

Bulletin 700-HL — "Terminal Block Relay"

- Relay and socket assembled interface modules for high density interposing or isolation applications
- Screw terminal and spring-clamp bases
- 6 A relay, choice of silver or gold contacts
- 2 A solid-state relay — DC output
- 1 A solid-state relay — AC output
- SPDT (relay), 1 N.O. (solid-state)
- Built-in retainer clip and snap-in marker lever
- Standard LED, reverse polarity protection, and surge protection *
- Externally replaceable relay modules
- Unique leakage current suppression version to address industry concerns of nuisance coil turn-on or contact non-drop out when connecting to PLCs with leakage current
- Available with hazardous location certification

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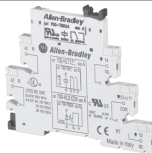
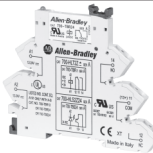
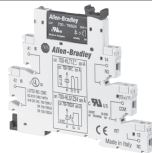
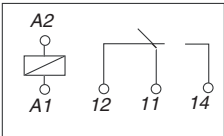
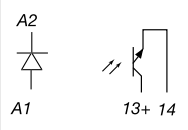
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See Specification table in this section, page 9-47.

Product Selection

Standard built-in Features:				
	Cat. No. 700-HLT1Z24	Cat. No. 700-HLT2Z24	Cat. No. 700-HLS1Z24	Cat. No. 700-HLS11Z24
Specifications			 *	
Output Type	SPDT (1 C/O); $I_{th} = 6A\ddagger$		1 N.O. solid-state; $I_{th} = 2\text{ A, } 24\text{V DC}$ or $I_{th} = 1\text{ A, } 240\text{V AC}$	
Recommended Tightening Torque	0.5 N • m max. (4.4 lb • in)			
Wire Range	Screw Terminal: 0.14 mm ² ...2.5 mm ² (#26...#14 AWG), Spring Terminal: 0.2 mm ² ...2.5 mm ² (#24...#14 AWG)			
Approvals	UL, cULus, cURus, ABS, CE			

Assembled Devices	Pkg. Quantity	Cat. No. (Screw Terminals)	Cat. No. (Spring Clamp Terminals)	Pkg. Quantity	Cat. No. (Screw Terminals) (DC Output)	Cat. No. (Spring Clamp Terminals) (DC Output)	Cat. No. (Screw Terminals) (AC Output)
Input Voltage							
12V DC	10	* 700-HLT1Z12	700-HLT2Z12	—	—	—	—
24V DC	10	* 700-HLT1Z24	700-HLT2Z24	10	* 700-HLS1Z24	700-HLS2Z24	700-HLS11Z24
48V DC	10	* 700-HLT1Z48	700-HLT2Z48	10	* 700-HLS1Z48	700-HLS2Z48	700-HLS11Z48
12V AC/DC	10	700-HLT1U12	700-HLT2U12	—	—	—	—
24V AC/DC	10	700-HLT1U24	700-HLT2U24	—	—	—	—
48V AC/DC	10	700-HLT1U48	700-HLT2U48	—	—	—	—
110/125V AC/DC	10	700-HLT1U1	700-HLT2U1	10	* 700-HLS1U1	700-HLS2U1	700-HLS11U1
220...240V AC/DC	10	700-HLT1U2	700-HLT2U2	10	* 700-HLS1U2	700-HLS2U2	700-HLS11U2
240V AC	10	700-HLT1A2	—	—	—	—	—
Built-in LCSC (leakage current suppression circuit) 120V AC and 125V DC§	10	* 700-HLT1L1	—	10	* 700-HLS1L1	—	700-HLS11L1
Built-in LCSC (leakage current suppression circuit) 240V AC§	10	* 700-HLT1L2	—	10	* 700-HLS1L2	—	700-HLS11L2
Hazardous Location Certification 24V DC	10	700-HLT1Z24-EX	—	10	700-HLS1Z24-EX	—	—
Hazardous Location Certification 12V DC	10	700-HLT1Z12-EX	—	10	—	—	—
Hazardous Location Certification 110/125V AC/DC	10	700-HLT1U1-EX	—	10	700-HLS1U1-EX	—	—

* Reverse polarity on the output terminals of the solid-state relay will result in the output being "On" regardless of the state of the input voltage.

* Electromechanical relay to solid-state relay interchangeability is possible.

‡ For Gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-HLT1Z24 is required with gold plating, the new cat. no. is 700-HLT1Z24X.

