CONTROL TECHNIQUES

COMMANDER S

MAKING SIMPLE APPLICATIONS, SIMPLE.

AC DRIVES, GENERAL PURPOSE

DRIVE OBSESSED

COMMANDER S

0.18 to 4 kW (0.25 to 5 hp)
1Ø 100 & 200 V, 3Ø 200 & 400 V
Linear V to F, square V to F, resistance compensation

Take charge of control and energy savings with the latest addition to the Control Techniques portfolio. With a feature set optimised for simple motion cycles, Commander S provides a cost-effective solution for applications that require plug and play control convenience straight from the box.

Commander S is the first drive to come with an app interface as a standard feature. The Marshal app is our revolutionary way to interface with the drive covering commissioning, monitoring, diagnostic and support.

5 YEAR FREE WARRANTY

Free 5 year warranty*

Our Commander S series is built to cope with harsh environments. In fact, it is so reliable we are confident enough to supply it with a free five-year warranty.

*Warranty terms and conditions apply.

Easy to install

The sleek curved design of Commander S optimises component layout for a small footprint and easy access to terminals. The click-on/click-off DIN rail mount makes installation remarkably easy.

Easy to use

Using our new Marshal app (Android/iOS) your drive will be up and running in under 60 seconds

Reliable

Durability is at the core of Commander S' design, guaranteeing performance throughout its whole life cycle.

Cost effective

Equipped with unique features designed to save you time, energy and money

GENERAL PURPOSE

MAKING SIMPLE APPLICATIONS, SIMPLE.

Fan, Pump, Compressor Applications

- Improved energy efficiency during periods of low demand
- PID functionality makes advanced control easy and efficient without the need of an external controller
- Easily avoid equipment resonant frequencies and reduce high vibration levels by using the skip frequency
- Catch an already spinning motor to reduce start-up time and increase efficiency
- Motor thermal protection prevents overheating of the motor under extreme environmental conditions

Moving Applications

conveyors, treadmills, automatic doors & barriers

- Reliable speed control with onboard communications
- S-ramp acceleration / deceleration profiling provides smooth speed transitions minimising machine jerk
- Linear V to F with a control-able boost to get the machine running
- Drive overload capacity up to 150% adds stability
- DC Injection Braking gives improved stopping capability

Processing Applications

mixers, crushers, agitators, centrifuges, kneaders, spinning & braiding machines for textile

- Ease of integration to external PLC or other management systems with on board communications
- Stop detection function protects the equipment from damage when sudden power failure occurs
- Stability optimizer for improved motor control
- Resistance compensation for excellent torque performance
- Built-in EMC filter effectively reduces electromagnetic interference

MARSHAL

REVOLUTIONISE THE WAY YOU INTERFACE WITH YOUR DRIVE

Control Techniques has a long tradition of challenging the status-quo with innovative ideas and making a profound impact in the drives industry. And we've done it again with Marshal: Control Techniques is the 1st drive supplier to implement the NFC technology as standard on a drive and offer the Marshal app interface at no extra cost.

Marshal is your drive expert in the field. This rich content interface means you can commission, clone, diagnose issues with and monitor the drive in just a few screen taps.

TAP: JUST BRING YOUR PHONE NEAR THE NFC LOGO TO CONNECT TO THE DRIVE

Download on the App Store

GET IT ON Google Play

For Microsoft users, this mobile app operates with Windows 10 only.

Powered by NFC* technology, the data transfer between the drive and the mobile device takes less than 0.5s.

** NFC - Near Field Communication*

MARSHAL
YOUR DRIVE EXPERT IN THE FIELD

Commissioning

- Power off or on commissioning (even in the box)
- FastStart – assisted commissioning. Only 4 key settings to get you up and running
- Advanced features available in parameter setting
- Pre-set application configurations

Cloning

- Parameters can be easily transferred from one drive to another - just tap to write as many drives as you want
- Back-up and restore the configuration via the app

Share

- Share configuration via Outlook, OneDrive, WhatsApp etc.
- Shared configurations are compatible with Marshal & Connect (our PC commissioning tool)
- Export configuration to PDF format

Offline capabilities

- Create new configurations in the app
- Open existing projects to review/change parameters

