sprecher+schuh

Control, Timing and Solid State Relays

Control & Timing Relays

Relpol Ice Cube Relays

GEFRAN Solid State Relays

CS7 Industrial Control Relays

Reliable, general purpose relays for heavy duty applications

The base four pole CS7 relay can be expanded up to twelve poles with the addition of front and side mount auxiliaries

CS7 Industrial Control Relays share the same design as our modern CA7 contactor range. They are compact and designed for heavy duty industrial control applications where reliability and versatility are essential.

Introducing Three CS7 Models for any Control Application

The standard CS7 relay utilizes x-stamped contact technology that reliably switches typical control circuits up to 10A (AC-15). For master relay circuits requiring higher amp capacity, the CS7-M Master Relay is designed for control circuits up to 15A (AC-15).

For applications requiring low energy switching such as PLC's or other electronic circuits, the CS7-B relay with bifurcated contacts is designed for 20 million operations down to a signal level of 5V @ 3mA.

The bifurcated H-bridge design divides each movable gold contact into two sections at the tip of the spanner which provides a higher degree of reliability for low signal applications.

Auxiliary components provide a range of options

CS7 auxiliary components convert the basic four pole relay into a:

- 5, 6, 7, 8, 9, 10, 11 or 12 pole relay
- 4, 5, 6, 7 or 8 pole latched relay
- 4, 5, 6, 7 or 8 pole relay with two pneumatic time delay contacts
- Mechanically latched 4, 5, 6, 7 or 8 pole relay
- Also available are top mounted bifurcated auxiliary contacts which operate down to 5V @ 3mA.

Since the CS7 uses the same auxiliary components as our CA7 contactors, inventory is reduced.

Mechanically linked contacts for safety

CS7 control relays are perfect for fail-safe control circuits. An interlock contact design, which maintains minimum 0.3mm clearance, prevents the NC contact from reclosing if the NO contact is welded when in operation. This feature not only includes the base contact poles, but extends to the front and/or side mounted auxiliary contacts. This is a requirement in safety circuits and is backed by SUVA-PRO certification.

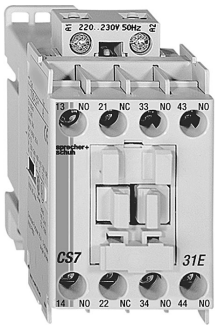
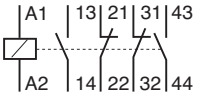
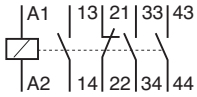
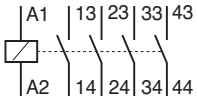
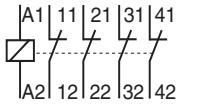
Maximum convenience and safety

CS7 relays are designed for fast and trouble free installation and maintenance. All components are modular and snap-on without the use of tools. The relays are DIN-rail mountable so they can be installed, moved or replaced quickly. All terminals are "captive" and are shipped in the open position, saving you an operation. The entire line is UL Listed, CSA Certified and CE marked and offers finger and back of hand protection to the strictest international standards.

Effortless installation

CS7 relays are DIN-rail mountable for instant installation and modification. Fittings are also included for base mounting. All terminals are clearly marked and ready for installation with either manual or power screwdrivers. A complete identification system is also available using self-adhesive labels, paper tags or plastic clip-on tags.

Series CS7 Standard Control Relays - 4 Pole ❶❹

CS7 Relay	Contact Arrangement and Numbering	Contacts ❶		AC Operation		Electronic DC ❺	
		NO	NC	Catalog Number	Price	Catalog Number	Price
 *CS7-31E*		2	2	**CS7-22E-✱**	**92**	**CS7E-22E-✱**	**127**
		3	1	**CS7-31E-✱**		**CS7E-31E-✱**	
		4	0	**CS7-40E-✱**		**CS7E-40E-✱**	
		0	4	**CS7-04E-✱**		**CS7E-04E-✱**	

Contact Ratings *(Per UL508/NEMA A600 & P600)*

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	6A/720VA	10
	240AC	30A/7200VA	3A/720VA	
	480AC	15A/7200VA	1.5A/720VA	
	600AC	12A/7200VA	1.2A/720VA	
P600	125DC ❷	1.1A/138VA	1.1A/138VA	5
	250DC ❷	0.55A/138VA	0.55A/138VA	
	301-600DC ❷	0.2A/138VA	0.2A/138VA	

Other UL Ratings

Maximum Voltage	600 volts AC or DC
General Purpose Amps	
CS7	25 amps
Auxiliaries (@ 40°C)	10 amps
Auxiliaries (@ 60°C)	6 amps

AC Coil Codes ❸

AC Coil Code	Voltage Range	
	50 Hz	60 Hz
24Z	24V	24V
120	**110V**	**120V**
208	~	208V
220W	**200V-220V**	**208V-240V**
240	220V	240V
277	240V	277V
380	380V-400V	440V
480	**440V**	**480V**
600	550V	600V

DC Coil Codes ❺

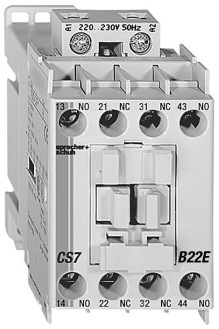
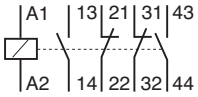
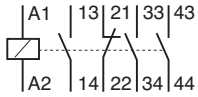
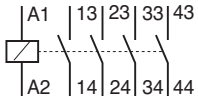
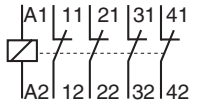
DC Coil Codes	Voltage
12E	12V
24E	**24V**
36E ❻	36-48V
48E ❻	48-72V
110E ❻	110-125V
220E ❻	220-250V

Ordering Instructions

Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

❶ Side mounted and/or top auxiliaries may be field installed to increase the number of available poles, limitations apply. Refer to page G15 for ordering and restriction details. Please note that side mount auxiliary terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.
❷ DC rating for CS7 base control relay.
❸ Other voltages available, see page G13. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*
❹ Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on 4 main poles.
❺ CS7E electronic coils are not interchangeable with non-electronic DC or AC coils.
❻ Not applicable with Electronic Timer accessories (CRZ_7).

Series CS7-B Control Relays - 4 Pole, Bifurcated Contacts for Lower Level Signals ❶❹

CS7-B Relay	Contact Arrangement and Numbering	Contacts ❶		AC Operation		Electronic DC ❺	
		NO	NC	Catalog Number	Price	Catalog Number	Price
 *CS7-B22E*		2	2	**CS7-B22E-✱**	**117**	**CS7E-B22E-✱**	**190**
		3	1	**CS7-B31E-✱**		**CS7E-B31E-✱**	
		4	0	**CS7-B40E-✱**		**CS7E-B40E-✱**	
		0	4	**CS7-B04E-✱**		**CS7E-B04E-✱**	

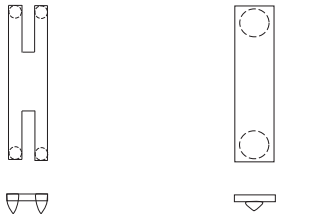
Contact Ratings *(Per UL508/NEMA A600 & Q600)*

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	6A/720VA	10
	240AC	30A/7200VA	3A/720VA	
	480AC	15A/7200VA	1.5A/720VA	
	600AC	12A/7200VA	1.2A/720VA	
Q600	125DC ❷	0.55A/69VA	0.55A/69VA	2.5
	250DC ❷	0.27A/69VA	0.27A/69VA	
	301-600DC ❷	0.1A/69VA	0.1A/69VA	

CS7-B Bifurcated Control Relay

- Gold plated bifurcated contacts for low level switching application, min 5V, 3mA
- Maximum voltage 600V AC or DC
- General purpose amps - 10 amps
- Positively guided/mechanically-linked main contacts

Principle moving contact designs:



CS7-B
Bifurcated Contacts

CS7
Standard Contacts

AC Coil Codes ❸

AC Coil Code	Voltage Range	
	50 Hz	60 Hz
120	110V	120V

DC Coil Codes ❺

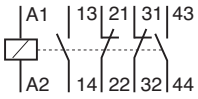
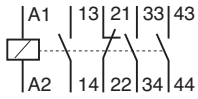
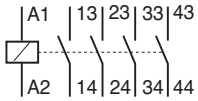
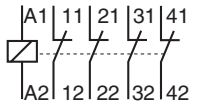
DC Coil Codes	Voltage
12E	12V
24E	**24V**
36E ❻	36-48V
48E ❻	48-72V
110E ❻	110-125V
220E ❻	220-250V

Ordering Instructions

Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

❶ Side mounted and/or top auxiliaries may be field installed to increase the number of available poles, limitations apply. Refer to page G15 for ordering and restriction details. Please note that side mount auxiliary terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.
❷ DC rating for CS7-B base control relay.
❸ Other AC voltages available, see page G13. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*
❹ Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on 4 main poles.
❺ CS7E electronic coils are not interchangeable with non-electronic DC or AC coils.
❻ Not applicable with Electronic Timer accessories (CRZ_7).

Series CS7 Master Control Relays - 4 Pole ❶❹

CS7-M Relay	Contact Arrangement and Numbering	Contacts ❶		AC Operation		Electronic DC ❺	
		NO	NC	Catalog Number	Price	Catalog Number	Price
 *CS7-M22E*		2	2	**CS7-M22E-✱**	**168**	**CS7E-M22E-✱**	**239**
		3	1	**CS7-M31E-✱**		**CS7E-M31E-✱**	
		4	0	**CS7-M40E-✱**		**CS7E-M40E-✱**	
		0	4	**CS7-M04E-✱**		**CS7E-M04E-✱**	

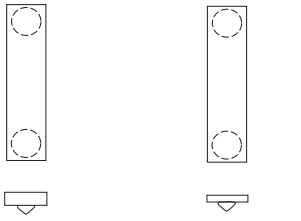
Contact Ratings *(Per UL508/NEMA A600 & P600)*

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	6A/720VA	20
	240AC	30A/7200VA	3A/720VA	
	480AC	15A/7200VA	1.5A/720VA	
	600AC	12A/7200VA	1.2A/720VA	
P600	125DC ❷	1.1A/138VA	1.1A/138VA	5
	250DC ❷	0.55A/138VA	0.55A/138VA	
	301-600DC ❷	0.2A/138VA	0.2A/138VA	

CS7-M Master Control Relays

- Excellent replacement for heavy duty NEMA master relay users.
- Maximum voltage 600V AC or DC
- General purpose rating 30 amps (2X A600 for CS7-M Base Relay)

Principle moving contact designs:



CS7-M
Contacts For
Master Control Relay

CS7
Standard Contacts

AC Coil Codes ❸

AC Coil Code	Voltage Range	
	50 Hz	60 Hz
120	110V	120V

DC Coil Codes ❺

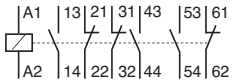
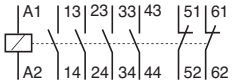
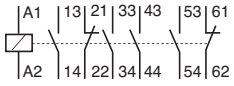
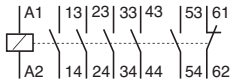
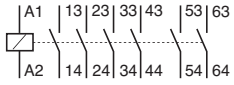
DC Coil Codes	Voltage
12E	12V
24E	**24V**
36E ❼	36-48V
48E ❼	48-72V
110E ❼	110-125V
220E ❼	220-250V

Ordering Instructions

Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

❶ Side mounted and/or top auxiliaries may be field installed to increase the number of available poles, limitations apply. Refer to page G15 for ordering and restriction details. Please note that side mount auxiliary terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.
❷ DC rating for CS7-M base control relay.
❸ Other AC voltages available, see page G13. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*
❹ Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on 4 main poles.
❺ CS7E electronic coils are not interchangeable with non-electronic DC or AC coils.
❼ Not applicable with Electronic Timer accessories (CRZ_7).

CS7 Complete Assemblies - 6 Pole, AC Control ❶❺

CS7 Relay	Contact Arrangement and Numbering	Contacts ❶		AC Operation	
		NO	NC	Catalog Number	Price
 *CS7-33Y*		3	3	**CS7-33Y-✱**	**122**
		4	2	**CS7-42E-✱**	
		4	2	**CS7-42Y-✱**	
		5	1	**CS7-51E-✱**	
		6	0	**CS7-60E-✱**	

AC Coil Codes ❹

AC Coil Code	Voltage Range	
	50 Hz	60 Hz
24Z	24V	24V
120	**110V**	**120V**
208	~	208V
220W	**200V-220V**	**208V-240V**
240	220V	240V
277	240V	277V
380	380V-400V	440V
480	440V	480V
600	550V	600V

Contact Ratings *(Per UL508/NEMA A600, P600 & Q600)*

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	6A/720VA	10
	240AC	30A/7200VA	3A/720VA	
	480AC	15A/7200VA	1.5A/720VA	
	600AC	12A/7200VA	1.2A/720VA	
P600	125DC ❷	1.1A/138VA	1.1A/138VA	5
	250DC ❷	0.55A/138VA	0.55A/138VA	
	301-600DC ❷	0.2A/138VA	0.2A/138VA	
Q600	125DC ❸	0.55A/69VA	0.55A/69VA	2.5
	250DC ❸	0.27A/69VA	0.27A/69VA	
	301-600DC ❸	0.1A/69VA	0.1A/69VA	

Other UL Ratings

Maximum Voltage
600 volts AC or DC

General Purpose Amps

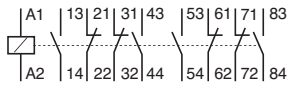
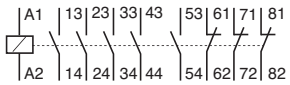
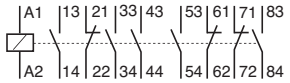
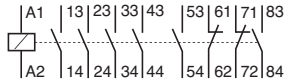
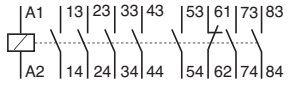
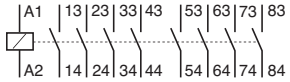
CS7	25 A
Aux. (@40°C)	10 A
Aux. (@60°C)	6 A

Ordering Instructions

Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

❶ Side mounted and/or top auxiliaries may be field installed to increase the number of available poles, limitations apply. Refer to page G15 for ordering and restriction details. Please note that side mount auxiliary terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.
❷ DC rating for CS7 base control relay.
❸ DC rating for CS7 auxiliary blocks.
❹ Other voltages available, see page G13. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*
❺ Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on 4 main poles and auxiliaries.

CS7 Complete Assemblies - 8 Pole, AC Control ❶❺

CS7 Relay	Contact Arrangement and Numbering	Contacts ❶		AC Operation	
		NO	NC	Catalog Number	Price
 *CS7-44E*		4	4	**CS7-44E-✱**	**150**
		4	4	**CS7-44Y-✱**	
		5	3	**CS7-53E-✱**	
		5	3	**CS7-53Y-✱**	
		6	2	**CS7-62E-✱**	
		7	1	**CS7-71E-✱**	
		8	0	**CS7-80E-✱**	

AC Coil Codes ❹

AC Coil Code	Voltage Range	
	50 Hz	60 Hz
24Z	24V	24V
120	**110V**	**120V**
208	~	208V
220W	**200V-220V**	**208V-240V**
240	220V	240V
277	240V	277V
380	380V-400V	440V
480	**440V**	**480V**
600	550V	600V

Contact Ratings *(Per UL508/NEMA A600, P600 & Q600)*

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	6A/720VA	10
	240AC	30A/7200VA	3A/720VA	
	480AC	15A/7200VA	1.5A/720VA	
	600AC	12A/7200VA	1.2A/720VA	
P600	125DC ❷	1.1A/138VA	1.1A/138VA	5
	250DC ❷	0.55A/138VA	0.55A/138VA	
	301-600DC ❷	0.2A/138VA	0.2A/138VA	
Q600	125DC ❸	0.55A/69VA	0.55A/69VA	2.5
	250DC ❸	0.27A/69VA	0.27A/69VA	
	301-600DC ❸	0.1A/69VA	0.1A/69VA	

Other UL Ratings

Maximum Voltage
600 volts AC or DC

General Purpose Amps

CS7	25 A
Aux. (@40°C)	10 A
Aux. (@60°C)	6 A

Ordering Instructions

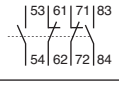
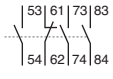
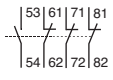
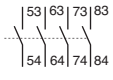
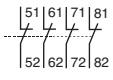
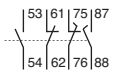
Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

❶ Side mounted and/or top auxiliaries may be field installed to increase the number of available poles, limitations apply. Refer to page G15 for ordering and restriction details. Please note that side mount auxiliary terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.
❷ DC rating for CS7 base control relay.
❸ DC rating for CS7 auxiliary blocks.
❹ Other voltages available, see page G13. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*
❺ Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on 4 main poles and auxiliaries.

Side Mount Auxiliary Contact Blocks (1 & 2 Pole) ❶❷

Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Standard Contacts Catalog Number	Price
 *1-pole (typical)*  *2-pole (typical)*	**Auxiliary Contact Blocks for Side Mounting ❷❸** • 1 and 2-pole • Two way numbering for right or left mounting on the contactor • Snap-on design - mounts without tools • Electronic compatible contacts 17V, 10mA • Late break / early make (L) available • Mirror contact performance to control relay poles	0	1		CS7 all	**CA7-PA-01**	**17**
		1	0		CS7 all	**CA7-PA-10**	**17**
		0	2		CS7 all	**CA7-PA-02**	**27**
		1	1		CS7 all	**CA7-PA-11**	**27**
		2	0		CS7 all	**CA7-PA-20**	**27**
		1L	1L		CS7 all	**CA7-PA-L11**	**37**

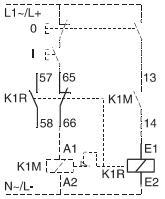
Top Mount Auxiliary Contact Blocks (2 & 4 Pole) ❷

Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Standard Contacts Catalog Number	Price	Bifurcated Contacts Catalog Number	Price
 *2-pole (typical)*  *4-pole (typical)*	**Auxiliary Contact Blocks for Top Mounting ❷** • 2 and 4 pole • Snap-on design - mounts without tools • Electronic compatible standard contacts down to 17V, 5mA, bifurcated version 5V, 3mA • Mechanically linked between N.O. and N.C. poles and to the control relay poles (excluding L types). • Several terminal numbering choices even for models with equal function • Late break / early make (L) available	0	2		CS7 all	**CS7-PV-02**	**27**	**CS7-PVB-02**	**42**
		1	1		CS7 all	**CS7-PV-11**	**27**	**CS7-PVB-11**	**42**
		2	0		CS7 all	**CS7-PV-20**	**27**	**CS7-PVB-20**	**42**
		2	2		CS7 all	**CS7-PV-22**	**53**	**CS7-PVB-22**	**80**
		3	1		CS7 all	**CS7-PV-31**	**53**	**CS7-PVB-31**	**80**
		1	3		CS7 all	**CS7-PV-13**	**53**	**CS7-PVB-13**	**80**
		4	0		CS7 all	**CS7-PV-40**	**53**	**CS7-PVB-40**	**80**
		0	4		CS7 all	**CS7-PV-04**	**53**	**CS7-PVB-04**	**80**
		1+1L	1+1L		CS7 all	**CS7-PV-L22**	**74**	***Not Available***	**~**

❶ Side mounted auxiliaries may be field installed to increase the number of available poles. Please note that terminal markings may conflict with base relay and/or top mount auxiliary terminal markings.

❷ See page G15 for maximum number of auxiliaries to be mounted.

Control Modules

Module	Description	For use with…	Connection Diagrams	Catalog Number	Price
	**Mechanical Latch** Following relay latching, the relay coil is immediately de-energized by the NC auxiliary contact (65-66). • Electrical or manual release • 1 NO + 1 NC auxiliary switch • Suitable for all CS7 relays	CS7 all		**CV7-11-✱** *Replace ✱ with coil code below (See Application Note)*	**94**

CV7 Mechanical Latch Coil Codes ❶❷❸

Coil Code	Application Range			Latch & Contactor Coil Rating
	50 Hz	60 Hz	VDC	
24Z	**24 VAC**	24 VAC	12 VDC	24V 50/60 Hz
48Z	48 VAC	48 VAC	**24 VDC**	48V 50/60 Hz
110	100 VAC	110 VAC	48 or 60VDC	110V50/110V60
120	110 VAC	**120 VAC**	~	110V50/120V60
220W	~	**208…240 VAC**	~	208…240V60
230Z	230 VAC	230 VAC	110 VDC	230V 50/60 Hz
240Z	**240 VAC**	**240 VAC**	125 VDC	240V 50/60 Hz
277	240 VAC	277 VAC	~	240V50/277V60
380	380…400 VAC	440 VAC	~	380…400V50/440V60
400Z	400 VAC	400 VAC	220 VDC	400V 50/60 Hz
415	400…415 VAC	~	~	400…415 V50 Hz
480	440 VAC	**480 VAC**	~	440V50/480V60
600	550 VAC	600 VAC	~	550V50/600V60

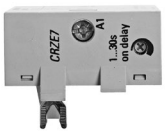
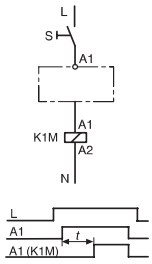
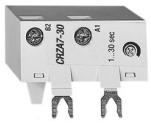
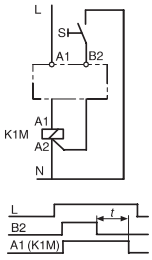
APPLICATION NOTE:

The CV7 Mechanical Latch for CS7 Control Relay may be used for both AC and DC applications; however when using DC control circuit the user must apply the following rules for coil selection of the control relay and latch combination:

- When DC control circuits are required use CS7 control relay with AC coil and latch with AC coil. From column "VDC" in the table on the left, identify the required application DC control voltage and then select its specific Coil Code. Enter this Coil Code to complete the catalog numbers for both the control relay and latch (i.e.: 125V DC control circuit should use a 240Z coil code in both the CS7 and CV7). This works because both coils are only momentary energized and coil clearing contacts breaks the circuit after closing or opening.
- The CS7E control relay uses an electronic DC coil and the CV7 latch coil code should be chosen from the table on the left. (i.e.: 24V DC control circuit select CS7E with code 24E and CV7 latch uses a 48Z AC coil code).

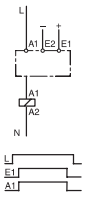
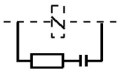
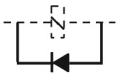
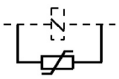
❶ Other voltages available. Contact your Sprecher + Schuh representative.
❷ CV7 must be wired for momentary impulse operation only.
❸ Command duration 0.03…15 seconds.
❹ Use 600V AC when 575 V is required.

Control Modules

Module	Description	For use with…	Connection Diagrams	Function	Catalog Number	Price
	**Pneumatic Timing Module –** The contacts in the Pneumatic Timing Element switch after the delay time. The contacts on the relay continue to operate without delay. • Continuous adjustment range	CS7 all		**ON-Delay** .3…30s 1.8…180s	**CZE7-30** **CZE7-180**	**160**
				**OFF-Delay** 0.3…30s 1.8…180s	**CZA7-30** **CZA7-180**	**160**
	**Electronic Timing Module – ON-Delay** ❶ The relay is energized at the end of the delay time.	CS7 all		110…240V 50/60Hz 110…250VDC0. 0.1…3s 1…30s 10…180s	**CRZE7-3-110/240** **CRZE7-30-110/240** **CRZE7-180-110/240**	**98**
				24…48VDC 0.1…3s 1…30s 10…180s	**CRZE7-3-24/48VDC** **CRZE7-30-24/48VDC** **CRZE7-180-24/48VDC**	**104**
	**Electronic Timing Module – OFF-Delay** ❶ After interruption of the control signal, the relay is de-energized at the end of the delay time.	CS7 all		110…240V 50/60Hz 0.3…3s 1…30s 10…180s	**CRZA7-3-110/240** **CRZA7-30-110/240** **CRZA7-180-110/240**	**112**
				24V AC 50/60Hz 0.3…3s 1…30s 10…180s	**CRZA7-3-24VAC** **CRZA7-30-24VAC** **CRZA7-180-24VAC**	**112**

❶ Not available for use on CS7E coil voltage 48V…220V.

Control Modules *(continued)*

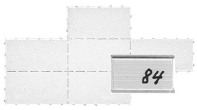
Module	Description	For use with…	Connection Diagrams	Function		Catalog Number	Price
	**Electronic Interface –** Interface between the DC control signal from a PLC and the AC operating mechanism of the relay. • Requires no additional surge suppression for the coils • Switching capacity 200VA • Suitable for all CS7 relays	CS7 all (with AC control)		Input 24V DC 18...30V DC 48V DC	Output 110… 240V AC	**CRI7E-24** **CRI7E-12** **CRI7E-48** *Indicates special order*	**72** **72** **72**
	**Surge Suppressors -** Limits coil switching transients. • Plug-in, coil mounted • Suitable for all CS7 contactors	CS7 all (with AC control)		**RC Module -** AC Control (50/60Hz) 24…48V 110…280V 380…480V		**CRC7-48** **CRC7-280** **CRC7-480**	**34**
		CS7C (with conventional DC control)		**Diode Module -** DC Control 12-250VDC		**CRD7-250** ❷	**34**
		CS7 all (with AC control) CS7C (with conventional DC control)		**Varistor Module -** AC/DC Control 12…55VAC/ 12…77VDC 56…136VAC/ 78…180VDC 137…277VAC/ 181…350VDC 278…575VAC		**CRV7-55** ❷ **CRV7-136** ❷ **CRV7-277** ❷ **CRV7-575** ❷	**34**

Assembly Components

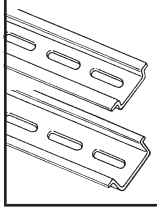
Component	Description	For Use With…	Pkg. Qty.	Catalog Number	Price Each
	**Protective Covers -** Protects against unintended manual operation.	CS7 all	1	**CA7-SCC**	**See page A54**
	**Protective Covers -** For front mounted auxiliary contacts, pneumatic timers and latches.	CS7-PV, CA7-PV, CZE7, CZA7, CV7	1	**CA7-SCF**	
	**Spade Connectors -** Dual stab for coil terminals (0.250 inch)	All CS7	20	**CA7-SC2**	**1.75**

❶ Minimum order quantity is one package of 10. Price each x 10 = total price.
❷ Electronic DC Control Relays (CS7E) include internal surge protection and do not require additional external surge protection.

Marking Systems

Component	Description	Pkg. Qty.	Catalog Number	Price Each
	**Label Sheet –** 1 sheet with 105 self-adhesive paper labels each, 6 x 17mm	1	**CA7-FMS**	**See page A54**
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover.	1	**CA7-FMP**	
	Transparent Cover - To be used with Marking Tag Sheets.	100 ❶	**CA7-FMC**	
	**Tag Carrier -** For marking with Series V7 Terminal Clip-on Tags.	100 ❶	**CA7-FMA2**	

Mounting Accessories

Accessory	Description	Catalog Number	Price
	**DIN-rail** – 2 meter lengths (6' 6") Top Hat, low profile (price per rail) Top Hat, high profile (price per rail)	 **3F** **3AF**	**See page A54**

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.

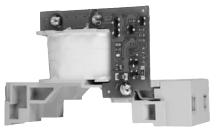
Renewal Coils - AC ❶❷

AC Control Voltages			AC Coil ⇓ Codes ⇓ ❷	Catalog No.
50 Hz	60 Hz	50/60 Hz		
~	12V	~	12B	**TA006**
12V	~	~	12A	**TA404**
~	24V	~	24B	**TA013**
24V	~	~	24A	**TA407**
~	~	24V	**24Z**	**TA855**
32V	36V	~	36	**TA481**
36V	~	~	36A	**TA410**
42V	48V	~	48	**TA482**
48V	~	~	48A	**TA414**
~	~	48V	48Z	**TA860**
100V	100…110V	~	110	**TA861**
110V	120V	~	**120**	**TA473**
~	~	110V	110Z	**TA856**
120V	~	~	120A	**TA425**
115V	127V	~	127	**TA424**
127V	~	~	127A	**TA428**
200V	200…220V	200V	220	**TA862**
~	208V	~	**208**	**TA049**
~	208V…240V	~	**220W**	**TA296**
220V	240V	~	**240**	**TA474**
220V…230V	260V	~	230A	**TA441**
~	~	200…230V	230W	**TA864**
~	~	230V	230Z	**TA851**
230V…240V	~	~	240A	**TA440**
240V	277V	~	**277**	**TA480**
~	~	240V	240Z	**TA858**
~	347V	~	347	**TA065**
~	380V	~	380B	**TA067**
380V…400V	440V	~	**380**	**TA071**
~	~	400V	400Z	**TA863**
400V…415V	~	~	415	**TA457**
440V	480V	~	**480**	**TA475**
~	~	440V	440Z	**TA859**
500V	~	~	500A	**TA479**
550V	600V	~	**600**	**TA476**
Price				**See page A56**

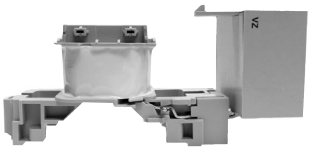
CS7 AC coil (typical)

Renewal Coils - DC ❶❷❺

DC Control Voltages	DC Coil ⇓ Codes ⇓ ❷	Electronic DC Coils ❻	True DC Coils	Two Winding DC Coils ❺
		Cat. No.	Cat. No.	Cat. No.
9V ❸	9D	~	**TA766**	**TA766Y**
12V	12E	**TC708E**	~	~
12V	12D	~	**TA708**	**TA708Y**
24V	**24E**	**TC714E**	~	~
24V ❹	**24D**	~	**TA714**	**TA714Y**
24V Diode ❹	24DD	~	**TA714M**	**TA714Y**
36-48V	36E	**TC719E**	~	~
36V	36D	~	**TA719**	**TA719Y**
48-72V	**48E**	**TC724E**	~	~
48V	48D	~	**TA724**	**TA724Y**
60V	60D	~	**TA774**	**TA774Y**
64V	64D	~	**TA727**	**TA727Y**
72V	72D	~	**TA728**	**TA728Y**
80V	80D	~	**TA729**	**TA729Y**
110-125V	**110E**	**TC733E**	~	~
110V	**110D**	~	**TA733**	**TA733Y**
115V	115D	~	**TA734**	**TA734Y**
125V	125D	~	**TA737**	**TA737Y**
220-250V	**220E**	**TC747E**	~	~
220V	**220D**	~	**TA747**	**TA747Y**
230V	230D	~	**TA749**	**TA749Y**
250V	250D	~	**TA751**	**TA751Y**
Price		**See page A57**		



12V & 24V Electronic DC coil ❻



36V…220V Electronic DC coil with Back Pack ❻

Two Winding DC coil (typical) ❺

❶ Other coil voltages available. Contact your Sprecher + Schuh representative for information.
❷ Coil Codes in bold letters indicate coils that are standard stocked items.
❸ Voltage operating range: 0.65…1.3 x U_s.
❹ Voltage operating range: 0.7…1.25 x U_s.
❺ CS7-…YY(EY) two winding coils are sold for renewal parts only and are not interchangeable with standard CS7-Y(E) AC coil relays or CS7C…Y(E) true DC coil relays. CS7-…YY(EY) relays should be tested following a coil swap to insure functionality of the timed auxiliary.
❻ Electronic DC Coils are not interchangeable with non-electronic DC or AC coils.

Technical Information

		Mounted Standard Auxiliary	Standard Control Relay CS7	Front Mounted Standard Auxiliary Contacts	Bifurcated Control Relay CS7-B	Front Mounted Bifurcated Auxiliary Contacts	Master Relay CS7-M	Side Mounted Contacts
Electrical Contact Ratings - NEMA			A600, P600	A600, Q600			2x A600, P600	A600, Q600
Min. Contact Rating			17V, 10 mA	17V, 5 mA	8V, 5 mA	5V, 3 mA		17V, 10 mA
Contact Ratings - IEC AC-15 (solenoids, contactors) rated voltage IEC 60947-5-1		24V	10 A	6 A	3 A	3 A	15 A	6 A
		48V	10 A	6 A	3 A	3 A	15 A	6 A
		120V	10 A	6 A	3 A	3 A	15 A	6 A
		240V	10 A	5 A	3 A	3 A	15 A	5 A
		400V	6 A	3 A	2 A	2 A	7.5 A	3 A
		480V/500V	2.5 A	1.6 A	1.2 A	1.2 A	5 A	1.6 A
		600V	1 A	1 A	0.7 A	0.7 A	2 A	1 A
		690V	1 A	1 A	0.7 A	0.7 A	2 A	1 A
AC-12 (Control of resistive loads) IEC 60947-5-1	**40 °C**	I_{th}	20 A	10 A	10 A	10 A	20 A	10 A
		230V	8 kW					
		400V	14 kW					
		690V	24 kW					
	60 °C	I_{th}	20 A	6 A	6 A	6 A	20 A	6 A
		230V	8 kW					
		400V	14 kW					
		690V	24 kW					
DC-12 Switching DC Loads $L/R < 1$ ms, Resistive Loads IEC 60947-5-1		24V	15 A	10 A	6 A	6 A	20 A	6 A
		48V	10 A	9 A	3.2 A	3.2 A	20 A	3.2 A
		110V	6 A	3.5 A	1.0 A	1.0 A	8 A	1.0 A
		220V	1.0 A	0.7 A	0.5 A	0.5 A	1.5 A	0.5 A
		440V	0.4 A	0.2 A	0.2 A	0.2 A	0.4 A	0.2 A
DC-13 IEC 60947-5-1, Solenoids and contactors		24V	5 A	5 A	2.5 A	2.5 A	5 A	5 A
		48V	3 A	3 A	1.5 A	1.5 A	3 A	2.5 A
		110V	1.2 A	1.2 A	0.6 A	0.6 A	1.2 A	0.68 A
		220V	0.6 A	0.6 A	0.3 A	0.3 A	0.6 A	0.32 A
		440V	0.3 A	0.15 A	0.15 A	0.15 A	0.3 A	0.15 A

Mechanically Linked Contacts ❷

Location of welded NO contacts	State of NC contacts if NO contact welds			
	Main	Front mount auxiliary	Left side auxiliary	Right side auxiliary
Main	Open	Open ❶	Open ❸	Open ❸
Front auxiliary	Open	Open ❶	Open ❸	Open ❸
Left side aux.	Open	Open ❶	Open ❸	Open ❸
Right side aux.	Open	Open ❶	Open ❸	Open ❸

DC Switching Ratings for CS7 Main Poles in Series (Resistive Load at 60 °C)

	1 pole	2 poles	3 poles
24/48 V	25/20 A	25 A	25 A
125 V	6 A	25 A	25 A
220 V	1.5 A	8 A	25 A
440 V	0.4 A	1 A	3 A

				CS7 Relays	Front Mount Auxiliaries & Pneumatic Timer Contacts
Mechanical					
Mechanical Life			[Mil]	15	5
Electrical Life AC-15 (240V, 3A) AC Operations	[Mil]			1.5	1.5	1.5
Weight			[g]	390	–
Terminal Cross-Sections					
Terminal Type					
Terminal Size per IEC 947-1				2 x A4	2 x A4
	Flexible with Wire End Ferrule	1 Cond.	[mm²]	1…4	0.5…2.5
		2 Cond.	[mm²]	1…4	0.75…2.5
	Solid/Stranded	1 Cond.	[mm2]	1.5…6	0.5…2.5
		2 Cond.	[mm2]	1.5…6	0.75…2.5
Max. Wire Size per UL/CSA			[AWG]	16…10	18…14
Tightening Torque			[Nm]	1.5…2.0	1…1.5
			[lb-in]	13.3…17.7	8.9…13.3

Standards Compliance

UL 508
CSA C22.2 NO. 14
EN/IEC 60947-1, -5-1
Meets the material restrictions for European Directive 2002/95/EC - EU-RoHS.

Certifications

cULus Listed (File No. E33916, Guide NKCR/NKCR7)
CE Marked

❶ If the accessory is a Pneumatic Timer or latch, there is no positive guidance; the accessory contacts are independent.
❷ Defined in IEC 947-5-1 annex L. Mechanically linked is a relationship between contacts of opposite types (i.e., NO and NC).
❸ Side mounted auxiliary contacts provide "mirror contact" performance with main poles only.

