

Specifications

General

Attribute	440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Dimensions, HxWxD [mm (in)]	119.14 x 22.5 x 113.6 (0.88 x 4.69 x 4.47)					
Shipping weight, approx. [g (lb)]	225 (0.5)	180 (0.4)	50 (0.33)	225 (0.5)	220 (0.49)	150 (0.33)
Wire size [mm ² (AWG)]	0.2...2.5 (24...14)					
Wiring category [°C (°F)]	Copper that withstands 75 (167)					
Terminal screw torque [N•m (lb•in)]	0.4 (4)					
Power supply voltage range	24V DC PELV/SELV, 0.85...1.1 x rated voltage					
Power on delay, max [s]	7					
Power consumption, typical [W]	4	3.3	2.5	2.8	2.9	2.5
Case material	Polyamide PA 6.6					
Terminal protection	IP20					
Enclosure protection	IP40 (NEMA 1)					
Mounting [mm (in)]	35 (1.38) DIN rail in enclosure that is rated to a minimum of IP54					

Environmental

Attribute	440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Temperature, operating [°C (°F)]	-5...+55 (23...131)					
Relative humidity	90%					
Vibration	10...55 Hz, 0.35 mm (0.01 in.)					
Shock	10 g, 16 ms					
Pollution level	2					
Installation group	Overvoltage Category III, VDE OT10-1					
Impulse withstand voltage [V]	2500					

Safety Inputs IN, IN1, and IN2

Attribute		440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Inputs		1 NC, 1 PNP (OSSD)	2 NC, 2 PNP (OSSD)	2 NC, 2 PNP (OSSD)	—	—	1 NC, 1 PNP (OSSD)
Wiring terminals		S12, S22	S12, S22, and S32, S42	S12, S22, and S32, S42	—	—	S12, S22
On voltage	Max [V]	26.4		—	—	—	26.4
	Min [V]	11		—	—	—	11
Off voltage, max [V]		5		—	—	—	5
Off current, max [mA]		2		—	—	—	2
On current, max	At 24V DC [mA]	11.0		—	—	—	11.0
	At 26.4V DC [mA]	11.1		—	—	—	11.1
Galvanic isolation: I/O from Logic		No		—	—	—	No
Overvoltage protection		Yes		—	—	—	Yes
Test out pulse	Duration [ms]	2.5	1.5, 3	—	—	—	1.5, 3
	Period [ms]	14	13.6	—	—	—	13.6
OSSD test pulse width, max [ms]		0.75		—	—	—	0.75
Off pulse accepted for OSSD setting without declaring the input as off, max [ms]		3.1	2.2	—	—	—	2.2
Recovery time, min [ms]		30		—	—	—	30
Reverse voltage protection		Yes		—	—	—	Yes
Input capacitance [nF]		10		—	—	—	10
Input simultaneity		Infinite		—	—	—	Infinite
Allowable input resistance, max [Ω]		900		—	—	—	900
Allowable cable capacitance, max [nF]	S11 to S21	350	160	—	—	—	160
	S11 to ground	350	320	—	—	—	320
	S21 to ground	350	320	—	—	—	320
Safety mat, max size [m ²]		23	35	—	—	—	35

Reset Input

Attribute		440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Wiring terminal		S34		—	—	—	S34
On voltage	Max [V]	26.4		—	—	—	26.4
	Min [V]	11		—	—	—	11
Off voltage, max [V]		5		—	—	—	5
Off current, max [mA]		2		—	—	—	2
On current, max	At 24V DC [mA]	11.0		—	—	—	11.0
	At 26.4V DC [mA]	11.1		—	—	—	11.1
Galvanic isolation: I/O from Logic		No		—	—	—	No
Overvoltage protection		Yes		—	—	—	Yes
Input capacitance [nF]		10		—	—	—	10
Duration [s]		0.25...3.0		—	—	—	0.25...3.0

