



Sumitomo Drive Technologies

About Sumitomo Drive Technologies
Sumitomo Drive Technologies has been trusted for over 130 years to provide quality products and innovative solutions to help our customers solve their complex challenges. This rich history has made us a leading manufacturer of power transmission and control products in a wide variety of applications for leading brands around the globe. Since 1966, Sumitomo Machinery Corporation of America has served the United States by providing local sales and support to a variety of customers spanning the many industries that are unique to our region, such as food and beverage, parcel handling, automotive, and mining.



Sumitomo Drive Technologies

OPTIDRIVE™ CP²

AC Variable Speed Drive

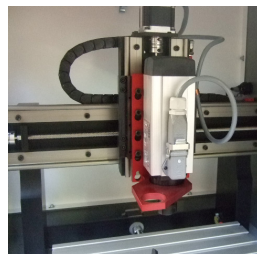
Powerful Performance
Advanced motor control

Global Drive Solutions

Inverter Drives operate at the heart of automated systems around the world



Crane Control
Demanding application at South African mine



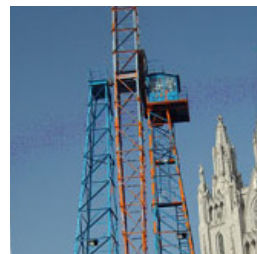
Machine Tool OEM
UK machine tool supplier specifies Optidrive



Film Manufacturing
Optimum tension control in Australia



Food Processing
Precision conveyor control in Spain



Amusement Parks
Reliable control of difficult loads in Spain



www.sumitomodrive.com

For worldwide locations, please visit www.sumitomodrive.com/worldwide
Contact your local representative at www.sumitomodrive.com/representative
Tel: 1-800-SM-CYCLO (762-9256)



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0.75kW – 250kW / 1HP – 350HP
200 – 600V Single & 3 Phase Input

Powerful Performance

World leading control for the latest generation of permanent magnet and standard induction motors

Manufacturing Conveyor Systems Machine Tools Processing Plants Chemical Pumping Plastics Rubber Elevators Cranes



World Leading Motor Control

The Optidrive P2 offers the perfect combination of high performance together with ease of use to allow even the most demanding applications to be tackled easily.

Designed for fast installation and commissioning, Optidrive P2 provides the most cost effective solution for industry.

All Optidrive P2 units provide 150% overload for 60 seconds as standard, ensuring each drive is suitable for Heavy Duty applications, whilst the IP55 enclosed versions ensure the drive is tough enough to survive in industrial environments.

Extensive I/O and communications interface capabilities ensure the drive can be integrated quickly and efficiently into a wide variety of control systems with the minimum commissioning time, ensuring rapid start up. Invertek's simple parameter structure, and carefully selected factory parameter settings ensure that commissioning time is kept to a minimum.



Compliant with international standards.
Manufactured in the UK.

Advanced Motor Control

Optidrive P2 has been uniquely developed to allow a wide range of different motor types to be used, with only parameter changes being required. This technology allows the same drive to be used in a wide range of applications, allowing OEMs and end user alike to take advantage of the energy saving provided by using the latest motor technologies.

AC Induction Motors

The majority of AC motors in use today around the world are standard induction motors. These motors are relatively low cost, readily available and provide good performance with long service life. With the ever increasing focus on energy efficiency, motor manufacturers have refined and improved their designs in recent years.

Optidrive P2 has been developed to provide optimum control and maximum efficiency when operating with older motors designs, or newer high efficiency designs.

Operation can be in simple V/F control mode or in High Performance Third Generation Vector Mode, which provides up to 200% torque from zero speed without requiring an encoder.

Permanent Magnet AC Motors

Permanent magnet AC motors provide improved efficiency compared to standard induction motors. Using permanent magnets in the motor construction eliminates the need for any magnetising current, reducing electrical losses. PM motors have been used for many years in high performance applications, however this has always required the use of a feedback device, such as a resolver or encoder. Optidrive P2 has been designed to operate with AC PM motors without requiring any feedback device, allowing them to be used for their energy efficiency benefits without incurring extra cost and complexity in applications which do not require position feedback.

