Shimaden, Temperature and Humidity Control Specialists

°C
%RH
SHIMADEN

MICROPROCESSOR-BASED *Series EM70*

INTELLIGENT SERVO CONTROLLER

CE approved

BASIC FEATURES

- □ *High visibility of Control Motor opening display, which is shown in a bar graph (20 dots) and 7 segments.*
- □ *Zero/Span adjustment of opening can be done automatically at the touch of a single button.*
- □ *By means of the combination of SSR and relay, the drive unit can control directly large capacities (20 to 240V / 2A).*
- □ *A wide selection of additional functions (optional) is available to suit various requirements. (Events, analog output, external operation, square root extraction, communication function)*
- □ *Dust and splash proof front panel equivalent to IP66*

SPECIFICATIONS

■ Display
- ● Position indicator
  - ◆ Output display color (LED bar graph) : Green
  - ◆ Display resolution/dot : 5%/20 dots
- ● Data display
  - ◆ Display digit/color : 5 digits/7 segments LED green display, Height of character: 14 mm
  - ◆ Display resolution : 1% (position, target value of position)
  - ◆ Accuracy : 1%FS±1digit
  - ◆ Display range : -10.0 to 110.0%
- ● Control input display (DATA, DISPLAY)
  - ◆ Resolution : 0.1%
  - ◆ Accuracy : 0.3%FS±1digit
  - ◆ Display range : -10.0 to 110.0%
- ● Sampling cycle : 0.2 seconds
- ● Status display : 15 types, LED lamp display
  - ◆ Position display : (POSITION) / Green
  - ◆ Control Input display : (INPUT) / Green
  - ◆ Target value of position/deviation display : (DES/DEV) / Green
  - ◆ Manual action : (MAN) / Green
  - ◆ Reverse action : (RA) / Green
  - ◆ Opening action : (OPEN) / Green
  - ◆ Closing action : (CLOSE) / Green
  - ◆ External control input : (DI1, 2, 3) / Green
  - ◆ Event action : (EV1, 2, 3) / Orange
  - ◆ Stand-by action : (STBY) / Green
  - ◆ Communication status : (COM) / Green

■ Control input
- ● Current/receiving impedance : 4 to 20, 0 to 20 mA DC/100Ω
- ● Voltage/input impedance : 1 to 5V, 0 to 5V, 0 to to 10V DC/1MΩ
- ● Input filter : 0 to 99 seconds
- ● Isolation : Non-insulated from Feedback potentiometers, DI and System
  Insulated from Analog output, Communication, Event, Control output and Power supply

■ Setting
- ● Setting system : By key switches (6 keys) on front panel
- ● Setting/selection item
  - ◆ Display switching : By DISP key switch on front panel
  - ◆ Auto/manual switching : By MAN/AUTO key switch on front panel
  - ◆ Zero/span adjustment : Provided with Automatic adjustment function; manual adjustment is also possible (correction of potentiometer error)
  - ◆ Selection of control characteristics : Direct (DA)/reverse (RA)
  - ◆ Control characteristics gain setting : Input values corresponding to 0% position and 100% position (scaling function) or position values corresponding to 0% input and 100% input (scaling function)
  - ◆ Position limiter setting : Higher limit value 1 to 100%, Lower limit value 0 to 99% (higher limit>lower limit)
  - ◆ Setting of speed : 10 to 100% Unsettable in case of contact output (Y or R) (Initial value: No inching at 100%)
  - ◆ Dead band setting : 0.2 to 10.0% of input signal (Initial value: 2.0%)
  - ◆ Hysteresis : PrP, 0.1 to 5.0%
    1/4 of dead band. Fixed to 0.2% when dead band is less than 0.8% of input.
  - ◆ Keylock : 3-stage lock

■ Feedback potentiometer
- ● Usable range : Arbitrary between 100Ω to 2kΩ/ three-wire type
- ● Excitation voltage : About 1V
- ● Isolation : Non-insulated from Control input, DI and System
  Insulated from Analog output, Communication, Event, Control output and Power supply

■ Control output
- ● Output type : (Y or R) mechanical relay contact 240V AC 2A
  (S) AC SSR(combination of mechanical relay contact and SSR)
  240V AC 2A Minimum load current 30mA
- ● Isolation : Insulated from other I/O, System and Power supply