Technical Information

Rated Insulation Voltage U_i	
IEC	690V
UL; CSA	600V
Rated Impulse Strength U_{imp}	6 kV
High Test Voltage	
1 minute (per IEC 947-4)	2500V
Rated Voltage U_e	
AC	115, 230, 400, 500, 690V
DC	24, 48, 110, 220, 440V
Rated Frequency	50/60 Hz, DC
Ambient Temperature	
Storage	–55…+80°C (–67…176°F)
Operation at nominal current	–25…+60°C (–13…140°F)
Conditioned 15% current reduction after AC-1 at > 60°C	–25…+70°C (–13…158°F)

Corrosion Resistance	humid-alternating climate, cyclic, per IEC 68-2-30 and DIN 50 016, 56 cycles
Altitude	2000m above main sea level, per IEC 947-4
Type of Protection	
IP 2X (IEC 60529 and DIN 40050)	in connected state
Finger Protection	safe from touch by fingers and back of hand per VDE 0106, Part 100
Shock Protection	
IEC 68-2: Half Sinusoidal shock 11ms	30G (in 3 directions)
Vibration Resistance	
IEC 68-2: static >2G in normal position	no malfunction <5G

Coil Data - AC Control Circuit

Operating Voltage Range	Pickup	[x U_s]	0.85…1.1
	Dropout	[x U_s]	0.3…0.6
Coil Consumption	Inrush	[VA/W]	75
	Seal	[VA/W]	9.5-2.7
Operating Times	Pickup Time	[ms]	15…30
	Dropout Time	[ms]	10…60

Latch Attachment Release, CV7-11

Coil Consumption	AC	[VA/W]	45 /40
	DC	[W]	25
Contact Signal Duration		[min/max]	0.03…15s

Timing Attachment, CRZE7, CRZA7

Reset Time		
at min. time setting	[ms]	10
at max. time setting	[ms]	70
Repeat Accuracy		± 10%

Coil Data - Electronic DC

Voltage Range			Coil Consumption & Operating Times ❸				
Voltage Code	Nominal Voltage US [VDC]	Ratings [xU_s]	Average/Peak Pickup [W]	Hold-in [W]	Dropout Voltage [xU_s]	Pickup [ms]	Dropout [ms]
12E	12	0.7…1.25	10/17	1.7	0.3…0.4	25…50	27…45
24E	24	0.7…1.25	10/17	1.7			
36E	36…48	0.7…1.25	10/17	1.7…1.9			
48E	48…72	0.8…1.25	10/17	1.7…1.9	0.3…0.4	25…50	23…33
110E	110…125	0.7…1.12	12/19	2.0…2.1			
220E	220…250	0.8…1.1	14/22	2.7…3.0			

Control Relays Maximum Auxiliary Contacts

CS7 (AC and DC electronic coils, vertical mounting, 60° C	CS7(E)-40E	CS7(E)-31E	CS7(E)-22E	CS7(E)-04E
Maximum N.O. Side Auxiliaries	2	2	4	2
Maximum N.C. Side Auxiliaries	4	4 ❶	4 ❶	2
Maximum N.O. Front Auxiliaries	4	4	4	4
Maximum N.C. Front Auxiliaries	4	4 ❷	2	0
Maximum N.O. Front + Side Auxiliaries	6	6	8	6
Maximum N.C. Front + Side Auxiliaries	7	5	5	2
Maximum N.O. + N.C. Front + Side Auxiliaries	8	8	8	6

❶ With no front auxiliary contacts installed. Otherwise 3 N.C. maximum.

❷ With no side mount auxiliary contacts installed. Otherwise 3 N.C. maximum.

❸ The hold-in demand of the CS7E is very low but the pick-up demand is approximately 1 ampere at 24 VDC. When sizing (dimensioning) a power supply for applications involving parallel switched contactors then multiply the peak demand by the number of contactors to be simultaneously switched and add to the hold-in demand of all other control circuit burdens, including other contactors, pilot devices, solenoids, etc.

Utilization Category Table from EN 947-5-1

Verification of Making and Breaking Capacities of Switching Elements Under Normal Conditions Corresponding to the Utilization Categories ❶

Utilization Category	Normal Condition of Use								
	Make ❷			Break ❷			Number & Rate of Making & Breaking Operations		
	I / I_e	U / U_e	COS Ψ	I / I_e	U / U_e	COS Ψ	No. of operating cycles ❸	Operating cycles per minute	ON time(s) ❺
AC-12 ❻	1	1	0.9	1	1	0.9	6050	6	0.05
AC-13 ❻	2	1	0.65	1	1	0.65	6050	6	0.05
AC-14 ❻	6	1	0.3	1	1	0.3	6050	6	0.05
AC-15 ❻	10	1	0.3	1	1	0.3	6050	6	0.05
DC			$T_{0.95}$			$T_{0.95}$			
DC-12	1	1	1ms	1	1	1ms	6050	6	0.05 ❺
DC-13	1	1	6 x *P* ❹	1	1	6 x *P* ❹	6050	6	0.05 ❺
DC-14 ❻	10	1	15ms	1	1	15ms	6050	6	0.05 ❺

I_e Rated operational current $P=U_eI_e$ steady-state power consumption (W)

U_e Rated operational voltage. Current to be made or broken.

$T_{0.95}$ Time to reach 95% of the steady-state current (ms) UVoltage before make

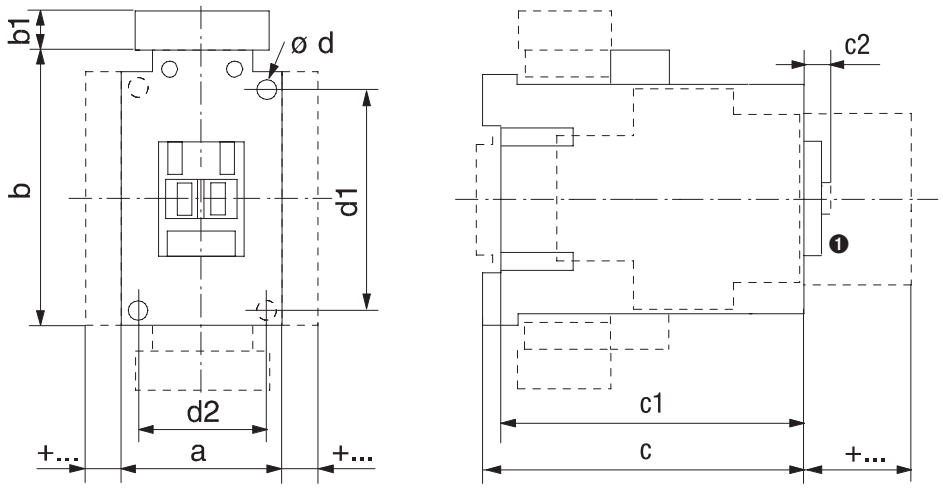
NEMA Ratings and Test Values for AC *(50 and 60Hz)* and DC Control Circuits Contacts

Designation ❼	Utilization Category	Therm. Continuous Test Current (A)	Maximum Current								VA	
			120V		240V		480V		600V			
AC			Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A150	AC-15	10	60	6.00	~	~	~	~	~	~	7200	720
A300	AC-15	10	60	6.00	30	3.00	~	~	~	~	7200	720
A600	AC-15	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B150	AC-15	5	30	3.00	~	~	~	~	~	~	3600	360
B300	AC-15	5	30	3.00	15	1.50	~	~	~	~	3600	360
B600	AC-15	5	30	3.00	15	1..50	7.5	0.75	6	0.60	3600	360
C150	AC-15	2.5	15	1.50	~	~	~	~	~	~	1800	180
C300	AC-15	2.5	15	1.50	7.5	0.75	~	~	~	~	1800	180
C600	AC-15	2.5	15	1.50	7.5	0.75	3.75	0.375	3	0.30	1800	180
D150	AC-14	1.0	3.60	0.60	~	~	~	~	~	~	432	72
D300	AC-14	1.0	3.60	0.60	1.8	0.30	~	~	~	~	432	72
E150	AC-14	0.5	1.80	0.30	~	~	~	~	~	~	216	36
2 x A300	AC-15	20	120	12	60	6.00	~	~	~	~	14400	1440
2 x A600	AC-15	20	120	12	60	6.00	30	3.00	24	2.40	14400	1440
DC			5…28V		125V		250V		301…600V		Make or Break at 300V or less [VA]	
N150	DC-13	10	10		2.2		~		~		275	
N300	DC-13	10	10		2.2		1.1		~		275	
N600	DC-13	10	10		2.2		1.1		0.40		275	
P150	DC-13	5.0	5.0		1.1		~		~		138	
P300	DC-13	5.0	5.0		1.1		0.55		~		138	
P600	DC-13	5.0	5.0		1.1		0.55		0.20		138	
Q300	DC-13	2.5	2.5		0.55		0.27		0.11		69	
Q600	DC-13	2.5	2.5		0.55		0.27		0.11		69	
2 x P600	DC-13	10	102.2		2.2		1.1		0.40		275	

❶ See sub-clause 8.3.3.5.2
❷ For tolerances on test quantities, see sub-clause 8.3.2.2
❸ The first 50 operating cycles shall be run at U/U_e=1.1 with the loads set at U_e
❹ The value "6 x *P*" results from an empirical relationship which is found to represent most DC magnetic loads to an upper limit of *P* = 50W, i.e. 6 x *P* = 300ms.
❺ The ON time shall be at least equal to $T_{0.95}$
❻ Where the break current differs from the make current value, the ON time refers to the make current value after which the current is reduced to break current value for a suitable period e.g., 0.05 s.
❼ This is the NEMA Contact Rating Designation, where the letter stands for the conventional thermal current and identifies AC or DC: e.g., B = 5A AC. The number that follows is the rated insulation voltage.

Series CS7 Industrial Control Relays (AC and Electronic DC)

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

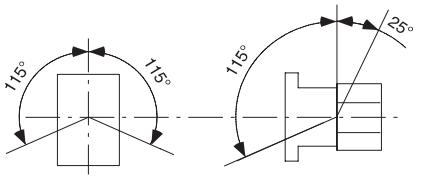


Catalog Number	Coil Code	a	b	b1	c	c1	c2	∅d	d1	d2
CS7 (AC)	All	45 (1-25/32)	81 (3-3/16)	~	80.5 (3-11/64)	75.5 (3-3/32)	6 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-25/64)
CS7 (Electronic DC)	12E…24E	45 (1-25/32)	81 (3-3/16)	~	80.5 (3-11/64)	75.5 (2-31/32)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
	36E…220E	45 (1-25/32)	81 (3-3/16)	24 (15/16)	80.5 (3-11/64)	75.5 (2-31/32)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)

Relays & Accessories (+…)

Relays with…		Dim. [mm]	Dim. [inches]
auxiliary contact block for front mounting	2-, or 4-pole	c/c1 + 39	c/c1 + 1-37/64
auxiliary contact block for side mounting	1-, or 2-pole	a + 9	a + 23/64
pneumatic timing module		c/c1 + 58	c/c1 + 2-23/64
electronic timing module	on coil terminal side	b + 24	b + 15/16
mechanical latch		c/c1 + 61	c/c1 + 2-31/64
interface module	on coil terminal side	b + 9	b + 23/64
surge suppressor	on coil terminal side	b + 3	b + 1/8
❶ Labeling with…	label sheet	+ 0	+ 0
	marking tag sheet with clear cover	+ 0	+ 0
	marking tag adapter for V7 Terminals	+ 5.5	+ 7/32

Mounting Position



Front View Side View

AC & Electronic DC control relays

CS8 Industrial Control Relays

The miniature relay system with big advantages

CS8 front mount auxiliaries are positive guidance

Despite increasing complexity, control systems and installations must become increasingly compact. And the CS8 Miniature Relay System packs maximum performance into minimum space.

Small but rugged

Sprecher + Schuh has subjected this relay series to monitored endurance tests that demonstrate their ruggedness. Under normal duty, CS8 contacts have an electrical life of 700,000 operations, while the AC magnet system has a mechanical life of 15,000,000 operations.

The coil is designed for absolute undervoltage reliability. Undervoltages that do not cause the contactor to close can be withstood indefinitely without damage.

The body of the device is sturdy as well. The front housing, containing the phase partitions and screwdriver guides, is manufactured in one piece. Front and rear housing are then joint fitted together.

Superior Contact Reliability

The standard CS8 base relay and auxiliary contacts are bifurcated H-bridge design which divides each movable contact into two sections at the tip of the spanner which provides a higher degree of reliability for low signal applications. Perfect fit for PLC and other electronic circuits operate at signals as low as 15V @ 2mA.

Mechanically linked contacts for safety

The CS8 control relay are the perfect choice for fail-safe control circuits to meet mechanically linked performance per IEC 60947-4-1. Mechanically linked is an interlock contact design that maintains minimum 0.5mm clearance which prevents the NC contact from reclosing if the NO contact is welded when in operation. This feature applies to CS8 base relays with AC & DC coils; base relays and add-on auxiliaries for DC coils only.

Accessories require no additional panel space

The entire CS8 system is logically engineered. Auxiliary contact blocks are modular and snap-on without increasing the CS8's original width of 45mm. Also, due to its sideways switching movement, the basic relay has the same low profile whether an AC or DC operating magnet is used. This permits the use of enclosures with shallow mounting depths. Once the CS8 is installed, all auxiliary contact blocks can be snapped on or removed without changing any existing wiring.

Auxiliary components provide flexibility

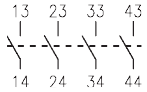
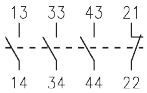
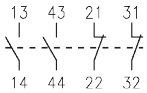
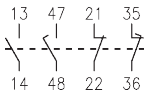
CS8 auxiliary components allow you to convert the basic four pole relay up to an 8 pole relay.

Effortless installation

CS8 relays are DIN-rail mountable for instant installation and modification. Fittings are also included for base mounting. All terminals are clearly marked and shipped in the open position for installation with either manual or power screwdrivers. Using self-adhesive labels, or plastic clip-on tags.

The entire line is cULus Listed and CE Certified and offers finger and back of hand protection to the strictest international standards.

CS8 Complete Assemblies - 4 Pole

CS8 Relay	Contact Arrangement and Numbering	Contacts NO	Contacts NC	AC Operation Catalog Number	AC Operation Price	DC Operation Catalog Number	DC Operation Price
		4	0	**CS8-40E-✱**	**79**	**CS8C-40E-✱**	**99**
		3	1	**CS8-31Z-✱**		**CS8C-31Z-✱**	
		2	2	**CS8-22Z-✱**		**CS8C-22Z-✱**	
		1+ 1EM	1+ 1LB	**CS8-L22Z-✱**		**CS8C-L22Z-✱**	

Contact Ratings *(Per UL508/NEMA B600 & Q600)* ❸

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
B600	120AC 240AC 480AC 600AC	30A/3600VA 15A/3600VA 7.5A/3600VA 6A/3600VA	3.0A/360VA 1.5A/360VA 0.75A/360VA 0.60A/360VA	10
Q600	125DC 250DC 301-600DC	0.55A/69VA 0.27A/69VA 0.1A/69VA	0.55A/69VA 0.27A/69VA 0.1A/69VA	2.5

Mechanical Link

- Base relay meets IEC 60947-5-1.

See page G21 for additional information.

AC Coil Codes ❶

AC Coil Code	Voltage Range 50 Hz	Voltage Range 60 Hz
12	12V	12V
24Z	**24V**	**24V**
48Z	48V	48V
120	**110V**	**120V**
208	200V-220V	208V-220V
240	240V	240V
380 ❹	Use Coil Code 400	
400 ❹	400V	400V
480	**440V**	**480V**
575 ❺	Use Coil Code 600	
600 ❺	525V	600V

DC Coil Codes ❶

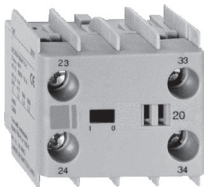
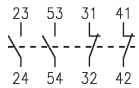
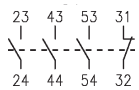
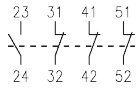
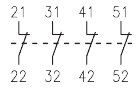
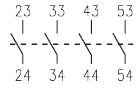
DC Coil Code	Voltage
12D	12V
24D	**24V ❷**
110D	110V
125D	125V
220D	220V

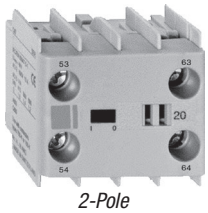
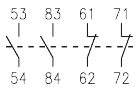
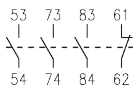
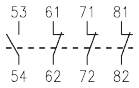
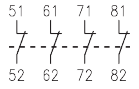
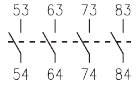
Ordering Instructions

Specify Catalog Number	
Replace (✱) with Coil Code	**See Coil Codes on this page**

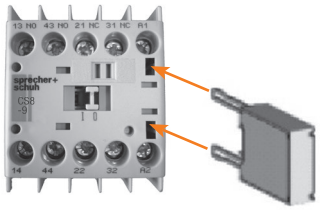
❶ The coil codes shown are for the most commonly stocked items. Contact your Sprecher + Schuh representative to determine if other voltages are on-hand or can be specially ordered in quantity.
❷ Integrated diode surge suppressor coils available. Order coil code **24DD** and add $42 to list price. Ex: CS8C-22Z-**24D** becomes CS8C-22Z-**24DD**.
❸ Contacts are bifurcated (H-bridge) with a minimum current rating of 2mA @ 15V.
❹ The European Community has agreed that 400V is the nominal voltage in lieu of 380V. Use this code when 380V is required.
❺ Use this code for 575V applications.

Auxiliary Contact Blocks (2 & 4 Pole) ❶❸

Auxiliary Contact Blocks	NO	NC	Contact Arrangement	Catalog No.	Price
 *2-Pole*	1	1		**CA8-P11**	
	0	2		**CA8-P02**	**27**
	2	0		**CA8-P20**	
Typical auxiliary contact block	2	2		**CA8-P22**	
	3	1		**CA8-P31**	
	1	3		**CA8-P13**	**54**
	0	4		**CA8-P04**	
 *4-Pole*	4	0		**CA8-P40**	

Auxiliary Contact Blocks	NO	NC	Contact Arrangement	Catalog No.	Price
 *2-Pole*	1	1		**CS8-P11E**	
	0	2		**CS8-P02E**	**27**
	2	0		**CS8-P20E**	
Typical auxiliary contact block	2	2		**CS8-P22Z**	
	3	1		**CS8-P31Z**	
	1	3		**CS8-P13E**	**54**
	0	4		**CS8-P04E**	
 *4-Pole*	4	0		**CS8-P40E**	

Miscellaneous Accessories

Accessory	Description	Catalog Number	Price
	**Surge Suppressor CR__8 -** for limiting voltage spikes when switching off coil. Coil itself provides sufficient limitation at voltages over 240V. RC Link (Type CRC8…) for AC Control 24-48VAC 110-280VAC 380-480VAC	 **CRC8-50** **CRC8-280** **CRC8-480**	**33**
	Diode Link (Type CRD8…) for DC Control ❷ 12-250VDC (diode)	**CRD8-250**	**33**
	Varistor Link (Type CRV8…) for AC/DC Control 12-55VAC/12-77VDC 56-136VAC/78-180VDC 137-277VAC/181-250VDC	 **CRV8-55** **CRV8-136** **CRV8-277**	**33**

❶ Auxiliary contact ratings per UL 508/NEMA (B600/Q600). Contacts are bifurcated (H-bridge) with a minimum current rating of 15V@2mA.

❷ CS8 relays with 24 VDC coils can be special ordered with integrated diodes (built-in) rather than applying CRD8 to the coil terminals.

❸ Base relay with add-on auxiliaries meet mechanically linked IEC 60947-5-1 for CS8 DC coil versions only. See page G21 for additional information.

Technical Information

				CS8	Auxiliary Contacts
Electrical					
Contact Ratings — NEMA				B600, Q600	B600, Q600
Contact Ratings — IEC					
AC-15 (solenoids, contactors)		24…120V	[A]	3	3
at rated voltage		230…240V	[A]	2	2
IEC 947, EN 60947		400V	[A]	1.2	1.2
NEMA A600		480…500V	[A]	1	1
		600…690V	[A}	0.6	0.6
AC-12 (Rated thermal current)					
Ambient Temperature 40°C	I_{th}	24…690V	[A]	10	10
Ambient Temperature 60°C	I_{th}	24…240V	[A]	6	6
Low Level Signal Switching					
Contact design				H-bridge bifurcated	H-bridge bifurcated
Minimum switching recommendation				15V 2mA	15V 2mA
Short Circuit Protection					
Coordination Type 2 acc. IEC 947-5-1		Fuse gG	[A]	10	10
Switching DC-13 (Q600)					
1 pole		24V	[A]	2.3	2.3
		48V	[A]	1	1
		110V	[A]	0.55	0.55
		125V	[A]	0.55	0.55
		220V	[A]	0.27	0.27
		250V	[A]	0.27	0.27
		400V	[A]	0.15	0.15
		440V	[A]	0.15	0.15
		600V	[A]	0.1	0.1
Load Carrying Capacity according to UL/CSA					
Rated voltage		AC	[V]	max. 600	max. 600
		DC	[V]	max. 600	max. 600
Continuous rating (40ºC)		AC	[A]	10	10
Switching Capacity		AC	[A]	B600	B600
		DC	[A]	Q600	Q600
Continuous rating (general purpose)		300V	[V]	5	5
		600V	[V]	10	10
Resistance and Power Dissipation					
Main current circuit resistance, 1 pole			[mΩ]	6.5	6.5
Power dissipation I_{th}, 4 poles			[W]	2.6	2.6
Total Power dissipation					
I_{th}	AC control, warm		[W]	4.4	4.4
	DC control, warm		[W]	5.2	5.2

Mechanically Linked Contacts and Mirror Contact Performance

Type	Coil	Add-on Auxiliary Contact	Conforms to IEC	Status
CS8	AC or DC	None	60947-5-1	Mechanically linked within the base relay
	DC	Yes	60947-5-1	Mechanically linked within the base relay and with add-on auxiliary contacts
	AC	Yes	~	Mechanically linked within the base relay only

Definitions

- Mechanically linked contacts (IEC 60947-5-1 Annex L):
- N.C. Auxiliary Contact will not re-close if a N.O. power pole welds.
- N.O. Power Pole or Auxiliary Contact will not close if N.C. contact welds.
- The term “Positive Guided” contacts is the same as mechanically linked.

Technical Information

Mechanical

			CS8 Relays
Mechanical Life		[Mil. Op]	15
Electrical Life			
AC-15 (240V, 2A) AC Operations		[Mil. Op]	0.7
Weight	AC control	[kg/lbs]	0.16 (0.35)
	DC control	[kg/lbs]	0.2 (0.44)

Terminations -
Main contacts and Auxiliary contacts

Terminal Type			Combination Screw Head: Cross, Slotted, Pozidrive
Fine stranded w/ ferrule	1 wire	[mm²]	0.75...2.5
	2 wires	[mm²]	0.75...2.5
Solid or coarse stranded	1 wire	[mm²]	1…4
	2 wires	[mm²]	1...2.5 + 1…4
Max. Wire Size ❶		[AWG]	18…12
Tightening Torque		[Nm]	1.2
		[lb-in]	10.6

Control Circuit

Operating Voltage			
AC 50/60 Hz	Pickup	[x U_s]	0.85…1.1
	Dropout	[x U_s]	0.2...0.75
DC	Pickup	[x U_s]	0.8…1.1
		[x U_s]	9,12,24,110V DC: 0.7...1.25
with protection circuit	Dropout	[x U_s]	0.1...0.75
Coil Consumption			
AC 50/60 Hz	Inrush	[VA/W]	35/32
	Seal	[VA/W]	5/1.8
DC	Inrush/Seal	[W]	cold 3.0, warm 2.6
Operating Times			
AC- 50/60 Hz	Pickup Time	[ms]	15…40
	Dropout Time	[ms]	15…33
With RC module	Pickup Time	[ms]	15…28
DC	Pickup Time	[ms]	18…40
	Dropout Time	[ms]	6…12
With Integ. diode	Pickup Time	[ms]	8…12
With External diode	Pickup Time	[ms]	35…50

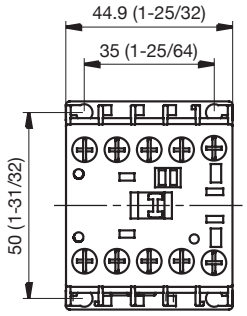
General

		CS8 Relays
Rated Voltage Withstand *U*		
IEC		690V
UL; CSA		600V
Rated Impulse Strength U_{imp}		6 kV
Rated Voltage U_e		
AC	[V]	24, 48, 120, 230, 400, 500, 600, 690
DC	[V]	24, 48, 110, 220, 440V
Rated Frequency		AC 50/60 Hz, DC
Ambient Temperature		
Storage		–55...+80°C (–67...176°F)
Operation at nominal current		–25...+60°C (–13...140°F)
At 85% rated operation current		–25...+70ºC (–13... 158ºF)
Resistance to Climatic Change		40º C (104º F), 95% relative humidity, 56 days
		23º C (73.4 º F), 83%/40 ºC (104 ºF), 93%, 56 cycles
Altitude		2000m M.S.L., per IEC 60947-4-1
Type of Protection		IP2X
Standards		IEC/EN 60947-1, -5-1, -5-4; UL 508; CSA 22.2. No. 14
Approvals UL File E33916		CE c UL us

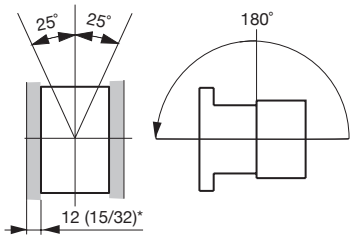
❶ Pozidrive No.2 / Blade No.3 screw

Series CS8 Industrial Control Relays

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

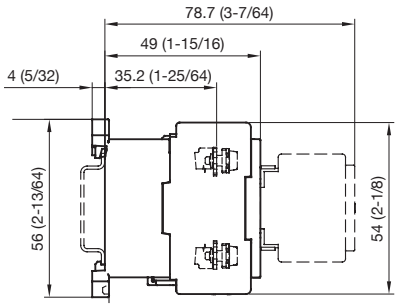


Mounting Position with Accessories



* Minimum distance to grounded parts or walls

Contactor with...		Dim. [mm]	Dim. [inches]
with aux. contact block		78.7	3.1
with timer	on contactor	81.7	3.25
	at side of contactor	66.9	2.63
with neutral terminal	at side of contactor	64.9	2.56
with nameplate		51	2



With front mount auxiliary

RZ7-FS Electronic Timing Relays

Precision DIN-rail mounted timing relays for any industrial application

Sprecher + Schuh's new RZ7-FS precision electronic timing relays offer 19 different output functions applicable to all types of industrial control. In addition to standard ON-Delay and OFF-Delay relays, the series also includes many specials such as an OFF-Delay that operates without supply voltage. Various timing ranges from 0.05 seconds to 60 hours are available, with many relays offering multi-time setting capability in the same device.

Solid state accuracy and reliability

Except for their hard silver contacts, all RZ7-FS timing relays are built with solid state electronics and controlled by a microprocessor. They are accurate to within 0.2 percent. Their ruggedness and high level of accuracy is due to the thorough testing of function, timing characteristics and surge voltage strength performed on each device prior to shipment.

In addition, RZ7-FS relays function reliably from 15% under rated operating voltage to 10% over rated voltage (AC). Voltage tolerance is even greater in DC applications.

Eliminates additional relays

The standard RZ7-FS is supplied with one single pole double throw (SPDT) contact within a compact case only 22.5mm wide. If more contacts are required, several relays are available that provide two separate, electrically isolated SPDT contacts within the same narrow footprint. Output two is selectable as an instantaneous contact, which can eliminate the need for auxiliary relays in complex installations. These two pole relays can also be used with an external potentiometer for remote time setting.

Multiple functions and timing ranges in one relay

The RZ7-FSM combines *eight* separate timing functions (plus ON and OFF functions) into one device. In addition, ten timing ranges are individually selectable from 0.05 seconds to 60 hours. These special relays reduce inventories and are ideal for maintaining remote installations where stocking several different timing relays would not be practical.

Many safety and convenience features

- Every RZ7 accepts a broad range of AC and DC supply voltages without special ordering.
- Each relay is equipped with an LED that indicates four output status conditions.
- Finger and back of hand protection to IP40.
- Terminals are captive and supplied in the open position.
- All RZ7's can be surface mounted, rail mounted, or mounted directly on our family of CA7/CS7 or CA8/CS8 devices.
- RZ7 relays can be mounted in any plane.
- Terminals, setting knob and LED's are all accessible from the front of the unit.
- RZ7 Timing Relays are very compact, measuring approximately 1" x 3" x 4".
- Hazardous location timing relays also available.

The new multifunction RZ7-FSM Electronic Timing Relay provides eight different timing functions and ten different timing ranges.

Quick Selection Guide

Single Function Timing Relays

RZ7-FS	A	3	A	U23
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**
	A On-Delay **B** Off-Delay **C** On and Off-Delay **D** One Shot / Watchdog **E** Fleeting Off-Delay **F** Symmetric flasher starting with a pulse **G** Symmetric flasher starting with a pause **I** On-Delay pulse generator **J** On-Delay (pulse controlled) **K** One Shot / Watch Dog (pulse controlled) **L** Impulse Converter	*All functions:* **3** One single pole double throw contact *Functions A & B only:* **4** Two single pole double throw contacts ❷ *(Available with Time Range "U" only. Not available with "U18" supply voltage)*	**A** 0.05…1 second **B** 0.15… 3 seconds **C** 0.5…10 seconds **D** 1.5…30 seconds **E** 0.05…1 minute **F** 0.15…3 minutes **G** 0.5…10 minutes **H** 1.5…30 minutes **I** 0.05…1 hour **J** 0.15…3 hours **K** 0.5…10 hours **L** 3.0…60 hours **U** 0.05s…60 hours ❶	*Standard:* **U23** 24…48VDC 24…240V 50/60Hz *Special Order:* **U18*** 24…240VAC or DC **A40** 346…440V 50/60Hz ❸ **Z12** 12VDC ** Not available with Time Range "U"*

RZ7-FS	Q	3	Q	U18
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**
	Q Off-Delay Without Supply Voltage	**3** One single pole double throw contact **4** Two single pole double throw contacts ❷	**Q** 0.15s…10 minutes ❶	**U18** 24…240VAC or DC

Multi-Function Timing Relay

RZ7-FS	M	3	U	U23
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**
	M Multi-Function *Eight single functions plus ON & OFF function (for installation/maintenance)* - On-Delay - Off-Delay - On and Off-Delay - One Shot / Watchdog - Fleeting Off-Delay - Symmetric flasher starting with a pulse	**3** One single pole double throw contact **4** Two single pole double throw contacts ❷	**U** 0.05…60 hours ❶	*Standard:* **U23** 24…48VDC 24…240V 50/60Hz *Special Order:* **U18** 24…240VAC or DC **A40** 346…440V 50/60Hz ❸ **Z12** 12VDC

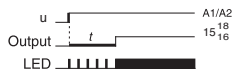
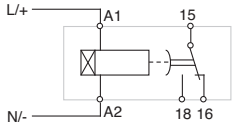
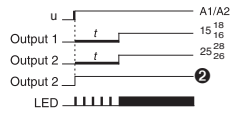
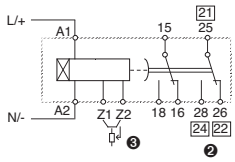
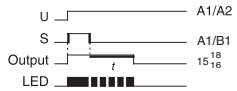
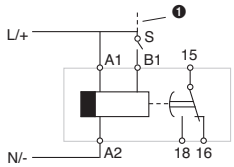
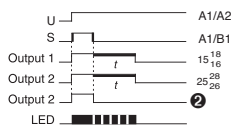
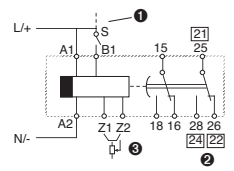
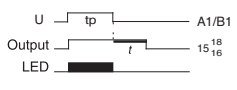
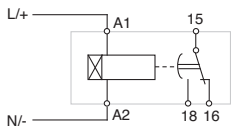
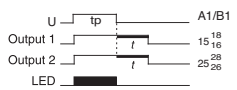
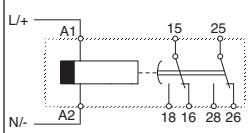
Special Function Timing Relays

RZ7-FS	H	3	U	U23
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**
	H Repeat Cycle Timer (Flasher) *Includes four separate functions* - Supply voltage controlled, output starts with a pause - Supply voltage controlled, output starts with a pulse - Pulse controlled, output starts with a pause - Pulse controlled, output starts with a pulse	*All functions:* **3** One single pole double throw contact	*For equal timing of pulse and pause* **U** 0.05s…60 hours ❶ *For separate timing of pulse and pause* **V** 2 x 0.05s…60 hours ❶	*Standard:* **U23** 24…48VDC 24…240V 50/60Hz *Special Order:* **A40** 346…440V 50/60Hz ❸ **Z12** 12VDC

RZ7-FS	Y	2	C	U23
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**
	Y Wye Delta Timing Relay	**2** Two normally open contacts	**C** 0.5…10 seconds **D** 1.5…30 seconds **E** 0.05…1 minute **F** 0.15…3 minutes **G** 0.5…10 minutes	*Standard:* **U23** 24…48VDC 24…240V 50/60Hz *Special Order:* **A40** 346…440V 50/60Hz ❸

❶ Multi-time setting range. See Technical Section for specific time settings.
❷ Second output selectable as timed or instantaneous.
❸ Timers with supply voltage code A40 (346...440VAC) are not UL listed. RZ7-FSx4 models are not available with supply voltage code A40.

RZ7-FS Timing Relays – Single Function, One and Two Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
ON-Delay Timing Relay (A) When supply voltage is applied, output contact(s) change state after time delay *t*.			• One SPDT contact • Single timing range	**RZ7-FSA3✱U23**	**102**
			• One SPDT contact • Multi-timing range (from 0.05s to 60h) ❹	**RZ7-FSA3UU23**	**107**
			• Two SPDT contacts ❷ • Multi-timing range (from 0.05s to 60h) ❹	**RZ7-FSA4UU23**	**141**
OFF-Delay Timing Relay (B) When control contact "S" closes, output contact(s) change state immediately. When control contact S opens, output contact(s) change state after time delay *t*. Constant supply voltage required on terminals A1/A2. ***Note:*** *Control pulse duration minimum 50ms (AC) - 30ms (DC).*			• One SPDT contact • Single timing range	**RZ7-FSB3✱U23**	**102**
			• One SPDT contact • Multi-timing range (from 0.05s to 60h) ❹	**RZ7-FSB3UU23**	**107**
			• Two SPDT contacts ❷ • Multi-timing range (from 0.05s to 60h) ❹	**RZ7-FSB4UU23**	**141**
Off-Delay Without Supply Voltage (Q) ❻ When supply voltage is applied, output contact(s) change state immediately. When supply voltage is removed, output contact(s) change state after time delay *t*.			• One SPDT contact • Multi-timing range (from 0.15s to 10min) ❺	**RZ7-FSQ3QU18**	**203**
			• Two SPDT contacts • Multi-timing range (from 0.15s to 10min) ❺	**RZ7-FSQ4QU18**	**237**

Supply Voltage

Single Function RZ7-FS...U23 timers (except RZ7-FSQ) accept supply voltages of 24…48VDC and 24…240VAC (RZ7-FSQ accepts 24…240VAC or DC). Other voltages are available by special order. See Quick Selection Guide on page G25 for details or contact your Sprecher + Schuh representative for information.

Timing Range Codes

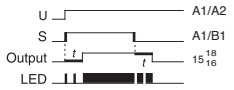
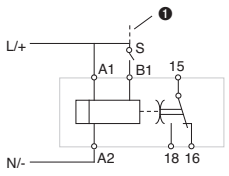
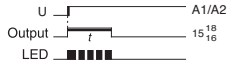
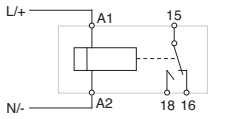
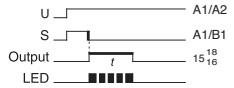
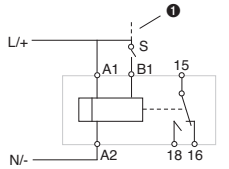
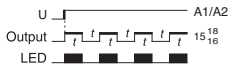
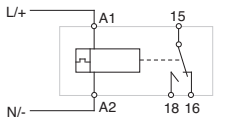
Replace (✱) with Timing Range Code

Timing Range	Code
0.05…1 sec	A
0.15…3 sec	B
0.5…10 sec	C
1.5…30 sec	D
0.05…1 min	E
0.15…3 min	F
0.5…10 min	G
1.5…30 min	H
0.05…1 hour	I
0.15…3 hour	J
0.5…10 hour	K
3.0…60 hour	L

RZ7-FS two pole timing relay

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Output two is selectable as an instantaneous contact by sliding a switch on the faceplate.
❸ Bridge or potentiometer 10kΩ, min. 0.25W (low voltage) for external time setting.
❹ Timing range is screwdriver selectable from the faceplate. Timing range selections include those found in the Timing Range Code chart.
❺ Timing range is screwdriver selectable from the faceplate. Exact timing ranges can be found in the Technical Section.
❻ Due to shock during shipment, the state of the contacts should be verified before initial use.

RZ7-FS Timing Relays – Single Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
ON and OFF-Delay Timing Relay (C) When control contact "S" closes, output contact changes state after time delay *t*. When control contact S opens, output contact changes state again after time delay *t*. Constant supply voltage required on terminals A1/A2. ***Note:*** *Closure duration of S must be greater than t.*			• One SPDT contact • Single timing range	**RZ7-FSC3✱U23**	**114**
One Shot / Watchdog Relay (D) When supply voltage is applied, the output contact changes state for time period *t*.			• One SPDT contact • Single timing range	**RZ7-FSD3✱U23**	**114**
Fleeting OFF-Delay Timing Relay (E) When control contact "S" is pulsed, output contact changes state for time period *t*. ***Note:*** *Control pulse duration minimum 50ms (AC) - 30ms (DC).*			• One SPDT contact • Single timing range	**RZ7-FSE3✱U23**	**114**
Symmetric Flasher Starting With A Pulse (F) When supply voltage is applied, output contact changes state immediately and then repeatedly changes after every time period *t*, continuing until supply voltage is removed.			• One SPDT contact • Single timing range	**RZ7-FSF3✱U23**	**114**

Supply Voltage

Single Function RZ7-FS...U23 timers accept supply voltages of 24…48VDC and 24…240VAC. Other voltages are available by special order. See Quick Selection Guide on page G25 for details or contact your Sprecher + Schuh representative for information.

