

DC Solid State Contactors

W 2021 (Rev. SC11A)





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About Nominal Controls



Nominal Controls Inc. is a Canadian manufacturer of industrial controls technologies

In 2010, a private electronics lab was established, dedicated to solving difficult technical problems surrounding industrial measurement and controls. In 2016, due to significant technical breakthroughs achieved, Nominal Controls Inc. was founded to transform these technologies into great products.

To date, our products have benefited a variety of industries including, research, automotive, industrial, space and defense. At Nominal Controls, our goal has always been to pioneer state-of-the-art technologies for elite systems across a multitude of industries.

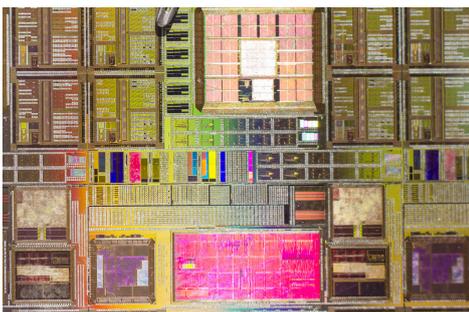
About Solid State Contactors

The term “solid state contactor (SSC)” is used synonymously with the term “solid state relay (SSR)”. Here “SSC” is used to describe solid-state switches with much higher power outputs.

Solid-state switches with DC output have been available for a few decades. However, they have predominantly been limited to switch relatively lower currents <100A DC. Several factors contribute to this limitation, such as overall market demand, semiconductor capabilities, and design challenges.

However, with the rise of DC-based systems sparked by renewable energy and electrification, it is necessary to develop a new generation of more powerful solid-state switches to support these technologies and applications.

Having developed such switches that would enable new feasibilities, we are ready to meet the demands of these technologies.



Benefits of Solid State Switches



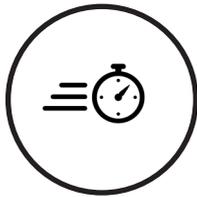
Guaranteed Cost Savings

Eliminate maintenance, repairs, and design costs. Solid-state contactors offer up to 500x improvement in reliability over conventional contactors.



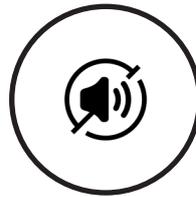
Suitable for Hazardous Locations

Solid-state switches do not arc and are resistant to chemical corrosions.



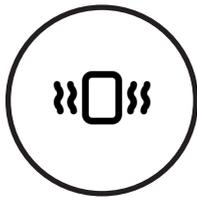
Ultra-Fast Response

Our SSCs can react to a command within 20 μ S and switch up to 100kHz with the latest semiconductor technology.



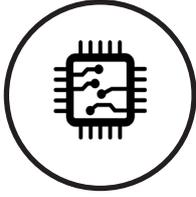
Quiet Operation

Whether configured for switching 100A or 1000A, solid-state contactors make no noise during make and break operations.



Resistant to External Forces

Solid-state switches can be mounted in any direction and are resistant to both shock and vibrations.



Digital Circuit Capability

Our solid-state switches can be controlled directly with low voltage logic signals such as CMOS and TTL.

NEW Applications!



High Voltage Solar



High Current DUTs



High Power DC Motors



Upgrades & Retrofits



Scientific Research



New Innovations

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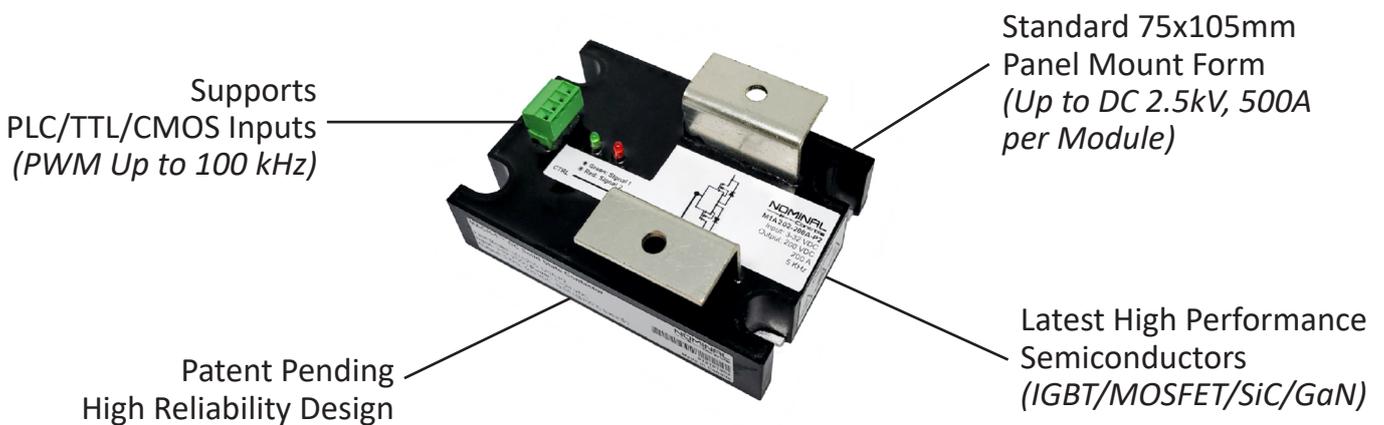
General Purpose DC Solid State Contactors

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MACH-1™ Solid-State Contactors

MACH-1™ DC solid-state contactors (SSC's) are built on a rugged, versatile, and compact 75x105mm platform capable of switching medium to high DC power up to 2500V, 500A. In addition to the traditional unidirectional configuration, a bi-directional configuration is also available in which allows the control of current flow in both directions.

