#### **Technical Data**

Original Instructions



# **Relay and Timer Specifications**

Bulletin 700

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700-P Industrial Relays

700-N Industrial Relays

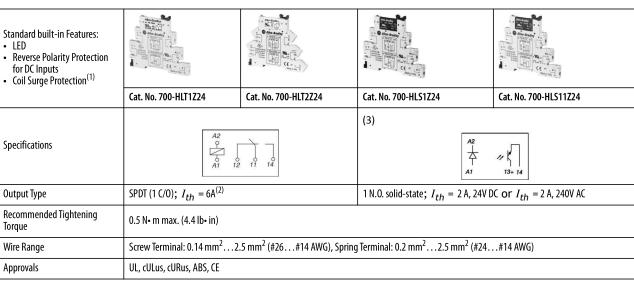
700-R Sealed Switch Relays

700-RTC — Solid-State Timing Relay

700S-P and 700S-PK — Heavy-Duty Safety Control Relays

#### 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
- 2 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





<sup>(2)</sup> For Gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-HLT1224 is required with gold plating, the new cat. no. is 700-HLT1224X.

<sup>(3)</sup> 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.

Input Voltage	Pkg. Qty.	Cat. No. (Screw Terminals)		Cat. No. (Spring Clamp Terminals)	Pkg. Quantity	(Scr	. No. rew Terminals) Output)	Cat. No. (Spring Clamp Terminals) (DC Output)	Cat. No. (Screw Terminals) (AC Output)
12V DC	10	(2)	700-HLT1Z12	700-HLT2Z12	_	_		_	_
24V DC	10	(2)	700-HLT1Z24	700-HLT2Z24	10	(2)	700-HLS1Z24	700-HLS2Z24	700-HLS11Z24
48V DC	10	(2)	700-HLT1Z48	700-HLT2Z48	10	(2)	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	(2)	700-HLS1U1	700-HLS2U1	700-HLS11U1
220240V AC/DC	10	700	-HLT1U2	700-HLT2U2	10	<sup>(2)</sup> 700-HLS1U2		700-HLS2U2	700-HLS11U2
240V AC	10	700	-HLT1A2	_	_	_		_	_



Input Voltage	Pkg. Qty.	Cat. (Scr	No. ew 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)
Built-in LCSC (leakage current suppression circuit) 120V AC and 125V DC <sup>(1)</sup>	10	(2)	700-HLT1L1	_	10	(2)	700-HLS1L1	_	700-HLS11L1
Built-in LCSC (leakage current suppression circuit) 240V AC <sup>(1)</sup>	10	(2)	700-HLT1L2	_	10	(2)	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		_	_

# Accessories - 700-HLT, -HLS Relays

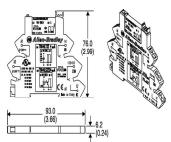
Photo	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
			12V AC/DC	700-TBR12
	(1)		24V AC/DC	700-TBR24
Alter Bradley on 70-max on as on the state of the state o	Replacement Relays <sup>(1)</sup> Order must be for 20 relays or multiples of 20.	20	48V AC/DC	700-TBR48
			110/125V AC/DC 220240V AC/DC	700-TBR60
	Replacement SSR		24V DC	700-TBS24
Allen-Bradis-	4-blade miniature relay for use with 1 N.O. SSR DC output. Order multiples of 20.	20	48V DC, 110/125V AC/DC 220240V AC/DC	700-TBS60
700 - 1000 A SEA A	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 220240V AC/DC	700-TBS160
			Color	•
	20-Way Jumper Can be cut to required length.		Red	700-TBJ20R
	$I_{th} = 36 \text{ A max per 20-way jumper.}$	1	Grey	700-TBJ20G
			Blue	700-TBJ20B

<sup>(1)</sup> Leakage current suppression up to 2.2 mA off state current.
(2) Electromechanical relay to solid-state relay interchangeability is possible.

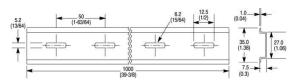
Photo	Description P Q		Socket Input Voltage	Cat. No.
8	<b>End Barrier</b> Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers.	10	Black	700-HN177
	Snap-in Marker These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay. For custom markers, contact your local Rockwell Automation sales office or Allen-Bradley distributor for more information.	100	Blank	1492-MC6X10

<sup>(1)</sup> 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.

#### Dimensions - 700-HL Relays



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.

