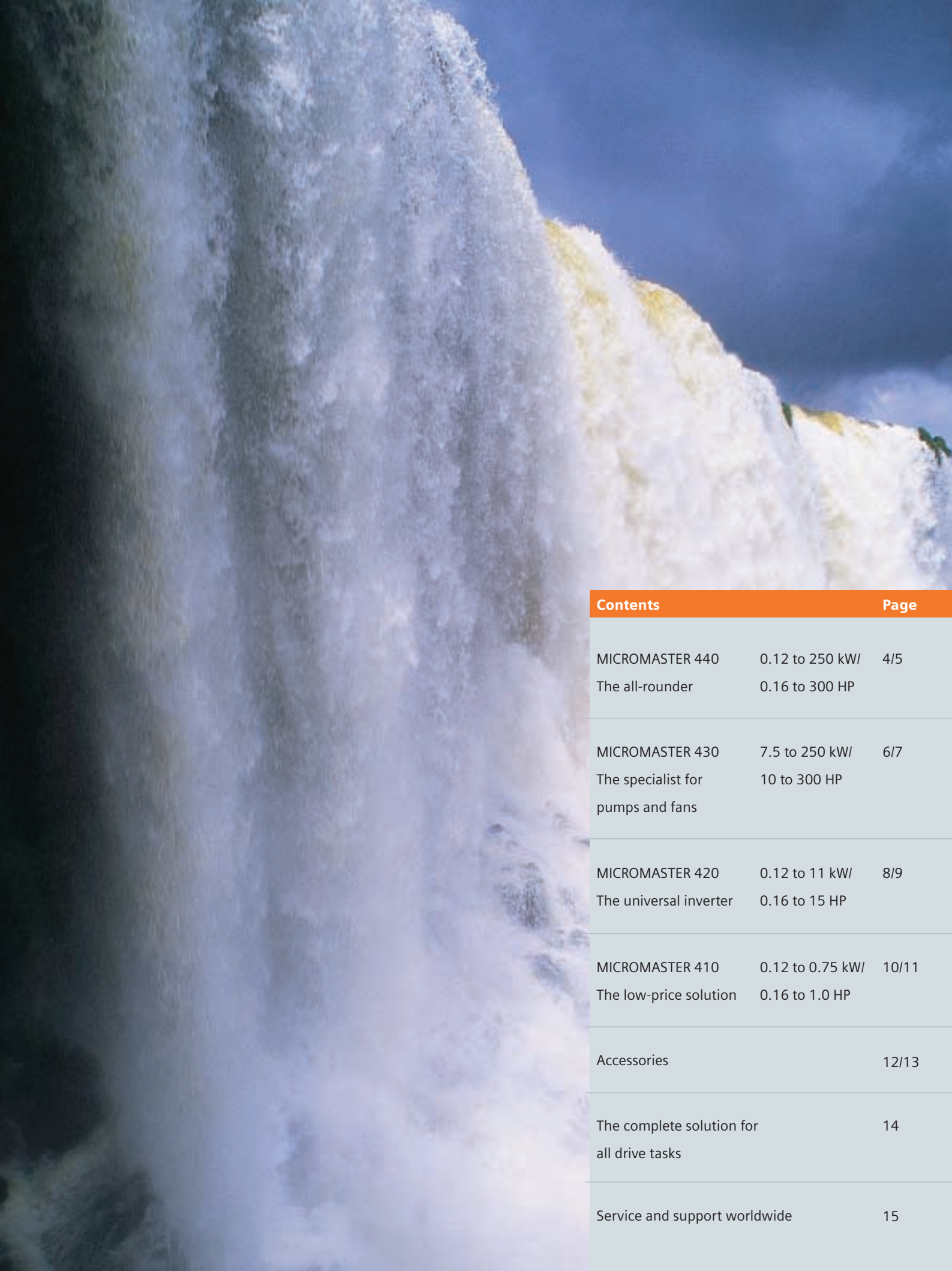


Unleash new sources of power
Frequency inverters, set everything in motion

micromaster



SIEMENS



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Simply indispensable – The wide-ranging functionality of MICROMASTER

A vast number of today's motor applications require the use of a Variable Speed Drive to ensure optimum performance. Making the correct speed adjustments can ensure dramatic savings in energy costs and improvements in application performance. From the technology available, which unit should you select to ensure these goals are met and your investment pays off? As a supplier of complete drive systems and technology, Siemens can offer you a wide range of frequency inverters: the MICROMASTER family. Thanks to their modular design, all the inverter units can be used in a variety of applications and are extremely flexible in use. With power ratings ranging from 0.12 to 250 kW (0.16 to 300 HP), they can readily be adapted to new requirements without any great effort.