Timing Range Codes

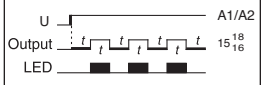
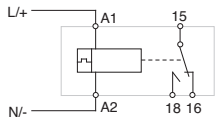
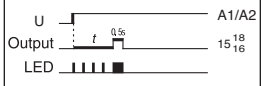
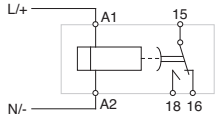
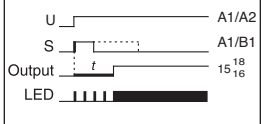
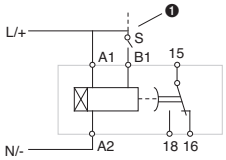
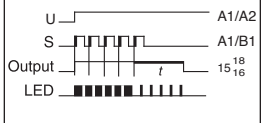
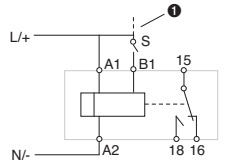
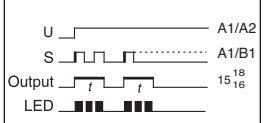
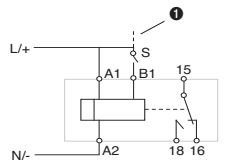
Replace (✱) with Timing Range Code

Timing Range	Code
0.05…1 sec	**A**
0.15…3 sec	**B**
0.5…10 sec	**C**
1.5…30 sec	**D**
0.05…1 min	**E**
0.15…3 min	**F**
0.5…10 min	**G**
1.5…30 min	**H**
0.05…1 hour	I
0.15…3 hour	**J**
0.5…10 hour	**K**
3.0…60 hour	**L**

RZ7-FS one pole timing relay

❶ For timing control, a voltage other than the supply voltage can also be used.

RZ7-FS Timing Relays – Single Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
Symmetric Flasher Starting With A Pause (G) When supply voltage is applied, output contact changes state after time period *t* and then repeatedly changes again after every period *t*, continuing until supply voltage is removed.			• One SPDT contact • Single timing range	**RZ7-FSG3✱U23**	**114**
On-Delay Pulse Generator (I) When supply voltage is applied, output contact changes state after time period *t*. Output contact changes state again after 0.5 seconds.			• One SPDT contact • Single timing range	**RZ7-FSI3✱U23**	**114**
On-Delay (pulse controlled) (J) When control contact "S" is pulsed, the output contact changes state after time period *t*.			• One SPDT contact • Single timing range	**RZ7-FSJ3✱U23**	**114**
One Shot / Watchdog (pulse controlled) (K) When control contact "S" closes, the output contact changes state immediately. After the last pulse of contact S, the output contact changes state after time delay *t*.			• One SPDT contact • Single timing range	**RZ7-FSK3✱U23**	**114**
Impulse Converter (L) When a pulse is applied to control contact "S", the output contact changes state immediately for time period *t*. Pulses received during timing period *t* have no further effect. ***Note:*** *The period t is not dependent on the length of the control pulse. Control pulse duration minimum 50ms (AC) - 30ms (DC).*			• One SPDT contact • Single timing range	**RZ7-FSL3✱U23**	**114**

Supply Voltage

Single Function RZ7-FS..U23 timers accept supply voltages of 24…48VDC and 24…240VAC. Other voltages are available by special order. See Quick Selection Guide on page G25 for details or contact your Sprecher + Schuh representative for information.

Timing Range Codes

Replace (✱) with Timing Range Code

Timing Range	Code
0.05…1 sec	**A**
0.15…3 sec	**B**
0.5…10 sec	**C**
1.5…30 sec	**D**
0.05…1 min	**E**
0.15…3 min	**F**
0.5…10 min	**G**
1.5…30 min	**H**
0.05…1 hour	**I**
0.15…3 hour	**J**
0.5…10 hour	**K**
3.0…60 hour	**L**

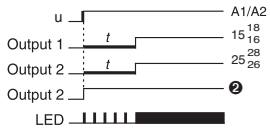
RZ7-FS one pole timing relay

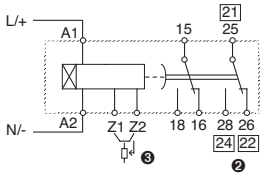
❶ For timing control, a voltage other than the supply voltage can also be used.

RZ7-FS Timing Relays – Multi-Function, One and Two Pole

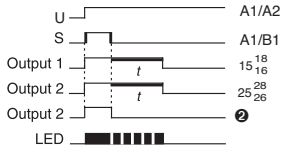
RZ7-FSM Multi-Function Relay	Functional Description	Type	Catalog Number	Price
	**Multi-Function Relay (M)** The RZ7-FSM multifunction relay combines *eight* timing functions plus ON and OFF functions (for installation and maintenance). Each timing function and timing range is selectable from the face of the relay with a screwdriver actuated knob. The RZ7-FSM offers the following timing functions: On-Delay On and Off-Delay Fleeting Off-Delay On-Delay Pulse Generator ON Function (see below) OFF Function (see below) Off-Delay One Shot / Watchdog Impulse Converter Symmetric Flasher Starting With a Pulse The two pole RZ7-FSM4 offers two separate, electrically isolated single pole double throw (SPDT) contacts which allow applications in complex installations without additional auxiliary relays. This series may also be operated remotely via an external potentiometer.	• One SPDT contact • Multifunction, multi-timing range relay (from 0.05s to 60h) ❹	**RZ7-FSM3UU23**	**170**
		• Two SPDT contacts ❷ • Multifunction, multi-timing range relay (from 0.05s to 60h) ❹	**RZ7-FSM4UU23**	**203**

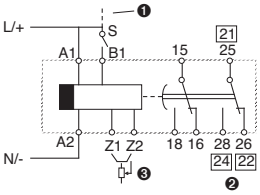
On-Delay (A)



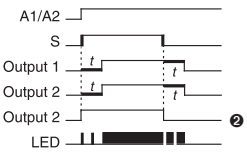


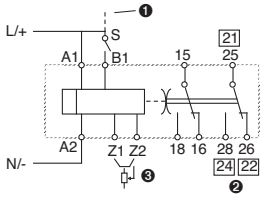
Off-Delay (B)



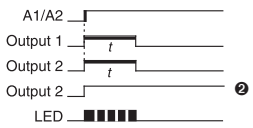


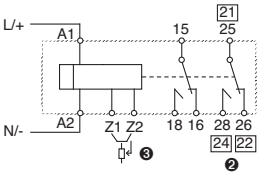
On and Off-Delay (C)



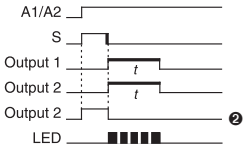


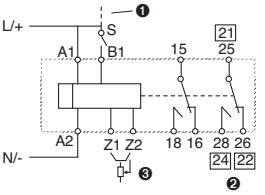
One Shot / Watchdog (D)



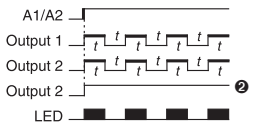


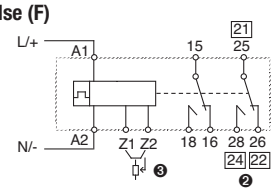
Fleeting Off-Delay (E)



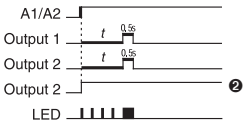


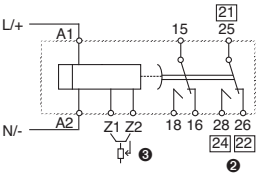
Symmetric Flasher Starting With a Pulse (F)



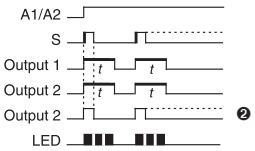


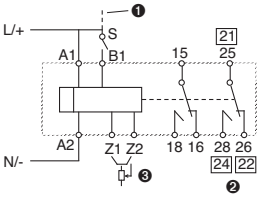
On-Delay Pulse Generator (I)



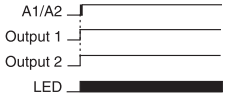


Impulse Converter (L)

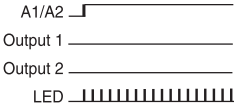




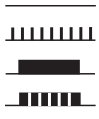
ON-Function



OFF-Function



Function display LED (Green)



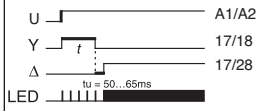
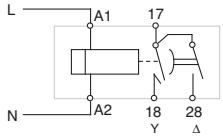
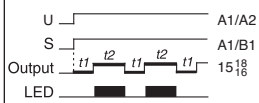
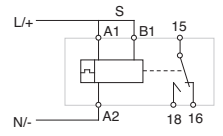
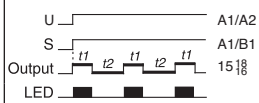
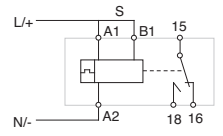
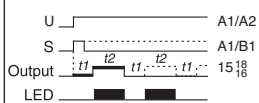
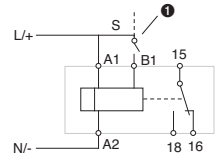
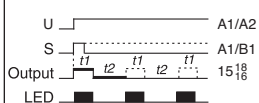
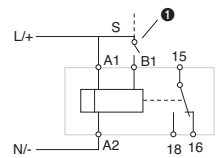
Output in rest position, no timing
Output in rest position, time running
Output in operation position, no timing
Output in operation position, time running

Supply Voltage

The RZ7-FSM timer accepts supply voltages of 24…48VDC and 24…240VAC. Other supply voltages are available by special order. See Quick Selection Guide on page G25 for details or contact your Sprecher + Schuh representative for information.

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Output two is selectable as an instantaneous contact by sliding a switch on the faceplate.
❸ Bridge or potentiometer 10kΩ, min. 0.25W (low voltage) for external time setting.
❹ Function selection and timing range is screwdriver selectable from the faceplate. Exact timing range selections can be found in Technical Information.

RZ7-FS Timing Relays – Special Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
Wye-Delta Timing Relay (Y) When supply voltage is applied, output contact Y closes for time period *t*. After time period *t*, plus a fixed time period t_u, (50-65ms) output contact Δ closes.			• Two single pole N.O. contacts • Single timing range	**RZ7-FSY2✱U23**	**136**
Repeat Cycle Timer (H) - (Flasher) The Repeat Cycle Timer offers four different operating characteristics within the same relay. Depending on how the unit is wired, cycles are initiated either by supply voltage being applied or by a pulse from control contact "S". Regardless of the activation method, each cycle may begin with a pause or a pulse. The RZ7-FSH3**U** relay sets the pulse and pause durations within one timing range setting. The RZ7-FSH3**V** allows individual time settings of pulse and pause within two timing range settings. Both relays offer multiple time settings between 0.05s and 60h, selectable in ten increments.	 ***Supply voltage controlled, output starts with a pause Switch is up***		• One SPDT contact • Multi-timing range (from 0.05s to 60h) ❷ Provides (1) range setting for t_1 and t_2	**RZ7-FSH3UU23**	**136**
	 ***Supply voltage controlled, output starts with a pause Switch is down***				
	 ***Pulse controlled, output starts with a pause Switch is up***		Provides (2) range settings for t_1 and t_2	**RZ7-FSH3VU23**	**136**
	 ***Pulse controlled, output starts with a pause Switch is down***				

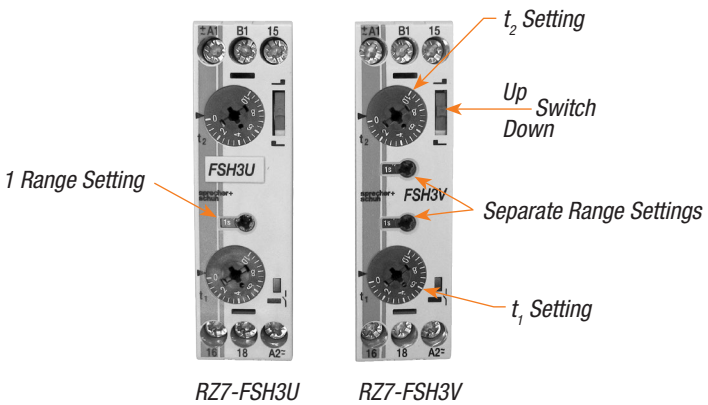
Supply Voltage

These timers accept supply voltages of 24…48VDC and 24…240VAC. A supply voltage of 346…440VAC is also available by special order. See Quick Selection Guide on page G25 for details or contact your Sprecher + Schuh representative for information.

Timing Range Codes

Replace (✱) with Timing Range Code

Timing Range	Code
0.5…10 sec	**C**
1.5…30 sec	**D**
0.05…1 min	**E**
0.15…3 min	**F**
0.5…10 min	**G**



RZ7-FSH3U *RZ7-FSH3V*

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Timing range is screwdriver selectable from the faceplate. Exact timing range selections can be found in Technical Information.

RZ7 Hazardous Location Electronic Timing Relays

Sprecher+Schuh's RZ7 hazardous location relay timers have been designed to meet the stringent requirements of hazardous location applications while maintaining the functionality of the existing RZ7-FS family of timing relays. The RZ7-FSM4...-EX is a multi-function timing relay with 8 single-functions, SPDT or DPDT contact output, and adjustable timing ranges. The -EX models are ideal for control panels installed in hazardous location areas such as in the oil, gas and petrochem industries.

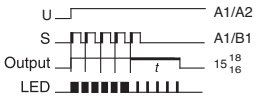
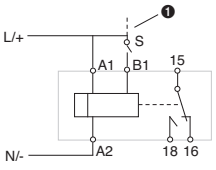
RZ7-FSK3CU23-EX

RZ7-FSM4UU23-EX

Multiple Approvals

- cULus Industrial Control Equipment for Hazardous Location Listed 87SL
- UL Class 1, Div. 2, Groups A,B,C,D UL Class 1, Zn 2, Group IIC
- Temperature Code T4A, 2A 32VDC max.

RZ7-FS Hazardous Location Timing Relay – Single Function, One Pole ❷

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
One Shot / Watchdog (pulse controlled) (K) When control contact "S" closes, the output contact changes state immediately. After the last pulse of contact S, the output contact changes state after time delay *t*.			• One SPDT contact • Single timing range 0.05...1 second 0.5...10 second	**RZ7-FSK3AU23-EX** **RZ7-FSK3CU23-EX**	**124**

Supply Voltage

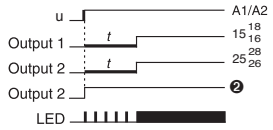
Single Function RZ7-FSK3...-EX timers accept supply voltages of 24…48VDC and 24…240VAC.

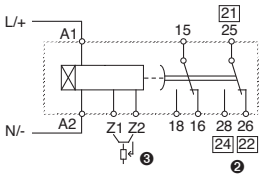
❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Technical data and dimensional information for the RZ7-FS...-EX models are the same as the standard RZ7-FS models.

RZ7-FS Hazardous Location Timing Relays – Multi-Function, One and Two Pole ❺

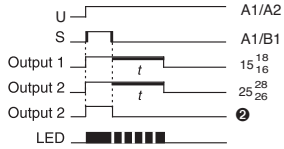
RZ7-FSM Multi-Function Relay	Functional Description	Type	Catalog Number	Price
	**Multi-Function Relay (M)** The RZ7-FSM multifunction relay combines *eight* timing functions plus ON and OFF functions (for installation and maintenance). Each timing function and timing range is selectable from the face of the relay with a screwdriver actuated knob. The RZ7-FSM offers the following timing functions: On-Delay On and Off-Delay Fleeting Off-Delay On-Delay Pulse Generator ON Function (see below) OFF Function (see below) Off-Delay One Shot / Watchdog Impulse Converter Symmetric Flasher Starting With a Pulse The two pole RZ7-FSM4 offers two separate, electrically isolated single pole double throw (SPDT) contacts which allow applications in complex installations without additional auxiliary relays. This series may also be operated remotely via an external potentiometer.	• One SPDT contact • Multifunction, multi-timing range relay (from 0.05s to 60h) ❹	**RZ7-FSM3UU23-EX**	**183**
		• Two SPDT contacts ❷ • Multifunction, multi-timing range relay (from 0.05s to 60h) ❹	**RZ7-FSM4UU23-EX**	**220**

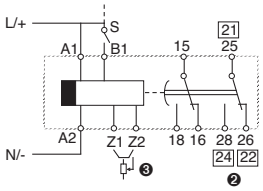
On-Delay (A)



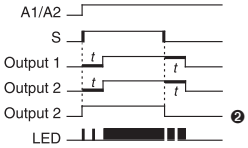


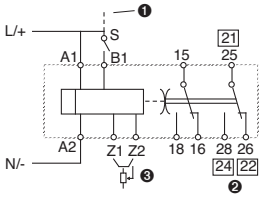
Off-Delay (B)



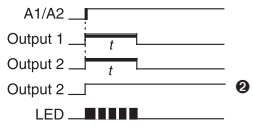


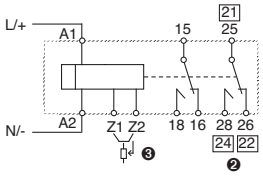
On and Off-Delay (C)



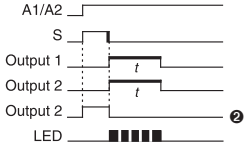


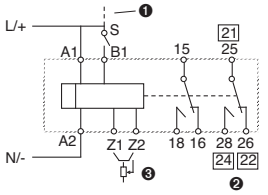
One Shot / Watchdog (D)



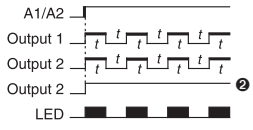


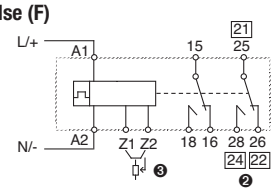
Fleeting Off-Delay (E)



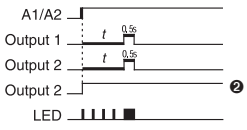


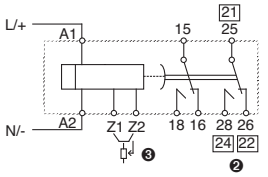
Symmetric Flasher Starting With a Pulse (F)



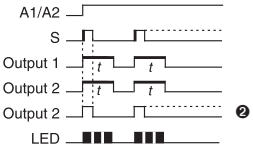


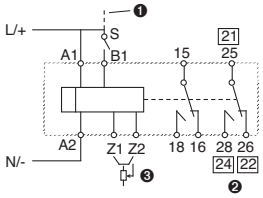
On-Delay Pulse Generator (I)





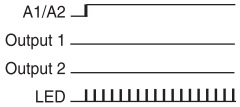
Impulse Converter (L)



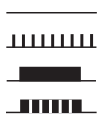


ON-Function

OFF-Function



Function display LED (Green)



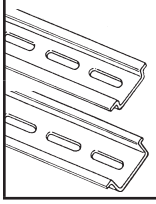
Output in rest position, no timing
Output in rest position, time running
Output in operation position, no timing
Output in operation position, time running

Supply Voltage

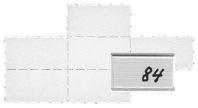
The RZ7-FSM timer accepts supply voltages of 24…48VDC and 24…240VAC.

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Output two is selectable as an instantaneous contact by sliding a switch on the faceplate for RZ7-FSM4 model.
❸ Bridge or potentiometer 10kΩ, min. 0.25W (low voltage) for external time setting for RZ7-FSM4 model.
❹ Function selection and timing range is screwdriver selectable from the faceplate. Exact timing range selections can be found in Technical Information.
❺ Technical data and dimensional information for the RZ7-FS...-EX models are the same as the standard RZ7-FS models.

Accessories

Accessory	Description	Catalog Number	Price
	**Setting Knob With Scale -** For time setting without tools.	**RZ7-FSK**	**8.50**
	**Panel Mounting Adaptor -** For surface mounting RZ7-FS/FE timing relays.	**RZ7-FSA ❷**	**6.75**
	**DIN-rail** - 2 meter lengths (≈ 6' 6") Top Hat, low profile (price per rail Top Hat, high profile (price per rail)	**3F** **3AF**	**See page A54**

Marking Systems

Component	Description	Pkg. Qty.	Catalog Number	Price Each
	**Label Sheet –** 1 sheet with 105 self-adhesive paper labels each, 6 x 17mm	1	**CA7-FMS**	**See page A54**
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover.	1	**CA7-FMP**	
	Transparent Cover - To be used with Marking Tag Sheets.	100 ❶	**CA7-FMC**	
	**Tag Carrier -** For marking with Series V7 Clip-on Tags.	100 ❶	**CA7-FMA2**	

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.
❷ Previously catalog number 26.506.221-01.

Technical Data

Timing Characteristics (according to VDE 0435, Part 2021)		
Timing ranges for		
RZ7-FSM-A, B, C, D, E, F, I, & L	(1s)	0.05…1 sec
RZ7-FSH	(3s)	0.15…3 sec
	(10s)	0.5…10 sec
	(1mn)	0.05…1 min
	(3mn)	0.15…3 min
	(10mn)	0.5…10 min
	(1h)	0.05…1 hour
	(3h)	0.15…3 hours
	(10h)	0.5…10 hours
	(60h)	3…60 hours
RZ7-FSQ	(2.5s)	0.15…2.5 sec
	(10s)	0.5…10 sec
	(80s)	4…80 sec
	(10mn)	0.5…10 min
Setting accuracy	±5% of full scale value	
Repeatability	±0.2% of the setting values	
Tolerance	Voltage: ±0.001%/%ΔU	
	Temperature: ±0.025%/°C	
Power Supply		
Supply voltages	24…48VDC and 24…240VAC, 50/60Hz	
	(multi voltage)	
	12VDC	
	24…240V AC or DC (universal voltage)	
	346…440VAC, 50/60Hz	
Voltage tolerance	AC: -15%... +10%	
	DC: -20%... +20%	
Power consumption	AC: 5VA at 240V	
	DC: 0.5W at 24V	
Time energized	100%	
Reset time	50ms	
Voltage interruption	≤20ms without reset (supply voltage)	
Input Impedance	Relay On: 3k-13k ohms Relay Off: 0.7k-4k ohms	
Cable length (supply voltage control)	250 meters (800 ft.) max.	
Pulse Control (B1)		
Impulse duration	≥50ms (AC), ≥30ms (DC)	
Input voltage	Supply voltage range	
Input current	1 mA	
Max. Leakage Current	400 micro Amps	
Cable length	max. 250 m (800 ft.) without parallel load between B1 & A2	
	max. 50 m (160 ft.) with load (<3kΩ) between B1 & A2	
Outputs		
Type of outputs	Relay contacts: hard silver	
Maximum admissible operating voltage	Alternating current: 440VAC	
Dielectric Coil to contact Withstand Voltage	5,000 V	
Switching capacity		
Current I_{th}: (AC1)	8A (5A for RZ7-FSQ)	
Power:	2000VA	
	according to IEC947-5-1:	
	3A/440VAC (inductive load, AC14)	
	3A/250VAC (inductive load, AC15)	
	1A/24VDC (inductive load, DC13)	
	according to UL 508:	
	1.5A/250VAC (B300)	
	3A/120VAC (B300)	
Short circuit resistance	10 A gL (fast blow fuse)	

Life expectancy (electrical)	4 million ops. at 1A/250VAC, cosφ = 1
	0.2 million ops. at 6A/250VAC, cosφ = 1
	1.5 million ops. at 1A/250VAC, cosφ = 0.3
	0.3 million ops. at 3A/250VAC, cosφ = 0.3
	0.5 million ops. at 6A/24VDC, resistive
	2 million ops. at 4A/24VDC, resistive
	2 million ops. at 0.2A/230VDC, resistive
	1 million ops. at 0.4A/24VDC, L/R = 20ms
	1 million ops. at 0.2A/110VDC, L/R = 20ms
	1 million ops. at 0.1A/230VDC, L/R = 20ms
Life expectancy (mechanical)	30 million operations
General Data Insulation Characteristics	2 kVAC/50 Hz test voltage according to VDE 0435 and 6 kV 1.2/50 µs surge voltage according to IEC 947-1 between all inputs and outputs
EMC/Interference Immunity	Performance of following requirements: - Surge capacity of the supply voltage according to IEC1000-4-5: 4 kV 1.2/50 µs - Burst according to IEC 1000-4-4: 6 kV/ 6/50ns - ESD discharge according to IEC 1000-4-2: - Contact 8 kV, air 8 kV - Electromagnetic HF field according to IEC 801-3 and conducted electromagnetic HF signal according to IEC 801-6: Level 3
EMC/Emission	Electromagnetic fields according to EN 55 022: Class B
Safe isolation	According to VDE 106, part 101
Climatic withstand	56 cycles (24h) at 25…40°C and 95% relative humidity according to IEC 68-2-30 and IEC 68-2-3.
Vibration resistance	4 g in 3 axis at 10…500 Hz, test FC according to IEC 68-2-6
Shock resistance	50 g according to IEC 68-2-27
Protection class	Enclosure: IP40 IP30 (single function) Terminal: IP20 according to IEC 947-1
Weight	100g
Approvals/Standards	UL File E14840, C-UL up to 240VAC, CE
Ambient temperature	Open: –25°C…+60°C Enclosed: –25°C…+45°C Storage –40°C…+85°C
Connections Screw terminal -	M3.5 for Pozidrive No.2, Phillips and slotted screws No.2 suitable for power screwdriver.
Rated tightening torque -	0.8 Nm (max. 1.2 Nm) - [8.8 lb-in]
Wire Size -	Dual-chamber system for terminal cross-sections of 1 x 0.5mm² (solid) or 2 x 2.5mm² (flexible with sleeve), AWG 20…14.
Finger Protection -	According to VDE 0106
Mounting Relays	– Snap-on mounting (35mm DIN-rail) – Side mounting on CA7contactors and CS7 with dovetail joint [surface mounting in any position] – Screw fixing by Panel Mount Adapter and two screws (M4) [surface mounting in any position]
Disposal	Synthetic material without dioxin according to EC/EFTA notification No. 93/0141/D. Electrical contacts contain cadmium.
Standards	EN 60947-1, EN 60947-5-1, EN 50081-1, IEC 947, UL 508. CSA 22.2 No. 14

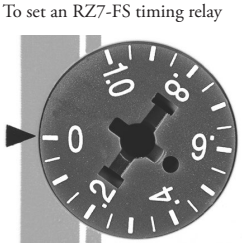
RZ7 Relative Scale Setting Knob

Series RZ7 Timing Relays have a "relative scale" setting knob numbered 0 to 1.0. Think about this as 0 to 100% of the relay's built-in time range. Example: To set an RZ7-FS timing relay (with a 0.05 to 1 minute range) to activate after 25 seconds:

1) Divide the desired activation time (25 seconds) by the maximum time limit of the relay (60 seconds).

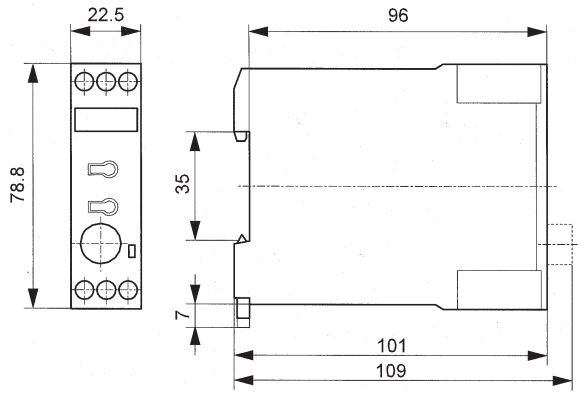
   25 ÷ 60 = .416

2) Rotate the setting knob to just past the .4 mark.

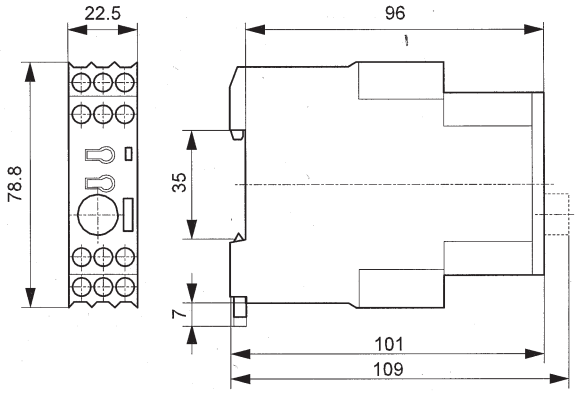


Series RZ7-FS Timing Relays *(one and two pole)*

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

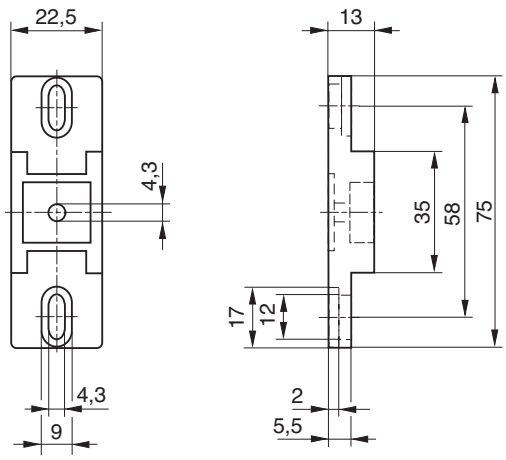


RZ7-FS (1 SPDT contact)



RZ7-FS (2 SPDT contacts)

Panel Mount Adaptor (RZ7-FSA)



RZ7-FE Electronic Timing Relays

The economical choice for most industrial timing applications

The RZ7-FEM multifunction timing relay combines all functions in one device.

Sprecher + Schuh's RZ7-FE electronic timing relays offer seven popular output functions in an economical package. This series is especially designed for applications where a high quality, yet basic timing relay is required. Timing formats include ON-delay, OFF-delay, Wye-Delta and four other choices. All models are multi-time relays, meaning that various time ranges (from 0.05 seconds to 10 hours) can be selected from the face of the relay.

Solid state accuracy and reliability

Except for their hard silver contacts, all RZ7-FE timing relays are built with solid state surface mounted electronics and are accurate to within one percent. Their ruggedness and accuracy is due to the thorough testing of function, timing characteristics and surge voltage strength performed on *each device* prior to shipment.

In addition, RZ7-FE relays function reliably from 15% under rated operating voltage to 10% over rated operating voltage (AC). Voltage tolerance is even greater in DC applications.

Universal voltage capability

All RZ7-FE timing relays operate with multiple supply voltages ranging from 24VAC or DC to 240VAC. Universal voltage capability means smaller inventories and more flexibility.

Choose from two different output contacts

New to the RZ7-FE series is the choice between one normally open (NO) contact or one single pole double throw (SPDT) contact. The new SPDT version can be used either normally open or normally closed. This version has several technical advantages such as shorter impulse duration requirements and a faster recovery time.

Multiple functions in one relay

The RZ7-FEM relay combines four of the most popular timing functions into one device. Six timing ranges are included that are individually selectable from 0.05 seconds to 10 hours. This multifunction relay reduces inventories and is ideal for maintaining remote installations where stocking several different timing relays would not be practical.

Many safety and convenience features

- Each relay is equipped with an LED that indicates output status conditions.
- Finger and back of hand protection to IP40.
- Terminals are captive and supplied in the open position.
- All RZ7's can be surface mounted, rail mounted, or mounted directly on our family of CA7/CS7 devices.
- RZ7 relays can be mounted in any plane.
- Terminals, setting knob and LED's are all accessible from the front of the unit.
- RZ7-FE Timing Relays are very compact, measuring approximately 1" x 3" x 3".

Quick Selection Guide

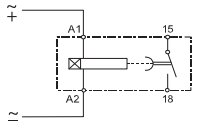
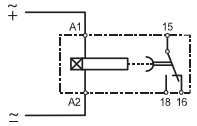
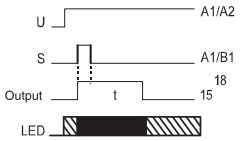
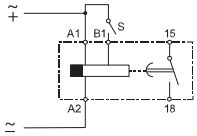
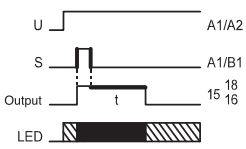
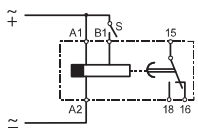
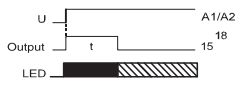
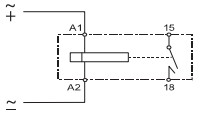
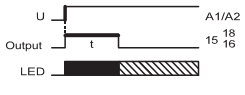
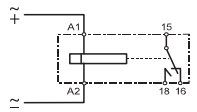
Single Function Timing Relays						
RZ7-FE	**A**	**1**	**T**	**U22**		
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**		
	A On-Delay **B** Off-Delay **D** One Shot / Watchdog **E** Fleeting Off-Delay ❷ **F** Symmetric flasher starting with a pulse **L** Impulse Converter ❷	*Functions A, B, D & F* **1** One normally open contact	**T** 0.05s…10 hours ❶	**U22**	24VAC or DC 110…240V 50/60Hz	A1/A2
		All Functions: **3** One single pole double contact	**T** 0.05s…10 hours ❶	**U23**	24…48VDC 24…240V 50/60Hz	A1/A2

Multi-Function Timing Relays						
RZ7-FE	**M**	**1**	**T**	**U22**		
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**		
	M Multi-function *Four single functions* *- On-delay* *- Off-delay* *- One shot* *- Symmetric flasher starting with a pulse*	**1** One normally open contact	**T** 0.05s…10 hours ❶	**U22**	24VAC or DC 110…240V 50/60Hz	A1/A2
		3 One single pole double contact	**T** 0.05s…10 hours ❶	**U23**	24…48VDC 24…240V 50/60Hz	A1/A2

Special Function Timing Relays						
RZ7-FE	**Y**	**2**	**Q**	**U23**		
Type	**Function**	**Contacts**	**Time Ranges**	**Supply Voltages**		
	Y Wye-Delta Timing Relay	**2** Two normally open contacts (one side common)	**Q** 0.15s…10 minutes ❶	**U23**	24…48VDC 24…240V 50/60Hz	A1/A2 A1/A2

❶ Multi-time setting range. See appropriate catalog page for specific time settings.
❷ Not available in RZ7-FEx1 model.

RZ7-FE Timing Relays – Single Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
ON-Delay Timing Relay (A) When supply voltage is applied, output contact(s) change state after time delay *t*.			• One NO contact • Multi-timing range (from 0.05s to 10h) ❷ • Supply voltage selected via wiring terminals A1, A2 • Bicolored LED indicator	**RZ7-FEA1TU22**	**84**
			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEA3TU23**	**90**
OFF-Delay Timing Relay (B) When control contact B1 closes, the output contact changes state immediately. When control contact B1 opens, the output contact changes state after time delay *t*. Constant supply voltage required on terminals A1/A2 or A3/A2. ***Note:*** *Control pulse duration minimum 250ms for RZ7-FEB1SU22; 50ms (AC) and 30ms (DC) for RZ7-FEB3TU23.*			• One NO contact • Multi-timing range (from 0.05s to 10h) ❷ • Supply voltage selected via wiring terminals A1, A2 • Bicolored LED indicator	**RZ7-FEB1TU22**	**90**
			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEB3TU23**	**97**
One Shot Relay / Watchdog (D) When supply voltage is applied, the output contact changes state for time period *t*.			• One NO contact • Multi-timing range (from 0.05s to 10h) ❷ • Supply voltage selected via wiring terminals A1, A2 • Bicolored LED indicator	**RZ7-FED1TU22**	**84**
			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FED3TU23**	**90**

Supply Voltage

The last three digits in the catalog number represent the supply voltage range the relay will accept:

U22	24V AC or DC	(A1/A2)
	110…240V 50/60Hz	(A1/A2)
U23	24…48VDC and 24…240V 50/60Hz	(A1/A2)

Timing Range Codes

RZ7-FE
0.05…1 sec
0.5…10 sec
0.05…1 min
0.5…10 min
0.05…1 hour
0.5…10 hour

Bicolored LED

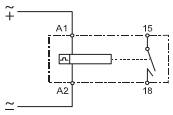
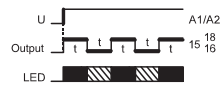
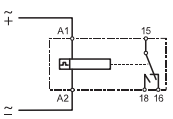
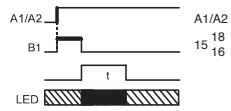
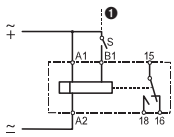
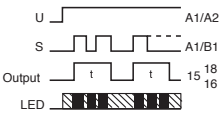
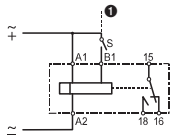
1 SPDT or 1 N.O. Contact Timers

- LED U = Green: Supply voltage available
- LED Relay = Red: Output is energized
- OFF: No color

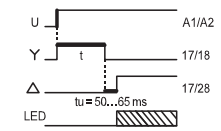
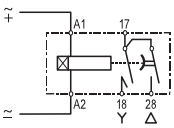
RZ7-FE timing relay

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Timing range is screwdriver selectable from the faceplate.

RZ7-FE Timing Relays – Single Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
Symmetric Flasher Starting With A Pulse (F) When supply voltage is applied, the output contact changes state immediately and then repeatedly changes after every time period *t*, continuing until supply voltage is removed.			• One NO contact • Multi-timing range (from 0.05s to 10h) ❷ • Supply voltage selected via wiring terminals A1, A2 • Bicolored LED indicator	**RZ7-FEF1TU22**	**84**
			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEF3TU23**	**90**
Fleeting OFF-Delay Timing Relay (E) When control contact B1 is pulsed, the output contact changes state for time period *t*. ***Note:*** *Control pulse duration minimum 50ms (AC) - 30ms (DC).*			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEE3TU23**	**97**
Impulse Converter (L) When a pulse is applied to control contact B1, the output contact changes state immediately for time period *t*. Pulses received during timing period *t* have no further effect. ***Note:*** *The period t is not dependent on the length of the control pulse. Control pulse duration minimum 50ms (AC) - 30ms (DC).*			• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEL3TU23**	**97**

RZ7-FE Timing Relays – Special Function, One Pole

Functional Description	Functional Diagram	Terminal Arrangement	Type	Catalog Number	Price
Wye-Delta Timing Relay (Y) When supply voltage is applied, output contact Y closes for time period *t*. After time period *t*, plus a fixed time period t_u, (50-65ms) output contact Δ closes.			• Two single pole N.O. contacts (one side common) • Multi-timing range (from 0.15s to 10m) ❷ • "Universal" terminals accept all appropriate supply voltages • LED indicator	**RZ7-FEY2QU23**	**121**

Supply Voltage

The last three digits in the catalog number represent the supply voltage range the relay will accept:

U22	24V AC or DC	(A1/A2)
	110…240V 50/60Hz	(A1/A2)
U23	24…48VDC and 24…240V 50/60Hz	(A1/A2)

Timing Range Codes

RZ7-FE with NO or SPDT contact	RZ7-FEY with two NO contacts
0.05…1 sec	0.15…3 sec
0.5…10 sec	0.5…10 sec
0.05…1 min	0.05…1 min
0.5…10 min	0.5…10 min
0.05…1 hour	
0.5…10 hour	

Bicolored LED

1 SPDT or 1 N.O. Contact Timers

- LED U = Green: Supply voltage available
- LED Relay = Red: Output is energized
- OFF: No color

Single Color LED

2 N.O. with Common

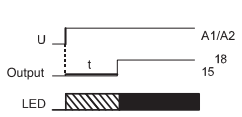
- ON = Green: Output is energized
- OFF = No Color

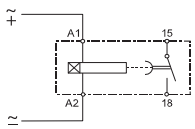
❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Timing range is screwdriver selectable from the faceplate.

