# M90-R1

10 digital inputs, 1 analog input, high-speed counter/shaft encoder input, 6 relay outputs, I/O expansion port, RS232

## Power supply
- 24VDC
- Permissible range: 20.4 to 28.8VDC
- Maximum current consumption: 140mA @ 24VDC
- Typical power consumption: 3.2W @ 24VDC

## Digital inputs
- 10 pnp (source) inputs
- Nominal input voltage: 25 VDC
- Input voltage: < 5 VDC for Logic '0', > 15 VDC for Logic '1'
- Input current: 3 mA @ 24VDC
- Input impedance: 8.4kΩ
- Response time:
  - '0' to '1': 5 mS
  - '1' to '0': 10 mS
- Galvanic isolation: None
- Input cable length: Up to 100 meters, unshielded

## High-speed counter
- Resolution: 16-bit
- Input frequency: Input#8 and input#9: 5kHz maximum
- Minimum pulse width: Input#8 and input#9: 80μs
- Inputs#8 and #9 can be used as a digital input, or as a counter.
- Inputs#8 and #9 can also be used as a shaft encoder.
- Inputs#8 and #9 can be used as either a digital input or as a counter reset.

## Analog input
- 10-bit, multi-range input: 0-5V, 0-10V, 0-20mA, 4-20mA
- Conversion method: Successive approximation
- Input impedance: >100kΩ at voltage 250Ω at current
- Galvanic isolation: None
- Resolution (except at 4-20mA): 10-bit (1024 units)
- Resolution at 4-20mA: 204 to 1024 (820 units)
- Conversion time: Synchronized to scan time
- Absolute max. rating: ± 15V
- Full scale error: ± 2 LSB
- Linearity error: ± 2 LSB

## Digital outputs
- 6 relay outputs, 230VAC / 24 VDC
- Output type: SPST-NO relay

## Type of relay
- Takamisawa JY-24H-K, or
- NAI/S (Matsushita) JQ1AP-24V or
- OMRON G8R - 111 - 24 VDC

## Isolation
- by relay

## Output current
- 5A max. (resistive load)
- 1A max. (inductive load)

## Max. frequency
- 10Hz

## Contact protection
- External precautions required

## Display
- STN, LCD display
- Illumination: LED yellow-green backlight
- Display size: 1 line, 16 characters long
- Character size: 5 x 7 matrix, 3.07 x 5.73mm

## Keypad
- Sealed membrane
- Number of keys: 15

## PLC program
- 2048 words

## Bits/Cells
- 256

## Integers/Registers
- 256

## Timers
- 64

## Execution time
- 12μs. for bit operations

## HMI displays
- 80 user-designed displays

## HMI variables
- 50 HMI variables are available to conditionally display and modify text, numbers, dates, times & timer values. The user can also create a list of up to 120 variable text displays, totaling up to 2K.

## RS232 serial port
- Programming: Download user program
- Network option: Via RS485/RS232 converter

## I/O expansion port
- Up to 64 additional I/Os, including digital & analog I/Os, RTD and more.

## Miscellaneous
- Clock (RTC): Date and time-year 2000 compliant, with typical 7 year battery back-up
- Weight: 380g (9.80 oz)
- Temperature: Operational: 0 to +50°C
- Storage: -20 to +60°C
- Mounting method: DIN-rail mounted (IP20)
- Panel mounted (IP65)