Brushless DC Motors

BLDC motors are similar to AC PM motors, however the design requires a slightly different control method to optimise the performance. Optidrive P2 has the flexibility to control this type of motor, requiring only simple parameter changes. This provides much greater flexibility for OEMs, allowing Optidrive P2 to be used in a variety of applications, with various motor types.

Synchronous Reluctance Motors

Synchronous Reluctance Motors (SynRM), not to be confused with Switched Reluctance Motors, share a similar stator construction to standard induction motors, however the rotor is substantially different, in order to improve the overall efficiency of the motor. SynRM motors are ideally suited to variable torque applications.

Optidrive P2 can control synchronous reluctance motors, allowing the energy saving benefits to be realised.

150% overload for
60 seconds

At a Glance...

High performance, excellent usability and flexible to meet the needs of your application

Keyhole Mounts for fast installation

IP55 / NEMA 12

Integrated Keypad & Display (LED or Multi-language Text Display)

Contactor-style Power Wiring Arrangement

Convenient Reference Card

Keyhole Mounts for fast installation

DIN Rail Mount

Modbus CANopen

Integrated EMC Filter

Pluggable Control Terminals

Integrated Cable Management

High Quality Long-life Fans

Integral Brake Transistor

Modbus RTU and CANopen on board as standard

Safe Torque Off (provided as standard)

With

Without

Optidrive P2 features a safe torque off function to allow simple integration into machine critical safety circuits.

- Simple machine design reduces component costs, saves panel space and minimises installation time
- Faster shut down and reset procedures reduce system maintenance time
- Better safety standard compared to mechanical solution
- Better motor connection. Single cable with no interruption.

Functional Safety
TÜV Rheinland FS

Applications

High performance, accurate motor control for even the most demanding of applications



Mining & Quarrying

- Feed conveyers
- Crushers
- Cranes

Metals & Processing

- Grinding
- Cutting
- Polishing
- Drilling
- Rolling

Rubber & Plastics

- Extruders
- Moulding
- Mixers
- Winding

Food & Beverage

- Conveyers
- Pumps
- Mixers
- Palletisers



Cranes



Requirements:

- High starting torque
- Smooth motor operation throughout starting and stopping phases
- Motor holding brake control
- Avoidance of load droop and sag
- Regeneration and braking capability during load lowering

Optidrive P2 provides:

- Dedicated Hoist Mode Operation with motor holding brake control algorithm
- Up to 200% torque from zero speed in vector operation without encoder feedback
- Multiple Preset Speed or variable speed operation
- Built in dynamic braking transistor, requires only an external resistor

Compressors



Requirements:

- Precise regulation of speed to ensure a consistent end product
- High starting torque demand in many applications
- Maximum efficiency under all conditions
- Safe operation to prevent accidents and injuries

Optidrive P2 Provides:

- PM Motor control mode to allow open loop operation with Permanent Magnet motors for maximum efficiency
- Maximum starting torque with standard AC motors
- Better than 0.5% speed holding accuracy in Open Loop Vector Operation
- Dedicated Safe Torque Off input complies with EN62061 SIL Level 2 for safe operation

Winding



Requirements:

- Precise control of motor torque over a broad speed range
- Accurate control of material tension under all conditions
- Open or closed loop control capability, based on tension feedback or winding diameter
- Web break protection in case of material breakage

Optidrive P2 Provides:

- PID Closed Loop Tension Control with feedback from a load cell or dancer arm
- Open Loop Vector control provides optimum control of the output torque level
- Encoder feedback option allows for a very wide speed range, even down to zero speed
- Safe Torque Off input immediately disables the drive in Emergency conditions

Powerful, versatile and easy to use

Options & Accessories

Installation options, plug-in modules and commissioning tools



Modbus RTU and CANopen on board as standard

For additional communication interfaces or functionality a range of plug-in modules is available:

Fieldbus Interfaces



Profibus DP
OPT-2-PROFB-IN



DeviceNet
OPT-2-DEVNT-IN



Ethernet IP
OPT-2-ETHNT-IN



Modbus TCP
OPT-2-MODIP-IN



Profinet
OPT-2-PFNET-IN



EtherCat
OPT-2-ETCAT-IN



Plug-in Options



Encoder Feedback
OPT-2-ENCOD-IN (5 Volt)
OPT-2-ENCHT-IN (15 – 30 Volt)

Closed loop encoder feedback, compatible with a wide range of incremental encoders