### **Specifications - 700-HLT Relays**

		Cat. No. 700-HLT	(Relay Output)						
		Electrical R	atings						
Pilot Duty Rating		B 300, R 300							
Rated Thermal Current ( $I_{ m th}$ )			1	-Pole — 6 A					
Rated Insulation Voltage ( <i>U</i> <sub>i</sub> )			250V	IEC, 300V UL/CSA					
				1-Pole					
		24V AC, 1-phase	30 A	►][◀ Make	5 A				
	Inductive V AC	120V AC, 1-phase	30 A		3 A	4][▶			
		240V AC, 1-phase	15 A		1.5 A	Break			
Contacts		24V DC	DC-13, 1.0 A		•	•	•		
	Inductive V DC	125V DC	DC-13, 0.2 A						
		240V DC	DC-13, 0.1 A						
	Resistive	24V DC	6.0 A						
	Make, Break, and	250V AC	6.0 A						
	Continuous	240V DC	0.1 A						
Inductive Load			AC-15 250V, 3 A N DC-13 24V, 1	.0. Contact, 1.5 A A N.O., <i>and</i> N.C. C					

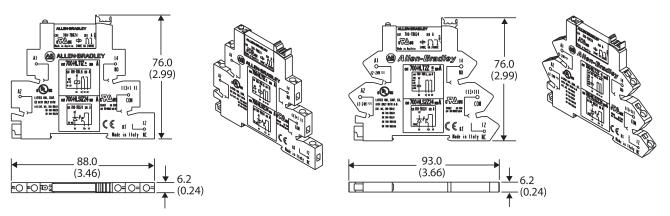
		Cat. No. 700-HLT	(Relay Output)						
Min. Permissible Contact Ratings			8V, 2.5 mA (2	2 mW) for Silver C 20 mW) for Gold C					
Permissible Coil Voltage Variation	Pickup:	Pickup: 85110% of Nominal Voltage at 50 Hz 85110% of Nominal Voltage at 60 Hz 80110% of Nominal Voltage at DC  Must Dropout 10% of Nominal Voltage at A Voltage: 5% of Nominal Voltage at DC							
Power Consumption ±10%	AC DC			0.3° 0.2					
	Des	ign Specification /	Test Requiremer	nts					
	Pole to Pole (VRMS)								
Dielectric Withstand Voltage	Contact to Coil (VRMS)			400	0V				
Input Voltage	12V AC/DC	24V AC/DC	48V AC/DC	120V AC/DC	240V AC/DC	120VLCSC	240VLCSC		
Impedance (Ohms)	1K	2 K	6 K	26 K	56 K	16 K	35 K		
	-	Mechan	ical	•	1				
Degree of Protection				IP20					
Mechanical Life Operations				1 x 10 <sup>7</sup>					
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 Overv	iew/Product Sele	ction				
Operating Time at Nominal Voltage at 20 °C	(ms) Pickup  Dropout	'							
Maximum Operating Rate (full load = 6 A)			(	6 cycles/min.					
Coil Surge Protection		(	Per EN 61000-4 Class III: 2 kV comr	.5; Surge Immuni non and 1 kV diff	ty (801-5) erential mode				
		Environm	ental						
Temperature	Operating Storage								
Altitude			20	00 m (6560 ft)					
	· ·	Construc	ction						
Insulating Material			Molded H	igh Dielectric Ma	terial				
Enclosure				Relay IP67					
Contact Material		Silver T	in Ox, AgSnO <sub>2</sub> or S	ilver with Gold Pl	ating, AgSnO <sub>2</sub> + A	u			
Terminal Markings on Socket			In accord	ance with EN50 0	005				
Certifications	cULı	ıs Listed (File No. E312		NLDX/NLDX7) wit n Bureau of Shipp		ket, CE Marked, A	BS		
Standards		EN 61810-1,			mpliant, ICS-2 Com	npliant			
			Class 1, Zn 2, Gro	ups IIC, Ex nC IIC T					
Hazardous Location Approvals	UL Listed (UL60079-15)				(12V DC supply) 1Z24-EX (24V DC su EX (110V/125V AC/				
	CSA Certified <sup>(1)</sup> (CAN/CSA E60079-15)		700-HLT	700-HLT1Z12-EX 1Z24-EX, 700-HLS	(12V DC supply) 1Z24-EX (24V DC su	ipply)			
(1) Product shall be installed in an enclosure providing	at least IP54 protection. Provisions sl	nall be made to prevent the	rated voltage from bei	ng exceeded by transie	nt disturbances of more	than 40%.			
	Cat. I	No. 700-HLS (So	<u>-</u>	t)					
		Electrica			<u> </u>				
Rated Thermal Current $(I_{th})$			2 A (DC o	• •		2 A (AC outpu	ıt)		
Rated Insulation Voltage ( <i>U</i> <sub>i</sub> )			250V IEC, 300	OV UL/CSA					