Our frequency inverters combine the highest technical quality with versatile functionality: from the basic MICROMASTER 410 for simple applications to the high-performance MICROMASTER 440 with sensorless vector control and a power range up to 250 kW (300 HP). Each individual member of our MICROMASTER family is characterized by its exceptionally simple handling: from installation and commissioning to operator control. Later adaptation to new requirements is simplicity itself.

Each frequency inverter belonging to the family allows flexible circuit connection of inputs and outputs for optimum link-up of a broad variety of digital and analog signals. With its default factory settings, it is immediately ready for use.

Part of Totally Integrated Automation (TIA)

All standard Siemens drives with the PROFIBUS option are integrated in TIA. On the basis of TIA's three-pronged universality with regard to communication, configuration and data management, our drive systems perform automation tasks smoothly and efficiently, with a savings potential of up to 30 %.

Safe operation – all over the world

All the important protection and overload functions are already standard features of our inverters. And the requirements of the EU low-voltage directive are met by all the devices in the MICROMASTER family. They have the CE label, as well as both UL and CUL certification. So the MICROMASTER family has just about everything.

MICROMASTER 440

The powerful all-rounder

Within the world of drive technology, some applications prove particularly hard to handle. That was until the high-performance MICROMASTER 440 entered the arena. Specially designed for those applications which require broader functionality and the ability to ensure greater dynamic response than is normally available. The sophisticated vector control system ensures a uniformly high drive quality, even when sudden load changes occur. Fast response inputs and positioning deceleration ramps allow movement to target positions even without an encoder. Due to an integrated brake chopper, it works with outstanding precision, even during braking and short deceleration ramps. All this is possible within a power range starting at 0.12 kW (0.16 HP) and going up to 250 kW (300 HP).

Typical uses

Numerous applications in areas such as material handling systems, the textile industry, elevators, hoisting gear, mechanical engineering and the food, beverages and tobacco industries.

Its strengths in brief

- Compact housing
- Easy to install
- Sophisticated vector control (speed/torque)
- Versatile inputs and outputs
- Guided commissioning
- High overload capacity

- Evaluation of motor pulse encoders (optional) for maximum control of torque at the lowest speeds (even at zero speed)
- Modular system of extension options
- Can be dimensioned for CT (constant torque) or VT (quadratic, i.e. variable torque)
- Load torque monitoring
- 3 selectable drive data to adapt the inverter to different operating circumstances
- Kinetic buffering against voltage dips
- Compound braking for controlled rapid braking
- Integrated brake chopper for power outputs up to 90 kW (125 HP)

- Free function blocks
- 4 skip frequencies minimize machine stress when resonance occurs
- Automatic restart
- Minimal stress on motor when inverter connected to rotating motor
- Evaluation of motor temperature for integrated motor protection
- Prepared for use in IT networks
- Available with and without integrated EMC filter

MICROMASTER 440 has everything needed to keep machine wear to a minimum.

MICROMASTER 440 – Technical data

Voltage and power ranges	200–240 V, ± 10%, 1 AC, 0.12 to 3 kW (0.16 to 4 HP) 380–480 V, ± 10%, 0.37 to 250 kW (0.5 to 300 HP)	200–240 V, ± 10%, 0.12 to 45 kW (0.16 to 60 HP) 500–600 V, ± 10%, 0.75 to 90 kW (1.0 to 125 HP)
Operating temperature	0.12 to 75 kW (0.16 to 1.0 HP) (CT): –10 °C to +50 °C; 90 to 200 kW (125 to 250 HP) (CT): 0 °C to +40 °C	
Process control	Internal PID controller (autotuning)	
Types of control	Vector control, FCC (Flux Current Control), multipoint characteristic (parameterizable V/f characteristic), V/f characteristic	
Inputs	6 digital inputs, 2 analog inputs, 1 PTC/KTY input	
Outputs	2 analog outputs, 3 relay outputs	
Link-up to automation	The ideal partner for your automation needs, from connection to SIMATIC S7-200 to integration in TIA with SIMATIC and SIMOTION.	