■ External operation input (DI)
- Number of points : 3 points (DI1, DI2 and DI3)
- Operable items : (1) Individual assignment to RA, STBY and present position value is possible.
  (2) Assignment to 7 preset position values by binary numerals is possible.
  (3) Assignment to 3 present position values and individual assignment to one of RA, STBY and preset position value is possible.
- Operation : Put in action when no-voltage contact or open collector turns ON.
- Isolation : Non- insulated from Control input, Insulated from Analog output, Communication, Event, Control output and Power supply

■ Event output (option)
- Number of event points : 3 points (EV1, EV2 and EV3)
- Types : Value of Position (higher limit, lower limit, hysteresis variable and stand-by action selectable), Input (higher limit, lower limit, hysteresis variable and stand-by action selectable), Operation, manual, potentiometer error, input error, and control loop trouble.
- Output rating/structure : 240V AC 1A Resistive load/"a" contact
- Action display : When EV1 to EV3 are in action, orange lamp lights.
- Isolation : Insulated from other I/O, System and Power supply

■ Analog output (option)
- Number/type : 1 point, either position or control input to be selected
- Analog output/rating : 4 to 20 mA/Load resistance 300Ω or less
- Output scaling : Inverse scaling possible (lower limit≠higher limit)
- Output accuracy : ±0.5% FS or less
- Isolation : Insulated from other I/O, System and Power supply

■ Square root extraction (option)
- Position output control by square root extraction of input signals

■ Communication function (option)
- Communication type : RS-232C, RS-485
- Communication system : RS-232C/3-line type half-duplex system
  RS-485 2-line type half-duplex multi-drop (bus) system
- Communication synchronization method : Half duplex asynchronous system
- Communication protocol : Shimaden Standard Protocol/MODBUS ASCII/MODBUS RTU
- Communication rate : 1200, 2400, 4800, 9600, 19200, 38400 bps
- Communication mode types : Mode1/Mode2
- Isolation : Insulated from other I/O, System and Power supply

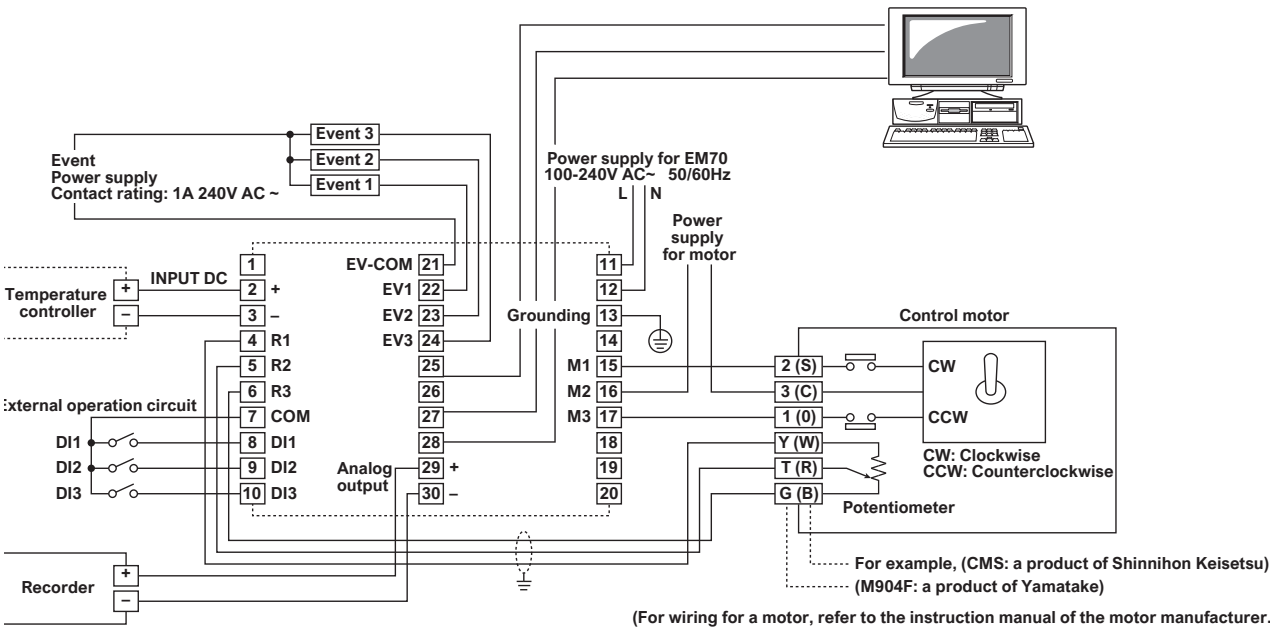
■ General specifications
- Data storage : Non-volatile memory
- Operating ambient temperature/ humidity range : -10 to 50°C/90% RH or less (no dew condensation)
- Storage temperature : -20 to 65°C
- Supply voltage : 100 to 240V AC±10% 50/60Hz
- Power consumption : 13VA (240V AC)
- Conformity with standards : Safety: IEC61010-1 and EN61010-1
  EN IEC 61010-2-030
  : EMC : EN61326-1
  : RoHS directive supported
- Insulation resistance : Between input/output terminals and power terminal 500V DC 20MΩ or above
  Between power terminal and ground terminal 500V DC 20MΩ or above
- Dielectric strength : Between input/output terminals and power terminal 3000V AC 1 minute
  Between power terminal and ground terminal 1500V AC 1 minute
- Protective structure : Only front panel has dust-proof and drip-proof structure. (IP66 equivalent)
  (However, only for plate thickness 1.2 to 3.2mm)
- Material of case : PPE resin molding (equivalent to UL 94 V-1)
- External dimensions : H96 ×W96 ×D111 (Panel depth: 100) mm
- Mounting : Push-in panel (one-touch mount)
- Panel thickness : 1 to 4 mm
- Panel cutout : 92 ×92 mm
- Weight : Approximately 460 g