MACH-1 SSCs' patent-pending design utilizes the latest semiconductors with much higher power and performance. Furthermore, along with strict manufacturing and testing protocols, MACH-1 SSCs deliver one of the most reliable switching operations yet.

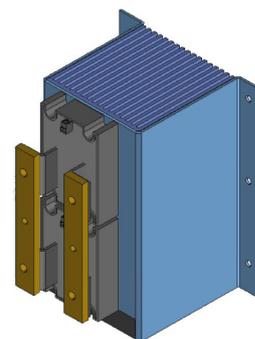


Other Features

- Isolated Input and Output
- Switch High Side or Low Side
- Modular Design Allows Easy Pairing
- Made in Canada, Semiconductors from the USA

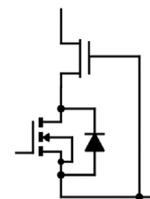
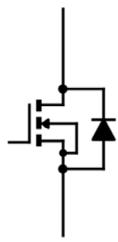
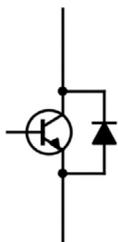
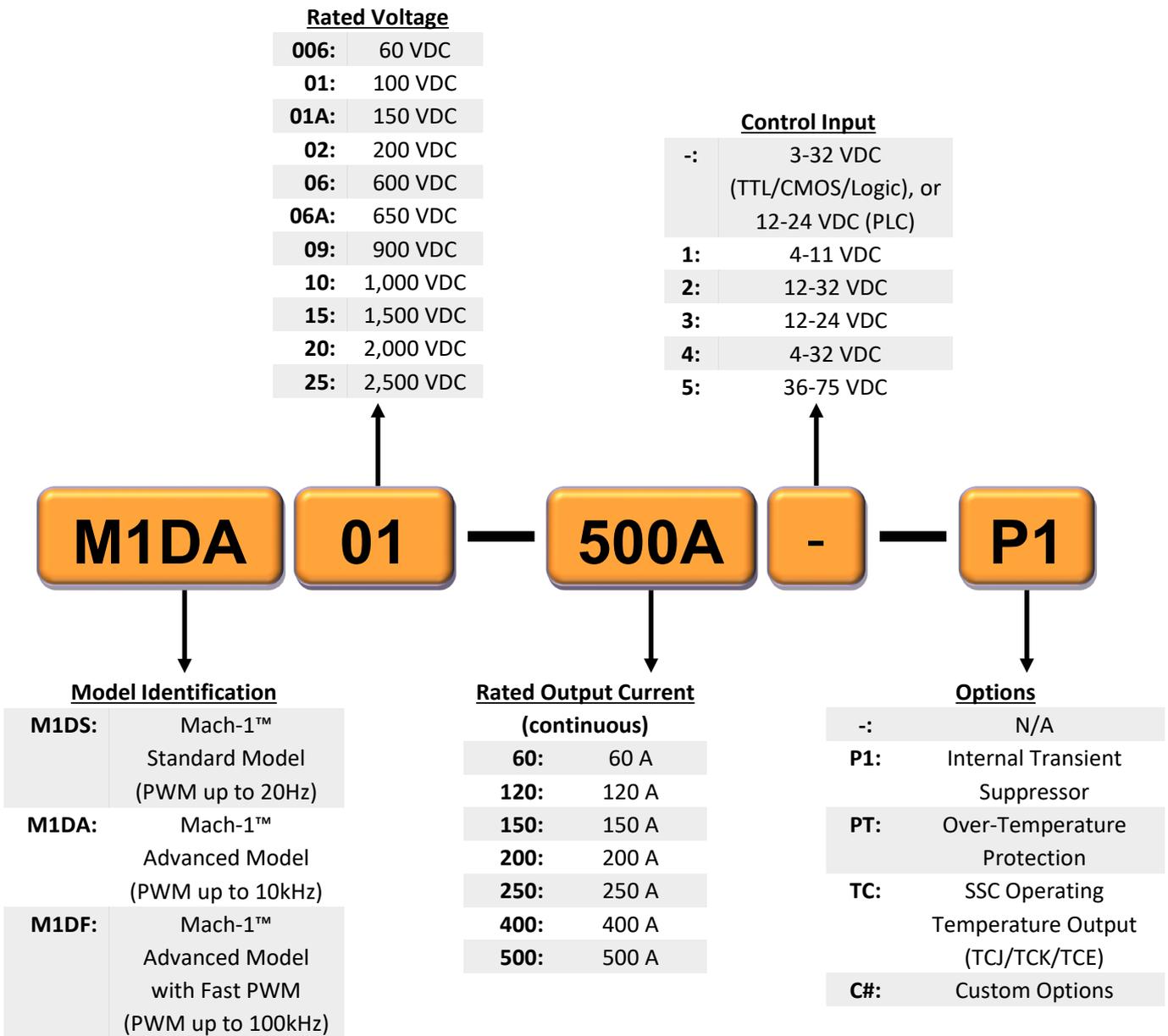


