



CD60M/CD80M Stepper Drive User Guide

***For engineering
assistance in Europe:***
Parker Hannifin plc
Electromechanical Division - Digiplan
21 Balena Close
Poole, Dorset
England, BH17 7DX
Direct Lines for Technical Support
Tel: 01202-699000 Fax: 01202-695750
E-mail: tech.help@digiplan.com

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***For engineering
assistance in the U.S.:***
Parker Hannifin Corporation
Compumotor Division
5500 Business Park Drive, Suite D
Rohnert Park, CA 94928
USA
Telephone: (800) 358-9070
Fax: (707) 584-3793
FaxBack System: (800) 936-6939
BBS: (707) 584-4059
E-mail: tech_help@cmotor.com

IMPORTANT INFORMATION FOR USERS

Installation and Operation of Digiplan Equipment

It is important that Digiplan motion control equipment is installed and operated in such a way that all applicable safety requirements are met. Note that it may be necessary for the complete installation to comply with the Low Voltage or Machinery Directives. It is your responsibility as an installer to ensure that you identify the relevant safety standards and comply with them; failure to do so may result in damage to equipment and personal injury. In particular, you should study the contents of this user guide carefully before installing or operating the equipment.

The installation, set-up, test and maintenance procedures given in this User Guide should only be carried out by competent personnel trained in the installation of electronic equipment. Such personnel should be aware of the potential electrical and mechanical hazards associated with mains-powered motion control equipment - please see the safety warning below. The individual or group having overall responsibility for this equipment must ensure that operators are adequately trained.

Under no circumstances will the suppliers of the equipment be liable for any incidental, consequential or special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with the use of the equipment or this user guide.



SAFETY WARNING

High-performance motion control equipment is capable of producing rapid movement and very high forces. Unexpected motion may occur especially during the development of controller programs. **KEEP WELL CLEAR** of any machinery driven by stepper or servo motors. Never touch any part of the equipment while it is in operation.

This product is sold as a motion control component to be installed in a complete system using good engineering practice. Care must be taken to ensure that the product is installed and used in a safe manner according to local safety laws and regulations. In particular, the product must be enclosed such that no part is accessible while power may be applied.

High voltages exist within enclosed units, on rack system backplanes (motherboards) and on transformer terminals. Operators must be denied access to these areas. Service personnel must keep clear of these areas when power is applied to the equipment.

If the equipment is used in any manner that does not conform to the instructions given in this User Guide, then the protection provided by the equipment may be impaired.

EMC INFORMATION

EMC Information is presented in boxed paragraphs (such as this one). Information in this User Guide consists of recommendations only; compliance is not guaranteed. CD60M/CD80M drives are sold as complex components for use by professional system builders. They are not intended for sale to end users.

The information in this user guide, including any apparatus, methods, techniques, and concepts described herein, are the proprietary property of Parker Digiplan or its licensors, and may not be copied, disclosed, or used for any purpose not expressly authorised by the owner thereof.

Since Digiplan constantly strives to improve all of its products, we reserve the right to modify equipment and user guides without prior notice. No part of this user guide may be reproduced in any form without the prior consent of Digiplan.

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User Guide Change Summary

The following is a summary of the primary changes to this user guide since the last version was released. This user guide, version 1600.192.02, supersedes version 1600.192.01.


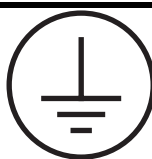
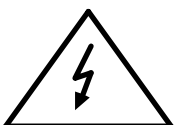



When a user guide is updated, the new or changed text is differentiated with a change bar in the outside margin (this paragraph is an example). If an entire chapter is changed, the change bar is located on the outside margin of the chapter title.

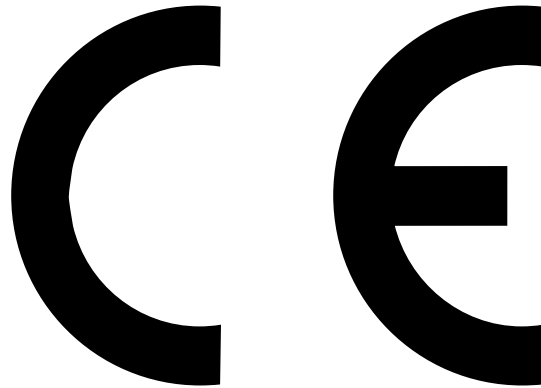
Major changes introduced at revision 02 are:

LVD Compliance

EMC installation guidelines

Warning symbols used on the CD60M/CD80M series of drives have the following meanings:

	Refer to the accompanying documentation		Protective conductor terminal
	Risk of electric shock		Alternating current
	Hot surface		Frame or chassis terminal



Product Type: CD60M, CD80M Stepper Drives

The above products are in compliance with the requirements of directives

- **73/23/EEC** Low Voltage Directive
- **93/68/EEC** CE Marking Directive

The CD60M/CD80M Series of drives are sold as complex components to professional assemblers, as components they are not compliant with Electromagnetic Compatibility Directive 89/336/EEC. However, information is offered in this User Guide on how to install these drives in a manner most likely to minimise the effects of drive emissions and to maximise the immunity of drives from externally generated interference.

CD60M & CD80M Quick Reference Guide

Overview

The CD60M and CD80M are rack-mounting ministep drives designed to operate with standard 2/4 phase motors operating at 120V (nominal), yet retaining pin-compatibility with previous CD drives.