Connection arrangement
for MICROMASTER 440



MICROMASTER 430

The specialist for pumps and fans



Connection arrangement
for MICROMASTER 430



Every task performed by a drive system involves its own specific requirements. There is therefore a demand for inverter solutions that can be easily and flexibly adapted to cope with the broadest variety of challenges. It is exactly this flexibility which characterizes our modular MICROMASTER 430. Specially for use with pumps and fans, it performs a wide variety of tasks in similar applications as well. Compared to the MICROMASTER 420, it features greater power efficiency and has more inputs and outputs as well as an optimized operator panel with switchover between manual and automatic modes of operation.

Typical uses

Specially suitable for pumps and fans

Its strengths in brief

- Compact housing
- Easy to install
- Guided commissioning
- Numerous communications options
- Ability to cope with high starting torques
- FCC control (Flux Current Control) for high drive quality, even when load changes occur
- Integrated activation of up to three additional drives (motor staging) for low-cost power multiplication for pump and fan drives

- Bypass support for rapid motor changeover to direct mains operation for maximum process safety
- Energy-saving function with motor shut-off for maximum energy saving without altering the availability of full drive output
- Dry-running detection for pump drives
- 3 sets of drive data from which can be selected in order to adapt the inverter to different operating circumstances
- Compound braking for controlled rapid braking
- 4 skip frequencies for minimizing stress on pipe networks or on the

load machine when resonance occurs

- Increase of equipment availability due to automatic restart
- Minimal stress on motor when inverter connected to rotating motor
- Evaluation of motor temperature by means of PTC/KTY input for integrated motor protection
- Prepared for use in IT networks
- Variants with an integrated EMC filter round off the range of products and help to reduce the amount of installation work needed.

MICROMASTER 430 is economically efficient in terms of both investment and operation.



MICROMASTER 430 – Technical data

Voltage and power ranges	380–480 V, $\pm 10\%$, 3 AC, 7.5 to 250 kW (10 to 300 HP)
Operating temperature	–10 °C to +40 °C
Process control	Internal PID controller
Types of control	FCC (Flux Current Control), multipoint characteristic (parameterizable V/f characteristic), V/f characteristic
Inputs	6 digital inputs, 2 analog inputs, 1 PTC/KTY input
Outputs	2 analog outputs, 3 relay outputs
Link-up to automation	The ideal partner for your automation needs, from connection to SIMATIC S7-200 to integration in TIA with SIMATIC and SIMOTION.

MICROMASTER 420

The universal inverter for every challenge

For your general-purpose drive applications the MICROMASTER 420 is simply configurable to ensure your individual requirements are met with the least possible effort. Available for both single and three-phase supplies and thanks to its modular design with expansion of the standard functions via a wide variety of options, this product is truly universal. With features such as the simple plug-in modules and screwless control terminals, configuration of this drive really is child's play.

Typical uses

Conveyor systems, material transport, pumps, fans, mechanical engineering

Its strengths in brief

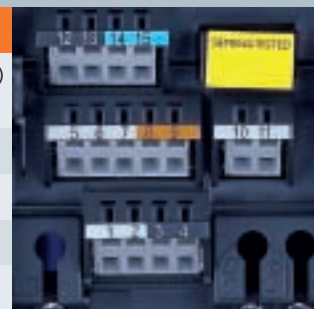
- Compact housing
- Easy to install
- Highly versatile inputs and outputs
- FCC control (Flux Current Control) for high drive quality, even when load changes occur
- Different methods of commissioning, via operator panel or cost-free software tool
- Modular system of inverter options
- Parameterizable acceleration/ deceleration times (0 to 650 s)
- Compound braking for controlled rapid braking
- 4 skip frequencies for minimizing stress on the machine when resonance occurs
- Automatic restart
- Minimal stress on motor when inverter connected to rotating motor
- Prepared for use in IT networks
- Integrated protection/overload functions
- Available with or without integrated EMC filter

MICROMASTER 420 – the universal inverter with a wide variety of features for improved drive performance.



MICROMASTER 420 – Technical data

Voltage and power ranges	200–240 V, $\pm 10\%$, 1 AC, 0.12 to 3 kW (0.16 to 4 HP) 380–480 V, $\pm 10\%$, 3 AC, 0.37 to 11 kW (0.5 to 15 HP)	200–240 V, $\pm 10\%$, 3 AC, 0.12 to 5.5 kW (0.16 to 7.5 HP)
Operating temperature	–10 °C to +50 °C	
Process control	Internal PI controller	
Types of control	FCC (Flux Current Control), multipoint characteristic (parameterizable V/f characteristic), V/f characteristic	
Inputs	3 digital inputs, 1 analog input	
Outputs	1 analog output, 1 relay output	
Link-up to automation	The ideal partner for your automation needs, from connection to SIMATIC S7-200 to integration in TIA with SIMATIC and SIMOTION.	