RZ7-FE Timing Relays – Multi-Function, One Pole

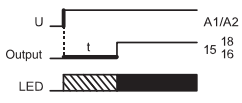
RZ7-FEM Multi-function Relay	Functional Description	Type	Catalog Number	Price
	**Multi-Function Relay (M)** The RZ7-FEM multifunction relay combines *four* timing functions in one device. Each timing function and timing range is selectable from the face of the relay with a screwdriver actuated knob. The RZ7-FEM offers the following timing functions: On-Delay Off-Delay One Shot/Watchdog Symmetric Flasher Starting With a Pulse The RZ7-FEM3 offers one single pole double throw contact that can be used as either a normally open or normally closed contact.	• One NO contact • Multi-timing range (from 0.05s to 10h) ❷ • Supply voltage selected via wiring terminals A1, A2 • Bicolored LED indicator	**RZ7-FEM1TU22**	**114**
		• One SPDT contact • Multi-timing range (from 0.05s to 10h) ❷ • "Universal" terminals accept all appropriate supply voltages • Bicolored LED indicator	**RZ7-FEM3TU23**	**121**

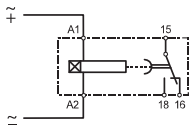
(A) On-Delay





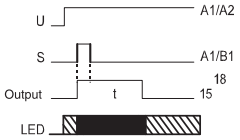
1 N.O. (SPST)

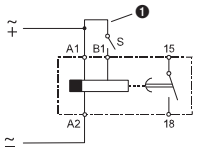




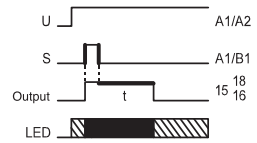
1 C/O (SPDT)

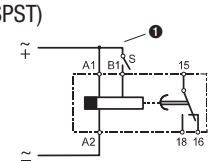
(B) Off-Delay





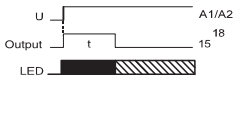
1 N.O. (SPST)

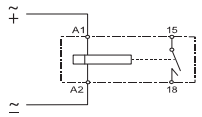




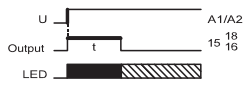
1 C/O (SPDT)

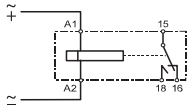
(D) One Shot





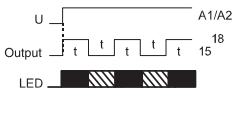
1 N.O. (SPST)

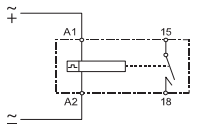




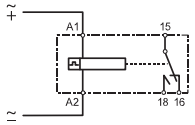
1 C/O (SPDT)

(F) Flasher (Repeat Cycle Starting with Pulse)





1 N.O. (SPST)



1 C/O (SPDT)

Supply Voltage

The last three digits in the catalog number represent the supply voltage range the relay will accept:

U22	24V AC or DC	(A1/A2)
	110…240V 50/60Hz	(A1/A2)
U23	24…48VDC and 24V…240V 50/60Hz	(A1/A2)

Bicolored LED

1 SPDT or 1 N.O. Contact Timers

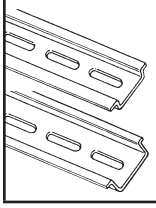
- LED U = Green: Supply voltage available
- LED Relay = Red: Output is energized
- OFF: No color

Timing Range Codes

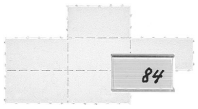
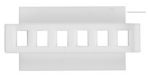
RZ7-FEM with one NO or SPDT contact
0.05…1 sec
0.5…10 sec
0.05…1 min
0.5…10 min
0.05…1 hour
0.5…10 hour

❶ For timing control, a voltage other than the supply voltage can also be used.
❷ Timing range is screwdriver selectable from the faceplate.

Accessories

Accessory	Description	Catalog Number	Price
	**Setting Knob With Scale -** For time setting without tools.	**RZ7-FSK**	**8.50**
	**Panel Mounting Adaptor -** For surface mounting RZ7-FS/FE timing relays.	**RZ7-FSA ❷**	**6.75**
	**DIN-rail** - 2 meter lengths (≈6' 6") Top Hat, low profile (price per rail) Top Hat, high profile (price per rail)	**3F** **3AF**	**See page A54**

Marking Systems

Component	Description	Pkg. Qty.	Catalog Number	Price Each
	**Label Sheet –** 1 sheet with 105 self-adhesive paper labels each, 6 x 17mm	1	**CA7-FMS**	**See page A54**
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover.	1	**CA7-FMP**	
	Transparent Cover - To be used with Marking Tag Sheets.	100 ❶	**CA7-FMC**	
	**Tag Carrier -** For marking with Series V7 Clip-on Tags.	100 ❶	**CA7-FMA2**	

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.
❷ Previously catalog number 26.506.221-01.

Technical Data

		RZ7-FE With NO Contact	RZ7-FE With SPDT Contact
Setting Accuracy		±5% of the time range final value ($t_{max.}$)	±5% of the time range final value ($t_{max.}$)
Repeatability		±1% of the time range final value ($t_{max.}$)	±1% of the time range final value ($t_{max.}$)
Tolerance		by voltage: ±0.01%/%ΔU by temperature: ±0.25%/°C	by voltage: ±0.001%/%ΔU by temperature: ±0.025%/°C
Supply			
Supply Voltage		24 AC or DC and 110…240VAC, 50/60Hz	24…48VDC and 24…240VAC, 50/60 Hz
Voltage Tolerance		-15%/+20% (DC), -15%/+10% (AC)	-15%/+20% (DC), -15%/+10% (AC)
Power Consumption		0.5W at 24VDC, 5VA at 240VAC	0.5W at 24VDC, 5VA at 240VAC
Timer Energized		100%	100%
Recovery Time		100ms	100ms
Voltage Isolation		–	≤30ms without reset (supply voltage)
Cable length (supply voltage control)		max. 250 meters (750 ft.)	max. 250 meters (750 ft.)
Pulse Control (B1)			
Impulse Duration		≥250ms	≥50ms (AC), ≥30ms (DC)
Input Voltage		supply voltage range	supply voltage range
Input Current		1mA	1mA
Cable Length		max. 250 meters without parallel load between B1 and A2 max. 50 meters with load (<3 kΩ) between B1 and A2	max. 250 meters without parallel load between B1 and A2 max. 50 meters with load (<3 kΩ) between B1 and A2
Outputs			
Contact Type		1N.O. contact	1 Form C-SPDT contact
Switching Capacity	Voltage:	250VAC	250VAC
	Current:	5A (Resistive, AC1)	5A (Resistive, AC1)
	Power:	1250VA	1250VA
	according to IEC 947-5-1:	1A/250VAC (inductive load, AC14)	1A/250VAC (inductive load, AC14)
		1A/24VDC (inductive load, DC13)	1A/24VDC (inductive load, DC13)
	according to UL508:	1A/300VAC (D300)	1A/300VAC (D300)
Short Circuit Resistance		6A gL (fast blow fuse)	6A gL (fast blow fuse)
Dielectric Withstand Voltage (contact to coil)		4000V	4000V
Life	mechanical:	20 million operations	
	electrical operations:	0.4 Mil. at 1A/250VAC, cosφ = 1 0.4 Mil. at 0.5A/250VAC, cosφ = 0.4 0.4 Mil. at 1A/24VDC, resistive	
State Indicator		1 bicolored LED (Supply = green; Relay = red)	
General Characteristics			
Insulation Characteristics		2 kVAC/50Hz test voltage according to VDE 0435 and 4kV 1.2/50µs surge voltage according to IEC 947-1 between all inputs and outputs	
EMC Interference Immunity		The following requirements are fulfilled: Surge capacity of the supply voltage according to IEC 1000-4-5: Level 3. Burst according to IEC 1000-4-4: Level 3. ESD discharge according to IEC 1000-4-2: Level 3.	
EMC/Emission		electromagnetic fields according to EN 55 022: Class B	
Safe Isolation		according to VDE 106, Part 101	
Climatic Withstand		56 cycles (24h) at 25…40°C and 95% relative humidity according to IEC 68-2-30 and IEC 68-2-3	
Vibration Resistance		4g in 3 axis at 10…500Hz, test FC according to IEC 68-2-6	
Shock Resistance		50g according to IEC 68-2-27	
Protection Class		Enclosure: IP40 Terminal: IP20	
Weight		60g	
Approvals/Standards		UL File E14840, C-UL, CE	
Ambient Temperature		Open: -25°C…+60°C Enclosed: -25°C…+45°C Storage: -40°C…+85°C	
Standard		EN 60947-1, EN 60947-5-1, EN 50081-1, IEC 947, UL 508, CSA 22.2	

Technical Data *(continued)*

		RZ7-FE With NO Contact	RZ7-FE With SPDT Contact
General Characteristics (continued)			
Connections	Screw terminals:	M3 for Pozidrive No: 1, Phillips and slotted screws No: 2, suitable for power screwdriver	
	Rated tightening torque:	0.8Nm (max. 1.0Nm) [8.8 lb-in]	
	Wire size:	Cross-sections of 1 x 0.5mm^2...2 x 1.5mm^2 (solid) or 2 x 1.5mm^2 (stranded with sleeve)	
	Finger protection:	AWG 20...14	
Mounting		according to VDE 0106 Snap-on mounting on 35mm DIN-rail Side mounting on CA7 contactors and CS7 relays (with dovetail joint) Screw fixing by Panel Mount and two screws (M4) - [surface mounting in any position]	
Disposal		Synthetic materials without dioxin according to EC/EFTA-Notification No: 93/0141/D Electrical contacts contain cadmium	

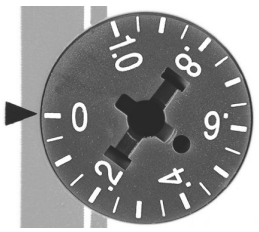
RZ7 Relative Scale Setting Knob

Series RZ7 Timing Relays have a "relative scale" setting knob numbered 0 to 1.0. Think about this as 0 to 100% of the relay's built-in time range. Example: To set an RZ7-FE timing relay (with a 0.05 to 1 minute range) to activate after 25 seconds:

1) Divide the desired activation time (25 seconds) by the maximum time limit of the relay (60 seconds).

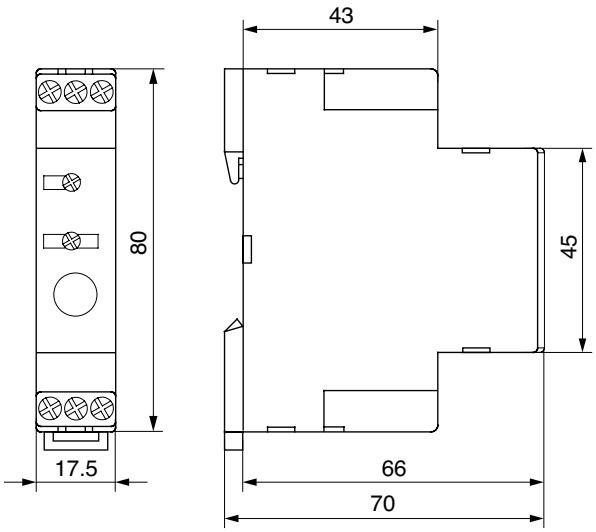
   25 ÷ 60 = .416

2) Rotate the setting knob to just past the .4 mark

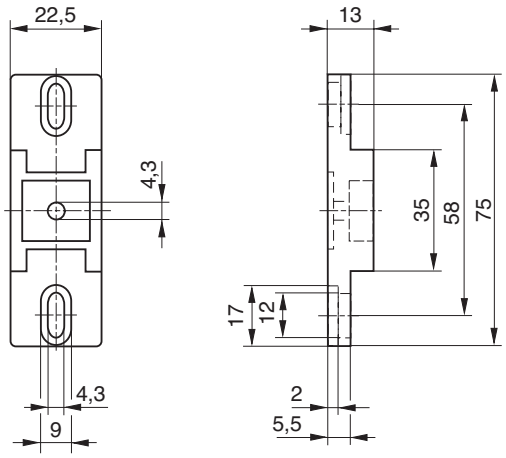


Series RZ7-FE Timing Relays *(one and two pole)*

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



Panel Mount Adaptor (26.506.221-01)



Notes

General Purpose Relays R2N/R4N Miniature Power Plug-in Relays

R2N Miniature Blade Type Relay

R4N Miniature Blade Type Relay

The Relpol R2N and R4N General Purpose Miniature Power Relays, typically called "miniature cube type" in the industry, offer high reliability and ruggedness without sacrificing the convenience and economy users have come to expect from relays in this size class. This line of plug-in devices is well suited to any application where a dependable low cost control relay is required.

Versatile design for any application

The R2N miniature power relay is rated at 12 amps resistive @240VAC and is available in a 2PDT (2 form-C contacts) contact arrangement. The R4N relay is rated at 6 amps resistive @240VAC and available in a 4PDT (4 form-C contacts) contact design.

The relay contact materials are cadmium--free and are made of highly reliable silver nickel (AgNi) which can perform to currents as low as 5mA@5V. For lower level signal applications, the R4N is also available with silver nickel gold plated contacts for circuits 2mA.

Each relay style is available in ten coil voltages from 6V DC to 110V DC and 6V AC to 240V AC.

Extremely rugged and reliable

The R2N and R4N relays provides long lasting high quality contact reliability even after millions of operations, due to their hard silver contacts with a mechanical life of 20 million cycles, and high contact switching capacity.

Convenient features

All R Series miniature power relay features a mechanical "flag" and a one piece "push-to--test button/latching" lever. The "push-to--test" button permits a momentary testing of the relay contacts. The "latching" lever allows the relay contacts to remain closed for longer testing periods until released back to normal. These standard features save time and labor when troubleshooting control circuitry.

A LED position indicator that shows whether the relay is energized and that the contacts have changed over is available as standard. All relays with DC coils are bi-polar, which means polarity input can either be +/- or -/+ to energize the coil.

DIN-rail mounted relay sockets

The GZT relay sockets offer a unique look in an IEC slim design style. The sockets can be DIN-mounted or screwed directly onto the panel. The socket terminals are fully opened and pin numbers are clearly identified. The relays are easily secured and fastened to the relay sockets. For high vibration applications, optional retainer clips are available to firmly hold the relays to the socket base.

Safety Approvals

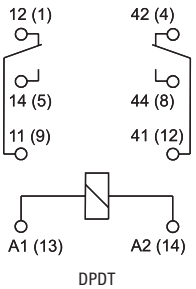
The R2N and R4N are UL recognized, CSA certified, VDE certified and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.

R4N relay and GZT4 socket with GZT4-0040 retainer clip

Plug-in Relays 2 Pole (Form C)- Miniature Blade Type ❶

R2N Relay	Description	Position Indication	Coil Voltage	Discontinued	Catalog Number	Price Each	Pkg Qty
	12A DPTDT 2 Pole (2 Form C) Single AgNi Contact **Features:** Push-to-test/ Latching Lever as standard Built-in LED	Indicating Flag Electrical LED	6VDC	R2-2012-23-1006-WTL	**R2N-2012-23-1006-WTL**	**24.50**	**10**
			12VDC	R2-2012-23-1012-WTL	**R2N-2012-23-1012-WTL**	**24.50**	
			24VDC	R2-2012-23-1024-WTL	**R2N-2012-23-1024-WTL**	**24.50**	
			48VDC	R2-2012-23-1048-WTL	**R2N-2012-23-1048-WTL**	**24.50**	
			110VDC	R2-2012-23-1110-WTL	**R2N-2012-23-1110-WTL**	**26.00**	
			6VAC	R2-2012-23-5006-WTL	**R2N-2012-23-5006-WTL**	**23.00**	
			12VAC	R2-2012-23-5012-WTL	**R2N-2012-23-5012-WTL**	**23.00**	
			24VAC	R2-2012-23-5024-WTL	**R2N-2012-23-5024-WTL**	**23.00**	
			120VAC	R2-2012-23-5120-WTL	**R2N-2012-23-5120-WTL**	**27.00**	
			240VAC	R2-2012-23-5240-WTL	**R2N-2012-23-5240-WTL**	**27.00**	

R2N Connections Diagram
(pin side view)



Note: Bi-polar input for DC versions

❶ The standard features of "Push-to-test/Latching" lever can be easily removed and plugged with an accessory plug or push-to-test only button. See installation guide and accessory plugs/push-to-test buttons on page G50.

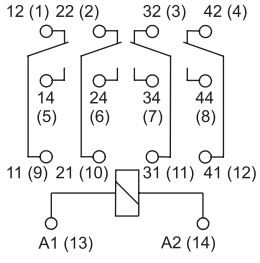
Plug-in Relays 4 Pole (Form C) - Miniature Blade Type ❶

R4N Relay	Description	Position Indication	Coil Voltage	Discontinued	Catalog Number	Price Each	Pkg Qty
	6A 4PDT 4 Pole (4 Form C) AgNi Contacts **Features:** Push-to-test/ Latching Lever as standard Built-in LED	Indicating Flag Electrical LED	6VDC	R4-2014-23-1006-WTL	**R4N-2014-23-1006-WTL**	**26.00**	**10**
			12VDC	R4-2014-23-1012-WTL	**R4N-2014-23-1012-WTL**	**26.00**	
			24VDC	R4-2014-23-1024-WTL	**R4N-2014-23-1024-WTL**	**26.00**	
			48VDC	R4-2014-23-1048-WTL	**R4N-2014-23-1048-WTL**	**26.00**	
			110VDC	R4-2014-23-1110-WTL	**R4N-2014-23-1110-WTL**	**27.50**	
			6VAC	R4-2014-23-5006-WTL	**R4N-2014-23-5006-WTL**	**24.50**	
			12VAC	R4-2014-23-5012-WTL	**R4N-2014-23-5012-WTL**	**24.50**	
			24VAC	R4-2014-23-5024-WTL	**R4N-2014-23-5024-WTL**	**24.50**	
			120VAC	R4-2014-23-5120-WTL	**R4N-2014-23-5120-WTL**	**27.75**	
			240VAC	R4-2014-23-5240-WTL	**R4N-2014-23-5240-WTL**	**28.50**	

Plug-in Relays 4 Pole (Form C) - Miniature Blade Type, Low Level Applications ❶

R4N Relay	Description	Position Indication	Coil Voltage	Discontinued	Catalog Number	Price Each	Pkg Qty
	6A 4PDT 4 Pole (4 Form C) AgNi/Au Gold Plated Contacts 2mA 5V **Features:** Push-to-test/ Latching Lever as standard Built-in LED	Indicating Flag Electrical LED	6VDC	R4-2314-23-1006-WTL	**R4N-2314-23-1006-WTL**	**29.50**	**10**
			12VDC	R4-2314-23-1012-WTL	**R4N-2314-23-1012-WTL**	**29.50**	
			24VDC	R4-2314-23-1024-WTL	**R4N-2314-23-1024-WTL**	**29.50**	
			48VDC	R4-2314-23-1048-WTL	**R4N-2314-23-1048-WTL**	**29.50**	
			110VDC	R4-2314-23-1110-WTL	**R4N-2314-23-1110-WTL**	**31.00**	
			6VAC	R4-2314-23-5006-WTL	**R4N-2314-23-5006-WTL**	**27.00**	
			12VAC	R4-2314-23-5012-WTL	**R4N-2314-23-5012-WTL**	**27.00**	
			24VAC	R4-2314-23-5024-WTL	**R4N-2314-23-5024-WTL**	**27.00**	
			120VAC	R4-2314-23-5120-WTL	**R4N-2314-23-5120-WTL**	**30.00**	
			240VAC	R4-2314-23-5240-WTL	**R4N-2314-23-5240-WTL**	**31.00**	

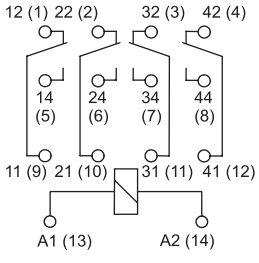
R4N-2014 Connections Diagram
(pin side view)



4PDT

Note:
Bi-polar input for DC versions

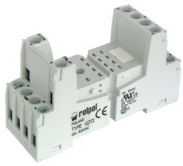
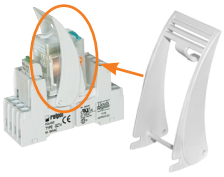
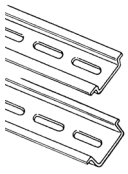
R4N-2314 Connections Diagram
(pin side view)



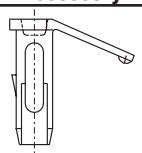
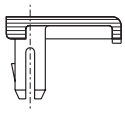
4PDT

❶ The standard features of "Push-to-test/Latching" lever can be easily removed and plugged with an accessory plug or push-to-test only button. See installation guide and accessory plugs/push-to-test buttons on page G50.

Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	Screw Terminal, Relpol Miniature Blade-Type Socket for R2N relays - Panel or DIN-rail mounting - 14 blade miniature socket - 12A, 300V rating CUR, CSA, CE	**GZT2**	**15.50**	10
	Screw Terminal, Relpol Miniature Blade-Type Socket for R4N relays - Panel or DIN-rail mounting - 14 blade miniature socket - 6A, 300V rating CUR, CSA, CE	**GZT4**	**15.50**	10
	Retainer clip for GZT2 & GZT4 Miniature blade relay sockets	**G41052**	**1.50**	25
	Retainer/retractor clip for GZT2 & GZT4 Miniature blade relay sockets	**GZT4-0040S**	**1.50**	10
	Description plate for GZT2 & GZT4 Miniature blade relay sockets	**GZT4-0035**	**1.60**	10
	DIN-rail - 2 meter lengths (6' 6") Top Hat, low profile Top Hat, high profile	**3F** **3AF**	**See page A54**	20 12

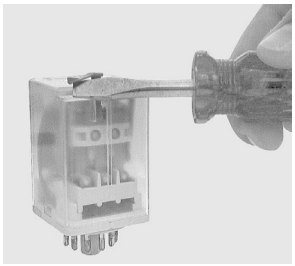
Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	P-Type button (push-to-test button) ❶ See application details below. For R2N/R4N Relays with AC Coils (orange button) For R2N/R4N Relays with DC Coils (green button)	 **PR4AC** **PR4DC**	 **1.75** **1.75**	100
	Relay hole plug. Plugs the hole when the T or P type inserts ❶ are removed. See installation details below. For R2N/R4N Relays with AC Coils (orange button) For R2N/R4N Relays with DC Coils (green button)	 **R4AC** **R4DC**	 **1.75** **1.75**	100

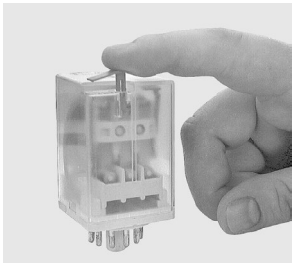
Plug & P-type button (Push-to-test) for R2N and R4N Relays

The R2N and R4N relays are equipped with a one-piece "T" insert that functions either as Push-to-test button or Latching of the relay contacts as standard. The "T" insert can be easily removed and replaced with an accessory Plug for applications that can not include these additional standard features.

The accessory P-Type button (Push-to-test) is recommended for applications that only require manual contact closure for control circuit testing. By manually pressing the P-Type button, the relay contacts change state for as long as the P-Type button is pressed. Contacts return to the initial position as soon as pressure is released from the P-Type button. This operation can be done while the coil is de-energized. The standard "T" insert can be easily removed and replaced with a P-Type button as shown.



Remove the standard "T" plastic insert with a small screwdriver as shown



Insert the P-Type button or Plug as shown and snap down into place

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.

Technical Information

		R2N	R4N
Contacts			
Contact number & arrangement		DPDT	4PDT
Contact material		AgNi	AgNi, AgNi/Au 5 µm
Max. switching voltage	AC/DC	250 V / 250 V	250 V / 250 V
Min. switching voltage		5 V	5 V
Rated load	AC1	12 A / 250 V AC	6 A / 250 V AC
	AC15	3 A /120 V 1.5 A / 240 V (B300)	1.5 A /120 V 0.75 A / 240 V (C300)
	AC3	370 W (Single-phase motor)	125 W (Single-phase motor)
	DC1	12 A / 24 V DC	6 A / 24 V DC
	DC13	0.22 A / 120 V DC 0.1 A / 250 V (R300)	0.22 A / 120 V DC 0.1 A / 250 V (R300)
Min. switching current		5 mA AgNi	2 mA AgNi/Au 5 µm
Max. inrush current		24 A	12 A
Rated current		12 A	6 A
Max. breaking capacity	AC1	3 000 VA	1 500 VA
Min. breaking capacity		0,3 W AgNi	0,3 W AgNi, 0,1 W AgNi/Au 5 µm
Resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		18 000 cycles/hour	
General data			
Operating time (typical value)			
Release time (typical value)		AC: 10 ms DC: 13 ms	
Electrical life		AC: 8 ms DC: 3 ms	
• resistive AC1		≥ 10^5 12 A, 250 V AC	≥ 10^5 6 A, 250 V AC
• cosϕ		see graphs on page G67	
Mechanical life (cycles)		≥ 2 x 10^7	
Dimensions (L x W x H)		27,5 x 21,2 x 35,6 mm	
Weight		35 g	
Ambient temperature			
• storing		-40...+85 °C	
• operating		AC: -40...+55 °C DC: -40...+70 °C	
Cover protection category		IP 40	
Shock resistance	(NO/NC)	10 g / 5 g	
Vibration resistance		5 g 10...150 Hz	
Solder bath temperature		max. 270 °C	
Soldering time		max. 5 s	
Insulation			
Insulation category		C250	B250
Insulation rated voltage		250 V AC	
Dielectric strength			
• coil - contact		2 500 V AC	
• contact - contact		1 500 V AC	
• pole - pole		2,500 V AC	2,000 V AC
Contact - coil distance			
• clearance		≥ 2,5 mm	≥ 1,6 mm
• creepage		≥ 4 mm	≥ 3,2 mm
UL/CSA Ratings			
Contact Ratings, General Purpose		10A 250V AC 12A 150V AC	6A 250VAC
DC Rating		10A 28V DC	
UL File Number		E105728	
CSA File Number		LR86957	
Standards		UL 508, CAN/CSA-C22.2 No. 14	

Technical Information

		R2N	R4N
Coil			
Rated voltage	50/60 Hz AC	6...240 V	
Contact material	DC	6...110 V	
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n	
Operating range of supply voltage		see tables below	
Rated power consumption	AC	1,6 VA	
	DC	0,9 W	

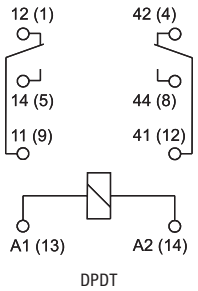
Coil Data - AC 50/60 Hz voltage version

Coil Code	Rated Voltage V AC	Coil Resistence (±10%) at 20 °C	Coil Operating Range V AC	
			min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	4,8	6,6
5012	12	39,5	9,6	13,2
2024	24	158,0	19,2	26,4
5120	120	3 770,0	96,0	132,0
5240	240	16 800,0	192,0	264,0

Coil Data - DC voltage version

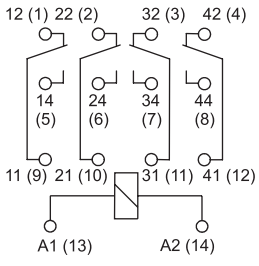
Coil Code	Rated Voltage V DC	Coil Resistence (±10%) at 20 °C	Coil Operating Range V DC	
			min. (at 20 °C)	max. (at 55 °C)
1006	6	40	4,8	6,6
1012	12	160	9,6	13,2
1024	24	640	19,2	26,4
1048	48	2600	38,4	52,8
1110	110	13 600	88,0	121,0

R2N Connections Diagram
(pin side view)



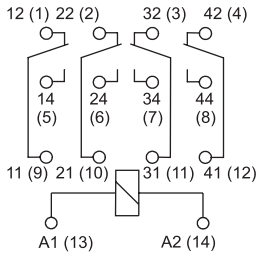
DPDT

R4N-2014 Connections Diagram
(pin side view)



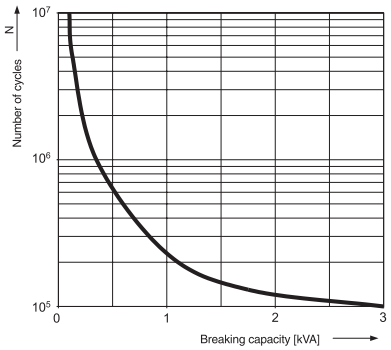
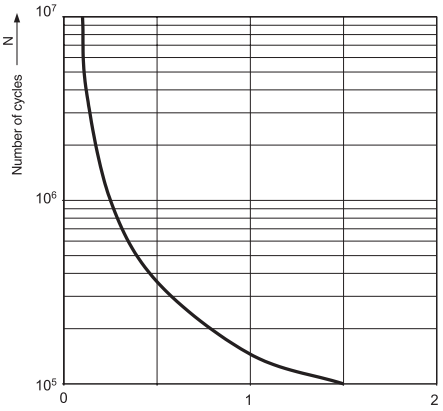
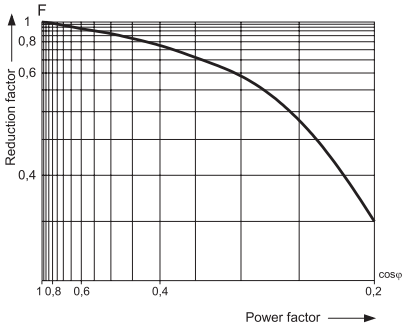
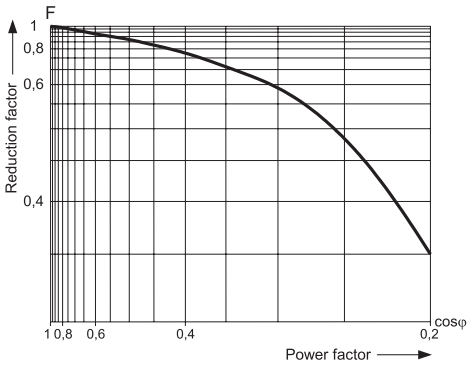
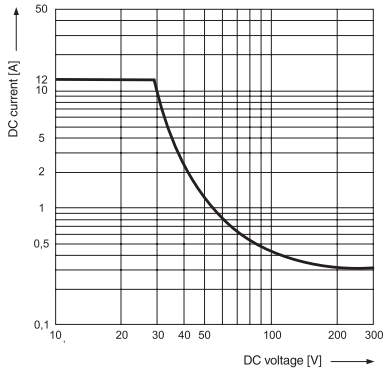
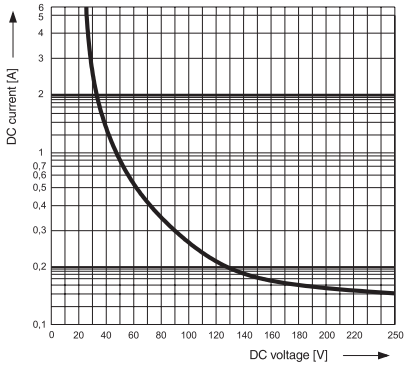
4PDT

R4N-2314 Connections Diagram
(pin side view)



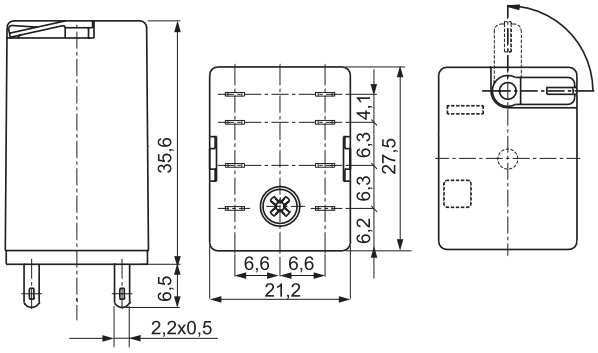
4PDT

Note: Bi-polar input for DC versions

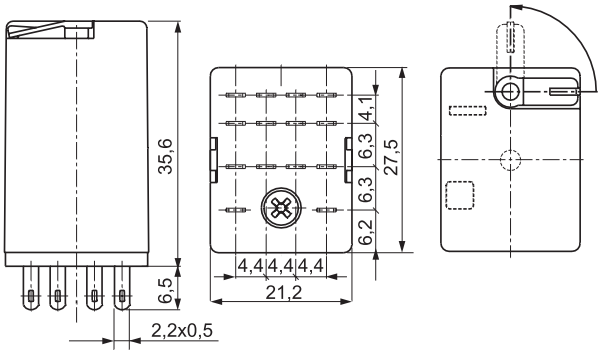
R2N	R4N
Electrical life at AC resistive load	**Electrical life at AC resistive load**
	
Electrical life reduction factor at AC inductive load	**Electrical life reduction factor at AC inductive load**
 $N_{cos\varphi} = N \times F$	 $N_{cos\varphi} = N \times F$
Maximum DC resistive load breaking capacity	**Maximum DC resistive load breaking capacity**
	

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

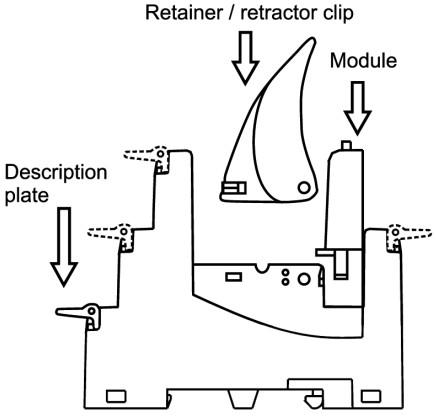
R2N Relay



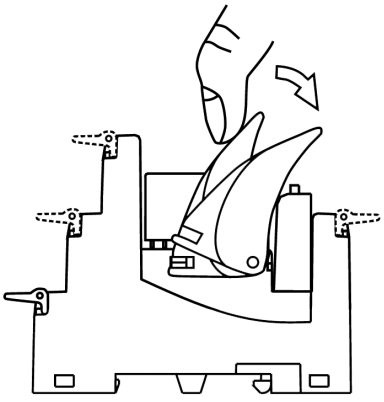
R4N Relay



Retainer/Retractor Clip GZT4-0040S



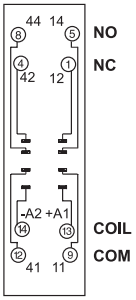
Installation of retainer / retractor clip, module and description plate



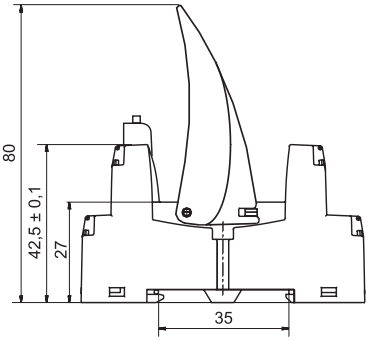
Retainer / retractor clip usage

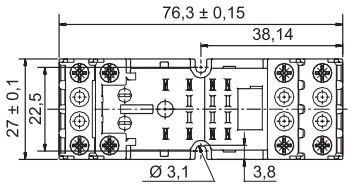
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.

GZT2 Socket

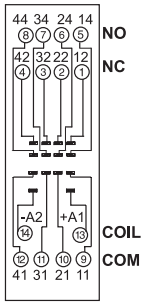


Connections diagram

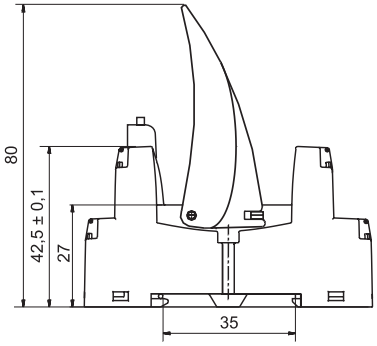


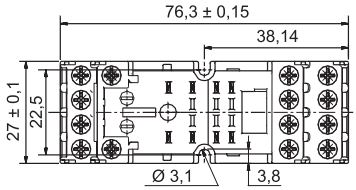


GZT4 Socket



Connections diagram





R15 Plug-in Power Relays Tube Base Style

R15 2PDT 8-Pin Relay

R15 3PDT 11-Pin Relay

The Relpol R15 General Purpose Plug-in Power Relays, offer high reliability and ruggedness in a full featured model design. This line of plug-in devices is well suited for the traditional tube base market. This is widely used in the industry where a dependable low cost control relay is required.

Designed for traditional applications

The R15 plug-in power relay is rated at 10 amps resistive @250VAC and is available in a 2PDT (2 form-C contacts) and 3PDT (3 form-C contacts) contact arrangement. The two pole and three pole relays are housed in traditional 8 pin and 11 pin designs.

The relay contact materials are cadmium-free and are made of highly reliable silver nickel (AgNi) which can perform to currents as low as 5mA@5V. The R15 relays are available in ten coil voltages from 6V DC to 110V DC and 6V AC to 240V AC.

