

Commander C200/C300

Step By Step Guide

Guide pas à pas

Schritt-für-Schritt-Anleitung

Guida dettagliata

Guía detallada

Frame sizes 1 to 4

Tailles 1 à 4

Baugrößen 1 bis 4

Taglie da 1 a 4

Tamaños 1 a 4

English

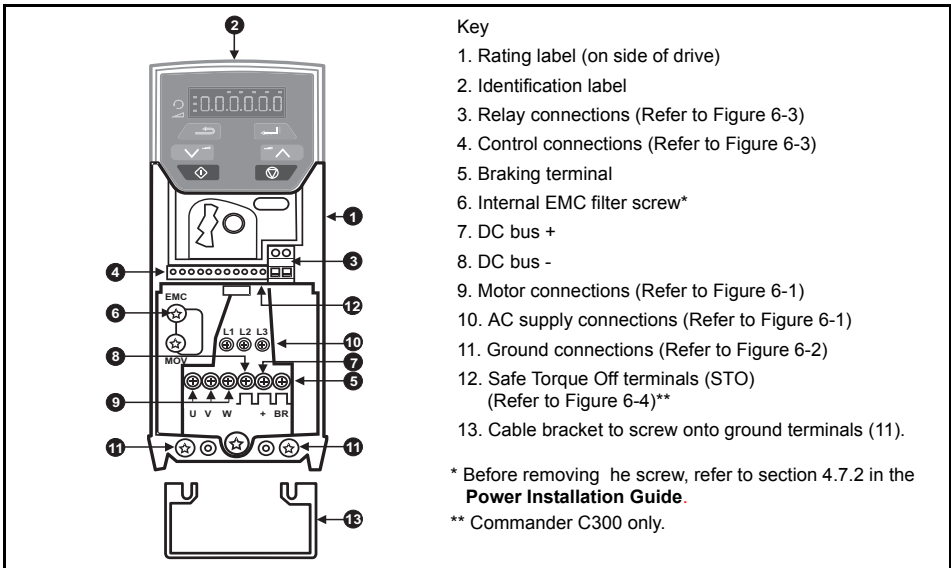
Introduction

The Commander C200 and C300 is a simple and flexible range of drives from 0.25 kW to 132 kW in 9 frame sizes and three input voltage ranges (100 V, 200 V, and 400 V).

This Step-by Step guide provides simple step-by-step instructions on how to mount the drive, fuse and cable selection, wiring the drive-up, programming the drive and running the motor in analog input mode or keypad mode on frames 1 to 4.

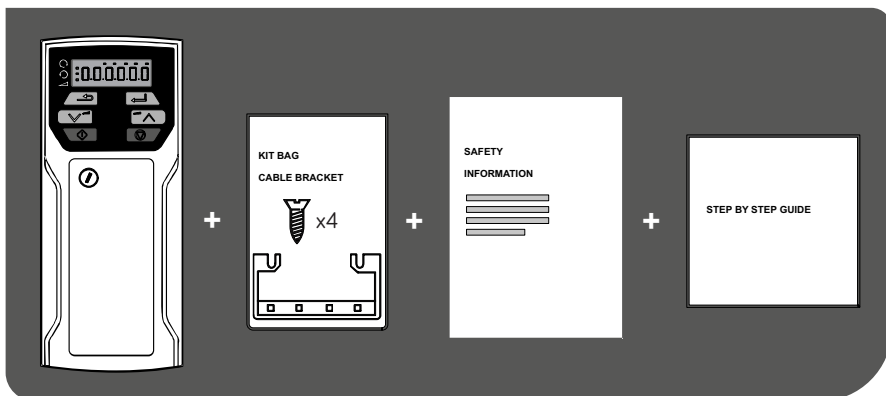
Features of the drive

Figure 1-1 Feature diagram (size 2 shown)