Diagnostics

- Diagnostics available with power off or on
- Get support with drive alarms within the app
- Error log & active error diagnostics – view active and historical error info
- Differences from default – compare configuration against factory defaults

Registration

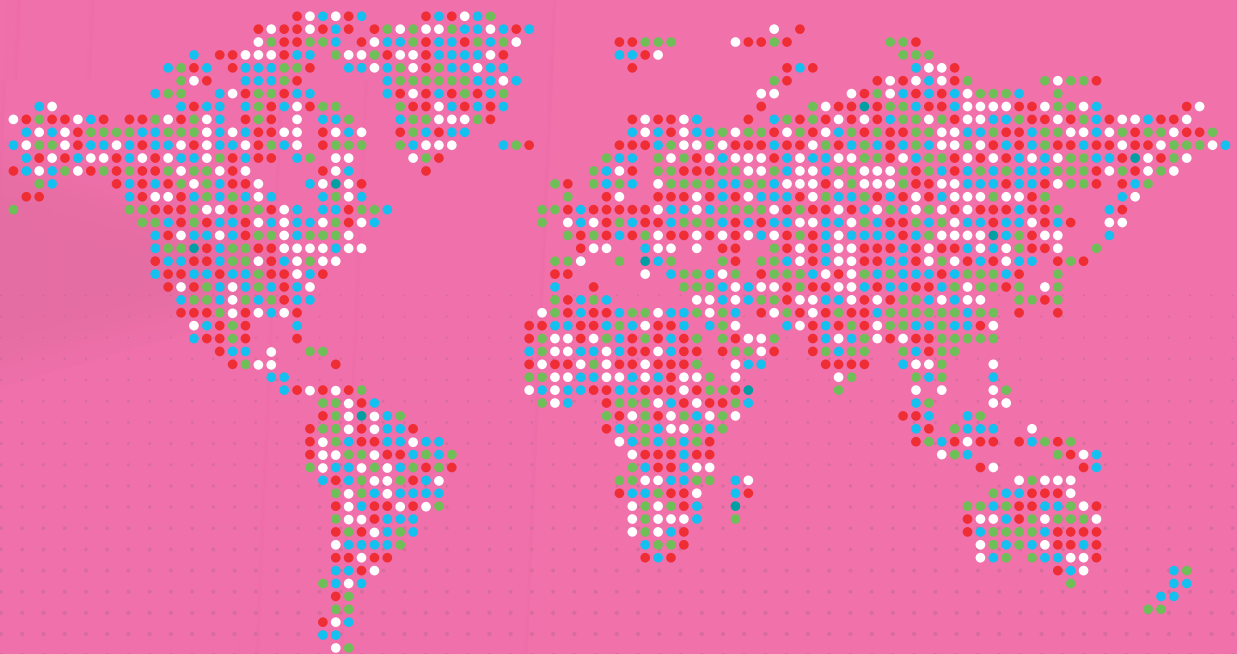
- Activate the 5 Year Warranty via the app
- View the drives registered under your account
- Access & download support materials via your CT account

Monitoring and security

- Quick view of parameter settings & drive status
- Restrict access to drive configuration via PIN
- Quick visualisation of I/O, motor, and speed settings

Contact us

Access to worldwide distribution network and local drive centres for buying and technical support



COMMANDER S

Cost effective

- Intelligent fan control reduces energy usage
- Easy integration to automation via the onboard ModbusRTU
- Integrated C1 EMC filter for residential installations saves space and cost
- Environmentally friendly – meets ECO design regulations

Easy to install

- Simple to fit with click on/click off DIN rail mounting
- Angled and offset screw terminal connectors for easy access and fast installation
- The small footprint and side-by-side installation saves cabinet space

Easy to use

- Marshal App interface enables drive set-up in only 60s
- Simple setup routines tailored to your application
- FastStart commissioning menu – only four key settings to get your motor running
- Full flexibility in choosing your preferred interface; Marshal, keypad, Connect
- A PIN can be set on the drive or Marshal to restrict unwanted access