Connection arrangement for MICROMASTER 420



MICROMASTER 410

The low-price solution for standard tasks



Connection arrangement for MICROMASTER 410

The simple solution for simple tasks. Optimally matched to requirements in the power range from 0.12 to 0.75 kW (0.16 to 1.0 HP), the MICROMASTER 410 is the low-price solution for 3-phase motors with variable speeds in 1-phase power systems. Its compact design allows fast and problem-free installation and commissioning; this smallest member of the MICROMASTER family can be mounted on its side and can therefore find space in the smallest control cabinet. And to top it off, its price-performance ratio is outstanding.

Typical uses

Pumps, fans, advertising panels, cabinets, door operating mechanisms, vending machines, packaging machines

Its strengths in brief

- Its contactor-like design enables a simple, EMC compliant installation with ease of handling
- Operation with 30-mA r.c.c.b. circuit breaker in conjunction with an integrated B class filter variant allows direct use of the inverter in household and industrial applications
- Fanless cooling but nevertheless compact for noise-sensitive applications
- For use with 230-V and 115-V single-phase power systems and can therefore be used globally
- Versatile inputs and outputs facilitate simple use of the inverter's universal functionality
- Various methods of commissioning with an operator panel or SW tool enabling simple set-up according to the wishes of the user
- Low-cost drive dimensioning due to high overload capability
- Compound braking for controlled rapid braking
- Increase in equipment availability due to automatic restart in the event of a power failure or operating fault
- Minimal stress on motor when inverter connected to a rotating motor
- Various methods of setting the frequency setpoint
- Communication interface (USS) in each inverter offers integra-

tion in a net-worked automation system

- Suitable for use in IT networks thanks to removable "Y" capacitor
- Optional plug-in operator panel

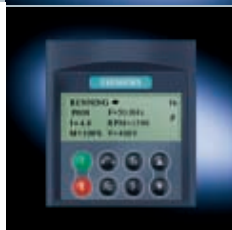
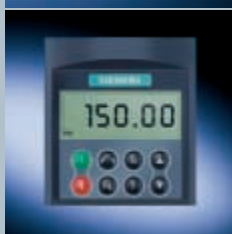
Protective functions

All the necessary protection and overload functions are already integrated as standard features. For example, the fast-acting current limiter (FCL) – the ultimate, universal protection mechanism.

MICROMASTER 410 – Technical data

Voltage and power ranges	100–120 V, ± 10%, 1 AC, 0.12 to 0.55 kW (0.16 to 0.75 HP) 200–240 V, ± 10%, 1 AC, 0.12 to 0.75 kW (0.16 to 1.0 HP)
Operating temperature	–10 °C to +50 °C
Types of control	V/f characteristic, multipoint characteristic (parameterizable V/f characteristic)
Inputs	3 digital inputs, 1 analog input
Outputs	1 relay output
Link-up to automation	The inverter partner for LOGO! and SIMATIC S7-200

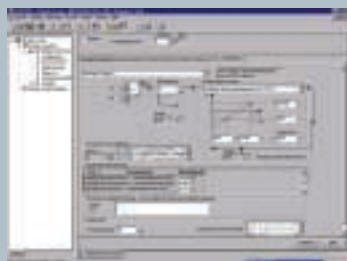
Accessories for MICROMASTER



Our Variable Speed Drives are suitable for a staggering range of tasks, with the right product always available from the MICROMASTER product family. Their compact design and application capabilities are characteristic features of the whole MICROMASTER family. But these are not the only advantages of our inverters. There are also additional options which can be used to improve energy efficiency, EMC compatibility or provide greater flexibility in user operation.

Simple commissioning

With each inverter, you receive the "Starter" commissioning tool. This makes it very easy to configure and start up your MICROMASTER with the help of a PC. The program guides you through the commissioning process step by step – it couldn't be simpler.