	Cat. No. 700	)-HLS (Solid-sta	ate Output)				
	Min. Control Voltage		}	30% nominal voltag	e		
	Maximum Control Voltage		1	10% nominal volta	ge		
	Control Current		9 mA ±10%	% (24V) 4 mA ±10%	(120/240V)		
Control Circuit	Release Voltage	0	.4 x nominal voltage	(24V), 0.35 x nomir	al voltage (120/240V)		
	Min. Control Circuit Resistance		3200 ohms (24V), 16k ohms (120V), 32k ohms (240V)		2500 ohms (24V), 12k ohms (120V), 24kohms (240V)		
	Load Voltage Range		024VDC		242	40VAC	
	Max. Repetitive Blocking Voltage		33V		60	0V	
Outputs	Max. Switching Current (inductive/resistive)		2 A DC		1 A	AC	
	On State Voltage Drop @ Max. Switching Current		<120 mV DC		<1	V AC	
	Leakage Current		m	ax. 100 μA (@U = 24	.V)		
Devices Communities + 100/	AC		0.	6VA(120V),1VA(240	V)		
Power Consumption ±10%	DC		0.2 W		0.3	s W	
	Design Spe	cification/Test Rec	uirements				
Did at Med a divide	Pole to Pole (VRMS)	2500V					
Dielectric Withstand Voltage	Contact to Coil (VRMS)	2500V					
Input Voltage	24V DC	48V DC	120V AC/DC	240V AC/DC	120VLCSC	240VLCSC	
Impedance (Ohms)	2K	9 K	26 K	58 K	16 K	35 K	
		Mechanical					
Degree of Protection			IP20				
Input Voltages		See 0	verview/Product Sel	ection			
Operating Time at Nominal Voltage at	Turn on Time		30 μs (DC only inp	ut voltage), 7 ms (A	C/DC input voltage)		
20 °C (ms)	Drop Out Time		350 μs (DC only inp	ut voltage), 10 ms (/	AC/DC input voltage)		
Maximum Operating Rate			300 Hz				
		Environmental					
Temperature	Operating			–20…+55°C			
lemperature	Storage			−40+70°C			
Altitude		•	2000 m (6560 ft)				
		Construction					
Insulating Material		Molde	d High-Dielectric M	laterial			
Enclosure			Relay IP67				
Terminal Markings on Socket		In ac	cordance with EN50	0005			
Certifications	cULus Listed (File N	lo. E14843, Guide NI	.DX/NLDX7), CE Marl	ked, ABS (American I	Bureau of Shipping)		
Standards		UL 508, 0	SA C22.2 No. 14, EN	N 61810-1			
		Class 1, Zn 2,	Groups IIC, Ex nC IIC	T5 Ta < 55 °C			
Hazardous Location Approvals	UL Listed (UL60079-15)			EX, 700-HLS1Z24-EX 0-HLS1U1-EX (110V)			
	CSA Certified <sup>(1)</sup> (CAN/CSA60079-15)		700-HLT1Z24-E	EX,700-HLS1Z24-EX	(24V DC supply)		

<sup>(1)</sup> 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%.

#### Dimensions - 700-HLT, -HLS Relays

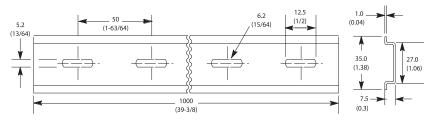
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



700-HLT / -HLS Screw Terminal Design
Single Wire: 0.14 mm<sup>2</sup>...2.5 mm<sup>2</sup> (#26 AWG...#14 AWG)
Double Wire: 2 x 0.14 mm<sup>2</sup>...2 x 1.5 mm<sup>2</sup> (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)

700-HLT / -HLS Spring Terminal Design
Single Wire: 0.2 mm<sup>2</sup> ...2.5 mm<sup>2</sup> (#24 AWG ...#14 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in.)

#### **Dimensions - 700-HLT, -HLS Relay Accessories**



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	В	C	D	Approx. Shipping Wt.	Pkg. Qty.
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

# 700-HL\_N Next Generation Terminal Block Relay

- Relay and socket assembled interface modules for high density interposing or isolation applications
- Screw terminal and push-in terminal bases
- 6 A relay, choice of silver or gold contacts
- 2 A solid-state relay DC output
- 2 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
- Universal input voltage versions
- Available with hazardous location certification



Standard built-in Features: LED Reverse Polarity Protection for DC Inputs Coil Surge Protection <sup>(1)</sup>	Alter-Bradley  Alter-	Annoratory  All a Color  Mino-brailey  All a Color  All a	Alter-Gradity  Alter-	Mine dradey  Mine		
	Cat. No. 700-HLTN1_	Cat. No. 700-HLTN2_	Cat. No. 700-HLSN1_	Cat. No. 700-HLSN2_		
Specifications	A2 Q A1 12	11 14	(3)  A2  A1	// K		
Output Type	SPDT (1 C/0); $I_{th} = 6A^{(2)}$		1 N.O. solid-state; $I_{th} = 2 \text{ A}$ , 24V D	C or I <sub>th</sub> = 2 A, 240V AC		
Recommended Tightening Torque	0.5 N• m max. (4.4 lb• in)					
Wire Range	Screw Terminal: 0.14 mm <sup>2</sup> 2	Screw Terminal: 0.14 mm <sup>2</sup> 2.5 mm <sup>2</sup> (#26 #14 AWG), Push-in Terminal: 0.2 mm <sup>2</sup> 2.5 mm <sup>2</sup> (#24 #14 AWG)				
Approvals	UL, cULus, cURus, ABS, CE					
(1) Diada surga protection provided	-					

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.

