DRH SERIES

DIN RAIL MOUNT SOLID STATE CONTACTORS

Features

- Ratings up to 18 & 20 Amps at 600 VAC
- Fits standard 35 mm DIN Rail
- Integrated over-temperature protection
- Alarm output in case of over-temperature
- Multicolor LED with input status and alarm indicator
- AC or DC control
- Zero Voltage (resistive loads) or instantaneous (inductive loads) turn-on output
- C-UL-US Listed, IEC Rated, CE & RoHS Compliant, Horsepower Rated
- Built-in Overvoltage Protection
- Fan controlled through thermistor and microprocessor to optimize fan operation

PRODUCT SELECTION

Control Voltage	18 A	20 A
90-280 VAC/VDC	DRH3P60A18	DRH3P60A20
4-32 VDC	DRH3P60D18	DRH3P60D20

SPECIFICATIONS

Output [1]

Description	18 A	20 A
Operating Voltage (47-63Hz) [Vrms]	48-600	48-600
Transient Overvoltage [Vpk] [2]	1200	1200
Maximum Off-State Leakage Current @ Rated Voltage [mArms]	3	3
Minimum Off-State dV/dt @ Maximum Rated Voltage [V/µsec]	500	500
Load Current, General Use UL508/IEC62314 @ 40°C [Arms] [3]	18	20
Load Current, Motor Starting UL508 FLA/IEC62314 @ 40°C [Arms] [3]	7.6	7.6
Minimum Load Current [Arms]	0.15	0.15
Maximum Surge Current [Apk] 1Cycle 60Hz	750	750
Maximum Surge Current [Apk] 1Cycle 50Hz	716	716
Maximum I^2t for Fusing (8.33 msec) [A^2sec]	2330	2330
Maximum I^2t for Fusing (10 msec) [A^2sec]	2560	2560
Maximum On-State Voltage Drop @ Rated Current [Vpk]	1.35 per channel	1.35 per channel
Minimum Power Factor (with Maximum Load)	0.5	0.5
Motor Rating UL 508/ IEC60947-4-2 [HP/kW] :240 VAC	2/1.5	2/1.5
Motor Rating UL 508/ IEC60947-4-2 [HP/kW] :380 VAC	3/2.2	3/2.2
Motor Rating UL 508/ IEC60947-4-2 [HP/kW] :480 VAC	5/3.7	5/3.7

Input [1]

Description	DRH3P60Dx	DRH3P60Ax
Control Voltage Range	4-32 VDC	90-280 VAC/VDC
Minimum Turn-On Voltage	4 VDC	90 VAC/VDC
Must Turn-Off Voltage	1 VDC	10 VAC
Minimum Input Current (for on-state)	2 mA	1 mA
Maximum Input Current	17 mA	3 mA
Nominal Input Resistance [Ohms]	2k	100k
Maximum Turn-On Time [msec]	1 Cycle [4]	30
Maximum Turn-Off Time [msec]	1 Cycle	40

Power Supply [1]

Description	DRH3P60Dx	DRH3P60Ax
Voltage Range	8-32 VDC	90-265 VAC/VDC
Minimum Turn-On Voltage	8 VDC	90 VAC/VDC
Must Turn-Off Voltage	3 VDC	5 VAC/VDC
Maximum Source Current [mA]	125	40
Maximum Start Up Time [msec]	20	50
Maximum Shut Off Time [msec]	40	500

Alarm Output [1]

Description	DRH3P60xxx
Maximum Contact Switching Voltage [Volts]	200 VDC, 120 VAC
Rated Current Resistive [A] [5]	0.5
Minimum Recommended Contact Load [mA]	10
Static Contact Resistance (max. init.)[Ohms]	0.2
Turn-On / Off Condition	See Status Chart