Reliable

- 100% conformal coating ensures moisture, corrosion and dust protection
- Free 5 Year Warranty gives peace of mind
- Latest generation of components from trusted suppliers, to meet long term robustness and reliability standards
- Keep running by default maintains a stable motor run even during unusual loadings or operation conditions

KEY USABILITY FEATURES

Accessible NFC location for pairing with mobile app MARSHAL

Fixed display with 4 control buttons for quick and easy commissioning and for monitoring drive performance

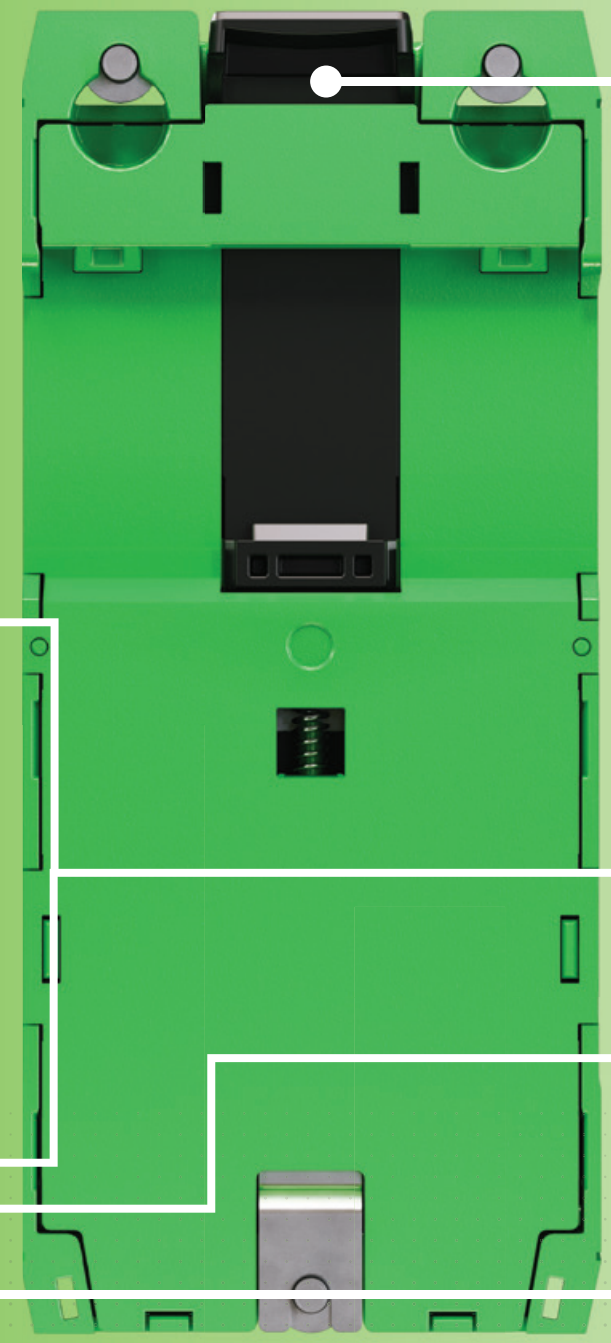
Drive identification info clearly marked

Rating info laser printed on the side of the drive

RJ-45 connector for ModbusRTU communication

Angled and offset screw terminal connectors for easy access

Internal EMC filter for C3 or C1 requirements. C3 filter can be disconnected if necessary.



Click-on/click-off DIN rail mounting

AND / OR

Installation with 3 x bolts with washer.

Drive drops down into position for a secure installation

Finger proof input and output power connections & relay screw terminals

Labelled power terminals

Ground / protective earth connections

FastStart

STEP BY STEP ASSISTANCE TO

There are only 4 simple steps to take to get your motor running:

1

Motor

Confirm/change motor information: voltage, current, rated speed, power factor

2

Speed

Input the max & min speed you want the motor to turn at and the acceleration and deceleration time

via your preferred interface

Full flexibility in choosing the interface: Marshal on your mobile phone, the integrated drive keypad or Connect on a PC.