Input Voltage	Pkg. Qty.	Cat. No. (Screw Terminals)	Cat. No. (Push-in Terminals)	Cat. No. (Screw Terminals) (DC Output)	Cat. No. (Push-in Terminals) (DC Output)	Cat. No. (Screw Terminals) (AC Output)	Cat. No. (Push-in Terminals) (AC Output)
12V AC/DC	10	700-HLTN1U12	700-HLTN2U12	_	_	_	-
24V AC/DC	10	700-HLTN1U24	700-HLTN2U24	700-HLSN1U24	700-HLSN2U24	700-HLSN11U24	700-HLSN21U24
24240V AC/DC <sup>(1)</sup>	10	700-HLTN1U18	700-HLTN2U18	700-HLSN1U18	700-HLSN2U18	700-HLSN11U18	700-HLSN21U18
Hazardous Location Certification 12V AC/DC	10	700-HLTN1U12-EX	700-HLTN2U12-EX	_	_	_	_
Hazardous Location Certification 24V AC/DC	10	700-HLTN1U24-EX	700-HLTN2U24-EX	700-HLSN1U24-EX	700-HLSN2U24-EX	700-HLSN11U24-EX	700-HLSN21U24-EX
Hazardous Location Certification 24240V AC/DC	10	700-HLTN1U18-EX	700-HLTN2U18-EX	700-HLSN1U18-EX	700-HLSN2U18-EX	700-HLSN11U18-EX	700-HLSN21U18-EX

<sup>(1)</sup> Leakage current suppression up to 2.2 mA off state current.

Diode surge protection provided.
For Gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-HLTNU24 is required with gold plating, the new cat. no. is 700-HLTNU24X.

# Accessories - 700-HLT, -HLS Relays

Photo	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
Allen-Brackey Out 700-TBR24 on A 3 CPJ us the Table of Allender The American America	<b>Replacement Relays</b> <sup>(1)</sup> Order must be for 20 relays or multiples of 20.	20	12V AC/DC 24V AC/DC 24240V AC/DC	700-TBR12 700-TBR24
Allen-Bradley	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR DC output. Order multiples of 20.		24V AC/DC	700-TBS24
woo in money topic as	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR AC output. Order multiples of 20.	20	24V AC/DC 24240V AC/DC	700-TBS124
			Color	
<del>/22000000000000</del>	16-Way Jumper Can be cut to required length.	1	Red	700-TBJ16R
	$I_{th} = 36 \text{ A max per 16-way jumper. Maximum 6 A per pole.}$	'	Grey	700-TBJ16G
			Blue	700-TBJ16B
Allen-Bradley  C € CAT. COAD GA 300V	Allows two wires per one push-in terminal.  Max wire 2 X 1.5 mm <sup>2</sup> (2 X #16 AWG)	5	_	700-TBT2
Allen-Bradity  Control of the Contro	<b>Terminal Block Relay Wiring Adapter</b> Plugs into 700-HL_N Relays	1	_	700-TBWA
London, Control of the Control of th	Cable Used with 700-TBWA.	1	_	700-TBCBL
	<b>End Barrier</b> Used for visual inspection of groups, safe separation of neighboring 700-HLN modules that end with jumpers.	10	Black	700-HN377
	Snap-in Marker These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay. For custom markers, contact your local Rockwell Automation sales office or Allen-Bradley distributor for more information.	100	Blank	1492-MC6X10

<sup>(1)</sup> 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.

# Specifications - 700-HLTN Relays

		at. No. 700-HLTN	. (Relav Output)					
		Electrical R						
Pilot Duty Rating				3 300, R 300				
Rated Thermal Current ( $I_{th}$ )				-Pole — 6 A				
Rated Insulation Voltage ( <i>U</i> <sub>i</sub> )			250V	IEC, 300V UL/CSA				
	1-Pole							
		24V AC, 1-phase	30 A	▶][◀	5 A	<b>4</b> ][▶		
	Inductive V AC	120V AC, 1-phase	30 A		3 A			
		240V AC, 1-phase	15 A	Make	1.5 A	Break		
ontacts		24VDC	DC-13, 1.0 A					
	Inductive V DC	125V DC	DC-13, 0.2 A					
		240V DC	DC-13, 0.1 A					
	Resistive	24VDC	6.0 A					
	Make, Break, and	250V AC	6.0 A					
	Continuous	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., <i>and</i> N.C. Contact						
Min. Permissible Contact Ratings	12V, 10 mA (120 mW) for Silver Contacts, 8V, 3 mA (25 mW) for Gold Contacts							
Permissible Coil Voltage Variation	Pickup: 80110% of Nominal Voltage at DC Must Dropout Voltage: 10% of Nominal Voltage				ninal Voltage			
Power Consumption ±10%	AC 0.4 VA DC 0.3 W							
	!	sign Specification / `	Test Requiremen	ts				
	Pole to Pole (VRMS) 1000V							
Dielectric Withstand Voltage	Contact to Coil (VRMS)			400	0V			
		Mechan	ical					
Degree of Protection				IP20				
Mechanical Life Operations				1 x 10 <sup>7</sup>				
Electrical Life Operations			24V DC, 1 A	stive: 100 000 m Inductive: 200 00 Inductive: 300 00	00 min.			
Switching Frequency Operations (no-load)			1	0 cycles/sec				
Coil Voltages				ew/Product Sele	ction			
	Pickup			6 n	ns			
Operating Time at Nominal Voltage at 20 °C (ms)	Dropout			6 n	ns			
Maximum Operating Rate (full load = 6 A)			6	cycles/min.				
Coil Surge Protection		(	Per EN 61000-4. lass III: 2 kV comm	5; Surge Immuni non and 1 kV diff	ity (801-5) erential mode			
		Environm	ental					
Temperature	Operating			<b>-40</b>	+70 °C	_	_	
icinpetature	Storage			-40	+100°C			
Altitude				00 m (6560 ft)				
	I	Construc						
Insulating Material			Molded Hi	gh Dielectric Ma	terial			

