TELEDYNE RELAYS
A Unit of Teledyne Electronics and Communications

NEW Series DRS

Single Output to 30A 510 Vac
DIN-Rail Solid-State Relay with Diagnostics

Part Number	Description
DRS24D25	25A, 280 Vac
DRS48D25	25A, 510 Vac
DRS48D30	30A, 510 Vac

Part Number Explanation

DRS — *Series*
24 — *Line Voltage*[1]
D — *Switch Type*[2]
25 — *Output Current - Amps*

NOTES
1) Line Voltage (nominal): 24 = 240 Vac, 48 = 480 Vac
2) Switch Type: D = Zero-cross turn-on

MECHANICAL SPECIFICATION

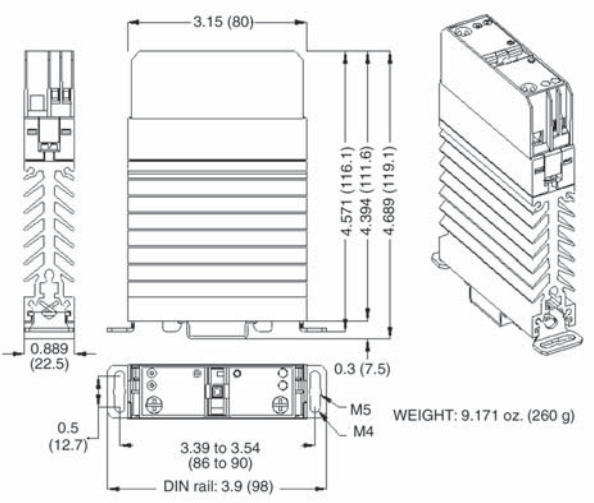


Figure 1 — DRS relay; dimensions in inches (mm)

TYPICAL APPLICATION

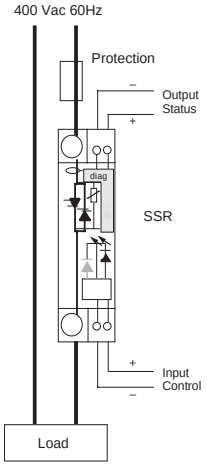


Figure 2 — DRS relay (See Note 4)



FEATURES/BENEFITS

- Easy mounting and dismounting on DIN rail without any tools or directly mountable on panel
- Diagnostics offer control and output status
- Tight zero-cross window for low EMI
- 50A back-to-back thyristors
- LEDs for visual diagnostics
- Switch ON in case of overvoltage (DRS24D25)
- Large control range

DESCRIPTION

The Series DRS single-phase DIN-rail relays with diagnostics are designed for all types of loads. The relays utilize optical isolation to protect the control from load transients. DRS relays have an integral heat sink and can be mounted and dismounted onto a DIN rail without any tools. The relays may also be panel mounted.

All relays offer a control LED and output LED for visual diagnostics. The DRS provides control and output transient suppression. A normally closed status output signal is provided for system diagnostics. The output will turn on for a short time to clamp high voltage surges.

APPLICATIONS

- Heating control
- Motor control
- Industrial process control

APPROVALS

Series DRS relays are pending UL recognition.

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INPUT (CONTROL) SPECIFICATION

	Min	Max	Units
Control Range			
DRS24	3	32	Vdc
DRS48	3.5	32	Vdc
Control Current Range		10	mAdc
Must Turn-Off Voltage	2		Vdc
Reverse Voltage		32	V
Clamping Voltage		42	V
Input LED		Green	

OUTPUT (LOAD) SPECIFICATION

	Min	Max	Unit
Operating Range			
DRS24	70	280	Vrms
DRS48	150	510	Vrms
Peak Voltage		1200	Vpeak
Clamping Voltage (@1mA)			
DRS48		820	V
Load Current Range			
DRSXXD25	.1	25	A
DRS48D30	.005	30	A
Zero-Cross Window (Typical)		±14	V
Motor Load			
DRS48D30		12	Arms
All others		contact factory	
Switch ON voltage in case of overvoltage			
DRS24		950	V
Non-Repetitive Overload Current (See Figure 6)			
DRSXXD25		550	A
DRS48D30		1000	A
On-State Voltage Drop (Typical)			
DRSXXD25		0.9	V
DRS48D30		0.75	V

