# **GE1A Series – ON Delay Timers**

## **Single Function**

## Key features of the GE1A series include:

- DPDT or SPDT + instantaneous SPDT
- 8-pin, octal base
- 8 time ranges
- Repeat error ±0.2% maximum
- Large, clear knob for easy setting
- Instant monitoring of operational status by LED indicators



**Switches & Pilot Lights** 

UL, c-UL Listed File No. E55996



#### Snecifications

Rated OperatingVeltage24V AC/DC 120 to 240V AC 220 to 240V AC 200 to 110%Voltage ToreC: 85 to 110% DC: 90 to 110%Contact Rating240V AC/5A 24V DC/5AContact ForDPDT or SPDT+ instantaneous SPDTRepeat Error9.05% ±10msec maximumVoltage Error33% maximumVoltage Error9.10% maximumSetting Error9.10% maximumSetting Error0.1 sec maximumSetting Error9.10% maximum (500V DC megger)Insulation Reset8.10% maximum (500V DC megger)Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute between contact circuits: 750V AC, 1 minuteNamese Insulation Reset9.86tween power and output terminals: 1,500V AC, 1 minute circuits: 750V AC, 1 minute circuit	Specifications					
Voltage ToleranceC: 90 to 110%Contact Rating240V AC/5A 24V DC/5AContact FormDPDT or SPDT+ instantaneous SPDTRepeat Error±0.2% ±10msec maximumVoltage Error±0.5% ±10msec maximumYoltage Error±3% maximumSetting Error±10% maximumSetting Error±10% maximumReset Time0.1 sec maximumInsulation Resistre100MΩ minimu (500V DC megger)Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute Between contact circuits: 750V AC, 1 minuteVibration ResistreDamage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz 20V AC type: 1.6 VAVibration Resistre24V AC type: 1.6 VA 24V DC type: 3.8 VA 220V AC type: 3.8 VAGetA+24V DC type: 0.8W 110V AC type: 3.5 VA 220V AC type: 8.0 VAElectrical Life10,000,000 operations minimum (at full rated load)Mechanical Life Implications minimum10,000,000 operations minimumOperating FW-10,000,000 operations minimumOperating FW-10,000,000 operations minim	Rated Operatin	ıg Voltage	100 to 120V AC			
Contact Form   24V DC/5A     Contact Form   DPDT or SPDT+ instantaneous SPDT     Repeat Error   ±0.2% ±10msec maximum     Voltage Error   ±0.5% ±10msec maximum     Voltage Error   ±3% maximum     Setting Error   ±3% maximum     Setting Error   ±10% maximum     Reset Time   0.1 sec maximum     Insulation Resistance   100MΩ minimu (500V DC megger)     Dielectric Strever   Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute     Shock Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Vibration Resistance   24V AC type: 1.6 VA     Appendentiation Resistance   24V AC type: 3.8 VA     Shock Resistance   24V AC type: 2.0 VA     Qe1AAC type: 3.6 VA   24V DC type: 3.5 VA     10V AC type: 3.5 VA   24V DC type: 3.5 VA     2004 Ac type: 8.0 VA   200 VAC type: 3.6 VA     10000 operations minimum (at full rated load)   200 Ac type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum <th>Voltage Tolera</th> <th>nce</th> <td></td>	Voltage Tolera	nce				
Repeat Error     ±0.2% ±10msec maximum       Voltage Error     ±0.5% ±10msec maximum       Temperature Error     ±3% maximum       Setting Error     ±10% maximum       Reset Time     0.1 sec maximum       Insulation Resistance     100MΩ minimum (500V DC megger)       Dielectric Strewth     Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute       Vibration Resistance     Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz       Shock Resistance     Damage limits: 500m/s² (Approx. 50G)       Power Consumption     E44 AC type: 1.6 VA       24V AC type: 1.6 VA     24V DC type: 1.0W       110V AC type: 3.8 VA     200V AC type: 7.7 VA       200V AC type: 2.0 VA     24V DC type: 0.8W       110V AC type: 3.5 VA     220V AC type: 3.5 VA       200V AC type: 8.0 VA     220V AC type: 8.0 VA       Electrical Life     100,000 operations minimum (at full rated load)       Mechanical Life     10,000,000 operations minimum	Contact Rating					
