Qualified for **Energy Technology List**
www.eca.gov.uk
TM

Authorised User No. 00198

Industrial Drives & Controls Ltd,
Drivetec House,
Aqueduct Business Park,
Marple,
Stockport,
Cheshire, SK6 5LD.

Tel: 0161 427 0022
Fax: 0161 427 0033

E-mail: sales@drives-and-controls.co.uk

Short Form Catalogue 2007.1

variable speed drives
LOW VOLTAGE MOTORS

MICROMASTER Variable Speed Drives 0.12 kW– 250 kW
COMBIMASTER Distributed Drive Solutions
SIPLUS IP65 Stainless Steel Enclosed Drive
High Efficiency Motors EFF1 EFF2
Customer Support and Training
Complementary AC and DC Drive Technology

SIEMENS

SIEMENS

Variable Speed Drives and Low Voltage Motors
– an ideal solution for every application

Siemens Automation & Drives supplies a comprehensive range of automation, electrical distribution and drives products worldwide and is the largest supplier of variable speed drives in Europe. Our drives manufacturing facility in Congleton, Cheshire ranks amongst the world's largest variable speed drive factories, producing in excess of 2000 drives per day.

This latest short form catalogue highlights the main features and benefits of our MICROMASTER drives and EFF1 / EFF2 high efficiency motor ranges and complements our latest drives and motors catalogues. With a reputation for innovative technology and the highest quality, our complete family of MICROMASTER drives can fulfil a vast range of application requirements. Add to that our high efficiency motors – robust and cost effective, and Siemens has the optimum solution for all drive applications.

No product range is complete without comprehensive service and training support and this is where Siemens is unrivalled amongst other suppliers. Whether you are looking for applications assistance, training solutions, or breakdown support, you can be assured of a professional and efficient service from Siemens. Our aim is to provide our customers with an outstanding level of support, which safeguards production and contributes to future success.

Call our hotline to arrange a free consultation with one of our expert drive specialists – **0161 446 6400**
E-mail: sales.ad.uk@siemens.com

STOP PRESS

Enclosed units (including IP54) available on request

Contents

Introduction	1
Low Voltage Motors	2
MICROMASTER 420 0.12 kW– 11 kW	3
MICROMASTER 430 7.5 kW– 250 kW	5
MICROMASTER 440 0.12 kW– 250 kW	7
MICROMASTER 411 **COMBIMASTER 411** 0.37 kW– 3 kW	9
SIPLUS IP65	10
MICROMASTER – Options and Accessories	11
ELECTROMAGNETIC COMPATIBILITY (EMC)	12
MICROMASTER Line Chokes / Output Reactors / Braking Resistors	13
MICROMASTER – Interface Connection Schematics	14
Dimensions	
MICROMASTER 420/430/440	16
EMC filter	17
Line commutating chokes	18
Output chokes	19
Brake resistors	20
Totally Integrated Automation – Including "Drive ES"	21
Complementary Drive Technology	22
The SINAMICS Family	
AC and DC Engineered Drive Solutions	
Technical Support, Service and Warranty	23
SITRAIN – Customer Training Solutions	24

Introduction

The latest Siemens MICROMASTER Variable Speed Drives range is now firmly established as the UK's premier brand. The product family is characterised by its ease of installation, simple set up, flexibility, and ease of integration into automation projects.

The integrated MICROMASTER family covers a range of applications unequalled by any of its rivals.

SIEMENS – THE BENCHMARK FOR DRIVE TECHNOLOGY

Easy to Install

A *no compromise* approach has been adopted to ensure the easiest installation in its class. Wiring is arranged for easy access from the front when installed on the mounting panel of a typical switchgear cubicle. The option of integrated EMC filters across the range avoids the cost of separate filter installation. The control connections are quick-release terminals which significantly reduce the typical connection time and provide higher reliability.

Easy to Set-Up

With its class-beating features, the drive is as easy to set up as the most basic of ac drives. This is achieved by separating the most commonly required parameters into a "quick commissioning" group, which is all that will be required by the majority of users. Most applications will be set up with only **12 parameters**.

Robust

Designed to cope with the most demanding environments, and to exceed all European and international standards for immunity to mains voltage disturbance. These units will keep on working where others fail, ensuring trouble-free operation at all times and providing a range of special functions and features to adapt to your requirements.

Fast Response

Through careful optimisation of software performance, a class-beating response time and repeatability to control signals has been achieved.

Totally Integrated Automation

The real problem facing today's plant manager or process engineer is finding system components that can be integrated together seamlessly, using common communications protocols, address registers, databases and user interfaces. This is where the idea of Totally Integrated Automation (TIA) comes in. TIA is a unique way of applying automation and drive solutions, that ensures reduced engineering costs, faster commissioning and increased plant availability.

SINAMICS G110 (0.12 kW – 3 kW)

This particularly compact drive operates with voltage frequency control on single phase supplies (200V to 240V). It is the ideal solution for low cost, low power drive applications. Refer to SINAMICS G110 Short Form catalogue for further details.

MICROMASTER 420 (0.12 kW– 11 kW)

The universal drive for single and three phase supplies. Especially suited for conveyors, pumps and fans.

MICROMASTER 430 (7.5 kW – 250 kW)

"The specialist drive for pumps and fans" with optimised operator panel (manual / auto switchover), matched software functionality and optimised power efficiency.

MICROMASTER 440 (0.12 kW – 250 kW)

"The all-purpose" drive with advanced vector control (with and without encoder feedback) and integrated logic control functions. For demanding applications in sectors such as conveying systems, textiles, elevators, hoisting gear and machine control requirements.

COMBIMASTER 411 (0.37 kW – 3 kW)

"Drive and motor combined". Motor and drive combine to give a perfect solution for decentralised applications from simple individual pump or fans through to multiple drive conveyors.

MICROMASTER Options

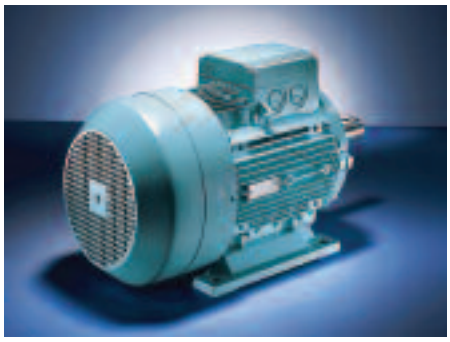
Operator panels, remote mounting kits, EMC filtering, fieldbus modules, PC to inverter connection kit, line commutating chokes, output reactors, gland plates, etc.

Motors

As global market leader, we ship more than 16,000 MW of motor power annually. With a complete range of standard motors that manage the majority of different requirements, and with customised designs where required. All are extremely cost-effective.

Low Voltage Motors – the World's Best Selling Motors

As global market leader, we ship more than 16,000MW of motor power annually – a complete portfolio of standard motors and customised designs which cover every application from pumps, fans and compressors through to highly sophisticated drive systems.



Lower running costs, longer lifetimes, resulting in quicker payback time of your capital

- Lowest lifetime cost
- Improved bearing life
- Low noise design as standard
- Service factor 1.15 for EFF1 motors
- EFF1 designs in standard frame sizes
- Inverter resistant patented insulation system (supply voltages ≤500V)
- Energy technology list qualified motors to 400kW
- Payback times as low as 3 months

Energy Saving Motors

With increasing emphasis on the need to reduce CO_2 within the environment, Siemens offers a comprehensive range of high efficiency, energy saving motors. These motors offer significantly lower operating costs, with up to 42% less power loss within the motor.

High efficiency motors are compliant to CEMEP EU requirements and to WIMES 3.03 specification efficiencies and are listed on the Carbon Trust approved energy technology list for enhanced capital allowances.

To provide complete flexibility, a range of additional modifications is available from the **modular mounting concept** including force ventilation kits, encoders, brake modules etc.

Frame sizes:	56 to 450
Power range:	0.06 to 1,000 kW (4-pole)
Number of Poles:	2, 4, 6, 8
Degree of protection:	IP55 (or greater)
Voltages:	All common voltages
Frequency:	50 Hz and 60 Hz
Design:	IM B3, IM B5, IM B35, IM B14, and others
Enclosure:	Frame sizes 56M – 225M aluminium. Frame sizes 100L... 450 cast iron
Type of cooling:	Fan cooled
Temperature class:	F, utilised according to B
Insulating system:	**Inverter-proof insulation system DURIGNIT® IR 2000**

For frame sizes 280 and above on inverter duty, an insulated non-drive end (NDE) bearing is recommended – available as a standard option.

ATEX certified motors are available, including motors for variable speed use

High Voltage Motors

A comprehensive range of HV motors is also available as part of the most complete motor range available in the marketplace today.

- High power density / Compact dimensions
- 315 - 630 frame (and larger)
- 200kW to 100MW
- 2 to 12 pole
- 2 to 13.8kV, 50 and 60Hz
- IP55
- Rib-cooled and Modular designs
- MICALASTIC® VPI Insulation system, F utilised to B
- Inverter designs available

The MICROMASTER 420 – "The Universal"

"The universal" inverter is suitable for motor speed control in a vast range of industrial variable speed drive applications such as pumps, fans and conveyor systems. It is especially characterised by its performance, flexibility, and ease of use.

- Output up to 11 kW
- Compact housing dimensions
- Simple to install and commission
- Robust construction
- Designed to make EMC compliance easy
- Wide range of user interfaces and communications options
- Operating temperature –10°C to +50°C
- Integrated PI Controller
- Remote I / O function via serial communication or fieldbus link
- Integrated compound braking function – often eliminates the need for external braking modules.

Performance Features and Benefits

- Flux-current control (FCC) to optimise the dynamic response and motor control
- Slip compensation ensuring constant motor speeds under changing load conditions
- "Flying re-start" function allows the inverter to be re-connected to motors which are still spinning after brief power interruptions
- Freely-programmable digital inputs and outputs
- The analogue I / O can be flexibly programmed (offset, range, addition to the digital set point etc)
- Multi-point V / f characteristics for simple adaption to different motor types
- Sophisticated dc injection braking and "compound braking" to assure minimum motor stopping times
- Fast current limit (FCL) guarantees that if the specified ramp times are too short for the load the drive adapts and does not trip
- Integrated kilowatt-hour (kWh) measurement for energy consumption
- Binary and analogue connection technology (BICO) allows the inputs / outputs to be soft-wired to internal function blocks
- Complete inverter and motor protection comprising under-voltage / overvoltage, inverter over-temperature, earth fault protection, short circuit protection, motor thermal protection, locked motor and stall prevention
- MICROMASTER 420 carries the CE mark for conformance to the low voltage and EMC Directives. It is Ⓤ and cⓊ listed.

The Detail

- Three fully programmable opto-isolated digital inputs (4th binary input available via the analogue input)
- Analogue input, 0-10 V (can accommodate 0 / 4 - 20 mA using a resistor link)
- Programmable and scalable analogue output, 0 (4) mA to 20 mA
- Fully programmable relay output, DC 30 V / 5 A resistive, AC 230 V / 2 A inductive
- Opto-isolated digital inputs for improved EMC immunity
- Fast reaction time to analogue, digital and fieldbus commands
- Integrated RS485 port for serial communications.

Supply Voltage – single phase 200 / 240 V*					
Rating	Frame size	Industrial	List price	Filtered †	List price
0.12 kW / 0.9 A	A	6SE6420-2UC11-2AA1	**£109**	6SE6420-2AB11-2AA1	**£122**
0.25 kW / 1.7 A	A	6SE6420-2UC12-5AA1	**£118**	6SE6420-2AB12-5AA1	**£132**
0.37 kW / 2.3 A	A	6SE6420-2UC13-7AA1	**£125**	6SE6420-2AB13-7AA1	**£144**
0.55 kW / 3.0 A	A	6SE6420-2UC15-5AA1	**£137**	6SE6420-2AB15-5AA1	**£153**
0.75 kW / 3.9 A	A	6SE6420-2UC17-5AA1	**£150**	6SE6420-2AB17-5AA1	**£169**
1.1 kW / 5.5 A	B	6SE6420-2UC21-1BA1	**£172**	6SE6420-2AB21-1BA1	**£195**
1.5 kW / 7.4 A	B	6SE6420-2UC21-5BA1	**£196**	6SE6420-2AB21-5BA1	**£225**
2.2 kW / 10.4 A	B	6SE6420-2UC22-2BA1	**£233**	6SE6420-2AB22-2BA1	**£266**
3 kW / 13.6 A	C	6SE6420-2UC23-0CA1	**£269**	6SE6420-2AB23-0CA1	**£326**

*Three phase 200 / 240 V units on request.

† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

Supply Voltage – three phase 380 / 480 V					
Rating	Frame size	Industrial	List price	Filtered †	List price
0.37 kW / 1.2 A	A	6SE6420-2UD13-7AA1	**£273**	6SE6400-2FA00-6AD0	**£59** [1)]
0.55 kW / 1.6 A	A	6SE6420-2UD15-5AA1	**£283**	6SE6400-2FA00-6AD0	**£59** [1)]
0.75 kW / 2.1 A	A	6SE6420-2UD17-5AA1	**£294**	6SE6400-2FA00-6AD0	**£59** [1)]
1.1 kW / 3.0 A	A	6SE6420-2UD21-1AA1	**£311**	6SE6400-2FA00-6AD0	**£59** [1)]
1.5 kW / 4.0 A	A	6SE6420-2UD21-5AA1	**£329**	6SE6400-2FA00-6AD0	**£59** [1)]
2.2 kW / 5.9 A	B	6SE6420-2UD22-2BA1	**£371**	6SE6420-2AD22-2BA1	**£415**
3 kW / 7.7 A	B	6SE6420-2UD23-0BA1	**£420**	6SE6420-2AD23-0BA1	**£470**
4 kW / 10.2 A	B	6SE6420-2UD24-0BA1	**£462**	6SE6420-2AD24-0BA1	**£518**
5.5 kW / 13.2 A	C	6SE6420-2UD25-5CA1	**£588**	6SE6420-2AD25-5CA1	**£659**
7.5 kW / 19.0 A	C	6SE6420-2UD27-5CA1	**£708**	6SE6420-2AD27-5CA1	**£793**
11 kW / 26.0 A	C	6SE6420-2UD31-1CA1	**£911**	6SE6420-2AD31-1CA1	**£1,020**

[1)] Additional footprint module to be used in conjunction with the standard industrial drive.

† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

Options		
6SE6400-0BP00-0AA0	Basic Operator Panel (BOP)	**£26**
6SE6400-0AP00-0AA1	Advanced Operator Panel (AOP)	**£99**
6SE6400-1PC00-0AA0	PC-MICROMASTER Connection Kit	**£22**
6SE6400-0MD00-0AA0	Multidrop Panel Mounting Kit (for AOP)	**£73**
6SE6400-0PM00-0AA0	Standard Panel Mounting Kit (for BOP or AOP)	**£66**
6SE6400-1PB00-0AA0	PROFIBUS Module	**£88**
6SE6400-1DN00-0AA0	Device Net Module	**£88**
6SE6400-1CB00-0AA0	CAN Bus Module	**£88**
6SE6400-0GP00-0AA0	Frame Size A Gland Plate	**£7**
6SE6400-0GP00-0BA0	Frame Size B Gland Plate	**£15**
6SE6400-0GP00-0CA0	Frame Size C Gland Plate	**£22**
6SE6400-5AA00-0BP0	Operating Instructions	**£45** [2)]
6SE6400-5BA00-0BP0	Parameter List	**£45** [2)]
6SE6400-5AD00-1AP1	Docu pack – supplied with drive	**£10**

[2)] A copy of the parameter list and operating instructions are supplied on a CD with the units and further copies can be downloaded from www.siemens.com / micromaster.

The MICROMASTER 430 – "The Specialist For Pumps and Fans"

The MICROMASTER 430 is specifically designed for integration into systems requiring variable speed control on industrial pump and fan applications including HVAC.

- Output up to 250 kW for centrifugal pumps & fans
- Compact IP20 housing
- Simple to install and commission
- Robust construction
- Energy saving mode and hibernation facility
- Motor / pump staging
- Manual / auto mode
- Load torque detection (detects dry running pumps)
- Designed to make EMC compliance easy
- Facility for external bypass control
- Direct "ptc" or "kty" motor temperature protection
- Remote I / O function via serial communication or fieldbus link
- Different ratings may apply for constant torque pumps and fans

Performance Features and Benefits

- Flux Current Control (FCC) for improved dynamic response and optimised motor control
- Programmable V / f characteristic
- Energy saving mode (eg stopping of a pump at low speeds)
- Motor staging (connection and disconnection of additional motors, use of inverter as the control drive in a pump cascade system – for example duty / assist)
- Manual / automatic mode with Basic Operator Panel 2 (BOP-2)
- Slip compensation ensuring constant motor speeds under changing load conditions
- "Flying re-start" function allows the inverter to be re-connected to motors which are still spinning after brief power interruptions
- Multi-point V / f characteristics for simple adaption to different motor types
- Fast current limit (FCL) guarantees that if the specified ramp times are too short for the load the drive adapts and does not trip
- Integrated kilowatt-hour (kWh) measurement for energy consumption monitoring
- Binary and analogue connection technology (BICO) allows the inputs / outputs to be soft-wired to internal function blocks for logic and arithmetic functions
- Complete inverter and motor protection comprising under-voltage / overvoltage, inverter over temperature, earth fault protection, short circuit protection, motor thermal protection, locked motor and stall prevention
- MICROMASTER 430 carries the CE mark for conformance to the low voltage and EMC directives. It is Ⓤ and c Ⓤ listed.

The Detail

- 6 fully programmable opto-isolated digital inputs (7th / 8th inputs via analogue inputs)
- 2 scalable, freely programmable analogue inputs, 0-10 V, 0 / 4 - 20 mA
- 2 programmable and scalable analogue outputs, 0 (4) mA to 20 mA
- 3 fully programmable relay outputs
- Integrated RS485 serial port for communication
- Fast and repeatable reaction time to analogue, digital and fieldbus commands
- Detachable control board.

Supply Voltage – three phase 380 / 480 V					
Rating	Frame size	Industrial	List price	Filtered †	List price
7.5 kW / 19 A	C	6SE6430-2UD27-5CA0	**£784**	6SE6430-2AD27-5CA0	**£964**
11 kW / 26 A	C	6SE6430-2UD31-1CA0	**£940**	6SE6430-2AD31-1CA0	**£1,058**
15 kW / 32 A	C	6SE6430-2UD31-5CA0	**£1,176**	6SE6430-2AD31-5CA0	**£1,324**
18.5 kW / 38 A	D	6SE6430-2UD31-8DA0	**£1,489**	6SE6430-2AD31-8DA0	**£1,614**
22 kW / 45 A	D	6SE6430-2UD32-2DA0	**£1,685**	6SE6430-2AD32-2DA0	**£1,826**
30 kW / 62 A	D	6SE6430-2UD33-0DA0	**£1,959**	6SE6430-2AD33-0DA0	**£2,124**
37 kW / 75 A	E	6SE6430-2UD33-7EA0	**£2,508**	6SE6430-2AD33-7EA0	**£2,712**
45 kW / 90 A	E	6SE6430-2UD34-5EA0	**£2,900**	6SE6430-2AD34-5EA0	**£3,135**
55 kW / 110 A	F	6SE6430-2UD35-5FA0	**£3,331**	6SE6430-2AD35-5FA0	**£3,605**
75 kW / 145 A	F	6SE6430-2UD37-5FA0	**£3,762**	6SE6430-2AD37-5FA0	**£4,067**
90 kW / 178 A	F	6SE6430-2UD38-8FA0	**£4,428**	6SE6430-2AD38-8FA0	**£4,788**
110 kW / 205 A	FX	6SE6430-2UD41-1FA0	**£5,704**	6SL3000-0BE32-5AA0	**£862** [1)]
132 kW / 250 A	FX	6SE6430-2UD41-3FA0	**£6,593**	6SL3000-0BE34-4AA0	**£1,425** [1)]
160 kW / 302 A	GX	6SE6430-2UD41-6GA0	**£7,408**	6SL3000-0BE34-4AA0	**£1,425** [1)]
200 kW / 370 A	GX	6SE6430-2UD42-0GA0	**£8,371**	6SL3000-0BE34-4AA0	**£1,425** [1)]
250 kW / 477 A	GX	6SE6430-2UD42-5GA0	**£9,779**	6SL3000-0BE36-0AA0	**£1,642** [1)]

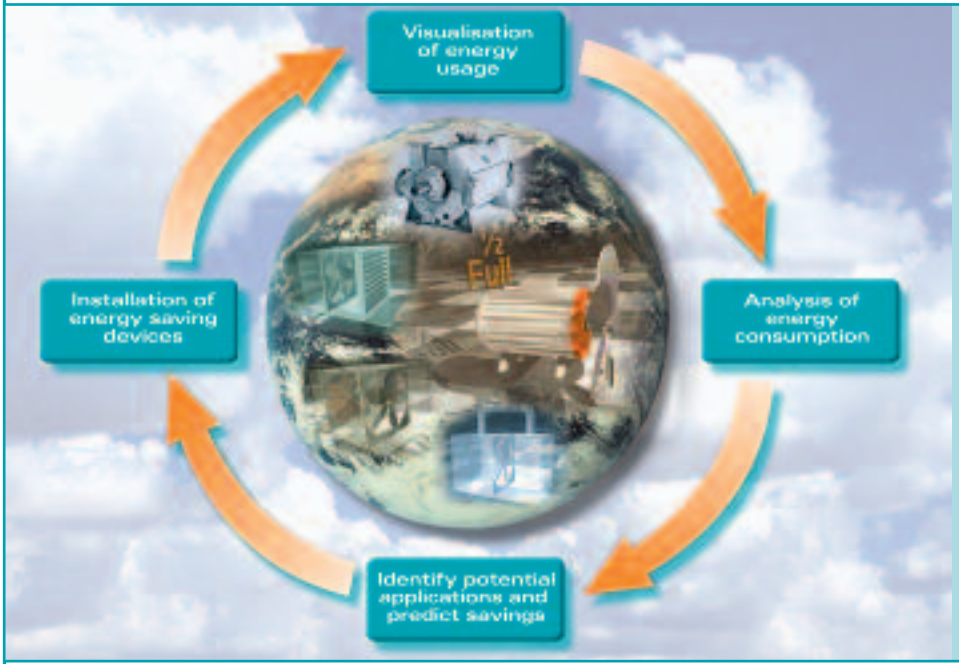
† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

[1)] Additional module to be used in conjunction with the standard industrial drive.

Options		
6SE6400-0BE00-0AA0	Basic Operator Panel (BOP2)	**£26**
6SE6400-1PC00-0AA0	PC-MICROMASTER Connection Kit	**£22**
6SE6400-0PM00-0AA0	Standard Panel Mounting Kit for BOP2	**£66**
6SE6400-1PB00-0AA0	PROFIBUS Module	**£88**
6SE6400-1DN00-0AA0	Device Net Module	**£88**
6SE6400-1CB00-0AA0	CAN Bus Module	**£88**
6SE6400-5AE00-0BP0	Operating Instructions	**£45** [2)]
6SE6400-5AF00-0BP0	Parameter List	**£45** [2)]
6SE6400-5AD00-1AP1	Docu pack – supplied with drive	**£10**

[2)] A copy of the parameter list and operating instructions are supplied on a CD with the units and further copies can be downloaded from www.siemens.com / micromaster.

Siemens also offers a complete range of financing options!



- A successful energy strategy encompasses a holistic approach to the facility or process. Implementation of "best practice" techniques can provide a range of benefits including:
  - Reduced energy demand
  - Lower cost
  - Reduced waste
  - Simplified regulatory compliance
  - Enhanced productivity
  - Improved profitability
- A continuous and systematic deployment based on the integrated life cycle analysis (LCA) techniques ensures optimum success. The precise components of the overall LCA are tailored to suit the specific facility, process or application.

MICROMASTER drives are an essential part of energy saving strategies

The MICROMASTER 440 – "The All Purpose"

The MM440 is the flagship model in the MICROMASTER family whose flexibility and performance ensure its suitability for a vast array of drive applications. In addition to variable torque pump and fan applications, for which dual ratings are provided, the 440 also covers more demanding tasks such as: cranes and hoisting gear, extruders, high bay warehouses, packaging machines etc.

- Output up to 250 kW
- Overloads available up to 200%
- Compact IP20 housing
- Simple to install and commission
- Integrated logic control functions
- Robust construction
- Designed to make EMC compliance easy
- Wide range of user interface and communications options
- Operating temperature –10°C to +50°C (0°C to +40°C over 75 kW and variable torque ratings)
- Integrated PID Controller
- Integral (100% rated) brake chopper for all units to 75 kW – (separate module available for units 90-250 kW)
- Remote I / O function via serial communication or fieldbus link
- Direct plc connection for low cost networking.

Worldwide voltages on request.

