

3.6

Control Relays and Timers

Solid-State Relays

3

Solid-State Relays



Contents

Description

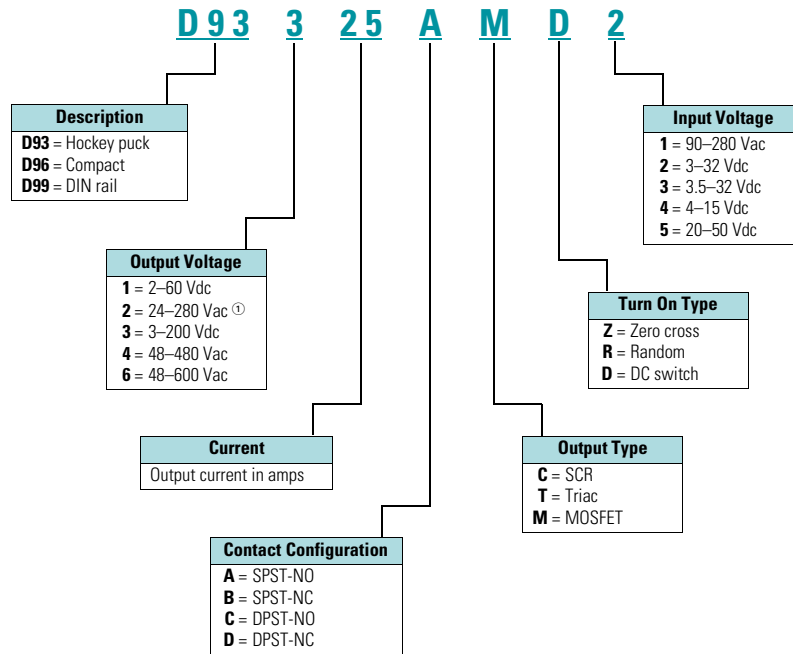
Page

Solid-State Relays	
D93 Series	V7-T3-123
D96 Series	V7-T3-130
D99 Series	V7-T3-135

Product Overview

Catalog Number Selection

Solid-State Relays—D93, D96 and D99 Series



Note

① For D96208ACZ3, output voltage is 3–150 Vdc.

D93 Series—Solid-State Relays



D93 Series

Product Description

Eaton's D93 series of solid-state relays is a line of heavy-duty industrial relays in the common "hockey puck" package. The removable, finger-safe cover and optional accessories make the D93 safe and easy to install in a variety of applications.

Models are available in a variety of input voltages and switch types up to 75 A.

Application Description

A solid-state relay (SSR) can perform many applications that an electromechanical relay can perform. The SSR differs in that it has no moving mechanical parts within it and has some distinct advantages over an electromechanical relay.

When used correctly in the intended application, the SSR provides a high degree of reliability, a long service life, significantly reduced electromagnetic interference, fast response and high vibration resistance.

Applications for the SSR typically include equipment that requires high cycling rates, low acoustical or electrical noise, or high vibration resistance. Some examples are medical equipment, heating/cooling equipment, lighting control and pumps/compressors, among others.

Contents

Description

Description	Page
D93 Series	
Product Selection	V7-T3-124
Accessories	V7-T3-124
Technical Data and Specifications	V7-T3-125
Dimensions	V7-T3-129
D96 Series	V7-T3-130
D99 Series	V7-T3-135

Features and Benefits

- All solid-state circuitry with no moving parts to wear
- Compact, panel mounting for flexible installation
- Isolated input and output terminals to protect the system from electrical noise
- Internal snubber circuitry to protect the SSR from transients

Standards and Certifications

- UL/cUL recognized—UL 508
- CSA certified
- CE marked
- RoHS compliant



3.6

Control Relays and Timers

Solid-State Relays

Product Selection

D93210ACZ1

D93 Series

3



Input Voltage	Output Voltage	Contact Configuration	Switching Type	Rated Current Load (Amps)	Catalog Number
90–280 Vac	24–280 Vac	SPST-NO	Zero cross	10	D93210ACZ1
3–32 Vdc	24–280 Vac	SPST-NO	Zero cross	10	D93210ACZ2
3–32 Vdc	24–280 Vac	SPST-NO	Triac	10	D93210ATZ2
90–280 Vac	24–280 Vac	SPST-NO	Zero cross	25	D93225ACZ1
3–32 Vdc	24–280 Vac	SPST-NO	Zero cross	25	D93225ACZ2
3–32 Vdc	24–280 Vac	SPST-NO	Triac	25	D93225ATZ2
90–280 Vac	24–280 Vac	SPST-NO	Zero cross	40	D93240ACZ1
3–32 Vdc	24–280 Vac	SPST-NO	Zero cross	40	D93240ACZ2
3–32 Vdc	24–280 Vac	SPST-NO	Triac	40	D93240ATZ2
90–280 Vac	24–280 Vac	SPST-NO	Zero cross	50	D93250ACZ1
3–32 Vdc	24–280 Vac	SPST-NO	Zero cross	50	D93250ACZ2
90–280 Vac	24–280 Vac	SPST-NO	Zero cross	75	D93275ACZ1
3–32 Vdc	24–280 Vac	SPST-NO	Zero cross	75	D93275ACZ2
3–32 Vdc	3–200 Vdc	SPST-NO	MOSFET	12	D93312AMD2
3–32 Vdc	3–200 Vdc	SPST-NO	MOSFET	25	D93325AMD2
3–32 Vdc	3–200 Vdc	SPST-NO	MOSFET	40	D93340AMD2