Extended I/O
OPT-2-EXTIO-IN

- Additional 3 Digital Inputs
- Additional Relay Output

Extended Relay
OPT-2-CASCD-IN

Additional 3 Relay Outputs:

Relay 3 – Drive Healthy Indication
Relay 4 – Drive Fault Indication
Relay 5 – Drive Running Indication

Functions are programmable / adjustable

Installation & Peripheral Options

A range of external EMC Filters, Brake Resistors, Input Chokes and Output Filters are available, to suit all installation requirements

Optistick Smart

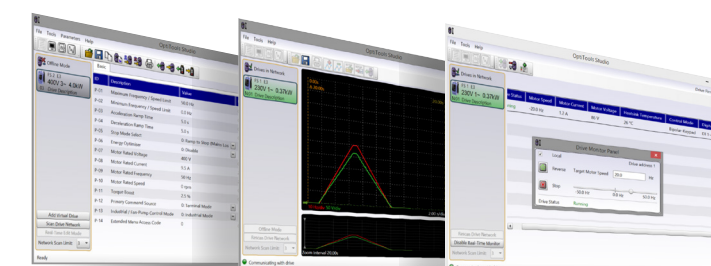


Rapid Commissioning Tool

- Allows copying, backup and restore of drive parameters
- Provides Bluetooth interface to a PC running OptiTools Studio or the OptiTools Mobile app on a smartphone
- Onboard NFC (Near Field Communication) for rapid data transfer

OPT-3-STICK-IN

OptiTools Studio



Powerful PC Software

Drive commissioning and parameter backup

- Real-time parameter editing
- Drive network communication
- Parameter upload, download and storage
- Simple PLC function programming
- Real-time scope function and data logging
- Real-time data monitoring

Compatible with:

Windows Vista
Windows 7
Windows 8
Windows 8.1
Windows 10

Replace # in model code with enclosure/display option

Frame Size			kW	HP	Amps	kW Model Code							HP Model Code						
IP20	IP55	IP66				Product Family	Generation	Frame Size	Power Rating Code	Supply Phase	Power Type	Brake Transistor	Product Family	Generation	Frame Size	Power Rating Code	Supply Phase	Power Type	Brake Transistor
200–240V±10% 1 Phase Input	2	2	0.75	1	4.3	ODP	- 2 - 2 2	075	- 1 K F 4	#			ODP	- 2 - 2 2	010	- 1 H F 4	#		
	2	2	1.5	2	7	ODP	- 2 - 2 2	150	- 1 K F 4	#			ODP	- 2 - 2 2	020	- 1 H F 4	#		
	2	2	2.2	3	10.5	ODP	- 2 - 2 2	220	- 1 K F 4	#			ODP	- 2 - 2 2	030	- 1 H F 4	#		
200–240V±10% 3 Phase Input	2	2	0.75	1	4.3	ODP	- 2 - 2 2	075	- 3 K F 4	#			ODP	- 2 - 2 2	010	- 3 H F 4	#		
	2	2	1.5	2	7	ODP	- 2 - 2 2	150	- 3 K F 4	#			ODP	- 2 - 2 2	020	- 3 H F 4	#		
	2	2	2.2	3	10.5	ODP	- 2 - 2 2	220	- 3 K F 4	#			ODP	- 2 - 2 2	030	- 3 H F 4	#		
	3	3	4	5	18	ODP	- 2 - 3 2	040	- 3 K F 4	#			ODP	- 2 - 3 2	050	- 3 H F 4	#		
	3		5.5	7.5	24	ODP	- 2 - 3 2	055	- 3 K F 4	#			ODP	- 2 - 3 2	075	- 3 H F 4	#		
	4	4	5.5	7.5	24	ODP	- 2 - 4 2	055	- 3 K F 4	#			ODP	- 2 - 4 2	075	- 3 H F 4	#		
	4	4	7.5	10	30	ODP	- 2 - 4 2	075	- 3 K F 4	#			ODP	- 2 - 4 2	100	- 3 H F 4	#		
	4	4	11	15	46	ODP	- 2 - 4 2	110	- 3 K F 4	#			ODP	- 2 - 4 2	150	- 3 H F 4	#		
	5	5	15	20	60	ODP	- 2 - 5 2	150	- 3 K F 4	#			ODP	- 2 - 5 2	020	- 3 H F 4	#		
	5	5	18.5	25	72	ODP	- 2 - 5 2	185	- 3 K F 4	#			ODP	- 2 - 5 2	025	- 3 H F 4	#		
	6A	6	22	30	90	ODP	- 2 - 6 2	022	- 3 K F 4	#			ODP	- 2 - 6 2	030	- 3 H F 4	#		
	6A	6	30	40	110	ODP	- 2 - 6 2	030	- 3 K F 4	#			ODP	- 2 - 6 2	040	- 3 H F 4	#		
380–480V±10% 3 Phase Input	6B	6	37	50	150	ODP	- 2 - 6 2	037	- 3 K F 4	#			ODP	- 2 - 6 2	050	- 3 H F 4	#		
	6B	6	45	60	180	ODP	- 2 - 6 2	045	- 3 K F 4	#			ODP	- 2 - 6 2	060	- 3 H F 4	#		
	7	7	55	75	202	ODP	- 2 - 7 2	055	- 3 K F 4	#			ODP	- 2 - 7 2	075	- 3 H F 4	#		
	7	7	75	100	240	ODP	- 2 - 7 2	075	- 3 K F 4	#			ODP	- 2 - 7 2	100	- 3 H F 4	#		
	2	2	0.75	1	2.2	ODP	- 2 - 2 4	075	- 3 K F 4	#			ODP	- 2 - 2 4	010	- 3 H F 4	#		
	2	2	1.5	2	4.1	ODP	- 2 - 2 4	150	- 3 K F 4	#			ODP	- 2 - 2 4	020	- 3 H F 4	#		
	2	2	2.2	3	5.8	ODP	- 2 - 2 4	220	- 3 K F 4	#			ODP	- 2 - 2 4	030	- 3 H F 4	#		
	2	2	4	5	9.5	ODP	- 2 - 2 4	400	- 3 K F 4	#			ODP	- 2 - 2 4	050	- 3 H F 4	#		
	3	3	5.5	7.5	14	ODP	- 2 - 3 4	055	- 3 K F 4	#			ODP	- 2 - 3 4	075	- 3 H F 4	#		
	3	3	7.5	10	18	ODP	- 2 - 3 4	075	- 3 K F 4	#			ODP	- 2 - 3 4	100	- 3 H F 4	#		
	3		11	15	24	ODP	- 2 - 3 4	110	- 3 K F 4	#			ODP	- 2 - 3 4	150	- 3 H F 4	#		
	4	4	11	15	24	ODP	- 2 - 4 4	110	- 3 K F 4	#			ODP	- 2 - 4 4	150	- 3 H F 4	#		
480–525V±10% 3 Phase Input	4	4	15	20	30	ODP	- 2 - 4 4	150	- 3 K F 4	#			ODP	- 2 - 4 4	200	- 3 H F 4	#		
	4	4	18.5	25	39	ODP	- 2 - 4 4	185	- 3 K F 4	#			ODP	- 2 - 4 4	250	- 3 H F 4	#		
	4	4	22	30	46	ODP	- 2 - 4 4	220	- 3 K F 4	#			ODP	- 2 - 4 4	300	- 3 H F 4	#		