Performance Features and Benefits

- High quality sensorless Vector control system as standard with encoder feedback option when required
- Flux Current Control (FCC) for improved dynamic response and optimised motor control
- Torque control mode
- Simple positioning function
- Kinetic buffering for ride through of brief supply interruptions
- Slip compensation ensuring constant motor speeds under changing load conditions
- "Flying re-start" function allows the inverter to be re-connected to motors which are still spinning after brief power interruptions
- Multi-point V / f characteristics for simple adaption to different motor types
- Sophisticated dc injection braking and "compound braking" to ensure minimum motor stopping times without external braking resistors
- Fast current limit (FCL) guarantees that if the specified ramp times are too short for the load the drive adapts and does not trip
- Integrated kilowatt-hour (kWh) measurement for energy consumption monitoring
- Binary and analogue connection technology (BICO) allows the inputs / outputs to be soft-wired to blocks in the drive inverter. (Includes logic and arithmetic functions)
- Complete inverter and motor protection comprising under-voltage / overvoltage, inverter over temperature, earth fault protection, short circuit protection, motor thermal protection, locked motor and stall prevention
- MICROMASTER 440 carries the CE mark for conformance to the low voltage and EMC directives. It is Ⓤ and c Ⓤ listed.

The Detail

- 6 fully programmable opto-isolated digital inputs (7th and 8th binary inputs available via the analogue inputs)
- 2 scalable, freely programmable analogue inputs, 0-10 V, 0 / 4 - 20 mA
- 2 programmable and scalable analogue outputs, 0 (4) mA to 20 mA
- 3 fully programmable relay outputs
- Integrated RS485 serial port for communication
- Fast and repeatable reaction time to analogue, digital and fieldbus commands
- Detachable control board for rapid product replacement.

Supply Voltage – single phase 200 / 240 V*					
Rating	Frame size	Industrial	List price	Filtered †	List price
0.12 kW / 0.9 A	A	6SE6440-2UC11-2AA1	**£154**	6SE6440-2AB11-2AA1	**£174**
0.25 kW / 1.7 A	A	6SE6440-2UC12-5AA1	**£163**	6SE6440-2AB12-5AA1	**£184**
0.37 kW / 2.3 A	A	6SE6440-2UC13-7AA1	**£177**	6SE6440-2AB13-7AA1	**£201**
0.55 kW / 3.0 A	A	6SE6440-2UC15-5AA1	**£192**	6SE6440-2AB15-5AA1	**£217**
0.75 kW / 3.9 A	A	6SE6440-2UC17-5AA1	**£202**	6SE6440-2AB17-5AA1	**£228**
1.1 kW / 5.5 A	B	6SE6440-2UC21-1BA1	**£232**	6SE6440-2AB21-1BA1	**£262**
1.5 kW / 7.4 A	B	6SE6440-2UC21-5BA1	**£265**	6SE6440-2AB21-5BA1	**£299**
2.2 kW / 10.4 A	B	6SE6440-2UC22-2BA1	**£312**	6SE6440-2AB22-2BA1	**£351**
3 kW / 13.6 A	C	6SE6440-2UC23-0CA1	**£365**	6SE6440-2AB23-0CA1	**£410**

*Three phase 200-240 V units on request.

† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

Supply Voltage – three phase 380 / 480 V						
Rating CT / VT		Frame size	Industrial	List price	Filtered †	List price
0.37 kW / 1.3 A		A	6SE6440-2UD13-7AA1	**£340**	6SE6400-2FA00-6AD	**£59** [1)]
0.55 kW / 1.7 A		A	6SE6440-2UD15-5AA1	**£355**	6SE6400-2FA00-6AD0	**£59** [1)]
0.75 kW / 2.2 A		A	6SE6440-2UD17-5AA1	**£368**	6SE6400-2FA00-6AD0	**£59** [1)]
1.1 kW / 3.1 A		A	6SE6440-2UD21-1AA1	**£392**	6SE6400-2FA00-6AD0	**£59** [1)]
1.5 kW / 4.1 A		A	6SE6440-2UD21-5AA1	**£440**	6SE6400-2FA00-6AD0	**£59** [1)]
2.2 kW / 5.9 A		B	6SE6440-2UD22-2BA1	**£510**	6SE6440-2AD22-2BA1	**£573**
3 kW / 7.7 A		B	6SE6440-2UD23-0BA1	**£573**	6SE6440-2AD23-0BA1	**£644**
4 kW / 10.2 A		B	6SE6440-2UD24-0BA1	**£645**	6SE6440-2AD24-0BA1	**£724**
CT	**VT**					
5.5 kW / 13 A	7.5 kW / 19 A	C	6SE6440-2UD25-5CA1	**£791**	6SE6440-2AD25-5CA1	**£888**
7.5 kW / 19 A	11 kW / 26 A	C	6SE6440-2UD27-5CA1	**£968**	6SE6440-2AD27-5CA1	**£1,086**
11 kW / 26 A	15 kW / 32 A	C	6SE6440-2UD31-1CA1	**£1,249**	6SE6440-2AD31-1CA1	**£1,401**
15 kW / 32 A	18.5 kW / 38 A	D	6SE6440-2UD31-5DA1	**£1,578**	6SE6440-2AD31-5DA1	**£1,706**
18.5 kW / 38 A	22 kW / 45 A	D	6SE6440-2UD31-8DA1	**£1,810**	6SE6440-2AD31-8DA1	**£1,956**
22 kW / 45 A	30 kW / 62 A	D	6SE6440-2UD32-2DA1	**£2,101**	6SE6440-2AD32-2DA1	**£2,270**
30 kW / 62 A	37 kW / 75 A	E	6SE6440-2UD33-0EA1	**£2,703**	6SE6440-2AD33-0EA1	**£2,921**
37 kW / 75 A	45 kW / 90 A	E	6SE6440-2UD33-7EA1	**£3,125**	6SE6440-2AD33-7EA1	**£3,377**
45 kW / 90 A	55 kW / 110 A	F	6SE6440-2UD34-5FA1	**£3,610**	6SE6440-2AD34-5FA1	**£3,900**
55 kW / 110 A	75 kW / 145 A	F	6SE6440-2UD35-5FA1	**£4,098**	6SE6440-2AD35-5FA1	**£4,427**
75 kW / 145 A	90 kW / 178 A	F	6SE6440-2UD37-5FA1	**£4,824**	6SE6440-2AD37-5FA1	**£5,212**
90 kW / 178 A	110 kW / 205 A	FX	6SE6440-2UD38-8FA1	**£6,004**	6SL3000-0BE32-5AA0	**£862** [1)]
110 kW / 205 A	132 kW / 250 A	FX	6SE6440-2UD41-1FA1	**£6,940**	6SL3000-0BE34-4AA0	**£1,425** [1)]
132 kW / 250 A	160 kW / 302 A	GX	6SE6440-2UD41-3GA1	**£7,798**	6SL3000-0BE34-4AA0	**£1,425** [1)]
160 kW / 302 A	200 kW / 370 A	GX	6SE6440-2UD41-6GA1	**£8,812**	6SL3000-0BE34-4AA0	**£1,425** [1)]
200 kW / 370 A	250 kW / 477 A	GX	6SE6440-2UD42-0GA1	**£10,293**	6SL3000-0BE36-0AA0	**£1,642** [1)]

[1)] Additional module to be used in conjunction with the standard industrial drive.

† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

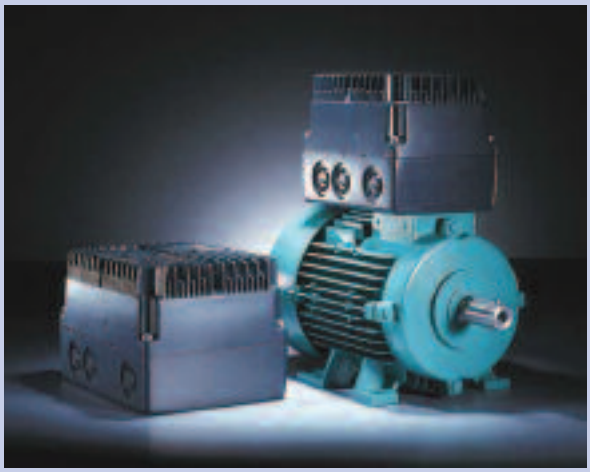
CT = Constant torque duty, eg conveyors. VT = Variable torque duty, eg fans and centrifugal pumps.

Options		
6SE6400-0BP00-0AA0	Basic Operator Panel (BOP)	**£26**
6SE6400-0AP00-0AA1	Advanced Operator Panel (AOP)	**£99**
6SE6400-1PC00-0AA0	PC – MICROMASTER Connection Kit	**£22**
6SE6400-0MD00-0AA0	Multidrop Panel Mounting Kit (for AOP)	**£73**
6SE6400-0PM00-0AA0	Standard Panel Mounting Kit (for BOP or AOP)	**£66**
6SE6400-1PB00-0AA0	PROFIBUS Module	**£88**
6SE6400-1DN00-0AA0	Device Net Module	**£88**
6SE6400-1CB00-0AA0	CAN Bus Module	**£88**
6SE6400-0EN00-0AA0	Encoder Feedback Module	**£110**
6SE6400-0GP00-0AA0	Frame Size A Gland Plate	**£7**
6SE6400-0GP00-0BA0	Frame Size B Gland Plate	**£15**
6SE6400-0GP00-0CA0	Frame Size C Gland Plate	**£22**
6SE6400-5AW00-0BP0	Operating Instructions	**£45** [2)]
6SE6400-5BB00-0BP0	Parameter List	**£45** [2)]
6SE6400-5AD00-1AP1	Docu pack – supplied with drive	**£10**

[2)] A copy of the parameter list and operating instructions are supplied on a CD with the units and further copies can be downloaded from www.siemens.com / micromaster.

MICROMASTER 411 (the drive "brick") / **COMBIMASTER 411** (combined drive and motor)

The MICROMASTER and COMBIMASTER 411 are ideally suited to decentralised drive applications where a high "IP" protection rating is required. It has been designed for use in a broad range of applications from simple pump and fans through to multiple drive conveyor applications including networked control systems.



- Output up to 3 kW
- IP66 protection rating for drive "brick"
- Modular construction with many options
- Operation possible without the need for an operator panel (using jumper / potentiometer)
- Integrated control potentiometer
- Thermally efficient heatsink design to allow mounting of inverter in all orientations (except upside-down)
- Operating temperature –10°C to +40°C
- Screwless I / O terminals for easy connection and high resistance to vibration.

Performance Features and Benefits

- Flux-current control (FCC) for improved dynamic response and optimised motor control
- Slip compensation ensuring constant motor speeds under changing load conditions
- "Flying re-start" function allows the inverter to be re-connected to motors which are still spinning after brief power interruptions
- Freely-programmable digital inputs and outputs
- The analogue I / O can be flexibly programmed (offset, range, addition to the digital set point etc)
- Multi-point V / f characteristics for simple adaption to different motor types
- Sophisticated dc injection braking and "compound braking" to ensure minimum motor stopping times
- Fast current limit (FCL) guarantees that if the specified ramp times are too short for the load the drive adapts and does not trip
- Integrated kilowatt-hour (kWh) measurement for energy consumption
- Binary and analogue connection technology (BICO) allows the inputs / outputs to be soft-wired to internal function blocks
- Ramp smoothing for reduced mechanical wear
- Complete inverter and motor protection comprising under-voltage / overvoltage, inverter over-temperature, earth fault protection, short circuit protection, motor thermal protection, locked motor and stall prevention
- MICROMASTER 411 carries the CE mark for conformance to the low voltage and EMC directives. It is Ⓤ and cⓊ listed.

The Detail

- Three fully programmable opto-isolated digital inputs (4th binary input available via analogue input)
- Analogue input, 0-10 V (0 / 4-20 mA using an additional resistor link)
- Programmable and scalable analogue output, 0(4) mA to 20 mA
- Fully programmable relay output, DC 30 V / 5 A resistive, AC 230 V / 2 A inductive
- PI feedback for simple process control
- Opto-isolated digital inputs for improved EMC immunity
- Fast reaction time to analogue, digital and fieldbus commands
- 150% load capability for 60 s in 5 mins.

