

# HDC SERIES

## PANEL MOUNT DC SOLID STATE CONTACTORS



### Features

- Ratings of 120 A and 160 A @ 48, 72 & 150 VDC
- LED Status Indicator
- Heavy Duty Stud Terminals
- AC or DC control
- Micro Seconds Turn-On and Off times
- Low On-State Voltage Drop
- PWM up to 1 kHz for DC input models

### PRODUCT SELECTION

| Control Voltage | 120 A                             | 160 A                             |
|-----------------|-----------------------------------|-----------------------------------|
| 4.5-32 VDC      | HDC60D120, HDC100D120, HDC200D120 | HDC60D160, HDC100D160, HDC200D160 |
| 90-140 VAC      | HDC60A120, HDC100A120, HDC200A120 | HDC60A160, HDC100A160, HDC200A160 |

### SPECIFICATIONS

#### Output <sup>(1)</sup>

| Description                                                      | HDC60x120     | HDC60x160     | HDC100x120    | HDC100x160    | HDC200x120     | HDC200x160     |
|------------------------------------------------------------------|---------------|---------------|---------------|---------------|----------------|----------------|
| Operating Voltage [Vdc]                                          | 7-48          | 7-48          | 7-72          | 7-72          | 7-150          | 7-150          |
| Blocking Voltage [Vdc]                                           | 60            | 60            | 100           | 100           | 200            | 200            |
| Rated Load Current [A] <sup>(2)</sup>                            | 120           | 160           | 120           | 160           | 120            | 160            |
| Rated Load Current {UL 508 Motor Controller} [FLA]               |               |               |               |               | 17 FLA / 2 HP  | 25 FLA / 3 HP  |
| Rated Load Current {IEC 60947-4-1 DC-1} [Adc] <sup>(4) (5)</sup> | 120 (≤48 VDC) | 160 (≤48 VDC) | 120 (≤72 VDC) | 160 (≤72 VDC) | 120 (≤150 VDC) | 160 (≤150 VDC) |
| Rated Load Current {IEC 60947-4-1 DC-3} [FLA] <sup>(4) (5)</sup> | 17 (≤48 VDC)  | 25 (≤48 VDC)  | 17 (≤72 VDC)  | 25 (≤72 VDC)  | 17 (≤150 VDC)  | 25 (≤150 VDC)  |
| Minimum Load Current [mA]                                        | 2.5           | 2.5           | 2.5           | 2.5           | 2.5            | 2.5            |
| Maximum Surge Current (10ms) [Adc]                               | 360           | 470           | 360           | 470           | 1200           | 1600           |
| Maximum Off-State Leakage Current @ Rated Voltage [mA]           | 0.1           | 0.1           | 0.15          | 0.15          | 0.2            | 0.2            |
| Maximum On-State Voltage Drop @ Rated Current [VDC]              | 0.53          | 0.56          | 0.52          | 0.56          | 0.72           | 0.64           |
| Thermal Resistance Junction to Case (Rjc) [°C/W]                 | 0.42          | 0.36          | 0.42          | 0.36          | 0.25           | 0.23           |
| Maximum On-State Resistance @ Rated Current (RDS-ON) [mOhms]     | 4.32          | 3.5           | 4.32          | 3.5           | 6.0            | 4.0            |
| Wire Size max (solid/stranded) [AWG/ IEC mm <sup>2</sup> ]       | 2/0 / 67.4    | 2/0 / 67.4    | 2/0 / 67.4    | 2/0 / 67.4    | 2/0 / 67.4     | 2/0 / 67.4     |

|                                                      |                        |                        |                        |                        |                        |                        |
|------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Output Terminal Nut Torque Range [lb-in (Nm)]</b> | 225-300<br>(25.4-33.9) | 225-300<br>(25.4-33.9) | 225-300<br>(25.4-33.9) | 225-300<br>(25.4-33.9) | 225-300<br>(25.4-33.9) | 225-300<br>(25.4-33.9) |
| <b>Maximum PWM (Hz) <sup>(3)</sup></b>               | 1000                   | 1000                   | 1000                   | 1000                   | 1000                   | 1000                   |