	C	at. No. 700-HLTN (Relay Output)				
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	cl	cULus Listed (File No. E3125, E14843 Guide NLDX/NLDX7) with Allen-Bradley socket, CE Marked				
Standards		EN 61810-1, CSA 22.2,UL 508,NEMA IEE MAC Compliant, ICS-2 Compliant				
		Class 1, Zn 2, Groups IIC, Ex nC IIC T6 Ta < 70°C				
Hazardous Location Approvals	UL Listed (UL60079-15)	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 <sup>(1)</sup> (CAN/CSA E60079-15)	700-HLT1Z12-EX (12V DC supply) 700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply)				

<sup>(1)</sup> 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%.

Min. Control Voltage       80%         Maximum Control Voltage       110%         Control Current       9 mA ± 10% (24 max)         Release Voltage       0.4 x nominal voltage (24 max)         Max. Repetitive Blocking Voltage       33V         Max. Switching Current (inductive/resistive)       2 A DC         On State Voltage Drop @ Max. Switching Current       <400 mV DC         Leakage Current       max. 100 μA         AC       0.6VA(         DC       0.6VA(         DC       0.6VA(         Design Specification/Test Requirements	2 A (AC output)  //IEC, 300V UL/CSA o nominal voltage 6 nominal voltage  4V) 4 mA ±10% (120/240V)  IV), 0.35 x nominal voltage (120/240V)  12275VAC  600V  2 A AC					
Rated Insulation Voltage (V)  Control Circuit  Min. Control Voltage  Maximum Control Voltage  Control Current  Release Voltage  Load Voltage Range  Max. Switching Current (inductive/ resistive)  On State Voltage Drop @ Max. Switching Current  Leakage Current  Max. Switching Current  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Min. Control Voltage  80%  Maximum Control Voltage  110%  9 mA ±10% (24  9 mA ±10% (24  9 mA ±10% (24  1533V DC  Max. Repetitive Blocking Voltage  33V  Max. Switching Current (inductive/ resistive)  2 A DC  On State Voltage Drop @ Max. Switching Current  max. 100 μA  AC  DC  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)	/IEC, 300V UL/CSA o nominal voltage 6 nominal voltage 4V) 4 mA ±10% (120/240V)  V), 0.35 x nominal voltage (120/240V)  12275VAC 600V					
Min. Control Voltage 80%  Maximum Control Voltage 110%  Control Circuit  Maximum Control Voltage 110%  Control Current 9 mA ± 10% (24 max + 10 max	o nominal voltage 6 nominal voltage 4V) 4 mA ±10% (120/240V) 4V), 0.35 x nominal voltage (120/240V) 12275V AC 600V					
Maximum Control Voltage       110%         Control Current       9 mA ±10% (24 mA ±10% (24 mA ±10%)	6 nominal voltage 4V) 4 mA ±10% (120/240V)  EV), 0.35 x nominal voltage (120/240V)  12275VAC  600V					
Control Circuit       9 mA ±10% (24 mominal voltage (	4V) 4 mA ±10% (120/240V) (V), 0.35 x nominal voltage (120/240V) 12275VAC 600V					
Control Current       9 mA ±10% (24 mat ±10%) (24 mat ±10%) (24 mat ±10%)         Load Voltage Range       0.4 x nominal voltage (24 mat ±10%)         Max. Repetitive Blocking Voltage       33V         Max. Switching Current (inductive/resistive)       2 A DC         On State Voltage Drop @ Max. Switching Current       <400 mV DC	12275V AC 600V					
Load Voltage Range 1.533 V DC  Max. Repetitive Blocking Voltage 33 V  Max. Switching Current (inductive/ resistive) 2 A DC  On State Voltage Drop @ Max. Switching Current  Leakage Current max. 100 μA  Power Consumption ±10%  AC 0.6 VA( DC 0  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Mechanical	12275VAC 600V					
Max. Repetitive Blocking Voltage  Max. Switching Current (inductive/ resistive)  On State Voltage Drop @ Max. Switching Current  Leakage Current  Max. Switching Current (inductive/ resistive)  On State Voltage Drop @ Max. Switching Current  Max. 100 μΔ  AC  DC  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Mechanical  Degree of Protection  IP20	600V					
Outputs       Max. Switching Current (inductive/ resistive)       2 A DC         On State Voltage Drop @ Max. Switching Current       < 400 mV DC						
Coutputs       resistive)       On State Voltage Drop @ Max.       Switching Current       Leakage Current       Max. 100 μA       AC     0.6VA(       Design Specification/Test Requirements       Dielectric Withstand Voltage       Pole to Pole (VRMS)       Contact to Coil (VRMS)       Mechanical       Degree of Protection       IP20	2 A AC					
Switching Current  Leakage Current  AC  DC  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Degree of Protection  Switching Current  AC  O.6VA(  DC  Design Specification/Test Requirements  Mechanical						
Power Consumption ±10%  AC	<1.5VAC					
Power Consumption ±10%  DC  Design Specification/Test Requirements  Dielectric Withstand Voltage  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Mechanical  Degree of Protection  IP20	max. 1.5 μA					
DC  Design Specification/Test Requirements  Pole to Pole (VRMS)  Contact to Coil (VRMS)  Mechanical  Degree of Protection  IP20	(120V),1VA(240V)					
Dielectric Withstand Voltage    Pole to Pole (VRMS)	0.3 W (24V)					
Contact to Coil (VRMS)  Mechanical  Degree of Protection  IP20						
Contact to Coil (VRMS)  Mechanical  Degree of Protection  IP20	2500V					
Degree of Protection IP20	3000V					
nput Voltages See Overview/Product Selection	on					
operating time at nothinal voltage at 1	oltage), 12 ms (AC/DC input voltage)					
20 °C (ms) Drop Out Time 600 μs (DC only input vo	Drop Out Time 600 µs (DC only input voltage), 12 ms (AC/DC input voltage)					
Maximum Operating Rate 300 Hz						
Environmental						
Operating —						
Storage –	−20+70 °C					
Altitude 2000 m (6560 ft)	–20…+70°C –40…+70°C					