Accessories for MICROMASTER 410

- Line commutating choke
- Adapter for standardized installation on DIN mounting rail
- Easy-to-use operator panel for convenient parameterisation of the inverter
- PC inverter connection kit
- PC commissioning tools

Accessories for MICROMASTER 420

- Line commutating choke
- EMC filter, Class A or B
- Gland plates
- Basic Operator Panel (BOP) for parameterising the inverter
- Plain-text Advanced Operator Panel (AOP) with multiple-language menu
- PROFIBUS, DeviceNet and CANopen communications modules
- PC connection kit
- Mounting kits for installing the operator panels in control-cabinet doors
- PC commissioning tools

Accessories for MICROMASTER 430

- Line commutating chokes
- EMC filter, Class B
- Output chokes
- Gland plates
- Basic Operator Panel 2 (BOP 2) for parameterising an inverter
- PROFIBUS, DeviceNet and CANopen communications modules
- PC connection kit
- Mounting kits for installing the operator panel in control-cabinet doors
- PC commissioning tools

Accessories for MICROMASTER 440

- Line commutating chokes
- EMC filter, Class A or B
- Output chokes
- Gland plates
- Basic Operator Panel (BOP) for parameterising the inverter
- Plain-text Advanced Operator Panel (AOP) with multiple-language menu
- PROFIBUS, DeviceNet and CANopen communications modules
- Pulse-encoder evaluation module
- PC connection kit
- Mounting kit for installing the operator panels in control-cabinet doors
- PC commissioning tools



Always the right drive

Complete solutions from a single source

As a complete systems supplier, we not only supply the frequency inverters you need but can also offer a comprehensive portfolio of motors and geared motors to create an integrated, overall drive system – for decentralized or central control, for any requirements, for any type of system as well as for complete automation systems and equipment.

Totally Integrated Automation (TIA)

All standard Siemens drives with the PROFIBUS option are integrated in TIA.

www.siemens.com/tia

Micro Automation Sets for small automation tasks

Specially developed for small automation solutions, these modular sets from Siemens have already been assembled and tested for specific tasks and requirements. Micro Automation Sets 1 and 12, for example, have been configured for use in drive systems. You can find further information on these and other sets under:

www.siemens.com/microset

Standard drives

High-performance energy-saving motors

Our energy-saving motors (IEC and NEMA dimensions) cover more than 90% of all types of use worldwide. They guarantee high operational safety, a reduction of operating costs, up to 45% lower power losses and an increased operating life.

Explosion-protected motors

For uses which require high safety standards have to be complied with, we supply a comprehensive range of EEx motors – with “Increased Safety” ignition protection, pressurized enclosure, non-sparking motors with gas-explosion protection and the latest addition, motors with dust-explosion protection.

The modular concept

Thanks to the modularity of our motors and the patented Siemens add-on system, complete solutions can be created which guarantee smooth functionality and high product availability by means of coordinated technology.

Decentralized drive systems

Cost-saving inverter motors

COMBIMASTER, a combination of the MICROMASTER 411 inverter and the EFF2 energy-saving motor, not only requires very little space but also reduces costs by up to 30% compared to conventional solutions.

Versatile geared motors

Whether helical, offset, angular or helical worm gears are required –

our geared motors cover all possible applications, provide protection even in highly sensitive environments and run reliably even in the roughest conditions. They can also be integrated in decentralized solutions with the help of ECOFAST.

The ECOFAST uniform connection system

A system solution for decentralization without the need for cabinets – with a standardized connection system based on PROFIBUS and the AS-Interface. With a single cable for all items of equipment. The advantage: more efficiency and reduced plant downtime.

Saving space with MICROSTARTER

The communications-capable direct and reversing starter is the space-saving solution for direct mounting on motors – with a rating of up to 4 kW and degree of protection IP 65. For more information on our drive systems, go to:

www.siemens.com/drives



Worldwide service

Where it's all about the customer

For precise planning of your drive system to match your needs, or if you are having problems with delivery, installation or maintenance, our experts are always directly on-hand to help you – in over 130 countries all over the world. Speed is both our strength and your advantage, whatever part of our services you require. Specifically the benefits for you are as follows:

Short delivery times

Irrespective of where you need one of our MICROMASTER devices, it will be sent to you quickly by the shortest route possible.

Complete documentation

Our inverters are delivered with our easy-to-use Care package with operating instructions, technical data and much, much more. We can also provide worldwide training or other courses matched to your needs.

Easy shopping at the Siemens Mall

You can select from our range of products and place your order in comfort over the Internet. Under www.siemens.com/automation/mall, all the information you need is set out in a clear and easily comprehensible manner. With EDIFACT, you can process your whole order over the Internet – from selection and ordering to on-line tracking.

Service and support

Do you need the help of a service specialist, spare parts or a product expert for advice, or do you simply want to ask a question?

No problem at all, you will be given the correct answer via our hotline or over the Internet quickly.

To get in touch with us quickly, contact:

Helpline Service & Support

www.siemens.com/automation/service&support



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Standard Drives

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