Allen-Bradley

Relays and Timers Specifications

Bulletin Number 700

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

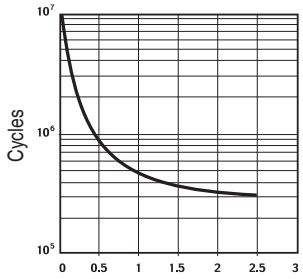
Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

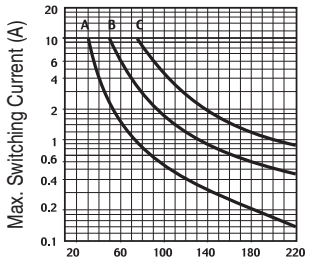
Cat. No. 700-HA…				
Electrical Ratings				
Pilot Duty Rating‡		NEMA B300		
Rated Thermal Current (I_{th})		HA = 10 A – 120V, 240V HAX = 6 A – 120V, 240V		
Rated Insulation Voltage (U_i)		250V IEC – 300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
		►][◄	◄][►	
	120V AC	30 A	3 A	1/3
	240V AC	15 A	1.5 A	1
	General Purpose	10 A, 240V AC		
	Resistive	10 A, 30V DC		
Min. Low Energy Permissible Load		HA = 10V, 5 mA HAX = 5V, 2 mA		
Permissible Coil Voltage Variation		Pickup: 80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%	AC Coils	**50 Hz**	**60 Hz**	
	Inrush	3.3 VA	2.85 VA	
	Sealed	2.2 VA	1.9 VA	
	DC Coils	1.3 W		
Must Dropout Voltage		20% of nominal V AC 10% of nominal V DC		
Max. Contact Resistance		50 MΩ (700-HA and 700-HAB) 30 MΩ (700-HAX)		
Design Specification/Test Requirements				
Electrical				
Pole-to-Pole		2000V		
Contact to Coil		2000V		
Electrical Life (Operating)		100 000 min.		
Mechanical				
Degree of Protection (Open Type) IEC 529		IP 40		
Mechanical Life Cycles (AC/DC)		> 20 x 10^6/ 50 x 10^6		
Switching Frequency Operations		3600/HR		
Coil Voltages		See Product Selection		
Operating Time	Max. Pickup	10 ms		
	Max. Dropout	10 ms		
Maximum Operating Rate		4 Ops/s		
Vibration	Endurance	5 G		
	Operational	2.5 G		
Shock	Endurance	50 G		
	Operational	9 G		
Environmental				
Temperature	Operating	AC/DC	–40…+70 °C	
	Storage	AC/DC	–40…+100 °C	
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High-Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		700-HA:	10 A– AgNi	
		700-HAX:	6 A–Bifurcated/Gold Plating AgNi	
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		8-Pin Socket — 700-HN100, -HN125, -HN204 11-Pin Socket — 700-HN101, -HN126, -HN205		
Certifications		cURus Recognized (File No. E3125, Guide NLDX2/NLDX8), cULus Listed when used with Bulletin 700-HN sockets noted above (File No. E3125, Guide NLDX/NLDX7), CE Marked, CSA Certified, UR Certified (File 229473)		
Standards		UL508, CSA C22.2 No. 14, EN 61810-1		

‡ NEMA Rating Chart is in publication 700-SG003*

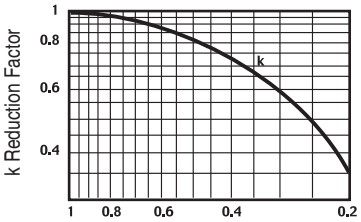
700-HA Relay Performance Graphs



Contact life vs. AC1 load at 1,800 cycles/h



Breaking capacity for DC1 load at 1,800 cycles/h.



Load reduction factor vs. cos ϕ

A *= load applied to one contact*
B *= load applied to two contacts in series*
C *= load applied to three contacts in series*

Time Module Cat. No. 700-HT3		
Electrical Ratings		
Operating Voltage Range		12…240V AC (50/60 Hz) 12…240V DC
Power Consumption		0.1 W (12V) 1.0 W (230V)
Mechanical		
Degree of Protection of Input (B1) Terminal		IP 20 (Guarded Terminal)
Input Terminal Wire Range		1.0 x 0.2 mm^2…2.5 mm^2 (24 AWG…14 AWG) 2.0 x 0.2 mm^2…1.5 mm^2 (24 AWG…16 AWG)
Input Terminal Torque Range		0.45…0.8 Nm (4…7 lb-in.)
LED Indicator		Red
Repeat Accuracy‡		±1%
Recovery Time		<50 ms
Selectable Timing Ranges		Three DIP switches, seven ranges (set from 5…100% of range): 1 s, 10 s, 100 s, 10 min, 100 min, 10 h, 100 h
Selectable Timing Modes		Three DIP switches, eight modes: 1. Power On–Delay 2. Power On One-Shot 3. Power On Repeat Cycle, On Start 4. Signal On-Delay and Signal Off-Delay 5. Signal Off-Delay 6. Signal On-One-Shot 7. Signal Off-One-Shot 8. Signal On and Signal Off Watchdog Monitor
Adjustable Trimmer Scale Accuracy		±5% of Time Range
Environmental		
Temperature	Operating	–20 °C…+50 °C (–4 °F…+122 °F)
	Storage	–55 °C…+85 °C (–67…+185 °F)
Altitude		2000 m (6560 ft)
Construction		
Enclosure		Gray Plastic Housing
Mounting with Socket Only		8- or 11-Pin Socket with Module Plug
Sockets		700-HN204 (8-Pin with Plug) 700-HN205 (11-Pin with Plug)
Certifications		cURus Recognized (File No. E14843, Guide NRNT2/NRNT8), CE Marked
Standards		UL508, CSA C22.2 No. 14, EN 61810-1

‡ At constant voltage and temperature.

Timing Charts, Cat. No. 700-HT3 Multi-Function Time Module (t = Time Range 0.05 s...100 h)

Terms:
U is Power Input
R is Relay Output
S Signal, **+A1** Socket, **B1** Timer
t is the resulting Time Delay (Red LED)

1. Power On-Delay

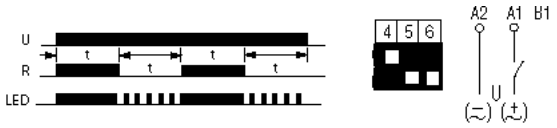
Apply power (U) to timer. Relay contacts (R) change state after time delay (t) is complete. Contacts return to their shelf state when power is removed. Terminal B1 is not used in this mode.

2. Power On One-Shot

Apply power (U) to timer. Relay contacts (R) change state immediately and the time delay begins. When the time delay (t) is complete, contacts return to their shelf state. Contacts return to their shelf state when power is removed. Terminal B1 is not used in this mode.

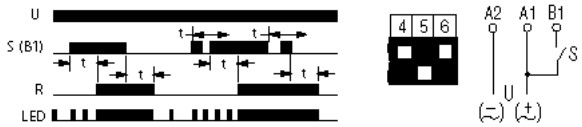
3. Power On Repeat Cycle, On Start

Apply power (U) to timer. Relay contacts (R) change state immediately and the time delay (t) begins. When the time delay is complete, the contacts return to their shelf state for time delay (t) (time on = time off). This cycle will repeat until the power is removed. Terminal B1 is not used in this mode.



4. Signal On-Delay and Signal Off-Delay

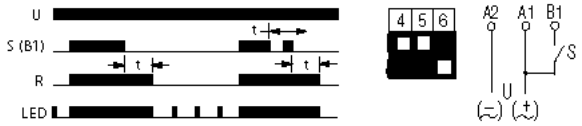
Apply power (U) to timer. When the signal (S) is closed the time delay (t) begins, after the time delay is complete the relay contacts (R) change state. Opening the signal starts the time delay, after the time delay is complete the contacts return to their shelf state. If the signal is closed or opened before the time delay is complete, the time delay is reset. Contacts return to their shelf state when power is removed.



Cat. No. 700-HT3 Timing Modes, Time Description, Timing Charts, and DIP Switch Selections

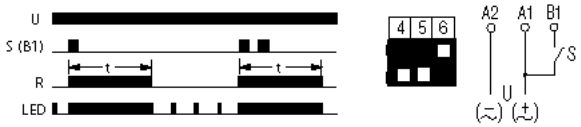
5. Signal Off-Delay

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) change state immediately. When the signal is opened, the time delay (t) begins. If the signal is closed before the time delay is complete, the time delay is reset and the relay remains energized. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



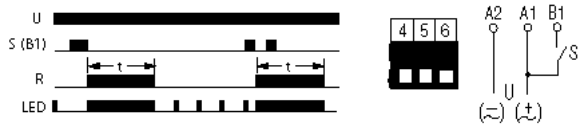
6. Signal On One-Shot

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) change state immediately and the time delay (t) begins. After the time delay begins, opening or closing the signal will not reset the time delay. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



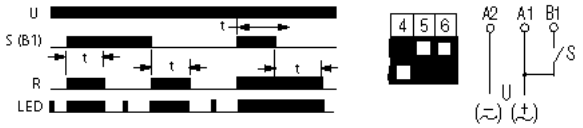
7. Signal Off One-Shot

Apply power (U) to timer. When the signal (S) is closed and then opened, the relay contacts (R) change state immediately and the time delay (t) begins. After the time delay begins, opening or closing the signal will not reset the time delay. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



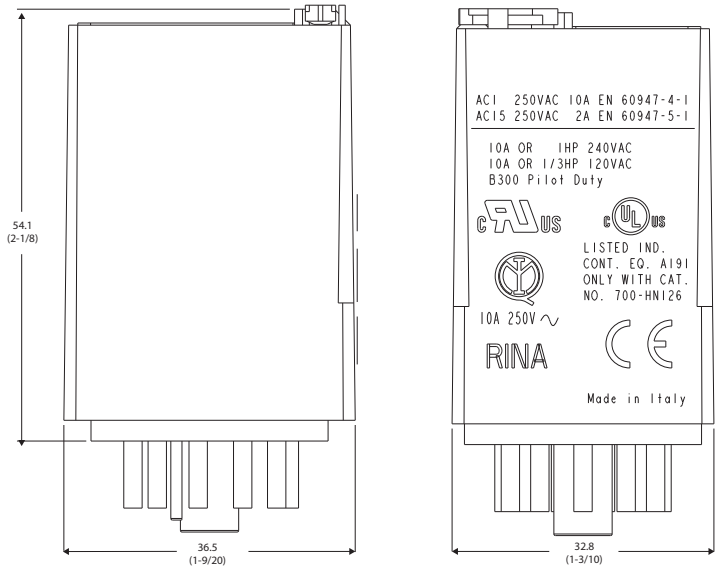
8. Signal On and Signal Off Watchdog Monitor

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) energize immediately and the time delay (t) begins. If the signal is opened before the time delay is complete, the relay remains energized and the time delay is reset. When the time delay is complete the contacts return to their shelf state. If the signal is opened after the time delay is complete, the relay contacts energize immediately and the same time delay begins. Continuous cycling of the signal at a rate that is faster than the time delay will cause the relay contacts to remain energized. Contacts return to their shelf state when power is removed.