OUTPUT (LOAD) SPECIFICATION (Continued)

	Min	Max	Unit
Thermal Resistance (Junction to Ambient)		3.3 (2.5)	W
Off State Leakage Current (60Hz)			
DRDXXD25		5	mA
DRS48D30		1	mA
Turn-On Time (60Hz)		8.3	ms
Turn-Off Time (60Hz)		8.3	ms
Operating Frequency Range	40	440	Hz
Off-State dv/dt		500	V/μs
I^2t for match fusing (<8.3ms)			
DRSXXD25		1500	A^2S
DRS48D30		5000	A^2S

CONTROL CHARACTERISTIC

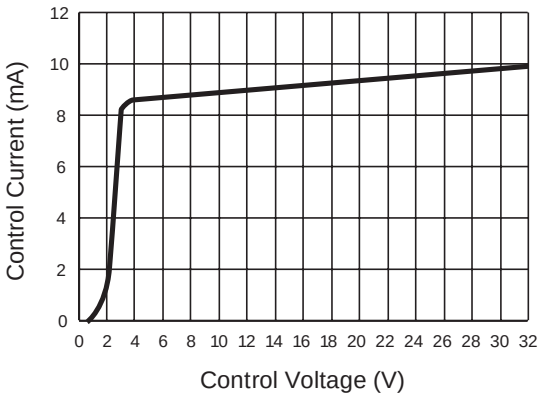


Figure 3 — DRS relay

SCHEMATIC

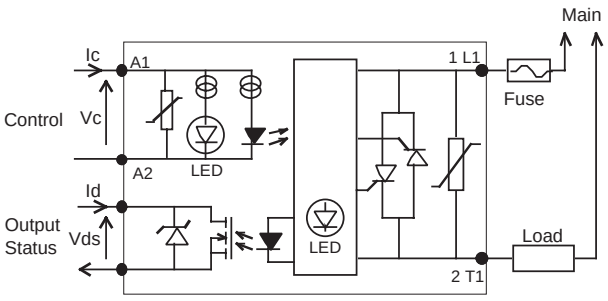


Figure 4 — DRS relay

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THERMAL CHARACTERISTICS

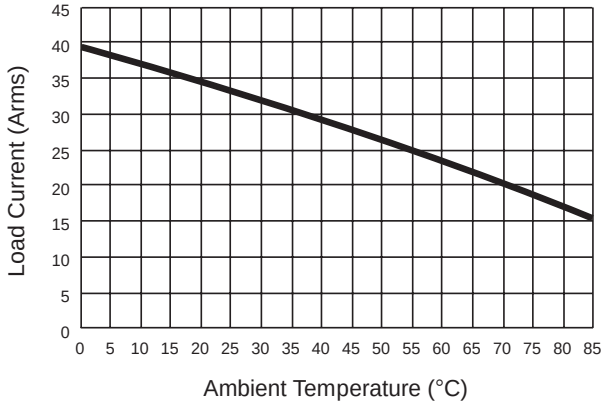


Figure 5a — DRSXXD25 relays

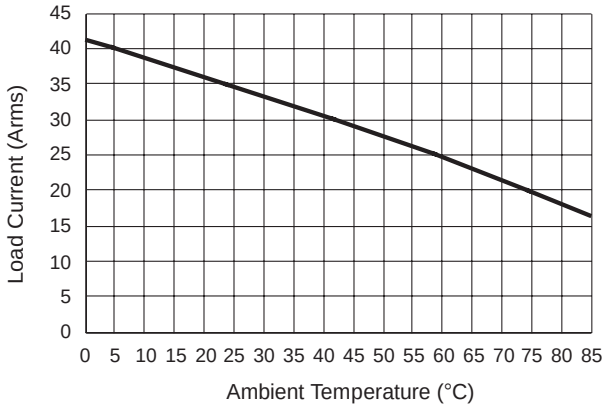


Figure 5b — DRS48D30 relay

SURGE CURRENTS

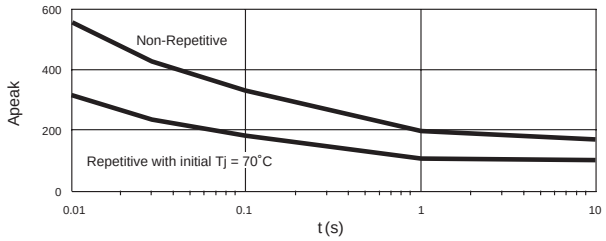


Figure 6a — DRSXXD25 relays

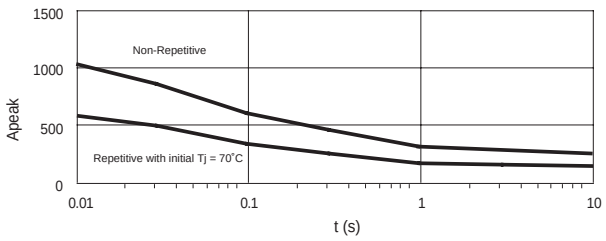


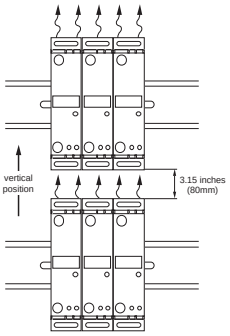
Figure 6b — DRS48D30 relay

ENVIRONMENTAL SPECIFICATION

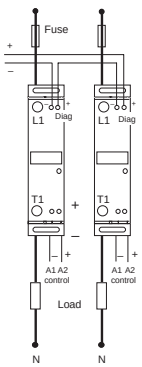
	Min	Max	Unit
Storage Temperature	–30	100	°C
Operating Temperature	–30	80	°C
Input-Output Isolation	4000		Vrms
Output-Case Isolation	2500		Vrms
Insulation Resistance (500 Vdc)	100		MΩ

NOTES:

1. Connections: For output terminals, the wire cross sections must be adapted to the load current and to the overcurrent protection device characteristics. The relay rated voltage must be adapted to the mains rated voltage. These relays use screw clamp connections.
