



micromaster



MICROMASTER 420/430/440
Inverters
0.12 kW to 250 kW

SIEMENS

Related catalogs

SINAMICS G110/SINAMICS G120 D 11.1
Inverter Chassis Units
SINAMICS G120D
Distributed Frequency Inverters
Order No.:
German: E86060-K5511-A111-A4
English: E86060-K5511-A111-A4-7600



SINAMICS G130 D 11
Drive Converter Chassis Units
SINAMICS G150
Drive Converter Cabinet Units
Order No.:
German: E86060-K5511-A101-A3
English: E86060-K5511-A101-A3-7600



MICROMASTER/COMBIMASTER DA 51.3
MICROMASTER 411 Inverters
COMBIMASTER 411
Distributed Drive Solutions
Order No.:
German: E86060-K5251-A131-A2
English: E86060-K5251-A131-A2-7600



**Industrial Communication
for Automation and Drives** IK PI
Part 6: ET 200 Distributed I/O
ET 200S FC Frequency Converter
Order No.:
German: E86060-K6710-A101-B5
English: E86060-K6710-A101-B5-7600



Low-Voltage Motors D 81.1
IEC Squirrel-Cage Motors
Frame sizes 56 to 450
Order No.:
German: E86060-K5581-A111-A2
English: E86060-K5581-A111-A2-7600



Low-Voltage Motors D 81.1
IEC Squirrel-Cage Motors
New Generation 1LE1
Frame size 100 to 160
Order No.:
German: E86060-K5581-A121-A2
English: E86060-K5581-A121-A2-7600



AC NEMA & IEC Motors D 81.2
Further details available on the
Internet at: U.S./Canada

<http://www.sea.siemens.com/motors>



MOTOX D 87.1
Geared Motors
Order No.:
German: E86060-K5287-A111-A1
English: Catalog available soon



Catalog CA 01 CA 01
The Offline Mall of Automation and Drives
Order No.:
CD: E86060-D4001-A100-C6 (Germ.)
CD: E86060-D4001-A110-C6-7600 (Engl.)
DVD: E86060-D4001-A500-C6 (Germ.)
DVD: E86060-D4001-A510-C6-7600 (Engl.)



A&D Mall

Internet:
<http://www.siemens.com/automation/mall>



Additional documentation

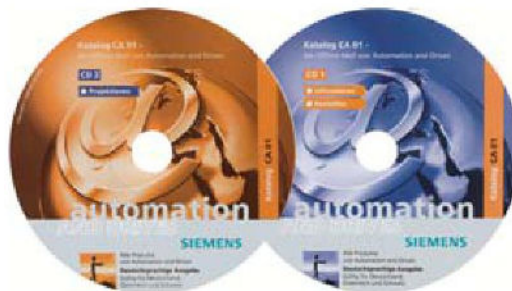
You will find all information material, such as brochures, catalogs, manuals and operating instructions for standard drive systems up-to-date on the Internet at the address

<http://www.siemens.com/micromaster/printmaterial>

You can order the listed documentation or download it in common file formats (PDF, ZIP).

Catalog CA 01 – Selection tool SD configurator

The selection tool **SD configurator** is available in combination with the electronic catalog CA 01.



On CD 2 for the selection and configuring tools, you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters and SIMATIC ET 200S FC frequency converters for distributed I/O, complete with:

- Dimension drawing generator for motors
- Data sheet generator for motors and inverters
- Starting calculation
- 3D models in STP format
- Extensive documentation

Hardware and software requirements

- PC with 500 MHz CPU or faster
- Operating systems
 - Windows 98/ME
 - Windows 2000
 - Windows XP
 - Windows NT 4.0 (Service Pack 6 or higher)
- 256 MB work memory (minimum)
- Screen resolution 1024 x 768, graphic with more than 256 colors, small fonts
- 150 MB spare hard disk space (after installation)
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

You can install this catalog directly from the CD-ROM as a partial version or full version on your hard disk or in the network.

MICROMASTER 420/430/440 Inverters 0.12 kW to 250 kW Catalog DA 51.2 2007/2008



Supersedes:
Catalog DA 51.2 · 2005/2006

The products in this catalog are also included
in the electronic catalog CA 01.

