%RH Max. at  $40^{\circ}\text{C}$

**VIBRATION RESISTANCE:** 0.5G max. (10–60 Hz)

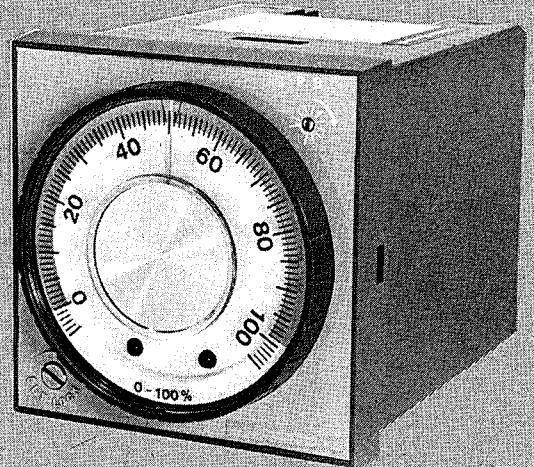
**MASK COLOR:** Light beige (Muncell 4Y 7.2/1.3)

**MASS:** 0.7 kg

**MOUNTING:** Panel mounting

**ACCESSORIES:** Mounting bracket (one set) N-3059

## MOTOR DRIVER



# RN796A101

## RESTRICTIONS ON USE

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment.

Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

## DIMENSIONS OF RN796 & PANEL CUTOUT

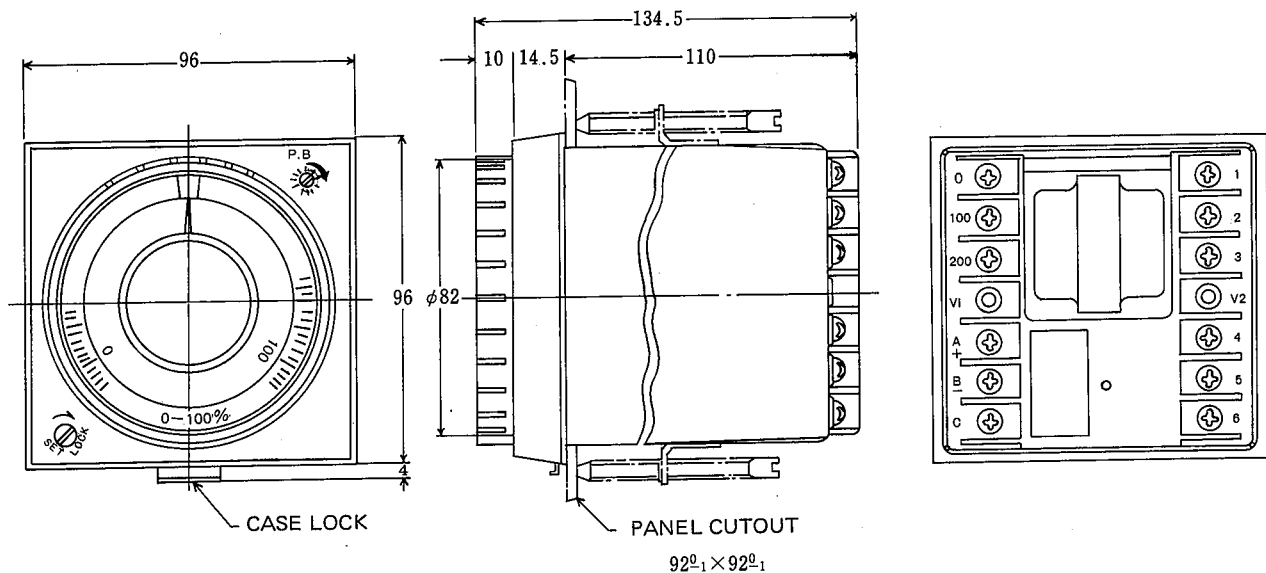


Figure 1

## INSTALLATION

### 1. Installation:

#### (1) Environment

Extremely high temperatures, high humidity, and dusty or corrosive atmospheres should be avoided. An ideal place is where the air is clean and dry and the temperature stable. The allowable ambient temperature and humidity are  $-10^{\circ}$  to  $50^{\circ}\text{C}$  and less than 90%RH.

#### (2) Method

The RN796A101 is flush-mounted on a panel. The case is inserted into the panel cutout from the front of the panel and fixed with panel mounting brackets at the top and bottom of the instrument housing.