Available Heatsink and Installation Kits



Available Full Assembly Packages, Design Included

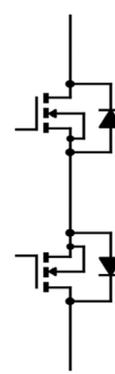
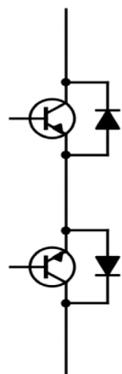
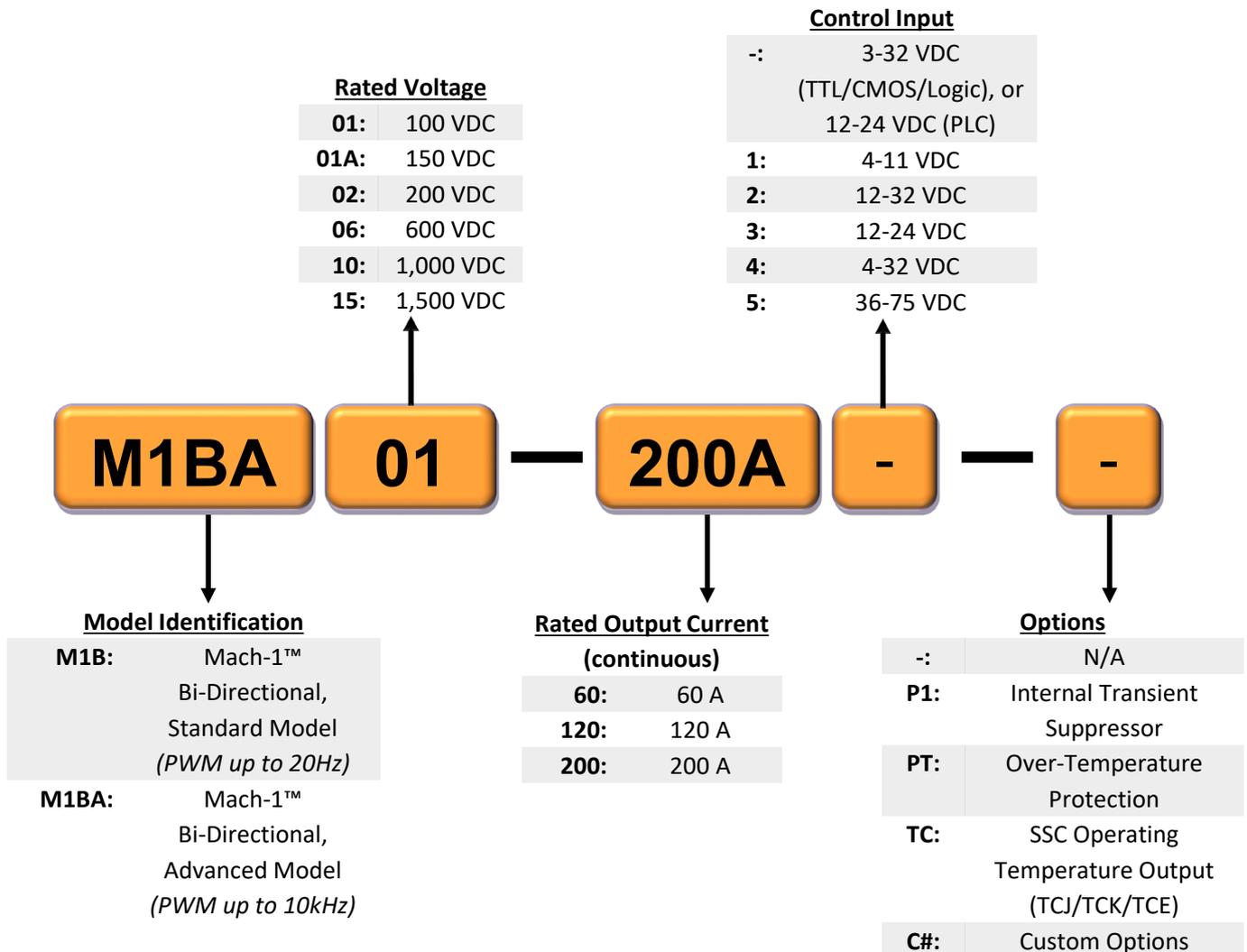
Unidirectional Model Name Guide