Order No.:
E86060-D4001-A110-C6-7600 (CD-ROM)
E86060-D4001-A510-C6-7600 (DVD)

Contact your local Siemens representative
for further information

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SIEMENS

Introduction

Siemens
Automation and Drives

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MICROMASTER

Overview

1

MICROMASTER 420 “The universal”

0.12 kW to 11 kW

2

MICROMASTER 430 “The specialist for pumps and fans”

7.5 kW to 250 kW

3

MICROMASTER 440 “The all-purpose”

0.12 kW to 250 kW

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Appendix

A

Siemens Automation and Drives. Welcome

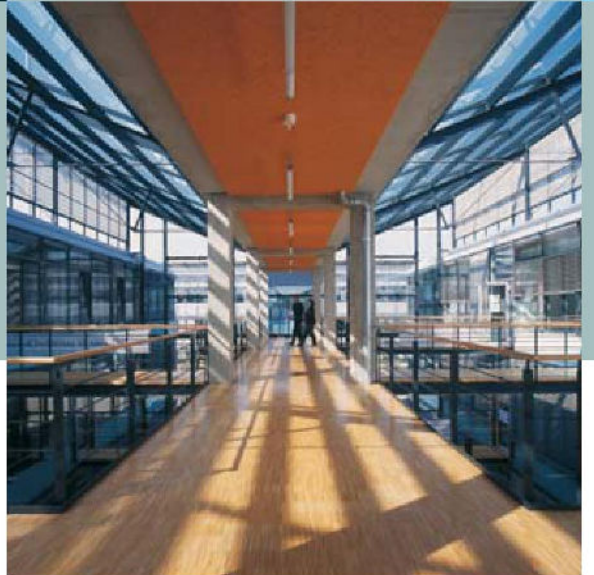
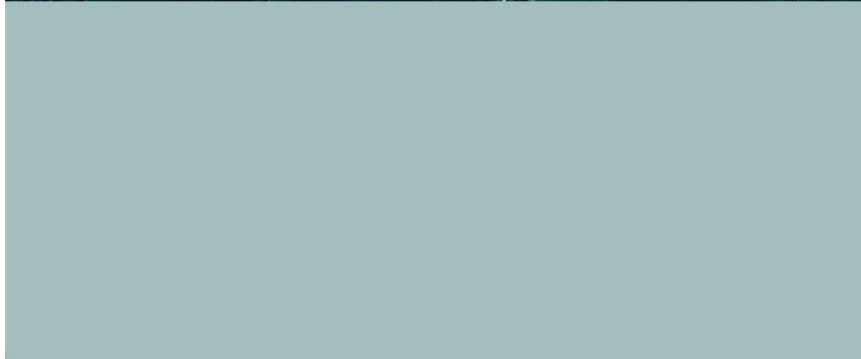
More than 70,000 people aiming for the same goal: increasing your competitiveness. That's Siemens Automation and Drives.

We offer you a comprehensive portfolio for sustained success in your sector, whether you're talking automation engineering, drives or electrical installation systems. Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) form the core of our offering. TIA and TIP are the basis of our integrated range of products and systems for the manufacturing and process industries as well as building automation. This portfolio is rounded off by innovative services over the entire life cycle of your plants.

Learn for yourself the potential our products and systems offer. And discover how you can permanently increase your productivity with us.

Your regional Siemens contact can provide more information. He or she will be glad to help.