ORDERING INFORMATION

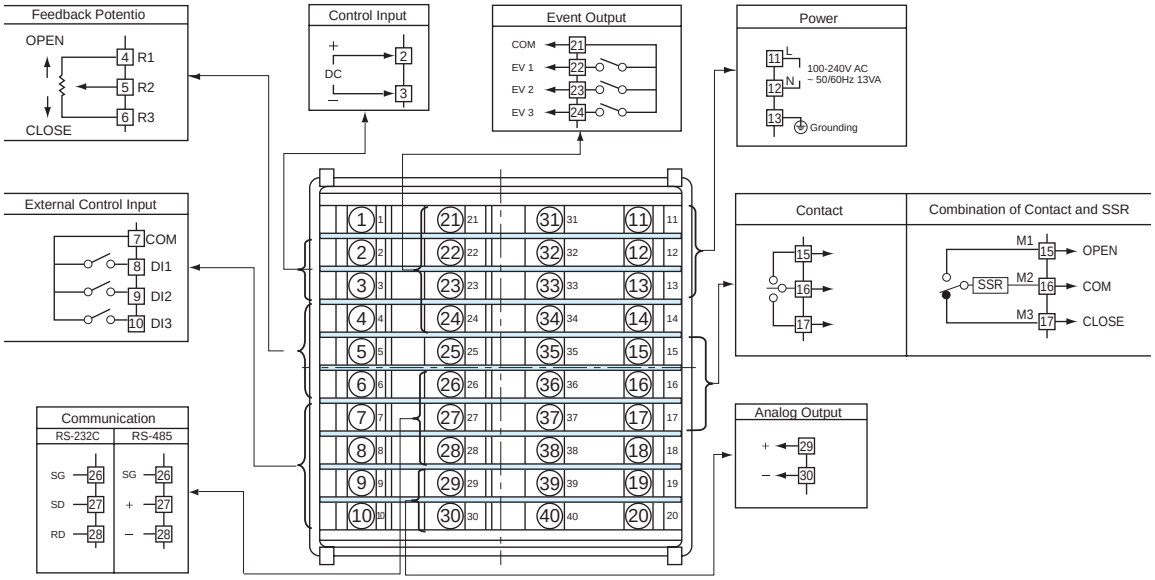
ITEM	CODE	SPECIFICATIONS
SERIES	EM70-	96×96 DIN size, Intelligent servo contoroller
CONTROL INPUT	4	Current 4 to 20, 0 to 20mA DC Receiving impedance: 100Ω
	6	Voltage 1 to 5, 0 to 5, 0 to 10 V DC Input impedance: 1MΩ min.
CONTROL OUTPUT	Y-	Contact: 240V AC/2A With CR absorber (internally installed)
	R-	Contact: 240V AC/2A Without CR absorber
	S-	Combination of SSR and contact 240V AC 2A
EVENT OUTPUT	0	Without
	1	Contact output (1a) / 3 points
ANALOG OUTPUT	0	Without
	4	4 to 20mA DC Load resistance: 300Ω max.
SQUARE ROOT EXTRACTION	0	Without
	1	Output by square root extraction of control input signal
COMMUNICATION	0	Without
	5	RS-485
	7	RS-232C
REMARKS	0	Without
	9	With (Please consult before ordering.)