MICROMASTER 411 Supply Voltage – three phase 380 / 480 V					
Rating	Frame size	Industrial	List price	Filtered †	List price
0.37 kW / 1.2 A	B	6SE6411-6UD13-7BA1	**£351**	6SE6411-6BD13-7BA1	**£430**
0.55 kW / 1.6 A	B	6SE6411-6UD15-5BA1	**£358**	6SE6411-6BD15-5BA1	**£440**
0.75 kW / 2.1 A	B	6SE6411-6UD17-5BA1	**£366**	6SE6411-6BD17-5BA1	**£447**
1.1 kW / 3.0 A	B	6SE6411-6UD21-1BA1	**£384**	6SE6411-6BD21-1BA1	**£463**
1.5 kW / 4.0 A	B	6SE6411-6UD21-5BA1	**£406**	6SE6411-6BD21-5BA1	**£487**
2.2 kW / 5.9 A	C	6SE6411-6UD22-2CA1	**£519**	6SE6411-6BD22-2CA1	**£607**
3 kW / 7.7 A	C	6SE6411-6UD23-0CA1	**£539**	6SE6411-6BD23-0CA1	**£631**

† EMC filtering generally suitable for 1st environment; additional filter options available on request – please refer to page 12 for specific categorisations.

Selection product specific options		List price
6SE6401-1PB00-0AA0	411 – PROFIBUS Module	**£219**
6SE6400-0AC00-0AA0	Advanced operator panel (AOP)	**£99**
6SE6401-1DF00-0AA0	Operator panel mounting Kit	**£29**
6SE6401-1BL00-0AA0	Interface link cable (pc programming without isolation)	**£18**
6SE6401-1CA00-0AA0	5m cable assembly for door mount kit	**£18**
6SE6401-1EM00-0AA0	411 – Electromechanical Brake control	**£139**
6SE6400-0BP00-0AA0	Basic operator panel	**£26**
6SE6400-1PC00-0AA0	PC to inverter connection kit (with isolation)	**£22** [1)]
6SE6401-0WM00-0AA0	Wall mounting kit	**£66**

[1)] For use in conjunction with operator panel mounting kit.

SIPLUS Converter F&B

The industry-specific frequency converter for three-phase motors in the food and beverage industry

- Stainless steel housing resistant to cleaning agents and solvents
- Smooth surfaces
- Degree of protection IP65
- Maintenance-free operation thanks to convection cooling (without fan)
- PROFIBUS DP connection
- Special fastenings and brackets for easy mounting
- Extensive status indicators
- Service interface on the outside
- Main and maintenance switches on the housing
- Supported three-phase motor outputs: 0.25 to 1.5 kW

	SIPLUS Converter 420	List price	SIPLUS Converter 440	List price
Supply voltage:	380 V to 480 V 3 AC		380 V to 480 V 3 AC	
Supply frequency:	47 Hz to 63 Hz		47 Hz to 63 Hz	
Performance range:	Up to 1.5 kW*		Up to 1.5 kW*	
Degree of protection:	IP65		IP65	
Approx. dimensions: W x H x D	440 mm x 250 mm x 166 mm		440 mm x 250 mm x 166 mm	
Weight:	9 kg		9 kg	
Interfaces:	PROFIBUS DP for SIPLUS AOP (service)		PROFIBUS DP for SIPLUS AOP (service)	
Operating temperature:	–10 °C to +50 °C**		–10 °C to +50 °C**	
Certifications:	CE / CUL applied for		CE / CUL applied for	
Signal inputs/outputs:	3 DI – 1 AI – 1 RO		4 DI – 1 AI – 2 RO	
Without filter	**6AG1420-2UD21-4AX1**	**£1,377**	**6AG1440-2UD21-4AX1**	**£1,525**
With Class A	**6AG1420-2UD21-4AA1**	**£1,463**	**6AG1440-2UD21-4AA1**	**£1,611**
With Class B	**6AG1420-2UD21-4AB1**	**£1,483**	**6AG1440-2UD21-4AA1**	**£1,632**

* 3 kW available soon ** from +45 °C, 25% derating

MICROMASTER Options Overview

DRIVE PROGRAMMING

Basic Operator Panel (BOP)

With the BOP, individual parameter settings can be made. Values and units are on a 5-digit display.

It can be directly mounted on the inverter or in a control-cabinet door using a mounting kit.

Basic Operator Panel 2 (BOP-2) (MICROMASTER 430 Only)

With the BOP, individual parameter settings can be made. Values and units are on a 5-digit display.

Advanced Operator Panel (AOP)

The AOP enables MICROMASTER parameter sets to be easily read and modified. The value and meaning can be displayed in several languages.

The AOP can be directly mounted on the drive or communicate via a door mounting kit. With the door mounting kit for multiple inverter control the AOP can communicate with up to 31 drives.

For servicing purposes the AOP supports download and upread of complete parameter sets.

KEYPAD PANEL MOUNTING KITS

BOP / AOP door mounting kit for single drive control

For mounting an operator panel in a control cabinet door. Degree of protection is IP56. Contains a cable adaptor board with screwless terminals for use with standard cables.

AOP door mounting kit for multiple drive control

For mounting an operator panel in a control cabinet door. Degree of protection is IP56. The AOP can communicate with 31 drives over the RS-485 connection.

PC to Drive Connection Kit

For parameterising the drive directly from a PC. Kit consists of an isolated RS-232 adaptor board for reliable point-to-point connection and an RS-232 standard cable.

FIELDBUS COMMUNICATION & ENCODER MODULE

PROFIBUS module

Remote connection at up to 12 Mbaud is possible on the PROFIBUS network. The module has a separate 24 V connection which can be used if access is required with the main power removed.

CAN bus module

For integrating MICROMASTERS into the CAN bus fieldbus system.

Remote and local operation of the inverter can be combined by using an operator panel with any of the communication modules.

DeviceNet module

For networking the inverters to the DeviceNet fieldbus system.
A maximum transmission rate of 500 kbaud is possible.

Encoder Module

The module enables direct connection of the most widely used HTL and TTL digital pulse encoders. This offers the following functions

- Full load torque at zero speed
- Extremely accurate speed control
- Increased dynamic response of speed and torque control.

COMPATIBILITY

Accessories	Order No.	MICROMASTER 411	420	430	440
Operator Panels		• Possible combination			
AOP	6SE6400-OAC00-OAAO	•			
BOP	6SE6400-OBP00-OAAO		•		•
AOP	6SE6400-OAP00-OAA1		•		•
BOP-2	6SE6400-OBE00-OAAO			•	

Accessories	Order No.	MICROMASTER 411	420	430	440
Modules		• Possible combination			
PROFIBUS	6SE6400-1PB00-OAAO		•	•	•
PROFIBUS 411	6SE6401-IPB00-OAAO	•			
DeviceNet	6SE6400-1DN00-OAAO		•	•	•
CAN bus	6SE6400-1CB00-OAAO		•	•	•
Pulse encoder evaluation	6SE6400-OEN00-OAAO			•	•

BRAKING RESISTORS

MICROMASTER 440 has an integrated 100% rated braking chopper (to 75 kW) for direct connection of a braking resistor where high braking duties are required. Selections below are nominally rated. For high braking duties, refer to our customer hotline.

LC/SINUSOIDAL FILTERS

The LC filter/sinusoidal filter limits the rate of rise of voltage and the capacitive charge/discharge currents which usually occur with inverter operation. This means that much longer shielded motor cables are possible when using LC filters/sinusoidal filters and the service life of the motor achieves values similar to those with direct mains operation. This may be useful for third party motors with undefined motor insulation characteristics.

Gland Plates

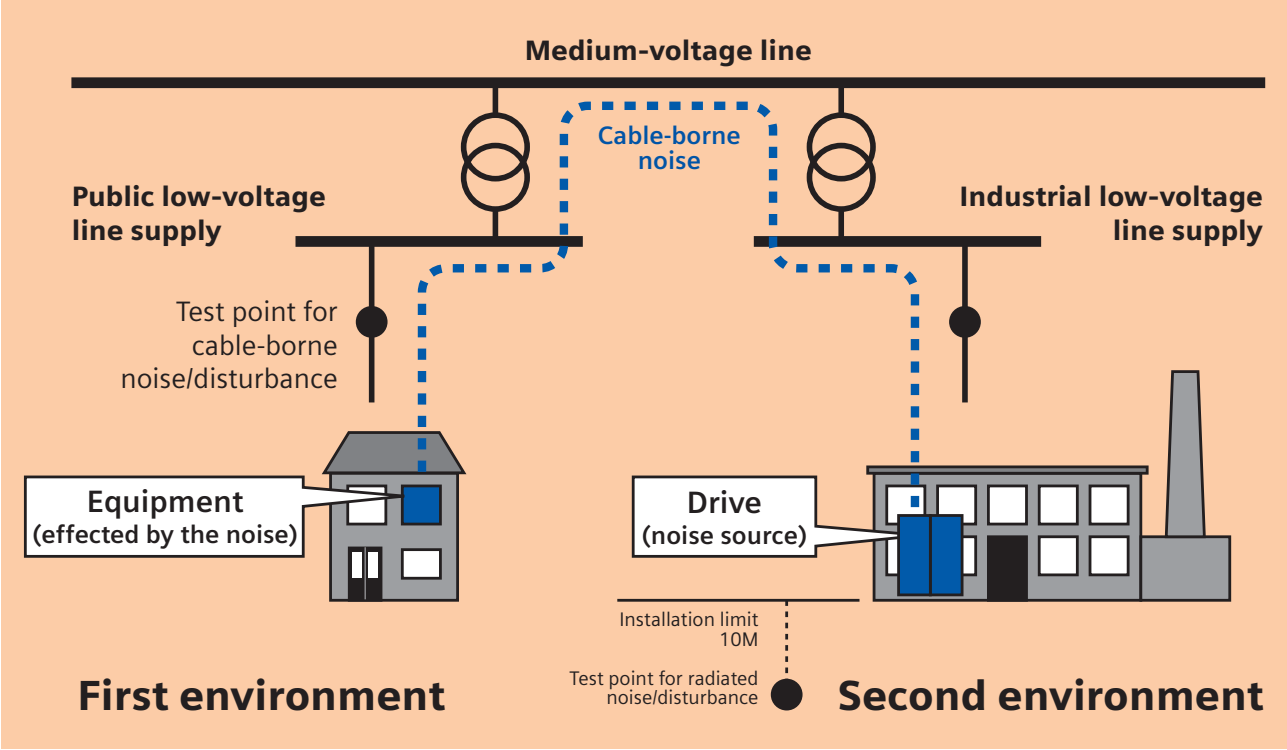
Gland plates are available for drives with frame sizes A, B and C. In frame sizes D and above the gland plates are integrated in the basic design.

The gland plate enables shielded connection of the power and control cables, ensuring optimum EMC performance.

ELECTROMAGNETIC COMPATIBILITY (EMC)

Electromagnetic compatibility describes – according to the definition of the EMC directive – "the capability of a device to work satisfactorily in the electromagnetic environment without itself causing electromagnetic interferences which are unacceptable for other devices present in this environment". To guarantee that the appropriate EMC directives are observed, the devices must demonstrate sufficiently high noise immunity, and also the emitted interference must be limited to acceptable values.

The EMC requirements for "Variable-speed drive systems" are described in the product standard EN 61800-3. A variable speed drive system (or power drive system, PDS) consists of the drive converter and the electric motor including cables. The driven machine is not part of the drive system. EN 61800-3 defines different limits depending on the location of the drive system, referred to as the first and second environments:



The **first environment** comprises living accommodation or locations where the drive system is directly connected to the public low-voltage network without an intermediate transformer.

The **second environment** is understood to be all locations outside living areas. These are basically industrial areas which are powered from the medium-voltage network via their own transformers.

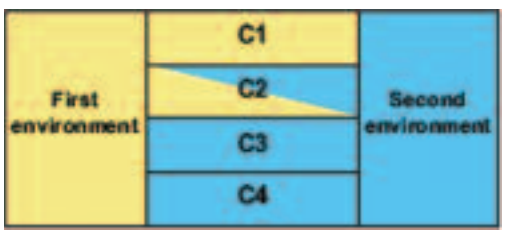
Four different categories are defined in EN 61800-3 Ed.2 depending on the location and the power of the drive:

Category C1: Drive systems for rated voltages < 1000 V for unlimited use in the first environment.

Category C2: Stationary drive systems for rated voltages < 1000 V for use in the second environment. Use in the first environment is possible if the drive system is installed and used by qualified personnel. The warning and installation information supplied by the manufacturer must be observed.

Category C3: Drive systems for rated voltages < 1000 V for exclusive use in the second (industrial) environment.

Category C4: Drive systems for rated voltages > 1000 V or for rated currents > 400 A for use in complex systems in the second environment.



Notes:

The level of EMC filtering should be selected to match the specific application and environment.

Correct installation techniques are mandatory in order to meet the requirements of the EMC directive and to comply with warranty requirements.