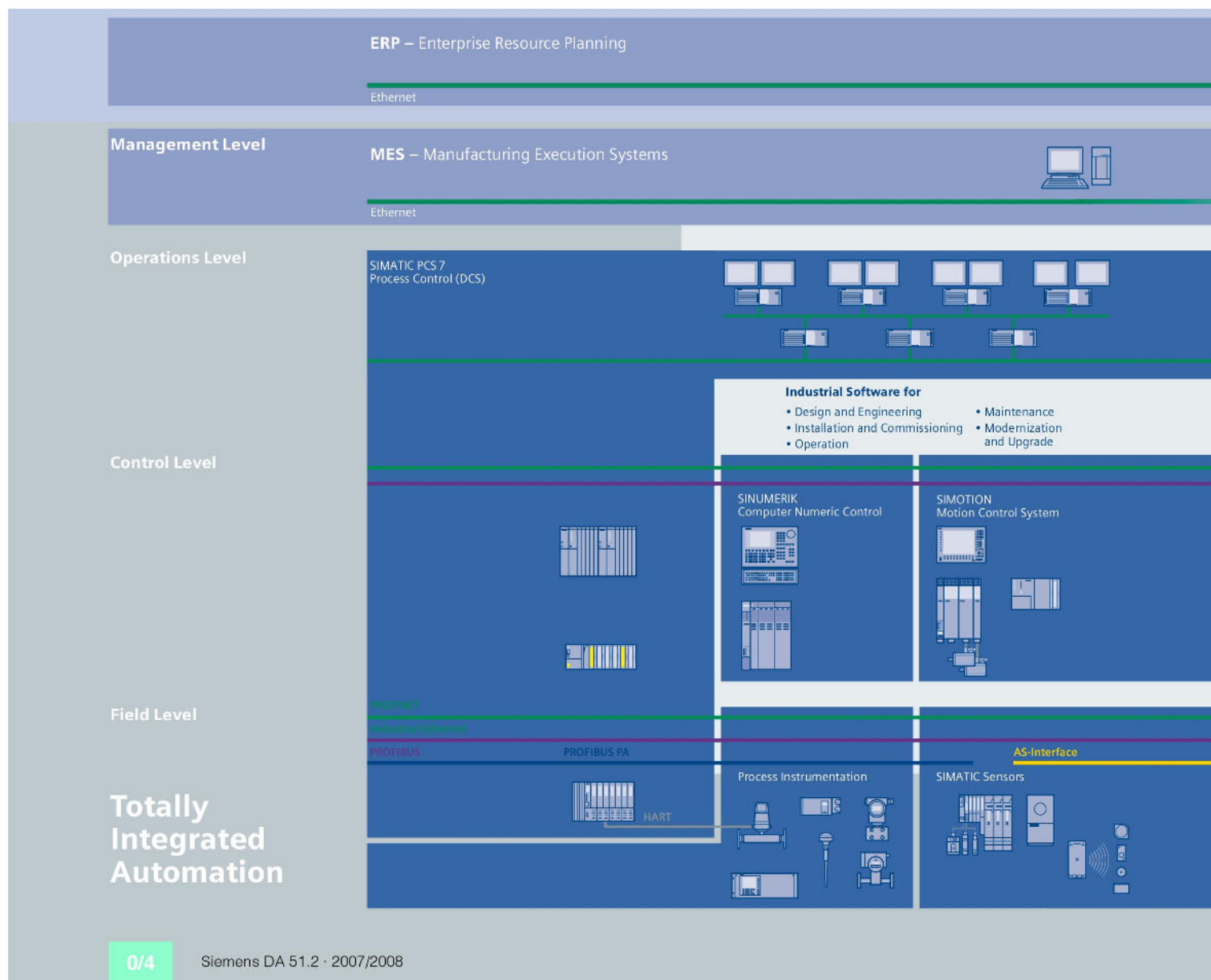




Sharpen your competitive edge. Totally Integrated Automation

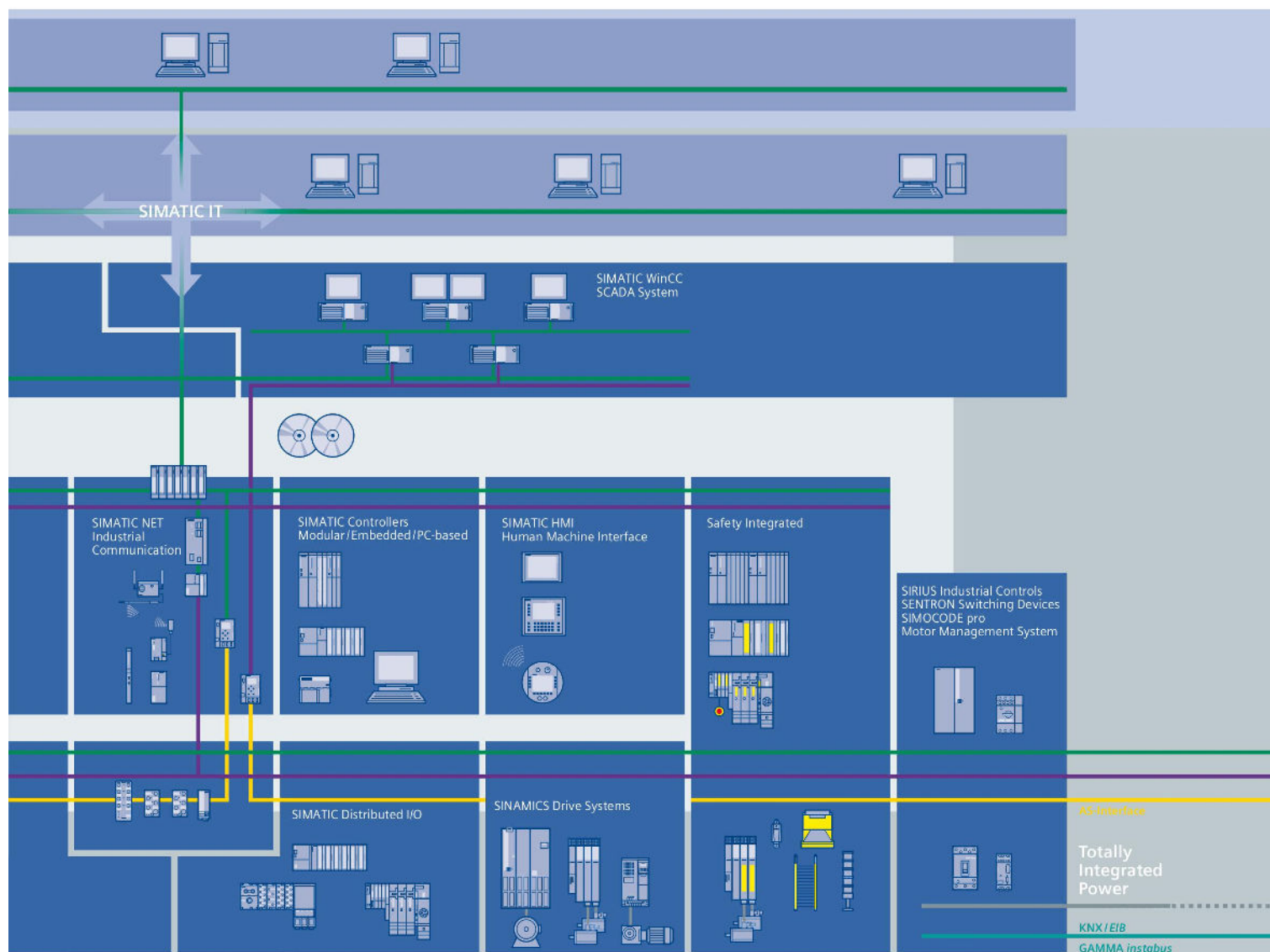
With Totally Integrated Automation (TIA), Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all sectors – from incoming goods to outgoing goods, from the field level through the production control level to connection with the corporate management level.

On the basis of TIA, we implement solutions that are perfectly tailored to your specific requirements and are characterized by a unique level of integration. This integration not only ensures significant reductions in interface costs but also guarantees the highest level of transparency across all levels.



It goes without saying that you profit from Totally Integrated Automation during the entire life cycle of your plants – from the first planning steps, through operation, right up to modernization. Consistent integration in the further development of our products and systems guarantees a high degree of investment security here.

Totally Integrated Automation makes a crucial contribution towards optimizing everything that happens in the plant and thus creates the conditions for a significant increase in productivity.



Protecting the environment and resources. Environmental sustainability



Environmental protection will continue to grow in importance as a result of progressive urbanization and global population growth. These global mega-trends make the careful and sustainable handling of natural resources a central challenge.

We are convinced that every individual - and especially every company - has an ecological responsibility. At Siemens Automation and Drives, we stand by this conviction. Our high environmental protection goals are part of our strict environmental management. We investigate the possible effects of our products and systems on the environment right back at the development stage. We concern ourselves, for example, with the question of how to reduce power consumption in plant operation - and we offer appropriate solutions, such as our energy-saving motors that cut power consumption in industrial manufacturing by up to 40% thanks to their high efficiency levels.