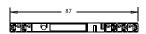
Cat. No. 700-HLSN (Solid-state Output)					
		Construction			
Insulating Material Molded High-Dielectric Material					
Enclosure		Relay IP67			
Terminal Markings on Socket		In accordance with EN50 0005			
Certifications	cULus Listed (File N	cULus Listed (File No. E14843, Guide NLDX/NLDX7), CE Marked, ABS (American Bureau of Shipping)			
Standards		UL 508, CSA C22.2 No. 14, EN 61810-1			
		Class 1, Zn 2, Groups IIC, Ex nC IIC T6 Ta < 70°C			
Hazardous Location Approvals	UL Listed (UL60079-15)	700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply) 700-HLT1U1-EX, 700-HLS1U1-EX (110V/125V AC/DC supply)			
	CSA Certified <sup>(1)</sup> (CAN/CSA60079-15)	700-HLT1Z24-EX,700-HLS1Z24-EX (24V DC supply)			

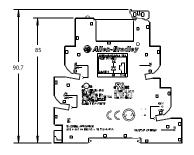
<sup>(1)</sup> Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

#### **Dimensions - 700-HLTN, -HLSN Relays**

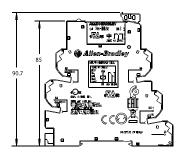
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.





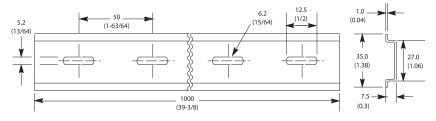


700-HLTN / -HLSN Screw Terminal Design
Single Wire: 0.5 mm<sup>2</sup>...2.5 mm<sup>2</sup> (#21 AWG...#14 AWG)
Double Wire: 2 x 0.5 mm<sup>2</sup>...2 x 1.5 mm<sup>2</sup> (2 x #26 AWG...2 x #16 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 10 mm (0.4 in). Torque: 0.5 N-m (4.4 lb-in)



700-HLTN / -HLSN Push-in Terminal Design
Single Wire: 0.5 mm²...2.5 mm² (#21 AWG...#14 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in.)

#### Dimensions - 700-HLTN, -HLSN Relay Accessories

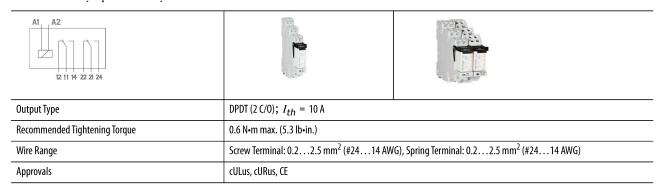


Cat. No. 199-DR1 DIN Mounting Rail Series B Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	В	C	D	Approx. Shipping Wt.	Pkg. Qty.
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

#### 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



Input Voltages	Pkg. Quantity	Cat. No. <sup>(1)</sup> (Screw Terminals)	Cat. No.(Spring Clamp Terminals)
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
220240V AC/DC	10	700-HLT12U2	700-HLT22U2

<sup>(1)</sup> 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\_2U24, 700-HLT\_2U24, 700-HLT\_2U14, and 700-HLT\_2U2. Not available on 12V and 48V DC products.

