

# Technical specifications

## 13 convenient M90/M91 models

	M90-T	M90-T1	M90-T1-CAN	M90-TA2-CAN	M90-19-B1A	M91-19-4R1	M91-19-4R2C	M91-2-R6C	M91-19-4T1	M91-2-T38	M91-19-4T2C	M91-19-4UN2	M91-19-4UA2
	8 Digital Inputs 6 Transistor Outputs	12 Digital Inputs 12 Transistor Outputs	12 Digital Inputs 12 Transistor Outputs	10 Digital Inputs 8 Transistor Outputs 2 Analog Inputs 1 Analog Output	10 Digital Inputs 6 Relay Outputs 1 Analog Input	10 Digital Inputs 6 Relay Outputs 1 Analog Input	10 Digital Inputs 6 Relay Outputs 2 Analog Inputs	6 Digital Inputs 6 Relay Outputs 6 Analog Inputs	12 Digital Inputs 12 Transistor Outputs	22 Digital Inputs 16 Transistor Outputs	10 Digital Inputs 12 Transistor Outputs 2 Analog/Digital Inputs <sup>1</sup>	10 Digital Inputs 12 Transistor Outputs 2 PT100/TC/Analog/Digital Inputs <sup>1</sup>	10 Digital Inputs 10 Transistor Outputs 2 TC/Analog/Digital Inputs <sup>1</sup> 2 Analog Outputs
Digital inputs	8 pnp (source) 24VDC	12 pnp (source) 24VDC	12 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	12 pnp/npn (source/sink) 12/24VDC	22 pnp/npn (source/sink) 24VDC	12 <sup>1</sup> pnp/npn (source/sink) 12/24VDC	12 <sup>1</sup> pnp/npn (source/sink) 12/24VDC	12 <sup>1</sup> pnp/npn (source/sink) 24VDC
High-speed counter/ Shaft-encoder/ Frequency measurer <sup>2</sup>	One 10 kHz, 16 bit resolution	One 10 kHz, 16 bit resolution	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	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	None	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	None	None	Two 10 bit inputs <sup>1</sup> : 0-10V, 0-20mA, 4-20mA	Two <sup>1</sup> 14 bit inputs: 0-10V, 0-20mA, 4-20mA	Two <sup>1</sup> 14 bit inputs: 0-10V, 0-20mA, 4-20mA
Temperature measurement	None	None	None	None	None	None	None	None	None	None	None	Two <sup>1</sup> PT100 or Thermocouple inputs	Two <sup>1</sup> Thermocouple inputs
<b>Outputs</b>													
Digital outputs	6 pnp (source)	12 pnp (source)	12 pnp (source)	8 pnp (source)	6 relay outputs	6 relay outputs	6 relay outputs	6 relay outputs	12 pnp (source)	16 pnp (source)	12 pnp (source)	12 pnp (source)	10 pnp (source)
High-speed outputs/PWM	None	Last output can be a HSO, 1.5 kHz max.			None	None	None	None	First 2 outputs can function as HSO, 2 kHz maximum				
Analog outputs	None	None	None	One 10 bit output 0-10V	None	None	None	None	None	None	None	None	Two 12 bit Outputs, 0-10V, 4-20mA
<b>Program</b>													
Ladder code memory (virtual)	24K	24K	24K	24K	12K	24K	24K	36K	24K	36K	24K	24K	24K
Execution time for bit operations	12µs	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)						
<b>Display</b>													
Type	STN LCD display, LED backlight						STN LCD display, LED backlight						
Display size	1 x 16 characters						1 x 16 characters	2 x 16 characters	1 x 16 characters	2 x 16 characters	1 x 16 characters	1 x 16 characters	1 x 16 characters
HMI displays	80 user-designed displays available						80 user-designed displays available						
Variables	50 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.						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.						
<b>Keypad</b>													
Number of keys	15 sealed membrane keys, including 14 programmable keys												
<b>Communication</b>													
Serial communications	RS232 port						RS232/RS485 port (selectable)						
CANbus	None	None	Yes	Yes	None	None	Yes	Yes	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 6 phone numbers. Up to 1K of user-defined messages.						
<b>General</b>													
Power supply	24VDC	24VDC	24VDC	24VDC	24VDC	12/24VDC	12/24VDC	24VDC	12/24VDC	24VDC	12/24VDC	12/24VDC	24VDC
I/O expansion port	Yes	Yes	Yes	Yes	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PID	None	4 independent PID loops					4 independent PID loops						
Clock (RTC)	Real-time clock functions (date and time)					Real-time clock functions (date and time)							

<sup>1</sup> 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.