Many of our products and systems comply with the EC Directive RoHS (Restriction of Hazardous Substances). All the relevant Siemens AG sites are, of course, certified in accordance with DIN EN ISO 14001.

Our commitment goes well beyond compliance with the relevant directives and legislation: we are an active driving force behind environmental protection, through further development of environmental management systems, for example, and we are involved in professional associations such as the German Electrical and Electronic Manufacturers Association (ZVEI).

Inverter MICROMASTER



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Selection guide

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Options

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Overview

Selection guide

	MICROMASTER 410	MICROMASTER 420
Main characteristics	Discontinued product The MICROMASTER 410 is no longer available. The model will be discontinued as of October 1, 2007. The MICROMASTER 410 can then only be ordered as a spare part.	"The universal" for three-phase networks and optional fieldbus interfacing, e.g. for conveyor belts, material transport, pumps, fans and machine tools
Power ranges	–	0.12 kW to 11 kW
Voltage ranges	–	1 AC 200 V to 240 V 3 AC 200 V to 240 V 3 AC 380 V to 480 V
Control methods	–	<ul style="list-style-type: none"> V/f characteristic Multipoint characteristic (programmable V/f characteristic) FCC (flux current control)
Process control	–	Internal PI controller
Inputs	–	3 digital inputs 1 analog input
Outputs	–	1 analog output 1 relay output
Interfacing to automation system	–	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION
Additional features	–	<ul style="list-style-type: none"> BICO technology Compound braking for controlled rapid braking
		

Section 2

MICROMASTER 430

“The specialist for pumps and fans”

with optimized OP (manual/automatic switchover), matched software functionality and optimized power yield

7.5 kW to 250 kW

3 AC 380 V to 480 V

- V/f characteristic
- Multipoint characteristic (programmable V/f characteristic)
- FCC (flux current control)

Internal PID controller

6 digital inputs
2 analog inputs
1 PTC/KTY input

2 analog outputs
3 relay outputs

The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION

- Low-energy mode
- Load torque monitoring (detects dry run of pumps)
- Motor staging
- Bypass mode
- BICO technology



Section 3

MICROMASTER 440

“The all-purpose”

with advanced vector control (with and without encoder feedback) for versatile applications in sectors such as conveying systems, textiles, elevators, hoisting equipment and machine construction

0.12 kW to 250 kW

1 AC 200 V to 240 V
3 AC 200 V to 240 V
3 AC 380 V to 480 V
3 AC 500 V to 600 V

- V/f characteristic
- Multipoint characteristic (programmable V/f characteristic)
- FCC (flux current control)
- Vector control

Internal PID controller (autotuning)

6 digital inputs
2 analog inputs
1 PTC/KTY input

2 analog outputs
3 relay outputs

The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION

- 3 selectable drive data kits
- Integrated brake chopper (up to 75 kW)
- Torque control
- BICO technology



Section 4

MICROMASTER 420/430/440

Overview

Options

Various options are available for the MICROMASTER inverters:

- Filters
- Chokes
- Operator panels
- PROFIBUS module
- DeviceNet module
- CANopen module
- Pulse encoder evaluation module
- Gland plates
- Mounting kits, etc.

1) The MICROMASTER 410 is no longer available. The model will be discontinued as of October 1, 2007. The MICROMASTER 410 can then only be ordered as a spare part.

Assignment of operator panels and modules to the inverter ranges

Options	Order No.	MICROMASTER			
		410 ¹⁾	420	430	440
Operator panels					
OP ¹⁾	6SE6400-0SP00-0AA0	●			
BOP	6SE6400-0BP00-0AA0		●		●
BOP-2	6SE6400-0BE00-0AA0			●	
AOP	6SE6400-0AP00-0AA1		●		●
AAOP	6SE6400-0AP00-0AB0		●		●
CAOP	6SE6400-0AP00-0CA0		●		●
Modules					
PROFIBUS	6SE6400-1PB00-0AA0		●	●	●
DeviceNet	6SE6400-1DN00-0AA0		●	●	●
CANopen	6SE6400-1CB00-0AA0		●	●	●
Pulse encoder evaluation	6SE6400-0EN00-0AA0			●	●