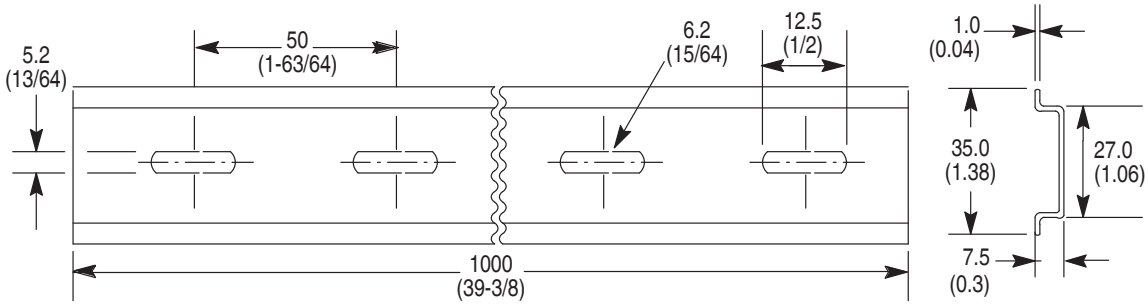


Approximate Dimensions

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



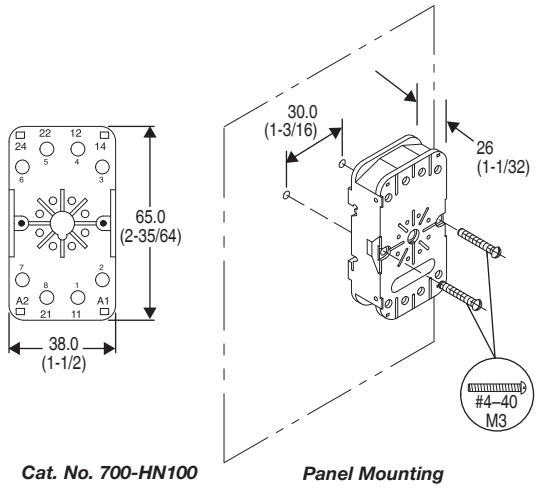
Bulletin 700-HA Relay



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

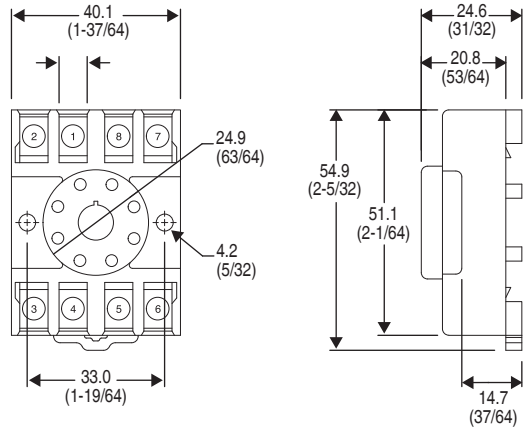
Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lb) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lb) (5/pkg)

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



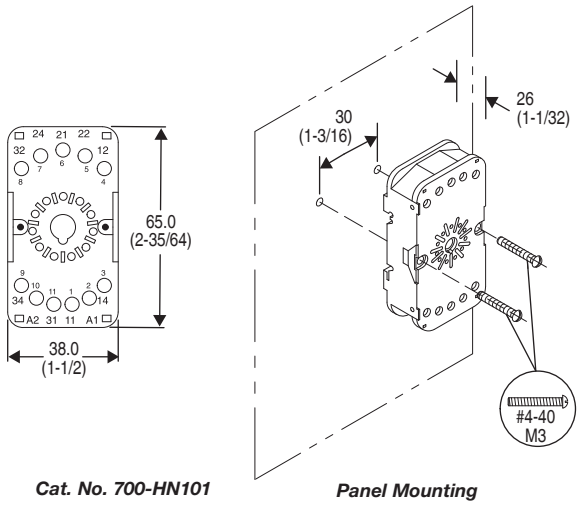
Cat. No. 700-HN100 ***Panel Mounting***

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2-14 AWG… #2-20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



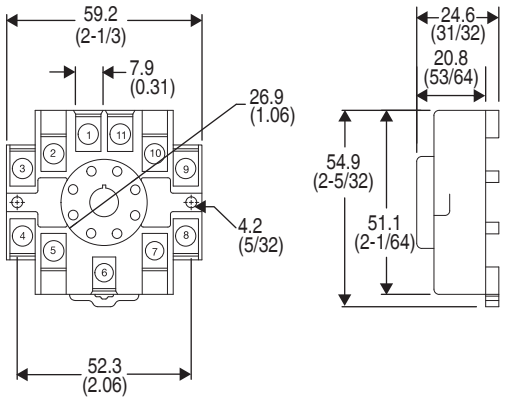
Cat. No. 700-HN125

Wire Size: 2 x 2.5 mm²
Single Wire – Up to 12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN101 ***Panel Mounting***

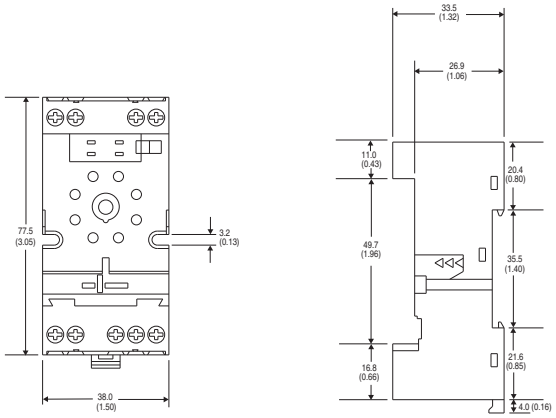
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN126

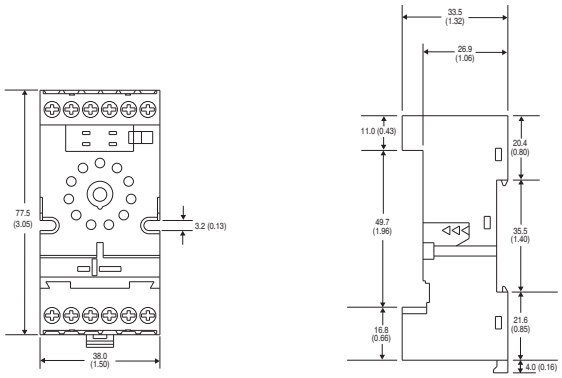
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)

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



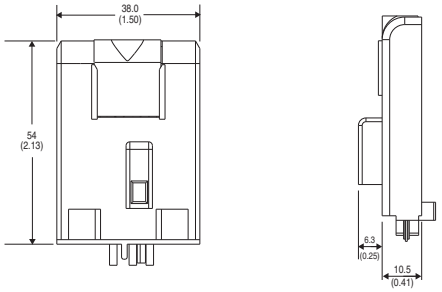
Cat. No. 700-HN204

Wire Size: 2 x 2.5 mm^2
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm^2 (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN205

Wire Size: 2 x 2.5 mm^2
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm^2 (#2–14 AWG …#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HT3

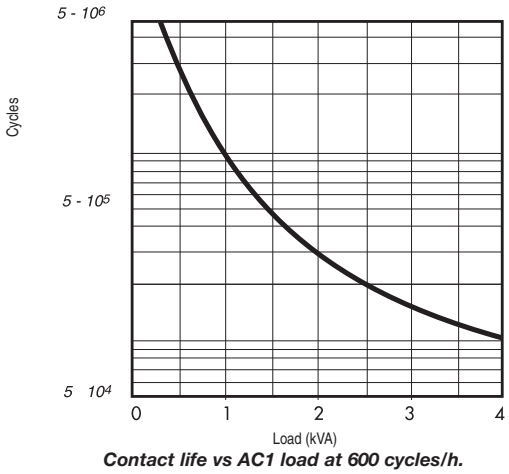
Wire Size: 2 x 1.5 mm^2 (#2 – 16 AWG…#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)

Specifications

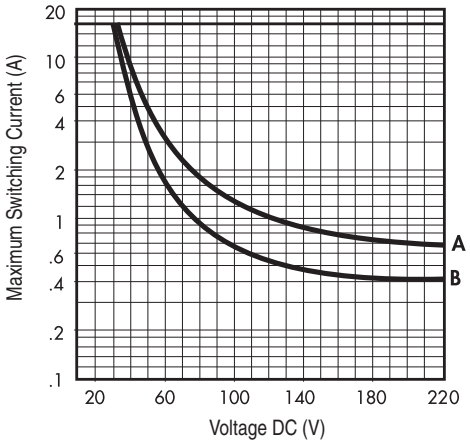
Cat. No. 700-HB…						
Electrical Ratings						
Pilot Duty Rating‡		NEMA B300				
Rated Thermal Current (I_{th})		15 A – 120V, 240V				
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA				
Contacts	Inductive	**Make**		**Break**		**Hp**
		►][◄		◄][►		
		2 -Pole	3 -Pole	2 -Pole	3 -Pole	
	120V AC	60 A	30 A	6 A	3 A	3/4
	240V AC	30 A	15 A	3 A	1.5 A	2
	General Purpose	15 A, 240V AC				
	Resistive	15 A, 30V DC				
Min. Low Energy Permissible Load		1000 mW (10V, 10 mA)				
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz				
		80…110% of Nominal Voltage at 60 Hz				
		80…110% of Nominal Voltage at DC				
Coil Consumption ±10%	AC Coils	**50 Hz**		**60 Hz**		
	Inrush	3.3 VA		2.85 VA		
	Sealed	2.2 VA		1.9 VA		
	DC Coils	1.3 W				
Max. Allowable Leakage		25% of VA				
		10% of W				
Max. Contact Resistance		50 mΩ				
Design Specification/Test Requirements Electrical						
Dielectric Withstand Voltage						
Pole-to-Pole		2500V				
Contact to Coil		4000V				
Mechanical						
Degree of Protection (Open Type) IEC 529		IP 40				
Mechanical Life Cycles (AC/DC)		> 10 x 10^6/30 x 10^6				
Switching Frequency Operations		3600/HR				
Coil Voltages		See Overview/Product Selection				
Operating Time (ms)	Pickup	20 ms				
	Dropout	4 ms				
Maximum Operating Rate		4 Ops/s				
Vibration	Endurance	5 G				
	Operational	1.5 G				
Shock	Endurance	50 G				
	Operational	15 G				
Environmental						
Temperature	Operating	AC/DC		–40…+70 °C		
	Storage	AC/DC		–40…+100 °C		
Altitude		2000 m (6560 ft)				
Construction						
Insulating Material		Molded High Dielectric Material				
Enclosure		Transparent Dust Cover				
Contact Material		AgCdO				
Terminal Markings on Socket		In accordance with EN50 0005				
Sockets		700-HN153, -HN154				
Certifications		cURus Recognized (File No. E3125, Guide NLDX2/NLDX8), cULus Listed when used with Bulletin 700-HN sockets noted above (File No. E3125, Guide NLDX/NLDX7), CE Marked, CSA Certified, UR Certified (File No. 229473)				
Standards		UL508, CSA C22.2 No. 14, EN 61810-1				

‡ NEMA Rating Chart is in publication 700-SG003*

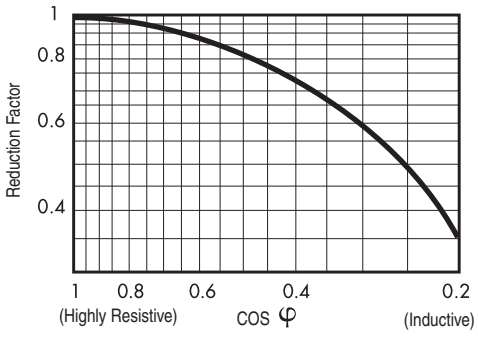
Technical Data



Contact life vs AC1 load at 600 cycles/h.