Unidirectional Model Specifications

Model #	Rated Voltage	Rated Continuous Current	Rated Inrush Current	ON Resistance, or Voltage Drop	Control Input	Approximate Weight
Standard Model (Max PWM 20Hz)						
M1DS006-250A	60 V	250 A	850A (200ms)	0.4 mΩ	4-11VDC, 12-32VDC, 12-24VDC, 4-32VDC, or 36-75VDC	400 g
M1DS01-400A	100 V	400 A	520A (200ms)	1.4 mΩ		375 g
M1DS01-500A	100 V	500 A	1200A (200ms)	0.5 mΩ		400 g
M1DS01A-200A	150 V	200 A	280A (200ms)	2.3 mΩ		350 g
M1DS01A-400A	150 V	400 A	400A (200ms)	1.5 mΩ		350 g
M1DS02-200A	200 V	300 A	300A (200ms)	2.6 mΩ		375 g
M1DS06-120A	600 V	120 A	150A (200ms)	1.4 VDC		350 g
M1DS06-200A	600 V	200 A	275A (200ms)	1.4 VDC		375 g
M1DS10-150A	1000 V	150 A	150A (200ms)	1.6 VDC		350 g
M1DS10-250A	1000 V	250 A	250A (200ms)	1.6 VDC		375 g
M1DS15-150A	1500 V	150 A	150A (200ms)	2.5 VDC		375 g
M1DS20-60A	2000 V	60 A	60A (200ms)	40 mΩ		350 g
M1DS25-60A	2500 V	60 A	60A (200ms)	40 mΩ		350 g
Advanced Model (Max PWM 10kHz)						
M1DA006-250A	60 V	250 A	850A (200ms)	0.4 mΩ	3-32 VDC (TTL/CMOS/Logic) or 12-24VDC (PLC)	400 g
M1DA01-400A	100 V	400 A	520A (200ms)	1.4 mΩ		375 g
M1DA01-500A	100 V	500 A	1200A (200ms)	0.5 mΩ		400 g
M1DA01A-200A	150 V	200 A	280A (200ms)	2.3 mΩ		350 g
M1DA01A-400A	150 V	400 A	400A (200ms)	1.5 mΩ		350 g
M1DA02-200A	200 V	300 A	300A (200ms)	2.6 mΩ		375 g
M1DA06-120A	600 V	120 A	150A (200ms)	1.4 VDC		350 g
M1DA06-200A	600 V	200 A	275A (200ms)	1.4 VDC		375 g
M1DA10-150A	1000 V	150 A	150A (200ms)	1.6 VDC		350 g
M1DA10-250A	1000 V	250 A	250A (200ms)	1.6 VDC		375 g
M1DA15-150A	1500 V	150 A	150A (200ms)	2.5 VDC		375 g
M1DA20-60A	2000 V	60 A	60A (200ms)	40 mΩ		350 g
M1DA25-60A	2500 V	60 A	60A (200ms)	40 mΩ		350 g
Advanced Model with Faster PWM (Max PWM 100 kHz)						
M1DF06A-20A	650 V	20 A	20A (200ms)	50 mΩ	3-32 VDC (TTL/CMOS/Logic)	300 g
M1DF06A-30A	650 V	30 A	30A (200ms)	30 mΩ		300 g
M1DF09-20A	900 V	20 A	20A (200ms)	60 mΩ		300 g
M1DF09-30A	900 V	30 A	30A (200ms)	40 mΩ		300 g
Contact Us for Other Requirements (e.g. lower power loss, higher current)						