Rugged and reliable

The R15 plug-in power relays provides long lasting high quality contact reliability even after millions of operations, due to their hard silver contacts with a mechanical life of 20 million cycles, and high contact switching capacity.

Convenient features

All R15 plug-in power relay features a mechanical “flag” and a one piece “push-to-test button/latching” lever. The “push-to-test” button permits a momentary testing of the relay contacts. The “latching” lever allows the relay contacts to remain closed for longer testing periods until released back to normal. These standard features save time and labor when troubleshooting control circuitry.

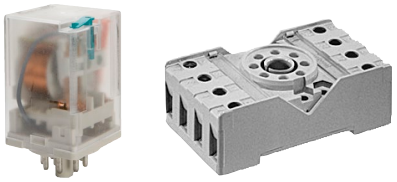
A LED position indicator shows whether the relay is energized and the contacts have changed over is available as standard.

DIN-rail mounted relay sockets

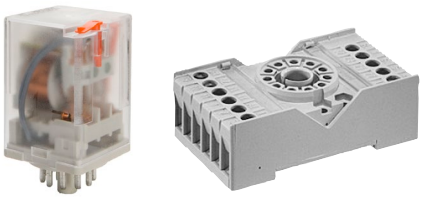
The PZ relay sockets offer a unique look in an IEC slim design style. The sockets can be DIN-mounted or screwed directly onto the panel. The socket terminals are fully opened and pin numbers are clearly identified. The relays are easily secured and fastened to the relay sockets. For high vibration applications, optional retainer clips are available to firmly hold the relays to the socket base.

Safety Approvals

The R15 plug-in power relays are UL recognized, CSA certified, VDE certified and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.



R15 2PDT relay and PZ8 socket



R15 3PDT relay and PZ11 socket

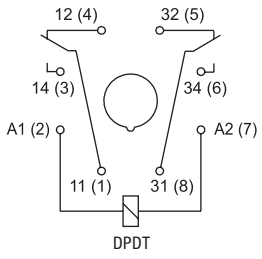
Plug-in Relays 2 Pole (Form C) - Tube Base 8-Pin Type ❶

R15 Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	10A DPDT 2 Pole (2 Form C) AgNi Contacts **Features:** Push-to-test/ Latching Lever as standard Built-in LED	Indicating Flag Electrical LED	6VDC	**R15-2012-23-1006-WTL**	**33.50**	**10**
			12VDC	**R15-2012-23-1012-WTL**	**33.50**	
			24VDC	**R15-2012-23-1024-WTL**	**33.50**	
			48VDC	**R15-2012-23-1048-WTL**	**39.75**	
			110VDC	**R15-2012-23-1110-WTL**	**39.75**	
			6VAC	**R15-2012-23-5006-WTL**	**39.00**	
			12VAC	**R15-2012-23-5012-WTL**	**34.50**	
			24VAC	**R15-2012-23-5024-WTL**	**34.50**	
			120VAC	**R15-2012-23-5120-WTL**	**34.50**	
			240VAC	**R15-2012-23-5240-WTL**	**37.75**	

Plug-in Relays 3 Pole (Form C) - Tube Base 11-Pin Type ❶

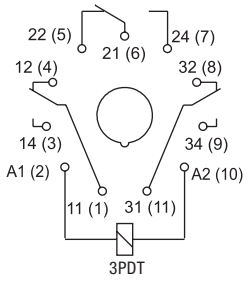
R15 Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	10A 3PDT 3 Pole (3 Form C) AgNi Contacts **Features:** Push-to-test/ Latching Lever as standard Built-in LED	Indicating Flag Electrical LED	6VDC	**R15-2013-23-1006-WTL**	**35.50**	**10**
			12VDC	**R15-2013-23-1012-WTL**	**35.50**	
			24VDC	**R15-2013-23-1024-WTL**	**35.50**	
			48VDC	**R15-2013-23-1048-WTL**	**41.50**	
			110VDC	**R15-2013-23-1110-WTL**	**41.50**	
			6VAC	**R15-2013-23-5006-WTL**	**41.00**	
			12VAC	**R15-2013-23-5012-WTL**	**36.00**	
			24VAC	**R15-2013-23-5024-WTL**	**36.00**	
			120VAC	**R15-2013-23-5120-WTL**	**36.00**	
			240VAC	**R15-2013-23-5240-WTL**	**39.00**	

R15 8-Pin Connection Diagram
(pin side view)



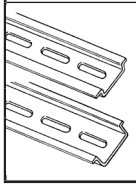
Note:
Bi-polar input for
DC versions

R15 11-Pin Connection Diagram
(pin side view)

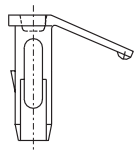
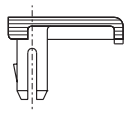


❶ The standard features of "Push-to-test/Latching" lever can be easily removed and plugged with an accessory plug or push-to-test button. See installation guide and accessory plugs/push-to-test buttons on page G59.

Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	Screw Terminal, Relpol Tube Base 8-PIN Socket for R15 relays - Panel or DIN-rail mounting - 10A, 250V rating, UR, CSA	**PZ8**	**9.25**	10
	Screw Terminal, Relpol Tube Base 11-PIN Socket for R15 relays - Panel or DIN-rail mounting - 10A, 250V rating, UR, CSA	**PZ11**	**11**	10
	Retainer clip for PZ8 & PZ11 tube base relay sockets	**PZ110031**	**1.50**	25
	DIN-rail - 2 meter lengths (6' 6") Top Hat, low profile Top Hat, high profile	**3F** **3AF**	**See page A54**	20 12

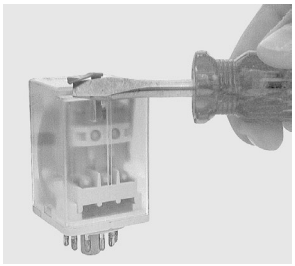
Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	P-Type button (push-to-test button) ❶ See application details below. For R15 Relays with AC Coils (orange button) For R15 Relays with DC Coils (green button)	 **PR15WTAC** **PR15WTDC**	 **1.25** **1.75**	100
	Relay hole plug. Plugs the hole when the T or P type inserts ❶ are removed. See installation details below. For R15 Relays with AC Coils (orange button) For R15 Relays with DC Coils (green button)	 **R15WTAC** **R15WTDC**	 **1.75** **1.75**	100

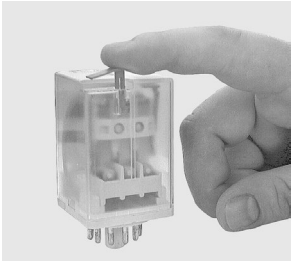
Plug & P-type button (Push-to-test) for R15 Relays

The R15 relays are equipped with a one-piece "T" insert that functions either as Push-to-test button or Latching of the relay contacts as standard. The "T" insert can be easily removed and replaced with an accessory Plug for applications that can not include these additional standard features.

The accessory P-Type button (Push-to-test) is recommended for applications that only require manual contact closure for control circuit testing. By manually pressing the P-Type button, the relay contacts change state for as long as the P-Type button is pressed. Contacts return to the initial position as soon as pressure is released from the P-Type button. This operation can be done while the coil is de-energized. The standard "T" insert can be easily removed and replaced with a P-Type button as shown.



Remove the standard "T" plastic insert with a small screwdriver as shown



Insert the P-Type button or Plug as shown and snap down into place

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.

Technical Information

		R15		
Contacts				
Contact number & arrangement		DPDT, 3PDT		
Contact material		AgNi		
Max. switching voltage	AC/DC	250 V		
Min. switching voltage		5 V AgNi		
Rated load	AC1	10 A / 250 V AC		
	AC15	3 A / 120V 1.5 A / 240 V (B300)		
	AC3	370 W (single-phase motor 1/2 HP / 240 V AC UL 508)		
	DC1	10 A / 24 V DC		
	DC13	0.22 A / 250 V 0.1 A / 250 V (R300)		
Min. switching current		5 mA AgNi		
Max. inrush current		20 A		
Rated current		10 A		
Max. breaking capacity	AC1	2 500 VA		
Min. breaking capacity		0,3 W		
Resistance		≤ 100 mΩ		
Max. operating frequency				
• at rated load	AC1	1 200 cycles/hour		
• no load		12 000 cycles/hour		
General data				
Operating time (typical value)		AC: 12 ms DC: 18 ms		
Release time (typical value)		AC: 10 ms DC: 7 ms		
Electrical life				
• resistive AC1		≥ $2x10^5$ 10 A, 250 V AC		
• cosϕ		see graphs on page G76		
Mechanical life (cycles)		≥ 2×10^7		
Dimensions (L x W x H)		35 x 35x 54,4 mm		
Weight		83 g		
Ambient temperature				
• storing		-40...+85 °C		
• operating		AC: -40...+55 °C DC: -40...+70 °C		
Cover protection category		IP 40		
Shock resistance	(NO/NC)	10 g		
Vibration resistance		5 g 10...150 Hz		
Solder bath temperature		max. 270 °C		
Soldering time		max. 5 s		
Insulation				
Insulation category		C250		
Insulation rated voltage		250 V AC		
Dielectric strength				
• coil - contact		2 500 V AC		
• contact - contact		1 500 V AC		
• pole - pole		2 000 V AC		
Contact - coil distance				
• clearance		≥ 3 mm		
• creepage		4,2 mm		
UL/CSA Ratings				
Contact Ratings, General Purpose		10A - 120 250V AC, 240 VAC		
Pilot Duty Ratings		B300		
Contacts	Inductive	Make	Break	HP
	120VAC	30A	3A	1/3
	240VAC	15A	1.5A	1/2
	DC	10A 28V DC		
UL File Number		E105728		
CSA File Number		LR86957		
Standards		UL 508, CAN/CSA-C22.2 No. 14		

Technical Information

	R15
Coil	
Rated voltage	AC: 6...240 V 50/60 Hz DC: 6...110 V
Must release voltage	AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage	see coil data tables below
Rated power consumption	AC: 2,8 VA 50 Hz 2,5 VA 60 Hz DC: 1,5 W

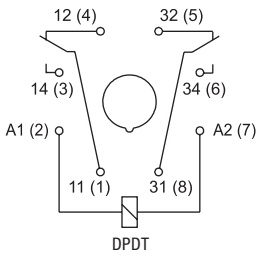
Coil Data - AC 50/60 Hz voltage version

Coil Code	Rated Voltage V AC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V AC	
			min. (at 20 °C)	max. (at 55 °C)
5006	6	4,3	4,8	6,6
5012	12	18,5	9,6	13,2
2024	24	75,0	19,2	26,4
5120	120	1 910,0	96,0	132,0
5240	240	7 760,0	192,0	264,0

Coil Data - DC voltage version

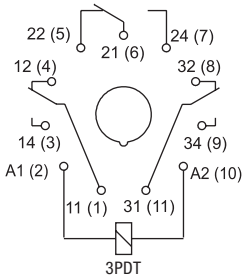
Coil Code	Rated Voltage V DC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V DC	
			min. (at 20 °C)	max. (at 55 °C)
1006	6	28	4,8	6,6
1012	12	110	9,6	13,2
1024	24	430	19,2	26,4
1048	48	1 750	38,4	52,8
1110	110	9 200	88,0	121,0

R15 8-Pin Connection Diagram
(pin side view)

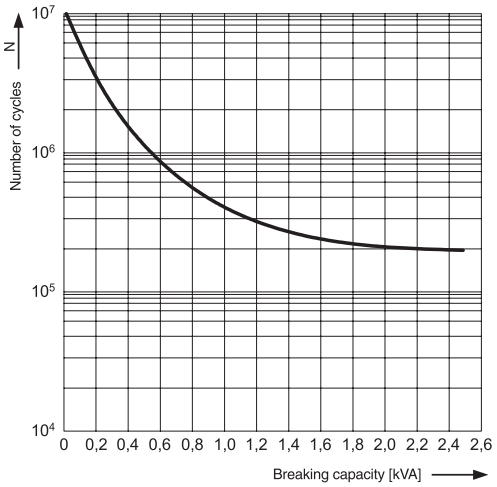


Note:
Bi-polar input for DC versions

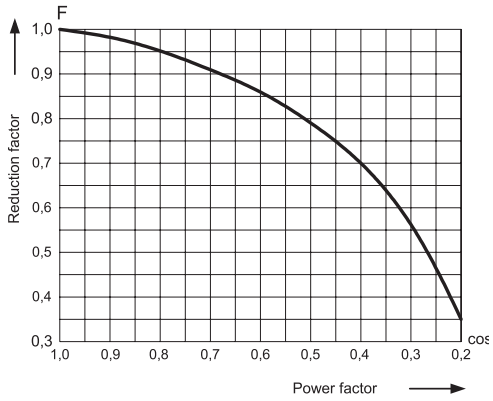
R15 11-Pin Connection Diagram
(pin side view)



Electric life at AC resistive load

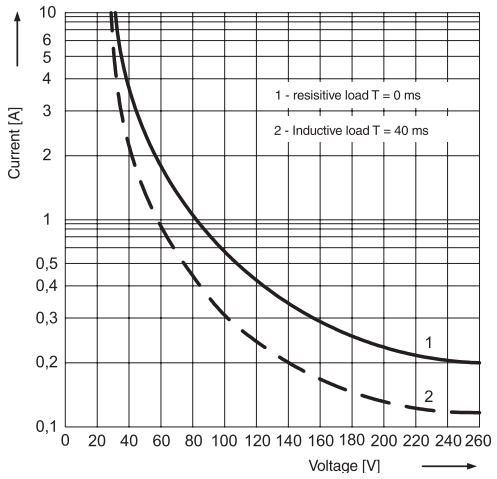


Electrical life reduction factor at AC inductive load



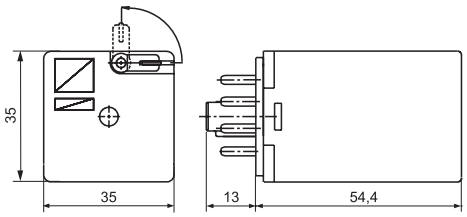
$N_{cos\varphi} = N \times F$

Max. DC load breaking capacity

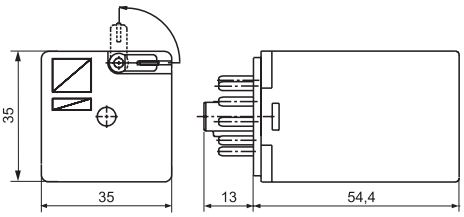


Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.

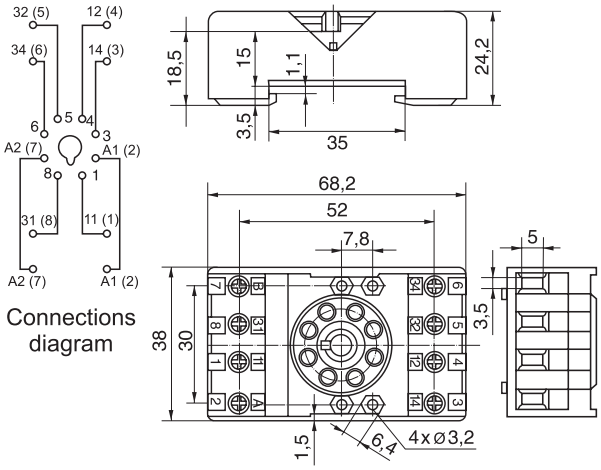
R15 2-Pole Relay



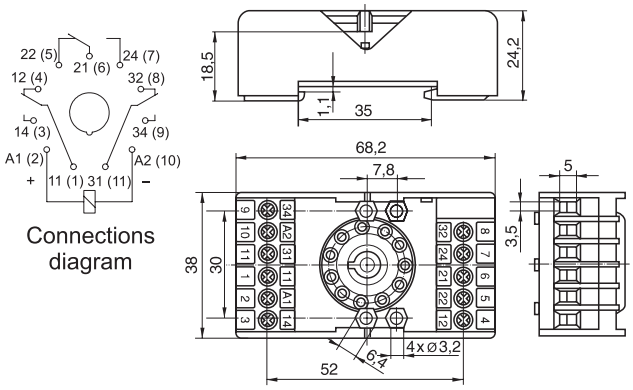
R15 3-Pole Relay



PZ8 Socket



PZ11 Socket



RUC Plug-in Power Relays Square Base Plug-in

RUC 3PDT Blade Type relay

The Relpol RUC General Purpose Plug-in Power Relays, offer high reliability and robustness in a traditional square base design. This line of plug-in devices is well suited for the traditional higher inrush current applications.

Designed for higher amps and inrush applications

The RUC plug-in power relay is rated at 15 amps resistive @250VAC and is available in a 2PDT (2 form-C contacts). It is also available in a 3PDT (3 form-C contacts) contact arrangement rated at 10 amps resistive @250VAC. These relays can handle inrush currents up to 40 amps.

The relay contact materials are made of highly reliable nickel cadmium which has a minimum switching capacity of 10mA@10V. The RUC relays are available in ten coil voltages from 6V DC to 110V DC and 6V AC to 240V AC.

Rugged and reliable

The RUC plug-in power relays provides long lasting high quality contact reliability even after millions of operations due to their hard nickel cadmium contacts, with a mechanical life of 20 million cycles, and high contact switching capacity.

Convenient features

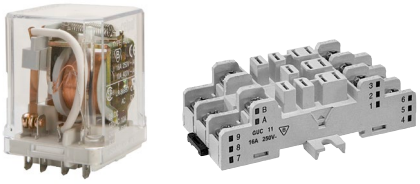
The RUC plug-in power relay offers a LED position indicator that shows whether the relay is energized and that the contacts have changed over.

DIN-rail mounted relay sockets

The SB11 relay sockets offer a traditional look in an IEC design. The sockets can be DIN-mounted or screwed directly onto the panel. The terminal pin numbers are clearly identified. The relays are easily secured and fastened to the relay sockets. For high vibration applications, optional retainer clips are available to firmly hold the relays to the socket base.

Safety Approvals

The RUC plug-in power relays are UL recognized, CSA certified and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.



RUC 3PDT relay and SB11 socket

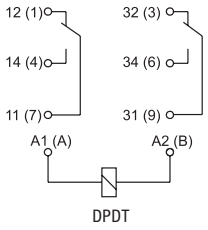
Plug-in Relays 2 Pole (Form C) - Square Base Blade Type ❶

RUC Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	15A DPDT 2 Pole (2 Form C) AgCdO Contacts **Features:** Built-in LED	Indicating Flag Electrical LED	6VDC	RUC-1012-26-1006-L	34.00	10
			12VDC	RUC-1012-26-1012-L	32.25	
			24VDC	RUC-1012-26-1024-L	32.25	
			48VDC	RUC-1012-26-1048-L	38.50	
			110VDC	RUC-1012-26-1110-L	37.00	
			6VAC	RUC-1012-26-5006-L	37.00	
			12VAC	RUC-1012-26-5012-L	32.50	
			24VAC	RUC-1012-26-5024-L	34.00	
			120VAC	RUC-1012-26-5120-L	34.00	
			240VAC	RUC-1012-26-5240-L	37.00	

Plug-in Relays 3 Pole (Form C) - Square Base Blade Type ❶

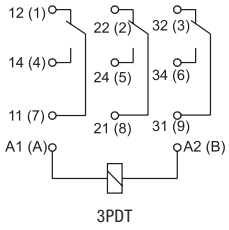
RUC Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	10A 3PDT 3 Pole (3 Form C) AgCdO Contacts **Features:** Built-in LED	Indicating Flag Electrical LED	6VDC	RUC-1013-26-1006-L	32.50	10
			12VDC	RUC-1013-26-1012-L	34.00	
			24VDC	RUC-1013-26-1024-L	34.00	
			48VDC	RUC-1013-26-1048-L	38.50	
			110VDC	RUC-1013-26-1110-L	38.50	
			6VAC	RUC-1013-26-5006-L	38.50	
			12VAC	RUC-1013-26-5012-L	35.25	
			24VAC	RUC-1013-26-5024-L	35.25	
			120VAC	RUC-1013-26-5120-L	35.25	
			240VAC	RUC-1013-26-5240-L	38.50	

RUC 2-Pole Connection Diagram
(pin side view)



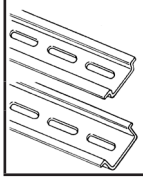
Note:
Bi-polar input for DC versions

RUC 3-Pole Connection Diagram
(pin side view)



❶ Relays can be special ordered with No LED's, contact your Sprecher + Schuh representative.

Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	Screw Terminal, Square Base Blade type Socket for RUC relays - Panel or DIN-rail mounting ❶ - 15A, 300VAC rating, UR, CSA	**SB11**	**16.25**	10
	Retainer clip for SB11 tube base relay sockets	**MBA**	**1.50**	25
	DIN-rail - 2 meter lengths (6' 6") Top Hat, low profile Top Hat, high profile	**3F** **3AF**	**See page A54**	20 12

❶ This product is sourced from a third party manufacturer, not Relpol.

Technical Information

		RUC
Contacts		
Contact number & arrangement		DPDT, 3PDT
Contact material		AgCd0
Max. switching voltage	AC/DC	250 V
Min. switching voltage		10 V
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC
Min. switching current		10 mA
Max. inrush current		40 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W
Resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour
General data		
Operating time (typical value)		AC: 12 ms DC: 12 ms
Release time (typical value)		AC: 10 ms DC: 7 ms
Electrical life		
• resistive AC1		≥ 10^5 16 A, 250 V AC
• cosϕ		see graphs on page <?>
Mechanical life (cycles)		≥ 10^7
Dimensions (L x W x H)		38,6 x 36,1 x 45,5 mm
Weight		85 g
Ambient temperature		
• storage		-40...+85 °C
• operating	AC	-40...+55 °C 3 C/O, 3 NO / 16A
		(+70 °C 2 C/O, 2 NO / 16 A)
	DC	-40...+55 °C 3 C/O, 3 NO / 16A
		(+70 °C 3 C/O, 3 NO / 10 A; 2 C/O, 2 NO / 16 A)
Cover protection category		IP 40
Shock resistance	(NO/NC)	10 g
Vibration resistance		5 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

		RUC		
Insulation				
Insulation category		C250		
Insulation rated voltage		400 V AC		
Dielectric strength				
• coil - contact		2 500 V AC		
• contact - contact		1 500 V AC		
• contact - contact 3 mm		2 500 V AC		
• pole - pole		2 000 V AC		
Contact - coil distance				
• clearance / • creepage		≥ 6 mm / ≥ 8 mm		
UL/CSA Ratings				
Contact Ratings		DPDT		3PDT
General Purpose Rating		10A 250 V AC 15A 250V (resistive) 15A 150 V AC		10 A 250 V AC
Motor Load according to UL 508	2 C/O:	1/3 HP 120 V AC single-phase motor		
		1/2 HP 240 V AC single-phase motor		
	3 C/O:	1/3 HP 120 V AC single-phase		
		1/2 HP 240 V AC single-phase motor		
		1/2 HP 240 V AC three-phase motor		
Pilot Duty Ratings		B300		
Contacts	Inductive	Make	Break	HP
	120VAC	30A	3A	1/3
	240VAC	15A	1.5A	1/2
	DC	10A 28V DC		
UL File Number		E105728		
CSA File Number		LR86957		
Standards		UL 508, CAN/CSA-C22.2 No. 14		

Technical Information

		RUC
Coil		
Rated voltage	50/60 HzAC	6...240 V
	DC	6...110 V
Must release voltage		AC: ≥ 0,15 U_n DC: 0,1 U_n
Operating range of supply voltage		see coil data tables below
Rated power consumption	AC	2,8 VA 50 Hz 2,5 VA 60 Hz
	DC	1,5 W 1,7 W with contact gap ≥ 3 mm

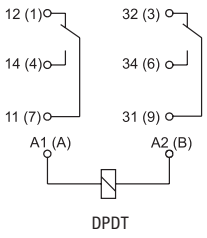
Coil Data - AC 50/60 Hz voltage version

Coil Code	Rated Voltage V AC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V AC	
			min. (at 20 °C)	max. (at 55 °C)
5006	6	4,3	4,8	6,6
5012	12	18,5	9,6	13,2
2024	24	75,0	19,2	26,4
5120	120	1 910	96,0	132,0
5240	240	7 760	192,0	264,0

Coil Data - DC voltage version

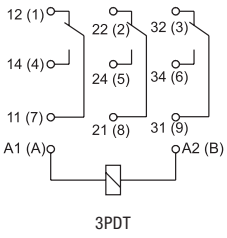
Coil Code	Rated Voltage V DC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V DC	
			min. (at 20 °C)	max. (at 55 °C)
1006	6	28	4,8	6,6
1012	12	110	9,6	13,2
1024	24	430	19,2	26,4
1048	48	1 750	38,4	52,8
1110	110	9 200	88,0	121,0

RUC DPDT Connection Diagram
(pin side view)



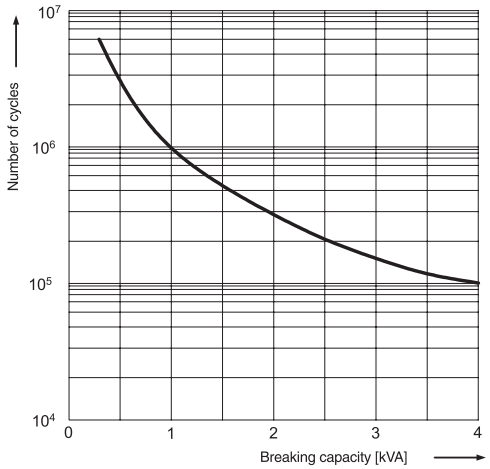
Note:
Bi-polar input for DC versions

RUC 3PDT Connection Diagram
(pin side view)

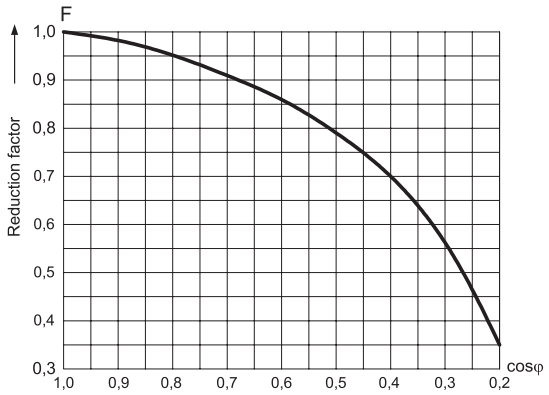


Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.

Electric life at AC resistive load

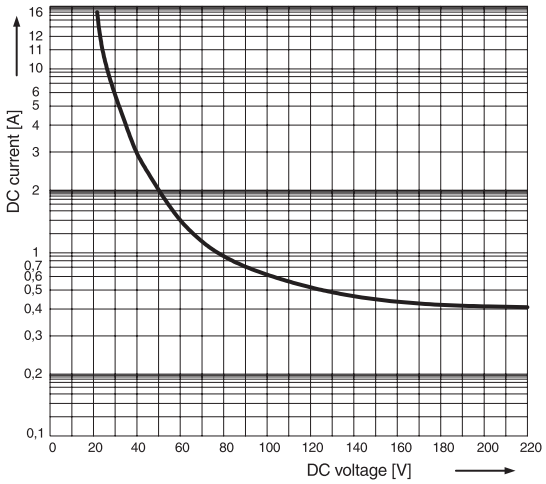


Electrical life reduction factor at AC inductive load

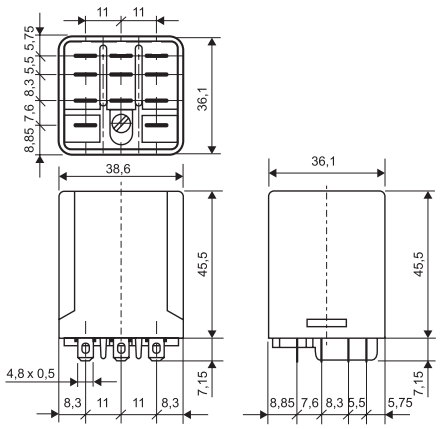


$N_{cos\varphi} = N \times F$

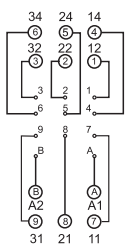
Max. DC load breaking capacity



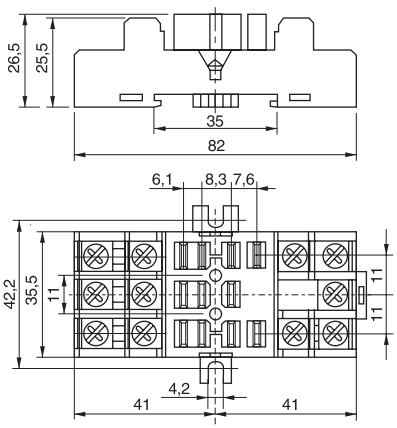
RUC Relay



SB11 Socket



Connections diagram



RY2 Plug-in Power Relays Slim Square Base

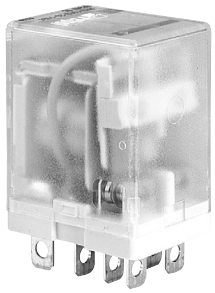
The Relpol RY2 General Purpose Plug-in Power Relays, is a traditional square base blade type style designed for higher current application in a small design.

RY2 2PDT Blade Type Relay

Designed for higher amp applications in a reduced size

The RY2 plug-in power relay is rated at 12 amps resistive @250VAC and is available in a 2PDT (2 form-C contacts). These relays can handle inrush currents up to 20 amps in a small packaged design.

The relay contact materials are made of highly reliable nickel cadmium which has a minimum switching capacity of 10mA@10V. The RY2 relays are available in ten coil voltages from 6V DC to 110V DC and 6V AC to 240V AC.



RY2 2PDT relay

Rugged and reliable

With a mechanical life of 20 million cycles, and high contact switching capacity due to their hard nickel cadmium contacts, the RY2 plug-in power relay provides long lasting high quality contact reliability even after millions of operations.

SB08 socket

Convenient features

All RY2 plug-in power relays features a mechanical "flag" indicator and a LED position indicator that shows whether the relay is energized and that the contacts have changed over.

DIN-rail mounted relay sockets

The SB08 relay sockets offer a slim space savings design. The sockets can be DIN-mounted or screwed directly onto the panel. The terminal pin numbers are clearly identified. The relays are easily secured and fastened to the relay sockets. For high vibration applications, optional retainer clips are available to firmly hold the relays to the socket base.

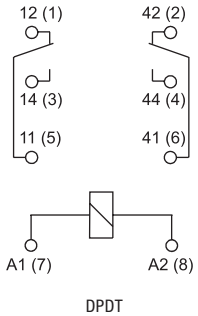
Safety Approvals

The RY2 plug-in power relays are cURus recognized and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.

Plug-in Relays 2 Pole (Form C) - Slim Blade Type

RY2 Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	12A DPDT 2 Pole (2 Form C) AgCdO Contact **Features**: Built-in LED	Indicating Flag Electrical LED	6VDC	**RY2-1012-26-1006-L**	**28.00**	**10**
			12VDC	**RY2-1012-26-1012-L**	**29.50**	
			24VDC	**RY2-1012-26-1024-L**	**29.50**	
			48VDC	**RY2-1012-26-1048-L**	**29.50**	
			110VDC	**RY2-1012-26-1110-L**	**29.50**	
			6VAC	**RY2-1012-26-5006-L**	**29.25**	
			12VAC	**RY2-1012-26-5012-L**	**29.25**	
			24VAC	**RY2-1012-26-5024-L**	**29.25**	
			120VAC	**RY2-1012-26-5120-L**	**27.75**	
			240VAC	**RY2-1012-26-5240-L**	**31.00**	

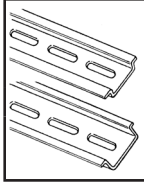
RY2 Connection Diagram
(pin side view)



DPDT

Note:
Bi-polar input for DC versions

Accessories

Accessory	Description	Catalog Number	Price Each	Pkg Qty
	Screw Terminal, Square Base Blade type Socket for RY2 relays - Panel or DIN-rail mounting ❶ - 15A, 300VAC rating, UR, CSA	**SB08**	**15.50**	10
	Retainer clip forGZY2 tube base relay sockets	**SP-8**	**1.50**	25
	DIN-rail - 2 meter lengths (6' 6") Top Hat, low profile Top Hat, high profile	**3F** **3AF**	**See page A54**	20 12

❶ This product is sourced from a third party manufacturer, not Relpol.

Technical Information

		RY2		
Contacts				
Contact number & arrangement		DPDT		
Contact material		AgCd0		
Max. switching voltage	AC/DC	250 V / 250 V		
Min. switching voltage		10 V		
Rated load	AC1	12 A / 250 V AC		
	DC1	12 A / 30 V DC		
Min. switching current		10 mA		
Max. inrush current		20 A		
Rated current		12 A		
Max. breaking capacity	AC1	3 000 VA		
Min. breaking capacity		1 W		
Resistance		≤ 100 mΩ		
Max. operating frequency				
• at rated load	AC1	1 200 cycles/hour		
• no load		18 000 cycles/hour		
General data				
Operating time (typical value)		15 ms		
Release time (typical value)		10 ms		
Electrical life				
• resistive AC1		≥ 10^5 12 A, 250 V AC		
• cosϕ		see graphs on page G88		
Mechanical life (cycles)		≥ 10^7		
Dimensions (L x W x H)		27,5 x 21,1 x 34,5 mm		
Weight		35 g		
Ambient temperature				
• storing		-40...+70 °C		
• operating		-40...+55 °C		
Cover protection category		IP 40		
Shock resistance	(NO/NC)	10 g		
Vibration resistance		5 g 15...150 Hz		
Solder bath temperature		max. 270 °C		
Soldering time		max. 5 s		
Insulation				
Insulation category		B250		
Insulation rated voltage		250 V AC		
Dielectric strength				
• coil - contact		2 500 V AC		
• contact - contact		1 500 V AC		
• pole - pole		2 500 V AC		
Contact - coil distance				
• clearance		≥ 2,6 mm		
• creepage		4 mm		
UL/CSA Ratings				
Contact Ratings				
General Purpose Rating		10A 250V AC		
Pilot Duty Ratings		B300		
Contacts	Inductive	Make	Break	HP
	120VAC	30A	3A	1/3
	240VAC	15A	1.5A	1/2
	DC		10A 28V DC	
UL File Number		E105728		
Standards		UL 508		

Technical Information

		RY2
Coil		
Rated voltage	50/60 Hz AC	6...240 V
	DC	6...110 V
Must release voltage		AC: ≥ 0,2 U_n DC: 0,1 U_n
Operating range of supply voltage		see coil data tables below
Rated power consumption	AC	1,6 VA
	DC	0,9 W

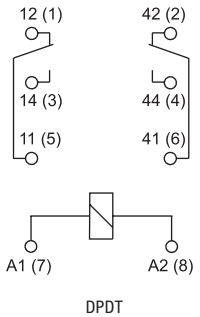
Coil Data - AC 50/60 Hz voltage version

Coil Code	Rated Voltage V AC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V AC	
			min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	4,8	6,6
5012	12	39,5	9,6	13,2
2024	24	158,0	19,2	26,4
5120	120	3 770,0	96,0	132,0
5240	240	16 800,0	192,0	264,0

Coil Data - DC voltage version

Coil Code	Rated Voltage V DC	Coil Resistence (±10%) at 20 °C Ω	Coil Operating Range V DC	
			min. (at 20 °C)	max. (at 55 °C)
1006	6	40	4,0	5,5
1012	12	160	9,6	13,2
1024	24	640	19,2	26,4
1048	48	2 600	38,4	52,8
1110	110	13 600	88,0	121,0

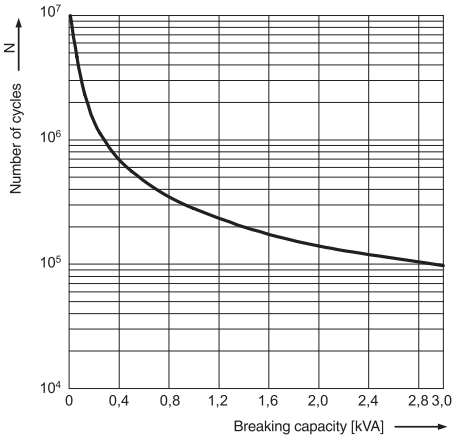
RY2 Connection Diagram
(pin side view)



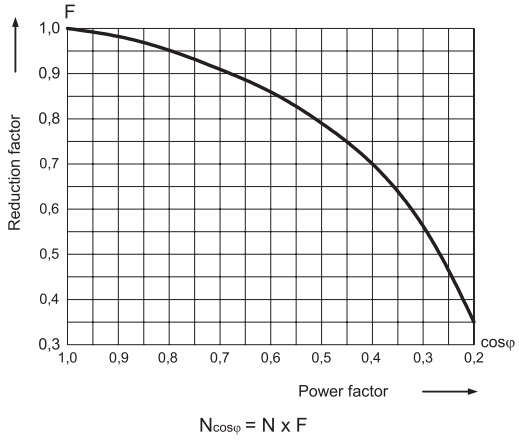
DPDT

Note: Bi-polar input for DC versions

Electric life at AC resistive load



Electrical life reduction factor at AC inductive load

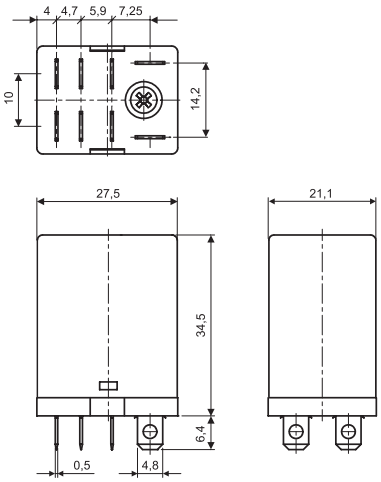


$N_{cos\varphi} = N \times F$

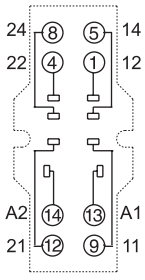
Dimensions

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

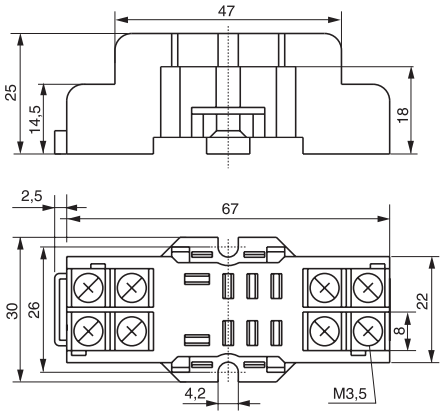
RY2 Relay



SB08 Socket



Connections diagram



Interface PCB Relays PI84/PI85

RM84 Interface PCB Relay used in PI84 complete assembly

RM85 Interface PCB Relay used in PI85 complete assembly

The Relpol PI84/PI85 Interface PCB Relays offer a unique design for high current applications. The low current input and power consumption with load capabilities of high current switching is ideal for limited input sources and panel space savings.