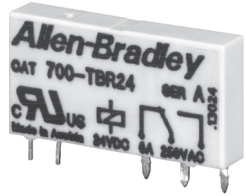
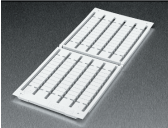
§ Leakage current suppression up to 2.2 mA off state current.

* Diode surge protection provided.

Interposing/Isolation Relays

Accessories

Accessories

	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
 Cat. No. 700-TBR24	Replacement Relays Order must be for 20 relays or multiples of 20.	20	12V AC/DC	700-TBR12*
			24V AC/DC	700-TBR24*
			48V AC/DC	700-TBR48*
			110/125V AC/DC 220...240V AC/DC	700-TBR60*
 Cat. No. 700-TBS24	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR DC output. Order multiples of 20.	20	24V DC	700-TBS24
			48V DC, 110/125V AC/DC 220...240V AC/DC	700-TBS60
	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR AC output. Order multiples of 20.	20	24V DC	700-TBS124
	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR AC output. Order must be for 20 relays or multiples of 20.	20	48V DC 110/125V AC/DC 220...240V AC/DC	700-TBS160
 Cat. No. 700-TBJ20B	20-Way Jumper Can be cut to required length. $I_{th} = 36$ A max per 20-way jumper.	1	Color	
			Red	700-TBJ20R
			Grey	700-TBJ20G
			Blue	700-TBJ20B
 Cat. No. 700HN177	End Barrier Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers.	10	Black	700-HN177
	Snap-in Marker These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay.	100	Blank	1492-MC6X10
			Standard 1492-MC6X10	www.ab.com/catalogs for information
			Custom	✱

* For gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if **Cat. No. 700-TBR24** is required with gold plating, the new cat. no. is 700-TBR24X.

✱ Go to <http://www.ab.com/software/> and click on "Terminal Marking System and WinABMS" to download software. Create custom text, save file, and e-mail to your local Rockwell Automation sales office or Allen-Bradley distributor.

Note: Terminal block relay bases are not sold separately.

Cat. No. 700-HLT... (Relay Output)							
Electrical Ratings							
Pilot Duty Rating	B 300, R 300						
Rated Thermal Current (I_{th})	1-Pole — 6 A						
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA						
Contacts	Inductive	1-Pole					
	24V AC, 1-phase	30 A	▶] [◀	5 A	◀ [] ▶		
	120V AC, 1-phase	30 A		3 A			
	240V AC, 1-phase	15 A		1.5 A			
	Make, Break & Continuous V DC	24V DC				1.0 A	
		120V DC				0.2 A	
		240V DC				0.1 A	
Inductive Load	AC-15 250V, 3 A N.O. Contact, 1.5 A N.C. Contact DC-13 24V, 1 A N.O. and N.C. Contact						
Min. Permissible Contact Ratings	12V, 6 mA (72 mW) for Silver Contacts, 8V, 2.5 mA (20 mW) for Gold Contacts						
Permissible Coil Voltage Variation	Pickup:	85...110% of Nominal Voltage at 50 Hz 85...110% of Nominal Voltage at 60 Hz 80...110% of Nominal Voltage at DC				Must Dropout Voltage:	10% of Nominal Voltage at AC 5% of Nominal Voltage at DC
Power Consumption ±10%	AC	0.3 VA					
	DC	0.2 W					
Design Specification/Test Requirements							
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1000V					
	Contact to Coil (VRMS)	4000V					
Input Voltage	12V AC/DC	24V AC/DC	48V AC/DC	120V AC/DC	240V AC/DC	120V LCSC	240V LCSC
Impedance (Ohms)	1 K	2 K	6 K	26 K	56 K	16 K	35 K
Mechanical							
Degree of Protection	IP20						
Mechanical Life Operations	1 x 10 ⁷						
Electrical Life Operations	6 A Resistive: 100 000 min. 24V DC, 1 A Inductive: 200 000 min. 120V AC 1 A Inductive: 300 000 min.						
Switching Frequency Operations (no-load)	10 cycles/sec						
Coil Voltages	See Overview/Product Selection						
Operating Time at Nominal Voltage at 20 °C (ms)	Pickup	7 ms					
	Dropout	3 ms					
Maximum Operating Rate (full load = 6 A)	6 cycles/min.						
Coil Surge Protection	Per EN 61000-4.5; Surge Immunity (801-5) Class III: 2 kV common and 1 kV differential mode						
Environmental							
Temperature	Operating	-40...+55 °C					
	Storage	-40...100 °C					
Altitude	2000 m (6560 ft)						
Construction							
Insulating Material	Molded High Dielectric Material						
Enclosure	Relay IP67						
Contact Material	Silver Tin Ox., AgSnO ₂ or Silver with Gold Plating, AgSnO ₂ + Au						
Terminal Markings on Socket	In accordance with EN50 0005						
Certifications	cULus Listed (File No. E3125, Guide NLDX/NLDX7) with Allen-Bradley socket, CE Marked, ABS (American Bureau of Shipping)						
Standards	EN60947-4-1, EN60947-5-1, CSA 22.2, UL 508, NEMA IEE MAC Compliant, ICS-2 Compliant						
Hazardous Location Approvals	Class 1, Zn 2, Groups IIC, Ex nC IIC T5 Ta < 55 °C						
	UL Listed (UL 60079-15)	700-HLT1Z12-EX (12V DC supply) 700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply) 700-HLT1U1-EX, 700-HLS1U1-EX (110V/125V AC/DC supply)					
	CSA Certified* (CAN/CSA E60079-15)	700-HLT1Z12-EX (12V DC supply) 700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply)					