### 2. Wiring Precautions:

- (1) All wiring must conform to local codes, ordinances, and practices.
- (2) Connect wires in accordance with the terminal symbols for connections. Use pressed terminals. (See Figs. 2 and 3 for wiring connections.)
- (3) 6 wires are connected at terminals from 1 to 6 between the RN796A and modutrol motor. Be sure to connect them properly.
- (4) Connect 100 V or 200 V power supply voltage. For 100/110 V power supply voltage, use 0-100 terminals. For 200/220 V, use 0-200 terminals.
- (5) The wirings of the controller RN796A and the modutrol motor must be separated at a distance more than 50 cm from line voltage wires. These wires must not be run in the same conduit. This caution also applies to the wiring in the panel.

# WIRING

Motor "OPEN" direction: Counterclockwise rotation (↺) as viewed from the power end of motor.

## (1) Normal Operation

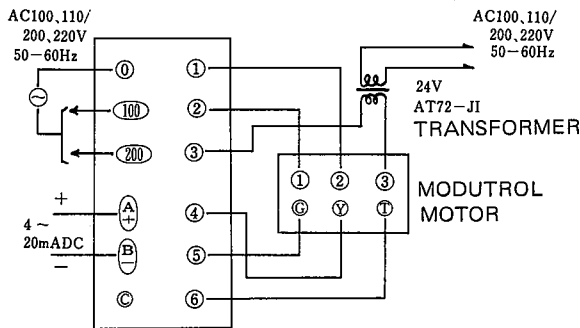


Figure 2

## (2) Reverse Operation

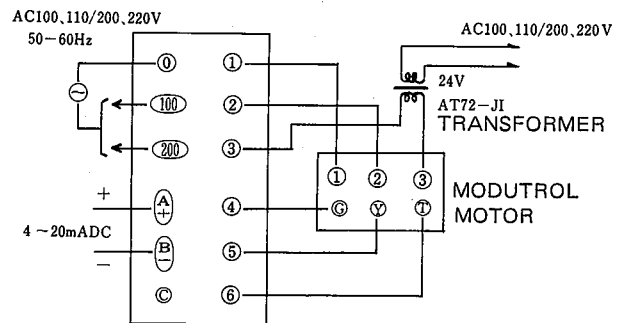


Figure 4

**Input Setpoint:**  
ON between terminals 1 and 3.  
Motor to rotate in "OPEN" direction.

**Input Setpoint:**  
ON between terminals 2 and 3.  
Motor to rotate in "CLOSE" direction.

**Input Setpoint:**  
ON between terminals 1 and 3.  
Motor to rotate in "CLOSE" direction.

**Input Setpoint:**  
ON between terminals 2 and 3.  
Motor to rotate in "OPEN" direction.

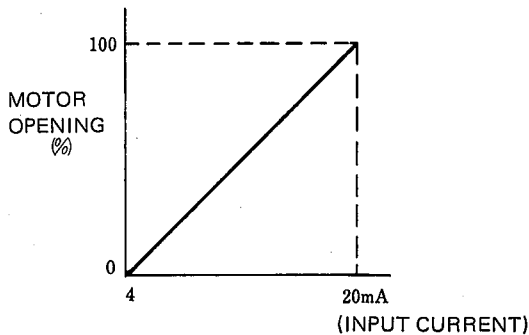


Figure 3

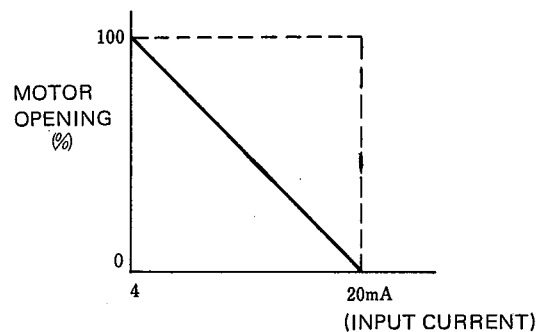


Figure 5

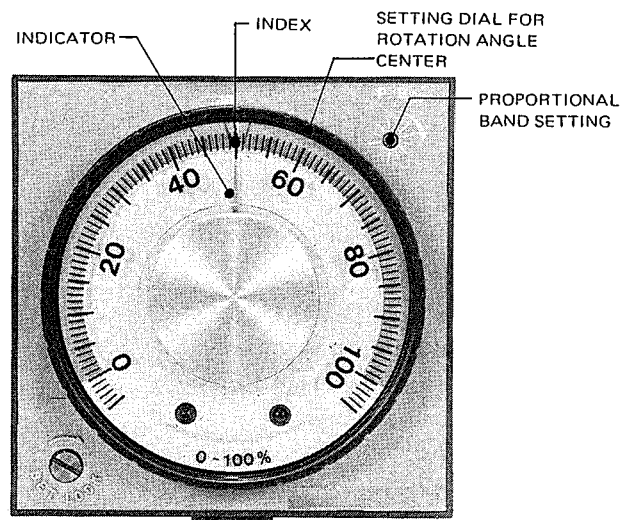
# START-UP PROCEDURE

### 1. Check Before Operation

- (1) Ensure that the AC line voltage is correct. Check that the connections of wires to the terminals are correct, especially between the RN796A and the modutrol motor.
- (2) Check that the leadwires (+, -) are connected to the correct terminals with correct polarity.
- (3) After double-checking items (1) and (2), turn ON the power switch.