Bi-Directional Model Name Guide



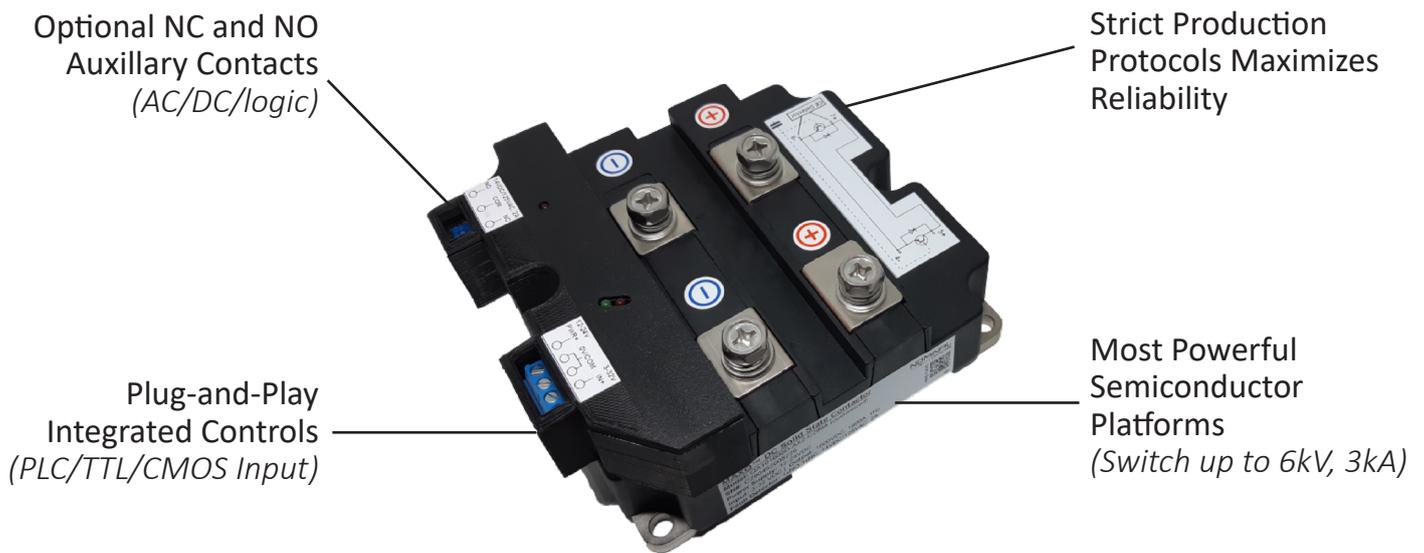
Bi-Directional Model Specifications

Model #	Rated Voltage	Rated Continuous Current	Rated Inrush Current	ON Resistance, or Voltage Drop	Control Input	Approximate Weight
Standard Model (Max PWM 20Hz)						
M1B01-200A	100 VDC or 70VAC RMS	200 A	850A (200ms)	3 mΩ	4-11VDC, 12-32VDC, 12-24VDC, 4-32VDC, or 36-75VDC	375 g
M1B01A-200A	150 VDC or 100VAC RMS	200 A	280A (200ms)	4 mΩ		375 g
M1B02-200A	200 VDC or 140VAC RMS	200 A	200A (200ms)	4 mΩ		375 g
M1B06-120A	600 VDC or 420VAC RMS	120 A	120A (200ms)	2.8 V		375 g
M1B10-100A	1000 VDC or 700VAC RMS	150 A	150A (200ms)	3.2 V		375 g
M1B15-60A	1500 VDC or 1130VAC RMS	60 A	60A (200ms)	40 mΩ		375 g
Advanced Model (Max PWM 10kHz)						
M1BA01-200A	100 VDC or 70VAC RMS	200 A	850A (200ms)	3 mΩ	3-32 VDC (TTL/CMOS/Logic), or 12-24VDC (PLC)	375 g
M1BA01A-200A	150 VDC or 100VAC RMS	200 A	280A (200ms)	4 mΩ		375 g
M1BA02-200A	200 VDC or 140VAC RMS	200 A	200A (200ms)	4 mΩ		375 g
M1BA06-120A	600 VDC or 420VAC RMS	120 A	120A (200ms)	2.8 V		375 g
M1BA10-100A	1000 VDC or 700VAC RMS	150 A	150A (200ms)	3.2 V		375 g
M1BA15-60A	1500 VDC or 1130VAC RMS	60 A	60A (200ms)	40 mΩ		375 g
Contact Us for Other Requirements (e.g. lower power loss, higher voltage)						

MAX-Q™ DC Solid-State Contactors

MAX-Q™ SSCs are based on the most powerful IGBT semiconductor platforms. Each unit is specifically designed to integrate and draw the maximum performance from the transistor.

MAX-Q SSCs were initially developed for cutting maintenance cost and down-time for a renowned electric car factory. Now MAX-Q SSCs support applications from various other high power applications in industries such as renewable energy, automotive, and scientific research.

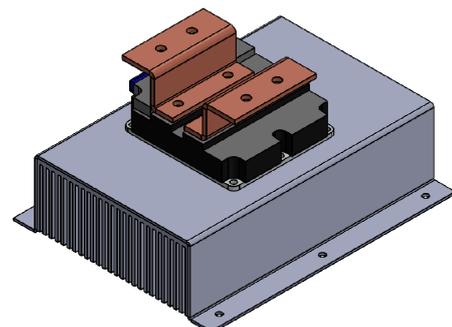


Other Features

- Isolated Input and Output
- Switch High Side or Low Side
- Advanced Switch Status Monitoring Functions
- Made in Canada, Semiconductors from the USA

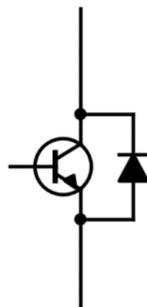
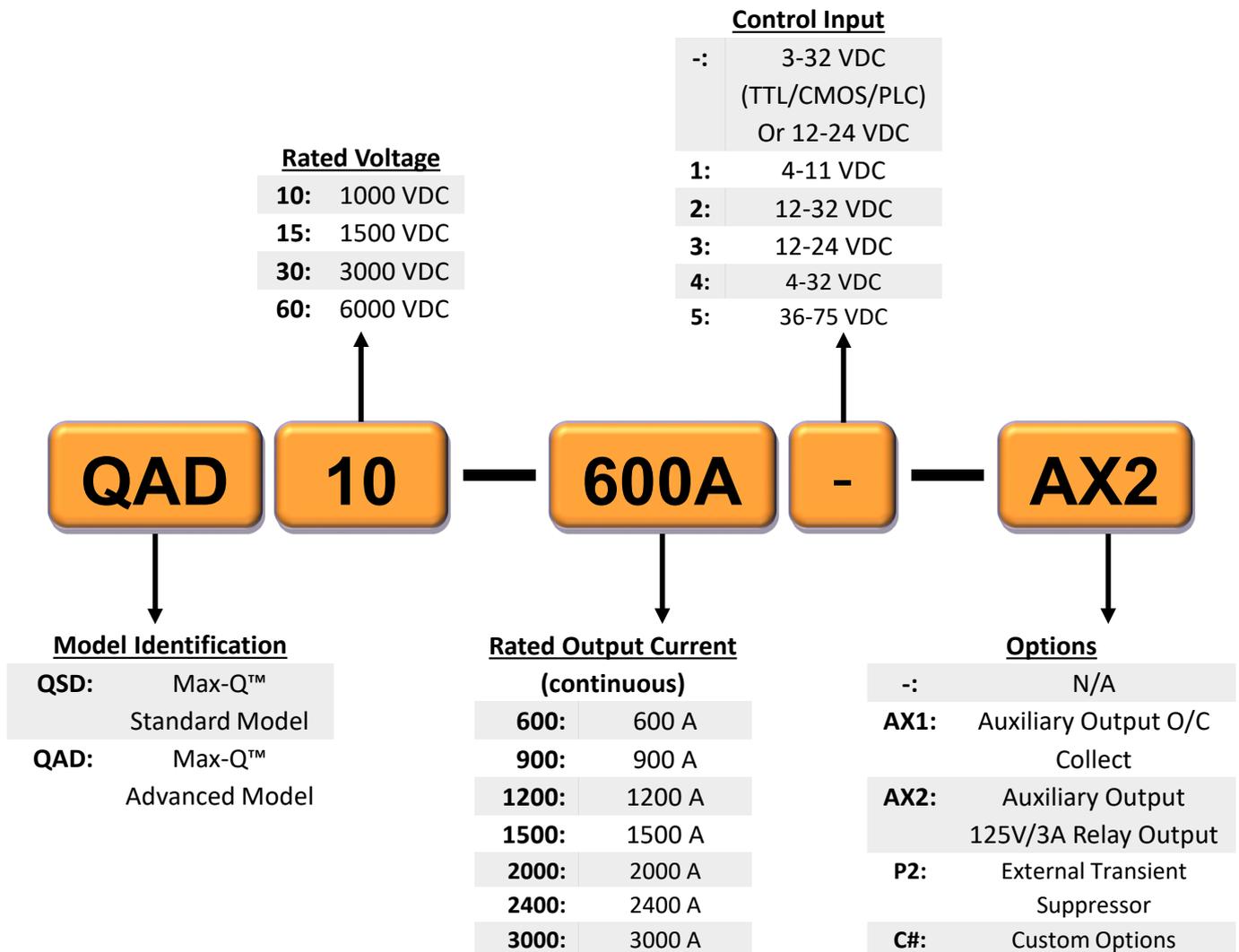