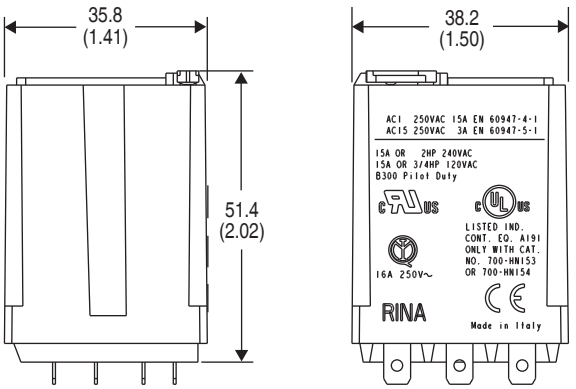
Breaking capacity for DC1 load at 600 cycles/h.
Load applied to 1 contact.
A = for N.O. types
B= other types



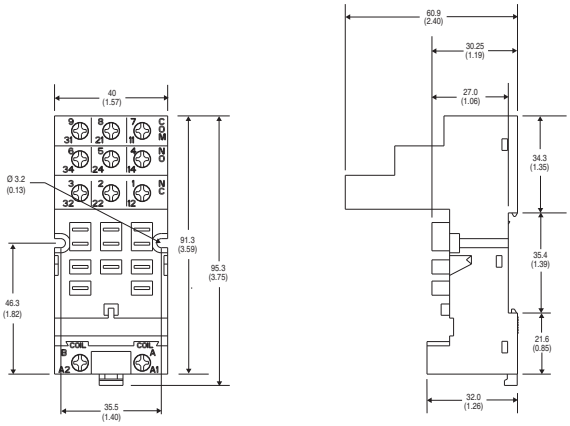
Load Reduction factor vs cos ϕ

Approximate Dimensions

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



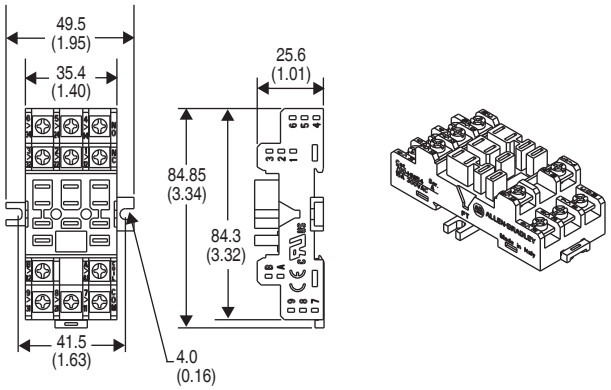
Bulletin 700-HB Relay



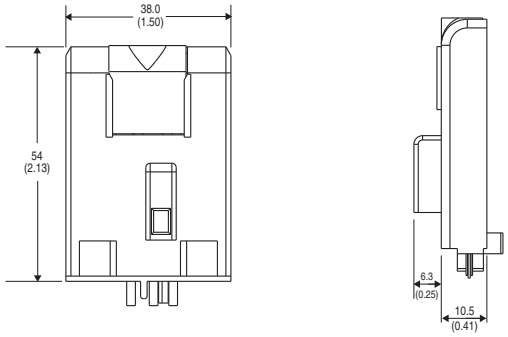
Cat. No. 700-HN153
Wire Size: 2 x 2.5 mm^2
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm^2 (#2–14 AWG... #2-20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)

Approximate Dimensions

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



Cat. No. 700-HN154
Wire Size: 2 x 2.5 mm^2
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm^2 (#2–14 AWG... #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HT3
Wire Size: 2 x 1.5 mm^2 (#2–16 AWG...#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)

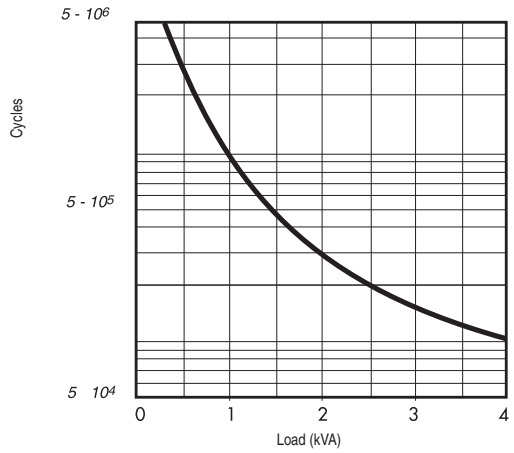
Specifications

Cat. No. 700-HD…						
Electrical Ratings						
Pilot Duty Rating‡		NEMA B300				
Rated Thermal Current (I_{th})		15 A§ – 120V 15 A§ – 240V				
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA				
Contacts	Inductive	**Make** ►][◄		**Break** ◄][►		**Hp**
		2-Pole	3-Pole	2-Pole	3-Pole	
	120V AC	60 A	30 A	6 A	3 A	3/4
	240V AC	30 A	15 A	3 A	1.5 A	2
	General Purpose	15 A, 240V AC				
	Resistive	15 A, 30V DC				
Min. Low Energy Permissible Load		1000 mW (10V, 10 mA)				
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC				
Coil Consumption ±10%	AC Coils	**50 Hz**		**60 Hz**		
	Inrush	3.3 VA		2.85 VA		
	Sealed	2.2 VA		1.9 VA		
	DC Coils	1.3 W				
Maximum Contact Resistance		50 mΩ				
Must Dropout Voltage		20% of Nominal V AC 10% of Nominal V DC				
Design Specification/Test Requirements						
Electrical						
Dielectric Withstand Voltage						
Pole-to-Pole		2500V				
Contact to Coil		4000V				
Mechanical						
Degree of Protection (Open Type) IEC 529		IP 40				
Mechanical Life Cycles (AC/DC)		> 10 x 10^6 / 30 x 10^6				
Switching Frequency Operations		3600/HR				
Coil Voltages		See Overview/Product Selection				
Operating Time	Pickup	20 ms				
	Dropout	4 ms				
Maximum Operating Rate		4 Ops/s				
Minimum Low Energy Permissible Load		1000 mN (10V, 10mA)				
Environmental						
Temperature	Operating	–40…+70 °C				
	Storage	–40…+100 °C				
Altitude		2000 m (6560 ft)				
Construction						
Insulating Material		Molded High Dielectric Material				
Enclosure		Transparent Dust Cover				
Contact Material		Silver Cad. Ox.				
Terminal Markings		In accordance with EN50 0005				
Certifications		cURs Recognized (File No. E3125, Guide NLDX2/NLDX8), CSA Certified (File No. 229473), CE Marked, UR Certified				
Standards		UL 508, CSA C22.2 No. 14, EN 61810-1				

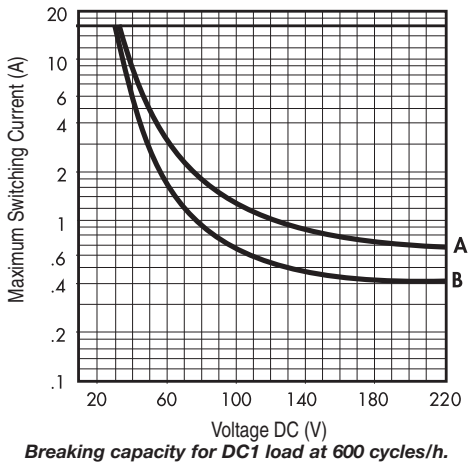
‡ NEMA Rating Chart is on page 19 of publication 700-SG003*

§ 3-pole relays have a 20 A maximum total current rating for all three poles.

Note: Bulletin 700-HD wiring terminals are the quick connect/solder type 4.7 x 0.5 mm (0.187 x 0.020 in.) termination.

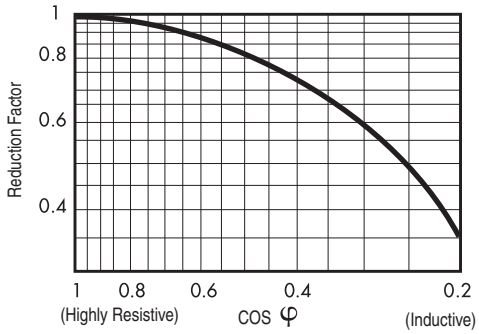


Contact life vs AC1 load at 600 cycles/h.



Breaking capacity for DC1 load at 600 cycles/h.

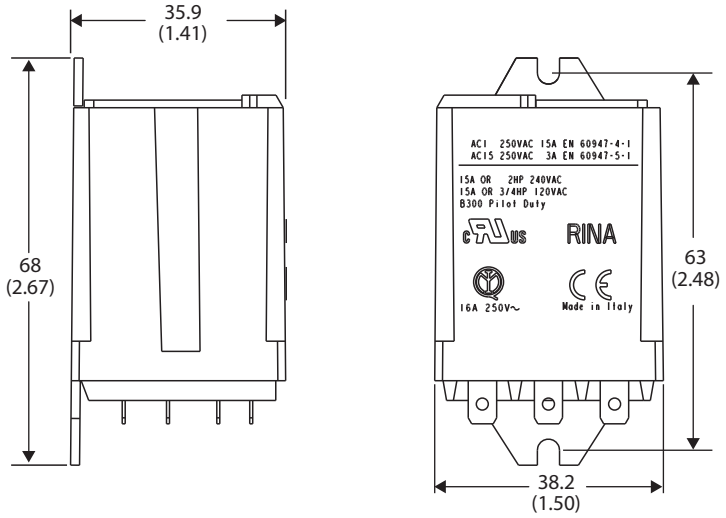
Load applied to 1 contact.
A = for N.O. types
B= other types



Load Reduction factor vs cos ϕ

Approximate Dimensions

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



Bulletin 700-HD Relay

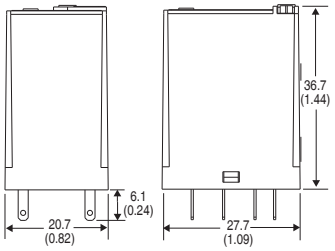
Specifications

Cat. No. 700-HC…								
Electrical Ratings								
Pilot Duty Rating ‡			NEMA C300, R300					
Rated Thermal Current (I_{th})			7 A and 10 A					
Rated Insulation Voltage (U_i)			250V IEC – 300V UL/CSA					
Contacts		Inductive	**700-HC_4**		**Hp**	**700-HC22**		**Hp**
			►][◄	◄][►		►][◄	◄][►	
		120V AC	15 A	1.5 A	1/8	15 A	1.5 A	1/3
		240V AC	7.5 A	0.75 A	1/3	7.5 A	0.75 A	3/4
		General Purpose	7 A, 277V AC			10 A, 277V AC		
		Resistive	7 A, 30V DC			10 A, 24V DC		
Min. Low Energy Permissible Load			100 mW (10V, 10 mA) - Silver Contacts 50 mW (5V, 10 mA or 25V, 2 mA) - Gold Contacts					
Permissible Coil Voltage Variation			Pickup:	80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		Must Dropout Voltage:	20% of Nominal Voltage at AC 10% of Nominal Voltage at DC	
			50 Hz			**60 Hz**		
Coil Consumption ±10%	AC Coils	Inrush	2.2 VA			1.6 VA		
		Sealed	1.3 VA			1.1 VA		
	DC Coils		1.0 W					
Max. Allowable Leakage			20% of VA (AC)					
			10% of W (DC)					
Design Specification/Test Requirements								
Electrical								
Dielectric Withstand Voltage		Pole-to-Pole	2000V					
		Contact to Coil	4000V					
Electrical Life (Cycles)			100 000 minimum					
Mechanical								
Degree of Protection (Open Type) IEC 529			IP 20 (Guarded Terminal Sockets)					
Mechanical Life Cycles			20 x 10^6 (AC) 50 x 10^6 (DC)					
Switching Frequency Operations			1800/HR					
Coil Voltages			See Product Selection					
Operating Time (ms)		Max. Pickup	10					
		Max. Dropout	3					
Maximum Operating Rate			8 cycles/s					
Environmental								
Temperature		Operating	–30…+55 °C					
			(–22…+131 °F)					
		Storage	–55…+85 °C					
			(–67…+185 °F)					
Altitude			2000 m (6560 ft)					
Insulating Material			Molded High Dielectric Material					
Enclosure			Transparent Dust Cover					
Contact Material			AgNi (700-HC2) AgNi + 5 µm All (700-HC1)					
Terminal Markings on Socket			In accordance with EN50 0005					
Sockets			700-HN103, -HN128, -HN104					
Certifications			cURus Recognized (File No. E14843, Guide NRNT2/NRNT8), cULus Listed when used with Bulletin 700-HN103, -HN104, and -HN128 sockets (File No. E14843, Guide NRNT/NRNT7), CE Marked, LR Certified					
Standards			UL 508, CSA 22.2 No. 14, EN 61810-1					

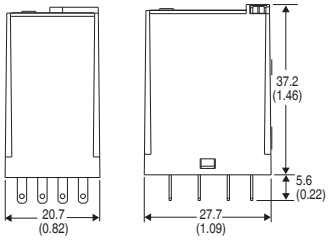
‡ NEMA Rating Chart is in publication 700-SG003*

