

High performance rack mounting ministep drives

When the highly-successful CD range was first introduced, it quickly became accepted as a benchmark for high-performance stepper drives. With the introduction of the CD60M and CD80M, Parker has now set a new standard for industrial automation. Ministepping resolution, higher working voltage, more current and smaller size are all features of this latest generation.

More power, higher resolution

Compared with previous models, the new CD drives can operate at a higher supply voltage of 120V DC. This gives up to 40% more high-speed torque to allow faster positioning. To ensure even higher reliability, the power stage has been conservatively designed with generous headroom at the rated supply voltage. The CD60M delivers up to 6A RMS, whilst the CD80M extends the output current range to 7.8A RMS (11A peak).

Ministepping is a standard feature on both the CD60M and CD80M. Operating at up to 4000 steps/rev, these drives deliver very smooth low-speed rotation without sacrificing high-speed performance. The current profile has been optimised to give good step-to-step accuracy over a wide range of motors.

Smaller size, universal mounting

The new narrow profile allows drives to be mounted on a 10HP (2") pitch; up to 6 drives can be fitted in a standard EuroRack together with a PM2000CN power unit, or up to 8 drives using an external supply. The compact dimensions have been made possible by the elimination of conventional heat shunts and by the extensive use of surface-mounted components (93% of all PCB parts are surface-mount).

The control card has been made larger than the power card to allow the use of either 100mm EuroCard guides or 111.7mm module guides. The larger control card gives additional mechanical support to the heatsink when 100mm guides are used.

Front panels and motherboards are available for 10HP pitch. The motherboards incorporate optical isolation and permit direct connection to Digiplan and Compumotor indexers. CD60M and CD80M drives are pin-compatible with previous CD models and may be used as replacement or upgrade units.

Simpler power supply requirements

Only one supply rail is required - all low-voltage supplies are generated internally, so no separate logic supply is necessary. The PM2000CN power supply is suitable for use with the CD60M and CD80M, and also provides a 24V DC output for control cards or motherboard opto-isolators. A range of compatible mains transformers is available.