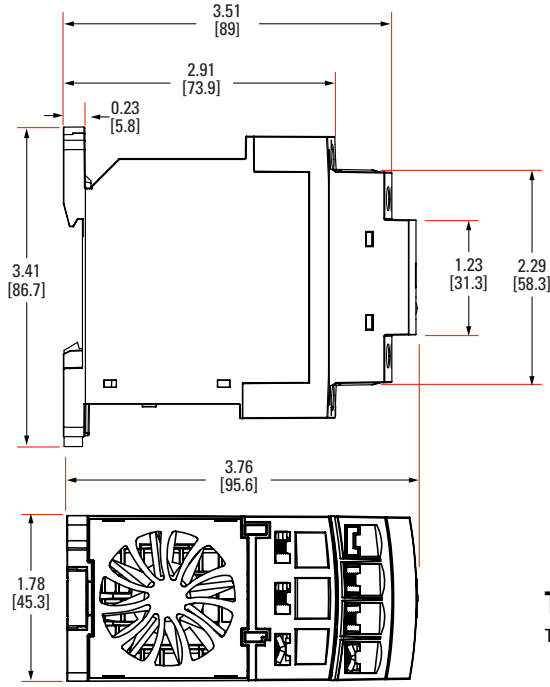
General [1]

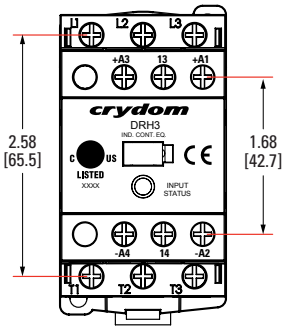
Description	Parameters
Dielectric Strength, Input/Output/Base (50/60Hz) [6]	3750 Vrms
Minimum Insulation Resistance (@ 500 VDC)	10^9 Ohm
Maximum Capacitance, Input/Output	20 pF
Ambient Operating Temperature Range [7]	-10 to 70 °C
Ambient Storage Temperature Range	-40 to 70 °C
Weight (typical)	2 Controlled Legs (7.4 oz [210 g]) / 3 Controlled Legs (8.5 oz [242 g])
Housing Material	UL94 V-0
Housing Color	Black and Light Gray
LED Status Indicator (color)	See Status Chart
Short Circuit Current Rating [8]	100kA
Pollution Degree	2
Protection Degree [9]	IP20
Humidity	85% non-condensing
Control and Auxiliary Contact Terminal Screw Torque Range (lb-in/Nm)	12 / 1.36
Load Terminal Screw Torque Range (lb-in/Nm)	15 / 1.7
Input Terminal Wire Capacity	18-12 AWG (IEC 1-4 mm2) (stranded /solid)
Output Terminal Wire Capacity	18-10 AWG (IEC 1-6 mm2) (stranded /solid)

MECHANICAL SPECIFICATIONS

Tolerance: ±0.02 in / 0.5 mm

All dimensions are in: inches [millimeters]

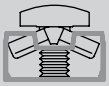




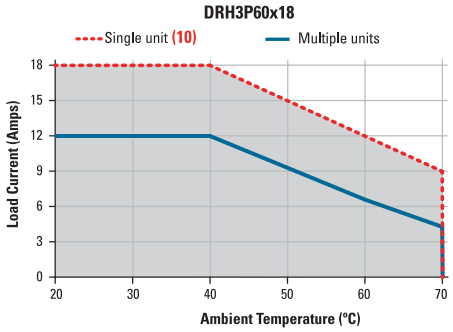
TERMINAL SCREW TYPE

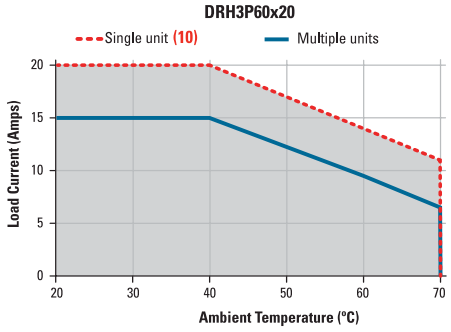
Top/Bottom view (Fig. 1)