Voltage Error£0.5% ±10msec maximumTemperature Error£3% maximumSetting Error£10% maximumBeset Time0.1 sec maximum (500V DC megger)Insulation ResetBetween power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minuteDielectric Str>Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.55mm, 10 to 55 Hz 	<b>Contact Form</b>		DPDT or SPDT+ instantaneous SPDT			
Temperature Error   ±3% maximum     Setting Error   ±10% maximum     Reset Time   0.1 sec maximum     Insulation Resistance   100MΩ minimum (500V DC megger)     Dielectric Strest   Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute     Vibration Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Power   24V AC type: 1.6 VA     100V AC type: 3.8 VA   220V AC type: 7.7 VA     220V AC type: 2.0 VA   24V AC type: 3.8 VA     220V AC type: 3.5 VA   24V AC type: 3.5 VA     100/AC type: 3.5 VA   24V AC type: 3.5 VA     100/AC type: 3.5 VA   220V AC type: 3.5 VA     100/AC type: 3.6 VA   220V AC type: 3.6 VA     100/AC type: 3.5 VA   220V AC type: 3.5 VA     220V AC type: 3.6 VA   220V AC type: 3.6 VA     100/AC type: 3.6 VA   220V AC type: 3.6 VA     Electrical Lif+   100,000 operations minimum (at full rated load)     Mechanical Lif+   10,000,000 operations minimum     Operations The set (without freezing)   -10 to +55°C (without freezing)	<b>Repeat Error</b>		±0.2% ±10msec maximum			
Setting Error±10% maximumReset Time0.1 sec maximumInsulation Restance100MΩ minimum (500V DC megger)Dielectric StreetBetween power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minuteVibration RestanceDamage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz Operations minimum (at full rated load)Power Operating extremes: August100,000 operations minimum Operations minimumHer Operating extremes: August100,000 operations minimumPower Operating extremes: Buditude freezing)100 to 455°C (without freezing)	Voltage Error		±0.5% ±10msec maximum			
Reset Time   0.1 sec maximum     Insulation Resistance   100MΩ minimum (500V DC megger)     Dielectric Strength   Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute     Vibration Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.55mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500M/s² (Approx. 50G)     Shock Resistance   Damage limits: 500M/s² (Approx. 50G)     Power   24V AC type: 1.6 VA     24V DC type: 1.0W   110V AC type: 3.8 VA     220V AC type: 7.7 VA   24V AC type: 2.0 VA     24V DC type: 0.8W   24V DC type: 0.8W     110V AC type: 3.5 VA   220V AC type: 3.5 VA     220V AC type: 8.0 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Terrure   -10 to +55°C (without freezing)	Temperature E	rror	±3% maximum			
Insulation Resistance   100MΩ minimum (500V DC megger)     Dielectric Stress   Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute     Vibration Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Power Consumption   24V AC type: 1.6 VA     42V DC type: 1.0W   100VAC type: 3.8 VA     220V AC type: 7.7 VA   24V AC type: 2.0 VA     424V DC type: 0.8W   24V DC type: 0.8W     110V AC type: 3.5 VA   110V AC type: 3.5 VA     Feletrical Lif±   100,000 operations minimum (at full rated load)     Mechanical Lit±   10,000,000 operations minimum     Operating Turbus   -10 to ±55°C (without freezing)	Setting Error		±10% maximum			
Dielectric Strength   Between power and output terminals: 1,500V AC, 1 minute Between contact circuits: 750V AC, 1 minute     Vibration Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz Operating extremes: Amplitude 0.5mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Power   24V AC type: 1.6 VA     24V DC type: 1.0W   110V AC type: 3.8 VA     200 AC type: 7.7 VA   24V AC type: 2.0 VA     24V DC type: 0.8W   24V DC type: 0.8W     110V AC type: 3.5 VA   20V AC type: 3.5 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Terrature   -10 to +55°C (without freezing)	Reset Time		0.1 sec maximum			