CD60M & CD80M features

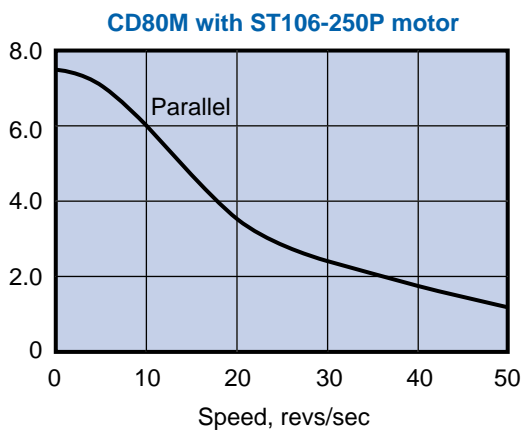
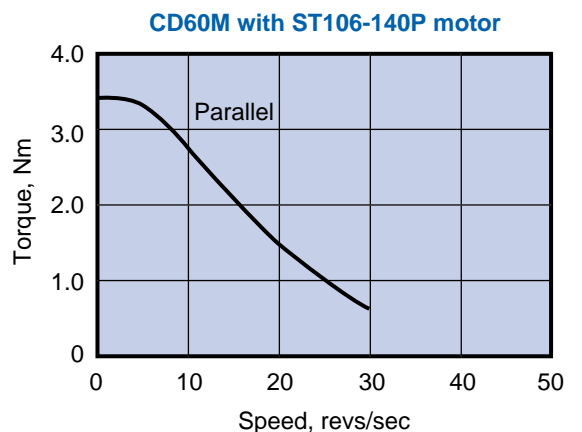
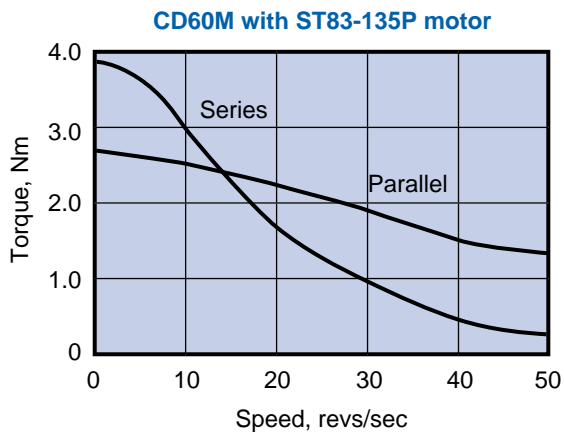
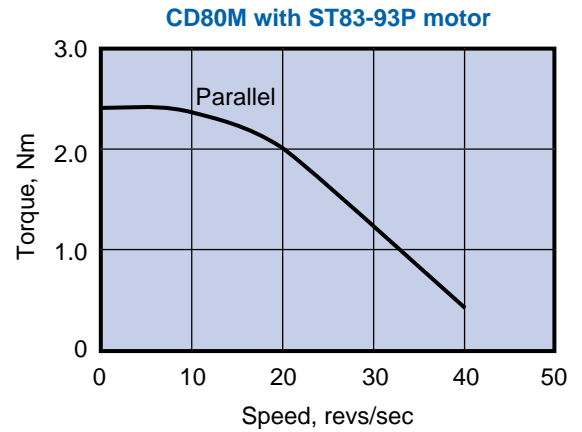
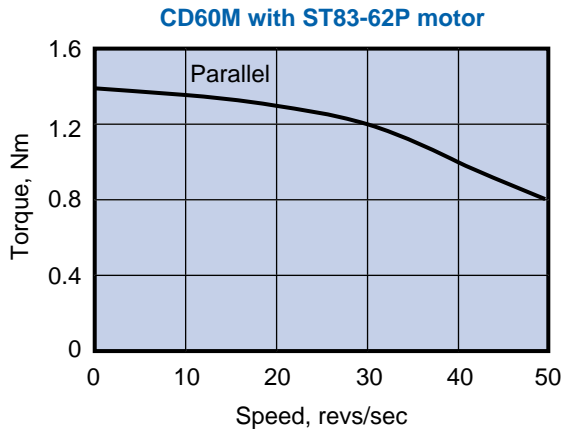
- Bipolar recirculating switch-mode power stage using MOSFET switches
- High-reliability construction with extensive use of Surface Mount Technology
- Nominal bus voltage 120VDC (140V maximum)
- Output current 6A RMS (CD60M), 7.8A RMS (CD80M)
- Programmable current down to 60% of peak (30% without standby reduction)
- 50% or 80% of programmed current at standby
- 4 selectable resolutions between 400 & 4000 steps/rev
- Full short-circuit protection (across phases, between phases and from each phase to ground)
- Overtemperature, over- & under-voltage protection
- Narrow profile allows mounting on 10HP (2") pitch
- Dual-width PCBs accept either 100mm or 111,7mm card guides
- Optional front panels and motherboards
- 4 diagnostic LED indicators

<i>Parameter</i>	<i>Value</i>
Power Input	
Motor Supply Voltage	Nominal 120VDC Operating 48–140VDC +10% -15%
Current Consumption ^{*1}	CD60M 4.0A; CD80M 5.5A
VA Consumption ^{*1}	CD60M 480VA; CD80M 660VA
Amplifiers	
Type	Bipolar recirculating PWM using MOSFETs
Motor Resolution	400, 1000, 2000, 4000 step/rev jumper selectable
Protection	Protection is detected and latched. Indicated by LED and FAULT output. Power cycle or reset input will clear fault.
Short Circuit	Across and between phases and phase-to-GND
Undervoltage	Shutdown if power supply voltage <38VDC
Overvoltage	Shutdown if power supply voltage >170VDC
Overtemperature	If heatsink temperature exceeds 85°C
Nominal Output Current	CD60M : 6A rms (8.5A pk); CD80M : 7.8A rms (11A pk)
Maximum Stepping Rate	200KHz at 4,000 step/rev
Nom. Chopping Frequency	18KHz
Automatic Standby	Automatic current reduction when motor at standstill. Jumper selectable for 80% or 50% of programmed value.
Permanent Standby	Jumper selectable to reduce nominal current by 50%. No current reduction when motor is at standstill.
Edge Connector	32-way DIN41612 Type D
Weight	0.64Kg
Physical	
Dimensions	See diagram
Rack Units	3U 10HP standard EuroCard or EuroModule
Command Interface (Drive Only)	
Input Impedance	4K7 pull-up to internal +12V rail
Input Logic Levels	Low level : max +2.0V min. 0V. High level : max +12V min. 10V
Input Functions	External reset, direction, clock (step), energize
Logic Output	NPN open collector transistor. Max. off-state voltage +30V; max. sink current 15mA On-state residual voltage of 0.4V max. at 15mA
Output Functions	Fault : low = normal, high = fault Zero-phase : low = zero state (one state/electrical cycle), high = normal
Environmental	
Operating Temperature	0°C to 50°C
Storage	-40°C to 85°C
Humidity	0 to 95% noncondensing
Motors	
Type	2-phase hybrid; 4, 6 or 8 leads
Min. Inductance	0.5mH (power supply <100VDC). 1mH (power supply >100VDC)
Max. Inductance	10mH recommended
Optional front panels	FP52 for CD60M; FP53 for CD80M