MICROMASTER – Line Chokes / Output Reactors / Braking Resistors

Line Chokes

Used to smooth voltage peaks, bridge commutating dips and reduce harmonics on the power supply. Footprint mounted to 45 kW VT (Block type for 55 kW VT-250 kW VT). Standard chokes 2%. 4% chokes available on application.

Output Reactors

Output reactors (chokes) should be used to reduce capacitive currents and dV / dt in long motor cables.

Typically required when the cable length exceeds 50-150 m depending on power rating and cable type with higher powers allowing longer cable lengths. Motor cable runs of several hundred metres can be accommodated. Footprint mounted to 15 kW VT (Block type for 18.5 kW VT-250 kW VT).

Supply Voltage – single phase 200 / 240 V

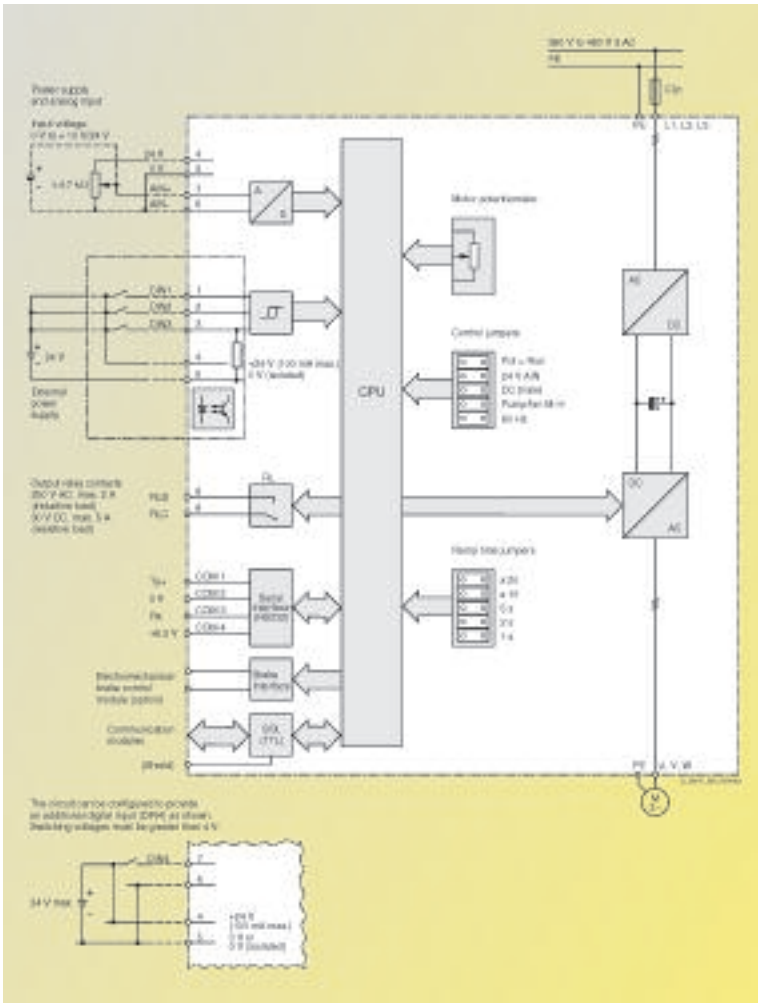
Rating	Input Choke	List price	Output Choke	List price	Brake Resistor (MM440 only)	List price
0.12 kW	6SE6400-3CC00-4AB3	**£51**	6SE6400-3TC00-4AD3	**£80**	6SE6400-4BC05-0AA0	**£89**
0.25 kW	6SE6400-3CC00-4AB3	**£51**	6SE6400-3TC00-4AD3	**£80**	6SE6400-4BC05-0AA0	**£89**
0.37 kW	6SE6400-3CC01-0AB3	**£51**	6SE6400-3TC00-4AD3	**£80**	6SE6400-4BC05-0AA0	**£89**
0.55 kW	6SE6400-3CC01-0AB3	**£51**	6SE6400-3TC00-4AD3	**£80**	6SE6400-4BC05-0AA0	**£89**
0.75 kW	6SE6400-3CC01-0AB3	**£51**	6SE6400-3TC00-4AD3	**£80**	6SE6400-4BC05-0AA0	**£89**
1.1 kW	6SE6400-3CC02-6BB3	**£74**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BC11-2BA0	**£128**
1.5 kW	6SE6400-3CC02-6BB3	**£74**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BC11-2BA0	**£128**
2.2 kW	6SE6400-3CC02-6BB3	**£74**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BC11-2BA0	**£128**
3 kW	6SE6400-3CC03-5CB3	**£75**	6SE6400-3TC03-2CD3	**£110**	6SE6400-4BC12-5CA0	**£146**

Supply Voltage – three phase 380 / 480 V

Rating (CT / VT)		Input Choke	List price	Output Choke	List price	Brake Resistor (MM440 only)	List price
0.37 kW		6SE6400-3CC00-2AD3	**£60**	6SE6400-3TC00-4AD2	**£99**	6SE6400-4BD11-0AA0	**£110**
0.55 kW		6SE6400-3CC00-2AD3	**£60**	6SE6400-3TC00-4AD2	**£99**	6SE6400-4BD11-0AA0	**£110**
0.75 kW		6SE6400-3CC00-4AD3	**£75**	6SE6400-3TC00-4AD2	**£99**	6SE6400-4BD11-0AA0	**£110**
1.1 kW		6SE6400-3CC00-4AD3	**£75**	6SE6400-3TC00-4AD2	**£99**	6SE6400-4BD11-0AA0	**£110**
1.5 kW		6SE6400-3CC00-6AD3	**£77**	6SE6400-3TC00-4AD2	**£99**	6SE6400-4BD11-0AA0	**£110**
2.2 kW		6SE6400-3CC01-0BD3	**£94**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BD12-0BA0	**£170**
3 kW		6SE6400-3CC01-0BD3	**£94**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BD12-0BA0	**£170**
4 kW		6SE6400-3CC01-4BD3	**£94**	6SE6400-3TC01-0BD3	**£102**	6SE6400-4BD12-0BA0	**£170**
CT	**VT**						
5.5 kW	7.5 kW	6SE6400-3CC02-2CD3	**£110**	6SE6400-3TC03-2CD3	**£105**	6SE6400-4BD16-5CA0	**£214**
7.5 kW	11 kW	6SE6400-3CC02-2CD3	**£110**	6SE6400-3TC03-2CD3	**£105**	6SE6400-4BD16-5CA0	**£214**
11 kW	15 kW	6SE6400-3CC03-5CD3	**£111**	6SE6400-3TC03-2CD3	**£105**	6SE6400-4BD16-5CA0	**£214**
15 kW	18.5 kW	6SE6400-3CC04-4DD0	**£176**	6SE6400-3TC05-4DD0	**£249**[1)]	6SE6400-4BD21-2DA0	**£268**
18.5 kW	22 kW	6SE6400-3CC04-4DD0	**£176**	6SE6400-3TC03-8DD0	**£256**[1)]	6SE6400-4BD21-2DA0	**£268**
22 kW	30 kW	6SE6400-3CC05-2DD0	**£176**	6SE6400-3TC05-4DD0	**£256**[1)]	6SE6400-4BD21-2DA0	**£268**
30 kW	37 kW	6SE6400-3CC08-3ED0	**£249**	6SE6400-3TC08-0ED0	**£585**[1)]	6SE6400-4BD22-2EA0	**£348**
37 kW	45 kW	6SE6400-3CC08-3ED0	**£249**	6SE6400-3TC07-5ED0	**£585**[1)]	6SE6400-4BD22-2EA0	**£348**
45 kW	55 kW	6SE6400-3CC11-2FD0	**£263**[1)]	6SE6400-3TC14-5FD0	**£388**[1)]	6SE6400-4BD24-0FA0	**£573**
55 kW	75 kW	6SE6400-3CC11-2FD0	**£263**[1)]	6SE6400-3TC15-4FD0	**£388**[1)]	6SE6400-4BD24-0FA0	**£573**
75 kW	90 kW	6SE6400-3CC11-7FD0	**£256**[1)]	6SE6400-3TC14-5FD0	**£388**[1)]	6SE6400-4BD24-0FA0	**£573**
90 kW	110 kW	6SL3000-0CE32-3AA0	**£429**[1)]	6SL3000-2BE32-1AA0	**£464**[1)]	On Application	
110 kW	132 kW	6SL3000-0CE32-8AA0	**£482**[1)]	6SL3000-2BE32-6AA0	**£521**[1)]	On Application	
132 kW	160 kW	6SL3000-0CE33-3AA0	**£527**[1)]	6SL3000-2BE33-2AA0	**£580**[1)]	On Application	
160 kW	200 kW	6SL3000-0CE35-1AA0	**£917**[1)]	6SL3000-2BE33-8AA0	**£645**[1)]	On Application	
200 kW	250 kW	6SL3000-0CE35-1AA0	**£917**[1)]	6SL3000-2BE35-0AA0	**£760**[1)]	On Application	

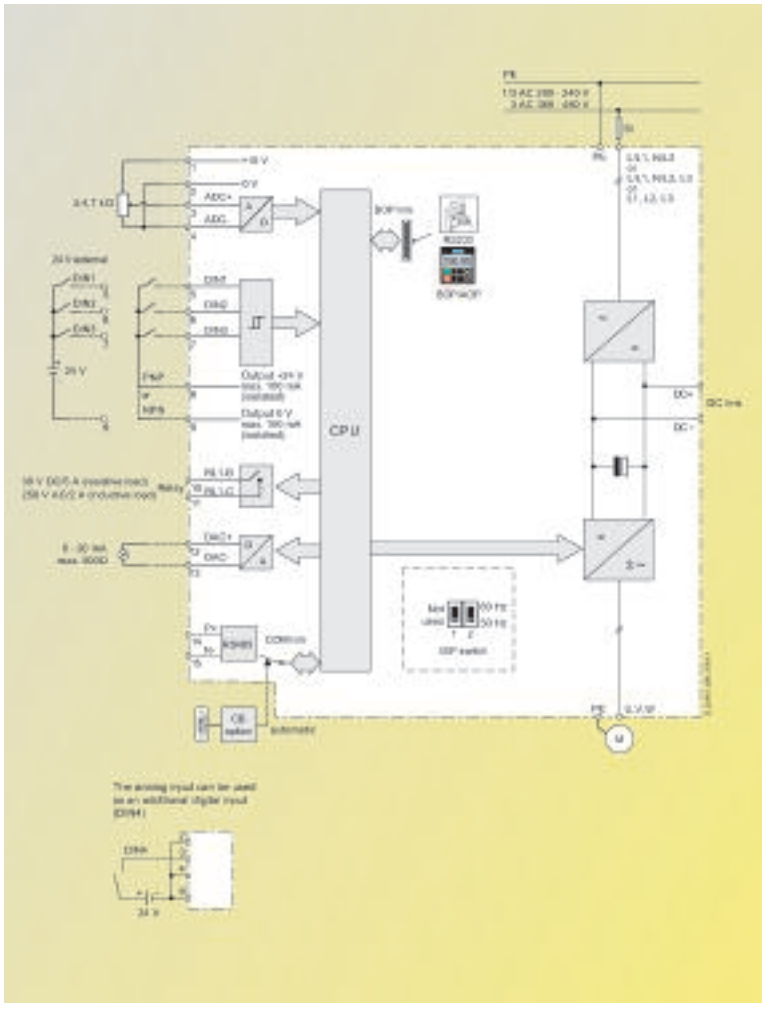
CT = Constant torque duty VT = Variable torque duty.

[1)] Block mounted.