Approximate Dimensions

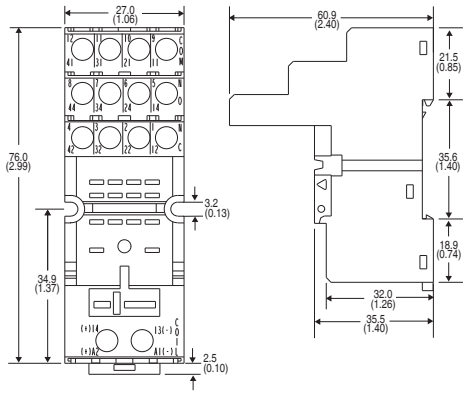
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HC Relay (Two-Pole)

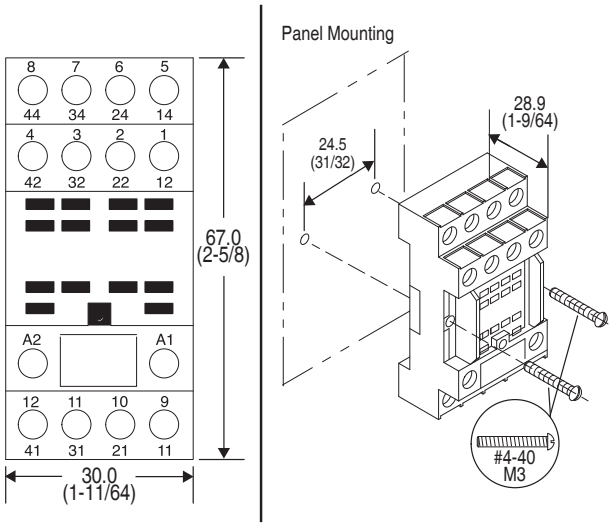


Bulletin 700-HC Relay (Four-Pole)



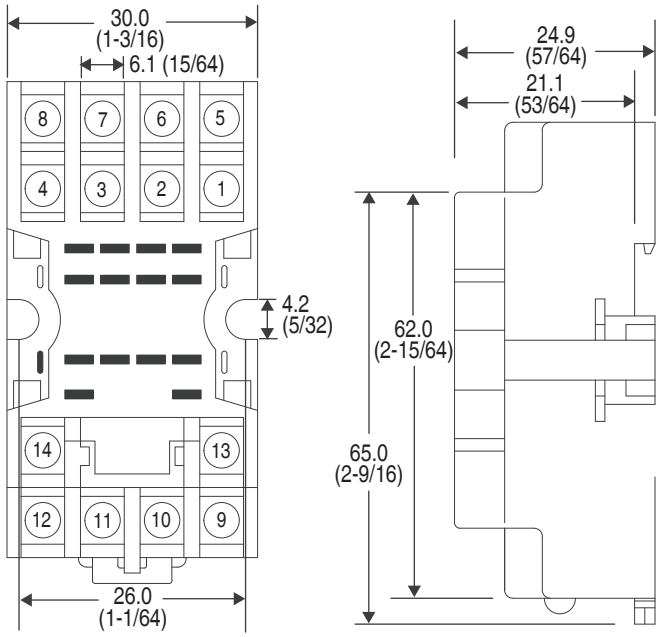
Cat. No. 700-HN104

Single Wire: 0.2 mm^2…2.5 mm^2 (#24 AWG…14 AWG)
Double Wire: 2 x 0.2 mm^2…2 x2.5 mm^2 (2 x 24 AWG…2 x 14 AWG)
Wire Type: solid or stranded, copper only
Strip Length: 7 mm (9/32 in.), Torque: 0.5 N•m (4.4 lb•in)



Cat. No. 700-HN103

Single Wire: 0.2 mm^2…2.5 mm^2 (#24 AWG…14 AWG)
Double Wire: 2 x 0.2 mm^2…2 x 1.5 mm^2 (2 x 24 AWG…2 x 16 AWG)
Wire Type: Solid or Stranded, Copper only
Strip Length: 8 mm (5/16 in.), Torque: 0.5 N•m (4.4 lb•in)



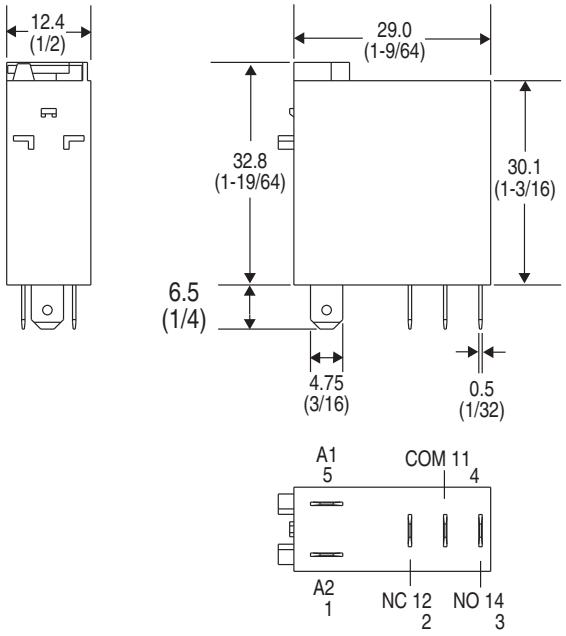
Cat. No. 700-HN128

Wire Size: 2 x 1.5mm^2 (#2-16 AWG…#1-20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Toque: 0.8 N•m (7 lb•in)

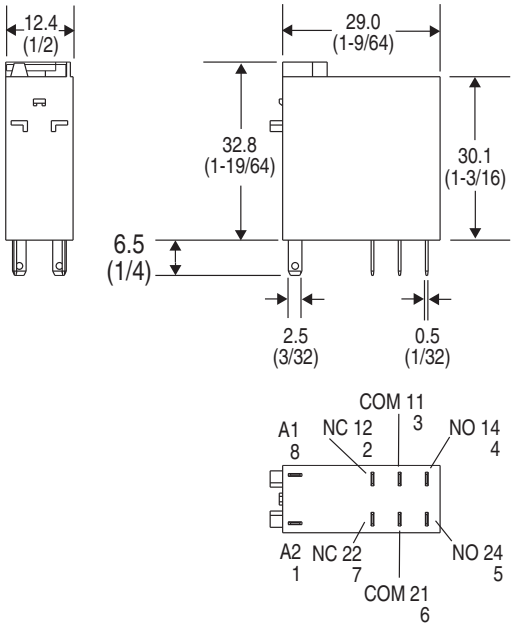
		Cat. No. 700-HK...			
Electrical Ratings					
Rated Thermal Current (I_{th})		1-Pole, 1 CO, SPDT — 16 A		2-Pole, 2 CO, DPDT — 8 A	
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA			
Contacts	Inductive V AC	120V AC	AC-15, 6.2 A B300 Pilot Duty, 3 A A300 (700-HKM_) 1/3 Hp (0.24 kW) 1-phase	120V AC	AC-15, 2.9 A B300 Pilot Duty, 3.0 A 1/4 Hp (0.18 kW), 1-phase
		240V AC	AC-15, 3.1 A B300 Pilot Duty, 1.5 A A300 (700-HKM_) 3/4 Hp (0.55 kW), 1-phase	240V AC	AC-15, 1.4 A B300 Pilot Duty, 1.5 A 1/2 Hp (0.37 kW), 1-phase
		230V AC	0.55 kW, 1-phase	230V AC	0.37 kW, 1-phase
	Inductive V DC	24V DC	DC-13, 5.0 A	24V DC	DC-13, 3.0 A
		125V DC	DC-13, 0.2 A R300 Pilot Duty, 0.22 A	125V DC	DC-13, 0.2 A R300 Pilot Duty, 0.22 A
		250V DC	DC-13, 0.1 A R300 Pilot Duty, 0.11 A	5 A, 250V AC	DC-13, 0.1 A R300 Pilot Duty, 0.11 A
	Resisitive	230V AC	AC-1, 16 A	230V AC	AC-1, 8 A
		277V AC	16 A, General Use	277V AC	8 A, General Use
	Make, Break & Continuous	30V DC	DC-1, 12 A 10 A, Resistive	30V DC	DC-1, 6 A 6 A, Resistive
Min. Permissible Contact Ratings		300 mW (5V/60 mA or 60V/5 mA) for AgNi Contacts (700-HK3_) 50 mW (5V/10 mA or 25V/2 mA) for AgNi + Gold Contacts (700-HKX_) 500 mW (100V/5 mA or 5V/100 mA) for $AgSnO_2$ Contacts (700-HKM_)			
Permissible Coil Voltage Variation	Pickup: holding Voltage: Must Dropout Voltage:	80…110% of Nominal Voltage at 50/60 Hz, 73...110% of Nominal Voltage at DC 80% of Nominal V AC at 50/60 Hz, 40% of Nominal V DC 20% of Nominal V AC at 50/60 Hz, 10% Nominal V DC			
Power Consumption		1.2V A (V AC Coils), 0.5 W (V DC Coils)			
Coil Voltages		See Overview/Product Selection			
Design Specification/Test Requirements					
Dielectric Withstand Voltage	Pole to Pole (VRMS)	2000V AC			
	Contact to Coil (VRMS)	4000V AC			
Mechanical					
Degree of Protection		IP 20 (guarded terminal sockets), RT II — Flux-proof (Relay)			
Mechanical Life Operations		10×10^6			
Electrical Life Cycles		230V AC, 16 A Resistive: 100 000 min. 277V AC, 16 A Resistive: 30 000 min. 30V DC, 10 A Resisitive: 30 000 min. B300, R300, Hp (kW): 6000 min. A300 (700-HKM_): 100,000 min.		230V AC, 8 A Resistive: 100 000 min. 277V AC, 8 A Resistive: 30 000 min. 30V DC, 6 A Resistive: 30 000 min. B300, R300, Hp (kW): 6000 min.	
Switching Frequency		Mechanical: 18,000 cycles/hr. Electrical: 900 cycles/hr.			
Operating Time at Nominal Voltage at 20 °C (ms)	Pickup	15 ms max.			
	Dropout	5 ms max.			
Vibration	Operational	10…2000 Hz, 0.76 mm (0.03 in.) 2.5 G			
	Non-Operational	10…2000 Hz, 0.76 mm (0.03 in.) 5.0 G			
Shock	Operational	15 G			
	Non-Operational	50 G			
Environmental					
Temperature	Operating	–40…+70 °C (–40…+158 °F)			
	Storage	–40…+85 °C (–40…+185 °F)			
Altitude		2000 m (6560 ft)			
Construction					
Insulating Material		Molded High Dielectric Material			
Enclosure		Transparent Dust Cover			
Contact Material		700-HK3_: Silver nickel (AgNi); 700-HKX_: Silver Nickel + Gold Plating (AgNi + Au); 700-HKM_: Silver Tin Oxide ($AgSnO_2$)			
Terminal Markings on Socket		In accordance with EN 50005			
Sockets		**1-Pole**		**2-Pole**	
	Screw Terminal	700-HN121 (10 A @ 70 °C) 700-HN221 (16 A @ 50 °C, 12 A @ 70 °C)		700-HN122 (2 x 5 A @ 70 °C) 700-HN222 (2 x 8 A @ 70 °C)	
	Spring Clamp (Available September 2006)	700-HN223 (15 A @ 40 °C with 2 conductors per terminal) (10 A @ 70 °C with 1 conductor per terminal)		700-HN224 (2 x 8 A@ 70 °C)	
Approvals					

Approximate Dimensions

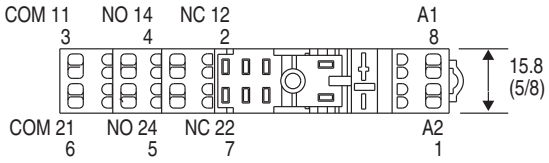
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



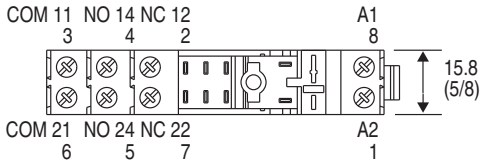
Cat. No. 700-HK36_ (SPDT)



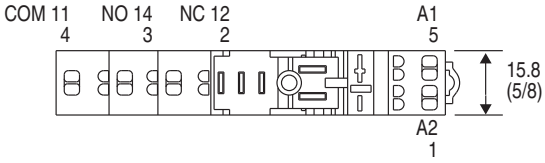
Cat. No. 700-HK32_ (DPDT)