Maximum possible configuration:

One pulse encoder evaluation module
+ one communication module + one operator panel

● Possible assignment



BOP in new design
(available soon)



BOP-2 in new design
(available soon)



AOP



AAOP

Operator panels



PROFIBUS



DeviceNet



CANopen



Pulse encoder evaluation

Modules

Inverter MICROMASTER 420



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Dimension drawings

MICROMASTER 420

Description



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Application

The MICROMASTER 420 inverter is suitable for a variety of variable-speed drive applications. It is especially suitable for applications with pumps, fans and in conveyor systems.

It is the ideal cost-optimized frequency inverter solution. The inverter is especially characterized by its customer-oriented performance and ease-of-use. Its large mains voltage range enables it to be used all over the world.

Design

The MICROMASTER 420 inverter has a modular design. The operator panels and communication modules can be easily exchanged without requiring any tools.

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Three fully programmable isolated digital inputs
- One analog input (0 V to 10 V, scalable) or for use as 4th digital input
- One programmable analog output (0 mA to 20 mA)
- One programmable relay output (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation through high pulse frequency, adjustable (observe derating if necessary)
- Complete protection for motor and inverter.

Options (overview)

- EMC filter, Class A/B
- LC filter
- Line commutating chokes
- Output chokes
- Gland plates
- Basic Operator Panel (BOP) for parameterizing the inverter
- Advanced Operator Panel (AOP) with multi-language plain text display
- Asian Advanced Operator Panel (AAOP) with Chinese and English plain text display
- Cyrillic Advanced Operator Panel (CAOP) with Cyrillic, German and English plain text display
- Communication modules
 - PROFIBUS
 - DeviceNet
 - CANopen
- PC connection kits
- Mounting kits for installing the operator panels in the control cabinet doors
- PC start-up programs executable under Windows 98 and NT/2000/ME/XP Professional
- TIA integration with Drive ES

International standards

- The MICROMASTER 420 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 420 inverter has the **CE** marking
- acc. to **UL** and **cUL** certified
- c-tick **CE**

Note:

See Appendix for standards.

Overview of SINAMICS G110 inverter chassis units

The SINAMICS G110 inverter chassis unit is a versatile drive. The table provides an overview of the features of this

product. The complete range of products together with ordering data, technical data and explanations are indica-

ted in the D 11.1 Catalog "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D

Distributed Frequency Inverters" and in the Internet under: <http://www.siemens.com/sinamics-g110>

SINAMICS G110	
Main features	As "a versatile drive for small outputs" , the frequency inverter of the SINAMICS G110 inverter chassis units can be used for a wide range of industrial drive applications with variable speeds. The especially compact SINAMICS G110 inverter works with voltage-frequency control (V/f) and is the ideal frequency inverter in the lower output and performance range of the SINAMICS family of products. The inverter is available in three frames for connection to single-phase power supply systems.
Electrical data	
Supply voltages, output range	1 AC 200 V ... 240 V, $\pm 10\%$; 0.12 kW ... 3.0 kW
Network types	IT, TN, TT
Mains frequency	50/60 Hz
Output frequency	0 Hz ... 650 Hz
Control method	V/f control, linear ($M \sim n$) V/f control, quadratic ($M \sim n^2$) V/f control, programmable
Fixed frequencies	3, programmable
Skip frequency ranges	1, programmable
Digital inputs	3 programmable digital inputs 24 V DC
Analog input (for the analog version)	1 analog input for setpoints from 0 V to 10 V, scalable or usable as 4th digital input
Digital output	1 digital output 24 V DC
Communication interface (for USS version)	RS485 serial interface for operation with USS protocol
Software functions	<ul style="list-style-type: none"> • Automatic restart after interruption of operation due to supply failure • Jerk-free connection of inverter to rotating motor • Programmable ramp-up/ramp-down times • Ramp rounding
Functions	
Protection functions	<ul style="list-style-type: none"> • Undervoltage • Overvoltage • Earth fault • Short-circuit • Stall prevention • I^2t motor thermal protection • Inverter overtemperature • Motor overtemperature
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Type of cooling for ≤ 0.75 kW inverters > 0.75 kW inverters	Ribbed heat sink with convection cooling; version with flat heat sink also available Internal air cooling (integrated fan)
Standards	
Standards complied with	CE, UL, cUL, c-tick