#### Accessories - 700-HL Relays (2- pole)

Photo	Description	Pkg. Qty.	Socket Input Voltage/Color	Cat. No.
			12V DC	700-TBR212
	<b>Replacement Relays</b> Order must be for 20 relays or multiples of 20.	20	24V AC/DC	700-TBR224
		20	48V DC	700-TBR248
			110/125V AC/DC, 220240V AC/DC	700-TBR2110
and the same of th	8-Way Jumper Can be cut to required length. $I_{th} =$		Red	700-TBJ08R
Salahara Salah		1	Grey	700-TBJ08G
	10 A max per 8-way jumper.		Blue	700-TBJ08B
	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 <sup>(1)</sup> These snap-in markers have a 6 x 12 mm surface and snap into the ejection lever for the relay.	100	Blank	1492-MS6X12

<sup>(1)</sup> For custom markers, contact your local Rockwell Automation sales office or Allen-Bradley distributor for more information.

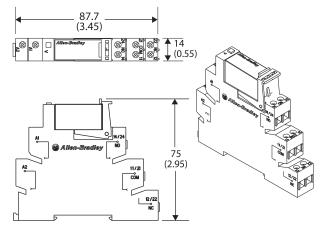
# Specifications - 700-HL Relays (2-Pole)

	Cat.	No. 700-HLT2	-Pole (Relay Out	put)			
		Electrica	l Ratings				
Pilot Duty Rating			B 300, R 300				
Rated Thermal Current ( $I_{th}$ )		2-Pole — 10 A					
Rated Insulation Voltage (U)				250V IEC, 3	00V UL/CSA		
	Inductive V AC	120V AC	AC-15, 3.0A		1/-	4 HP (186 W), 1-pha	se
	01	240V AC	AC-15, B 300,		1/.	2 HP (373 W), 1-pha	se
Contacts		24V DC	DC-13,	, 2.0 A			
Unitacts	Inductive V DC	125V DC	DC-13,	, 0.3 A			
		250V DC	DC-13,	, 0.2 A			
	Resistive Make,	250V AC	10	Α			
	Break, and Continuous	24VDC	10	Α			
	Continuous	250V DC	0.2	8 A			
Min. Permissible Contact Ratings		12\	V, 10 mA (120 mW	) for Silver Conta	cts, 5V, 1 mA (50 m	nW) for Gold Contac	
Permissible Coil Voltage Variation		Pickup:	85110% of Nominal Voltage at 60 Hz  85110% of Nominal Voltage at 60 Hz  Voltage: 5% of Non			10% of Nominal Voltage at AC 5% of Nominal Voltage at DC	
	Ι	) Design Specification	/Test Requirement	ts			
		Pole to Pole (VRMS)	1000V				
Dielectric Withstand Voltage		Contact to Coil (VRMS)	5000V				
		Adjacent Contacts (VRMS)	2500V				
Input Voltage		12V AC/DC	24V AC/DC	48V DC	120V AC/DC	240V A	C/DC
Impedance (Ohms)		1 K	2 K	3 K	34 K	72	K
Power Consumption ±10%	AC	N/A	0.5V A	N/A	0.4V A	0.8\	'A
Tower Consumption ± 1070	DC	0.4 W	0.5 W	0.8 W	0.5 W	0.7	W
		Mecha	anical				
Degree of Protection		IP20					
Mechanical Life Operations		3 x 10 <sup>7</sup>					
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 c	ycles/sec		
Coil Voltages			<u> </u>	See Overview/F	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 cycl	es/min.		

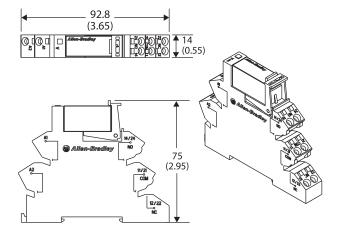
Cat. No. 700-HLT2-Pole (Relay Output)				
Environmental				
Tomonovatura	Operating	−40…+60°C		
Temperature	Storage	−40+100 °C		
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High-Dielectric Material		
Enclosure		Relay RT II — flux-proof, pollution degree 2 installation environment		
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 61810-1		

#### Dimensions - 700-HL (2-pole)

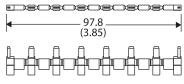
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



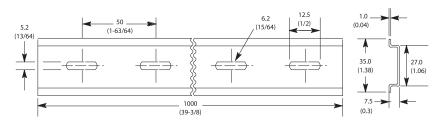
Bulletin 700-HL Screw Terminal Design
Single Wire: 0.14 mm<sup>2</sup>...2.5 mm<sup>2</sup> (#26 AWG...14 AWG)
Double Wire: 2 x 0.14 mm<sup>2</sup>...2 x 1.5 mm<sup>2</sup> (2 x #26 AWG...2 x 16 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in). Torque: 0.5 N•m (4.4 lb•in)



Bulletin 700-HL Spring Terminal Design Single Wire: 0.2 mm<sup>2</sup>...2.5 mm<sup>2</sup> (#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	В	С	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)

#### 700-HLF Terminal Block Timing Relay

- Relay and socket assembled modules for high-density applications
- Screw terminal bases
- 6 A relay, choice of silver or gold contacts
- SPDT (relay)
- Four timing functions
- Time range from 0.1 sec...6 hr
- Built-in retainer clip and snap-in marker lever
- Standard LED, reverse polarity protection, and surge protection
- Externally replaceable relay modules



Wiring Diagram	A2 Q A1 16 15 18		
Output Type	SPDT (1 C/0); $I_{th} = 6$ AS		
Recommended Tightening Torque	0.5 N•m max. (4.4 lb•in)		
Wire Range	Screw Terminal: 0.14 mm <sup>2</sup> 2.5 mm <sup>2</sup> (#26 #14 AWG)		
Approvals	cULus, cURus, CE		

#### **Assembled Device**

Input Voltage	Pkg. Quantity	Cat. No. <sup>(1)</sup>
24V AC/DC	10	700-HLF1U24

<sup>(1)</sup> For gold-plated contacts add an X after the catalog number listed.