Diffectric Strengt   Between contact circuits: 750V AC, 1 minute     Vibration Resistance   Damage limits: Amplitude 0.75mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Shock Resistance   24V AC type: 1.6 VA     Power   24V AC type: 1.0 V     Consumption   24V AC type: 1.0 V     ReflA-B   24V AC type: 7.7 VA     220V AC type: 7.7 VA   24V DC type: 0.8 V     110V AC type: 3.5 VA   220V AC type: 3.5 VA     220V AC type: 8.0 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Terruture   -10 to +55°C (without freezing)	Insulation Resistance		$100M\Omega$ minimum (500V DC megger)			
Yubration Resistance   Operating extremes: Amplitude 0.5mm, 10 to 55 Hz     Shock Resistance   Damage limits: 500m/s² (Approx. 50G)     Power   24V AC type: 1.6 VA     24V DC type: 1.0W   24V DC type: 1.0W     110V AC type: 3.8 VA   200V AC type: 7.7 VA     24V DC type: 0.8W   24V DC type: 0.8W     110V AC type: 3.5 VA   200V AC type: 3.5 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Terrature   -10 to +55°C (without freezing)	Dielectric Strength					
Power   24V AC type: 1.6 VA     GE1A-B   24V DC type: 1.0W     10V AC type: 3.8 VA   220V AC type: 7.7 VA     220V AC type: 2.0 VA   24V AC type: 2.0 VA     Autor type: 0.8W   24V DC type: 0.8W     110V AC type: 3.5 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)	Vibration Resis	stance				
Power   GE1A-B   24V DC type: 1.0W     100 AC type: 3.8 VA   220V AC type: 7.7 VA     24V DC type: 7.7 VA   24V AC type: 2.0 VA     24V DC type: 0.8W   24V DC type: 3.5 VA     220V AC type: 3.5 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum (at full rated load)	Shock Resista	nce	Damage limits: 500m/s <sup>2</sup> (Approx. 50G)			
Power   GE1A-B   110V AC type: 3.8 VA     200V AC type: 7.7 VA   220V AC type: 7.7 VA     Pomer   24V AC type: 2.0 VA     Pomer   24V AC type: 0.8W     110V AC type: 3.5 VA   110V AC type: 3.5 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)			24V AC type: 1.6 VA			
Power   110V AC type: 3.8 VA     Consumption   220V AC type: 7.7 VA     GE1A-C   24V AC type: 2.0 VA     24V DC type: 0.8W   24V DC type: 3.5 VA     220V AC type: 3.5 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)			24V DC type: 1.0W			
Consumption   24V AC type: 2.0 VA     24V DC type: 0.8W     24V DC type: 3.5 VA     220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)		GETA-D	110V AC type: 3.8 VA			
GE1A-C   24V DC type: 0.8W     110V AC type: 3.5 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)	Power		220V AC type: 7.7 VA			
GE1A-C   110V AC type: 3.5 VA     110V AC type: 8.0 VA   220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)	Consumption		24V AC type: 2.0 VA			
I10V AC type: 3.5 VA     220V AC type: 8.0 VA     Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)		GE1A_C	24V DC type: 0.8W			
Electrical Life   100,000 operations minimum (at full rated load)     Mechanical Life   10,000,000 operations minimum     Operating Temperature   -10 to +55°C (without freezing)		GLIA-0	110V AC type: 3.5 VA			
Mechanical Life10,000,000 operations minimumOperating Temperature-10 to +55°C (without freezing)			220V AC type: 8.0 VA			
<b>Operating Temperature</b> -10 to +55°C (without freezing)	Electrical Life		100,000 operations minimum (at full rated load)			
	Mechanical Li	fe	10,000,000 operations minimum			
Operating Humidity 35 to 85% RH (without freezing)	<b>Operating Temperature</b>		-10 to +55°C (without freezing)			
	<b>Operating Hum</b>	nidity	35 to 85% RH (without freezing)			