Marshal

Keypad

GET YOU UP AND RUNNING

3

Control

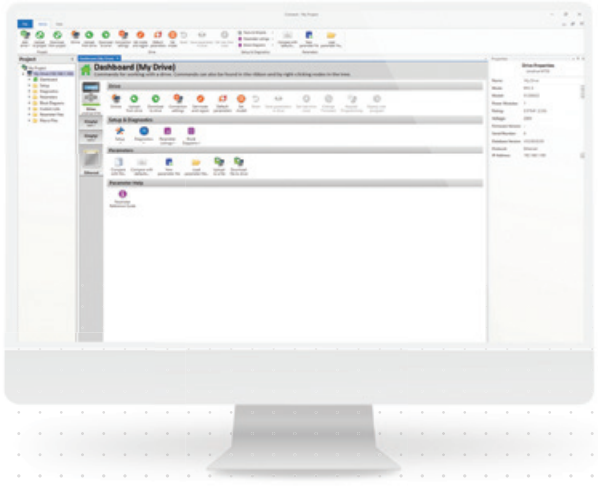
Set-up how the drive speed is controlled: via control inputs or keypad, and how to start the drive

4

Confirm

Summary of settings.

Drive ready to run



Connect

Connect offers an easy way to commission the drive on your PC.

The dynamic drive logic diagrams allow the visualisation and control of the drive in real time. The parameter browser enables viewing, editing and saving of parameters as well as importing parameter files from other drives.

Connect is a one tool interface for all CT drives.

COMMANDER S
SPECIFICATIONS

Power & control	
Supply requirements	100 V drive: 100 V to 120 V ±10 % 200 V drive: 200 V to 240 V ±10 % 400 V drive: 380 V to 480 V ±10 % Maximum supply imbalance: 2 % negative phase sequence (equivalent to 3 % voltage imbalance between phases)
Power range	0.18 to 4 kW / 0.25 to 5 hp
Input frequency range	45 to 66 Hz
Output frequency/speed range	0 to 300 Hz
Switching frequency range	4 kHz or 12 kHz
Heavy duty overload capability	150 % for 60 s (from cold), 150 % for 8 s (from hot)
Operating modes	Linear V to F, square V to F, resistance compensation
Stopping modes	Coast, Ramp, Ramp & DC Braking, DC Braking with 0Hz detect, Timed DC Braking, Distance Stop
Accuracy	Output frequency resolution: 0.1 Hz Analog input 1: 11 bit Analog input 2: 11 bit Current: The resolution of the current feedback is 10 bit Accuracy: typical 2 %, worst case 5 %
Communication & Interfaces	
Communications	RS-485 for Modbus RTU, NFC for app interface
Keypads	Fixed LED keypad, Remote RTC Keypad (available as an accessory) Remote IP66 Keypad (available as an accessory)
User software tools (free to download)	Connect (PC commissioning tool) Marshal (mobile app)
Inputs & Outputs	
Analog	2 x Analog input (can also be used as digital inputs) 0-10 V; 0-20 mA; 4-20 mA 1 x Analog output 0-10 V
Digital	4 x Digital inputs (1 frequency input) 1 x Digital input / output (can be used as a frequency or PWM output to represent analog value) Positive or Negative input logic (PNP or NPN sensors)
Relay	1 x Relay (single pole, double throw relay)
Mounting & Environment	
IP rating	IP20
Storage temperature	-40 °C to 60 °C (-40 °F to 140 °F)
Operating temperature without de-rate	-10 °C to 40 °C (14 °F to 104 °F)
Operating temperature with de-rate	-10 °C to 60 °C (14 °F to 140 °F)
Cooling	Natural convection (frame 1 ≤0.55 kW / 0.75 hp), Cooling of power electronics via heat sink with integrated fan (all other drives)
Altitude	≤3000 m (1000 m to 3000 m derate 1 % over 100 m)