Available Heatsink and Installation Kits



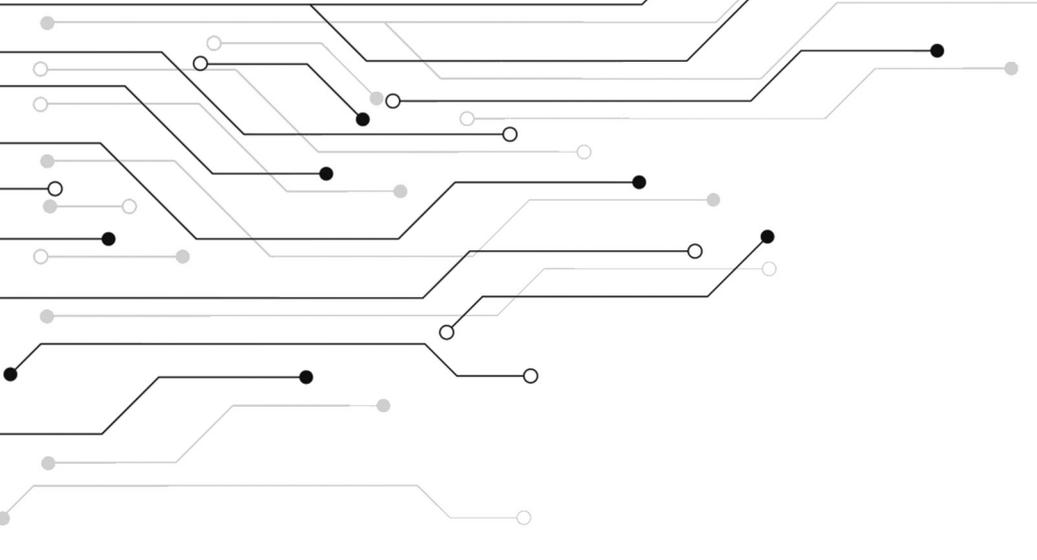
Available Full Assembly Packages, Design Included