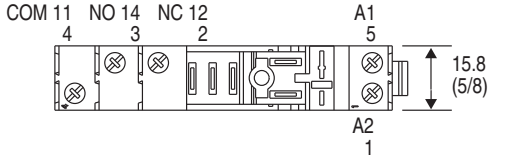
Cat. No. 700-HN224



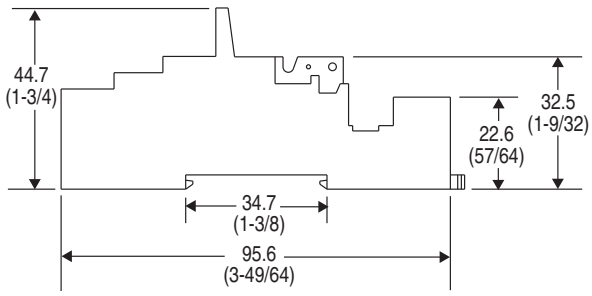
Cat. No. 700-HN222



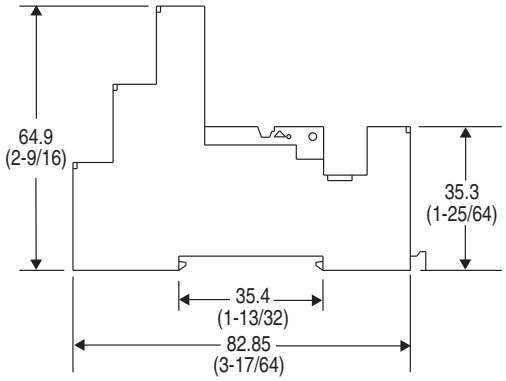
Cat. No. 700-HN223



Cat. No. 700-HN221

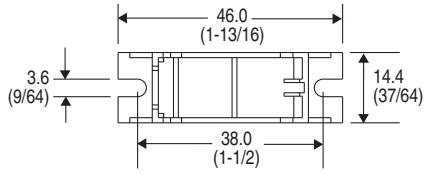


Cat. No. 700-HN223, 700-HN224
Wire Size: 0.2 mm^2...1.5 mm^2 (#24 AWG....#14 AWG)
Either Solid or Stranded
Strip Length: 8 mm (5/16 in)

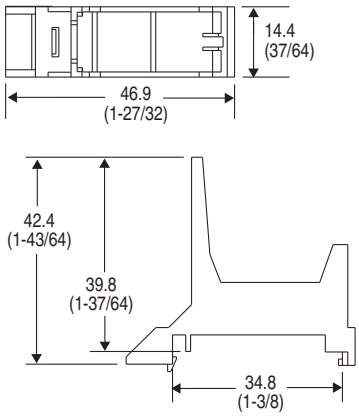


Cat. No. 700-HN221, 700-HN222
Wire Size: 0.2 mm^2...2.5 mm^2 (#24 AWG....#12 AWG)
Either Solid or Stranded
Strip Length: 8 mm (5/16 in), Torque: 0.8Nm (7.0 lb.-in.)

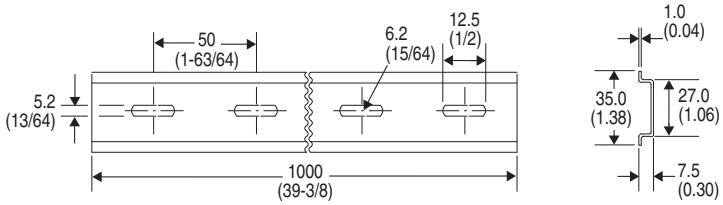
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Cat. No. 700-HN226

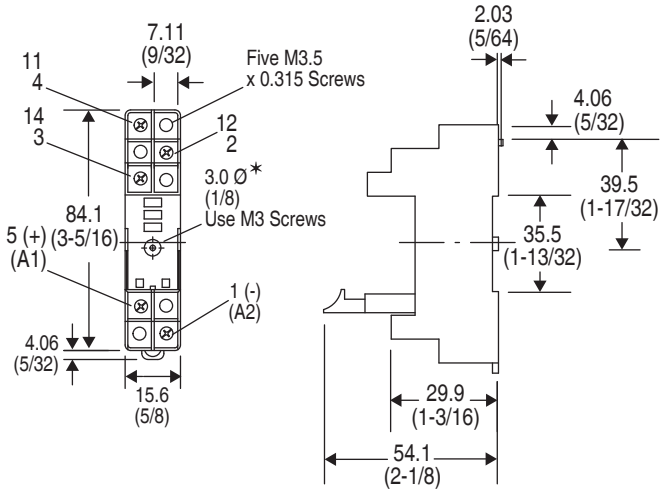


Cat. No. 700-HN227

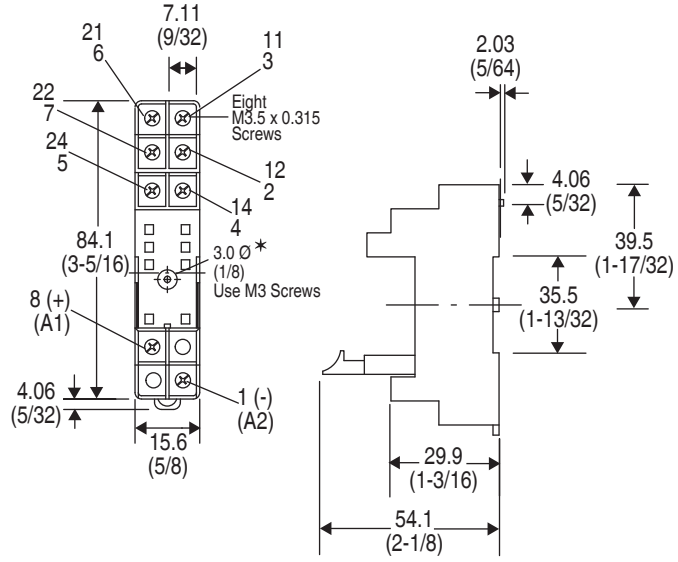


Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes
Cat. No. 199-DR1 DIN Mounting Rail Series B

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)



Cat. No. 700-HN121
Wire Size: 2 x 2.5 mm² Single Wire – Up to #14 AWG Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG) (Either Solid or Stranded) Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN122
Wire Size: 2 x 2.5 mm² Single Wire – Up to #14 AWG Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG) (Either Solid or Stranded) Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb•in)

★ Holes required for mounting [3 mm (1/8 in.) diameter].

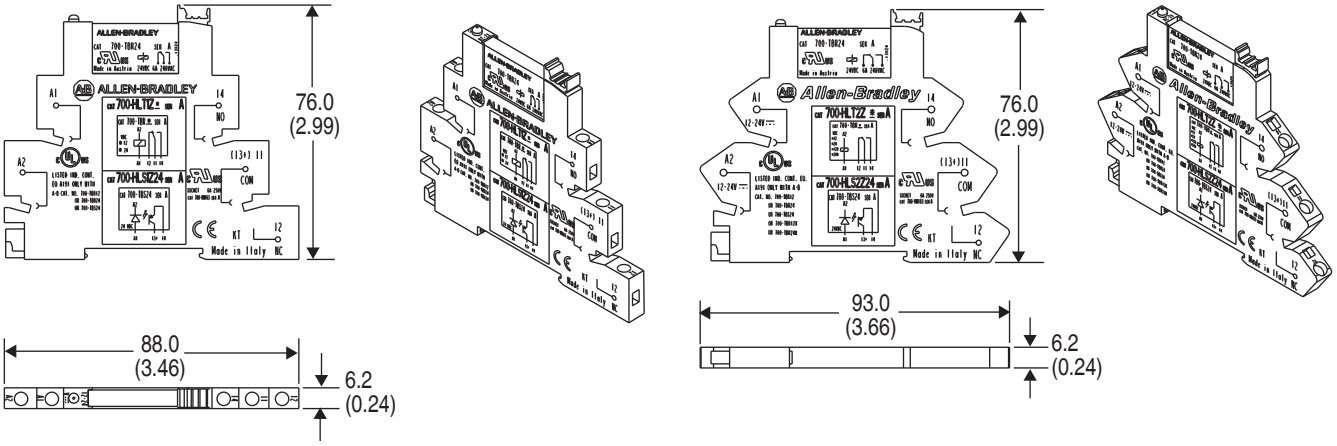
Cat. No. 700-HLT… (Relay Output)							
Electrical Ratings							
Pilot Duty Rating	B 300, R 300						
Rated Thermal Current (I_{th})	1-Pole — 6 A						
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA						
Contacts	Inductive	1-Pole					
	24V AC, 1-phase	30 A	►][◄	5 A	◄][►		
	120V AC, 1-phase	30 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	EN 61810-1, 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)					

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 ±10% (24V) 4 mA ±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 µA (@U = 24V)				
Power Consumption ±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 µs (DC only input voltage), 7 ms (AC/DC input voltage)				
	Drop Out Time	350 µs (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 61810-1					
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)				

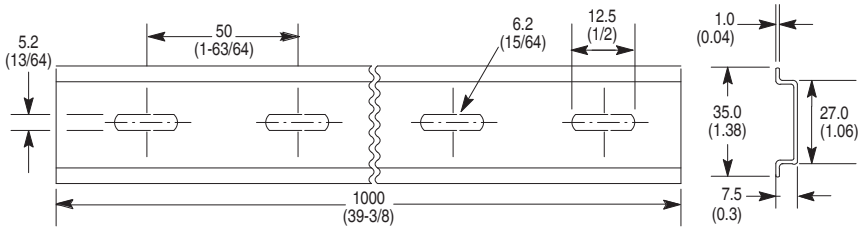
★ Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

Approximate Dimensions

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



Bulletin 700-HL 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.)



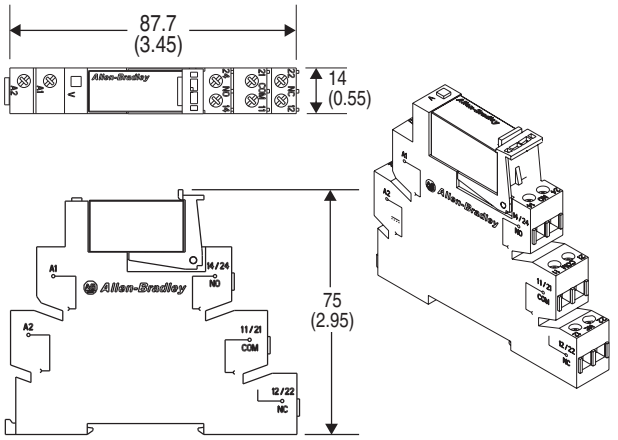
Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

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)

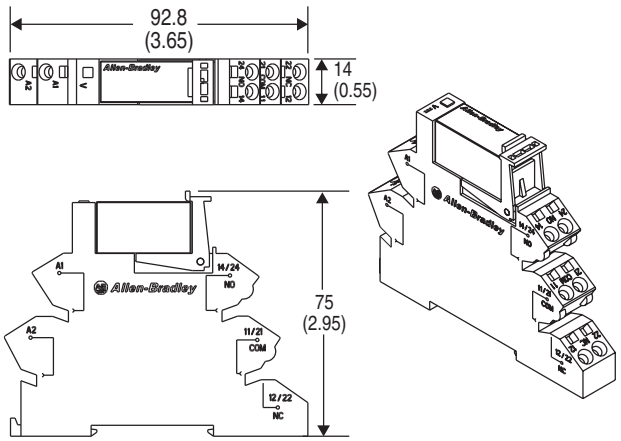
Cat. No. 700-HLT…2-Pole (Relay Output)							
Electrical Ratings							
Rated Thermal Current (I_{th})		2-Pole — 10 A					
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA					
Contacts	Inductive V AC UL	120V AC	AC-15, 3.0A B 300, 3.0 A	1/4 HP (186 W), 1-phase			
		240V AC	AC-15, 3.0 A B 300, 1.5 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 ±10%	AC	N/A	0.5V A	N/A	0.4V A	0.8V A	
	DC	0.4 W	0.5 W	0.8 W	0.5 W	0.7 W	
Mechanical							
Degree of Protection		IP20					
Mechanical Life Operations		3×10^7					
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 61810-1					

Approximate Dimensions

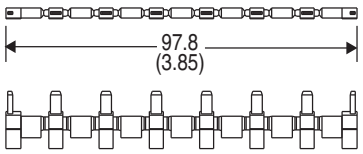
Approximate dimensions are shown in millimeters (inches). Approximate dimensions are not intended to be used for manufacturing purposes.