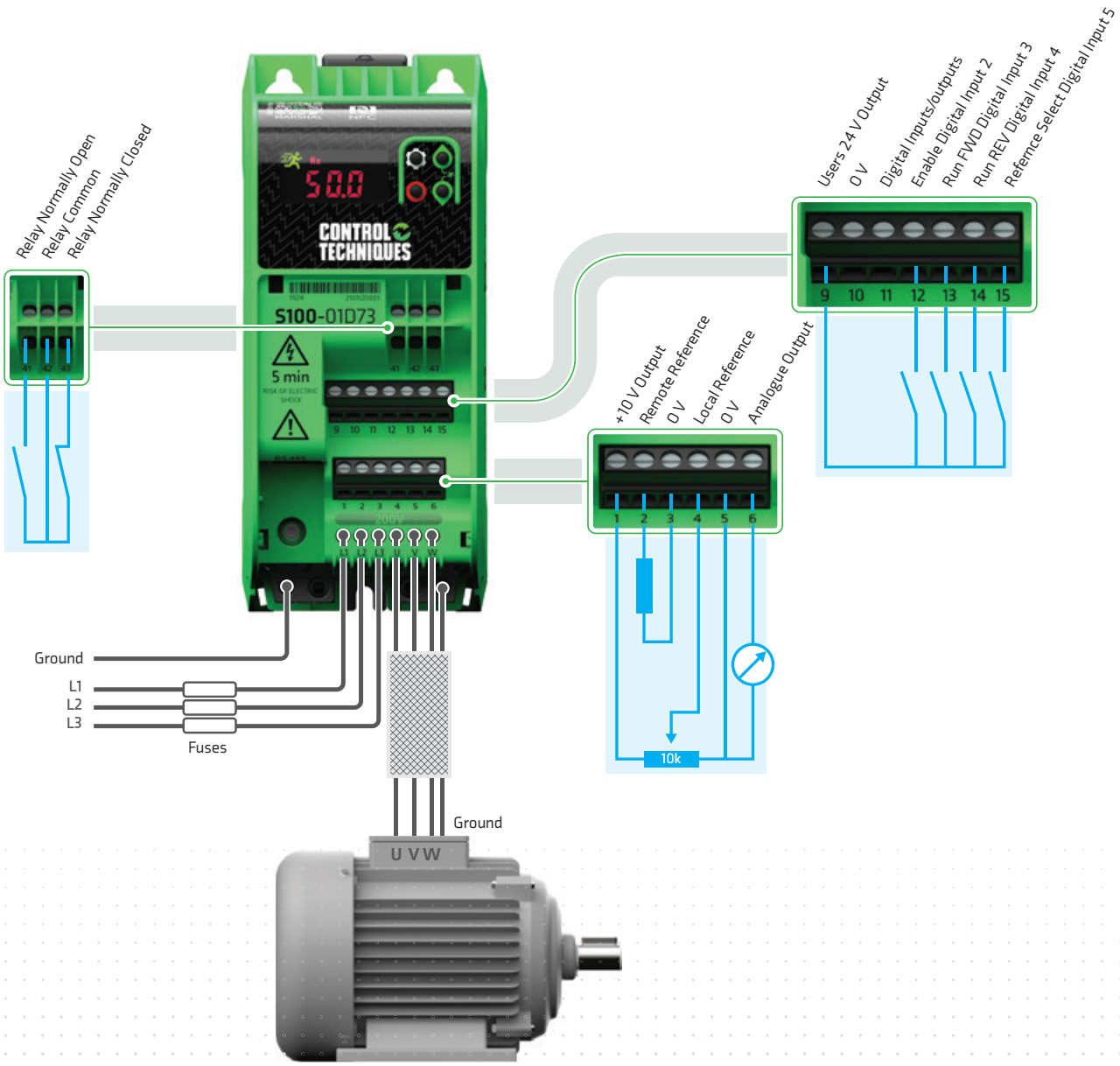
Humidity	95 % non-condensing at 40 °C / 104 °F - EN61800-2(3k3)
Pollution	Pollution degree 2 - dry, non-conducting pollution only
Mounting methods	Click on/click off DIN rail mount, screw mount, 0 mm side by side
Standards	
Approvals	C-Tick, EAC, KC, cUL, CE
EMC standards, radiated emissions and disturbance voltage (conducted emissions and radiated emissions when installed according to EMC requirements)	EN61800-3 category C3, 2nd environment (industrial premises): EN61800-3 category C1, 1st environment (domestic premises) for 1 200 V selected variants External EMC filters available for compliance to EN61800-3 category C1 & C2