Fig. 1

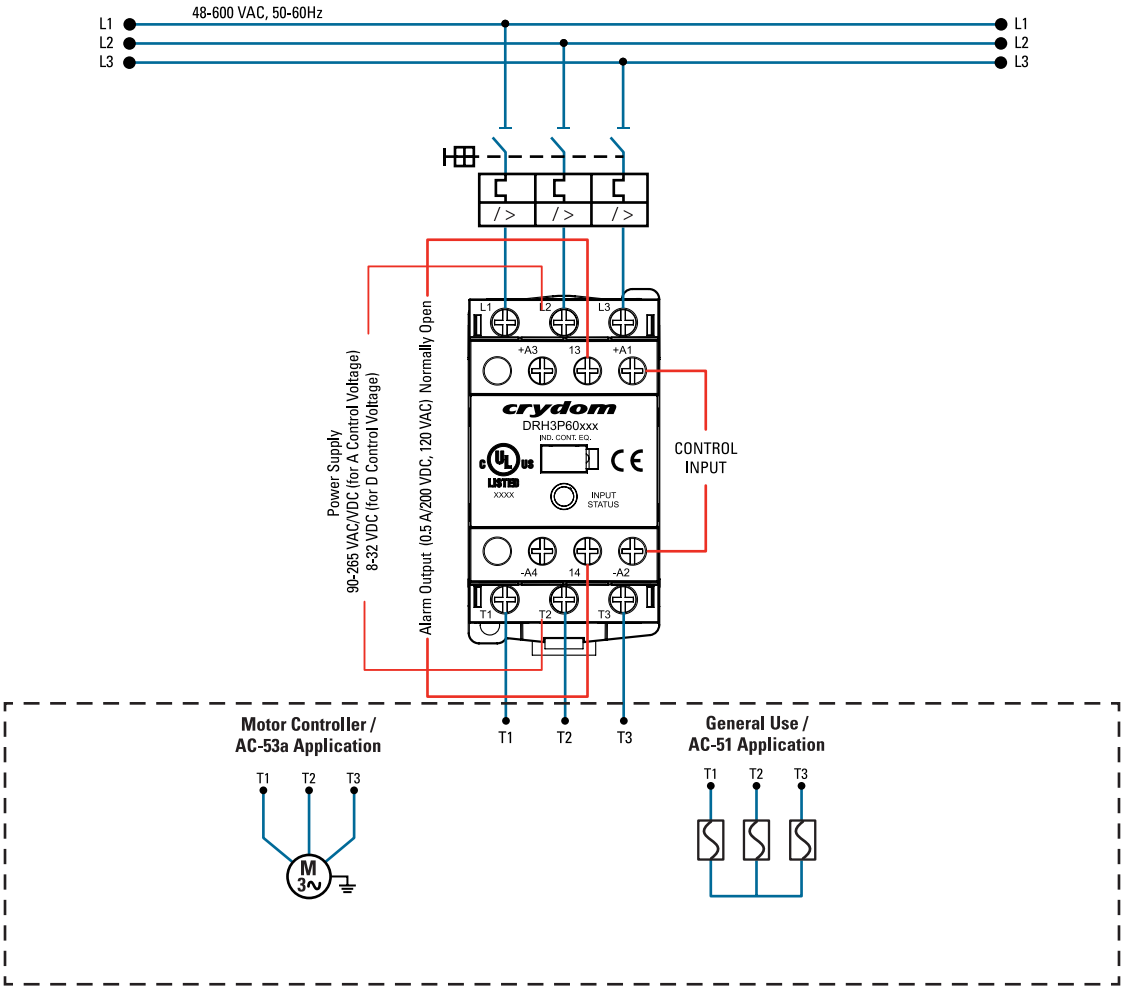


THERMAL DERATE INFORMATION

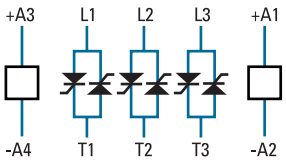




WIRING AND BLOCK DIAGRAM

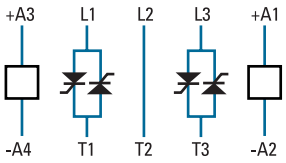


DRHP60x18
(3 controlled legs model)
Main Circuit



Alarm Output
(DRHP60x18 & DRHP60x20)

DRHP60x20
(2 controlled legs model)
Main Circuit



SHORT CIRCUIT AND OVERLOAD PROTECTION FOR ALL DEVICES

IEC standard 60947-4-1 make a distinction between two different types of protection, (called "coordination"), which are designated types "1" and "2". Any short-circuit that occurs is cleared safely by either type of coordination.
The only difference between the 2 categories concerns the extent of the SSR damage caused by the short-circuit.

Type "1" coordination requires that in the event of a short-circuit, the Solid State Contactor does not endanger personnel or installations, but permanent damage to the SSC is permissible. In this case the SSC may need to be replaced. For this type of co-ordination, the use of fusing or circuit breakers adequate to protect the system and wiring from short circuits, (but not specifically considering SSC protection), can be used.