A full featured model in one small package

The PI84/PI85 interface PCB relays are offered as a complete package which includes the following five factory installed pieces:

1. PCB (Printed Circuit Board module)
2. Relay socket
3. LED position indicator
4. Retainer clip
5. Description plate

Low input current, high switching capabilities

The PI84 interface PCB relays is rated at 8 amps resistive @250VAC and is available in a 2PDT (2 form-C contacts). The PI85 is rated at 16 amps resistive @250VAC and is available in a SPDT (1 form-C contact). The coil power consumption is approximately 750mA AC or 480mW DC.

Both interface relay styles are available in 24V DC, 24V AC and 120V AC models.

Rugged and reliable

With a mechanical life of 20 million cycles, and high contact switching capacity due to their hard nickel cadmium contacts, the PI84/PI85 interface PCB relays provides long lasting high quality contact reliability even after millions of operations.

DIN-rail mounted relay sockets

The PI84/PI85 interface relay DIN-mounted sockets offer a slim space savings design. The relay socket includes a retainer clip to firmly hold the PCB relay and a description plate as standard.

Safety Approvals

The RM84 & RM85 interface PCB relays are UL recognized, CSA, VDE certified and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.

PI84 Interface PCB Relay complete assembly

Interface PCB Relays (Form C) - 2 Pole

PI84 PCB Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	8A DPDT 2 Pole (2 Form C) AgNi Contacts **Includes:** PCB relay, plug-in socket, protective module, retainer clip and description plate	Electrical LED	24VDC	**PI84-24DC-M41G**	**34.00**	10
			24VAC	**PI84-24AC-M91G**	**35.00**	
			120VAC	**PI84-120AC-M93G**	**38.50**	

Interface PCB Relays (Form C) - 1 Pole

PI85 PCB Relay	Description	Position Indication	Coil Voltage	Catalog Number	Price Each	Pkg Qty
	16A SPDT 1 Pole (1 Form C) AgNi Contacts **Includes:** PCB relay, plug-in socket, protective module, retainer clip and description plate	Electrical LED	24VDC	**PI85-24DC-M41G**	**34.00**	10
			24VAC	**PI85-24AC-M91G**	**35.00**	
			120VAC	**PI85-120AC-M93G**	**38.50**	

Accessories

RM84/RM85	Description	For use with…	Catalog Number	Price Each	Pkg Qty
 RM85	**Replacement PCB Relay** Replacement operational relays for PI84/PI85 Interface PCB Relays	PI84-24DC-M41G	**RM84-2012-25-1024**	**15**	20
		PI84-24AC-M91G	**RM84-2012-25-5024**		
		PI84-120AC-M93G	**RM84-2012-25-5120**		
		PI85-24DC-M41G	**RM85-2011-25-1024**	**15**	20
		PI85-24AC-M91G	**RM85-2011-25-5024**		
		PI85-120AC-M93G	**RM85-2011-25-5120**		

Technical Information

		PI84	PI85
Contacts			
Contact number & arrangement		DPDT	SPDT
Contact material		AgNi	
Max. switching voltage	AC/DC	400 V / 300 V	
Min. switching voltage		5 V	
Rated load	AC1	8 A / 250 V AC	16 A / 250 V AC
	AC15	3 A / 120 V AC	3 A / 120 V AC
		1.5 A / 240 V AC (B300)	1.5 A / 240 V AC (B300)
	AC3	550 W (single-phase motor)	750 W (single-phase motor)
	DC1	8 A / 24 V DC	16 A / 24 V DC
	DC13	0.22 A / 120 V DC	0.22 A / 120 V DC
		0.1 A / 250 V DC (R300)	0.1 A / 250 V DC (R300)
Min. switching current		5 mA	
Max. inrush current		15 A	30 A
Rated current		8 A	16 A
Max. breaking capacity	AC1	2 000 VA	4 000 VA
Min. breaking capacity		0,3 W	
Resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		172 000 cycles/hour	
General data			
Operating time (typical value)		7 ms	
Release time (typical value)		3 ms	
Electrical life			
• resistive AC1		> 10^5 8 A, 250 V AC	≥ 0.7 x 10^5 16 A, 250 V AC
• cosϕ		see graphs on page 94	
Mechanical life (cycles)		≥ 3 x 10^7	
Dimensions (L x W x H)		75,3 x 15,5 x 67 mm	
Weight		62 g	
Ambient temperature			
• storing		-40...+85 °C	
• operating		AC: -40...+70 °C DC: -40...+85 °C	
Protection category			
• cover		IP 40	
• terminals		IP 20	
Shock resistance		20 g	30 g
Vibration resistance	(NO/NC)	10 g / 5 g	
Insulation			
Insulation category		C250	
Insulation rated voltage		400 V AC	
Dielectric strength			
• coil - contact		5 000 V AC	
• contact - contact		1 000 V AC	
• pole - pole		2 500 V AC	
Contact - coil distance			
• clearance		≥ 10 mm	
• creepage		≥ 10 mm	

Technical Information

		PI84	PI85
Coil			
Rated voltage	50/60 Hz AC	24-120 V	
	DC	24V	
Must release voltage		AC: ≥ 0,15 U_n DC: 0,1 U_n	
Operating range of supply voltage		see Table 1, 2 and Fig. 4, 5	
Rated power consumption	AC	0,75 VA	
	DC	0,4...0,48 W	

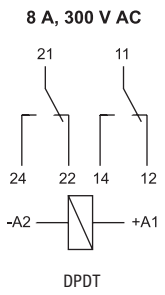
Coil Data - AC 50/60 Hz voltage version

Coil Code	Rated Voltage V AC	Coil Resistence (±10%) at 20 °C	Coil Operating Range V AC	
			min. (at 20 °C)	max. (at 55 °C)
24AC	24	400	19,2	26,4
120AC	120	10 200	96,0	144,0

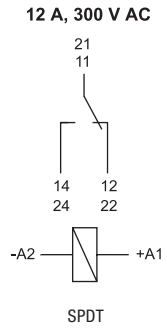
Coil Data - DC voltage version

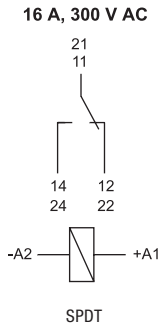
Coil Code	Rated Voltage V DC	Coil Resistence (±10%) at 20 °C	Coil Operating Range V DC	
			min. (at 20 °C)	max. (at 55 °C)
24DC	24	1 440	16,8	61,2

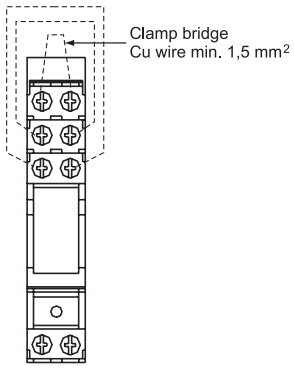
PI84 Connection Diagram
(pin side view)



PI85 Connection Diagram
(pin side view)

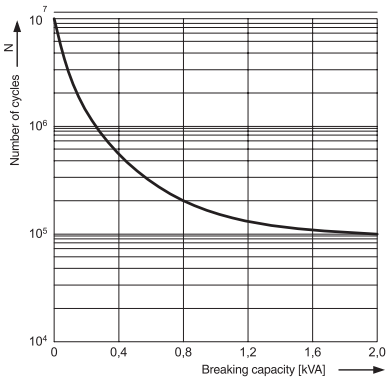




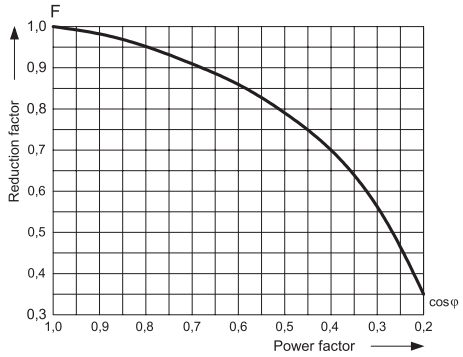


Note: Loads above 12 A require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however)

Electrical life at AC resistive load

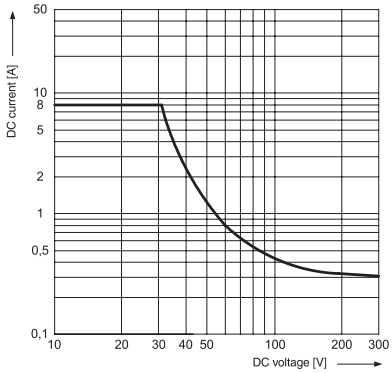


Electrical life reduction factor at AC inductive load

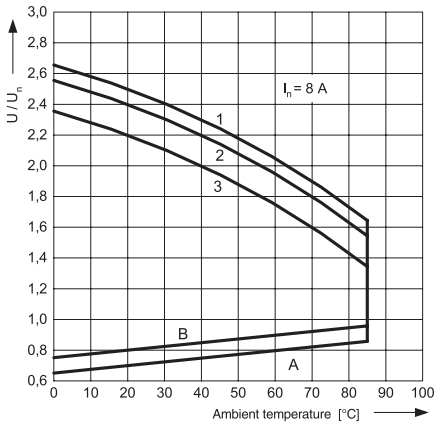


$N_{\cos\varphi} = N \times F$

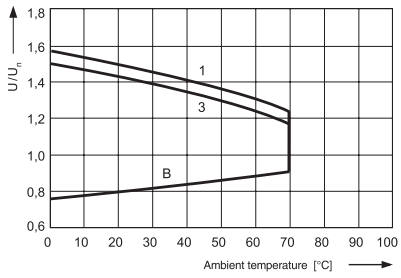
Max. DC resistive load breaking capacity



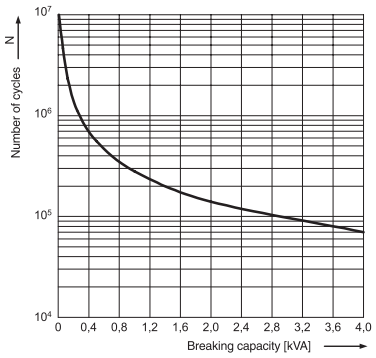
Coil operating range - DC



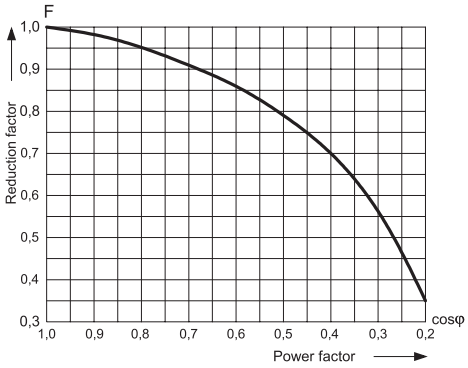
Coil operating range - AC



Electrical life at AC resistive load

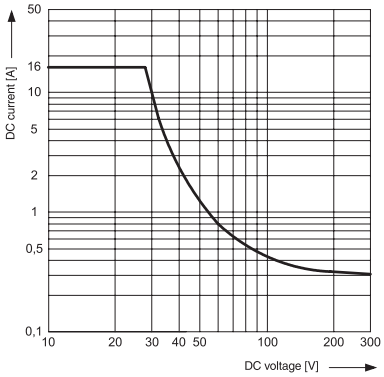


Electrical life reduction factor at AC inductive load

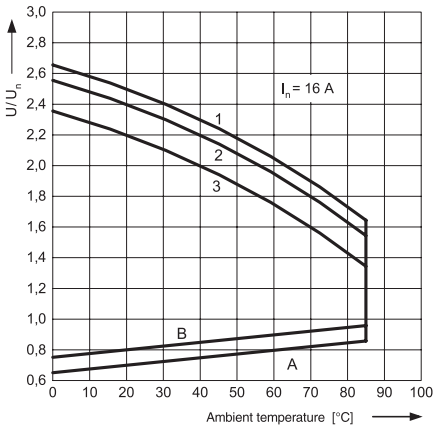


$N_{cos\varphi} = N \times F$

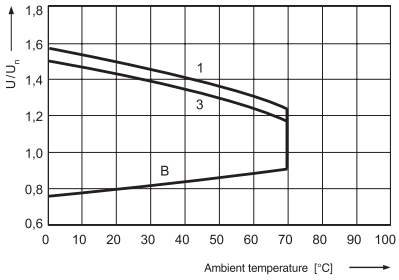
Max. DC resistive load breaking capacity



Coil operating range - DC

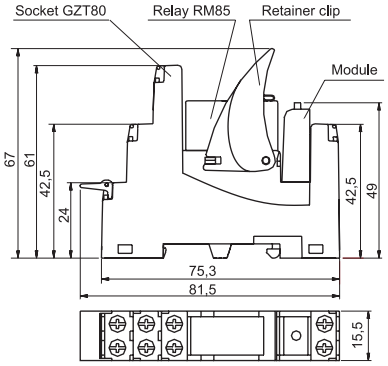


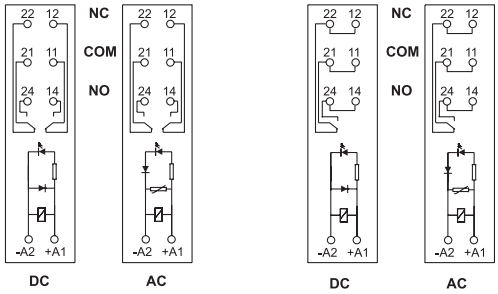
Coil operating range - AC



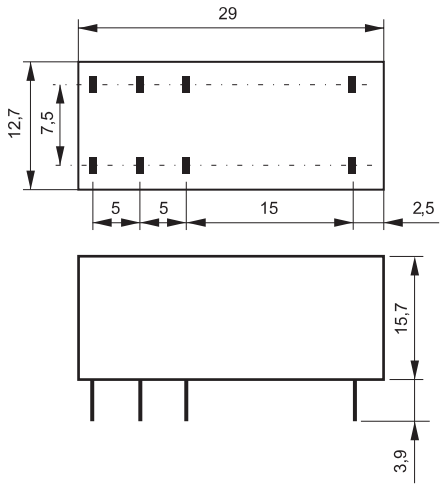
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.

PI84/PI85 Interface Relay and Socket

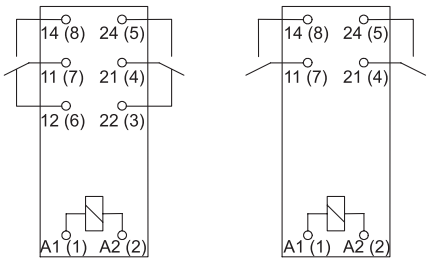




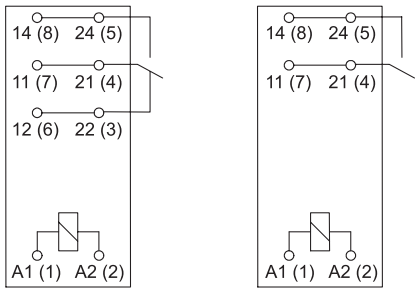
RM84/RM85 Replacement Relay



RM84



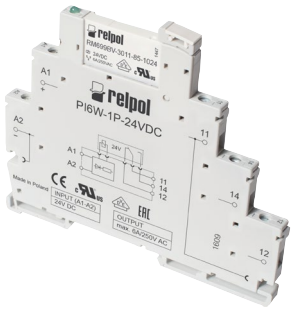
RM85



Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
mm	ϕ 0,6	0,5 x 0,9
Drilling hole	for relays ϕ 1,3 mm ± 0,1 for sockets ϕ 1,5 mm ± 0,1	

PIR6W Slim Interface Terminal Block Relays

The Relpol PIR6W Slim Interface Terminal Block Relay is ideally compact, designed for a variety of high-density isolation and interposing applications.



PIR6W Slim Interface Relay Complete Assembly

A full featured model in one small package

The PIR6W slim interface relays are offered as a complete package which includes the following:

- Changeover relay, rated load 6 A / 230 V (ACI)
- Interface Relay socket with built-in LED position indicator
- Description plate

Low input current, high switching capabilities

The PIR6W slim interface relay contacts are rated at 6 amps resistive @230VAC and available in SPDT (1 form - C contact). The minimum contact current capablilties are 100mA at 24V. The coil power cosumption is approximately 0.3...0.8VA AC or 0.3…0.9W DC. The PIR6W interface relays are available in 24V DC, 24V AC/DC and 120V models.

Rugged and reliable

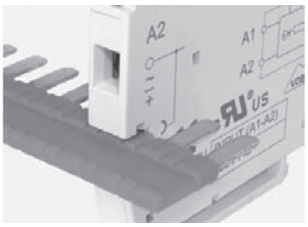
With a mechanical life of 20 million cycles, and high contact switching capacity due to their silver tin oxide ($AgSnO_2$) contacts, the PIR6W interface relays provides long lasting high quality contact reliability even after millions of operations.

DIN-rail mounted

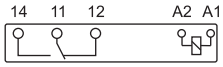
The PIR6W slim interface relays are DIN-rail mountable which can be easily installed along side other control terminal blocks for a space saving design.

Safety approvals

The PIR6W slim interface relays are cURus, VDE and CE marked which meets the requirements of all important international approval organizations, making them ideal for use in both domestic and export equipment.

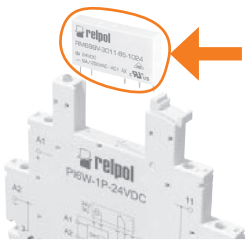


Interface Terminal Block Relays (1 Form C) - 1 Pole ❶

PIR6W	Specifications	Input Voltage	Catalog Number	Price Each	Pkg Qty
	 **6A SPDT** 1 Pole (1 Form C) $AgSnO_2$ Includes: – Change over relay with built-in Green LED indicator	12VDC	PIR6W-1P-12VDC	25	10
		24VDC	**PIR6W-1P-24VDC**		
		24V AC/DC	PIR6W-1P-24VAC/DC	30	
		115V AC/DC	**PIR6W-1P-115VAC/DC**		

* Gray denotes special order.

Accessories

Accessory	Description	For use with…	Catalog Number	Price Each	Pkg Qty
	**Interface Operational Relay** ❷ Replacement operational relays for PIR6W Interface Terminal Block Relays	PIR6W-1P-12VDC	**RM699BV-3011-85-1012**	15	20
		PIR6W-1P-24VDC PIR6W-1P-24VAC/DC ❸ PIR6W-1P-115VAC/DC	**RM699BV-3011-85-1024**		
	**20-Way Jumper** Can be cut to required length 36A max per 20-way Jumper Red Black Blue	PIR6W-1P…	**ZG20-1** **ZG20-2** **ZG20-3**	5.30	20
	**Replacement Description Plates** Allows user to label individual PIR6W Relays (one included with PIR6W-1P Relays)	PIR6W-1P…	**PI6W-1246**	2	100

❶ Other input voltages available as special order; contact your Sprecher + Schuh Representative.
❷ It should be noted that rated voltage U_n of the input/operational relay coil does not always comply with the rated voltage U_n of the interface relay (which is important on ordering operational relays for sockets).
❸ Previously accepted older model RM699V-3011-85-1012 12VDC replacement relay. Now supports a 24VDC relay model RM699BV-3011-85-1024.
❹ In March 2016, Relpol changed the DIN-rail fixing place location as represented in this view.

Contacts

Contact number & arrangement		1 C/O
Contact material		**$AgSnO_2$**
Max. switching voltage	AC/DC	$AgSnO_2$: 250 V / 400 V AC/ 125 V DC
Min. switching voltage	AC/DC	$AgSnO_2$: 10 V
Rated load	AC1	$AgSnO_2$: 6 A / 250 V AC
	DC1	$AgSnO_2$: 6 A / 24 V DC
Min. switching current		$AgSnO_2$: 100 mA / 24 V
Max. inrush current (20 ms)		$AgSnO_2$: 10 A
Rated current		6 A
Max. breaking capacity	AC1	$AgSnO_2$: 1 500 VA
Min. breaking capacity		$AgSnO_2$: 1 W
Resistance - initially		$AgSnO_2$: ≤ 100mΩ 100 mA, 24 V
Max. operating frequency		
• at rated load	AC1	360 cycles/hour
• no load		72 000 cycles/hour

Input control circuit

Rated voltage	DC	**12-24 V**
	AC/DC	**24**-**115** V AC:50/60 Hz
Must release voltage		AC:≥ 0,2 U_n
		DC:≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Must operate voltage		AC and DC: ≤ 0,8 U_n
Rated power consumption	AC/DC	0.3...2.1 VA / 0.3...1.0W
	DC	0.3 W

Insulation

Insulation RATED VOLTAGE		250 V AC (PN-EN 60664-1)
Rated surge voltage		4 000 V AC 1.2 / 50 µs
Overvoltage category		III IEC 61810-52 (PN-IEC 664-1)
Insulation pollution degree		3
Dielectric strength		
• input - output		4 000 V AC 50/60 Hz, 1 min., type of insulation: reinforced
• input - output		6 000 V 1,2 / 50 µs, surge voltage
• input - output		2 500 V AC 50/60 Hz 1 min.
• contact clearance		1 000 V AC 50/60 Hz 1 min., type of clearance: micro-disconnection
Input-Output - coil distance		
• clearance		≥ 6 mm
• creepage		≥ 8 mm

General data

Operating time (typical value)		AC: 11 ms DC: 8 ms
Release time (typical value)		AC: 15 ms DC: 10 ms
Electrical life		
• resistive AC1	360 cycles/hour	> 0,6 x 10^5 6 A, 250 V AC
• cos ø = 0,4		> 2 x 10^5 2 A, 250 V AC
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		98.5 x 6.2 x 85.5 mm
Weight		45g
Ambient temperature		
• storage		-40...+70˚C
• operating		-40...+55˚C -40...+60˚C 12,24 V DC
Protection category		IP 20, PEN-EN 60529
Environmental protection		RTI, PEN-EN 116000-3
Shock resistance		10 g
Vibration resistance		5 g 10...500 Hz

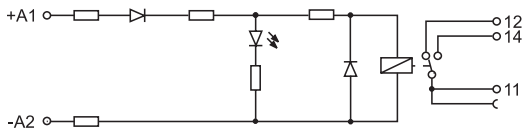
❶ Standard contact materials and coil rated voltages are marked with bold type.

Input Data

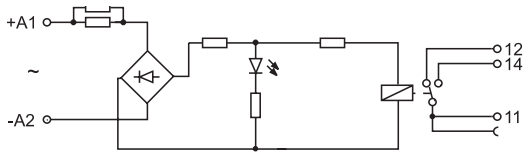
Relay code	Nominal input voltage U_n	Input power control circuit (U_n)	Input - voltage range V	
			min.	**max.**
PIR6W-1P-12VDC	12 V DC	0,3 W	9,6	14,14
PIR6W-1P-24VDC	24 V DC	0,3 W	19,2	28,0
PIR6W-1P-24VAC/DC	24 V AC/DC	0,3 VA / 0,3 W	19,2	26,4
PIR6W-1P-115VAC/DC	115 V DC	0,9 VA / 0,9 W	92,0	130,0

Connection Diagrams

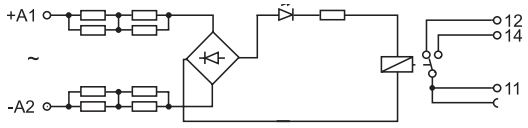
PIR6W-1P-12VDC
PIR6W-1P-24VDC



PIR6W-1P-24VAC/DC

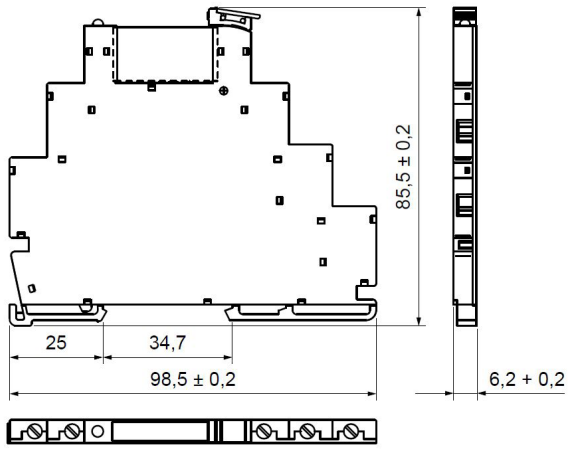


PIR6W-1P-115VAC/DC

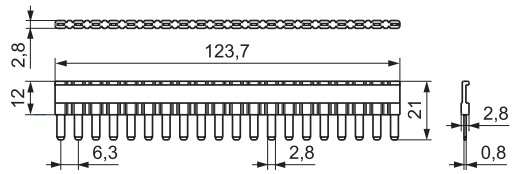


Dimensions

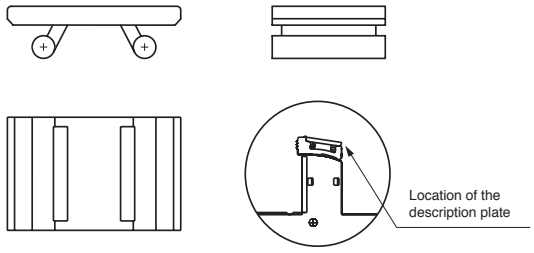
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes. ❶



Interconnection Strip ZG20



Description Plate PI6W-1246



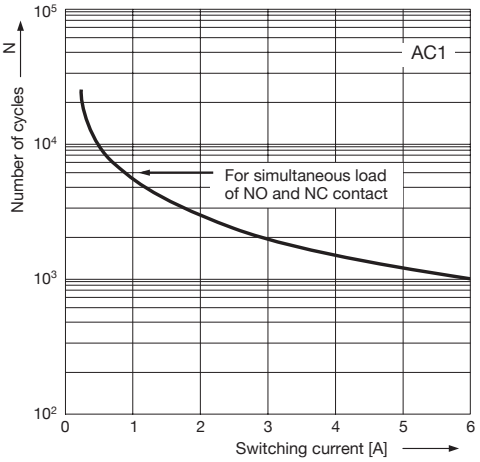
Mounting

Relays **PIR6W** are designed for 35 mm DIN rail mount, EN 50022.

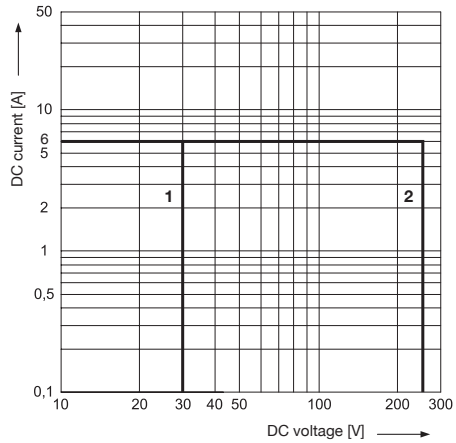
PIR6W are adapted for the co-operation with interconnection strip type **ZG20**. Interconnection strip **ZG20** allows to common bridging outputs or inputs. Maximum current rate is 36 A. Colors of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue.

❶ In March 2016, Relpol changed the DIN-rail fixing place location as represented in this view.

Electrical life at AC resistive load.
Maximum switching frequency at rated load

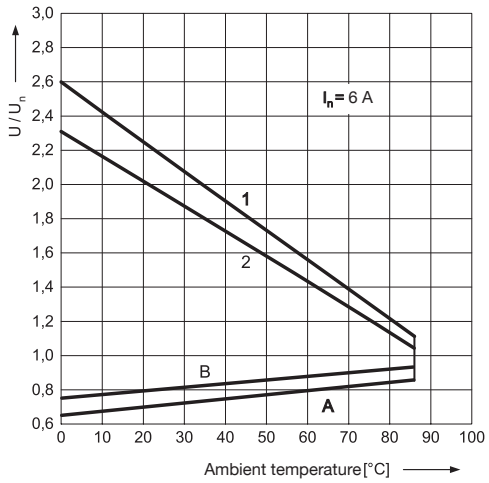


Max. DC resistive load breaking capacity



1 - resistive load DC1
2 - resistive load AC1

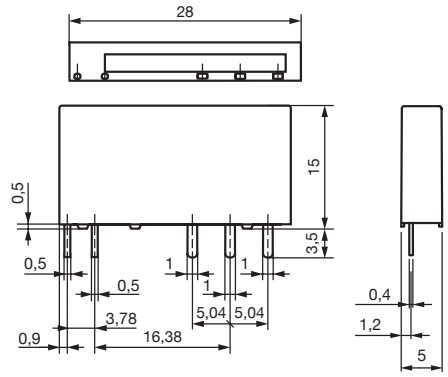
Coil Operating Range - DC



RM699 Interface Operational Relay Dimensions

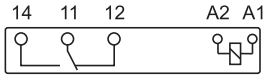
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.

vertical version (V)



RM699 Connections Diagrams (pin side view)

vertical version (V)

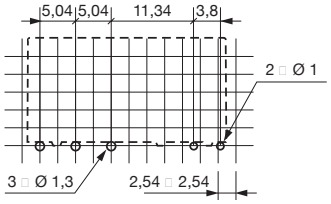


1C/O

RM699 Mounting openings raster (solder side view)

horizontal version (H)

1C/O



Description of Coil Operating Range
A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 Un, at continues load of In on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2,3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Notes

GEFRAN

Panel Mount "Hockey Puck" Relays and DIN Rail Mounted Solid State Relays up to 120 Amps

With forty years of experience, Gefran is the world leader in the design and production of solutions for measuring, controlling, and driving industrial production processes. Gefran's know-how and experience guarantee continuity and tangible solutions. Gefran's line of solid state relays are the ideal solution for applications where high speed switching and long life are essential. In specific applications, solid state relays offer many advantages over electromechanical devices including no moving parts or contact arcing. In addition, solid state relays are directly compatible with logic components such as microprocessors and PLCs.

Broad selection for many applications

The Gefran GQ solid state relays are available in single phase "hockey puck" models up to 90 amps and the GTS DIN-rail single phase units with integral heatsink up to 120 amps. The GTZ three phase models with integral heatsink up to 55 amps are also available.

Opto-isolated input limits current leakage

All Gefran solid state relays feature opto-isolated inputs where an internal LED signals a photosensitive element when output switching is to occur. This provides up to 4,000V isolation between the input voltage and the output voltage and also limits current leakage. This feature is important in certain medical, residential and industrial applications. The Gefran solid state relays also include built-in metal oxide varistor (MOV) protection to protect against internal damage to the solid state relay.

Output Circuit Features

The Gefran solid state relays feature zero voltage turn-on, which means they are designed to turn on at the next zero crossover after application of the control voltage. This limits electromagnetic interference, reducing the chance of damage to downstream equipment. A built-in MOV reduces the likelihood of damage to the relay from rapid changes in voltage (dv/dt) and transient voltages.

Many safety and convenience features

All Gefran solid state relays come standard with an LED to indicate when the relay is in an operational state. This increases safety and speeds troubleshooting.

In addition, all GQ hockey puck type relays come standard with a load side cover that provides touch protection. The GTS DIN-Rail mounted relays also offer touch protection through the use of a removable protective cover plate.

Common Applications

Heating controls

Injection molding machines

Semiconductor manufacturing equipment

Glass processing

Welding controls

Food processing

Industrial & commercial ovens

Soldering machines

Medical equipment

Office machinery

Robotics

GEFRAN

Integral heatsink with DIN-rail mounting

A complete selection of solid state relays are available with a built-in heatsink (GTS/GTZ models). This eliminates the hassle of selecting and installing a properly sized heatsink, or mounting to a panel mount relay directly on the back pan with silicone thermoconductive grease.

Approvals

The Series GQ and GTZ solid state relays are cURus approved and CE marked. The GTZ DIN-rail solid state relays are cULus Listed and CE marked.

❶ Finger Safe Protection Covers

❷ AC or DC Input Connections

❸ AC Output Connection Models

❹ LED Status Indicator

❺ Internal MOV protection

❻ Integrated or optional heatsinks

❼ cURus, CE

❽ cULus, CE

Catalog Number Quick Guide

GQ- 15 - 24 - D - 1 - 4

	Nominal Current	Nominal Voltage	Control Voltage	Overvoltage	Connectors
Hockey Puck 1-Phase Panel Mount	15 15A AC 25 25A AC 50 50A AC 90 90A AC	24 230V AC 60 600V AC	D 3…32V DC A 20…260V AC	1 Internal protection	4 Two-pin screw connector, low profile enclosed

GTS- 25 / 60 - D - 0 -

	Rated Current	Rated Voltage	Control Voltage	Alarm Output	Fan
1-Phase DIN Rail mount	15 15A AC 25 25A AC 40 40A AC 50 50A AC 60 60A AC 75 75A AC 90 90A AC 120 120A AC	60 600V AC	D 6…32V DC A 20…260V AC/DC	0 None	VEN-90 230V 14W 80x80x40 VEN-91 115V 14W 80x80x40 Required on 120A models only

GTZ 40 / 60 - D - 0 - VEN-91

	Nominal Current	Nominal Voltage	Control Voltage	Alarm Output	Fan
3-Phase DIN Rail mount	25 25A AC 40 40A AC 55 55A AC	60 600V AC	D 5…32V DC A 20…260V AC/DC	0 None	VEN-90 230V 14W 80x80x40 VEN-91 115V 14W 80x80x40 Required on 40A & 55A models only

1 Pole Panel Mount Relay, 3-32V DC Control, 230V AC Output

Specifications	15 Amp		25 Amp		50 Amp		90 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GQ-15-24-D-1-4	45	GQ-25-24-D-1-4	50	GQ-50-24-D-1-4	79	GQ-90-24-D-1-4	104
Input								
Voltage Range	3 - 32V DC		3 - 32V DC		3 - 32V DC		3 - 32V DC	
Turn-on Voltage (min.)	≥ 2.7V DC		≥ 2.7V DC		≥ 2.7V DC		≥ 2.7V DC	
Turn-off Voltage (max.)	≤ 1V DC		≤ 1V DC		≤ 1V DC		≤ 1V DC	
Consumption	≤ 13mA @ 32V		≤ 13mA @ 32V		≤ 13mA @ 32V		≤ 13mA @ 32V	
Reverse Voltage	< 36V DC		< 36V DC		< 36V DC		< 36V DC	
Output								
Amp Rating AC51	15		25		50		90	
Nominal Voltage	24…230V AC		24…230V AC		24…230V AC		24…230V AC	
Maximum Voltage	20…253V AC		20…253V AC		20…253V AC		20…253V AC	
Zero Switching Voltage	≤ 20V		≤ 20V		≤ 20V		≤ 20V	
Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)	58 (H) x 45 (W) x 30.5 (D), from base to top of control terminal 45 (D)							

1 Pole Panel Mount Relay, 20-260V AC Control, 230V AC Output

Specifications	15 Amp		25 Amp		50 Amp		90 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GQ-15-24-A-1-4	53	GQ-25-24-A-1-4	55	GQ-50-24-A-1-4	88	GQ-90-24-A-1-4	112
Input								
Voltage Range	20…260V AC		20…260V AC		20…260V AC		20…260V AC	
Turn-on Voltage (min.)	≥ 15V AC		≥ 15V AC		≥ 15V AC		≥ 15V AC	
Turn-off Voltage (max.)	≤ 6V AC		≤ 6V AC		≤ 6V AC		≤ 6V AC	
Consumption	≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC	
Output								
Amp Rating AC51	15		25		50		90	
Nominal Voltage	24…230V AC		24…230V AC		24…230V AC		24…230V AC	
Maximum Voltage	20…253V AC		20…253V AC		20…253V AC		20…253V AC	
Zero Switching Voltage	≤ 20V		≤ 20V		≤ 20V		≤ 20V	
Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)	58 (H) x 45 (W) x 30.5 (D), from base to top of control terminal 45 (D)							

1 Pole Panel Mount Relay, 3-32V DC Control, 600V AC Output

Specifications	*50 Amp*		*90 Amp*	
	Catalog Number	**Price**	**Catalog Number**	**Price**
	GQ-50-60-D-1-4	**96**	**GQ-90-60-D-1-4**	**134**
Input				
Voltage Range	3 - 32V DC		3 - 32V DC	
Turn-on Voltage (min.)	≥ 2.7V DC		≥ 2.7V DC	
Turn-off Voltage (max.)	≤ 1V DC		≤ 1V DC	
Consumption	≤ 13mA @ 32V		≤ 13mA @ 32V	
Reverse Voltage	< 36V DC		< 36V DC	
Output				
Amp Rating AC51	50		90	
Nominal Voltage	48…600V AC		48…600V AC	
Maximum Voltage	40…660V AC		40…660V AC	
Zero Switching Voltage	≤ 40V		≤ 40V	
Frequency Range	45…65 Hz		45…65 Hz	
Dimension (mm)	58 (H) x 45 (W) x 30.5 (D), from base to top of control terminal 45 (D)			

1 Pole Panel Mount Relay, 20-260V AC Control, 600V AC Output

Specifications	*50 Amp*		*90 Amp*	
	Catalog Number	**Price**	**Catalog Number**	**Price**
	GQ-50-60-A-1-4	**104**	**GQ-90-60-A-1-4**	**145**
Input				
Voltage Range	20…260V AC		20…260V AC	
Turn-on Voltage (min.)	≥ 15V AC		≥ 15V AC	
Turn-off Voltage (max.)	≤ 6V AC		≤ 6V AC	
Consumption	≤ 8mA @ 260V AC		≤ 8mA @ 260V AC	
Output				
Amp Rating AC51	50		90	
Nominal Voltage	48…600V AC		48…600V AC	
Maximum Voltage	40…660V AC		40…660V AC	
Zero Switching Voltage	≤ 40V		≤ 40V	
Frequency Range	45…65 Hz		45…65 Hz	
Dimension (mm)	58 (H) x 45 (W) x 30.5 (D), from base to top of control terminal 45 (D)			

GQ Relays are cUR (E243386). Not CSA.