Warranty	
Free 5 year warranty (T&Cs apply)	
Accessories	
Remote interfaces	Remote keypad IP66, Remote keypad RTC, HMI
Filters & cables	EMC filter, Cable management bracket
Protection	
DC Bus Undervoltage Error Level	100 V Drives= 175 V 200 V Drives = 175 V 400 V Drives = 330 V
DC Bus Overvoltage Error Level	100 V Drives = 415 V 200 V Drives = 415 V 400 V Drives = 830 V
Overcurrent limit	150 % Motor Rated Current (Programmable)
Motor Thermal Protection	Electronically protects the motor from over-heating due to loading conditions
Fire mode	A special operating mode of the drive when used in fan applications that is activated by a signal from the building's fire alarm system that specifically indicates a fire condition. The aim of Fire Mode is to maximise availability of the smoke control system used in a building for smoke extraction in the event of a fire. Once operating in Fire Mode the drive will run until it fails.
Keep running by default	Allows for continuous run during unusual loadings or operation conditions

Applications

- PID Controller with threshold detection, feed forward and programmable slew-rate
- Catch an already spinning motor
- Low energy mode (dynamic voltage to frequency mode)
- Motor stability optimiser
- Programmable skip frequency
- Automatic reference & run/stop configurations
- S-ramps
- 4 configurable references
- Built in drive diagnostics
- Auto-reset
- Supply loss ride through
- Up to 12 kHz switching frequency
- Positive or Negative input logic (PNP or NPN sensors)
- Slip compensation
- Up/down reference (motorised potentiometer)
- Parameter cloning with Marshal or over ModbusRTU
- Fire mode
- Keep running by default

COMMANDER S
WIRING DIAGRAM



COMMANDER S
ORDERING GUIDE

How to select a drive

Electrical Considerations

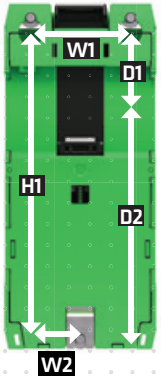
- What is the supply voltage?
- Single or three phase input power?
- What is the motor rating?
- Continuous current – FLA (Full Load Amps)
- Select the drive based on motor Amps rather than power rating

Frame 01 Frame 02 Frame 03

Dimensions

Model Number	Overall Dimensions							
	Height		Depth		Width		Weight	
	mm	in	mm	in	mm	in	kg	lb
S100-01	156	6.14	68	2.70	130	5.12	0.7	1.54
S100-02	192	7.56	68	2.70	132	5.20	0.8	1.76
S100-03	192	7.56	90	3.54	132	5.20	1.0	2.2

Commander S100 Mounting Dimensions



Model Number	H1		W1		W2		D1		D2		Mounting Hole Diameter	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
S100-01	145	5.71	45	1.77	22	0.89	40	1.56	105	3.66	4.8	0.19
S100-02	180	7.11	45	1.77	22	0.89	40	1.56	140	5.55	4.8	0.19
S100-03	180	7.11	65	2.56	37	1.48	40	1.56	140	5.55	4.8	0.19

COMMANDER S

PART NUMBERS

Product Code	Input Phases	Frame Size	Internal EMC Filter Performance	Heavy Duty		
				Max Cont. Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
100/120 Vac +/-10%						
S100-01113-0A0000	1	1	C3	1.2	0.18	0.25
S100-01123-0A0000	1	1	C3	1.4	0.25	0.33
S100-01133-0A0000	1	1	C3	2.2	0.37	0.5
S100-03113-0A0000	1	3	C3	3.2	0.55	0.75
S100-03123-0A0000	1	3	C3	4.2	0.75	1
S100-03133-0A0000	1	3	C3	6	1.1	1.5
200/240 Vac +/-10%						
S100-01S13-0A0000	1	1	C3	1.2	0.18	0.25
S100-01213-0A0000	3	1	C3	1.2	0.18	0.25
S100-01S23-0A0000	1	1	C3	1.4	0.25	0.33
S100-01223-0A0000	3	1	C3	1.4	0.25	0.33
S100-01S33-0A0000	1	1	C3	2.2	0.37	0.5
S100-01233-0A0000	3	1	C3	2.2	0.37	0.5
S100-01S43-0A0000	1	1	C3	3.2	0.55	0.75
S100-01243-0A0000	3	1	C3	3.2	0.55	0.75
S100-01S53-0A0000	1	1	C3	4.2	0.75	1
S100-01253-0A0000	3	1	C3	4.2	0.75	1
S100-01D63-0A0000	1|3	1	C3	6	1.1	1.5
S100-01D73-0A0000	1|3	1	C3	6.8	1.5	2
S100-03D13-0A0000	1|3	3	C3	9.6	2.2	3
380/480 Vac +/-10%						
S100-02413-0A0000	3	2	C3	1.2	0.37	0.5
S100-02423-0A0000	3	2	C3	1.7	0.55	0.75
S100-02433-0A0000	3	2	C3	2.2	0.75	1
S100-02443-0A0000	3	2	C3	3.2	1.1	1.5
S100-02453-0A0000	3	2	C3	3.7	1.5	2
S100-02463-0A0000	3	2	C3	5.3	2.2	3
S100-03413-0A0000	3	3	C3	7.2	3	3
S100-03423-0A0000	3	3	C3	8.8	4	5