## Input <sup>(1)</sup>

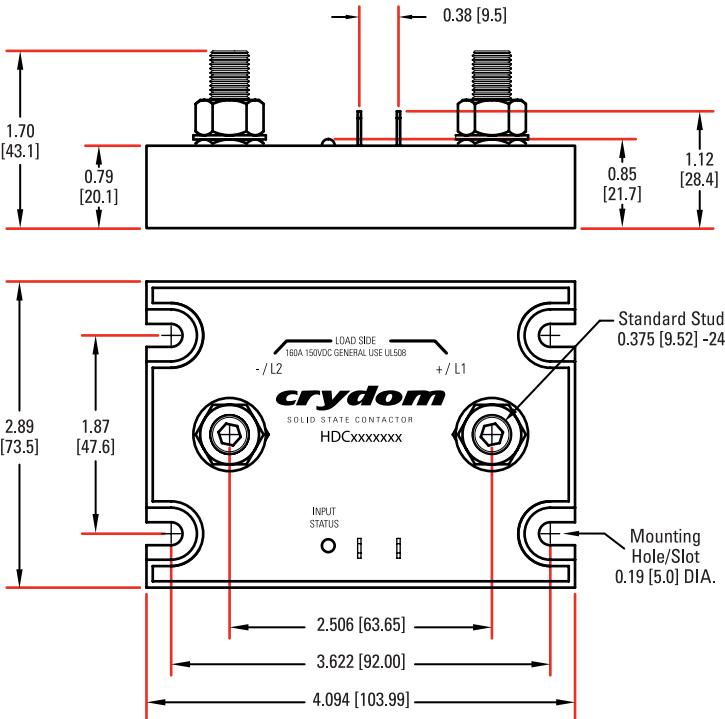
| Description                                                       | HDC60D<br>& HDC100D | HDC60A<br>& HDC100A | HDC200D           | HDC200A           |
|-------------------------------------------------------------------|---------------------|---------------------|-------------------|-------------------|
| <b>Control Voltage Range</b>                                      | 4.5-32 VDC          | 90-140 VAC          | 4.5-32 VDC        | 90-140 VAC        |
| <b>Must Turn-Off Voltage</b>                                      | 4.2 VDC             | 35 VAC              | 4.2 VDC           | 35 VAC            |
| <b>Minimum Input Current @ Minimum Voltage<br/>(for on-state)</b> | 23 mA               | 31 mA               | 23 mA             | 31 mA             |
| <b>Maximum Input Current @ Maximum Voltage</b>                    | 45 mA               | 33 mA               | 45 mA             | 33 mA             |
| <b>Nominal Input Impedance</b>                                    | Current Regulated   | Current Regulated   | Current Regulated | Current Regulated |
| <b>Maximum Turn-On Time at min voltage</b>                        | 90.5 µs             | 6 ms                | 92 µs             | 6 ms              |
| <b>Maximum Turn-On Time at max voltage</b>                        | 8.5 µs              | 4 ms                | 12.0 µs           | 4 ms              |
| <b>Maximum Turn-Off Time at min voltage</b>                       | 145 µs              | 9.2 ms              | 195 µs            | 9.2 ms            |
| <b>Maximum Turn-Off Time at max voltage</b>                       | 330 µs              | 9.2 ms              | 405 µs            | 9.2 ms            |
| <b>Terminal Type / size in (mm)</b>                               | QC / 0.187 (4.75)   | QC / 0.187 (4.75)   | QC / 0.187 (4.75) | QC / 0.187 (4.75) |