	5	5	30	40	61	ODP	- 2 - 5 4	300	- 3 K F 4	#			ODP	- 2 - 5 4	040	- 3 H F 4	#		
	5	5	37	50	72	ODP	- 2 - 5 4	370	- 3 K F 4	#			ODP	- 2 - 5 4	050	- 3 H F 4	#		
	6A	6	45	60	90	ODP	- 2 - 6 4	045	- 3 K F 4	#			ODP	- 2 - 6 4	060	- 3 H F 4	#		
	6A	6	55	75	110	ODP	- 2 - 6 4	055	- 3 K F 4	#			ODP	- 2 - 6 4	075	- 3 H F 4	#		
	6B	6	75	100	150	ODP	- 2 - 6 4	075	- 3 K F 4	#			ODP	- 2 - 6 4	100	- 3 H F 4	#		
	6B	6	90	150	180	ODP	- 2 - 6 4	090	- 3 K F 4	#			ODP	- 2 - 6 4	150	- 3 H F 4	#		
	7	7	110	175	202	ODP	- 2 - 7 4	110	- 3 K F 4	#			ODP	- 2 - 7 4	175	- 3 H F 4	#		
	7	7	132	200	240	ODP	- 2 - 7 4	132	- 3 K F 4	#			ODP	- 2 - 7 4	200	- 3 H F 4	#		
	7	7	160	250	302	ODP	- 2 - 7 4	160	- 3 K F 4	#			ODP	- 2 - 7 4	250	- 3 H F 4	#		
500–600V±10% 3 Phase Input	8		200	300	370	ODP	- 2 - 8 4	200	- 3 K F 4	#			ODP	- 2 - 8 4	300	- 3 H F 4	#		
	8		250	350	450	ODP	- 2 - 8 4	250	- 3 K F 4	#			ODP	- 2 - 8 4	350	- 3 H F 4	#		
	7		132	–	185	ODP	- 2 - 7 5	132	- 3 K 0 4	#				–					
	7		150	–	205	ODP	- 2 - 7 5	150	- 3 K 0 4	#				–					
	7		185	–	255	ODP	- 2 - 7 5	185	- 3 K 0 4	#				–					
	7		200	–	275	ODP	- 2 - 7 5	200	- 3 K 0 4	#				–					
	2	2	0.75	1	2.1	ODP	- 2 - 2 6	075	- 3 K 0 4	#			ODP	- 2 - 2 6	010	- 3 H 0 4	#		
	2	2	1.5	2	3.1	ODP	- 2 - 2 6	150	- 3 K 0 4	#			ODP	- 2 - 2 6	020	- 3 H 0 4	#		
	2	2	2.2	3	4.1	ODP	- 2 - 2 6	220	- 3 K 0 4	#			ODP	- 2 - 2 6	030	- 3 H 0 4	#		
	2	2	4	5	6.5	ODP	- 2 - 2 6	400	- 3 K 0 4	#			ODP	- 2 - 2 6	050	- 3 H 0 4	#		
	2	2	5.5	7.5	9	ODP	- 2 - 2 6	550	- 3 K 0 4	#			ODP	- 2 - 2 6	075	- 3 H 0 4	#		
	3	3	7.5	10	12	ODP	- 2 - 3 6	075	- 3 K 0 4	#			ODP	- 2 - 3 6	100	- 3 H 0 4	#		
kW Models: Factory Settings Motor Rated Frequency: 50Hz Motor Rated Voltage: 230/400/575V	3	3	11	15	17	ODP	- 2 - 3 6	110	- 3 K 0 4	#			ODP	- 2 - 3 6	150	- 3 H 0 4	#		
	3		15	20	22	ODP	- 2 - 3 6	150	- 3 K 0 4	#			ODP	- 2 - 3 6	200	- 3 H 0 4	#		
	4	4	15	20	22	ODP	- 2 - 4 6	150	- 3 K 0 4	#			ODP	- 2 - 4 6	200	- 3 H 0 4	#		
	4	4	18.5	25	28	ODP	- 2 - 4 6	185	- 3 K 0 4	#			ODP	- 2 - 4 6	250	- 3 H 0 4	#		
	4	4	22	30	34	ODP	- 2 - 4 6	220	- 3 K 0 4	#			ODP	- 2 - 4 6	300	- 3 H 0 4	#		
	4	4	30	40	41	ODP	- 2 - 4 6	300	- 3 K 0 4	#			ODP	- 2 - 4 6	400	- 3 H 0 4	#		
	5	5	37	50	54	ODP	- 2 - 5 6	370	- 3 K 0 4	#			ODP	- 2 - 5 6	050	- 3 H 0 4	#		
	5	5	45	60	65	ODP	- 2 - 5 6	450	- 3 K 0 4	#			ODP	- 2 - 5 6	060	- 3 H 0 4	#		
	6	6	55	75	78	ODP	- 2 - 6 6	055	- 3 K 0 4	#			ODP	- 2 - 6 6	075	- 3 H 0 4	#		
	6	6	75	100	105	ODP	- 2 - 6 6	075	- 3 K 0 4	#			ODP	- 2 - 6 6	100	- 3 H 0 4	#		
	6	6	90	125	130	ODP	- 2 - 6 6	090	- 3 K 0 4	#			ODP	- 2 - 6 6	125	- 3 H 0 4	#		
	6	6	110	150	150	ODP	- 2 - 6 6	110	- 3 K 0 4	#			ODP	- 2 - 6 6	150	- 3 H 0 4	#		
kW Models: Factory Settings Motor Rated Frequency: 50Hz Motor Rated Voltage: 230/400/575V			HP Models: Factory Settings Motor Rated Frequency: 60Hz Motor Rated Voltage: 230/460/575V																