Variants with C1 built-in EMC filter

Product Code	Input Phases	Frame Size	Internal EMC Filter Performance	Heavy Duty		
				Max Cont. Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (HP)
200/240 Vac +/-10%						
S100-02S11-0A0000	1	2	C1	1.2	0.18	0.25
S100-02S21-0A0000	1	2	C1	1.4	0.25	0.33
S100-02S31-0A0000	1	2	C1	2.2	0.37	0.5
S100-02S41-0A0000	1	2	C1	3.2	0.55	0.75
S100-02S51-0A0000	1	2	C1	4.2	0.75	1
S100-02S61-0A0000	1	2	C1	6	1.1	1.5
S100-02S71-0A0000	1	2	C1	6.8	1.5	2

ACCESSORIES

ORDERING GUIDE

Remote Interface			Order code
Remote Keypad IP66		Remote mountable, intuitive plain text, multilingual LCD keypad for rapid setup and helpful diagnostics from the outside of a panel. Meets IP66 (NEMA 4)	82500000000001
Remote keypad RTC		Remote mountable, intuitive plain text, multilingual LCD keypad allowing flexible mounting on the outside of a panel (meets IP54/NEMA 12). Battery operated real-time clock allows accurate time stamping of events, aiding diagnostics.	82400000019600
HMI		The MCh panels and MChMobile Software have been designed for the easy development of HMI applications including factory and building automation.	ESMART04-MCH040 ESMART07M-MCH070

Cable Management			Order code
Cable Management Bracket		Use of the optional cable management bracket allows the wiring cables to be neatly secured under the drive	xxxxxxxxxxxxxxxxx

Documentation and downloads

Product documentation and PC tools available for download from:

www.controltechniques.com/support

DRIVE OBSESSED

CONTROL TECHNIQUES

Control Techniques has been designing and manufacturing the best variable speed drives in the world since 1973.

Our customers reward our commitment to building drives that outperform the market. They trust us to deliver on time every time with our trademark outstanding service.

More than 45 years later, we're still in pursuit of the best motor control, reliability and energy efficiency you can build into a drive. That's what we promise to deliver, today and always.

1.4K+
Employees

70
Countries

#1 FOR ADVANCED MOTOR AND DRIVE TECHNOLOGY

Nidec

Nidec Corporation is a global manufacturer of electric motors and drives.

Nidec was set up in 1973. The company made small precision AC motors and had four employees. Today, it's a global corporation that develops, builds and installs cutting-edge drives, motors and control systems in over 70 countries with a workforce of more than 110,000.

You'll find its innovations in thousands of industrial plants, IoT products, home appliances, cars, robotics, mobile phones, haptic devices, medical apparatus and IT equipment all over the world.

109K	$14.6B	70+	330+
Employees	Group Turnover	Countries	Companies

CONTROL TECHNIQUES

CONTROL TECHNIQUES IS YOUR GLOBAL DRIVES SPECIALIST.

With operations in over 70 countries, we're open for business wherever you are in the world.

For more information, or to find your local drive centre representatives, visit:

www.controltechniques.com

Connect with us

THE AUTOMATION ENGINEER

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Nidec
All for dreams

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