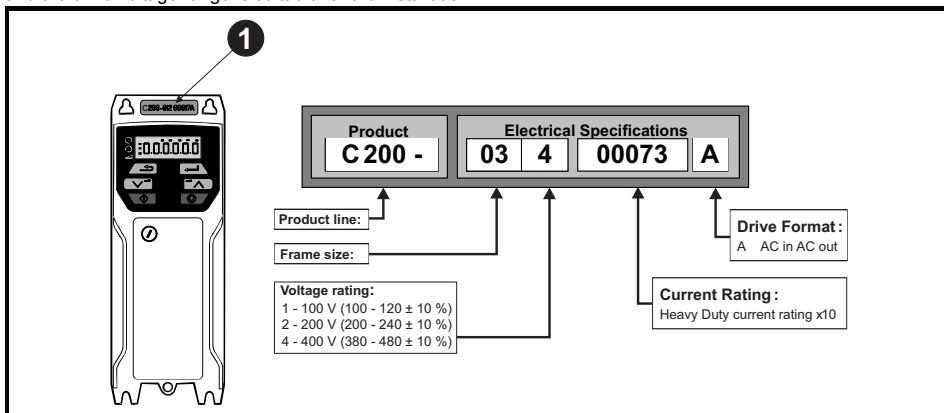
STEP 1: Check the contents of the box

Check you have all the components and your drive has not been damaged during transportation.



STEP 2: Check model and voltage

The model number can be found on the identification label **1** on the top of the drive. Please check that the model and the drive voltage range is suitable for the installation.

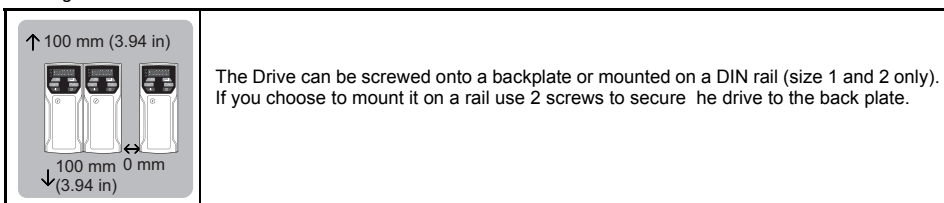


STEP 3: Mount the drive

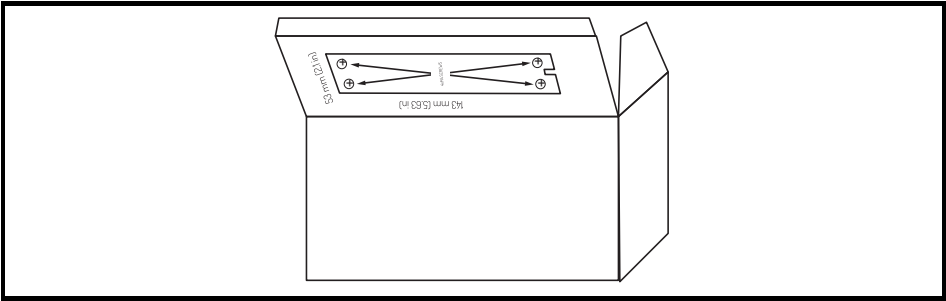
The drive should be mounted in an ambient temperature range of - 20 °C to 60 °C (- 4 °F to 140 °F).

Output current derating may be required at ambient temperatures > 40 °C (104 °F). Refer to the **Power Installation Guide** (section 5.1). For UL installations, the maximum ambient temperature permitted is 50 °C (104 °F) with any specified derating applied.

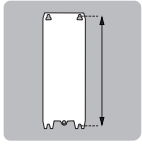
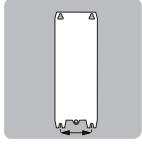
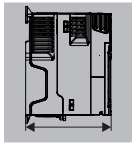

Drives can be panel mounted with **0 mm** space between them. A minimum clearance of **100 mm (3.94 in)** is required above and below the drive. Refer to section 3.4 in the **Power Installation Guide** for information on derating for reduced clearances.