Drive Specification

Input Ratings	Supply Voltage	200–240V±10% 380–480V±10% 500–600V±10%	Fieldbus Connectivity	Built-in	CANopen 125–1000kpbs Modbus RTU 9.6–115.2kpbs selectable (8N1, 8N2, 8E1, 8O1)
	Supply Frequency	48–62Hz	Optional	Other	PROFIBUS DP (DPV1) PROFINET IO DeviceNet/IP EtherCAT Modbus TCP
Output Ratings	Displacement Power Factor	> 0.98	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer	
	Phase Imbalance	3% Maximum allowed	Programmable Inputs	5 Total as standard (Optional additional 3) 3 Digital (Optional additional 3) 2 Analog / Digital Selectable	
Ambient Conditions	Inrush Current	< rated current	Digital Inputs	Opto - Isolated 8–30 Volt DC, internal or external supply Response time < 4ms	
	Power Cycles	120 per hour maximum, evenly spaced	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < 1% full scale Parameter adjustable scaling and offset	
Enclosure	Output Power	230V 1Ph. Input: 0.75–2.2kW (1–3HP) 230V 3Ph. Input: 0.75–75kW (1–100HP) 400V 3Ph. Input: 0.75–250kW 460V 3Ph. Input: 1–350HP 575V 3Ph. Input: 0.75–110kW (1–150HP)	PTC Input	Motor PTC / Thermistor Input Trip Level: 3kΩ	
	Overload Capacity	150% for 60 seconds	Programmable Outputs	4 Total (Optional additional 3) 2 Analog / Digital 2 Relays (Optional additional 3)	
Programming	Output Frequency	0–500Hz, 0.1Hz resolution	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 5A AC, 5A DC	
	Acceleration Time	0.01–600 seconds	Application Features	PID Control Internal PID Controller Multi Setpoint Select Standby / Sleep Mode Boost Function	
Control Specification	Deceleration Time	0.01–600 seconds	Hoist Mode	Dedicated Hoist Mode Motor Holding Brake Pre-Torque & Control Over Limit Protection	
	Typical Efficiency	> 98%	Maintenance & Diagnostics	Fault Memory Last 4 Trips stored with time stamp Data Logging Logging of data prior to trip for diagnostic purposes: Output Current Drive Temperature DC Bus Voltage	
Setpoint Control	Temperature	Storage: –40 to 60°C Operating: –10 to 50°C	Maintenance Indicator	Maintenance Indicator with user adjustable maintenance interval Onboard service life monitoring	
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL Approved Up to 4000m maximum (non UL)	Monitoring	Hours Run Meter Resettable & Non Resettable kWh meters Cooling Fan Run Time	
Standards Compliance	Humidity	95% Max, non condensing	Standards Compliance	Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU Additional Conformance UL, cUL, EAC, RCM Marine Certification DNV Type Approval	
	Vibration	Conforms to IEC 60068-2-6 Sinusoidal Vibration 10–57Hz @ 0.075mm Pk 57–150Hz @ 1g Pk	Environmental Conditions	Designed to meet IEC 60721-3-3, in operation: IP20 Drives: 3S2/3C2 IP55 & 66 Drives: 3S3/3C3	
Braking	PWM Frequency	4–32kHz Effective	Braking	Motor Flux Braking Built-in Braking Transistor	
	Stopping Mode	Ramp to Stop: User Adjustable 0.01–600 secs Coast to Stop	Skip Frequency	Single point, user adjustable	
Analog Signal	Braking	Motor Flux Braking Built-in Braking Transistor	Setpoint Control	Analog Signal 0 to 10 Volts 10 to 0 Volts –10 to +10 Volts 0 to 20mA 20 to 0mA 4 to 20mA 20 to 4mA	Digital Motorised Potentiometer (Keypad) Modbus RTU CANopen
	Skip Frequency	Single point, user adjustable			

Model Code Guide