1 Pole DIN-Rail Mount Relay, 6-32V DC Control, 480V AC Output

DISCONTINUED SEE 600V




Specifications	15 Amp		25 Amp		40 Amp		50 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GTS-15/480-0	99	GTS-25/480-0	111	GTS-40/480-0	134	GTS-50/480-0	242
Input								
Voltage Range	6 - 32V DC		6 - 32V DC		6 - 32V DC		6 - 32V DC	
Turn-on Voltage (min.)	> 5.1V DC		> 5.1V DC		> 5.1V DC		> 5.1V DC	
Turn-off Voltage (max.)	< 3V DC		< 3V DC		< 3V DC		< 3V DC	
Consumption	≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V	
Reverse Voltage	< 36V DC		< 36V DC		< 36V DC		< 36V DC	
Output								
Amp Rating AC51	15		25		40		50	
Nominal Voltage	24…480V AC		24…480V AC		24…480V AC		24…480V AC	
Maximum Voltage	20…530V AC		20…530V AC		20…530V AC		20…530V AC	
Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)	100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

1 Pole DIN-Rail Mount Relay, 20-260V AC Control, 480V AC Output

DISCONTINUED SEE 600V




Specifications	15 Amp		25 Amp		40 Amp		50 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GTS-15/480-0-AC	108	GTS-25/480-0-AC	117	GTS-40/480-0-AC	147	GTS-50/480-0-AC	250
Input								
Voltage Range	20…260V AC		20…260V AC		20…260V AC		20…260V AC	
Turn-on Voltage (min.)	≥ 15V AC		≥ 15V AC		≥ 15V AC		≥ 15V AC	
Turn-off Voltage (max.)	≤ 6V AC		≤ 6V AC		≤ 6V AC		≤ 6V AC	
Consumption	≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC	
Output								
Amp Rating AC51	15		25		40		50	
Nominal Voltage	24…480V AC		24…480V AC		24…480V AC		24…480V AC	
Maximum Voltage	24…530V AC		24…530V AC		24…530V AC		24…530V AC	
Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)	100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

R/F = Refer to factory for availability

1 Pole DIN-Rail Mount Relay, 6-32V DC Control, 480V AC Output

DISCONTINUED
SEE 600V



Specifications		60 Amp		75 Amp		90 Amp		120 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
without integrate fan (not required)		GTS-60/480-0	301	GTS-75/480-0	358	GTS-90/480-0	633		
with integrated fan 230V								GTS-120/480-0-VEN-90	750
with integrated fan 115V								GTS-120/480-0-VEN-91	
Input	Voltage Range	6 - 32V DC		6 - 32V DC		6 - 32V DC		6 - 32V DC	
	Turn-on Voltage (min.)	> 5.1V DC		> 5.1V DC		> 5.1V DC		> 5.1V DC	
	Turn-off Voltage (max.)	< 3V DC		< 3V DC		< 3V DC		< 3V DC	
	Consumption	≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V	
	Reverse Voltage	< 36V DC		< 36V DC		< 36V DC		< 36V DC	
Output	Amp Rating @ 40ºC	60		75		90		120	
	Nominal Voltage	24…480V AC		24…480V AC		24…480V AC		24…480V AC	
	Maximum Voltage	24…530V AC		24…530V AC		24…530V AC		24…530V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
	Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)		108 (H) x 80 (W) x 107 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 158 (D)	

1 Pole DIN-Rail Mount Relay, 20-260V AC Control, 480V AC Output

DISCONTINUED
SEE 600V



Specifications		60 Amp		75 Amp		90 Amp		120 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
without integrate fan (not required)		GTS-60/480-0-AC	316	GTS-75/480-0-AC	366	GTS-90/480-0-AC	646		
with integrated fan 230V								GTS-120/480-0-AC-VEN-90	770
with integrated fan 115V								GTS-120/480-0-AC-VEN-91	
Input	Voltage Range	20…260V AC		20…260V AC		20…260V AC		20…260V AC	
	Turn-on Voltage (min.)	≥ 15V AC		≥ 15V AC		≥ 15V AC		≥ 15V AC	
	Turn-off Voltage (max.)	≤ 6V AC		≤ 6V AC		≤ 6V AC		≤ 6V AC	
	Consumption	≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC		≤ 8mA @ 260V AC	
Output	Amp Rating @ 40ºC	60		75		90		120	
	Nominal Voltage	24…480V AC		24…480V AC		24…480V AC		24…480V AC	
	Maximum Voltage	24…530V AC		24…530V AC		24…530V AC		24…530V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
	Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)		108 (H) x 80 (W) x 107 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 158 (D)	

R/F = Refer to factory for availability

GTS Relays are cUL (E243386)

1 Pole DIN-Rail Mount Relay, 6-32V DC Control, 600V AC Output

NEW




Specifications	15 Amp		25 Amp		40 Amp		50 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GTS-15/60-D-0	109	GTS-25/60-D-0	122	GTS-40/60-D-0	147	GTS-50/60-D-0	266
Input								
Voltage Range	6 - 32V DC		6 - 32V DC		6 - 32V DC		6 - 32V DC	
Turn-on Voltage (min.)	> 5.1V DC		> 5.1V DC		> 5.1V DC		> 5.1V DC	
Turn-off Voltage (max.)	< 3V DC		< 3V DC		< 3V DC		< 3V DC	
Consumption	≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V	
Reverse Voltage	< 36V DC		< 36V DC		< 36V DC		< 36V DC	
Output								
Amp Rating AC51	15		25		40		50	
Nominal Voltage	24…600V AC		24…600V AC		24…600V AC		24…600V AC	
Maximum Voltage	20…660V AC		20…660V AC		20…660V AC		20…660V AC	
Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)	100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

1 Pole DIN-Rail Mount Relay, 20-260V AC Control, 600V AC Output

NEW




Specifications	15 Amp		25 Amp		40 Amp		50 Amp	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	GTS-15/60-A-0	119	GTS-25/60-A-0	129	GTS-40/60-A-0	162	GTS-50/60-A-0	275
Input								
Voltage Range	20…260V AC/DC		20…260V AC/DC		20…260V AC/DC		20…260V AC/DC	
Turn-on Voltage (min.)	≥ 15V AC/DC		≥ 15V AC/DC		≥ 15V AC/DC		≥ 15V AC/DC	
Turn-off Voltage (max.)	≤ 6V AC/DC		≤ 6V AC/DC		≤ 6V AC/DC		≤ 6V AC/DC	
Consumption	≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC	
Output								
Amp Rating AC51	15		25		40		50	
Nominal Voltage	24…600V AC		24…600V AC		24…600V AC		24…600V AC	
Maximum Voltage	20…660V AC		20…660V AC		20…660V AC		20…660V AC	
Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)	100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

1 Pole DIN-Rail Mount Relay, 6-32V DC Control, 600V AC Output

NEW

Specifications		60 Amp		75 Amp		90 Amp		120 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
without integrate fan (not required)		GTS-60/60-D-0	331	GTS-75/60-D-0	394	GTS-90/60-D-0	696		
with integrated fan 230V								GTS-120/60-D-0-VEN-90	825
with integrated fan 115V								GTS-120/60-D-0-VEN-91	
Input	Voltage Range	6 - 32V DC		6 - 32V DC		6 - 32V DC		6 - 32V DC	
	Turn-on Voltage (min.)	> 5.1V DC		> 5.1V DC		> 5.1V DC		> 5.1V DC	
	Turn-off Voltage (max.)	< 3V DC		< 3V DC		< 3V DC		< 3V DC	
	Consumption	≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V		≤ 10mA @ 32V	
	Reverse Voltage	< 36V DC		< 36V DC		< 36V DC		< 36V DC	
Output	Amp Rating @ 40ºC	60		75		90		120	
	Nominal Voltage	24…600V AC		24…600V AC		24…600V AC		24…600V AC	
	Maximum Voltage	20…660V AC		20…660V AC		20…660V AC		20…660V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
	Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)		108 (H) x 80 (W) x 107 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 158 (D)	

1 Pole DIN-Rail Mount Relay, 20-260V AC Control, 600V AC Output

NEW

Specifications		60 Amp		75 Amp		90 Amp		120 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
without integrate fan (not required)		GTS-60/60-A-0	348	GTS-75/60-A-0	403	GTS-90/60-A-0	711		
with integrated fan 230V								GTS-120/60-A-0-VEN-90	847
with integrated fan 115V								GTS-120/60-A-0-VEN-91	
Input	Voltage Range	20…260V AC/DC		20…260V AC/DC		20…260V AC/DC		20…260V AC/DC	
	Turn-on Voltage (min.)	≥ 15V AC/DC		≥ 15V AC/DC		≥ 15V AC/DC		≥ 15V AC/DC	
	Turn-off Voltage (max.)	≤ 6V AC/DC		≤ 6V AC/DC		≤ 6V AC/DC		≤ 6V AC/DC	
	Consumption	≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC	
Output	Amp Rating @ 40ºC	60		75		90		120	
	Nominal Voltage	24…600V AC		24…600V AC		24…600V AC		24…600V AC	
	Maximum Voltage	20…660V AC		20…660V AC		20…660V AC		20…660V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V		< 20V	
	Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)		108 (H) x 80 (W) x 107 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 142 (D)		108 (H) x 127 (W) x 158 (D)	

GTS Relays are cUL (E243386)

3 Pole DIN-Rail Mount Relay, 5-32V DC Control, 480V AC Output

DISCONTINUED
SEE 600V

Specifications		25 Amp		40 Amp		55 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	Without integrated fan (not required)	GTZ25/480-0-0	285				
	with integrated fan 230V AC			GTZ40/480-0-0-VEN-90	330	GTZ55/480-0-0-VEN-90	390
	with integrated fan 115V AC			GTZ40/480-0-0-VEN-91		GTZ55/480-0-0-VEN-91	
Input	Voltage Range	5 - 32V DC		5 - 32V DC		5 - 32V DC	
	Turn-on Voltage (min.)	> 4.5V DC		> 4.5V DC		> 4.5V DC	
	Turn-off Voltage (max.)	≤ 3V DC		≤ 3V DC		≤ 3V DC	
	Consumption	18 mA @ 5V DC - 22mA @ 32V DC		18 mA @ 5V DC - 22mA @ 32V DC		18 mA @ 5V DC - 22mA @ 32V DC	
	Reverse Voltage	< 36V DC		< 36V DC		< 36V DC	
Output	Amp Rating AC51	25		40		55	
	Nominal Voltage	24…480V AC		24…480V AC		24…480V AC	
	Maximum Voltage	24…530V AC		24…530V AC		24…530V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V	
	Frequency Range	45…65 Hz		45…65 Hz		45…65 Hz	
Dimension (mm)		100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

3 Pole DIN-Rail Mount Relay, 5-32V DC Control, 600V AC Output

DISCONTINUED
SEE 600V

Specifications		40 Amp		55 Amp	
		Catalog Number	Price	Catalog Number	Price
	with integrated fan 230V AC	GTZ40/600-0-0-VEN-90	350	GTZ55/600-0-0-VEN-90	410
	with integrated fan 115V AC	GTZ40/600-0-0-VEN-91		GTZ55/600-0-0-VEN-91	
Input	Voltage Range	5 - 32V DC		5 - 32V DC	
	Turn-on Voltage (min.)	> 4.5V DC		> 4.5V DC	
	Turn-off Voltage (max.)	≤ 3V DC		≤ 3V DC	
	Consumption	18 mA @ 5V DC - 22mA @ 32V DC		18 mA @ 5V DC - 22mA @ 32V DC	
	Reverse Voltage	< 36V DC		< 36V DC	
Output	Amp Rating AC51	40		55	
	Nominal Voltage	24…600V AC		24…600V AC	
	Maximum Voltage	24…660V AC		24…660V AC	
	Zero Switching Voltage	< 20V		< 20V	
	Frequency Range	45…65 Hz		45…65 Hz	
Dimension (mm)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

GTZ Relays are cUR (E243386). Not CSA.

3 Pole DIN-Rail Mount Relay, 5-32V DC Control, 600V AC Output

NEW

Specifications		25 Amp		40 Amp		55 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	Without integrated fan (not required)	GTZ25/60-D-0	305				
	with integrated fan 230V AC			GTZ40/60-D-0-VEN-90	350	GTZ55/60-D-0-VEN-90	410
	with integrated fan 115V AC			GTZ40/60-D-0-VEN-91		GTZ55/60-D-0-VEN-91	
Input	Voltage Range	5 - 32V DC		5 - 32V DC		5 - 32V DC	
	Turn-on Voltage (min.)	> 4.5V DC		> 4.5V DC		> 4.5V DC	
	Turn-off Voltage (max.)	≤ 3V DC		≤ 3V DC		≤ 3V DC	
	Consumption	18 mA @ 5V DC - 22mA @ 32V DC		18 mA @ 5V DC - 22mA @ 32V DC		18 mA @ 5V DC - 22mA @ 32V DC	
	Reverse Voltage	< 36V DC		< 36V DC		< 36V DC	
Output	Amp Rating AC51	40		40		55	
	Nominal Voltage	24…600V AC		24…600V AC		24…600V AC	
	Maximum Voltage	24…660V AC		24…660V AC		24…660V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V	
	Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)		100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

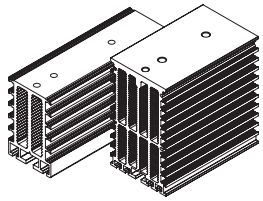
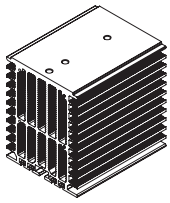
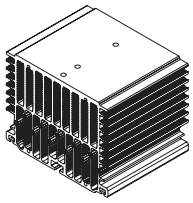
3 Pole DIN-Rail Mount Relay, 20…260V AC Control, 600V AC Output

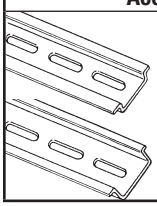
NEW

Specifications		25 Amp		40 Amp		55 Amp	
		Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
	Without integrated fan (not required)	GTZ25/60-A-0	342				
	with integrated fan 230V AC			GTZ40/60-A-0-VEN-90	392	GTZ55/60-A-0-VEN-90	459
	with integrated fan 115V AC			GTZ40/60-A-0-VEN-91		GTZ55/60-A-0-VEN-91	
Input	Voltage Range	20…260V AC/DC		20…260V AC/DC		20…260V AC/DC	
	Turn-on Voltage (min.)	≥ 15V AC/DC		≥ 15V AC/DC		≥ 15V AC/DC	
	Turn-off Voltage (max.)	≤ 6V AC/DC		≤ 6V AC/DC		≤ 6V AC/DC	
	Consumption	≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC		≤ 8mA @ 260V AC/DC	
Output	Amp Rating @ 40ºC	60		60		55	
	Nominal Voltage	24…600V AC		24…600V AC		24…600V AC	
	Maximum Voltage	24…660V AC		24…660V AC		24…660V AC	
	Zero Switching Voltage	< 20V		< 20V		< 20V	
	Frequency Range	50/60 Hz		50/60 Hz		50/60 Hz	
Dimension (mm)		100 (H) x 24 (W) x 107 (D)		108 (H) x 35 (W) x 142 (D)		108 (H) x 60 (W) x 142 (D)	

GTZ Relays are cUR (E243386). Not CSA.

Accessories

Heatsinks	Description	Catalog Number	Price
 DIS-25GD DIS-50G	**Heatsink –** Extruded aluminum DIN-rail mount for mounting one GQ relay. Includes PAN-1 kit attachment for panel mounting. - For use with GQ 15A & 25A relays - 100 x 24 x 65mm - Thermal Resistance Rth > 2.8 K/W	**DIS-25GD**	**97**
	- For use with GQ 25A & 50A relays - 100 x 60 x 100mm - Thermal Resistance Rth > 8.3 K/W	**DIS-50G**	**97**
	**Heatsink –** Extruded aluminum DIN-rail mount for mounting one GQ relay. Includes PAN-1 kit attachment for panel mounting. - For use with GQ 50A relays - 100 x 80 x 100mm - Thermal Resistance Rth > 0.66 K/W	**DIS-60G**	**115**
	**Heatsink –** Extruded aluminum DIN-rail mount for mounting one GQ relay. Includes PAN-1 kit attachment for panel mounting. - For use with GQ 90A relays - 100 x 126 x 100mm - Thermal Resistance Rth > 0.56 K/W	**DIS-90G**	**145**
	**Kit Attachment –** Allows for panel mounting the GTS Series and DIS heat sinks. Includes 2 plastic supports, 2 screws, and 2 washers.	**PAN-1**	**19**
	**Silicone thermoconductive paste –** for coupling the GQ Relay power module to the heat sink. 100 g tube.	**SIL-1**	**82**
	**Graphite Film –** 35 x 55 mm graphite film for GQ relays. - 0.12 mm thick, 2.1 W (m*K). - 200 x 240 mm sheet with 25 adhesives	**SIL-GQ**	**79**

Accessory	Description	Catalog Number	Price
	**DIN-rail** - 2 meter lengths (6'6") Top Hat, low profile (price per rail) Top Hat, high profile (package of 20, price per rail)	**3F** **3AF**	**See page A51**

Cross Reference Series SAR/SAS to Gefran Solid State Relays

Sprecher+Schuh Catalog Number	Gefran Catalog Number	Gefran Product Status
SAR Series DIN-Rail Mount		
SAR6-25-1D	GTS-25/60-D-0	
SAR6-25-1	GTS-25/60-A-0	
SAR6-40-1D	GTS-40/60-D-0	
SAR6-40-1	GTS-40/60-A-0	
SAR6-50-1D	GTS-50/60-D-0	
SAR6-50-1	GTS-50/60-A-0	
SAR6-75-1D	GTS-75/60-D-0	
SAR6-75-1	GTS-75/60-A-0	
SAR6-100-1D	GTS-90/60-D-0	Select GTS-120/60-D... For above 90A+
SAR6-100-1	GTS-90/60-A-0	Select GTS-120/60-A... For above 90A+
~	GTS-120/60-D-0-VEN*	New 120A offering
~	GTS-120/60-A-0-VEN*	New 120A offering
SAR6-30-3D	GTZ25/60-D-0	Select GTZ40/60-D-0-VEN* for above 25A+
SAR6-30-3	GTZ25/60-A-0	Select GTZ40/60-A-0-VEN* for above 25A+
~	GTZ40/60-D-0-VEN*	New 40A offering
~	GTZ40/60-A-0-VEN*	New 40A offering
~	GTZ55/60-D-0-VEN*	New 55A offering
~	GTZ55/60-A-0-VEN*	New 55A offering
SAS Series Panel Mount		
SAS3-10-1D	GQ-15-24-D-1-4	
SAS3-10-1	GQ-15-24-A-1-4	
SAS3-25-1D	GQ-25-24-D-1-4	
SAS3-25-1	GQ-25-24-A-1-4	
SAS3-50-1D	GQ-50-24-D-1-4	
SAS3-50-1	GQ-50-24-A-1-4	
SAS3-75-1D	GQ-90-24-D-1-4	
SAS3-75-1	GQ-90-24-A-1-4	
SAS6-50-1D	GQ-50-60-D-1-4	
SAS6-50-1	GQ-50-60-A-1-4	
SAS6-75-1D	GQ-90-60-D-1-4	
SAS6-75-1	GQ-90-60-A-1-4	

* Suffix code for selected fan voltage

Technical Information

			GQ-15-24-...	GQ-25-24-...	GQ-50-24-...	GQ-90-24-...	GQ-50-60-...	GQ-90-60-...
Amp Rating	AC51	[A rms]	15	25	50	90	50	90
	AC53	[A rms]	3	5	15	20	15	20
Min. load current		[A rms]	0.1	0.3	0.3	0.5	0.3	0.5
Repetitive overcurrent (t = 1s)		[A rms]	≤ 35	≤ 60	≤ 125	≤ 150	≤ 125	≤ 150
Non-repetitive overcurrent (t = 20 s)		[A p]	200	300	600	1500	600	1500
Current drop at nominal voltage and frequencies		[mA rms]	≤ 8	≤ 8	≤ 8	≤ 10	≤ 8	≤ 10
I^2t for fusing (t = 1-10 ms)		[A^2s]	≤ 200	≤ 450	≤ 1,800	≤ 11,200	≤ 1,800	≤ 11,200
Critical dI/dt		[A/µs]	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100
Voltage drop at nominal current		[V rms]	≤ 1.45	≤ 1.45	≤ 1.35	≤ 1.35	≤ 1.35	≤ 1.35
Critical dV/dt off state		[V/µs]	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000
I_{th}		[A]	15	25	50	90	50	90

Input

DC Control	Voltage Range	3 - 32V DC		
	Turn-on Voltage (min.)	≥ 2.7V DC		
	Turn-off Voltage (max.)	≤ 1V DC		
	Consumption	≤ 13mA @ 32V		
	Reverse Voltage	< 36V DC		
AC Control	Voltage Range	20…260V AC/V DC		
	Turn-on Voltage (min.)	≥ 15V AC/V DC		
	Turn-off Voltage (max.)	≤ 6V AC/V DC		
	Consumption	≤ 8mA ac/cc @ 260V AC/V DC		
Output				
	Nominal Voltage	24…230V AC		48…600V AC
	Maximum Voltage	20…253V AC		40…660V AC
	Non-repetitive Voltage	600Vp		1200Vp
	Zero Switching Voltage	≤ 20V		≤ 40V
	Frequency Range	45…65 Hz		45…65 Hz

Insulation

Nominal voltage	input/output	[V ac]	≥ 4000
	output/case	[V ac]	≥ 2500
Resistance	input/output	[Ω]	≥ 10^{10}
	output/case	[Ω]	≥ 10^{10}
Capacity	input/output	[pF]	≤ 8
	output/case	[pF]	≤ 100

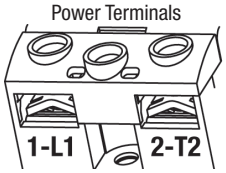
Ambient Conditions

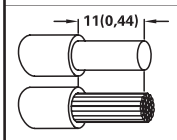
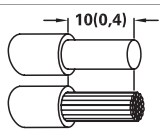
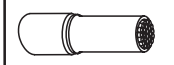
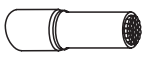
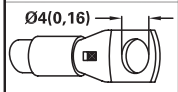
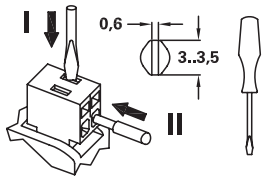
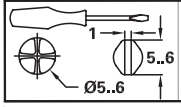
Ambient temperature	-25…+80ºC [-13…176ºF]
Storage temperature	-55…+100ºC [-67…212ºF]
Maximum relative humidity	50% at 40ºC
Maximum installation altitude	2000 m above sea level
Pollution level	3

Thermal Features

Junction temperature			≤ 125ºC [257ºF]					
Rth	junction/ambient	[K/W]	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
	junction/case	[K/W]	≤ 1.25	≤ 1.25	≤ 0.65	≤ 0.30	≤ 0.65	≤ 0.30
Heatsink			Rth = (90ºC - max amb. T / Pd) Where Pd = dissipated power Max. amb. T = max. air temperature inside the electrical cabinet Use a heatsink with thermal resistance less than the calculated Rth value					

Terminals and Leads

Terminal Type	Power Terminals	Command Terminals
		
	Screw (m4) contact area (LxP) 13 x 11 mm	screw M2.5 MORS4 (22…16 AWG)

1(L1) 2(T1)		3(A1) 4(A2)	
	1x 2,5...6 mm² 1x 14...10 AWG 2x1,5...2,5 mm² 2x16...14 AWG 2x 2,5...6 mm² 2x 14...10 AWG		1x 0,2...2,5 mm² 1x 24...14 AWG 2x 0,2...1,5 mm² 2x 24...16 AWG
	1x 1,5...6 mm² 1x 16...10 AWG 2x 1,5...6 mm² 2x 16...10 AWG		1x0,25...2,5 mm² 1x 23...14 AWG 2x0,25...1 mm² 2x 23...18 AWG
	1x 2,5...25 mm² 1x 14...4 AWG		
	2...2,4 Nm 18...21 lb×in		

S	GQ..15.. 2,5 mm² 14 AWG	GQ..25.. 6 mm² 10 AWG	GQ..50.. 12 mm² (2x6) 7 AWG (2x10)	GQ..90.. 25 mm² 4 AWG

Recommended Fuses (by others)

HIGH SPEED FUSES			
Model	**Size I²T**	**Bussman Part No.**	**Dissipated power @ In**
GQ15...	16A 150A²S	FWC16A10F 338470	3,5W
GQ25...	25A 390A²S	FWC25A10F 338474	6W
	375A²S	FWC25A14F 338130	7W
GQ50...	50A 1800A²S	FWC50A14F 338079	9W
	50A 1600A²S	FWC50A22F 338127	9,5W
GQ90...	80A 6600A²S	FWP80A22F 338199	14W
	100A 12500A²S	FWP100A22F 338478	16W

Heatsink / Thermal Resistance

Model	Gefran Heatsink (see accessories)	Thermal Resistance
GQ15... GQ25...	DIS 25GD DIS 50G	$R_{th} \geq 2,8$ K/W $R_{th} \geq 0,83$ K/W
GQ50...	DIS 50G	$R_{th} \geq 0,83$ K/W
GQ90...	DIS 90G	$R_{th} \geq 0,56$ K/W

Data relating to 40°C ambient temperature, heatsink in vertical position with 15 cm of free air above and below.

Section Cable

Model	Section
GQ15...	2.5mm² / 14 AWG
GQ25...	6mm² / 10 AWG
GQ50...	12mm² / 7 AWG
GQ90...	25mm² / 4 AWG

Minimum allowed rated section based on the rated currents of the power solid state relays, for copper leads isolated in PVC in continuous use and at room temperature of 40°C, according to standards CEI 44-5, CEI 17-11, IEC 408 pursuant to standard EN60204-1.
Power terminals in compliance with standard EN60947-1

EMC Emission

EN 61000-6-4	Emissions conducted at radiofrequency	Class A (Industrial devices)
EN 61000-6-4	Emissions irradiated at radiofrequency	Class A (Industrial devices)

The product is designed for type A environments. Use of the product in type B environments may cause undesired electromagnetic noise. In this case, the user should take appropriate steps for improvement.

EMC Immunity

EN 61000-6-2	Immunity for industrial environments	
EN 61000-4-2	Electrostatic discharges 4kV by contact; 8 kV in air.	Performance criterion 2
EN 61000-4-6	Electromagnetic field at radiofrequency Test level 3. 0.15-80MHz	Performance criterion 1
EN 61000-4-3	Electromagnetic field at radiofrequency Test level 10V/m. 80-1000MHz	Performance criterion 1
EN 61000-4-4	Immunity to burst	Test level 2kV/100 KHz. Performance criterion 2
EN 61000-4-5	Immunity to surge	Test level: 2kV (Phase-ground); 1kV (Phase-phase). Performance criterion 2

Safety

EN 61010-1	Safety requirements

Technical Information

Amp Rating		GTS-15	GTS-25	GTS-40	GTS-50	GTS-60	GTS-75	GTS-90	GTS-120
Rated Current @ 40ºC (continuous service)	[A rms]	15	25	40	50	60	75	90	120
Non-repetitive overcurrent (t = 20 ms)	[A]	400	400	600	1150	1150	1300	1500	1500
I^2t for blowout	[A^2s]	≤ 450	≤ 645	≤ 1010	≤ 6600	≤ 6600	≤ 8000	≤ 11,200	≤ 11,200
dV/dt critical with output deactiviated	[V/µs]	1000	1000	1000	1000	1000	1000	1000	1000

Input		
DC Control	Voltage Range	6 - 32V DC
	Turn-on Voltage (min.)	> 5.1V DC
	Turn-off Voltage (max.)	< 3V DC
	Consumption	≤ 10mA @ 32V
	Reverse Voltage	< 36V DC
AC Control	Voltage Range	20…260V AC/DC
	Turn-on Voltage (min.)	≥15V AC/DC
	Turn-off Voltage (max.)	≤6V AC/DC
	Consumption	≤8mA @ 260V AC/DC

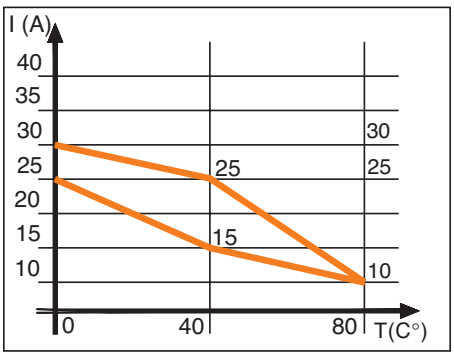
Output		
	Nominal Voltage	24…600V AC
	Maximum Voltage	20…660V AC
	Non-repetitive Voltage	500Vp for 230V models, 1200Vp for 480V models
	Zero Switching Voltage	< 20V
	Frequency Range	50/60 Hz

Isolation			
Rated voltage	input/output	[V ac]	≥ 4000

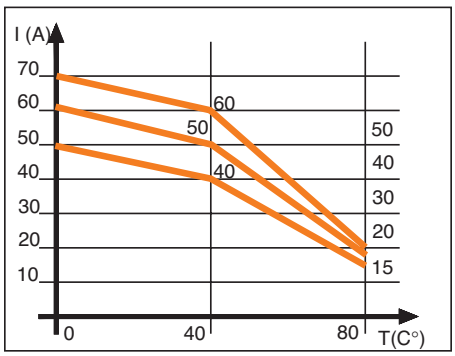
Ambient Conditions	
Ambient temperature	0º…+80ºC [32º…+176ºF] according to dissipation curves
Storage temperature	-20…+85ºC [-4º…+185ºF]
Maximum relative humidity	50% at 40ºC
Maximum installation altitude	2000m above sea level
Pollution level	3

Dissipation Curves

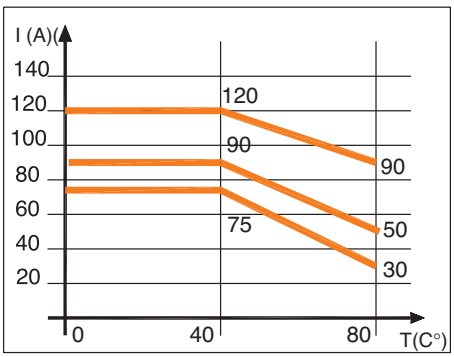
GTS 15 - 25



GTS 40 - 50 - 60



GTS 75 - 90 - 120



N.B.: Curves for the GTS 120 refer to the device complete with standard running.

Technical Information

Terminal and Conductors

Size	Terminal	Contact area (WxD) screw type	Type of preisolated terminal ❷	Max section. ❶ conductor tightening torque
15/20A	C	6.4x9 M3	1, 2, 4	6mm² / 10AWG 0.6Nm max
	P	6.4x9 M3	1, 2, 4	6mm² / 10AWG 0.4 - 0.6Nm
	G	9x12 M5	1	6mm² / 10AWG 1.3 - 1.8Nm
25A	C	6.4x9 M3	1, 2, 4	6mm² / 10AWG 0.6Nm max
	P	6.4x9 M3	1, 2	6mm² / 10AWG 0.4 - 0.6Nm
	G	9x12 M5	1	6mm² / 10AWG 1.3 - 1.8Nm
40A	C	6.3x9 M3	1, 2, 3	2.5mm² / 14AWG 0.6Nm max
	P	12x12 M5	1, 2	16mm² / 6AWG 1.5 - 2.2Nm
	G	11.5x12 M5	1	16mm² / 6AWG 1.5 - 2.2Nm
50/60A	C	6.3x9 M3	1, 2, 3	2.5mm² / 14AWG 0.6Nm max
	P	16x18 M6	1, 2	50mm² / 0AWG 3.5 - 6Nm
	G	14x16 M5	1	50mm² / 0AWG 1.8 - 2.5Nmm
75-90A	C	6.3x9 M3	1, 2, 3	2.5mm² / 14AWG 0.6Nm max
	P	16x18 M6	1, 2	50mm² / 0AWG 3.5 - 6Nm
	G	14x16 M5	1	50mm² / 0AWG 1.8 - 2.5Nmm
120A	C	6.3x9 M3	1, 2, 3	2.5mm² / 14AWG 0.6Nm max
	P	16x18 M6	1, 2	50mm² / 0AWG 3.5 - 6Nm
	G	14x16 M5	1	50mm² / 0AWG 1.8 - 2.5Nm

Terminal: C = Control, P = Power, G = Ground

Terminal Types

1. Eyelet

2. Fork

3. Tip

4. Faston

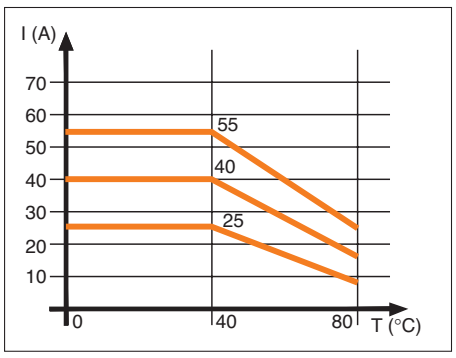
❶ The max. sections specified refer to unipolar copper wires isolated in PVC..
❷ The screw terminals must be suitable for field wiring connection only when the wire is provided with eyelet tube terminal type 1.

Technical Information

			GTZ-25/60	GTZ-40/60	GTZ-55/60	GTZ-40/60	GTZ-55/60
Amp Rating							
Category AC51, AC53a		[A rms]	25	40	55	40	55
Nominal current (I_{max})		[A rms]	3x25	3x40	3x55	3x40	3x55
Non-repetitive overcurrent (t = 20 ms)		[A]	400	600	1150	600	1150
I^2t for blowout		[A^2s]	645	1010	6600	1010	6600
DC Control Input	Voltage Command Circuit (Uc)		5…32V DC				
	Turn-on Voltage (min.)		> 4.5V DC				
	Turn-off Voltage (max.)		< 3V DC				
	Consumption		≤ 18mA @ 5V DC - 22mA @ 32V DC				
	Reverse Voltage		< 36V DC				
AC Control INPUT	Voltage Range		20…260V AC/DC				
	Turn-on Voltage (min.)		≥ 15V AC/DC				
	Turn-off Voltage (max.)		≤ 6V AC/DC				
	Consumption		≤ 8mA @ 260V AC/DC				
	Frequency Range		50/60 Hz				
Activation Time			≤ 1/2 cycle				
Deactivation Time			≤ 1/2 cycle				
Critcal dV/dt OFF-state		[V/µs]	1000				
Potential drop at rated current		[Vrms]	≤ 1.4				
Peak Voltage			>1200V DC				
Protection			IP20				
Isolation							
Nominal voltage (U_i)		[V ac]	600				
Insulation							
Nominal voltage input/output		[KV ac]	4				
Nominal inpulse withstand (U_{imp})		[V AC]	2500				
Ambient Conditions							
Working temperature			-20…+80°C [-4°…176°F]				
Storage temperature			-20…+85°C [-4°…185°F]				
Maximum relative humidity			50% at 40°C				
Maximum installation altitude			1000m asl				
Pollution level			3 (suitable for use in degree 2 environment)				
Class			A (industrial device)				

Dissipation Curve

GTZ 25 - 40 - 55



Technical Information

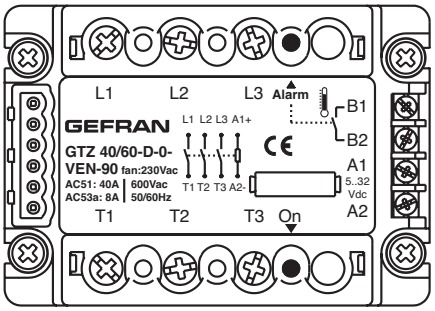
Terminals and Conductors

Size	Nominal ❷ Section Cable mm²	Control Terminal (A1, A2, B1, B2)			Power Terminal (L1, L2, L3, T1, T2, T3)			Ground Terminal ❶	
		Contact area (WxD) screw type	Type of preisolated terminal	Section conductor tightening torque ❶	Contact area (WxD) screw type	Type of preisolated terminal	Max. section conductor tightening torque	Contact area (WxD) screw type	Max. section conductor tightening torque
25A	6	6.3x9 M3	Eye / fork / tip	min. 0.35 mm² max. 2.5 mm² 0.6 Nm Max	12 x 12 M5	Eye / fork / tip	*Tip Terminal* min. 1mm² (17AWG) max. 10mm² (7AWG) *Eye or Fork Terminal* min. 1mm² (17AWG) max. 16mm² (5AWG) 1.5 …2.2Nm	12x12 self-tapping screw 3.9x12 DIN7981	min. 1mm² (17AWG) max. 16mm² (5AWG) 1.5 …1.8Nm
40A	10								
55A	16							12x12 M5	min. 1mm² (17AWG) max. 16mm² (5AWG) 2.5Nm

❶ Note: The maximum sections specified refer to unipolar copper wires isolated in PVC. For the ground terminal, a eye wire terminal is required.
(WxD) = Width x depth

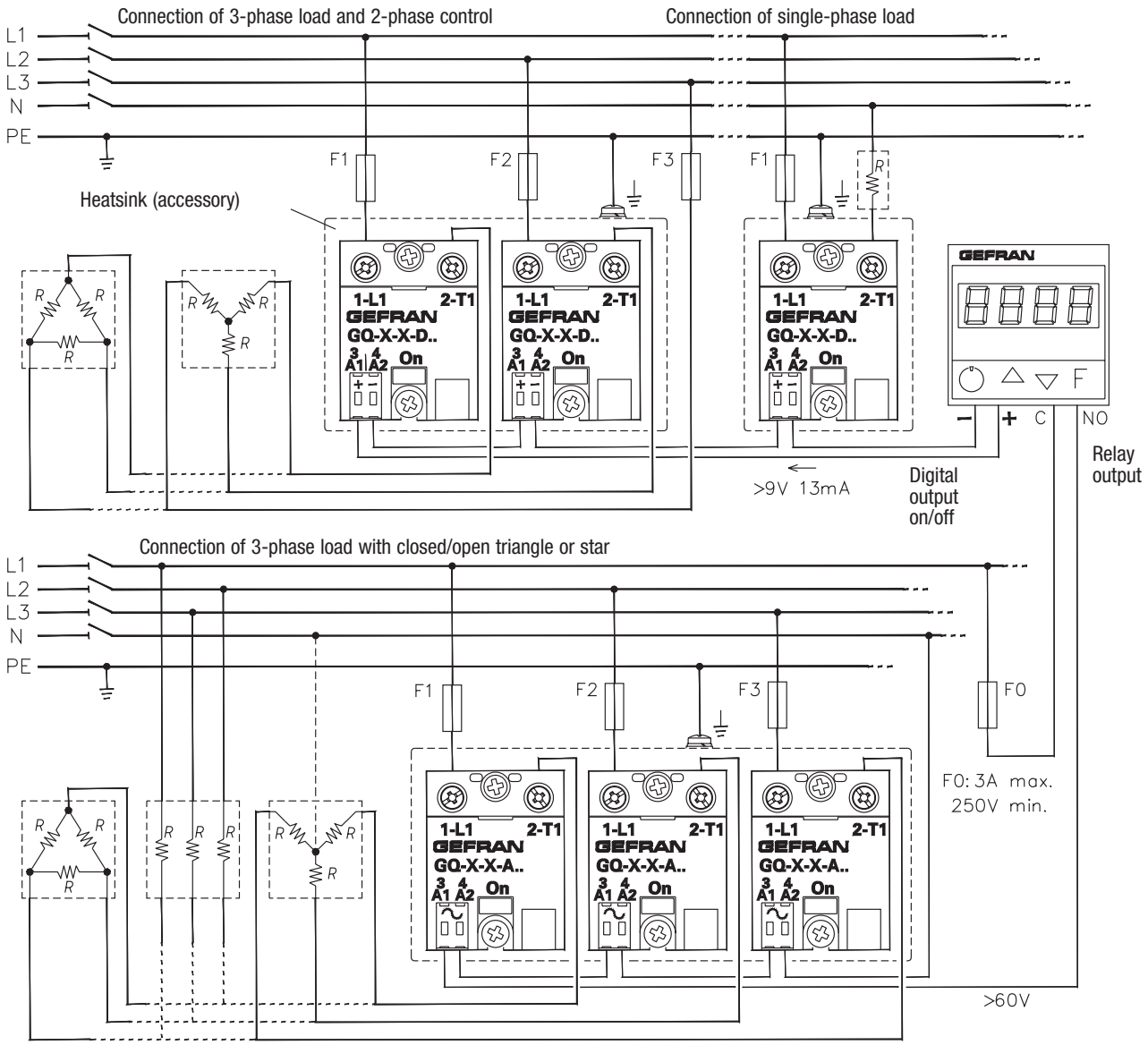
❷ The minimum acceptable nominal section based on the nominal currents of the power solid state units is given for copper conductors isolated in PVC, under continuous operating conditions and at 40ºC ambient temperature according to standards CEI 44-5, CEI 17-11, IEC 408 in accordance with EN60204-1.