Type "2" coordination requires that under a short-circuit condition, the circuit is interrupted, the SSC does not endanger persons or installations, and in addition the SSR will be able to operate after the fault condition is repaired.

Type of coordination 1

For resistive loads:

Protection by Thermal Magnetic Circuit Breaker or by Fuse (11)			
Nominal Current	**Class gG fuses (example from Littlefuse)**	**Solid State Contactor 2 controlled legs**	**Solid State Contactor 3 controlled legs**
0.15-20 A	CY14X51G25	DRH3P60x20	DRH3P60x18 (up to 18A)

For motor loads:

Protection by Thermal Magnetic Circuit Breaker or by Fuse (11)				
Nominal Motor Current	**Thermal Magnetic Circuit Breaker (Schneider Electric)**	**Class gG fuses (example from Littlefuse)**	**Solid State Contactor 2 controlled legs**	**Solid State Contactor 3 controlled legs**
0.40-0.63 A	GV2ME04 / GV2P04	CY14X51G16	DRH3P60x20	DRH3P60x18
0.63-1 A	GV2ME05 / GV2P05	CY14X51G16	DRH3P60x20	DRH3P60x18
1-1.6 A	GV2ME06 / GV2P06	CY14X51G25	DRH3P60x20	DRH3P60x18
1.6-2.5 A	GV2ME07 / GV2P07	CY14X51G25	DRH3P60x20	DRH3P60x18
2.5-4 A	GV2ME08 / GV2P08	CY14X51G25	DRH3P60x20	DRH3P60x18
4-6.3 A	GV2ME10 / GV2P10	CY14X51G40	DRH3P60x20	DRH3P60x18
6.3-10 A	GV2ME14 / GV2P14	CY14X51G40	DRH3P60x20 (up to 7.6A)	DRH3P60x18 (up to 7.6A)

Type of coordination 2

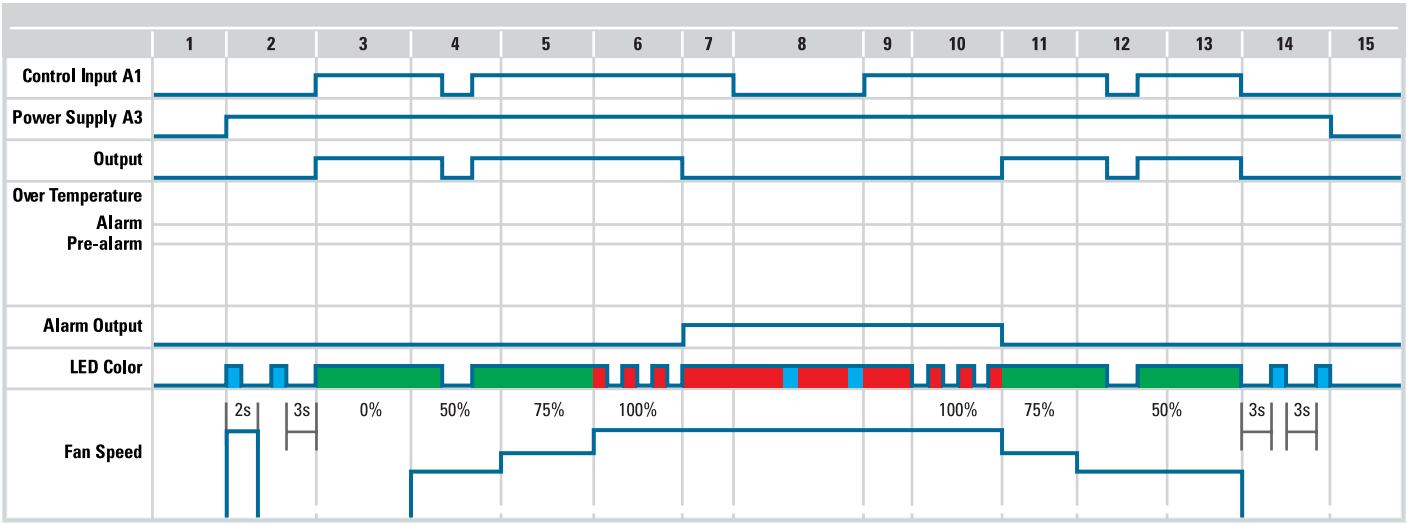
For resistive loads:

Protection by Fuse (11)					
Nominal Current	**Semiconductor fuses with less than 2330 A^2s**			**Solid State Contactor 2 controlled legs**	**Solid State Contactor 3 controlled legs**
	Littlefuse	**SIBA1 (Cylindric)**	**Ferraz (Cylindric)**		
0.15-20 A	LA50QS35-4	50 058 06.32	Z093908	DRH3P60x20	DRH3P60x18 (up to 18A)

For motor loads:

Protection by Fuse (11)					
Nominal Motor Current	**Semiconductor fuses with less than 2330 A^2s**			**Solid State Contactor 2 controlled legs**	**Solid State Contactor 3 controlled legs**
	Littlefuse	**SIBA1 (Cylindric)**	**Ferraz (Cylindric)**		
0.15-7.6 A	LA50QS40-4	50 058 06.40	A093909	DRH3P60x20	DRH3P60x18

STATUS CHART



Step	Description
1, 15	Initial Condition
2, 14	Stand by condition. LED is blinking Blue. Fan is activated at full speed for 2 seconds after power is applied to A3
3	A1 is On, Output is activated, temperature rises. LED is Green
4, 12	Fan is activated at 50% speed. If A1 is disabled, LED changes to blinking Blue
5, 11	Fan is at 75% speed
6, 10	LED changes to blinking Red, fan is at full speed
7	Output is Off, Alarm Output is On, LED changes to solid Red
8	If A1 is disabled while alarm output is active, LED alternates between Blue and Red
9	LED is solid Red, temperature starts to fall
13	Fan is activated at 50% speed, temperature is steady

LED Color

Blue Green Red

ORDERING OPTIONS

Example : DRH3P60A18R

DRH - 3P - 60 - A - 18 - R

Family

DRH

Function

3P : Contactor

Operating Voltage

60 : 48-600 VAC

Control Voltage

A : 90-280 VAC/VDC
D : 4-32 VDC

Rated Load Current

18 : 18 Amps (3 Controlled legs)
20 : 20 Amps (2 Controlled legs)

Switching Type

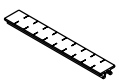
Blank : Zero Voltage Turn-On
R : Instantaneous Turn-On

— Required for valid part number
☐ For options only and not required for valid part number

GENERAL NOTES

(1) All parameters at 25°C unless otherwise specified.
(2) Relay will self trigger between 950-1200V, Not suitable for capacitive loads.
(3) Mounted in the Vertical position.
(4) Turn-on time for Instantaneous turn-on version is 4 msec.
(5) Decrease Maximun Current 15mA/°C above 40°C ambient temperature.
(6) For input to alarm output the dielectric strength is 1.5kV.
(7) UL approval up to 40°C surrounding temperature.
(8) 100kA, 480 VAC, when protected with CC class fuses rated 600VAC, 20 A or equivalent.
(9) IP20 rating is not associated with the UL approval.
(10) Minimum spacing to obtain max. current is 22mm between adjacent units.
(11) Combination of these Protective Devices and Solid State Contactor have not been evaluated by UL.

ACCESSORIES

ID Marker	
 **ID Marker**	Package of 10 plastic strip comprising 10 individual markers which can be placed for easy identification during the use of multiple units.
CNLB CNLN CNL2	

AGENCY APPROVALS & CERTIFICATIONS

c UL us LISTED E116949

Certification in accordance with:
United States Standard for Industrial Control Equipment - UL 508 and
Canadian Standard Association for Industrial Control Equipment – C22.2 No. 14.

DRH series conforms to the harmonized EN standard EN/IEC 60947-4-2

Electromagnetic Compatibility:
IEC 61000-4-2 : Electrostatic Discharge – Level 3
IEC 61000-4-4 : Electrically Fast Transients – Level 3
IEC 61000-4-5 : Electrical Surges – Level 3

Vibration Resistance:
IEC 60068-2-6: Amplitude Range 10-55 Hz, Displacement 0.75mm

Shock Resistance:
IEC 60068-2-27: Peak Acceleration 15g, Duration 11msec.

WARNINGS

RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE
- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

Failure to follow these instructions can result in serious injury, or equipment damage.

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH
- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

Failure to follow these instructions will result in death or serious injury.

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