MICROMASTER 411

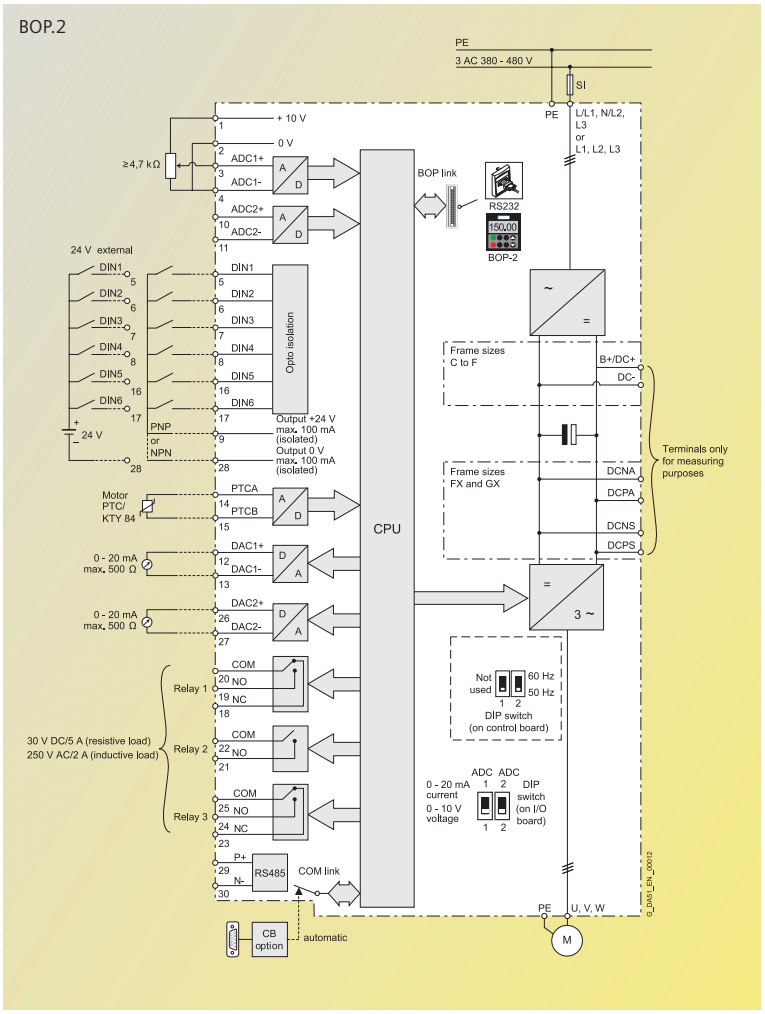
Interface
Connection
Schematic



MICROMASTER 420

Interface
Connection
Schematic

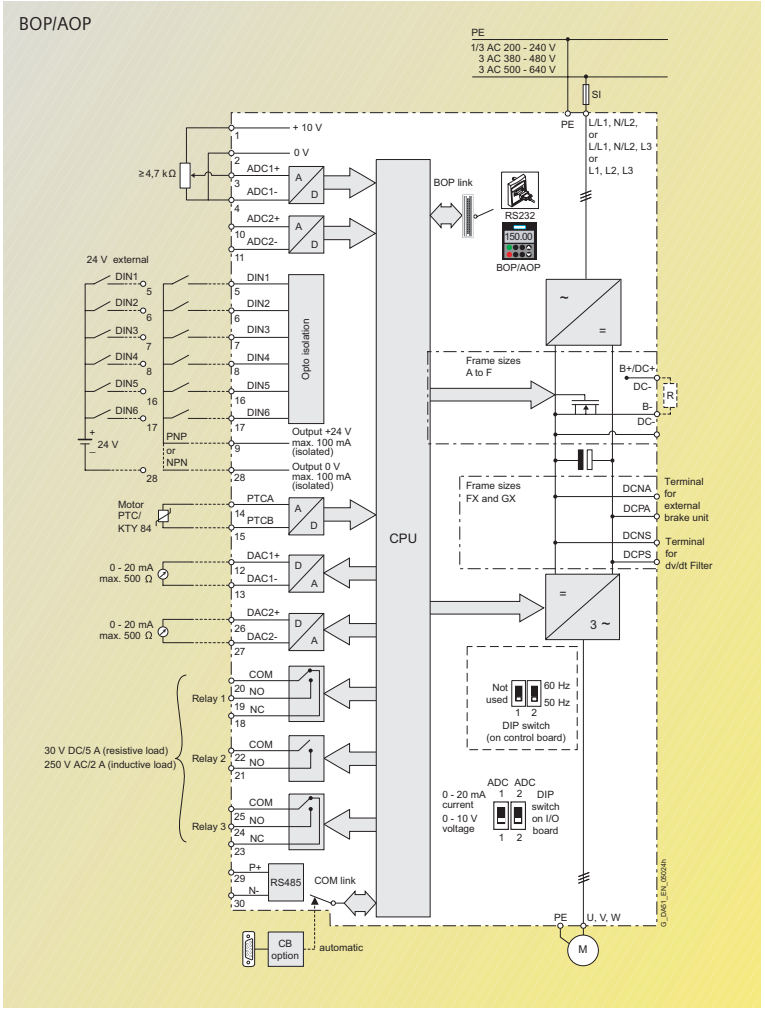
BOP.2



MICROMASTER 430

Interface Connection Schematic

BOP/AOP

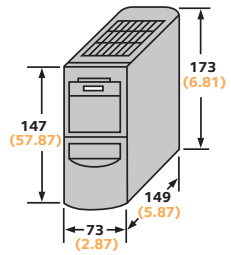


MICROMASTER 440

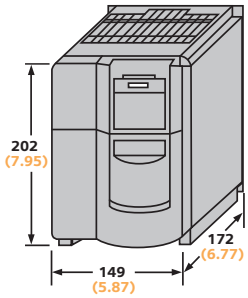
Interface Connection Schematic

DIMENSIONS

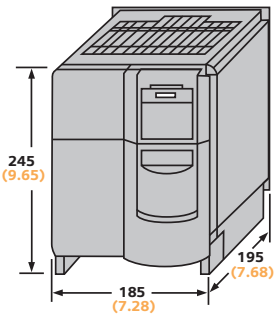
MICROMASTER 420/430/440 – Standard Frame Sizes



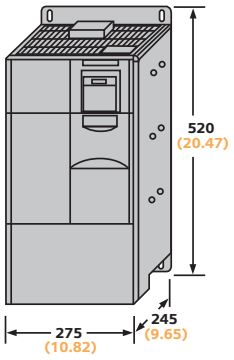
Frame size A



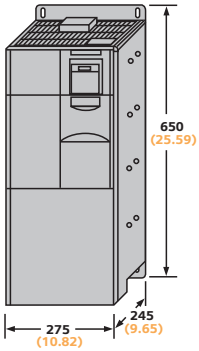
Frame size B



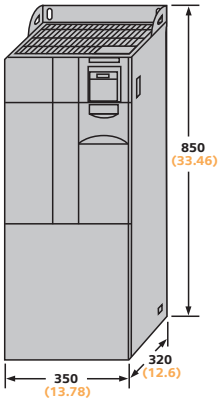
Frame size C



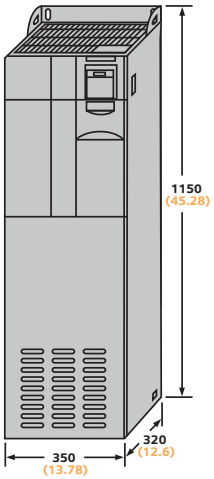
Frame size D



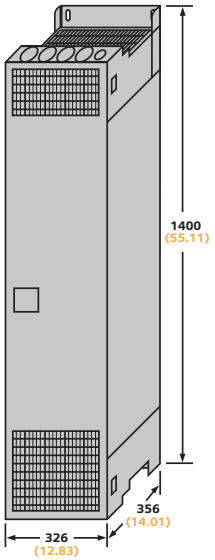
Frame size E



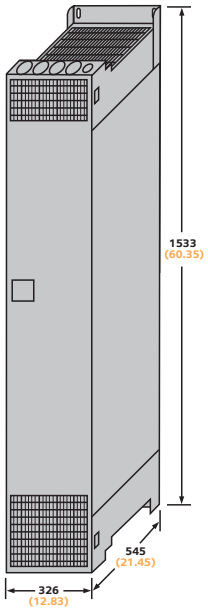
Frame size F
industrial



Frame size F
with class A EMC filter



Frame size FX



Frame size GX

Notes:

For cabinet sizing purposes, allow for 3% of the drive rating as heat loss.

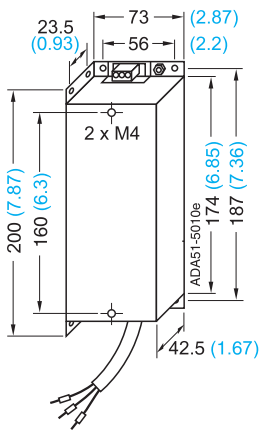
Allow ventilation clearances around the drives as follows:

Frame Size	Above mm	Below mm	Side mm
A, B & C	100	100	zero
D & E	300	300	zero
F	350	350	zero
FX & GX	250	150	zero

Note: FX & GX also require 100 mm clearance in front of the drive

DIMENSION DRAWINGS

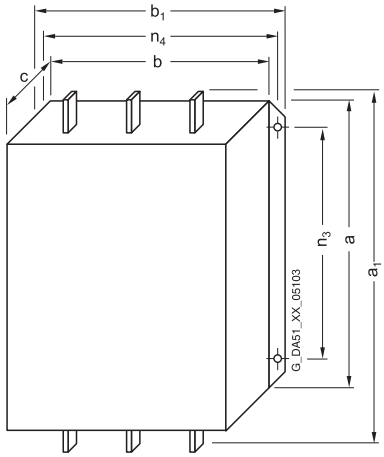
EMC Filter



EMC filter for frame size **A**

Note:

Frame sizes B to F can be supplied with integral EMC filter.



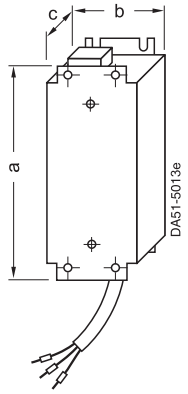
EMC filter for frame sizes **FX and GX**

EMC filter Class A Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	a_1	b	b_1	c	n_3	n_4	Weight, approx kg
0BE32-5AA0	**FX**	270 *(10.63)*	360 *(14.17)*	200 *(7.87)*	240 *(9.45)*	116 *(4.57)*	210 *(8.27)*	220 *(8.66)*	12.3
0BE34-4AA0	**GX/GX**	270 *(10.63)*	360 *(14.17)*	200 *(7.87)*	240 *(9.45)*	116 *(4.57)*	210 *(8.27)*	220 *(8.66)*	12.3
0BE36-0AA0	**GX**	310 *(12.2)*	400 *(15.75)*	215 *(8.46)*	265 *(10.43)*	140 *(5.51)*	250 *(9.84)*	240 *(9.45)*	19.0

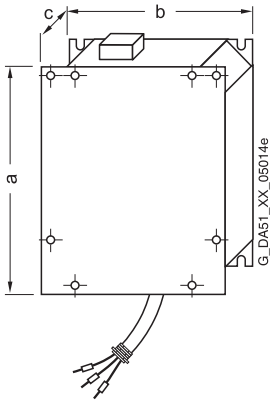
All dimensions in mm *(values in brackets are in inches)*

DIMENSION DRAWINGS

Line commutating chokes

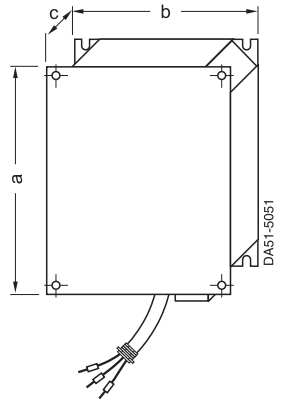


Line commutating choke for frame size **A**



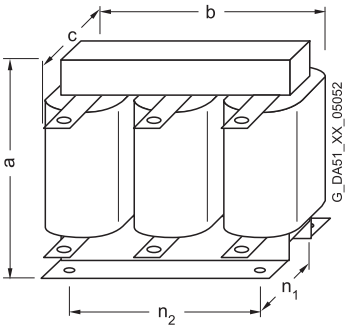
For frame sizes **B** and **C**

Line commutating choke for	Dimensions a	b	c	Weight (max.) kg
Frame size **A**	200 *(7.87)*	75.5 *(2.97)*	50 *(1.97)*	0.8
Frame size **B**	213 *(8.39)*	150 *(5.91)*	50 *(1.97)*	1.3
Frame size **C** (380–480 V)	280 *(11.02)*	185 *(7.28)*	50 *(1.97)*	2.3
Frame size **C** (500–600 V, 0.75–1.5 kW)	280 *(11.02)*	185 *(7.28)*	50 *(1.97)*	4.4
Frame size **C** (500–600 V, 2.2–4 kW)	280 *(11.02)*	185 *(7.28)*	50 *(1.97)*	5.0
Frame size **C** (500–600 V, 5.5–11 kW)	280 *(11.02)*	185 *(7.28)*	80 *(3.15)*	6.8



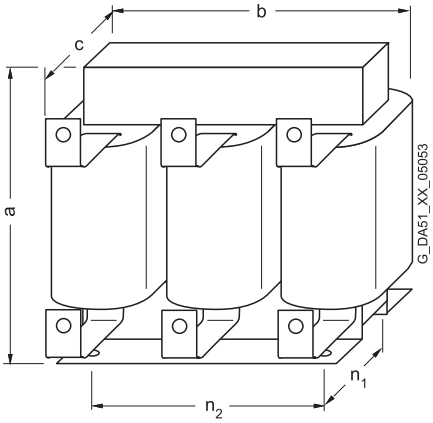
Line commutating choke for frame sizes **D** and **E**