B1 Input

Attribute		440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Wiring terminal		—	—	—	—	B1	—
On voltage	Max [V]	—	—	—	—	26.4	—
	Min [V]	—	—	—	—	11	—
Off voltage, max [V]		—	—	—	—	5	—
Off current, max [mA]		—	—	—	—	2	—
On current, max	At 24V DC [mA]	—	—	—	—	11.0	—
	At 26.4V DC [mA]	—	—	—	—	11.1	—
Galvanic isolation: I/O from Logic		—	—	—	—	No	—
Overvoltage protection		—	—	—	—	Yes	—
Input capacitance [nF]		—	—	—	—	10	—

Safety Outputs

Attribute		440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Wiring terminal		13/14, 23/24, 33/34	13/14, 23/24	14, 24, 34, 44	13/14, 23/24, 33/34, 43/44	17/18, 27/28, 37/38, 47/48	13/14, 23/24
Output type		3 N.O.	2 N.O.	4 PNP	4 N.O.	4 N.O. delayed	2 N.O.
Thermic current I_{th} [A]		1 x 6		—	1 x 6		
Fuses output (external) [A]	Slow blow	6	—	—	6		
	Quick blow	10			10		
Switched current, min [mA]		10	—	—	10		
Switched voltage, min [V]		10	—	—	10		
Mechanical life		10,000,000 cycles		—	10,000,000 cycles		
Rating		- UL: 2 x C300 - AC-15: 1.5 A / 250V AC - DC13: 2 A / 24V DC (0.1 Hz)	- UL: 2 x C300 - AC-15: 3 A / 250V AC - DC13: 4 A / 24V DC (0.1 Hz)	14, 24: 1.5 A each 34, 44: 0.5 A each	- UL: 4 x C300 - AC-15: 1.5 A / 250V AC - DC13: 2 A / 24V DC (0.1 Hz)		- UL: 2 x C300 - AC-15: 1.5 A / 250V AC - DC13: 2 A / 24V DC (0.1 Hz)
Capacitance		—		14, 24: 1.6 μ F each 34, 44: 9 μ F each	—		
Contact material		AgNi	AgNi + 0.2 μ Au	—	AgNi		
Reaction time safety output [ms]	L12	—	45	40	100	45	—
	Inputs	150	35	25	—	—	150
	Mat operation		40	30			
Reaction time single wire safety output [ms]	L12	—	40	45	0	45	—
	Inputs	25	25	25	—	—	25
	Mat operation	30	30	30			30
Reaction time to jog, max [ms]	B1	—	—	—	—	35	—
Response time safety output [ms]	L12	45	45	45	45	45	45
	Inputs	35	35	25	—	—	35
	Mat operation	45	45	35			45
Response time single wire safety output [ms]	L12	45	45	45	45	45	45
	Inputs	25	25	25	—	—	25
	Mat operation	40	35	35			35
	Single-wire fault	55	50	50	(1)	45	50
Response time to jog, max [ms]	B1	—	—	—	—	35	—

(1) Response time of the single-wire source device.

Auxiliary Output

Attribute	440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Wiring terminal	—	Y32		X32		Y32
Output type	1 N.C.	1 PNP, 50 mA max				

Single Wire Safety (SWS)

Attribute		440R-S13R2 (CI)	440R-D22R2 (DI)	440R-D22S2 (DIS)	440R-EM4R2 (EM)	440R-EM4R2D (EMD)	440R-S12R2 (SI)
Wiring terminal	Output	L11					
	Input	L12					
Continuous output current, max [mA]		50					
On state voltage drop (P/S to +), max [V]		0.2					
Surge output current, max [mA]		700					
Surge output current duration, max [ms]		5					
Load capacitance, max [μF]		1					
Off state leakage current, max [mA]		< 0.1					
Short circuit detection		No					
Short circuit protection		Yes					
Galvanic isolation: I/O from Logic		No					
Fanout (max number of connections to L11)		10			Repeater ⁽¹⁾	10	
Cable length between L11 and L12 [m]		30				30	

(1) The EM safety relay has a direct connection from L12 to L11, so it cannot fan out to 10 additional devices. It repeats the signal. The EM safety relay must be included as one of the fan-out units.