## General <sup>(1)</sup>

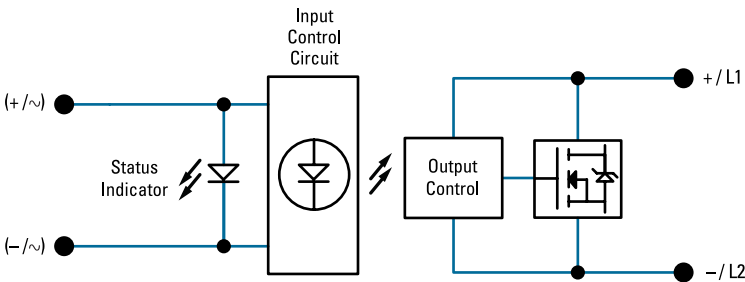
| Description                                               | Parameters               |
|-----------------------------------------------------------|--------------------------|
| <b>Dielectric Strength, Input/Output/Base (50/60Hz)</b>   | 2500 Vrms                |
| <b>Minimum Insulation Resistance (@ 500 VDC)</b>          | 10 <sup>9</sup> Ohm      |
| <b>Maximum Capacitance, Input/Output</b>                  | 10 pF                    |
| <b>Ambient Operating Temperature Range <sup>(6)</sup></b> | -30 to 80°C              |
| <b>Ambient Storage Temperature Range</b>                  | -40 to 125 °C            |
| <b>Maximum Humidity</b>                                   | 85% non-condensing       |
| <b>Weight (typical) lb/g</b>                              | 0.75/340.2               |
| <b>Housing Material</b>                                   | PBT 30% GF, UL 94 V-0    |
| <b>SSR Mounting Torque Range [lb-in/Nm]</b>               | 18-20 (2-2.2)            |
| <b>Baseplate Material</b>                                 | Aluminum                 |
| <b>Encapsulation</b>                                      | Thermal Conductive Epoxy |
| <b>LED Input Status Indicator</b>                         | Green                    |

# MECHANICAL SPECIFICATIONS

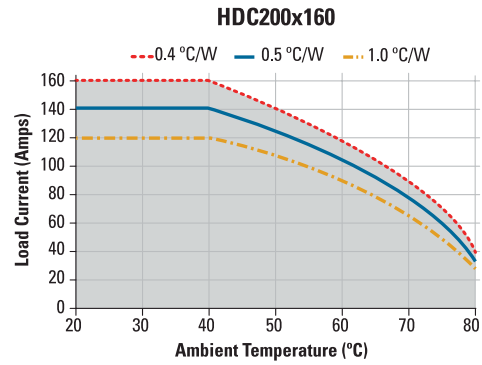
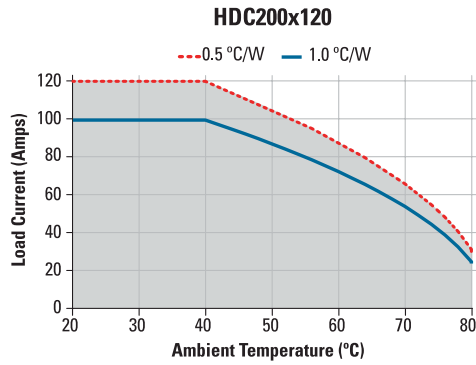
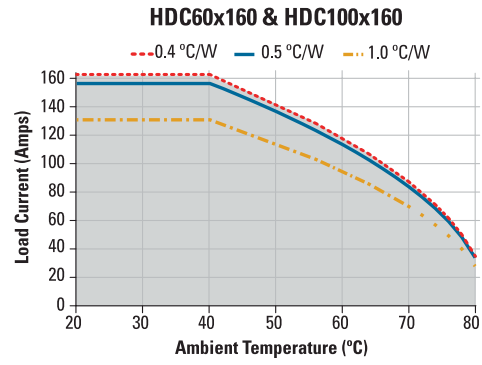
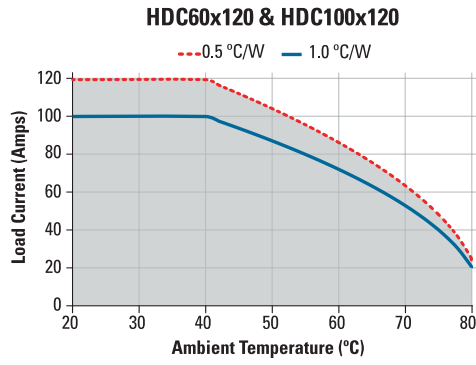
Tolerance: ±0.02 in / 0.5 mm  
 All dimensions are in: inches [millimeters]