* Performance Data – See this catalog, Important 3.

* Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

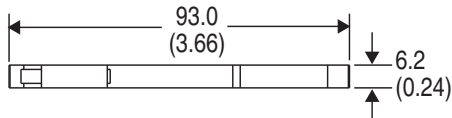
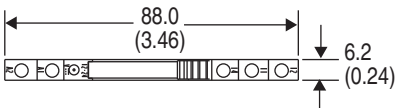
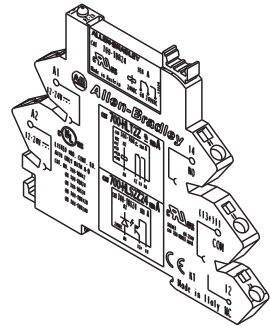
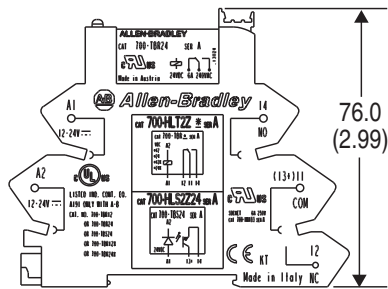
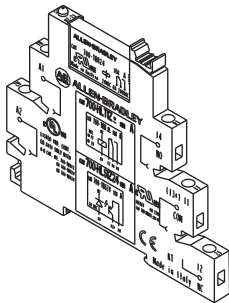
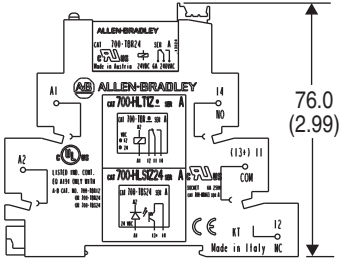
Bulletin 700-HL
Interposing/Isolation Relays
Specifications

Cat. No. 700-HLS... (Solid State Output)						
Electrical						
Rated Thermal Current (I_{th})		2 A (DC output)			1 A (AC output)	
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA					
Control Circuit	Min. Control Voltage	80% nominal voltage				
	Maximum Control Voltage	110% nominal voltage				
	Control Current	9 mA $\pm$ 10% (24V) 4 mA $\pm$ 10% (120/240V)				
	Release Voltage	0.4 x nominal voltage (24V), 0.35 x nominal voltage (120/240V)				
	Min. Control Circuit Resistance	3200 ohms (24V), 16k ohms (120V), 32k ohms (240V)		2500 ohms (24V), 12k ohms (120V), 24k ohms (240V)		
Outputs	Load Voltage Range	0...24V DC			24...240V AC	
	Max. Repetitive Blocking Voltage	33V			600V	
	Max. Switching Current (inductive/resistive)	2 A DC			1 A AC	
	On State Voltage Drop @ Max. Switching Current	<120 mV DC			<1V AC	
	Leakage Current	max. 100 μ A (@U = 24V)				
Power Consumption $\pm$ 10%	AC	0.6 VA (120V), 1 VA (240V)				
	DC	0.2 W			0.3 W	
Design Specification/Test Requirements						
Dielectric Withstand Voltage	Pole to Pole (VRMS)	2500V				
	Contact to Coil (VRMS)	2500V				
Input Voltage	24V DC	48V DC	120V AC/DC	240V AC/DC	120V LCSC	240V LCSC
Impedance (Ohms)	2K	9 K	26 K	58 K	16 K	35 K
Mechanical						
Degree of Protection	IP20					
Input Voltages	See Overview/Product Selection					
Operating Time at Nominal Voltage at 20 °C (ms)	Turn on Time	30 μ s (DC only input voltage), 7 ms (AC/DC input voltage)				
	Drop Out Time	350 μ s (DC only input voltage), 10 ms (AC/DC input voltage)				
Maximum Operating Rate	300 Hz					
Environmental						
Temperature	Operating	-20...+55 °C				
	Storage	-40...70 °C				
Altitude	2000 m (6560 ft)					
Construction						
Insulating Material	Molded High-Dielectric Material					
Enclosure	Relay IP67					
Terminal Markings on Socket	In accordance with EN50 0005					
Certifications	cULus Listed (File No. E14843, Guide NLDX/NLDX7), CE Marked, ABS (American Bureau of Shipping)					
Standards	UL 508, CSA C22.2 No. 14, EN/IEC 60947-1, -5-1					
Hazardous Location Approvals	Class 1, Zn 2, Groups IIC, Ex nC IIC T5 Ta < 55 °C					
	UL Listed (UL 60079-15)	700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply) 700-HLT1U1-EX, 700-HLS1U1-EX (110V/125V AC/DC supply)				
	CSA Certified* (CAN/CSA 60079-15)	700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply)				

* Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HL Screw Terminal Design

Single Wire: 0.14 mm²...2.5 mm² (#26 AWG...14 AWG)

Double Wire: 2 x 0.14 mm²...2 x 1.5 mm² (2 x #26 AWG...2 x 16 AWG)

Wire Type: Solid or stranded, copper only

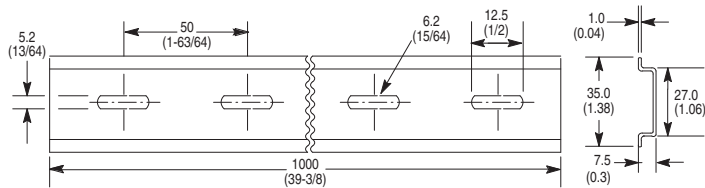
Strip Length: 9 mm (11/32 in.). Torque: 0.5 N•m (4.4 lb•in)

Bulletin 700-HL Spring Terminal Design

Single Wire: 0.2 mm²...2.5 mm² (#24 AWG...#14 AWG)

Wire Type: Solid or stranded, copper only

Strip Length: 9 mm (11/32 in.)



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lb) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lb) (5/pkg)



- Bulletin 700-HL 2-Pole "Terminal Block Relay"
- Relay and socket assembled interface modules for high density interposing or isolation applications
- Screw terminal and spring-clamp bases
- 10 A relay, choice of silver or gold contacts
- DPDT (relay)
- Built-in retainer clip and snap-in marker lever
- Standard LED, reverse polarity protection, and surge protection
- Externally replaceable relay modules

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Standards Compliance and Certifications

See Specification table in this section, page 9-52.

Catalog Number Explanation

700 – HL T 1 2 Z24 X*

Bulletin Number Series Type Relay Type Terminal Type Output Supply Voltage Gold-Plated Contact Option

700 – HL T 1 2 Z24 X*

Bulletin Number a b c d e f

a

Series Type	
Code	Description
HL	Terminal Block relay

c

Terminal Type	
Code	Description
1	Screw Terminal
2	Spring Clamp Terminal

e

Supply Voltage	
Code	Description
Z12	12V DC
Z24	24V DC
Z48	48V DC
U24	24V AC/DC
U1	110...125V AC/DC
U2	220...240V AC/DC

f*

Gold-Plated Contact Option	
Code	Description
Blank	None
X	Gold Plate

b

Relay Type	
Code	Description
T	EM Relay

d

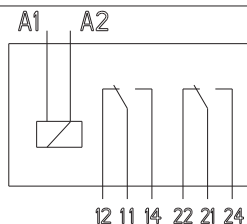
Output	
Code	Description
2	DPDT (2 C/O), 14 mm

* For Gold-plated contacts: Add the letter "X" at the end of the catalog number. Example: Cat. No. 700-HLT12Z24 with gold plated contacts is catalog number 700-HLT12Z24X. The following relays are available with the gold-plated contact option: 700-HLT_Z224, 700-HLT_2U24, 700-HLT_2U1, and 700-HLT_2U2.