A **Drill template** for wall mounting is included on the drive packaging (shown below).



Alternatively refer to the table below for the mounting and overall dimensions.

Frame	 H		 W		 D	 Ø	Weight
	Mounting	Overall	Mounting	Overall	Overall	Diameter	
1	143 mm (5.7 in)	160 mm (6.3 in)	53 mm (2.08 in)	75 mm (2.95 in)	130 mm (5.1 in)	5 mm (0.2 in)	0.75 kg (1.65 lb)
2	194 mm (7.63 in)	205 mm (8.07 in)	55 mm (2.17 in)	75 mm (2.95 in)	150 mm (5.9 in)	5 mm (0.2 in)	1.3 kg (3.0 lb)
3	215 mm (8.46 in)	226 mm (8.9 in)	70.7 mm (2.80 in)	90 mm (3.54 in)	160 mm (6.3 in)	5 mm (0.2 in)	1.5 kg (3.3 lb)
4	265 mm (10.43 in)	277 mm (10.9 in)	86 mm (3.40 in)	115 mm (4.5 in)	175 mm (6.9 in)	6 mm (0.23 in)	3.13 kg (6.9 lb)

STEP 4: Select supply / motor cables and fuses or MCB

The supply/motor cables and fuses or MCB's used should follow the ratings provided in the table below:



The voltage rating of fuses and MCBs must be greater than or equal to the highest supply voltage of the system. **Fuses:** The AC supply to the drive must be installed with suitable protection against overload. Failure to observe this requirement will cause risk of fire.

NOTE

Ground conductor size:- Either 10 mm² or two conductors of the same cross-sectional area as the input conductors.

Model	Input Phases	Fuses		MCB rating**	Cables			
		IEC Class gG	UL Class CC J, or T*		IEC60364-5-52 mm ²		UL 508C AWG	
		A	A		Input	Output	Input	Output
01100017	1	10	15	15	1	1	16	16
01100024	1	16	15	15	1.5	1	14	16
02100042	1	20	20	15	2.5	1	12	16
02100056	1	25	25	15	4	1	10	16
01200017	1	6	6	15	1	1	16	16
01200024	1	6	6	15	1	1	16	16
01200033	1	10	15	15	1	1	16	16
01200042	1	16	15	15	1	1	16	16
02200024	1 / 3	6/6	6/6	15	1	1	16	16
02200033	1 / 3	10/10	10/10	15	1	1	16	16
02200042	1 / 3	16/10	15/10	15	1	1	16	16
02200056	1 / 3	20/16	20/15	15	2.5/1.5	1	12/14	16
02200075	1 / 3	20/16	20/15	15	2.5	1	12	16
03200100	1 / 3	25/20	25/20	25/20	4	1.5	10/12	14
04200133	1 / 3	25/20	25/20	25/20	4/2.5	2.5	10	12
04200176	3	25	25	25	4	2.5	10	12
02400013	3	6	6	15	1	1	16	16
02400018	3	6	6	15	1	1	16	16
02400023	3	6	6	15	1	1	16	16
02400032	3	6	6	15	1	1	16	16
02400041	3	10	6	15	1	1	16	16
03400056	3	10	15	15	1	1	14	16
03400073	3	16	15	15	1.5	1	12	16
03400094	3	16	15	25	2.5	1.5	12	14
04400135	3	20	20	20	2.5	2.5	10	12
04400170	3	25	25	25	4	2.5	10	12

* These fuses are fast acting.