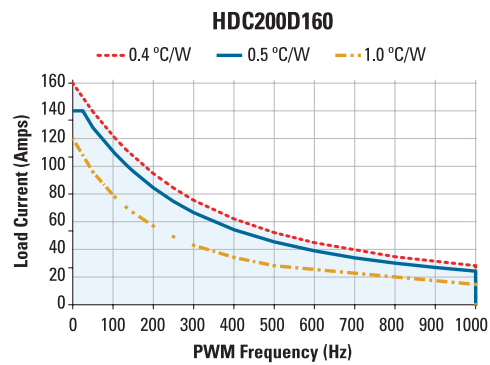
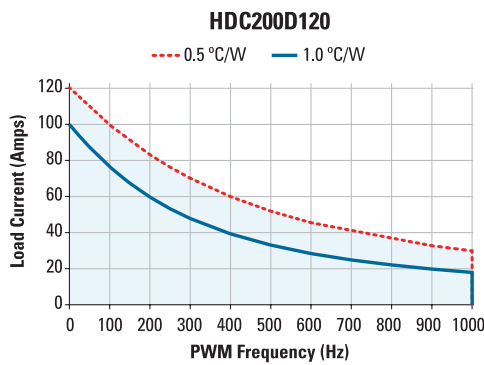
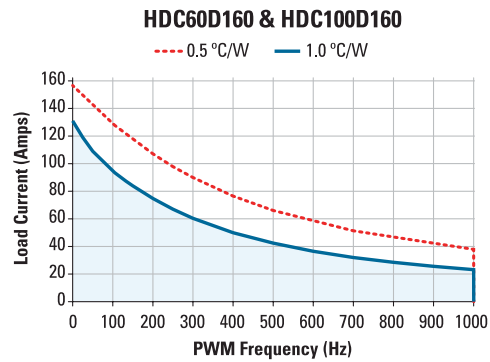
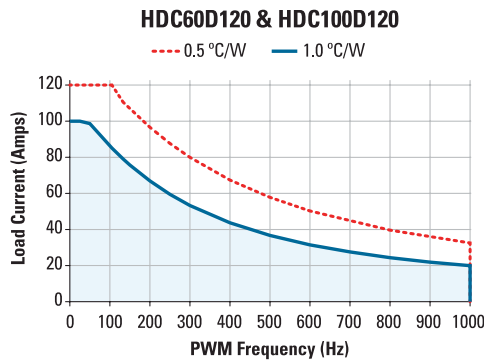
# WIRING DIAGRAM