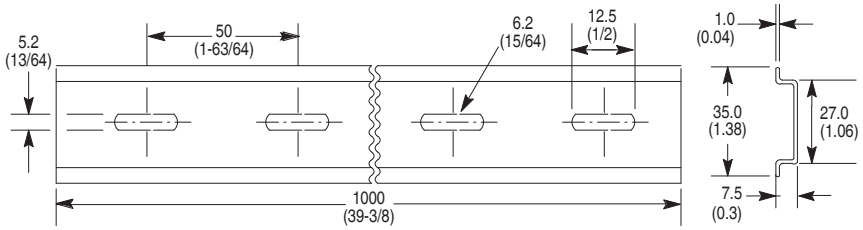
Bulletin 700-HL Screw Terminal Design
Single Wire: 0.14 mm^2…2.5 mm^2 (#26 AWG…14 AWG)
Double Wire: 2 x 0.14 mm^2…2 x 1.5 mm^2 (2 x #26 AWG…2 x 16 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in). Torque: 0.5 N•m (4.4 lb•in)



Bulletin 700-HL Spring Terminal Design
Single Wire: 0.2 mm^2…2.5 mm^2 (#24 AWG…#14 AWG)
Wire Type: Solid or stranded, copper only
Strip Length: 9 mm (11/32 in)



Bulletin 700-TBJ08_ 8-Way Jumper

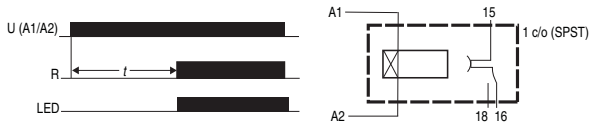


Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

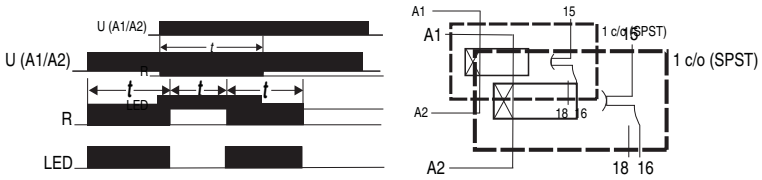
Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lb) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lb) (5/pkg)

Function and Connection Diagrams

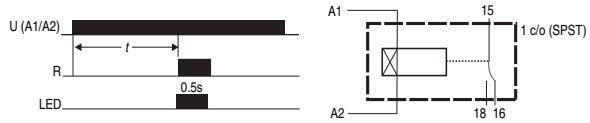
On-Delay



One Shot



Pulse



Flasher

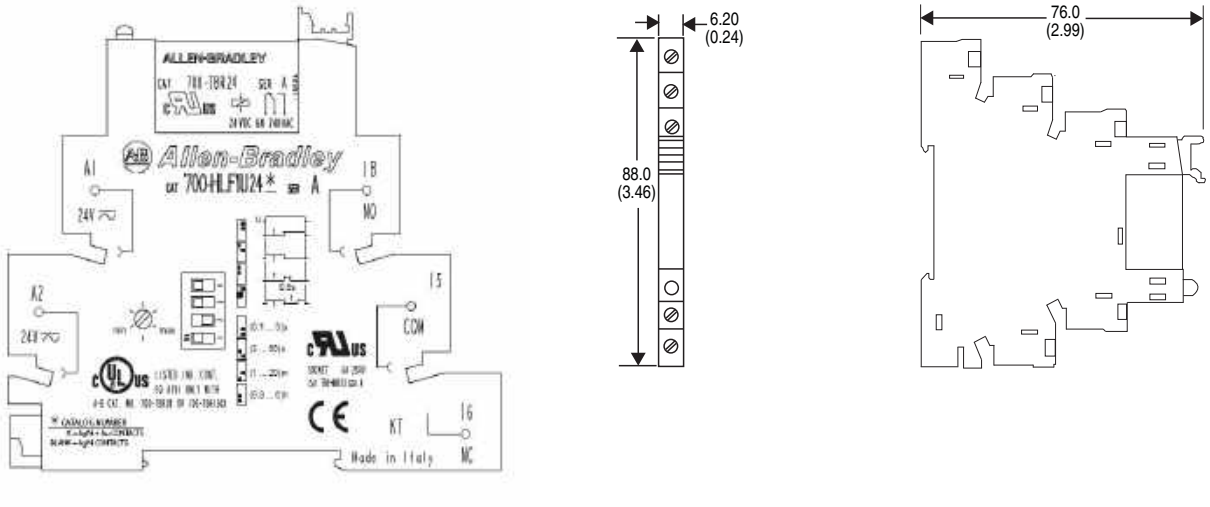
Specifications

Cat. No. 700-HLF… (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/DC	0.5 VA			
Design Specification/Test Requirements					
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1000V			
	Contact to Coil (VRMS)	4000V			
Input Voltage	24V AC/DC				
Impedance (Ohms)	2 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				
Timer Functions	On-Delay, One Shot, Pulse and Flasher				
Timer Settings	0.1...3 s, 3...60 s, 1...20 min, and 0.3...6 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			
	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				
Standards	EN60947-4-1,EN60947-5-1,CSA 22.2,UL 508,NEMA IEE MAC Compliant, ICS-2 Compliant				

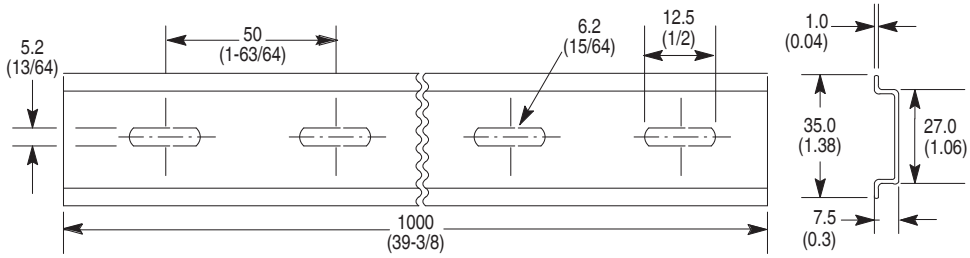
‡ Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

Approximate Dimensions

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



Bulletin 700-HLF Screw Terminal Design
Single Wire: 0.14 mm^2…2.5 mm^2 (#26 AWG…14 AWG)
Double Wire: 2 x 0.14 mm^2…2 x 1.5 mm^2 (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	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-HP Pin Style (PCB) Slim Line Relay, Socket, and Retainer Clip Reference Chart

Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HPX2	700-HN123	700-HN119
700-HP32	700-HN123	700-HN119
700-HPS2	700-HN123	700-HN119
700-HPSX	700-HN123	700-HN119

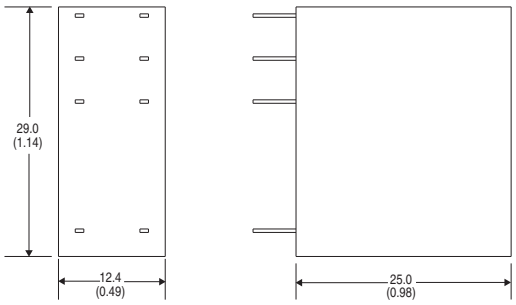
Specifications *

Cat. No. 700-HP…			Cat. No. 700-HP3…, 700-HPX	Cat. No. 700-HPS…
Contacts	Inductive	V AC	AC 15 @ 500V AC	
			C300	B300
			1/3 Hp @ 240V AC	1/2 Hp @ 240V AC
			1/6 Hp @ 120V AC	1/3 Hp @ 120V AC
			AC-1 2000VA	
		V DC	R300	—
			DC-1: 8A @ 30V DC	
			DC-1: 0.3A @ 110V DC	DC-1: 0.65A @ 110V DC
			DC-1: 0.1A @ 220V DC	DC-1: 0.2A @ 220V DC
	Resistive	AC	8 A @ 277V AC (per pole)	
		DC	8 A @ 30V DC (per pole)	
	Minimum Load		700-HP32: 300mW (5V, 5 mA) 700-HPX2: 50mW (5V, 5 mA)	700-HPS2: 500 mW (10V, 10 mA) 700-HPSX: 50 mW (5V, 5 mA)
Nominal Coil Power (AC/DC)			1.2 VA / 0.65 W	0.7 W
Operating Range (AC/DC)			80...110% / 73...150% Nominal Voltage	75...120% Nominal Voltage DC
Holding Voltage (AC/DC)			80 / 40% Nominal Voltage	40% Nominal Voltage DC
Must Drop Out Voltage (AC/DC)			20 / 10% Nominal Voltage	10% Nominal Voltage DC
Insulation Voltage			250V AC	
Design Specification/Test Requirements			**700-HP3, 700-HPX**	**700-HPS**
Dielectric Withstand Voltage for one minute	Pole to Pole (VRMS)		2000V AC	
	Contact to Coil (VRMS)		4000V AC	
Mechanical				
Degree of Protection			Open Type (Sockets)	
Mechanical Life Cycles			10×10^6 (AC Coils), 20×10^6 (DC coils)	10×10^6 (DC Coils)
Switching Frequency Operations			1800/hr (no load)	900/hr (no load)
Coil Voltages			See Overview/Product Selection	
Operating Time at Nominal Voltage at 20 °C (ms)	Pickup		12	10
	Dropout		4	
Maximum Operating Rate			16 Ops/s (full load)	8 Ops/s (full load)
Vibration	Enclosure		5 G	
	Fragility		2.5 G	
Shock	Endurance		50 G	
	Fragility		15 G	
Max. Socket Torque			0.5 N•m (4.4 lb•in)	
Environmental				
Temperature	Operating		–40…+85 °C	–40…+70 °C
	Storage		–45…+100 °C	–50…+80 °C
Altitude			2000 m (6560 ft)	
Construction				
Insulating Material			Molded High-Dielectric Material	
Enclosure			Transparent Dust Cover	Red Transparent Dust Cover
Contact Material			Silver Nickel, (AgNi) (700-HP32 and 700-HPS2), Silver Nickel + Gold Plating (AgNi + Au) (700-HPX2 and 700-HPSX)	
Terminal Markings on Socket			In accordance with EN50 0005	
Sockets			2-Pole	
			700-HN123	
Approvals				
Certifications			cURus Recognized (File No. E3125, Guide NLDX2/NLDX8), cULus Listed when used with Bulletin 700-HN123 socket (File No. E3125, Guide NLDX/NLDC7), CSA Certified (files 229473), CE Marked, LR Certified (700-HP), IMQ & TUV Certified (700-HPS)	
Standards			UL 508, CSA 22.2 No. 14, EN 61810-1, EN 50205 (700-HPS)	

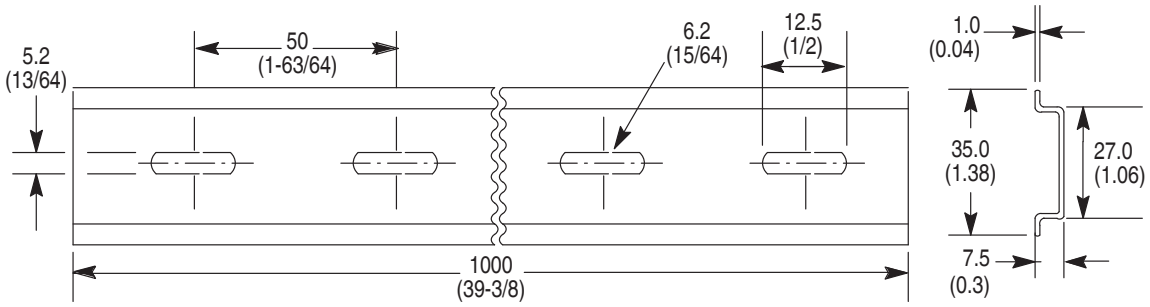
‡ NEMA Rating Chart is in publication 700-SG003*
§ The inrush VA equals 1.5 times the sealed VA.