SINAMICS G110 inverter chassis units

MICROMASTER 420/430/440

Appendix

Overview of SINAMICS G120 inverter chassis units

The SINAMICS G120 inverter chassis unit is a modular drive. The table provides an overview of the features of this product. The complete range

of products together with ordering data, technical data and explanations are indicated in the D 11.1 Catalog "SINAMICS G110/SINAMICS

G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and in the Internet under:

<http://www.siemens.com/sinamics-g120>

SINAMICS G120	
Main features	As "a modular single drive for low and medium outputs" , the frequency inverter of the SINAMICS G120 inverter chassis units can be used for a wide range of industrial drive applications. The SINAMICS G120 frequency inverter distinguishes itself through its modular design (Power Module and Control Unit), and the globally unique integration of numerous innovative functions in safety technology and regenerative feedback into the line supply. There are extensive system components available in the range from 0.37 to 90 kW. This means that the drive units are suitable for a multitude of drive applications.
Electrical data	
Supply voltages, output range	3 AC 380 V ... 480 V, $\pm 10\%$; 0.37 kW ... 90 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	V/f control, linear ($M \sim n$) V/f control, quadratic ($M \sim n^2$) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 9 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	RS485/USS; PROFIBUS; PROFINET
Functions	
Software functions	<ul style="list-style-type: none"> • Programmable ramp-up times 0 ... 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	<ul style="list-style-type: none"> • Motor temperature (PTC/KTY, f_t) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS, SBC
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Cooling method	Innovative cooling concept: the power electronics are cooled by means of heat sinks with an external fan; open-loop and closed-loop control electronics are cooled by convection
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2



SINAMICS G120 inverter chassis units

Overview of SINAMICS G120D distributed frequency inverter

The SINAMICS G120D frequency inverter is a modular drive. The table provides an overview of the features of this product. The complete range

of products together with ordering data, technical data and explanations are indicated in the D 11.1 Catalog "SINAMICS G110/SINAMICS

G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and in the Internet under:

<http://www.siemens.com/sinamics-g120d>

SINAMICS G120D	
Main features	"The modular drive for low and medium outputs" – the SINAMICS G120D distributed frequency inverter can be especially used for sophisticated conveyor applications in industry as for many other high-performance applications. The SINAMICS G120 frequency inverter distinguishes itself through its modular design (Power Module and Control Unit) as well as through its extremely flat type of construction, an identical drilling template for all outputs and a high degree of safety. It offers safety functions that are unique in its class. It helps to save significant amounts of energy as a result of its line-commutated regenerative feedback capability. It goes without saying that the frequency inverter is also capable of communications.
Electrical data	
Supply voltages, output range	3 AC 380 V ... 480 V, $\pm 10\%$; 0.75 kW ... 7.5 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	V/f control, linear ($M \sim n$) V/f control, quadratic ($M \sim n^2$) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 6 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	PROFIBUS; PROFINET
Functions	
Software functions	<ul style="list-style-type: none"> • Programmable ramp-up times 0 ... 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	<ul style="list-style-type: none"> • Motor temperature (PTC/KTY, P_t) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP65
Cooling method	Convection cooling, for higher outputs with fan
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2



SINAMICS G120D distributed frequency inverter

MICROMASTER 420/430/440

Appendix

Overview of IEC squirrel-cage motors

With an output range from 0.06 to 1250 kW, low-voltage motors are available for the widest range of requirements and applications that are harmonized and coordinated with the MICROMASTER and SINAMICS frequency inverters.

In addition to energy-saving motors and explosion-proof motors, there are also sector and customer-specific motors such as smoke extraction motors.