## THERMAL DERATE INFORMATION



## PWM DERATE INFORMATION

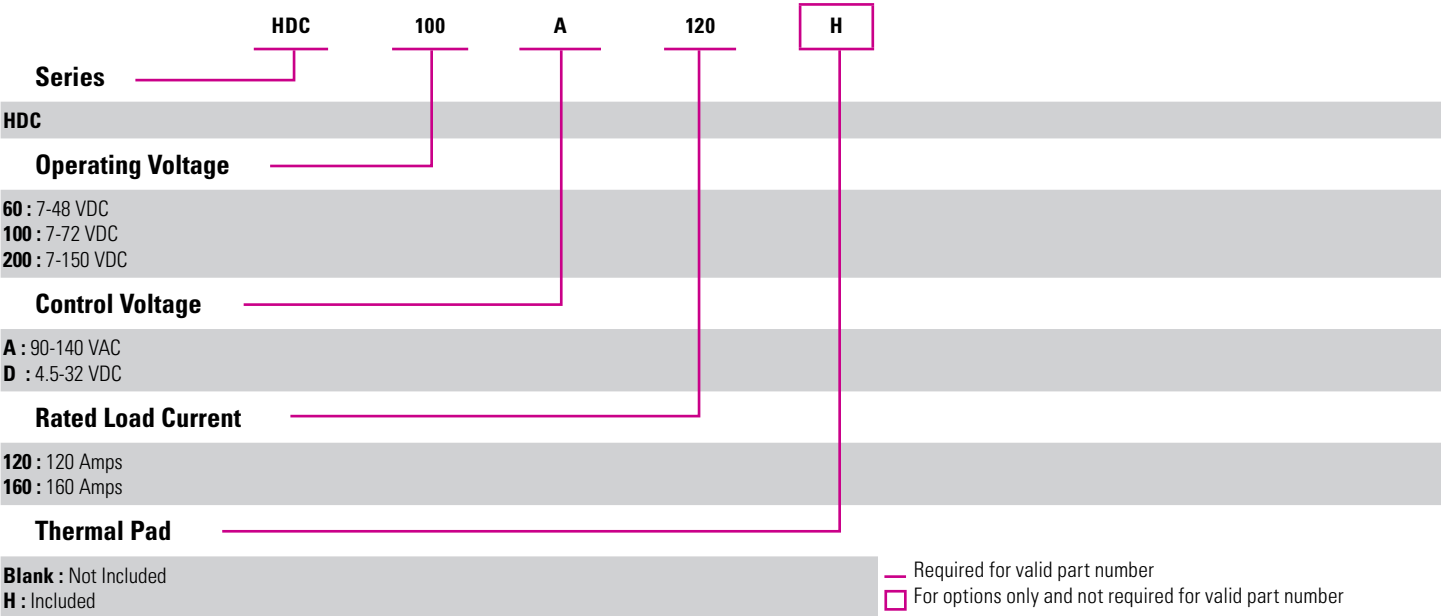


## ACCESSORIES

| Recommended Accessories                                                           |                                                                                   |                                                                                   |                                                                                   |                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------|
|  |  |  |  |                |
| Hardware Kit                                                                      | Heat Sink Part No.                                                                | Thermal Resistance [°C/W]                                                         | Lug Terminal                                                                      | Thermal Pad    |
| HK1                                                                               | HS103 / HS103DR<br>HS053                                                          | 1.0<br>0.5                                                                        | TRM3/0                                                                            | HSP-3<br>HSP-5 |

## ORDERING OPTIONS

Example : HDC100A120H



## GENERAL NOTES

- (1) All parameters at 25°C unless otherwise specified
- (2) Heat sinking required, see derating curves
- (3) See PWM Derating Chart for DC Input Models Only
- (4) In order to achieve indicated ratings, on HDC60xxx and HDC100xxx series, it is required to connect four varistors in parallel to the output with the following specifications:  
Varistor Voltage: 82 V  
Energy (2ms): >40 J
- (5) In order to achieve indicated ratings, on HDC200xxx series, it is required to connect two varistors in parallel to the output with the following specifications:  
Varistor Voltage: 200 V  
Energy (2ms): >100 J
- (6) At 80°C operating temperature, the maximum input voltage for DC versions is 12 VDC

## AGENCY APPROVALS & CERTIFICATIONS



E116949



Designed in accordance with the requirements of IEC 62314  
IEC 61000-4-2 : Electrostatic Discharge – Level 3 (Criteria A)  
IEC 61000-4-4 : Electrically Fast Transients – Level 3 (Criteria A)  
IEC 61000-4-5 : Electrical Surges – Level 3 (Criteria A)  
IEC 60068-2-6 : Vibration 0.33mm and 0.75 mm Amplitude over 10-500 Hz  
IEC 60068-2-27 : Shock Resistance 50g/11ms  
IEC60947-4-1 : Contactors and Motor-Starters (DC-1,DC-3)

## 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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