Approximate Dimensions

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



Bulletin 700-HP Relay



Cat. No. 700-HN123

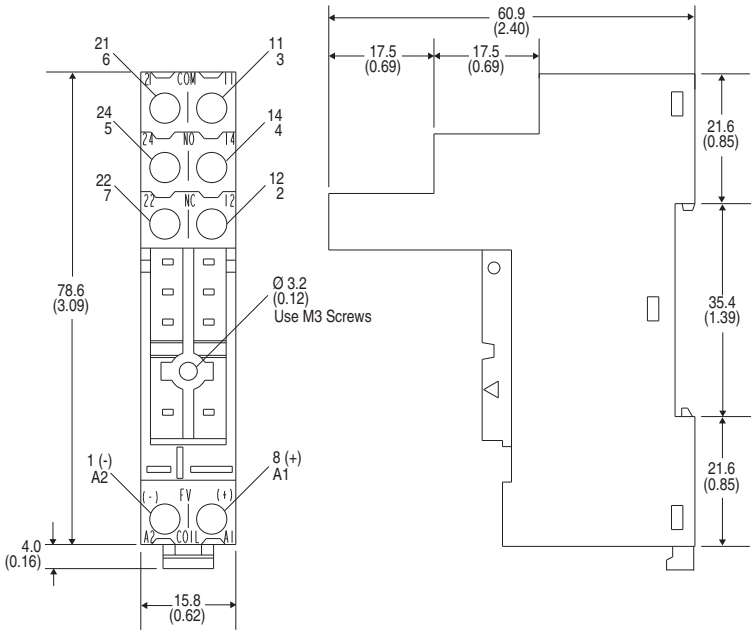
Single Wire: 0.2.....2.5 mm^2 (#24.....14 AWG)

Double Wire: 2 X 0.2.....2 X 2.5 mm^2 (#2 X 24....2 X 14 AWG)

Wire Type: solid or stranded, copper only

Strip Length: 7 mm (9/32 in.), Torque: 0.5 N•m (4.4 lb•in)

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)



Cat. No. 700-HN123

Single Wire: 0.2.....2.5 mm^2 (#24.....14 AWG)

Double Wire: 2 X 0.2.....2 X 2.5 mm^2 (#2 X 24....2 X 14 AWG)

Wire Type: solid or stranded, copper only

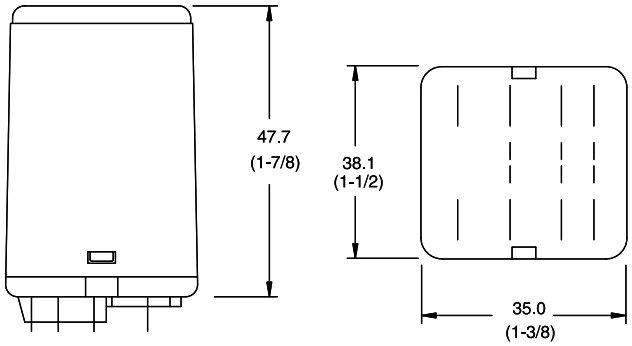
Strip Length: 7 mm (9/32 in.), Torque: 0.5 N•m (4.4 lb•in)

Specifications

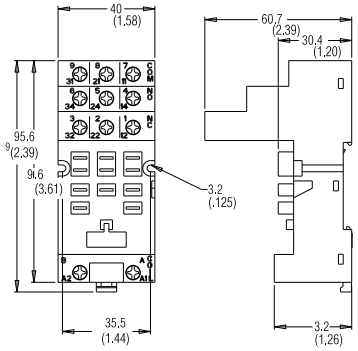
			Cat. No. 700-HJ…		
Electrical Ratings					
Pilot Duty Rating			—		
Rated Thermal Current (I^{th})			10 A		
Rated Insulation Voltage (U_i)			250V IEC, 300V UL/CSA		
Contacts		Inductive	**Make**	**Break**	**Hp**
			►][◄	◄][►	
		120V AC 240V AC	30 A 15 A	3 A 1.5 A	1/4 1/3
		DC	24V DC, 10 A		
Permissible Coil Voltage Variation			85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
			Single AC Coil	**Single DC Coil**	**Dual DC Coil**
Coil Consumption ±10%	AC Coils	Inrush Sealed	1.44 VA 1.44 VA	—	—
	DC Coils		—	1.2 W	12V 1.63 W 24V 1.67 W
Design Specification/Test Requirements					
Dielectric Withstand Voltage		Pole-to-Pole	1500V AC		
		Contact-to-Pole	1500V AC		
		Contact-to-Frame	1500V AC		
Mechanical					
Degree of Protection			Open Type (Guarded Terminal Sockets)		
Mechanical Life Operations			10×10^6		
Switching Frequency Operations			1800/HR		
Coil Voltages			See Product Selection		
Operating Time at Nominal Voltage at 20 °C		Pickup Dropout	25 ms 25 ms		
Maximum Operating Rate			—		
Environmental					
Temperature		Operating	–45…+50 °C (–49…+122 °F)		
		Storage	–45…+100 °C (–49…+212 °F)		
Altitude			2000 m (6560 ft.)		
Construction					
Insulating Material			Molded High Dielectric Material		
Enclosure			Transparent Dust Cover		
Contact Material			Silver Cad. Ox.		
Terminal Markings on Socket			In accordance with EN50 0005		
Sockets			11-Blade Socket Cat. No. 700-HN153 Cat. No. 700-HN154		
Certifications			CSA Certified, File LR700026, UL Recognized, File E3125, Guide NLDX 2		
Standards			UL 508, CSA 22.2 No. 14, EN/IEC 60947-4-1, -5-1		

Approximate Dimensions

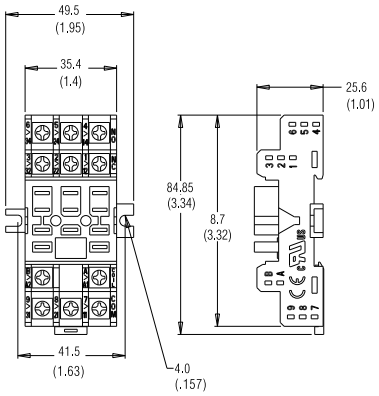
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



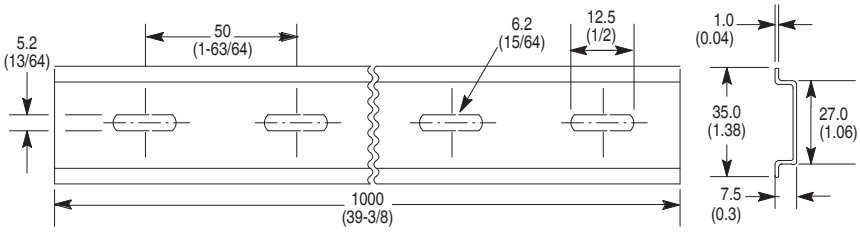
Bulletin 700-HJ Relay



Cat. No. 700-HN153
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG... #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN154
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG... #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) – Torque: 0.8 N•m (7 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	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 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

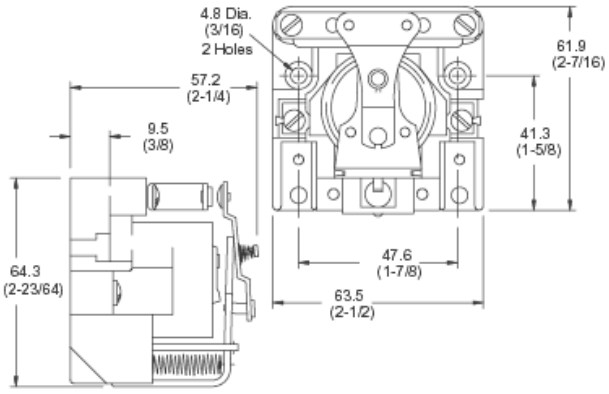
Specifications

Cat. No. 700-HG...												
Electrical Ratings												
Pilot Duty Rating ‡	A600											
Rated Thermal Current (I_{th})	40 A											
Rated Insulation Voltage (U_i)	600V UL											
Contact Ratings: AC Ratings SPST-NO-DM						**Contact Ratings**: AC Ratings SPDT, DPST - NO and DPDT						
Volts	Inductive			Resistive - Make/Break and Continuous	HP	Volts	Inductive			Resistive - Make/Break and Continuous	HP§	
	Make	Break	Continuous				Make	Break	Continuous			
120	60 A	6 A	10 A	40 A	2	120	60 A	6 A	10 A	40 A	1 - 1/2	
240	30 A	3 A	10 A	40 A		240	30 A	3 A	10 A	40 A		
480	15 A	1.5 A	10 A	12 A	2	480	15 A	1.5 A	10 A	5 A	1 - 1/2	
600	12 A	1.2 A	10 A	10 A		600	12 A	1.2 A	10 A	5 A		
DC Ratings: Without Magnetic Blowouts - 28V 40 A - Make, Break and Continuous Est Drop 125V 1.2...3 A												
DC Ratings: With Magnetic Blowouts:		SPST - NO - DM	SPDT, DPST - NO and DPDT									
Make, Break and Continuous		110V	20 A	10 A								
		220V	8 A	4 A								
		325V	4 A	2 A								
		500V	2 A	—								
Permissible Coil Voltage Variation			80...100% of Nominal Voltage at 50 Hz									
			85...110% of Nominal Voltage at 60 Hz									
			80...110% of Nominal Voltage at DC									
			50 HZ	**60 HZ**								
Coil Consumption ±10%	AC Coils	Inrush	13 VA	16 VA								
		Sealed	10 VA	11 VA								
	DC Coils		2.0 W									
Design Specification/Test Requirements												
Dielectric Withstand Voltage	Pole-to-Pole	2200V AC										
	Contact to Pole	2200V										
	Contact to Frame	2200V AC										
Mechanical												
Degree of Protection	Open Type											
Mechanical Life Operations	5×10^6											
Switching Frequency Operations	1600/Hr											
Coil Voltage	See Overview/Product Selection											
Operating Time at Nominal Voltage at 20 °C	Pickup	40 ms										
	Dropout	35 ms										
Maximum Operating Rate	—											
Environmental												
Temperature	Operating	-30...+55 °C										
		(-22...+149 °F)										
	Storage	-30...+65 °C										
		(-22...+149 °F)										
Altitude	2000 m (6560 ft.)											
Construction												
Insulating Material	Molded Thermo											
	Setting Plastic											
Enclosure	—											
Contact Material	Silver Cadmium Oxide											
Terminal Markings on Socket	—											
Sockets	N/A											
Certifications	CSA Certified, File 225674, UL Listed, File E3125, Guide NLDX, CE Marked											
Standards	UL 508, CSA 22.2 No. 14, EN/IEC 60947-1, -5-1											

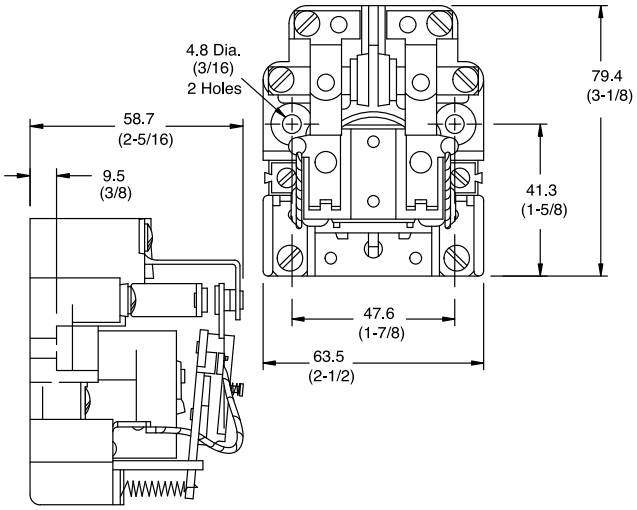
‡ NEMA Rating Chart is on page 19 of publication 700-SG003B-EN-P.
§ For DPDT only: 2 Hp Switching 2 Poles, 200...600V AV, 50/60 Hz.