Line commutating choke for	Dimensions a	b	c	Weight (max.) kg
Frame size **D**	520 *(20.47)*	275 *(10.83)*	85 *(3.35)*	9.5
Frame size **E**	650 *(25.59)*	275 *(10.83)*	95 *(3.74)*	17.0



Line commutating choke for inverter frame size **F**

Line commutating choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
3CC11-....	**F**	228 *(8.98)*	240 *(9.45)*	141 *(5.55)*	95 *(3.74)*	185 *(7.28)*	25.0



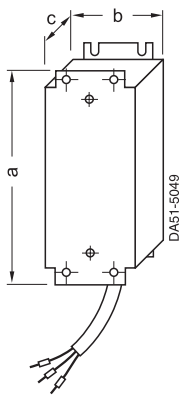
Line commutating choke for inverters of frame sizes **FX** and **GX**

Line commutating choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
0CE32-....	**FX**	248 *(9.76)*	255 *(10.04)*	203 *(7.99)*	101 *(3.98)*	200 *(7.87)*	24.0
0CE33-....	**GX**	248 *(9.76)*	255 *(10.04)*	203 *(7.99)*	101 *(3.98)*	200 *(7.87)*	25.0
0CE35-....	**GX**	269 *(10.59)*	275 *(10.83)*	210 *(8.27)*	118 *(4.65)*	224 *(8.82)*	35.0

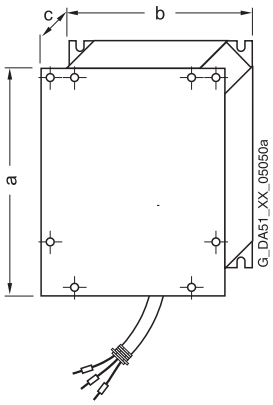
All dimensions in mm *(values in brackets are in inches)*

DIMENSION DRAWINGS

Output Chokes

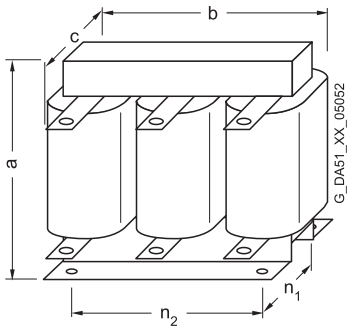


Output choke
for frame size **A**
6SE6400-3TC00-4AD2
6SE6400-3TC00-4AD3



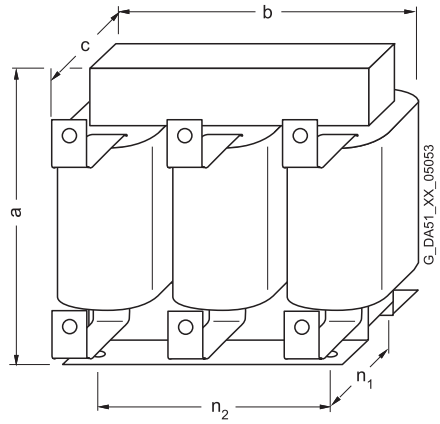
For frame sizes **B** and **C**
6SE6400-3TC01-0BD3
6SE6400-3TC01-8CE3
6SE6400-3TC03-2CD3

Output choke Type 6SE6400-	Dimensions a	b	c	Weight (max.) kg
3TC00-4AD2	200 *(7.87)*	75.5 *(2.97)*	110 *(4.33)*	1.95
3TC00-4AD3	200 *(7.87)*	75.5 *(2.97)*	50 *(1.97)*	0.8
3TC01-0BD3	213 *(8.39)*	150 *(5.91)*	70 *(2.76)*	3.4
3TC01-8CE3	245 *(9.65)*	185 *(7.28)*	150 *(5.91)*	9.6
3TC03-2CD3	245 *(9.65)*	185 *(7.28)*	80 *(3.15)*	5.6



Output chokes
for inverters of frame sizes **D**, **E** and **F**

Output choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions a	b	c	to DIN 41 308 n_1	n_2	Weight (max.) kg
3TC03-2DE0	**D**	210 *(8.27)*	225 *(8.86)*	179 *(7.05)*	94 *(3.70)*	176 *(6.93)*	16.0
3TC03-8DD0	**D**	210 *(8.27)*	225 *(8.86)*	179 *(7.05)*	94 *(3.70)*	176 *(6.93)*	16.1
3TC05-4DD0	**D**	210 *(8.27)*	225 *(8.86)*	150 *(5.91)*	70 *(2.76)*	176 *(6.93)*	10.7
3TC06-2FE0	**F**	269 *(10.59)*	300 *(11.81)*	220 *(8.66)*	118 *(4.65)*	224 *(8.82)*	33.9
3TC07-5ED0	**E**	248 *(9.76)*	270 *(10.63)*	209 *(8.23)*	101 *(3.98)*	200 *(7.87)*	24.9
3TC08-0ED0	**E**	210 *(8.27)*	225 *(8.86)*	150 *(5.91)*	70 *(2.76)*	176 *(6.93)*	10.4
3TC08-8FE0	**F**	321 *(12.64)*	350 *(13.78)*	288 *(11.34)*	138 *(5.43)*	264 *(10.39)*	51.5
3TC14-5FD0	**F**	321 *(12.64)*	350 *(13.78)*	288 *(11.34)*	138 *(5.43)*	264 *(10.39)*	51.5
3TC15-4FD0	**F**	248 *(9.76)*	270 *(10.63)*	209 *(8.23)*	101 *(3.98)*	200 *(7.87)*	24.0



Output chokes
for inverters of frame sizes **FX** and **GX**

Output choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
2BE32-1AA0	**FX**	285 *(11.22)*	300 *(11.81)*	257 *(10.12)*	163 *(6.42)*	224 *(8.82)*	60.0
2BE32-6AA0	**FX**	315 *(12.4)*	300 *(11.81)*	277 *(10.91)*	183 *(7.2)*	224 *(8.82)*	66.0
2BE33-2AA0	**GX**	285 *(11.22)*	300 *(11.81)*	257 *(10.12)*	163 *(6.42)*	224 *(8.82)*	62.0
2BE33-8AA0	**GX**	285 *(11.22)*	300 *(11.81)*	277 *(10.91)*	183 *(7.2)*	224 *(8.82)*	73.0
2BE35-0AA0	**GX**	365 *(14.37)*	300 *(11.81)*	277 *(10.91)*	183 *(7.2)*	224 *(8.82)*	100.0

All dimensions in mm *(values in brackets are in inches)*

DIMENSION DRAWINGS

Brake resistors

Fig. 1:

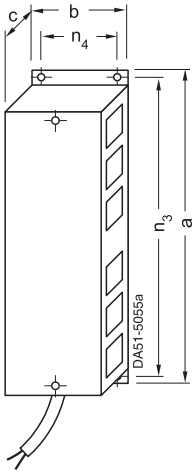


Fig. 2:

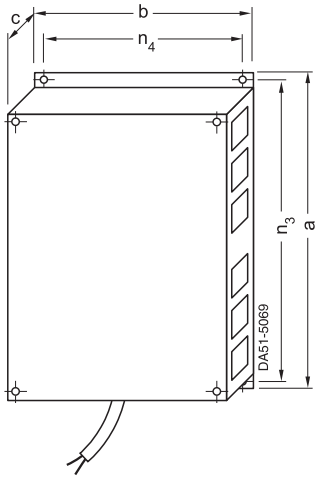
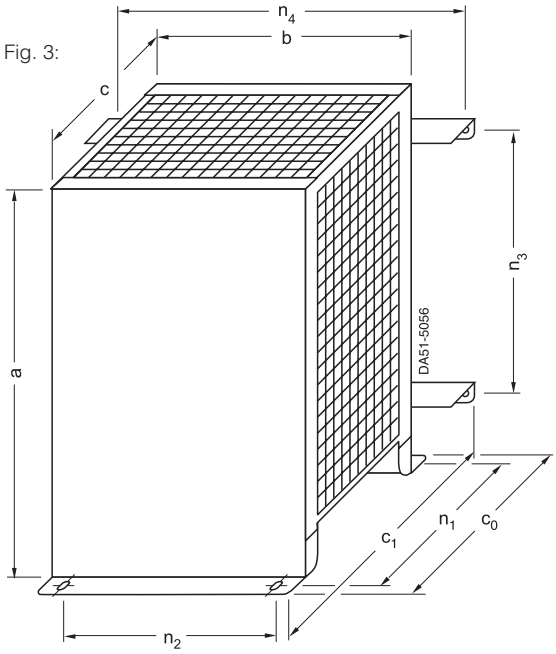


Fig. 3:



Brake resistors for inverters of frame sizes **A** to **F**

Brake resistors Type 6SE6400-	Resistor Ohm	for inverter Frame size (FS)	Figure No.	Dimensions a	b	c	c_0	c_1	For floor mounting n_1	n_2	For wall mounting n_3	n_4	Weight (max.) kg
4BC05-0AA0	180	**A**	1	230 *(9.06)*	72 *(2.83)*	43.5 *(1.71)*	–	–	–	–	217 *(8.54)*	56 *(2.20)*	1.0
4BC11-2BA0	68	**B**	2	239 *(9.41)*	149 *(5.87)*	43.5 *(1.71)*	–	–	–	–	226 *(8.90)*	138 *(5.43)*	1.6
4BC12-5CA0	39	**C**	3	285 *(11.22)*	185 *(7.28)*	150 *(5.91)*	185 *(7.28)*	217 *(8.54)*	170 *(6.69)*	145 *(5.71)*	200 *(7.87)*	230 *(9.06)*	3.8
4BC13-0CA0	27	**C**	3	285 *(11.22)*	185 *(7.28)*	150 *(5.91)*	185 *(7.28)*	217 *(8.54)*	170 *(6.69)*	145 *(5.71)*	200 *(7.87)*	230 *(9.06)*	3.8
4BC18-0DA0	10	**D**	3	515 *(20.28)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	350 *(13.78)*	315 *(12.40)*	7.4
4BC21-2EA0	6.8	**E**	3	645 *(25.39)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	480 *(18.90)*	315 *(12.40)*	10.6
4BC22-5FA0	3.3	**F**	3	650 *(25.59)*	400 *(15.75)*	315 *(12.40)*	382 *(15.04)*	382 *(15.04)*	335 *(13.19)*	270 *(10.63)*	510 *(20.08)*	435 *(17.13)*	16.7
4BD11-0AA0	390	**A**	1	230 *(9.06)*	72 *(2.83)*	43.5 *(1.71)*	–	–	–	–	217 *(8.54)*	56 *(2.20)*	1.0
4BD12-0BA0	160	**B**	2	239 *(9.41)*	149 *(5.87)*	43.5 *(1.71)*	–	–	–	–	226 *(8.90)*	138 *(5.43)*	1.6
4BD16-5CA0	56	**C**	3	285 *(11.22)*	185 *(7.28)*	150 *(5.91)*	185 *(7.28)*	217 *(8.54)*	170 *(6.69)*	145 *(5.71)*	200 *(7.87)*	230 *(9.06)*	3.8
4BD21-2DA0	27	**D**	3	515 *(20.28)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	350 *(13.78)*	315 *(12.40)*	7.4
4BD22-2EA0	15	**E**	3	645 *(25.39)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	480 *(18.90)*	315 *(12.40)*	10.6
4BD24-0FA0	8.2	**F**	3	650 *(25.59)*	400 *(15.75)*	315 *(12.40)*	382 *(15.04)*	382 *(15.04)*	335 *(13.19)*	270 *(10.63)*	510 *(20.08)*	435 *(17.13)*	16.7
4BE14-5CA0	120	**C**	3	285 *(11.22)*	185 *(7.28)*	150 *(5.91)*	185 *(7.28)*	217 *(8.54)*	170 *(6.69)*	145 *(5.71)*	200 *(7.87)*	230 *(9.06)*	3.8
4BE16-5CA0	82	**C**	3	285 *(11.22)*	185 *(7.28)*	150 *(5.91)*	185 *(7.28)*	217 *(8.54)*	170 *(6.69)*	145 *(5.71)*	200 *(7.87)*	230 *(9.06)*	3.8
4BE21-3DA0	39	**D**	3	515 *(20.28)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	350 *(13.78)*	315 *(12.40)*	7.4
4BE21-8EA0	27	**E**	3	645 *(25.39)*	270 *(10.63)*	175 *(6.89)*	210 *(8.27)*	242 *(9.53)*	195 *(7.68)*	205 *(8.07)*	480 *(18.90)*	315 *(12.40)*	10.6
4BE24-2FA0	12	**F**	3	650 *(25.59)*	400 *(15.75)*	315 *(12.40)*	382 *(15.04)*	382 *(15.04)*	335 *(13.19)*	270 *(10.63)*	510 *(20.08)*	435 *(17.13)*	16.7

All dimensions in mm *(values in brackets are in inches)*

Totally Integrated Automation (Drive ES)

MICROMASTER drives, COMBIMASTER and low-voltage motors are integral components of Totally Integrated Automation (TIA) – using the Drive ES engineering tool in conjunction with the market leading S7 plc range. This breakthrough allows automation tasks to be handled by drives in a unified, user-friendly fashion. **Many suppliers can connect to Fieldbus, but only Siemens offers TIA.**

Seamless integration

Using the Drive ES (engineering system), Siemens drives have been fully embedded and integrated into the engineering and programming software of TIA (Simatic Manager for Step 7). This Drive ES tool has been specifically developed to provide:

- Unified solution for all Automation & Drives equipment
- Simple programming facility via the Profibus network
- Reduced engineering overhead
- Faster installation, commissioning and diagnostics
- Single package for configuration, data management and communications
- Fast 'drive swap' facility without programming.