** For UL installations, the circuit breaker must be listed under category control number DIVQ / DIVQ7, rated 600 Vac with a short circuit rating > 10 kA. In other countries, circuit breakers compliant with EN IEC 60947-2 are recommended, with > 10 kA short circuit breaking capacity

NOTE

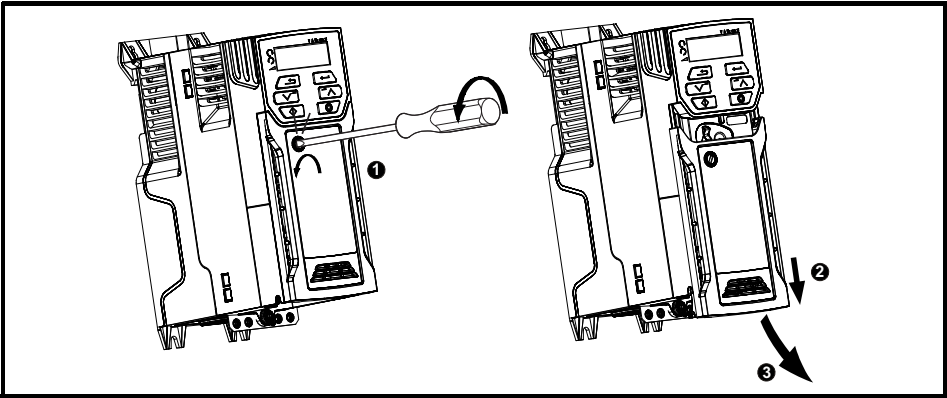
The product is UL listed for use on a circuit up to 100 kA maximum supply symmetrical fault current, when protected by fuses.

NOTE

IEC cable sizes assume Copper conductor, PVC insulation, Installation method B2 and ambient temperature of 40 °C (104 °F). UL cable sizes assume Copper conductor with insulation rated at 75 °C (167 °F).

STEP 5: Remove the terminal cover

1. Using a flat bladed screwdriver, turn the terminal cover locking clip anti-clockwise by approximately 30°.
2. Slide the terminal cover down.
3. Remove terminal cover in direction shown.



STEP 6: Wire the drive up

Power connections

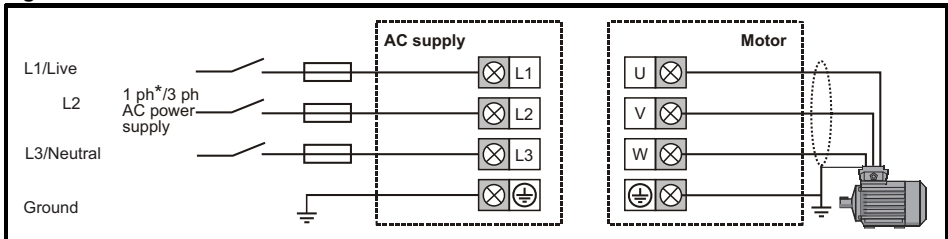
When wiring the drive the power, ground and control connections, they should be tightened to the recommended torque settings shown in the table below:

Table 6-1 Recommended torque settings

Model size	Terminal block description	Torque settings
All	Control terminals	0.2 N m (0.15 lb ft)
	Relay terminals	0.5 N m (0.37 lb ft)
1	Power terminals	0.5 N m (0.37 lb ft)
2, 3, 4		1.4 N m (1.03 lb ft)
All	Ground terminals	1.5 N m (1.10 lb ft)

Connect the supply and motor connections using the cables and fuses or MCB's quoted in the table shown in Step 4. When using a single phase supply, the supply should be connected to L1 and L3.

Figure 6-1 Power terminal connections



Ground connections

The supply and motor ground connections are made using the ground busbar located at the bottom of the drive as shown in Figure 6-2.



Electrochemical corrosion of grounding terminals

Ensure that grounding terminals are protected against corrosion i.e. as could be caused by condensation.