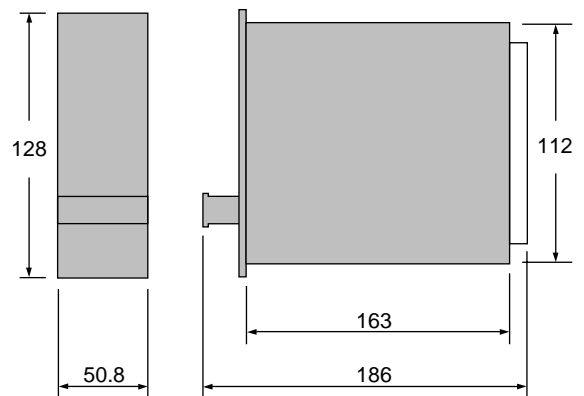
^{*1} Note: Worst case consumption quoted at 120VDC operation. Actual consumption depends on duty cycle, motor current, motion profile and load characteristics. Lower consumption can be expected under normal operating conditions.

^{*2} Note: In high duty cycle applications, fan cooling may be required during prolonged operation at speeds below 15rps at full current.

Typical performance data



CD60M/CD80M dimensions (mm)



A range of pre-assembled rack systems for SD and CD series stepper drives

To simplify the installation and commissioning of rack-mounted drive modules, Parker offer a range of pre-assembled rack systems to house up to six drives. The system is based on individual motherboards for each drive, with additional motherboards catering for power supplies and control cards. Each rack system is fitted with the appropriate number of motherboards according to the module complement, allowing all external connections to be made via screw terminals or plug-in connectors.

All assemblies are based on the standard Euro-rack system and are 3U high (132mm). Module and panel widths are always quoted in horizontal pitches (HP), the width of a standard rack being 84HP. For example, SD drive front panels are 14HP wide, so six panels will occupy the full rack width of 84HP.

All drive motherboards used in SC and CN series racks incorporate opto-isolation of the control signals, making them directly compatible with the Parker indexers listed later in this catalogue.

SC series racks for SD drives

The SD drive operates directly from an isolating transformer and therefore requires no separate power supply module. This allows up to six SD drives to be housed in a single SC series rack. When combined with IFX indexer cards, the maximum number of axes per rack is three.

CN series racks for CD drives

CD60M and CD80M drives require a separate PM2000CN power supply module, which is 24HP wide. This still allows room for six drives in a CN series rack since each drive front panel is only 10HP wide. When combined with IFX indexer cards, up to three axes can be accommodated in a single rack.

PM2000CN power supply module

The PM2000CN offers a convenient and economic method of powering CD series drives. All necessary components are included with the exception of the mains transformer which is mounted separately from the rack. The power module has an output current rating of 16A DC at a bus voltage of 120V. A regenerative power dump circuit is included, and the module comes complete with a 24HP front panel. The AC input to the PM2000CN may be single or three phase.



Transformers

There is a range of standard transformers available to power SD or CD series drives. The required transformer size depends partly on motor size, shaft power demand and duty cycle, however the quantities listed in the table form a useful guide. These are based on no more than half the axes being in motion at any one time.

All single-phase transformers may be operated from 115V and 230V supplies. Models TO181 and TO182 have four-winding primaries which also permit line-to-line connection on 400V 3-phase supplies.

Ordering information

SC and CN racks can be supplied as drive-only versions or for drives with indexer cards. Please refer to the order codes and select the appropriate rack according to the number of axes required. Standard rack systems do not allow for a mix of drives with and without indexer cards, however other combinations are available to special order. The rack order code refers to the rack assembly only; all plug-in drive modules, power supplies, front panels and transformers are ordered separately. When all parts are ordered at the same time, the rack will be supplied with all modules and front panels fitted.