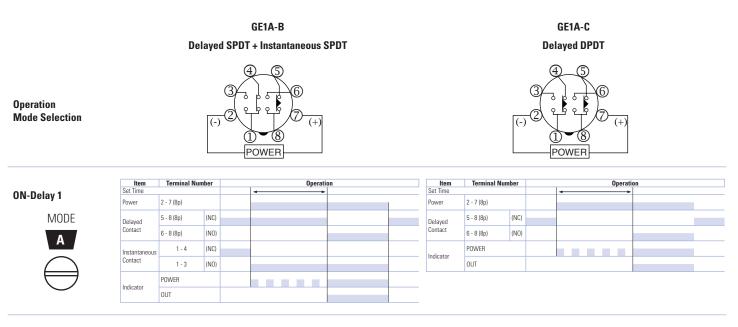


**Timers** 

## Part Numbering List

Mode of Operation	Contact	Output	Rated Voltage	Time Range	Complete Part Number
			24V AC/DC		GE1A-B10MAD24
			110-120V AC	0.1s to 10m	GE1A-B10MA110
	Delayed SPDT +		220-240V AC		GE1A-B10MA220
	Instantaneous SPDT		24V AC/DC	0.1m to 10h	GE1A-B10HAD24
	Delayed DPDT	24V DC/120V AC, 5A 240V AC, 5A	110-120V AC		GE1A-B10HA110
ON-Delay			220-240V AC		GE1A-B10HA220
			24V AC/DC	0.1s to 10m 0.1m to 10h	GE1A-C10MAD24
			110-120V AC		GE1A-C10MA110
			220-240V AC		GE1A-C10MA220
			24V AC/DC		GE1A-C10HAD24
			110-120V AC		GE1A-C10HA110
			220-240V AC		GE1A-C10HA220

## **Timing Diagrams/Schematics**



IDEC

**Switches & Pilot Lights** 

**Display Lights** 

Relays & Sockets

Timers

## Accessories

	Style	Appearance	Part No.
DIN Rail/Surface Mounting Accessories	8-Pin Screw Terminal (dual tier)		SR2P-05
	8-Pin Fingersafe Socket	iden oct sector oct	SR2P-05C
_	8-Pin Screw Terminal		SR2P-06
	DIN Mounting Rail Length 1000mm	Contraction Contraction	BNDN100
Panel Mounting Accessories	8-Pin Solder Terminal		SR2P-51
	Screw Terminal Socket		SR6P-M08
	Panel Mount Adapter		GE9Z-AD

### Other Accessories

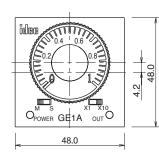
Style	Appearance	Part No.
Dust Cover	And and a second second	GE9Z-C48

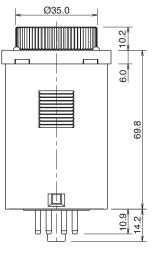
**Terminal Blocks** 

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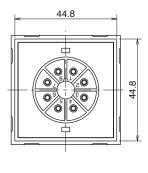
# Dimensions

## **GE1A** Timer

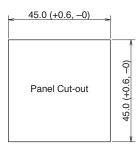




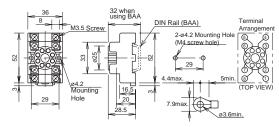




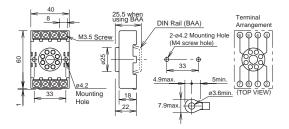
## **GE1A Timer Panel Cutout**



## 8-Pin SR2P-05



## 8-Pin SR2P-06



# GT5P Series – ON Delay Timers

## Key features of the GT5P series include:

- SPDT, 5A contacts
- 8-pin, octal base
- 9 time ranges
- Repeat error ±0.2% maximum
- Control settings by hand or screwdriver
- Power ON and timing out LED indicators
- Uses the same sockets and hold down clips as IDEC's RR2P 8-pin relays