MAX-Q™ Model Name Guide



MAX-Q™ Model Specifications

Model #	Rated Voltage	Rated Continuous Current	Voltage Drop	Control Input	Dimensions (LxWxH) (mm)	Approximate Weight
Standard Model (Max PWM 20Hz)						
QSD10-600A	1000 VDC	600A	2 VDC	4-11VDC, 12-32VDC, 12-24VDC, 4-32VDC, or 36-75VDC	106x61x55	400 g
QSD10-900A	1000 VDC	900A	2 VDC		106x61x55	450 g
QSD10-1600A	1000 VDC	1600A	2 VDC		140x130x45	1450 g
QSD10-2400A	1000 VDC	2000A	2 VDC		190x140x55	2000 g
QSD10-3000A	1000 VDC	3000A	2 VDC		190x140x55	2000 g
QSD15-600A	1500 VDC	600A	2.4 VDC		106x61x55	400 g
QSD15-1200A	1500 VDC	1200A	2.3 VDC		140x130x45	1450 g
QSD15-2400A	1500 VDC	2400A	2.3 VDC		140x130x45	1450 g
QSD30-900A	3000 VDC	900A	3 VDC		140x130x45	1000 g
QSD60-150A	6000 VDC	200A	3 VDC		600x140x55	600 g
QSD60-400A	6000 VDC	400A	3.7 VDC		140x130x55	1150 g
Advanced Model (Max PWM 10kHz)						
QAD10-600A	1000 VDC	600A	2 VDC	3-32 VDC (TTL/CMOS/Logic) or 12-24VDC (PLC)	106x61x55	400 g
QAD10-900A	1000 VDC	900A	2 VDC		106x61x55	450 g
QAD10-1600A	1000 VDC	1600A	2 VDC		140x130x45	1450 g
QAD10-2400A	1000 VDC	2400A	2 VDC		190x140x55	2000 g
QSD10-3000A	1000 VDC	3000A	2 VDC		190x140x55	2000 g
QSD15-600A	1500 VDC	600A	2.4 VDC		106x61x55	400 g
QSD15-1200A	1500 VDC	1200A	2.3 VDC		140x130x45	1450 g
QSD15-2400A	1500 VDC	2400A	2.3 VDC		140x130x45	1450 g
QSD30-900A	3000 VDC	900A	3 VDC		140x130x45	1000 g
QSD60-150A	6000 VDC	200A	3 VDC		600x140x55	600 g
QSD60-400A	6000 VDC	400A	3.7 VDC		140x130x55	1150 g
Contact Us for Other Requirements (e.g. lower power loss, higher voltage)						



DC Reversing Solid State Relays

DRV-Series Solid-State DC Reversers

DRV- Series DC Reversing Solid State Relay may be used in place of both mechanical reversers and motor controllers. With a solid-state H-bridge, its internal diode bridge provides a natural discharge path for back-EMF generated at the motor's turn-OFF, thus resulting in a switch that is arc-free, wear-free, and noise-free.

While DRV-Series "standard model" is for directional control only, an "advanced model" is available for both directional control and PWM speed adjustments. Currently, a single DRV-Series switch supports ratings up to 200VDC, 200A continuous. However, more powerful assemblies are available for ratings over 600VDC and 200A. Contact us for more details.



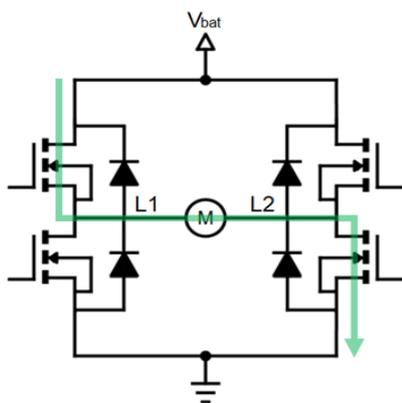
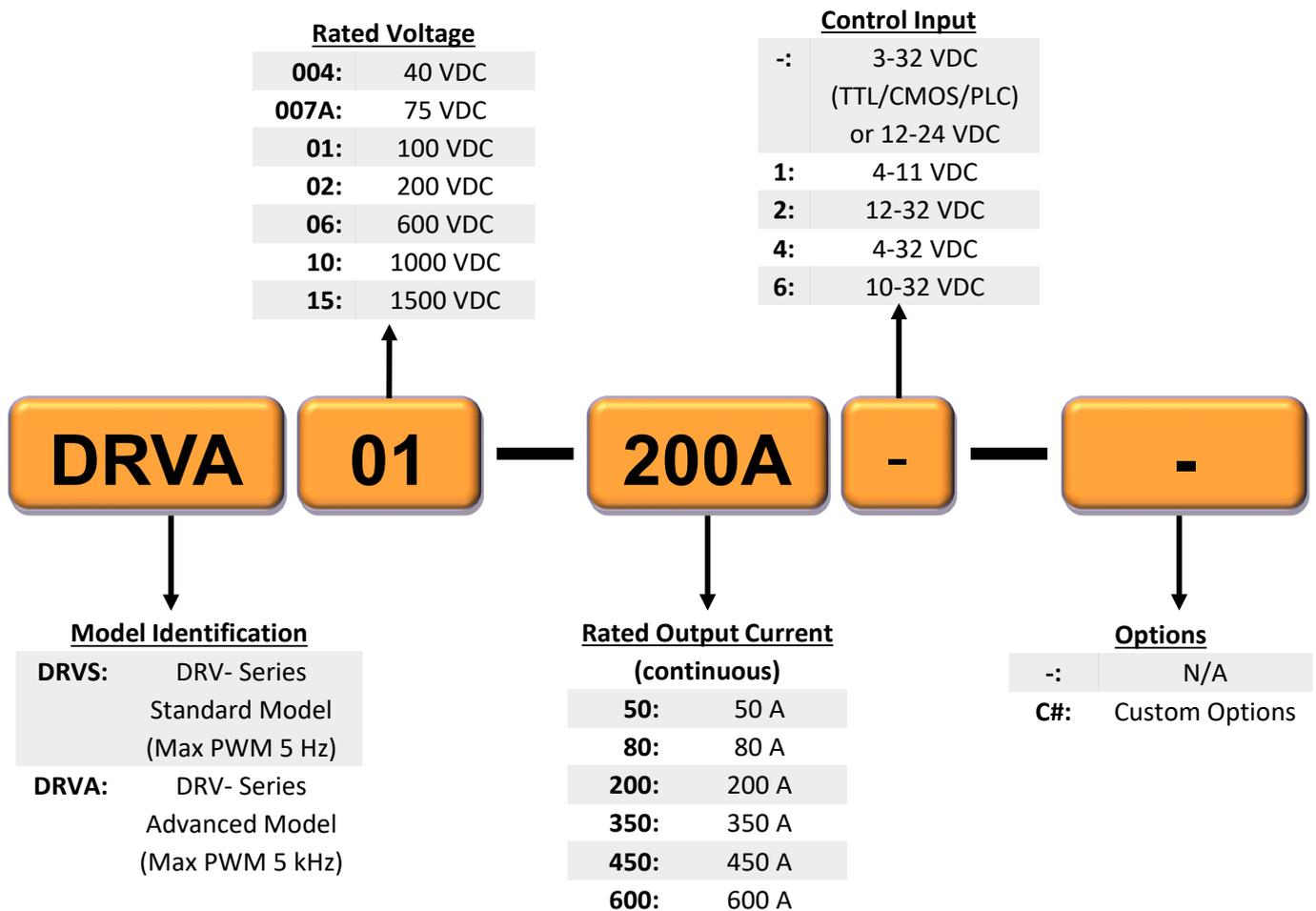
Sample Applications