2. Mounting: Only in vertical position. Protect heat-sensitive materials as well as people from contact with the heat sink. For non-vertical mounting, the load current must be derated by 50%. The SSR requires air convection. Lack of air convection produces an abnormal heating. Keep a distance between the upper SSR and the lower SSR (see figure on the right). In case of zero space between two SSRs, reduce the load current. It's suggested to maintain the heat sink temperature under 90°C. Forced cooling significantly improves the thermal performances.



3. Typical application loads: The DRS relay may handle motor and resistive loads. For different loads, check the inrush current at turn-ON and possible overvoltages at turn-OFF or contact the factory.
   • Incandescent lamps — Inrush current is generally 10 times the nominal current for 10ms.
   • Electric discharge lamp — These loads often have overcurrent at turn-ON and overvoltage at turn-OFF. Use 480Vac SSR on 240Vac mains.
   • Transformer loads — Very high inrush current, up to 100 times the nominal current.
   • Capacitive loads — Very high current at turn-On and overvoltage at turn-Off. Use only zero-cross models.
4. Protection: To protect the SSR against a short-circuit of the load, use a fuse with a I^2t value = 1/2 I^2t value.
5. EMC:
   Immunity: Immunity levels of the DRS comply with EN61000-4-4 &5.
   Emission: The system integrator must ensure that systems containing SSRs comply with the requirements of any rules and regulations applicable at the system level. The very low zero-cross voltage (<20V) improves the conducted emission level in comparison with most SSRs with zero-cross voltage higher than 50V.
6. All electrical parameters specified at 25°C unless otherwise noted.