Siemens is the first manufacturer in the world with the ability to seamlessly integrate variable speed drives into the automation environment.

Drive ES Simatic also offers standard libraries and uniform operator control interfaces for a standard "look and feel" and for a simpler handling of all the TIA automation and drive components.

The Drive ES PCS7 package enables simple integration into a PCS7 SCADA package with pre written faceplates.

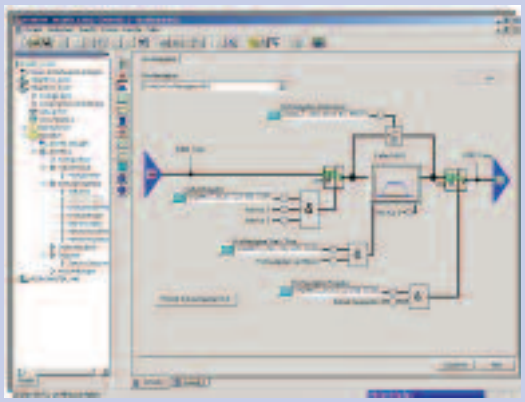
Drive ES Basic	6SW1700-5JA00-4AA0	**£239**
Drive ES SIMATIC	6SW1700-5JC00-4AA0	**£357**
Drive ES PCS7	6SW1700-6JD00-0AA0	**£821**

A software update service can be ordered for all packages

Microsystems

- Lowest cost networking
- Direct RS485 connection to S7-200 plc from all Siemens variable speed drives
- Pre-written control and function blocks available.

Commissioning Tools – STARTER



Starter is the graphical commissioning package for the MICROMASTER / COMBIMASTER. Included are features such as simple wizards to guide you through the set up process, the ability to generate user definable parameter sets and a control panel to take local control of the drive.

Starter is provided free of charge for drive commissioning using the PC connection kit option. When using the Drive ES package, STARTER is integrated so a common user interface is maintained.

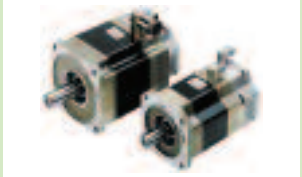
Complementary Drive Technology
The SINAMICS Family

The versatile SINAMICS G110 single drive for the lower power range	The modular SINAMICS G120 single drive for small to medium output ranges	The universal SINAMICS G130/G150 drive solution for single drives with high output rating	The flexible SINAMICS S120 modular drive system for demanding drive tasks
Main applications			
• Plants and machines for industrial and commercial applications	• Machines and plants for industrial and commercial applications (mechanical engineering, automotive, textiles, chemicals, printing, steel)	• Plants and machines in the process and production industry, water/waste water, power stations, oil and gas, petrochemicals, chemical raw materials, paper, cement, stone, steel	• Plants and machines for industrial applications (packaging, plastics, textiles, printing, wood, glass, ceramics, presses, paper, lifting equipment, semiconductors, automated assembly and testing equipment, handling, machine tools)
Application examples			
• Pumps and fans • Conveyor systems • Billboards • Door/gate operating mechanisms • Centrifuges	• Conveyor systems • Converting • Hoists • Extruders • Centrifuges	• Pumps and fans • Compressors • Extruders and mixers • Mills • Conveyors	• Motion control applications (positioning, synchronous operation) • Converting • Technological applications
Benefits			
• Compact • Flexible adaptation to different applications • Simple, fast commissioning • Ready for operation • Clear terminal layout • Optimum interaction with SIMATIC and LOGO!	• Modular • Flexible expansion capability • Quick and easy commissioning • Regenerative feedback • Innovative cooling concept • Optimum interaction with SIMOTION and SIMATIC • SINAMICS Safety Integrated	• Space-saving • Low-noise • Simple, fast commissioning • G130: Modular components • G150: Ready-to-connect cabinet unit • Optimum interaction with SIMATIC	• Scalable in terms of power, function, number of axes, performance • Quick and easy commissioning, auto-configuration • Innovative, future-oriented system architecture • Optimum interaction with SIMOTION, SIMATIC and SINUMERIK • SINAMICS Safety Integrated

Masterdrive Features

- Vector control, DC or motion control
- Rectifiers, inverters, converters and options
- 6/12/18/24 Pulse configurations
- Chassis units, cubicles and complete systems
- Water-cooled units available
- The most comprehensive system drive in the world
- 200,000 units per year manufactured
- Clean power technology benefits

ServoMaster Brushless – AC motors



The ServoMaster motor range covers the complete spectrum of high performance motors from the economy range of 1FK6 servomotors, high dynamic IFT6 motors through to high performance square frame induction motors (including IPH7 and IPL6 types).

They feature:

- High power density with low physical volume
- Typically conform to dc motor sizes
- Water cooled options available
- Speed to zero without torque reduction
- Integrated feedback devices as standard.

Technical Support, Service and Warranty

From project concept to implementation and beyond, Siemens Automation & Drives provides comprehensive life cycle support. Our extensive support team includes Applications and Technical Support Engineers, Product Specialists and Field Service Engineers, who provide a wide range of services:

- Application consultancy
- Technical support
- Field service, including installation, commissioning, maintenance, breakdown recovery
- Warranty handling, including repair, parts replacement, service exchange
- On line – a comprehensive information system available on the internet at www.siemens.com / micromaster.

In addition to the above, we offer a number of proactive services to optimise the availability and performance of all types of installations, such as

- **Service / maintenance contract options**
  - 7 days / week, 365 days / year
  - fast response to site
  - tailored service contracts available to meet individual customer requirements.
- **Asset management options**
  - plant maintenance management – including preventative measures
  - bonded stock availability
  - repair contracts
  - software update service (SUS)
  - asset management software solutions
  - leasing.
- **Process improvement strategies**
  - consultancy
  - best practice programmes
  - site audits.

Harmonic Measurement Service and Power Quality Analysis

Power frequency harmonics are a key consideration for many users and Siemens is able to offer a comprehensive package of products, system analysis, software tools and the services to guarantee compliance to the UK regulations G5/4-1: Planning levels for harmonic distortion in the UK supply network (available from the energy networks association).

Available both as pre and post installation services, to measure harmonic levels of either the drive itself, the application or the whole site. The audit will report harmonic levels and make remedial recommendations, such as additional mains filtering, to ensure that harmonic levels fall within current requirements.

Energy Efficiency Consultation

Qualified for Energy Technology List
Authorised User No. 00198

Electric motors use two thirds of electrical energy in industry. High efficiency motors and variable speed drives offer significant potentials for energy savings. Additionally, we can offer a complete service including software tools, energy management systems, high efficiency products and site services. Furthermore, a range of financial options including low cost leasing can underpin the package.

We can offer a comprehensive energy efficiency audit service to measure energy consumption trends, over extended operating periods, for a wide range of plant including pumps and fans. Using the latest energy monitoring equipment engineers are able to calculate optimum operational conditions and make recommendations for energy optimisation by the correct use of motor drive technology. Repeat audits can then be used to confirm cost saving predictions after the installation is complete.

The Siemens offer therefore consists of the following:

- **System design consultation**
- **Site survey – 7 day "G5/4-1" measurement**
- **Harmonic prediction service**
- **Evaluation of optimum harmonic solution – cost and size**
- **Total system responsibility**
- **Complete product range**
  - 6 pulse drives and input line reactors
  - 12 pulse drives (and higher)
  - NEW! - Innovated line harmonic filters (LHF) for larger drives
  - Active filter techniques
  - Clean power designs
  - Low voltage and high voltage soft starters

Unrivalled in our scope of technical support, we can assure you of a competent service – whatever your requirement.

Help Desk Number: 0161 446 5545 **E-mail: support.ad.uk@siemens.com**

24hr information available from www.siemens.com / micromaster

SITRAIN® – Customer Training Solutions

Customer training is part of a range of Siemens support programmes aimed at optimising the skills of staff involved in designing, installing and maintaining Siemens automation and drives systems.

Training plans often need to be integrated with a planned service approach to optimise automation system performance. Siemens Automation & Drives Training will work with customers to develop a training programme which will meet their specific needs for developing staff and complementing their chosen service option. SITRAIN® provides quality training solutions based on a hands-on, 'learning by doing' approach.

Professional Training from SITRAIN:

- **Is the fastest way to acquire knowledge**
- **Reduces the cost of downtime**
- **Builds staff confidence and competence**
- **Supports QA and Health & Safety requirements**

As part of the comprehensive programme of training solutions for Siemens automation and drives applications, SITRAIN offers the following MICROMASTER Drives Course which can be attended in standard format as a scheduled course. Alternatively the course can be tailored to customer requirements and delivered either at Siemens or the customer site.

MICROMASTER 4 servicing, commissioning SI-MM4 (2 days) **£690 + VAT**

This is a practical introduction to commissioning and maintaining the Micromaster 4 drive, as well as the use of associated software, and includes:

- Basic drive theory
- Overview of MICROMASTER
- Connections on MICROMASTER 420 / 440
- Commissioning
- Analogue / digital, inputs and outputs
- BICO technology
- Free blocks
- Factory default
- Faults and Alarms
- Starter configuration software
- Profibus DP
- S7 PLC operation with MICROMASTER.

There are also some options to do basic Micromaster 4 training using CBT or WBT

For CBT and WBT training options, log on to: www.sitrain.com

As well as training for the Micromaster drives family, SITRAIN UK can deliver drives training solutions for Masterdrive VC/MC, SINAMICS G110, S120, G130, G150 and SIMOREG DC drives.

SITRAIN UK provides a wide range of training solutions across most industry sectors to support Totally Integrated Automation (TIA) from Siemens. We can deliver standard or tailored solutions incorporating Siemens process control, PLCs, communications, SCADA/HM1, safety and motion control technology.

For all your training needs contact:
Tel: 0161 446 5741 / 5744 / 6782
Fax: 0161 446 5742

Further information is contained in the following catalogues:

Standard drives	MICROMASTER range	DA51.2
	COMBIMASTER range	DA51.3
	SINAMICS G110 range	D11.1
	SINAMICS G120 range	D11.1N
Engineered drives	Masterdrives VC	DA65.10
	Masterdrives MC	DA65.11
	SINAMICS S120 Servo	D21.2
	SINAMICS S120 Vector	D21.1
Large Drives	SINAMICS G130 Chassis Unit	D11
	SINAMICS G150 Cabinet	D11
	SINAMICS S150 Cabinet	D21.3
Low voltage motors	EFF1 and EFF2	M11

Please call our literature hotline **0845 7 70 50 70** to obtain the above catalogues, or further information on the complete range of automation and drives products and solutions.

Literature can be ordered or downloaded at the following website:
www.siemens.co.uk/automationliterature

Additional information on the complete range of drives can be obtained from:

www.siemens.com / drives

Industrial Drives & Controls Ltd, distributor stamp
Drivetec House,
Aqueduct Business Park,
Marple,
Stockport,
Cheshire, SK6 5LD.

Tel: 0161 427 0022
Fax: 0161 427 0033

E-mail: sales@drives-and-controls.co.uk

Siemens Automation & Drives
Sir William Siemens House
Princess Road
Manchester
M20 2UR

Tel: 0161 446 6400
Fax: 0161 446 5471

E-mail: sales.ad.uk@siemens.com

PCo-402551-10/06

Short Form Catalogue