#### **Accessories - 700-HLF Relays**

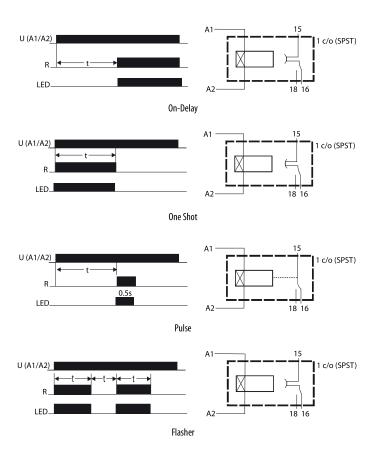
Terminal block timing relay bases are not sold separately.

Photo	Description		Socket Input Voltage	Cat. No.
Aller Bradley on 70-1022 on A i  Show to pro-	Replacement Relays Order must be for 20 relays or multiples of 20.	20	24V AC/DC	700-TBR24 <sup>(1)</sup>
	<b>20-Way Jumper</b> Can be cut to required length. $I_{th}=36\mathrm{A}$ max per 20-way jumper.		Color	
		1	Red	700-TBJ20R
			Grey	700-TBJ20G
			Blue	700-TBJ20B
	<b>End Barrier</b> Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers.	10	Black	700-HN177
	<b>Snap-in Marker</b> These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay.		Blank	1492-MC6X10

<sup>(1)</sup> 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.



# Function and Connection Diagrams - 700-HLF Relays



# Specifications- 700-HLF Relays

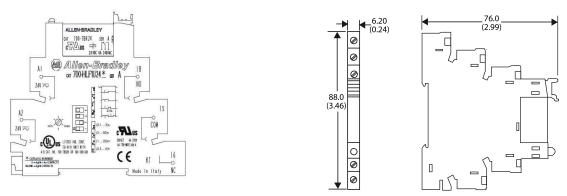
Cat. No. 700-HLF (Relay Output) <sup>(1)</sup>					
	E	lectrical Ratings			
Pilot Duty Rating		B 300, R 300			
Rated Thermal Current ( $I_{ m th}$ )		1-Pole — 6 A			
Rated Insulation Voltage ( <i>v</i> <sub>i</sub> )		250V IEC, 300V UL/CSA			
Contacts	Inductive	1-Pole			
	24V AC, 1-phase	30 A	▶][◀	5 A	
	120V AC, 1- phase	30 A		3 A	<b>∢</b> ][▶
	240V AC, 1- phase	15 A		1.5 A	
		24VDC			1.0 A
	Make, Break and Continuous V DC	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. <i>and</i> 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:	85110% of Nominal Voltage at 50 Hz 85110% of Nominal Voltage at 60 Hz 80110% of Nominal Voltage at DC	Must Dropout Voltage: 10% of Nominal Voltage at AC, 5% of Nominal Voltage at DC		
Power Consumption ±10%	AC/DC	0.5VA			
	Design S <sub>l</sub>	pecification/Test Requirements			
Dielectric Withstand Voltage	Pole to Pole (VRMS)				
	Contact to Coil (VRMS)	4000			
Input Voltage		24V AC/DC			
Impedance(Ohms)		2 K			
		Mechanical			
Degree of Protection	IP20				
Mechanical Life Operations	1 x 10 <sup>7</sup>				
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				
Timer Functions	On-Delay, One Shot, Pulse, and Flasher				
Timer Settings	0.13 s, 360 s, 120 min, and 0.36 hr				
Timer Adjustments	Min and Max adjustments with Potentionmeter				
Timer Accuracy	Repeatability 1%, Recovery Time < 50 ms, Setting Accuracy Full Range 5%				
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 (−40+131°F)			
remperature	Storage	−40+100°C (−40+212°F)			
Altitude	2000 m (6560 ft)				
		Construction			
Insulating Material	Molded High Dielectric Material				
Enclosure	Relay IP67				
Contact Material	Silver Tin Ox, AgSnO <sub>2</sub> or Silver with Gold Plating, AgSnO <sub>2</sub> + 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				
Standards	EN60947-4-1,EN60947-5-1,CSA 22.2,UL 508,NEMA IEE MAC Compliant, ICS-2 Compliant				
	•				

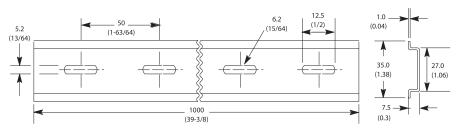
<sup>(1)</sup> Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

#### **Dimensions-700-HLF Relays**

Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



700-HLF 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)



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	В	С	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 (4.07lb) (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)