- Standard built-in Features:
- LED
 - Reverse Polarity Protection for DC Inputs
 - Coil Surge Protection



Specifications



Output Type	DPDT (2 C/O); $I_{th} = 10$ A
Recommended Tightening Torque	0.6 N•m max. (5.3 lb•in.)
Wire Range	Screw Terminal: 0.2...2.5 mm ² (#24...14 AWG), Spring Terminal: 0.2...2.5 mm ² (#24...14 AWG)
Approvals	cULus, cURus, CE

Assembled Devices	Pkg. Quantity	Cat. No. (Screw Terminals)	Cat. No. (Spring Clamp Terminals)
Input Voltage			
12V DC	10	700-HLT12Z12	700-HLT22Z12
24V DC	10	700-HLT12Z24*	700-HLT22Z24*
48V DC	10	700-HLT12Z48	700-HLT22Z48
24V AC/DC	10	700-HLT12U24*	700-HLT22U24*
110/125V AC/DC	10	700-HLT12U1*	700-HLT22U1*
220...240V AC/DC	10	700-HLT12U2*	700-HLT22U2*

* For Gold-plated contacts: Add the letter "X" at the end of the catalog number. Example: Cat. No. 700-HLT12Z24 with gold plated contacts is Cat. No. 700-HLT12Z24X. The following relays are available with the gold-plated contact option: 700-HLT_2Z24, 700-HLT_2U24, 700-HLT_2U1, and 700-HLT_2U2.

	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
 Cat. No. 700-TBR224	Replacement Relays Order must be for 20 relays or multiples of 20.	20	12V DC	700-TBR212
			24V AC/DC	700-TBR224*
			48V DC	700-TBR248
			110/125V AC/DC 220...240V AC/DC	700-TBR2110*
 Cat. No. 700-TBJ08B	8-Way Jumper Can be cut to required length. $I_{th} = 10$ A max per 8-way jumper.	1	Color	
			Red	700-TBJ08R
			Grey	700-TBJ08G
 Cat. No. 700-HN177	End Barrier Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers.	10	Blue	700-TBJ08B
			Black	700-HN177
 Cat. No. 700-HN177	Snap-in Marker These snap-in markers have a 6 x 12 mm surface and snap into the ejection lever for the relay.	100	Blank	1492-MS6X12
			Standard 1492-MS6X12	www.ab.com/catalogs for information
			Custom	⊗

* For gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-TBR224 is required with gold plating, the new cat. no. is 700-TBR224X.

⊗ Go to <http://www.ab.com/software/>, click on "Terminal Marking System and WinABMS" to download software. Create custom text, save file, and e-mail to your local Rockwell Automation sales office or Allen-Bradley distributor.

Note: Terminal Block Relay bases are not sold separately.

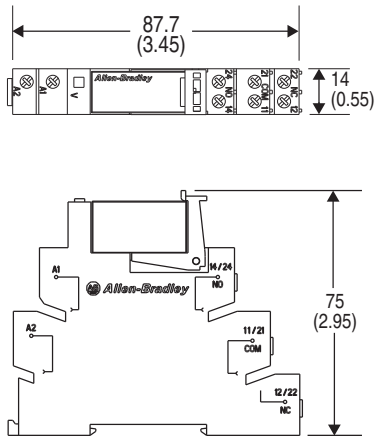
Bulletin 700-HL
Interposing/Isolation Relays
Specifications