### 2. Setting of Rotation Angle Center (Setpoint)

The SETPOINT is the input current value at the 50% opening of the modutrol motor, and is adjustable within a 4-20 mA range. The setting is made by turning the dial so that the SETPOINT index (▼) indicates the required setpoint value.



### 3. Proportional Band Setting

The PROPORTIONAL BAND is the range of input current variation required to drive the modutrol motor for 0–100% full stroke, and is adjustable within a 10–100% (1.6 to 16.0 mA) range.

Proportional band is set with the proportional band setting potentiometer provided at the upper right of

the front mask after the setting of the rotation angle center is finished.

Proportional band increases when the potentiometer is turned clockwise (↻).

The proportional band is set at the maximum value at factory shipment.

#### Rotation Angle Center vs Proportional Band Setting

Example No. 1

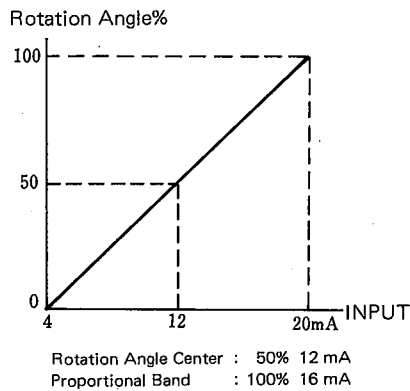


Figure 6

Example No. 2

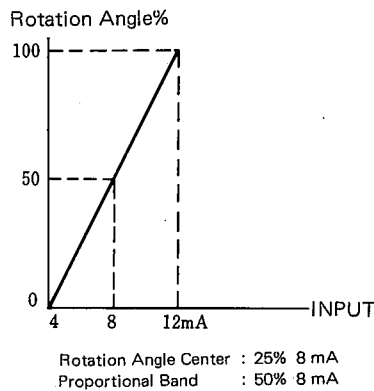


Figure 7

Example No. 3

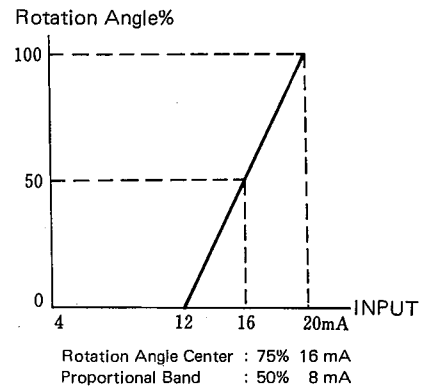


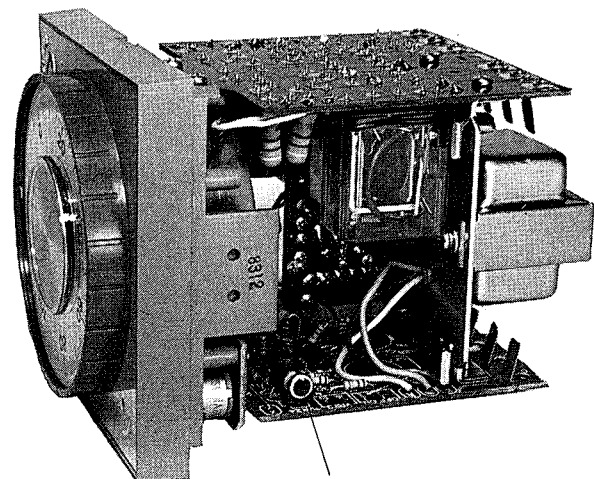
Figure 8

### 4. Dead Band Adjustment

The DEAD BAND is the range of input current variation required until the motor restarts in a reverse direction after the stop, and is adjustable within a range of 1–8% of proportional band.

Dead band adjustment is made after the setting of rotation angle center and proportional band are finished. If the modutrol motor causes hunting during operation, pull the body of the RN796A out of the case and conduct adjustments with the VR24 dead band adjusting potentiometer provided on the internal printed circuit board.

Dead band increases when the potentiometer is turned counterclockwise (↶). The dead band is set at the minimum value at factory shipment.



DEAD BAND ADJUSTMENT POTENTIOMETER (VR24)

**YAMATAKE**

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