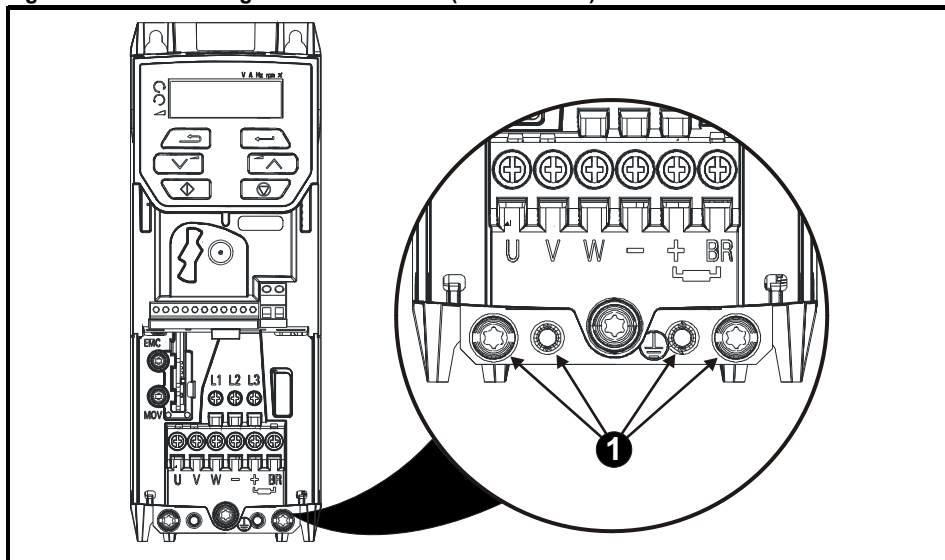


The ground loop impedance must conform to the requirements of local safety regulations. The drive must be grounded by a connection capable of carrying the prospective fault current until the protective device (fuse, etc.) disconnects the AC supply. The ground connections must be inspected and tested at appropriate intervals.

Minimum ground conductor size

Either 10 mm² or two conductors of the same cross-sectional area as the input phase conductor.

Figure 6-2 Size 1 to 4 ground connections (size 2 shown)

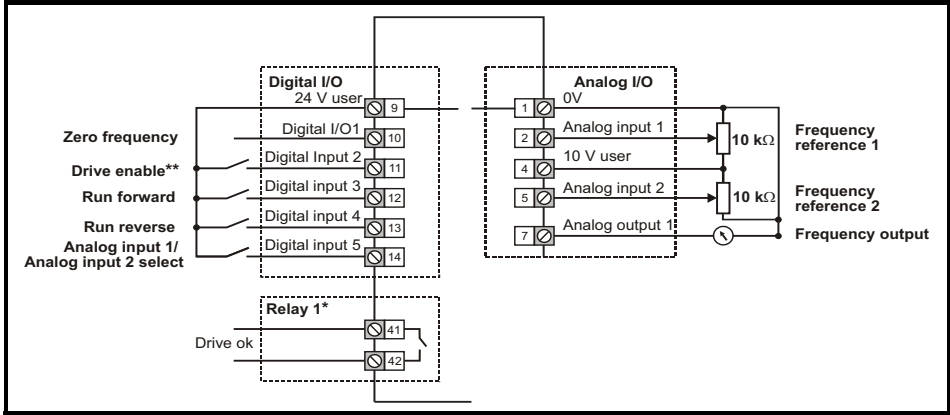


1: 4 x M4 threaded holes for the ground connection busbar.

Control connections

The control terminals are configured by default for the arrangement shown below:

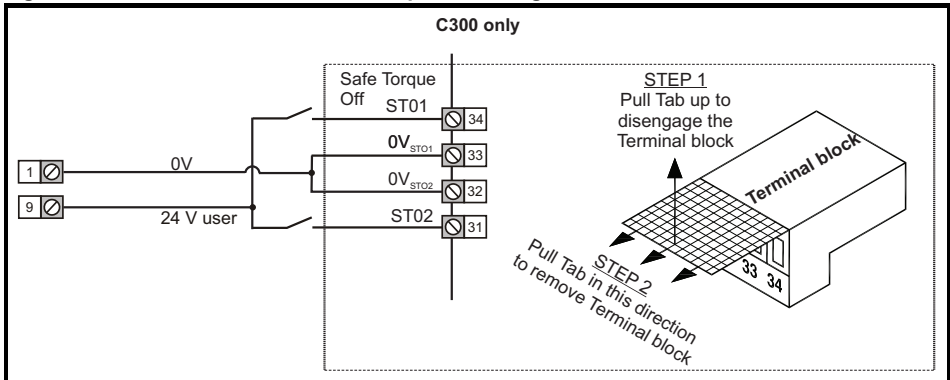
Figure 6-3 Commander C200/C300 control terminal connections



* 250 Vac maximum (UL class 1).

** Commander C300 uses 'Safe Torque Off' so terminal 11 is unassigned on the Commander C300. When using a Commander C300 refer to the 'Safe Torque Off' wiring instructions below:

Figure 6-4 Commander C300 Safe Torque Off wiring instructions

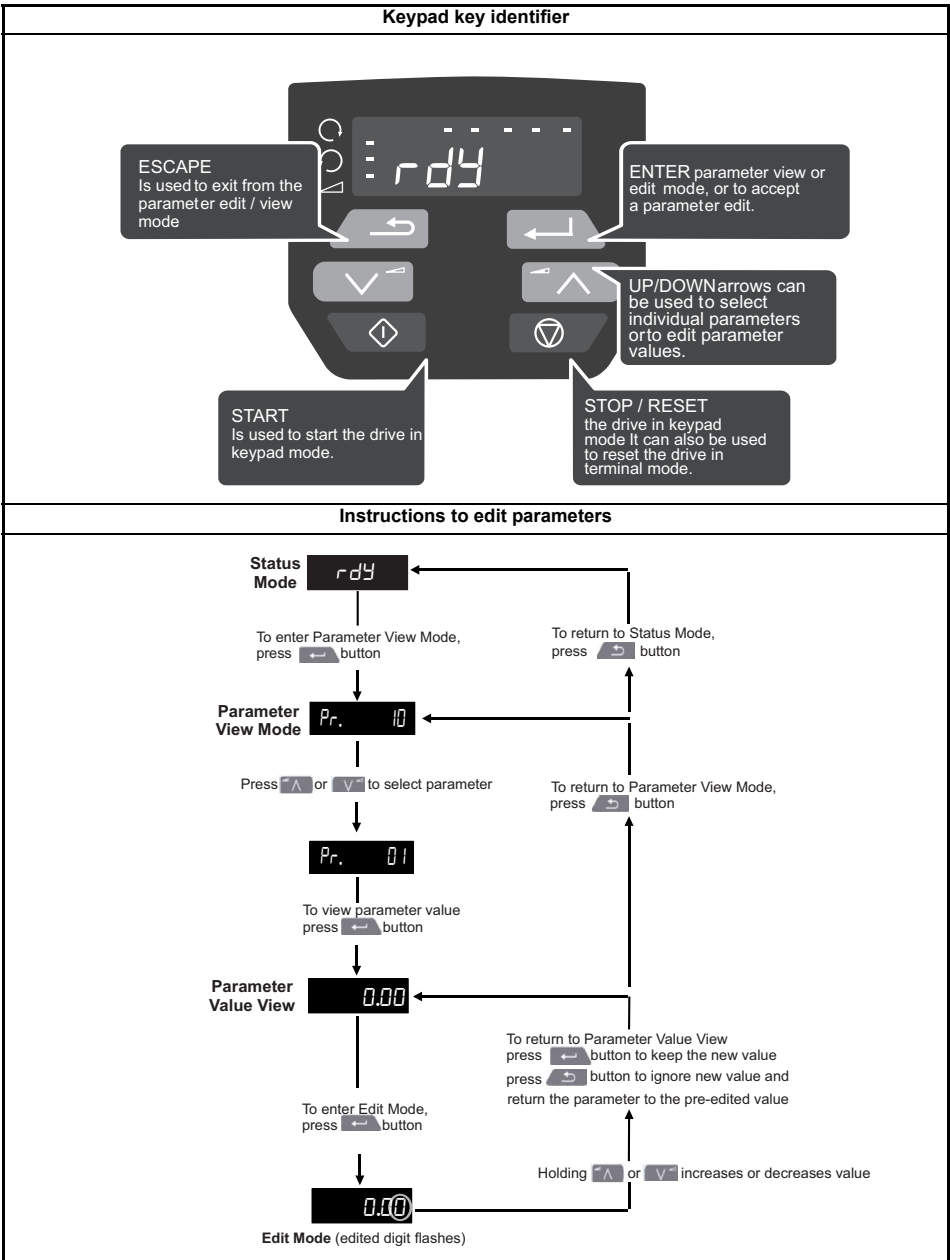


After completing step 6 re-fit the terminal cover (refer to step 5).

Refer to section 4.4 in the **Control User Guide** for information and wiring diagrams for alternative configurations.

STEP 7: Use the keypad

The display provides information to the user regarding the operating status of the drive, alarms and trip code. The keypad provides the means for changing parameters, stopping and starting the drive, and the ability to perform a drive reset.



Additional Information

Troubleshooting

When the drive detects a fault it will display an error code. To locate and solve all error codes, a 'Diagnostic Tool (App)' is available on Microsoft, Android and iOS platform via the 'Apps' store on Smartphone / Tablet, search for '**Control Techniques diagnostics tool in the Apps store**'. Alternatively, please download the 'Diagnostic Tool (App)' from the Control Techniques 'App Center' or view the diagnostics section in the **Control User Guide** available for download from the Control Techniques or Leroy Somer website.

Status Indicators


The table below shows the different status indicators available on the display.

Table 10-1 Status indications

String	Description	Drive output stage
inh	The drive is inhibited and cannot be run. The Drive Enable signal is not applied to the drive enable terminal or is set to 0.	Disabled
rdy	The drive is ready to run. The drive enable is active, but the drive inverter is not active because the final drive run is not active	Disabled
Stop	The drive is stopped / holding zero speed.	Enabled
LOSS	Supply loss condition has been detected	Enabled
dc inj	The drive is applying dc injection braking	Enabled
Er	The drive has tripped and no longer controlling the motor. The trip code appears on the display.	Disabled
UV	The drive is in the under voltage state.	Disabled

Restoring drive defaults

The drive can be restored to the original factory settings by following the procedure below:

1. Ensure the drive is not enabled, i.e. terminal 11(or terminal 31 and 34 on Commander C300) is open.
2. Select 'Def.50 (50 Hz settings) or Def.60 (60 Hz settings)' in Pr **00**.
3. Press the red  reset button.

Basic parameters range and default

For information on parameters beyond Pr **00** to Pr **10** refer to the Quick Start Guide.

Parameter		Range (⇕)	Default (⇔)
01	Minimum Speed	0.00 to Pr 02 Hz	0.00 Hz
02	Maximum Speed	0.00 to 550.00 Hz	Def.50: 50.00 Hz Def.60: 60.00 Hz
03	Acceleration Rate 1	0.0 to 32000.0 s	5.0 s
04	Deceleration Rate 1	0.0 to 32000.0 s	10.0 s
05	Drive Configuration	AV (0), AI (1), AV.Pr (2), AI.Pr (3), PrESEt (4), PAd (5), PAd.rEF (6), E.Pot (7), torquE (8), Pid (9) Refer to the Control User Guide for further information	AV (0)
06	Motor Rated Current	0.00 to Drive Rating Amps	Maximum Heavy Duty Rating Amps
07	Motor Rated Speed	0 0 to 33000 0 rpm	Def.50: 1500.0 rpm Def.60: 1800.0 rpm
08	Motor Rated Voltage	0 to 240 V or 0 to 480 V	110V drive: 230 V 200V drive: 230 V 400V drive Def 50: 400 V 400V drive Def.60: 460 V
09	Motor Rated Power Factor	0.00 to 1.00	0.85
10	User Security Status	Refer to the Control User Guide for further information	LEVEL.1

Appendix A UL listing information

This addendum provides additional information requested by UL to be supplied with the product.