### **Specifications**

Specification	S			
Rated Operating Voltage		100 to 120V AC (50/60Hz) 200 to 240V AC (50/60Hz) 24V AC/DC 12V DC		
Voltage Tolerance		AC type: ±15% DC type: ±10% (ripple 10% maximum)		
	Resistive load	120V AC/24V DC, 5A 240V AC, 3A		
Contact Rating	Inductive load	240V AC, 0.8A 120V AC, 1.4A 24V DC, 1.7A		
Allowable Cont (resistive load)	act Power	960VA AC 120W DC		
<b>Contact Form</b>		SPDT		
Voltage		250V AC, 150V DC		
Repeat Error		±0.2% ±10msec		
Voltage Error		±0.5% ±10msec		
Temperature Err	or	$\pm 3\%$ maximum (over –10 to 50°C, reference temperature 20°C)		
Setting Error		±10% maximum		
Reset Time		When turning power off after time up: 0.1 sec maximum When turning power off before time up: 1 sec maximum		
Insulation Resis	tance	100MΩ minimum		
<b>Dielectric Stren</b>	gth	2000V AC, 1 minute (except between contacts of the same pole)		
Vibration Resist	ance	100N (approximate 10G)		
Shock Resistan	ce	Operating extremes: 100N (approximate 10G) Damage limits: 500N (approximate 50G)		
Power Consump	otion	100V AC type: 1.5VA (at 50Hz) 200V AC type: 1.6VA (at 50Hz) 24V DC type: 0.9W		
Electrical Life		100,000 operations minimum (at rated load)		
Mechanical Life	)	20,000,000 operations minimum		
Operating Temp	erature	−10 to +50°C		
<b>Operating Humi</b>	dity	45 to 85% RH		

Inductive load (reference), cos ø =0.3 to 0.4 or L/R=15msec.
Minimum applicable load: 5VDC/10mA (reference).

**Switches & Pilot Lights** 

**Terminal Blocks** 

Part	Num	bering	List
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Mode of Operation	Contact	Output	Rated Voltage	Time Range	Complete Part No.
				1S	—
				3S	GT5P-N3SA100
				6S	—
			100	10S	GT5P-N10SA100
			100 to 120V AC	30S	GT5P-N30SA100
			1201710	60S	GT5P-N60SA100
				3M	GT5P-N3MA100
				6M	GT5P-N6MA100
				10M	GT5P-N10MA100
				1S	GT5P-N1SA200
				3S	—
				6S	GT5P-N6SA200
				10S	GT5P-N10SA200
			200 to 240V AC	30S	GT5P-N30SA200
			2101710	60S	GT5P-N60SA200
	SPDT			3M	GT5P-N3MA200
				6M	GT5P-N6MA200
		24V DC/120V AC, 5A		10M	GT5P-N10MA200
ON-Delay		240V AC, 3A		1S	GT5P-N1SAD24
				3S	—
				6S	GT5P-N6SAD24
				10S	GT5P-N10SAD24
			24V AC/DC	30S	—
				60S	GT5P-N60SAD24
				3M	—
				6M	GT5P-N6MAD24
				10M	GT5P-N10MAD24
				1S	—
				3S	—
				6S	—
				10S	GT5P-N10SD12
			12V DC	30S	GT5P-N30SD12
				60S	GT5P-N60SD12
				3M	—
				6M	—
				10M	GT5P-N10MD12



For sockets and accessories, see page 851.

**Switches & Pilot Lights** 

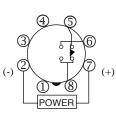
**Display Lights** 

Relays & Sockets

## Timing Diagram/Schematic/Electrical Life Curves

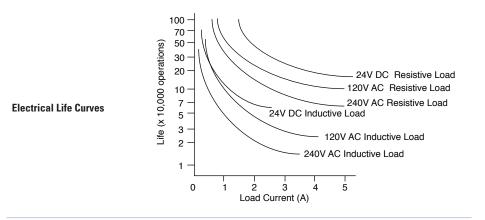
#### SPDT

**Operation Mode** 



Do not apply voltage to terminals 1, 3, and 4.

	Item	Terminal Number		Operation			
	Set Time				4	*	
	Power	2 - 7 (8p)					
ON-Delay	Delayed	5 - 8 (8p)	(NC)				
Ula-Delay	Contact	6 - 8 (8p)	(NO)				
	Indicator	POWER	POWER				
	OUT						