- DC motor, PWM/soft-start/soft-stop
- Actuators/Coil Reversing
- Cathode/Anode Electrochemicals

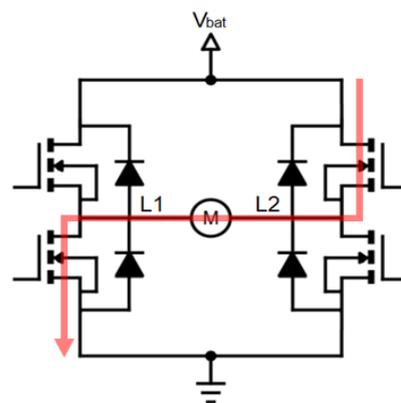


Available Heatsinks and Installation Kits

DRV-Series Model Name Guide



Forward



Reverse

DRV-Series Model Specifications

Model #	Rated Voltage	Rated Continuous Current	Inrush Current	On Resistance, or Voltage Drop	Control Input	Dimensions (LxWxH, mm)	Weight
Standard Model (Max PWM 5Hz)							
DRVS004-200A	40 VDC	200 A	400A (200ms)	<1.8 mΩ	4-11 VDC, or 12-32 VDC	106x74x50	420 g
DRVS007A-200A	75 VDC	200 A	300A (200ms)	<4 mΩ	4-11 VDC, or 12-32 VDC	106x74x50	420 g
DRVS01-50A	100 VDC	50 A	100A (200ms)	0.3 VDC	4-32 VDC	56x45x30	180 g
DRVS01-80A	100 VDC	80 A	250A (200ms)	0.5 VDC	4-32 VDC	105x73x41	375 g
DRVS02-50A	200 VDC	50 A	100A (200ms)	0.5 VDC	4-32 VDC	56x45x30	180 g
DRVS02-80A	200 VDC	80 A	200A (200ms)	0.8 VDC	4-32 VDC	105x73x41	375 g
DRVS06-350A (assembly)	600 VDC	350 A	350A (200ms)	3.2 VDC	12-32 VDC	See Corresponding Assembly	
DRVS10-350A (assembly)	1200 VDC	350 A	350A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVS10-450A (assembly)	1200 VDC	450 A	450A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVS10-600A (assembly)	1200 VDC	600 A	600A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVS15-350A (assembly)	1500 VDC	350 A	350A (200ms)	4.5 VDC	12-32 VDC	See Corresponding Assembly	
Advanced Model (Max PWM 5kHz)							
DRVA004-200A	40 VDC	200 A	400A (200ms)	<1.8 mΩ	4-11 VDC, or 12-32 VDC	106x74x50	420 g
DRVA007A-200A	75 VDC	200 A	300A (200ms)	<4 mΩ	4-11 VDC, or 12-32 VDC	106x74x50	420 g
DRVA01-50A	100 VDC	50 A	100A (200ms)	0.3 VDC	4-32 VDC	56x45x30	180 g
DRVA01-80A	100 VDC	80 A	250A (200ms)	0.5 VDC	4-32 VDC	105x73x41	375 g
DRVA02-50A	200 VDC	50 A	100A (200ms)	0.5 VDC	4-32 VDC	56x45x30	180 g
DRVA02-80A	200 VDC	80 A	200A (200ms)	0.8 VDC	4-32 VDC	105x73x41	375 g
DRVA06-350A (assembly)	600 VDC	350 A	350A (200ms)	3.2 VDC	12-32 VDC	See Corresponding Assembly	
DRVA10-350A (assembly)	1200 VDC	350 A	350A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVA10-450A (assembly)	1200 VDC	450 A	450A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVA10-600A (assembly)	1200 VDC	600 A	600A (200ms)	4 VDC	12-32 VDC	See Corresponding Assembly	
DRVA15-350A (assembly)	1500 VDC	350 A	350A (200ms)	4.5 VDC	12-32 VDC	See Corresponding Assembly	
Contact Us for Other Requirements (e.g. faster PWM, higher power)							

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