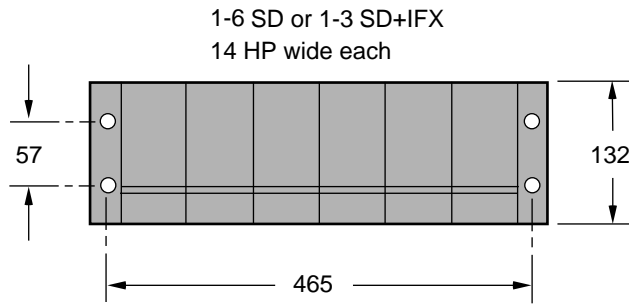
Order codes

SC: for SD drives
CN: for CD drives
Number of axes

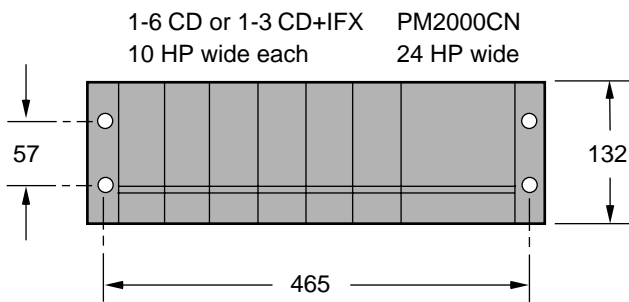
SC 1 0
0: drives only
2X/RS232C: drives with IFX indexer cards

Example - SC30: three SD drives

CN22X/RS232C: two CD drives with IFX cards

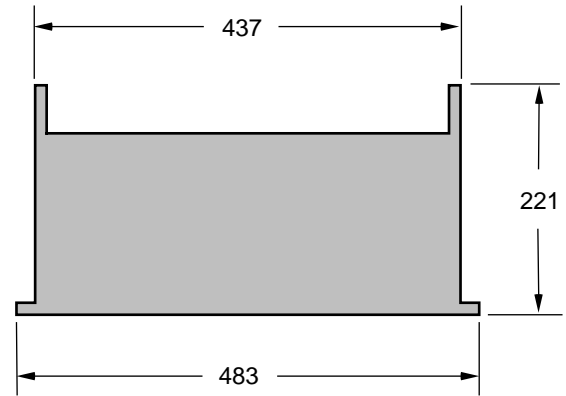


SC-Series Racks



CN-Series Racks

SC & CN rack dimensions (mm)



Top view, all types

Completing the rack

The table below shows the number of blank panels required for each rack type in order to cover control cards or empty slots in the rack.

Rack type	Number of blank panels required		
	FP55	FP39	FP54
SC10, SC12X		5	
SC20, SC22X		4	
SC30, SC32X		3	
SC40		2	
SC50		1	
CN10, CN12X	1		2
CN20			2
CN30	1		1
CN40			1
CN50	1		
CN22X	2		1
CN32X	3		

Ordering front panels

Optional front panels are available for all drive modules as well as blank panels to cover control cards or unused spaces in the rack. Please note that these panels are not included with the drive and must be ordered separately if required.

Panel type	Width	Part No.
SD12	14HP	FP36
SD13	14HP	FP37
SD15	14HP	FP38
SD15M	14HP	FP48
CD60M	10HP	FP52
CD80M	10HP	FP53
Blank	10HP	FP55
Blank	14HP	FP39
Blank	20HP	FP54

Transformers for rack-mounting drives

	Models for SD drives		Models for CD drives			
	TO193	TO194	TO181	TO182	TO185	TO186
AC input range	110-240v	110-240v	90-480v	90-480v	180-480v	180-480v
Single/three phase	1	1	1	1	3	3
DC bus voltage	60	60	120	120	120	120
VA rating	300	600	2600	1200	2500	5000
Max. number of drives*	3 x SD12 2 x SD13 1 x SD15	6 x SD12 4 x SD13 2 x SD15	8 x CD60M 6 x CD80M	4 x CD60M 3 x CD80M	8 x CD60M 6 x CD80M	11 x CD60M 8 x CD80M
Dimensions w x d x h	117x117x181	126x168x212	172x215x261	135x195x234	302x132x319	380x140x359
Weight kg	3.5	7.5	25	16	34	50

* Assumes 50% duty cycle. Larger numbers of drives may be accommodated at lower duty cycles