Technical specifications

12 convenient M90/M91 models

	M90-T 8 Digital Inputs 6 Transistor Outputs	M90-TA2-CAN 10 Digital Inputs 8 Transistor Outputs 2 Analog Inputs 1 Analog Output	M90-19-B1A 10 Digital Inputs 6 Relay Outputs 1 Analog Input	M91-2-R1 10 Digital Inputs 6 Relay Outputs 1 Analog Input	M91-2-R2C 10 Digital Inputs 6 Relay Outputs 2 Analog Inputs	M91-2-R6C 6 Digital Inputs 6 Relay Outputs 6 Analog Inputs	M91-2-R34[1] 20 Digital Inputs 12 Relay Outputs 2 Analog/Digital Inputs	M91-2-T1 12 Digital Inputs 12 Transistor Outputs	M91-2-T38[1] 22 Digital Inputs 16 Transistor Outputs	M91-2-T2C 10 Digital Inputs 12 Transistor Outputs 2 Analog/Digital Inputs[1]	M91-2-UN2 10 Digital Inputs 12 Transistor Outputs 2 PT100/TC/Analog/ Digital Inputs[1]	M91-2-UA2 10 Digital Inputs 10 Transistor Outputs 2 TC/Analog/Digital Inputs[1] 2 Analog Outputs
Inputs												
Digital inputs	8 pnp (source) 24VDC	10 pnp (source) 24VDC	10 pnp (source) 24VDC	10 pnp/npn (source/sink) 12/24VDC	10 pnp/npn (source/sink) 12/24VDC	6 pnp/npn (source/sink) 24VDC	22 pnp/npn (source/sink) 24VDC	12 pnp/npn (source/sink) 12/24VDC	22 pnp/npn (source/sink) 24VDC	12[2] pnp/npn (source/sink) 12/24VDC	12[2] pnp/npn (source/sink) 12/24VDC	12[2] pnp/npn (source/sink) 24VDC
High-speed counter/ Shaft-encoder/ Frequency measurer[3]	One 10 kHz, 16 bit resolution	One 10 kHz, 16 bit resolution	One 10 kHz, 16 bit resolution	Three 10 kHz, 16 bit resolution	Three 10 kHz, 16 bit resolution	One 10 kHz, 16 bit resolution	Three 10 kHz, 16 bit resolution	Two 10 kHz, 16 bit resolution	Two 10 kHz, 16 bit resolution	Three 10 kHz, 16 bit resolution	Two 10 kHz, 16 bit resolution	One 10 kHz, 16 bit resolution
Analog input types	None	Two 10 bit inputs: 0-10V	One 10 bit input: 0-5V, 0-10V, 0-20mA, 4-20mA	One 10 bit input: 0-10V, 0-20mA, 4-20mA	Two 10 bit inputs: 0-10V, 0-20mA, 4-20mA	Six 10 bit inputs: Two 0-10V, 0-20mA, 4-20mA Four 0-20mA, 4-20mA	Two[2] 10 bit inputs: 0-10V, 0-20mA, 4-20mA	None	None	Two[2] 10 bit inputs: 0-10V, 0-20mA, 4-20mA	Two[2] 14 bit inputs: 0-10V, 0-20mA, 4-20mA	Two[2] 14 bit inputs: 0-10V, 0-20mA, 4-20mA
Temperature measurement	None	None	None	None	None	None	None	None	None	None	Two[2] PT100 or Thermocouple inputs	Two[2] Thermocouple inputs
Outputs												
Digital outputs	6 pnp (source)	8 pnp (source)	6 relay outputs	6 relay outputs	6 relay outputs	6 relay outputs	12 relay outputs	12 pnp (source)	16 pnp (source)	12 pnp (source)	12 pnp (source)	10 pnp (source)
High-speed outputs/PWM	None	None	None	None	None	None	None	First 2 outputs can function as HSO, 2 kHz maximum				
Analog outputs	None	One 10 bit output 0-10V	None	None	None	None	None	None	None	None	None	Two 12 bit Outputs, 0-10V, 4-20mA
Program												
Ladder code memory (virtual)	24K	24K	12K	36K	36K	36K	36K	36K	36K	36K	36K	36K
Execution time for bit operations	12µS	12µS	12µS	12µS	12µS	12µS	12µS	12µS	12µS	12µS	12µS	12µS
Bit/Coils	256			256								
Integers/Registers (16 Bit)	256			256								
Timers	64			64								
Database	1024 integers (indirect access)			1024 integers (indirect access)								
Display												
Type	STN LCD display, LED backlight			STN LCD display, LED backlight								
Display size	**1 line x 16 characters**			**2 lines x 16 characters**								
HMI displays	80 user-designed displays available			80 user-designed displays available								
Variables	50 HMI variables enable the conditional display & modification of text, numbers, dates, times & timer values. List Variables can add up to 120 conditional text messages.			64 HMI variables are available to conditionally display and modify text, numbers, dates, times and timer values. The user can also create a list of up to 120 variable text displays, totaling up to 2K.								
Keypad												
Number of keys	15 sealed membrane keys, including 14 programmable keys			15 sealed membrane keys, including 14 programmable keys								
Communication												
Serial communications	RS232 port			RS232/RS485 port (selectable)								
CANbus	None	Yes	None	None	Yes	Yes	None	None	None	Yes	None	None
GSM support	None	Enables SMS messages, containing text and variable data, to be communicated to and from 6 phone numbers. Up to 1K of user-defined messages.		Enables SMS messages, containing text and variable data, to be communicated to and from cellular devices. Up to 1K of user-defined messages.								
MODBUS	None	None	None	Supports MODBUS protocol, Master-Slave								
General												
Power supply	24VDC	24VDC	24VDC	12/24VDC	12/24VDC	24VDC	24VDC	12/24VDC	24VDC	12/24VDC	12/24VDC	24VDC
I/O expansion option	Up to 64 additional I/Os		None	Up to 96 additional I/Os								
PID	None	4 independent PID loops with Auto-tune[4]		4 independent PID loops with Auto-tune[4]								
Clock (RTC)	Real-time clock functions (date and time)			Real-time clock functions (date and time)								

[1] M91-2-T38 and M91-2-R34 are not yet UL certified.

[2] In these models certain inputs can function as either digital, analog, thermocouple or PT100 inputs (model-dependent). When using these inputs as thermocouple or PT100, the number of free digital inputs is reduced to 8 or 7, respectively.

[3] Certain inputs can function as high-speed counters, shaft-encoder inputs, frequency measurers, or normal digital inputs.

[4] Auto-tune is provided via an external PC based application.

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