Outline specification

Nominal operating voltage	120V DC
Operating voltage range	48 to 140V DC +10% -15%
Output current, RMS	6A (CD60M), 7.8A (CD80M)
Output current, peak	8.5A (CD60M), 11A (CD80M)
Max. power supply current (at 120V)	4A (CD60M), 5.5A (CD80M)
Max. step frequency	200kHz at 4000 steps/rev
Min. step pulse width	1µs (recommended setting for Compumotor indexers)
Signal input levels:	
Direct	Low <+2V or S/C to 0V, high +10 to +12V or O/C (4k7 pull-up to +12V built-in)
Via opto motherboard	TTL, low <0.8V, high >3.5V, max. current 20mA
Signal output levels:	
Direct	NPN open-collector transistor, +30V max off, 0.4V on at 15mA max.
Via opto motherboard	Free NPN transistor (collector = Fault +), 28V max off, 0.8V on at 5mA max

Connections direct to edge connector

2a Motor B-	2c Motor B-
4a Motor B+	4c Motor B+
6a Motor A-	6c Motor A-
8a Motor A+	8c Motor A+
10a n/c	10c Opto supply out
12a HV in (120V DC)	12c HV in
14a HV in	14c HV in
16a Power 0V	16c Power 0V
18a Power 0V	18c n/c
20a Fault out	20c n/c
22a Zero phase out*	22c n/c
24a External reset*	24c n/c
26a Direction in	26c n/c
28a Clock in*	28c n/c
30a Energise in*	30c n/c
32a Reserved	32c n/c

*Active-low signals

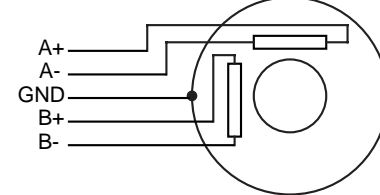
Connections using opto motherboard

(25-way D-type socket SKT1)

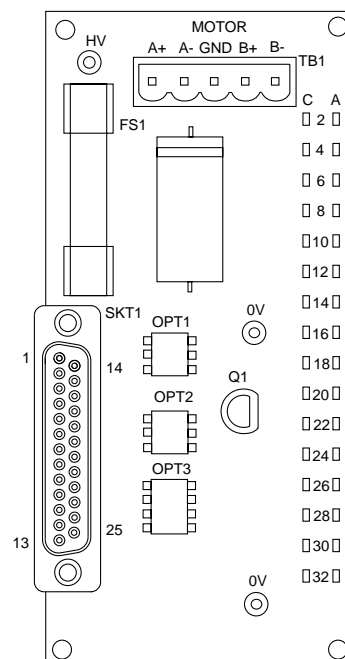
1 Step + in	16 Shutdown + in
14 Step - in	17 Shutdown - in
2 Direction + in	9 Fault + out
15 Direction - in	21 Fault - out

Fuse rating 10A QB HBC (CD60M & CD80M)
6.3mm x 32mm

Motor connections



Layout of 10HP motherboard



Compatibility

The Boost function has been eliminated on the CD60M/CD80M series of drives and the previous CD Boost terminal has now been used as a reset input.

Power Supplies

Both the CD60M and the CD80M only require a single DC motor supply. A current limited +12V DC supply generated on the card supplies optocouplers used on the 10HP motherboard via edge connector 10c (previously unused). The 10HP motherboard has faster optos and is needed when running at 50 rps and 4000 steps/rev. If a drive is used with a 14HP opto motherboard then a +24V DC supply will still be required for motherboard circuits, but its presence will not harm the drive.

CD60M & CD80M drives can be run from any DC voltage between 48V and 140V (+10% - 15%). This means that at 120V there is ample headroom to allow for poor power supply regulation or pump-up during regeneration. Use PM2000CN power supply for operation at 120V DC, PM1200CN for operation at 85V DC.

Suitable transformers are; TO92 (600VA), TO73 (1200VA) for 85V DC or TO182 (1000VA) for 120V DC. Allow up to 450VA for the CD60M and 600VA for the CD80M at 120V (300VA and 450VA respectively at 85V).

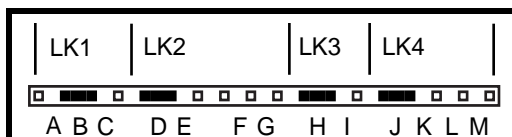
Jumper Link Settings: *=Factory settings

Link No.	Option	Link Position	Value	
LK1	Standby current reduction	A	80% of full load	
		B*	50% of full load	
		C	Permanent (50%) standby	
LK2	Resolution	D*	4,000 steps/rev	
		E	2,000 steps/rev	
		F	1,000 steps/rev	
		G	400 steps/rev	
LK3	Energise	H*	Permanently energised	
		I	Energise externally controllable	
LK4	Motor current		CD60M	CD80M
		J*	6A	7.8A
		K	5.5A	7A
		L	4.4A	5.6A
		M	3.8A	4.9A

Motor currents are quoted as RMS values. Note: peak (one-phase-on) are 40% higher.

Jumper Layout: Shown in their factory settings

LK2 can occupy positions D, E, F or G - there is an unused position between E and F.



Mounting: 4.4 inch (111.7mm) EuroModule or 100mm EuroCard guides can be used

Drives should be mounted vertically within the rack to ensure the maximum flow of cooling air over the heatsink. In high duty cycle applications, fan cooling may be required during prolonged operation at speeds below 15 rps and at full current.