Approximate Dimensions

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



Bulletin 700-HG Relays, SPST-NO-DM



Bulletin 700-HG Relays

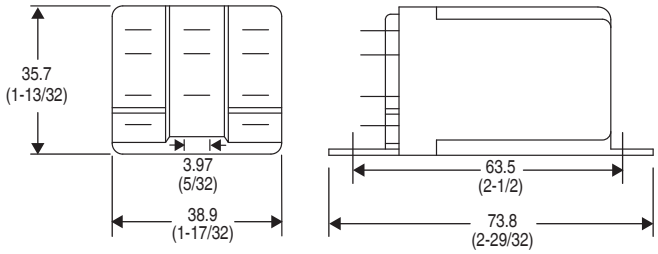
Specifications

Cat. No. 700-HHF…										
Electrical Ratings										
Pilot Duty Rating‡		SPST-NO-DM			NEMA A600					
		DPDT			NEMA B600					
		3PDT			NEMA B300					
Rated Thermal Current (I^{th})		SPST-NO-DM 30 A, DPDT 25A, 3PDT 20 A								
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA								
Contacts	Inductive	**SPST-NO-DM**		**Hp**	**DPDT**		**Hp**	**3PDT**		**Hp**
		►][◄	◄][►		►][◄	◄][►		►][◄	◄][►	
	120V AC	60 A	6 A	1	30 A	3 A	1	30 A	3 A	1/2
	240V AC	30 A	3.0 A	1-1/2	15 A	1.5 A	1-1/2	15 A	1.5 A	—
	DC	28V DC, 30 A			28V DC, 13 A			—		
Permissible Coil Voltage Variation		85…110% of Nominal Voltage at 50 Hz								
		85…110% of Nominal Voltage at 60 Hz								
		80…110% of Nominal Voltage at DC								
		SPST-NO-DM			DPDT			3PDT		
		50 Hz	**60 Hz**		**50 Hz**	**60 Hz**		**50 Hz**	**60 Hz**	
Coil Consumption ±10%	AC Coils Inrush	7.2 VA	6.3 VA		7.2 VA	6.3 VA		7.2 VA	6.3 VA	
	AC Coils Sealed	4.8 VA	4.2 VA		4.8 VA	4.2 VA		4.8 VA	4.2 VA	
	DC Coils	1.4 W								
Max. Allowable Leakage		25% of VA								
		10% of W								
Design Specification/Test Requirements										
Dielectric Withstand Voltage	Pole-to-Pole	2200V AC								
	Contact-to-Pole	2200V AC								
	Contact-to-Frame	1600V AC								
Mechanical										
Mechanical Life Operations		5×10^6								
Switching Frequency Operations		3600/Hr								
Coil Voltages		See Overview/Product Selection								
Operating Time at Nominal Voltage at 20 °C	Pickup	20 ms								
	Dropout	15 ms								
Maximum Operating Rate		4 Ops/s.								
Environmental										
Temperature	Operating	–30…+50 °C								
		(–22…+122 °F)								
	Storage	–30…+100 °C								
		(–22…+212 °F)								
Altitude		2000 m (6560 ft)								
Construction										
Insulating Material		Molded High Dielectric Material								
Enclosure		Transparent Dust Cover								
Contact Material		Silver Cadmium Oxide								
Terminal Markings		In accordance with EN50 0005								
Sockets		§								
Certifications		cURus Recognized, File E3125,Guide NLDX2/NLDX8, CE Marked								
Standards		UL 508, CSA 22.2 No.14, EN/IEC 60947-1, -5-1								

‡ NEMA Rating Chart is in 700-SG003_-EN-P.
§ Bulletin 700-HHF relay wiring and terminals are the quick connect/solder type 6.35 x 0.82 mm (0.250 x 0.032 in) termination.

Approximate Dimensions

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



Bulletin 700-HHF Relays

Specifications

			Cat. No. 700-HTA…		
Electrical Ratings					
Pilot Duty Rating‡			NEMA B300 AC 15		
Rated Thermal Current (I^{th})			10 A		
Rated Insulation Voltage (U_i)			250V IEC, 300V UL/CSA		
Contacts		Inductive	Make	Break	HP
			►][◄	◄][►	
		120V AC	30 A	3 A	1/3
		240V AC	15 A	1.5 A	1/2
		Resistive 30V DC	10 A	10 A	—
Permissible Coil Voltage Variation			85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz		
Power Consumption ±10%	AC	24V AC	2 VA		
		120V AC	4 VA		
		240V AC	4 VA		
Design Specification/Test Requirements					
Dielectric Withstand Voltage		Pole-to-Pole, same circuit (VRMS)	1000V AC		
		Pole-to-Pole, different circuits (VRMS)	2000V AC		
		Contact-to-Coil (VRMS)	2000V AC		
Electrical Life Operations			100,000 minimum		
Switching Frequency Operations			1800/hr		
Coil Voltages			See product selection		
Mechanical					
Degree of Protection			Open Type (Guarded Terminal Sockets)		
Mechanical Life Operations			10×10^6		
Switching Frequency Operations			18,000/hr		
Start-up Time (max. time from power application until unit is timing)			0.05 sec		
Max. Function Time (max. time power can drop out and unit continues timing)			0.01 sec		
Min. Cycle Time			100 ms on release of the control switch		
Environmental					
Temperature		Operating	–28…+65 °C (50 °C max., 240V AC coil) (–18…+149 °F) (122 °F max., 240V AC coil)		
		Storage	–55…+85 °C (–67…+185 °F)		
Altitude			2000 m (6560 ft)		
Construction					
Insulating Material			Molded High Dielectric Material		
Enclosure			Impact Resistant Dust Cover		
Contact Material			Silver Tin Oxide		
Terminal Markings on Socket			In accordance with EN50 005		
Sockets			8- or 11-Pin Socket 700-HN100, -HN125 700-HN101, -HN126		
Certifications			CSA Certified, File 223833, UL Recognized (File E3125 Guide NLDX2/NLDX8), cULus Listed with 700-HN100, 700-HN101, 700-HN125, and 700-HN126 Sockets (File No. E3125 Guide NLDX/NLDX7), CE-Marked (per EU Low Voltage Directive)		
Standards			EN 61812-1, EN/IEC 60947-1, -5-1, CSA 22.2 No. 14, UL 508		

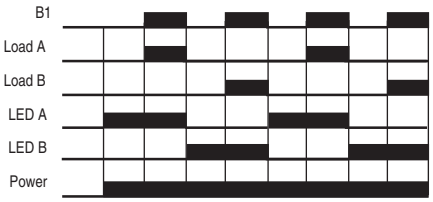
‡ NEMA Rating Chart is in publication 700-SG003_-EN-P.

Trigger Signal Cat. Nos. 700-HTA

Contact closure provides signal to timer. A low energy signal is generated by the 700-HTA alternating relay. For optimum reliability, use contacts designed for low energy switching (10V, 1 mA) (Example: Bul. 800F-X__V, 800T-X__V). No external voltage should be connected to the contact signal.

Load Diagrams

Common Input/Output SPDT/DPDT

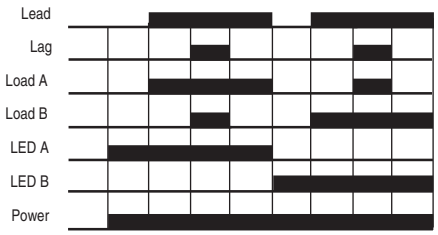


Socket Pinout Map SPDT	
Relay	Socket
A1	4
A2	3

Socket Pinout Map DPDT	
Relay	Socket
A1	4
A2	8

Note: pin out in wiring diagram may not match actual printed socket see pinout map for wiring up the power source

Cross Wired Lead/Lag/Lag/lead Sequence

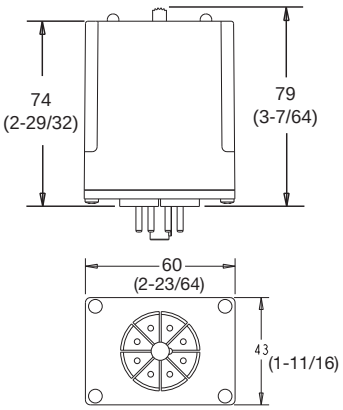


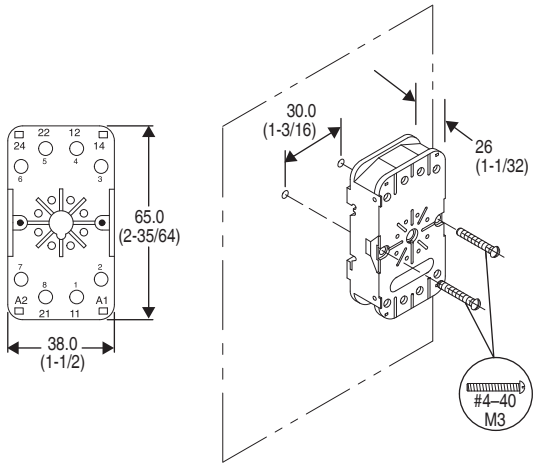
Socket Pinout Map Cross-Wired	
Relay	Socket
A1	3
A2	6

Note: pin out in wiring diagram may not match actual printed socket see pinout map for wiring up the power source

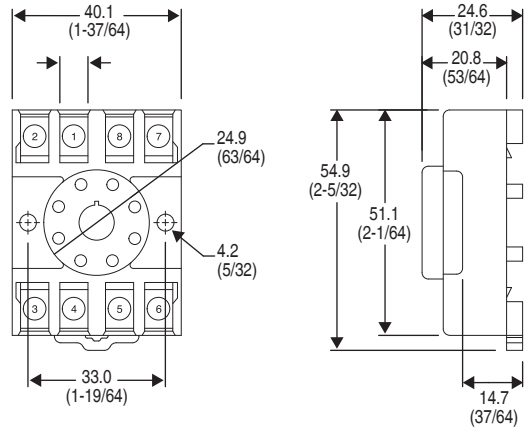
Approximate Dimensions

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

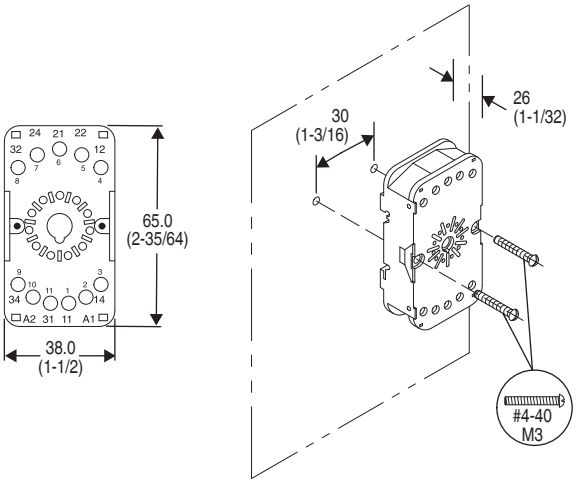




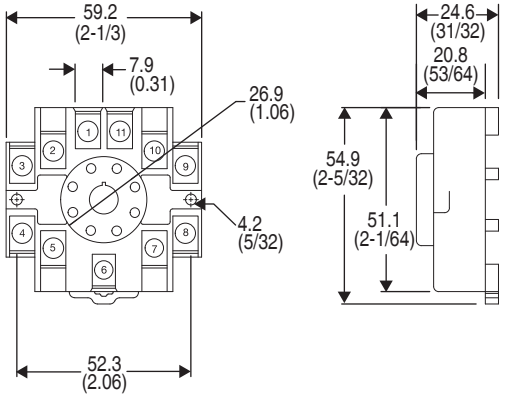
Cat. No. 700-HN100
Panel Mounting
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN125
Wire Size: 2 x 2.5 mm²
Single Wire — Up to #12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG… #2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) — Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN101
Panel Mounting
Double Wire – 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) – Torque: 0.8 N•m (7 lb•in)



Cat. No. 700-HN126
Wire Size: 2 x 2.5 mm²
Single Wire — Up to 12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in) — Torque: 0.8 N•m (7 lb•in)