Accessories

D93HS1



D93 Series—Heat Sink

Eaton's D93HS1 heat sink is specifically designed to be used with D93 solid-state relays. It is pre-drilled and tapped, and matches the heat dissipation requirements for relays up to 50 A.

Heat Sink Accessory

Description	Catalog Number
Heat sink	D93HS1

Note: Always ensure that all details of the application are considered when determining heat dissipation requirements, including ambient temperature. The D93 relays must be firmly mounted to the heat sink using a suitable thermally conductive grease or thermal transfer pad.

D93TP1



D93 Series—Thermal Transfer Pad

The D93TP1 is a self-adhesive transfer pad designed for use with Eaton's D93 solid-state relays. When used properly, it will adequately conduct the heat to a heat sink without the use of grease.

Technical Data and Specifications

D93 Series

Description	Units	D93210ACZ1	D93210ACZ2	D93210ATZ2	D93225ACZ1	D93225ACZ2	D93225ATZ2
Output Characteristics							
Contact configuration		SPST-NO	SPST-NO	SPST-NO	SPST-NO	SPST-NO	SPST-NO
Switching device		SCR	SCR	Triac	SCR	SCR	Triac
Current rating	A	10	10	10	25	25	25
Switching type		Zero cross	Zero cross	Zero cross	Zero cross	Zero cross	Zero cross
Maximum rate of rise off state voltage (DV/DT)	V/us	200	250	700	500	500	250
Incandescent lamp ampere rating (rms)	A	8	16	16	16	16	16
Motor load rating (rms)	A	4.5	8	8	8	8	8
Min. load current to maintain on	mA	50	120	250	120	120	120
Non-repetitive surge current (1 cycle)	A	83	250	1000	250	250	250
Max. rms overload current (1 second)	A	24	80	50	40	40	80
Max. off state leakage current (rms)	mA	8	10	10	8	10	10
Peak blocking voltage	Vpk	600	300	—	600	600	—
Typical on state voltage drop (rms)	Vac	1.6	1.6	1.35	1.6	1.6	1.6
Max. on state voltage drop (rms)	Vac	1.6	1.6	1.6	1.6	1.6	1.6
Max. I ² t for fusing (A ²)		72	300	1700	312	250	300
Input Characteristics							
Must release voltage	V	10 AC	1 DC	10 AC	10 AC	1 DC	1 DC
Typical input impedance	ohms	13k	Current regulator	16–25k	13k	Current regulator	1.5k
Nominal input current at 5 Vdc or 240 Vac	mA	20	2	12	20	16	2
Reverse polarity protection		NA	Yes	NA	NA	Yes	Yes
Performance Characteristics							
Operating time (response time)							
ON	ms	8.3	8.3	8.3	8.3	8.3	8.3
OFF	ms	8.3	8.3	8.3	8.3	8.3	8.3
Rated insulation voltage—input to input	Vac	4000	4000	4000	4000	4000	4000
Dielectric strength—terminal to chassis	Vac	4000	4000	4000	4000	4000	4000
Environment							
Product certifications		UR, CSA, CE	UR, CSA, CE	UR, CSA, CE	UR, CSA, CE	UR, CSA, CE	UR, CSA, CE
Ambient air temperature							
Storage	°C	–40 to 100	–40 to 100	–40 to 100	–40 to 100	–40 to 100	–40 to 100
Operating	°C	–40 to 80	–40 to 80	–40 to 80	–40 to 80	–40 to 80	–40 to 80
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
Miscellaneous Characteristics							
Thermal resistance (junction to case)	°C/W	3.5	3.5	1.45	1.02	1.02	1.45
Weight	g (oz)	100 (3.5)	100 (3.5)	100 (3.5)	100 (3.5)	100 (3.5)	100 (3.5)
LED—input		Green	Green	Green	Green	Green	Green
Input terminals		M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Output terminals		M4	M4	M4	M4	M4	M4
Terminal torque (max.)	Nm	1.0	1.0	1.0	1.0	1.0	1.0