Connection Examples



L1 : Phase 1 input
L2 : Phase 2 input
L3 : Phase 3 input
T1 : Phase 1 output
T2 : Phase 2 output
T3 : Phase 3 output
A1 : Control signal (+)
A2 : Control signal (-)
B1 : Alarm output (+) (Special unit)
B2: Alarm output (-) (Special unit)
Led1: Red led signal indicator
Led2: Yellow led (alarm overtemperature junction)

Series GQ Solid State Relays

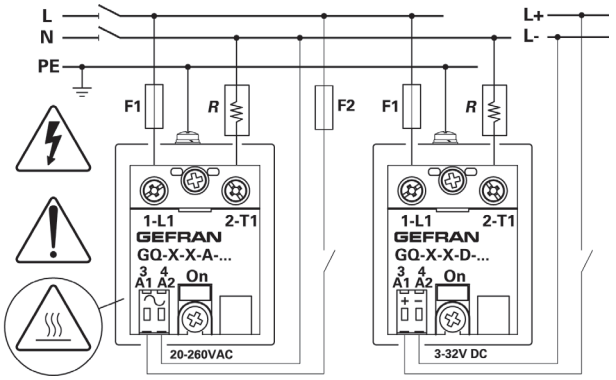


Series GQ Fuse Connections

The solid state group must be connected using proper fuses against short circuits

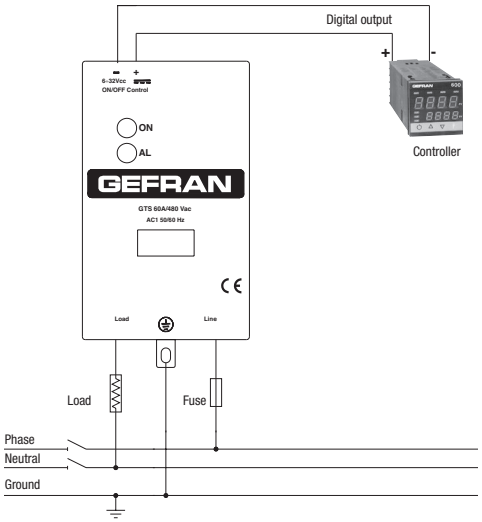
F1:		
GQ-15..	FUS-016 10 x 38	FWC 16A 10F BUSSMANN
GQ-25..	FUS-025 10 x 38	FWC 25A 10F BUSSMANN
GQ-50..	FUS-050 22 x 58	FWP 50A 22F BUSSMANN
GQ-90..	FUS-100 22 x 58	FWP100A 22F BUSSMANN

F2:		
GQ-X-X-A..	3A max 250V min.	UL Category JDYX - JDYX2

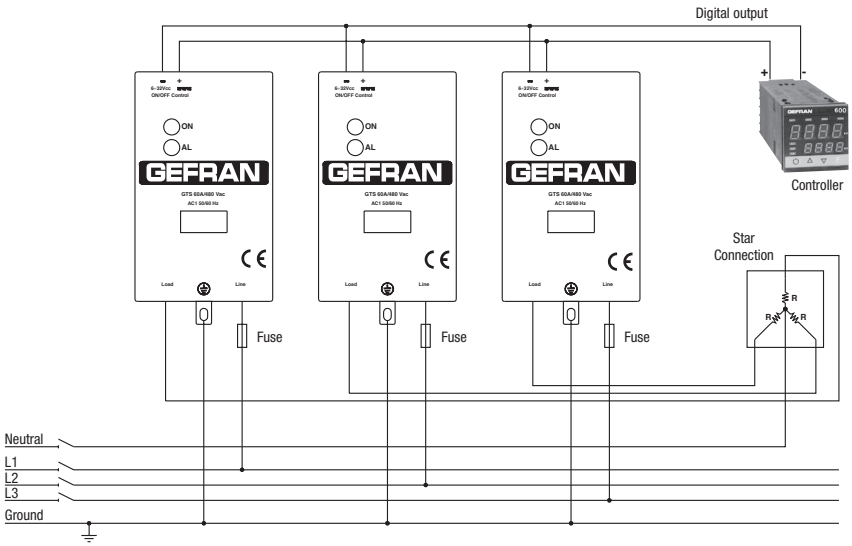


Series GTS Solid State Relays

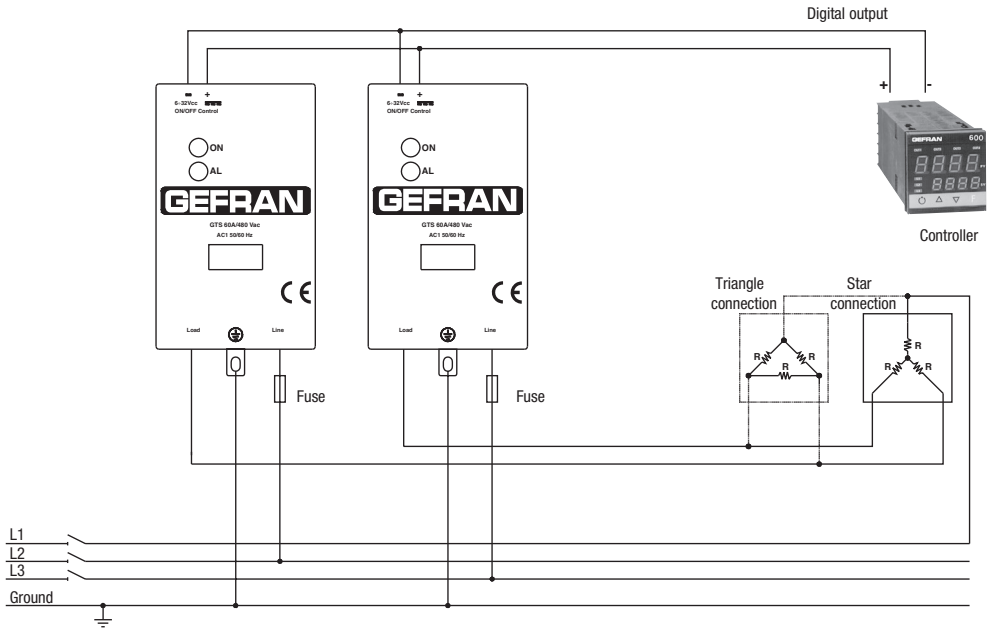
Single-phase connection



Three-phase Star connection with neutral

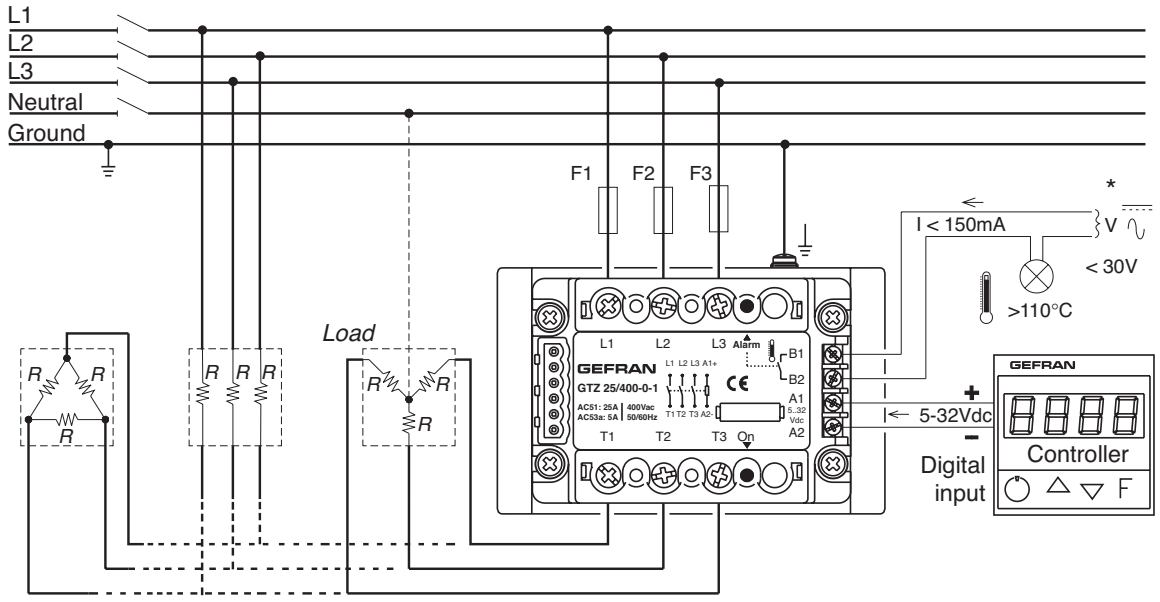


Three-phase Triangle or Star connection without neutral on two phases



Series GTZ Solid State Relays

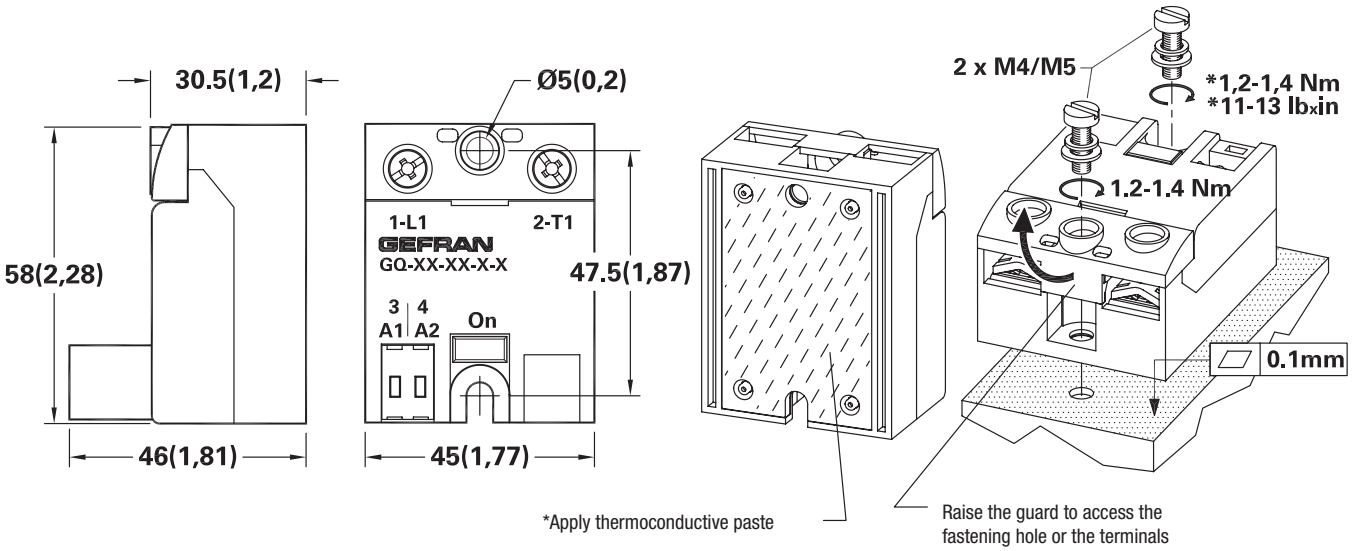
Three-phase Triangle or Star connection (with and without neutral)



* Only in the version with option overtemperature alarm output

GQ Panel Mount Relays

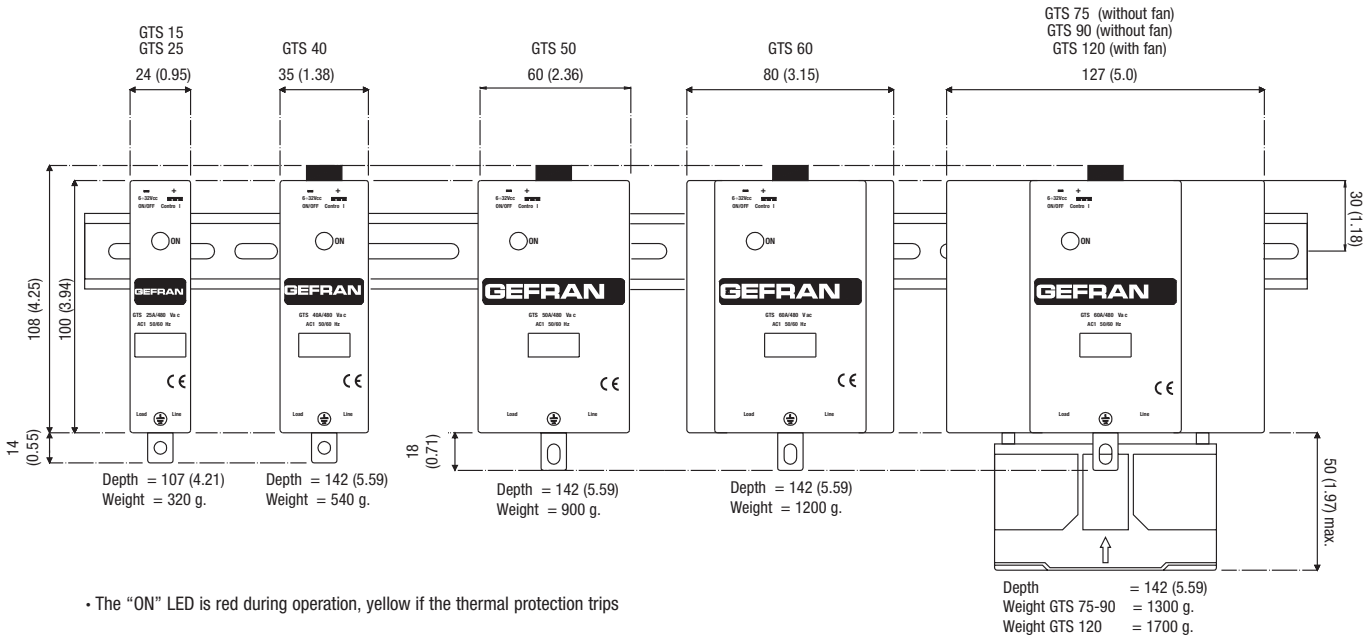
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.



(*) See installation notes

GTS 1-Pole DIN-Rail Mount Relays

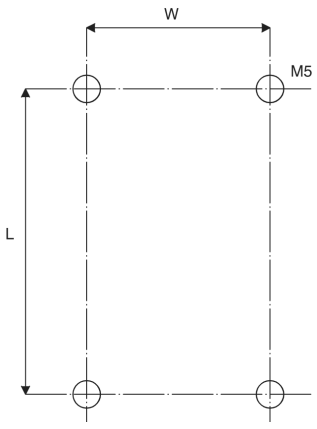
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.



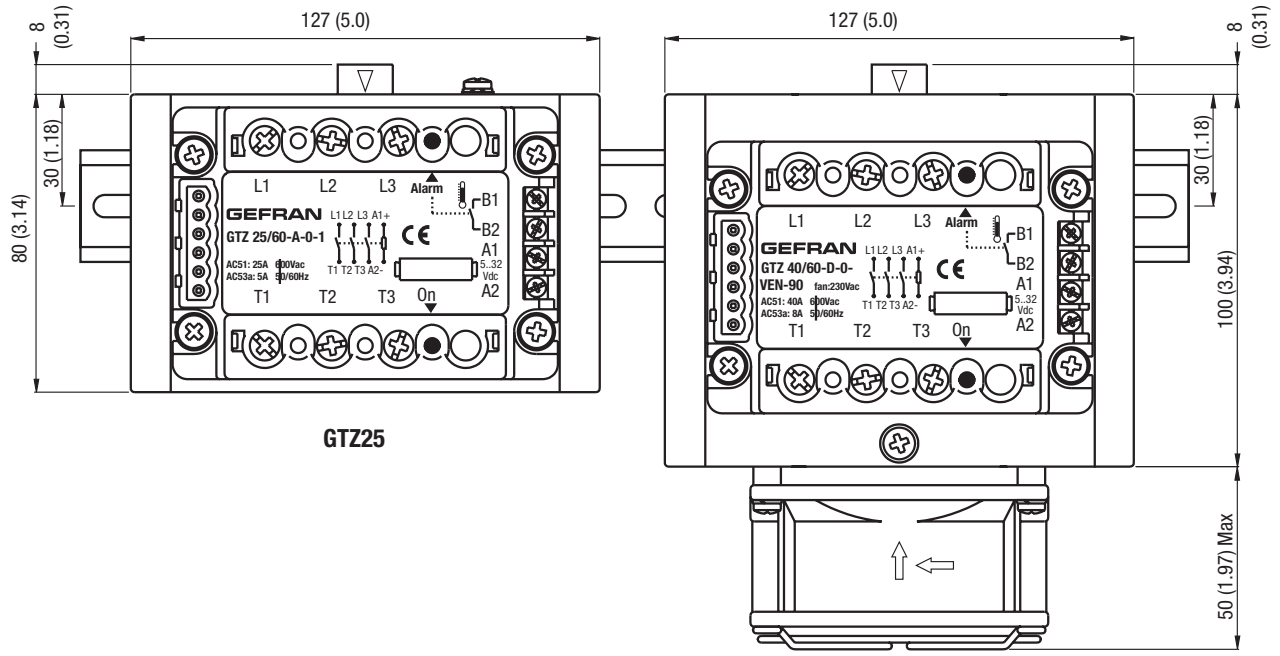
• The "ON" LED is red during operation, yellow if the thermal protection trips

PAN-1 Panel Mount Accessory for GTS - Hole Template

GTS 1-Pole Relays	Length mm (inches)	Width mm (inches)
GTS-15…25	112 (4.41)	0 (0.00)
GTS-40	112 (4.41)	25 (0.98)
GTS-50…60	112 (4.41)	44 (1.73)
GTS-90…120	112 (4.41)	113 (4.45)

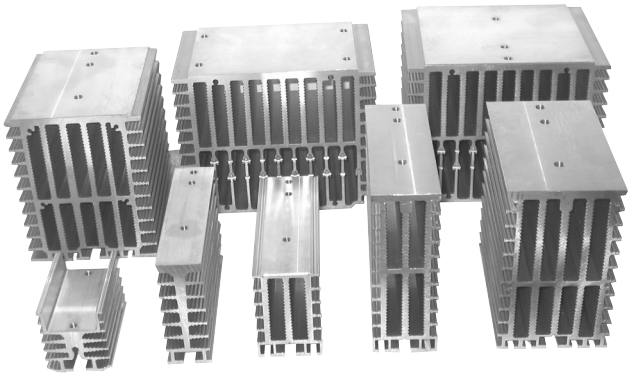


GTZ 3-Pole DIN-Rail Mount Relays



General Application Notes

Heatsinks



Different models of heatsinks have been designed and tested to meet size and dimension needs.

How to choose a heatsink

- Set max. air temperature inside the panelboard ($Tmax_a$)
- Set max. operating current: Imax = Inom. load + 10%
- Draw on the "graphs" $Tmax_a$, Imax points.
- Choose the smallest heatsink (starting from upwards), which point [$Tmax_a$ Imax] is in the gray working area of dissipation curves
- Respect installation distances

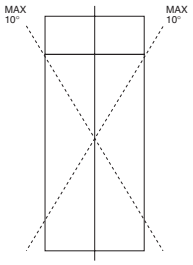
Installation

In order to obtain best reliability, it is important to install a heatsink correctly inside the panel, to reach an adequate thermal exchange between the device and the surrounding air in natural convection conditions.

How to install it correctly:

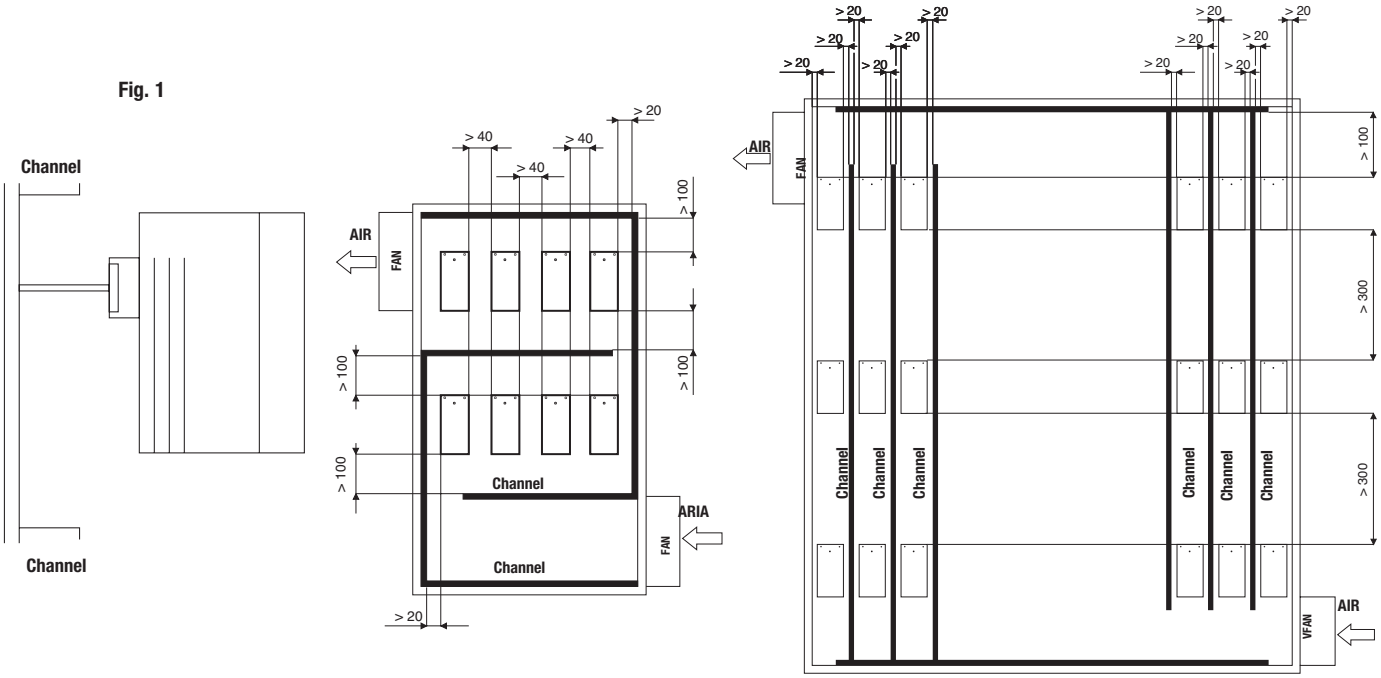
Mount it vertically (max. 10° inclination from the vertical axis)

- Vertical distance between a heatsink and the panel wall: 100 mm at leas.
- Horizontal distance between a heatsink and the panel wall: 20 mm at least.
- Vertical distance between two heatsinks: 300 mm at least.
- Horizontal distance between two heatsinks: 40 mm at least.



Check that cable channels do not reduce these distances; should it happen, mount the relays overhanging from the panel, so that the air can flow vertically on the heatsink without obstables (see Fig.1).

Fig. 1

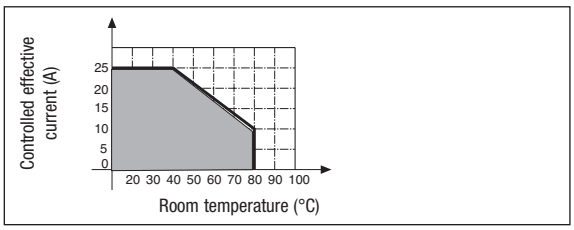


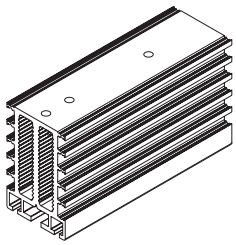
General Application Notes *(continued)*

Dissipation Curves

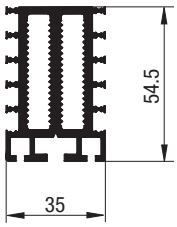
Effective current controllable based on room temperature

DIS 25GD

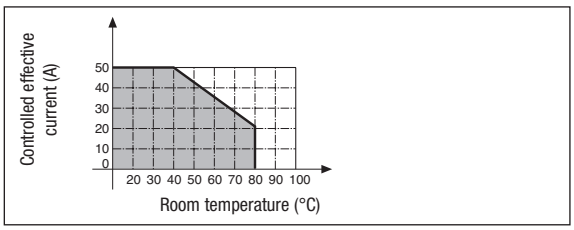


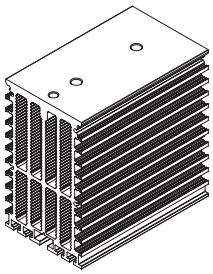


h = 100mm
R_{th} = 2.8°C/W
(*)

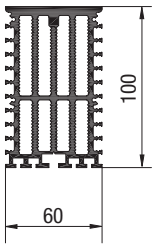


DIS 50G

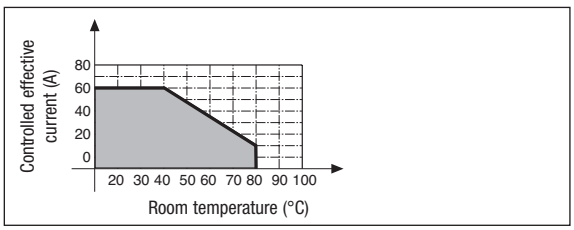


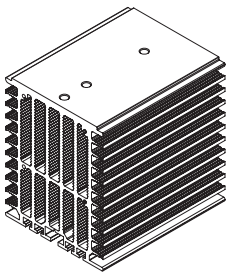


h = 100mm
R_{th} = 0.83°C/W
(*)

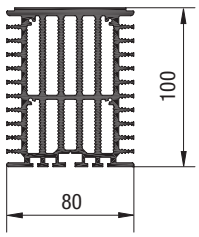


DIS 60G

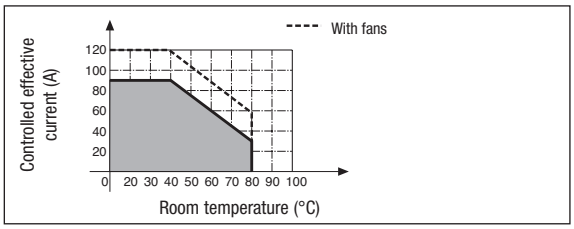


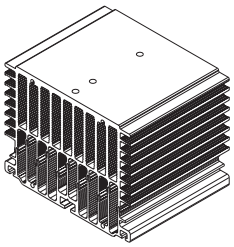


h = 100mm
R_{th} = 0.66°C/W
(*)

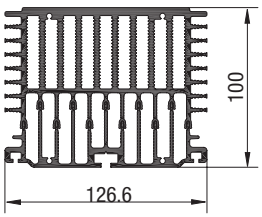


DIS 90G



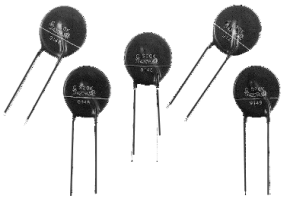


h = 100mm
R_{th} = 0.56°C/W
(*)



General Application Notes *(continued)*

Varistors (MOV)



If your application is located near inductive loads, or shares power sources with large inductive loads that are creating transients in excess of the blocking voltage of the Gefran solid state relay, then you must install a metal oxide varistor (MOV) to protect the solid state relay. It is up to the installation company to properly size the MOV to the application! Ideally, the MOV protection is near the noise generating inductive load (such as a motor, drive, or other large inductive coil) or you can place MOVs directly across the output terminals of the SSR.

Recommended MOVs from EPCOS:

Part Number	Working Voltage (V)
S20K300	120-290 V AC
S20K420	291-400 V AC
S20K510	401-500 V AC

The Gefran solid state relays include technology that dramatically reduces your need to install an external MOV except in extremely noisy environments or inductive load applications.

Fuses and Fuse Holders

These fuses ensure the maximum safety in solid state relay applications. Fuses with a very high cutoff power are used for this kind of applications. See Table 1.

Table 1.

Recommended Fuses (by others) for GQ, GTS & GTZ Relays					
Type relay	**i²t**	**Nominal voltage**	**Size**	**Dimensions (mm)**	**Bussman Part No.**
GQ 15A	450	230 480	16A	10x38	FWC16A10F
GTS 25A GQ 25A	645 450	230 480 600	25A	10x38	FWC25A10F
GTS 40A	1010	230 480	40A	14x51	FWP40A14
GTS 50A GQ 50A	6600	230 480 600	63A	22x58	FWP63A22F
GTS 60A	6600	230 480 600	80A	22x58	FWP80A22F
GTS 75A	8000	230 480	80A	22x58	FWP80A22F
GTS 90A GQ 90A	11200	230 480 600	100A	22x58	FWP100A22F
GTS 120A	11200	230 480 600	125A	0-0-0-TN/80 100x51x30	170M1418000-TN/80
GTZ 25A	450 645	400 480	25A	12x32	FWC25A10F
GTZ 40A	1010	480 600	40A	14x51	FWP40A14
GTZ 55A	6600	480 600	63A	22x58	FWP63A22F

(*) PF for fuseholders: LEGRAND, PFI for fuseholders: ITALWEBER

General Application Notes *(continued)*

Series GQ Installation notes

- The heat sink must be grounded.
- Power controllers are designed to assure a switching function that does not include protection of the load line or of devices connected to it. The customer must provide all necessary safety and protection devices in conformity to current electrical standards and regulations.
- Protect the solid state relay by using an appropriate heat sink (accessory). The heat sink must be sized according to room temperature and load current.

Dissipated Power Calculation

Single-phase relay
Pd GQ..15/25 = 1.45 * IRMS [W]
Pd GQ..50/90 = 1.35 * IRMS [W]
IRMS = single-phase load current

Heatsink Thermal Resistance Calculation

Rth = (90°C - max amb. T) / Pd

- where Pd = dissipated power
- Max. amb. T = max air temperature inside the electrical cabinet.

Use a heatsink with thermal resistance inferior to the calculated one (Rth).

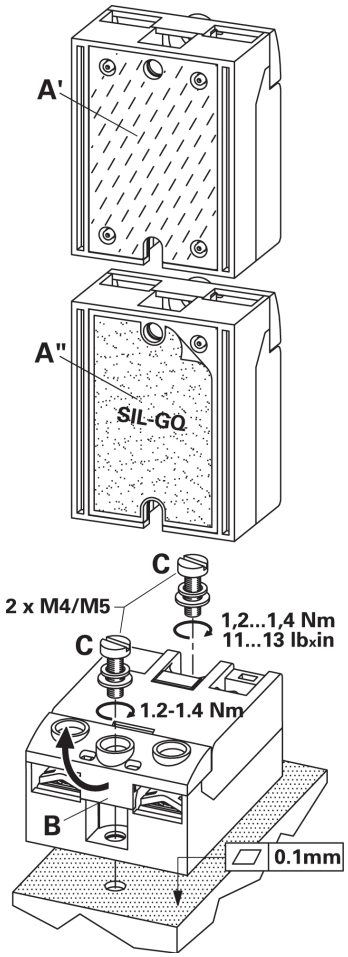
Maximum surrounding air temperature 40°C suitable for use in pollution degree 2 or better.

Procedure for mounting on heat sink:
The module-heat sink contact surface must have a maximum planarity error of 0.05mm. and maximum roughness of 0.02mm. The fastening holes on the heat sink must be threaded and countersunk.

Attention: spread 1 gram of thermoconductive silicone (we recommend DOW CORNING 340 HeatSink) on the dissipative metal surface of the module. The surfaces must be clean and there must be no impurities in the thermoconductive paste. As alternative it is also possible to use the graphite film SIL-GQ available as accessory.

- Alternately tighten the two fastening screws until reaching a torque of 0.4...0.6 Nm. Wait 5 minutes for any excess paste to drain.
- Alternately tighten the two fastening screws until reaching a torque of 1.2...1.4 Nm.

Installation on sink:



General Application Notes *(continued)*

Series GTS Installation notes

Power controllers are designed to assure a switching function that does not include protection of the load line or of devices connected to it. The customer must provide all necessary safety and protection devices in conformity to current electrical standards and regulations.

To assure maximum reliability, it is essential to install the unit correctly in the panel in order to guarantee adequate heat exchange between the heat sink and the room under natural convection conditions.

Maximum surrounding air temperature 40°C "Open Type Equipment" suitable for use in pollution degree 2 or better.

Install the unit vertically (max 10° inclination from vertical axis).

- Vertical distance between unit and panel wall >100 mm
- Horizontal distance between unit and panel wall at least 20 mm
- Vertical distance between one unit and the next at least 300 mm
- Horizontal distance between one unit and the next at least 20 mm

Make sure that the wire raceways do not reduce such distances. If they do, install the units cantilevered to the panel so that air can flow vertically onto the heat sink without obstruction.

Equipment should be short circuit protected by semiconductor fuse type:

Model	Fuse manufacturer	Fuse Model size
GTS 15/230	Bussmann Div Cooper (UK) Ltd	FWC16A10F 10x38
GTS 25/480		FWC25A10F 10x38
GTS 40/230, GTS 40/480		FWP40A14F 14x51
GTS 50/230, GTS 50/480		FWP63A22F 22x58
GTS 60/230, GTS 60/480, GTS 75/230, GTS 75/480		FWP80A22F 22x58
GTS 90/230, GTS 90/480		FWP100A22F 22x58
GTS 120/230, GTS 120/480	Bussmann Intn'l Inc. USA	170M1418 000-TN/80

Series GTZ Installation notes

Power controllers are designed to assure a switching function that does not include protection of the load line or of devices connected to it. The customer must provide all necessary safety and protection devices in conformity to current electrical standards and regulations.

To assure maximum reliability, it is essential to install the unit correctly in the panel in order to guarantee adequate heat exchange between the heat sink and the room under natural convection conditions.

Install the unit vertically (max 10° inclination from vertical axis).

- Vertical distance between a heatsink and panel wall >100 mm
- Horizontal distance between a heatsink and panel wall at least 20 mm
- Vertical distance between two heatsink at least 300 mm
- Horizontal distance between two heatsink at least 20 mm

Make sure that the cable raceways do not reduce such distances. If they do, install the GTZ overhanging from the panel, so that the air can flow vertically on the heatsink without obstruction.

General Application Notes *(continued)*

Warnings

During continuous operation, the heat sink can reach very high temperatures, and keeps a high temperature even after the unit is turned off due to its high thermic inertia.

DO NOT work on the power section without first cutting out electrical power to the panel.

Follow the instructions in the technical manual.

Notes