Cat. No. 700-HLT...2-Pole (Relay Output)							
Electrical Ratings							
Rated Thermal Current (I_{th})		2-Pole — 10 A					
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA					
Contacts	Inductive V AC UL	120V AC	AC-15, 3.0A B 300, 3.0 A		1/4 HP (186 W), 1-phase		
		240V AC	AC-15, 3.0 A B 300, 1.5 A		1/2 HP (373 W), 1-phase		
	Inductive V DC	24V DC	DC-13, 2.0 A				
		125V DC	DC-13, 0.3 A				
		250V DC	DC-13, 0.2 A				
	Resistive Make, Break and Continuous	250V AC	10 A				
		24V DC	10 A				
		250V DC	0.28 A				
Min. Permissible Contact Ratings		12V, 10 mA (120 mW) for Silver Contacts, 5V, 1 mA (50 mW) for Gold Contacts					
Permissible Coil Voltage Variation		Pickup: 85...110% of Nominal Voltage at 50 Hz 85...110% of Nominal Voltage at 60 Hz 80...110% of Nominal Voltage at DC				Must Dropout Voltage: 10% of Nominal Voltage at AC 5% of Nominal Voltage at DC	
Design Specification/Test Requirements							
Dielectric Withstand Voltage		Pole to Pole (VRMS)	1000V				
		Contact to Coil (VRMS)	5000V				
		Adjacent Contacts (VRMS)	2500V				
Input Voltage		12V AC/DC	24V AC/DC	48V DC	120V AC/DC	240V AC/DC	
Impedance (Ohms)		1 K	2 K	3 K	34 K	72 K	
Power Consumption		AC	N/A	0.5V A	N/A	0.4V A	0.8V A
±10%		DC	0.4 W	0.5 W	0.8 W	0.5 W	0.7 W
Mechanical							
Degree of Protection		IP20					
Mechanical Life Operations		3 x 10 ⁷					
Electrical Life Operations		250V AC/24V DC, 8 A Resistive: 100 000 min.					
		24V DC, 10 A Resistive: 6000 min.					
		250V DC, 0.28 A Resistive: 6000 min.					
		250V AC, 10 A Resistive: 30 000 min.					
Switching Frequency Operations (no-load)		1200 cycles/sec					
Coil Voltages		See Overview/Product Selection					
Operating Time at Nominal Voltage at 20 °C (ms)		Pickup	typical 10 ms				
		Dropout	typical 10 ms				
Maximum Operating Rate (full load = 6 A)		6 cycles/min.					
Environmental							
Temperature		Operating	−40...+60 °C				
		Storage	−40...+100 °C				
Altitude		2000 m (6560 ft)					
Construction							
Insulating Material		Molded High-Dielectric Material					
Enclosure		Relay RT II — flux-proof, pollution degree 2 installation environment					
Contact Material		AgNi 90/10 or AgNi 90/10 + Au					
Terminal Markings on Socket		In accordance with EN50 0005					
Certifications		cULus Listed (File No. E3125, Guide NRNT/NRNT7), CE Marked					
Standards		UL 508, CSA C22.2 No. 14, EN/IEC 60947-1, -5-1					

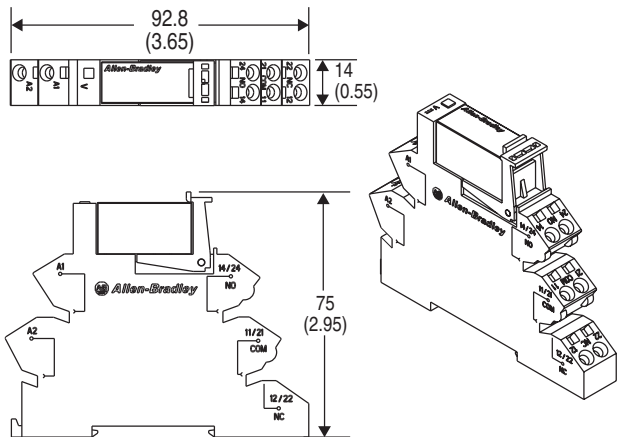
* Performance Data – See this catalog, Important 3

Approximate Dimensions

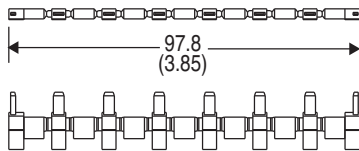
Approximate dimensions are shown in millimeters (inches). Approximate dimensions are not intended to be used for manufacturing purposes.



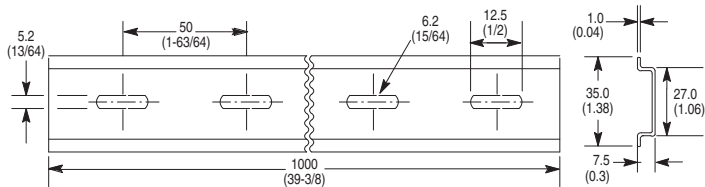
Bulletin 700-HL Screw Terminal Design
Single Wire: 0.14 mm²...2.5 mm² (#26 AWG...14 AWG)
Double Wire: 2 x 0.14 mm²...2 x 1.5 mm² (2 x #26 AWG...2 x 16 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in). Torque: 0.5 N•m (4.4 lb•in)



Bulletin 700-HL Spring Terminal Design
Single Wire: 0.2 mm²...2.5 mm² (#24 AWG...#14 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in)



Bulletin 700-TBJ08_ 8-Way Jumper



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lb) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lb) (5/pkg)