A.1 UL file reference

All models are UL Listed to both Canadian and US requirements. The UL file reference is: NMMS/7.E171230. Products that incorporate the Safe Torque Off function have been investigated by UL. The UL file reference is: FSPC.E171230.

A.2 Option modules, kits and accessories

Option Modules, Control Pods, Installation Kits and other accessories for use with these drives are UL Listed.

A.3 Enclosure ratings

All models are Open Type as supplied.

The drive enclosure is not classified as a fire enclosure. A separate fire enclosure must be provided. A UL/ NEMA Type 12 enclosure is suitable.

When fitted with a conduit box the drives meet the requirements for UL Type 1. Type 1 enclosures are intended for indoor use, primarily to provide a degree of protection against limited amounts of falling dirt.

The drives meet the requirements for UL Type 12 when installed inside a Type 12 enclosure and through-hole mounted using the sealing kit and the high-IP insert (where provided).

When through-hole mounted, the drives have been evaluated as suitable for use in surrounding air temperatures up to 40 °C.

Remote Keypads are UL Type 12 when installed with the sealing washer and fixing kit provided.

When installed in a Type 1 or Type 12 enclosure, the drives may be operated in a compartment handling conditioned air.

A.4 Mounting

Drives may be surface mounted using the appropriate brackets. Drives may be mounted singly or side by side with suitable space between them (bookcase mounting).

A.5 Environment

Drives must be installed in a Pollution Degree 2 environment or better (dry, non-conductive pollution only).

The drives have been evaluated for use at ambient temperatures up to 40 °C. The drives have additionally been evaluated for 50 °C and 55 °C ambient air temperatures with a derated output.

A.6 Electrical Installation

OVERVOLTAGE CATEGORY

OVC III

SUPPLY

The drives are suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes, 600 Volts AC Maximum.

TERMINAL TORQUE

Terminals must be tightened to the rated torque as specified in the Installation Instructions.

WIRING TERMINALS

Drives must be installed using cables rated for 75 °C operation, copper wire only.

Where possible, UL Listed closed-loop connectors sized according to the field wiring shall be used for all field power wiring connections.

GROUND CONNECTION INSTRUCTIONS

UL Listed closed-loop connectors sized according to the field wiring shall be used for grounding connections.

BRANCH CIRCUIT PROTECTION

The fuses and circuit breakers required for branch circuit protection are specified in the Installation Instructions.

OPENING OF BRANCH CIRCUIT

Opening of the branch-circuit protective device may be an indication that a fault has been interrupted. To reduce the risk of fire or electric shock, the equipment should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code (NEC), The Canadian Electrical Code, and any additional local codes.

DYNAMIC BRAKING

Commander C200/C300, frame sizes 1 to 4 have been evaluated for dynamic braking applications. Other drive models have not been evaluated for dynamic braking.

A.7 Motor overload protection and thermal memory retention

The devices incorporate solid state overload protection for the motor load. The protection levels are expressed as a percentage of full-load current. Refer to the *Control User Guide* for further information.

In order for the motor protection to work properly, the motor rated current must be entered into Pr **06** or Pr **05.007**.

The protection level may be adjusted below 150 % if required. Refer to the *Control User Guide* for further information.

All models are provided with thermal memory retention.

A.8 External Class 2 supply

The external power supply used to power the 24 V control circuit shall be marked: "UL Class 2". The power supply voltage shall not exceed 24 Vdc.