* Y: Select when directly controlling the control motor
  S: Select when controlling a direct AC voltage control motor, long life

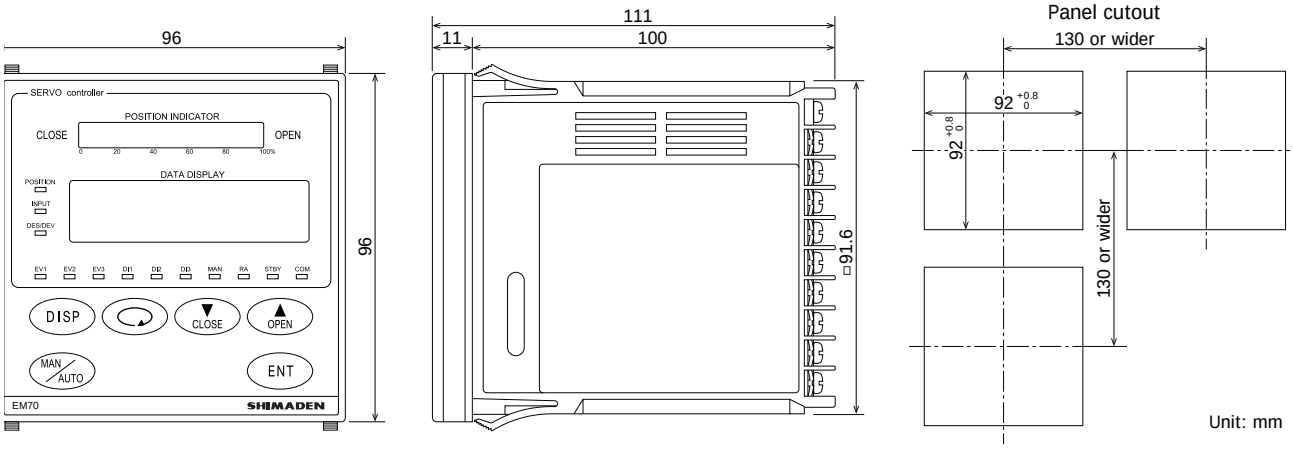
WIRING EXAMPLE



TERMINAL ARRANGEMENT

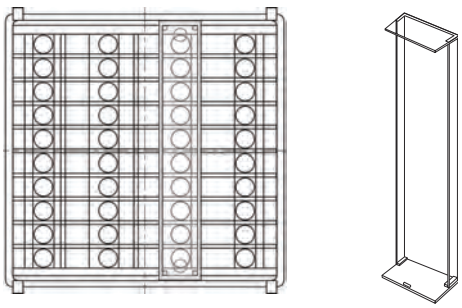


EXTERNAL DIMENSIONS & PANEL CUTOUT



TERMINAL COVER (AVAILABLE SEPARATELY)

Model	SPECIFICATIONS
QCR003	Material/Appearance: PVc/transparent Thickness: 1 mm



■ The contents of this material are subject to change without notice.

WARNING	* Be sure to follow the instruction manual when operating this device. * This device is designed for industrial use to control temperature, humidity and other physical values. Avoid using it for control of devices upon which human life is dependent. * If the possibility of loss or damage to your system or property as a result of failure of any parts of the process exists, proper safety measures must be made before the instrument is put into use so as to prevent the occurrence of trouble.

Head Office & Saitama Factory
ISO 9001/ISO14001 Certification Obtained

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