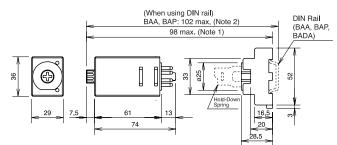


Timers

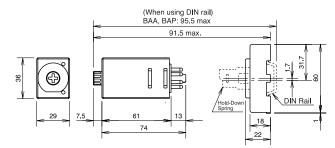
# Accessories

Mounting									
	Ν	Nounting Accessories and Sockets		Applicable Hold-Down Springs					
	Style	Appearance	Use with Timers	Part No.	Appearance	Part No.	& Pi		
	8-Pin Screw Terminal (dual tier)	and a state of the	GT5P	GT5P SR2P-05		SFA-203	Switches & Pilot Lights Di		
DIN Rail/ Surface Mounting	8-Pin Fingersafe Socket	iden sources sources	GT5P	SR2P-05C		017200	Display Lights		
Accessories	8-Pin Screw Terminal		GT5P	SR2P-06	CLAR PROPERTY	SFA-202	Relays & Sockets		
	DIN Mounting Rail Length 1000mm		—	BNDN1000			_		
		Part Numbers: Mounting Accessories	and Sockets		Applicable Hold-Down Sprin	ıgs	Timers		
Mounting Accessories	8-Pin Solder Terminal	1059		SR2P-51	6	SFA-402	s Terminal Blocks		
Installation of H DIN Rail Mount	Installation of Hold-Down Springs DIN Rail Mount Socket Holdown Spring								
Insert the springs into the outer slots with the projections facing inside. Socket SR2P-06 Hold-down Spring (sold separately) SFA-202 (use two springs)									

## GT5P Timer, 8-Pin with SR2P-05



## GT5P Timer, 8-Pin with SR2P-06



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## **General Instructions for All Timer Series**

## Load Current

With inductive, capacitive, and incandescent lamp loads, inrush current more than 10 times the rated current may cause welded contacts and other undesired effects. The inrush current and steady-state current must be taken into consideration when specifying a timer.

## **Contact Protection**

Switching an inductive load generates a counter-electromotive force (back EMF) in the coil. The back EMF will cause arcing, which may shorten the contact life and cause imperfect contact. Application of a protection circuit is recommended to safeguard the contacts.

## **Temperature and Humidity**

Use the timer within the operating temperature and operating humidity ranges and prevent freezing or condensation. After the timer has been stored below its operating temperature, leave the timer at room temperature for a sufficient period of time to allow it to return to operating temperatures before use.

#### Environment

Avoid contact between the timer and sulfurous or ammonia gases, organic solvents (alcohol, benzine, thinner, etc.), strong alkaline substances, or strong acids. Do not use the timer in an environment where such substances are prevalent. Do not allow water to run or splash on the timer.

#### Vibration and Shock

Excessive vibration or shocks can cause the output contacts to bounce, the timer should be used only within the operating extremes for vibration and shock resistance. In applications with significant vibration or shock, use of hold down springs or clips is recommended to secure a timer to its socket.

### **Time Setting**

The time range is calibrated at its maximum time scale; so it is desirable to use the timer at a setting as close to its maximum time scale as possible. For a more accurate time delay, adjust the control knob by measuring the operating time with a watch before application.

#### **Input Contacts**

Use mechanical contact switch or relay to supply power to the timer. When driving the timer with a solid-state output device (such as a two-wire proximity switch, photoelectric switch, or solid-state relay), malfunction may be caused by leakage current from the solid-state device. Since AC types comprise a capacitive load, the SSR dielectric strength should be two or more times the power voltage when switching the timer power using an SSR.

Generally, it is desirable to use mechanical contacts whenever possible to apply power to a timer or its signal inputs. When using solid state devices, be cautious of inrushes and back-EMF that may exceed the ratings on such devices. Some timers are specially designed so that signal inputs switch at a lower voltage than is used to power the timer (models designated as "B" type).

#### **Timing Accuracy Formulas**

Timing accuracies are calculated from the following formulas:

#### Repeat Error

= ± <u>1 x Maximum Measured Value – Minimum Measured Value x 100%</u> 2 Maximum Scale Value

Voltage Error

= ± <u>Tv - Tr x 100%</u> Tr

= ± <u>Tt - T20 x 100%</u>

T20

Tv: Average of measured values at voltage V Tr: Average of measured values at the rated voltage

Temperature Error

Tt: Average of measured values at °C T20: Average of measured values at 20°C

Setting Error

= ± <u>Average of Measured Values - Set Value x 100%</u> Maximum Scale Value

Relays & Sockets

Switches & Pilot Lights

**Terminal Blocks** 

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