STATUS OUTPUT ANSWER CHARACTERISTICS

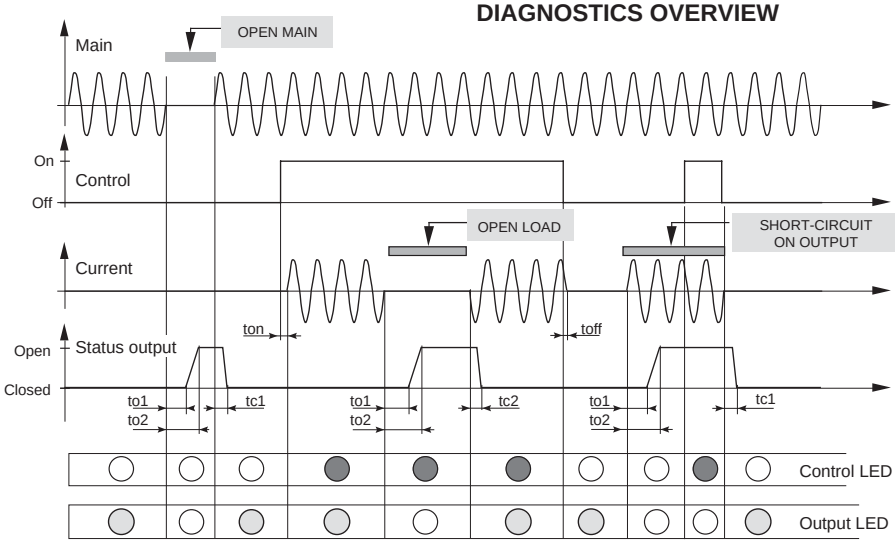
	Min	Max	Unit
Voltage Range	1	32	V
Output Current		0.1	A
On Resistance		2	Ω
Open Delay (to1) (faults)	70		ms
Total Open Delay (to2) (faults)	120		ms
Close Main Delay (tc1) (tc2)		20	ms
Maximum Cable Length for Open Load		40	m

DIAGNOSTIC DESCRIPTION

Control	Control LED	Main	Load	SSR	Output LED	Output Status
0	○	No	x	x	○	Open
1	●	No	x	x	○	Open
0	○	Yes	OK	OK	●	Closed
1	●	Yes	OK	OK	●	Closed
0	○	Yes	Open	OK	○	Open
0	○	Yes	OK	Short-Circuit	○	Open
1	●	Yes	Open	OK	○	Open
1	●	Yes	OK	Short-Circuit	○	Open

Figure 7 — DRS relay

DIAGNOSTICS OVERVIEW



- Output status is normally closed without failure on the relay and the load. The output LED is normally ON:
- In case of failure on the load (open) or on the SSR (short-circuit condition):
  - the status is open
  - the output LED is switched OFF

Figure 8 — DRS relay

DIN-RAIL MOUNTING

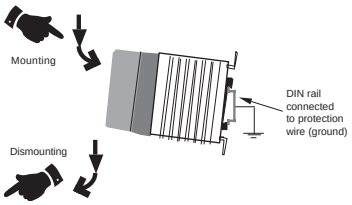


Figure 9 — DRS relay

PANEL MOUNTING

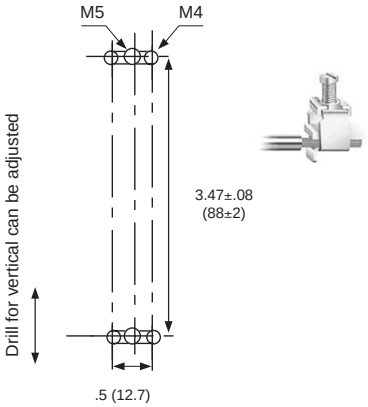


Figure 10 — DRS relay

CONNECTIONS

wires (mm²)	torque	screwdriver
control 1 x (0.75-->2.5) L = 6mm	0.4N.m (0.6N.m max)	3.5 x 0.5mm
Power 1 x (1.5-->16) 1 x (1.5-->10) L = 10mm	1.2N.m (1.8N.m max)	Pozidriv2/ 0.8 x 5.5 (1 x 6)

Figure 11 — DRS relay

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