The table shows an overview of the technical features of these motors. You will find the available product range with ordering data, technical data and detailed explanations in Catalog D 81.1 "Low-Voltage

Motors – IEC Squirrel-Cage Motors – Frame Sizes 56 to 450" and

in the Internet under:
<http://www.siemens.com/motors>

Versions	IEC Squirrel-Cage Motors		
	Energy-saving motors		Smoke extraction motors
	Aluminum housing	Gray cast housing	Temp.-time classes F200/F300/F400
Rated power	0.06 ... 45 kW	0.75 ... 1250 kW	0.37 ... 200 kW
Frame sizes	56 M to 225	100 L to 450	80 M to 315 L
Type of construction	All common types of construction	All common types of construction	All common types of construction
Speed	750 ... 3000 rpm	750 ... 3000 rpm	1000 ... 3000 rpm
Rated torque	0.3 ... 292 Nm	9.9 ... 10300 Nm	2.5 ... 1546 Nm
Rated voltages	All commonly used voltages	All commonly used voltages	230VΔ/400 VY, 500 VΔ, 400VΔ/690 VY, 500 VY
Designation	EFF1, EFF2	EFF1, EFF2	EFF1, EFF2
Degree of protection	IP55	IP55	IP55
Housing	Aluminum	Gray iron	Aluminum Gray iron
Cooling type	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B)
Approvals	CE, CCC, UL, CSA	CE, CCC, UL, CSA	CE
Approvals for marine propulsion drives	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	No
Explosion protection (incl. temp. class)	Ex nA II T3 (Zone 2), Dust-ex (Zone 21, 22)	Ex nA II T3 (Zone 2), Dust-ex (Zone 21, 22)	No



Examples, energy-saving motors



Example, smoke extraction motors

Overview of IEC squirrel-cage motors

Versions	IEC Squirrel-Cage Motors			
	Explosion-proof motors			
	Type of protection "e"	Type of protection "d"	Type of protection "n"	Dust explosion protection
Rated power	0.12 ... 165 kW	0.25 ... 950 kW	0.09 ... 1000 kW	0.06 ... 1000 kW
Frame sizes	63 M to 315 L	71 M to 450	63 M to 450	Zone 21: 56 M to 315 L Zone 22: 56 M to 450
Type of construction	All common types of construction	All common types of construction	All common types of construction	All common types of construction
Speed	1000 ... 3000 rpm	750 ... 3000 rpm	750 ... 3000 rpm	750 ... 3000 rpm
Rated torque	0.61 ... 1300 Nm	1 ... 8579 Nm	1 ... 8090 Nm	0.3 ... 8090 Nm
Rated voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages
Designation	See Catalog D 81.1	See Catalog D 81.1	Analog energy-saving motors EFF1/EFF2	Analog energy-saving motors EFF1/EFF2
Degree of protection	IP55, IP56 (non-heavy-sea), IP65	IP55, IP56 (non-heavy-sea)	IP55, IP56 (non-heavy-sea), IP65	Zone 21: IP65 Zone 22: IP55
Housing	FS 63 ... 160 L Aluminum FS 100 L ... 315 L Gray iron	FS 71 M ... 315 L Gray iron FS 355 ... 450 Steel	FS 63 M ... 160 L Aluminum FS 100 L ... 450 Gray iron	FS 63 M ... 225 M Aluminum FS 100 L ... 450 Gray iron
Cooling type	Surface-cooled	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B) (line operation) 155 (F) utilized to 155 (F) (frequency inverter operation)	155 (F) utilized to 130 (B)	155 (F) utilized to 130 (B)
Approvals	CE, CCC, GOST, ATEX	CE, CCC, GOST, ATEX, NEPSI	CE, CCC, GOST, ATEX, NEPSI	CE, CCC, GOST, ATEX
Approvals for marine propulsion drives	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR
Explosion protection (incl. temp. class)	II 2G Ex e II T1-T3	II 2G Ex de IIC T1-T4	II 3G Ex nA II T3	Zone 21: II 2D Ex tD A21 IP65 T125 °C Zone 22: II 3D Ex tD A22 IP55 T125 °C



Examples, explosion-proof motors

MICROMASTER 420/430/440

Appendix

Overview of IEC squirrel-cage motors – new generation 1LE1

Increasing energy costs have resulted in greater emphasis on the power consumption of drive systems. It is extremely important to utilize the full potential for minimization here to secure competitiveness today and in the future. This is the reason that already today,

Siemens is developing a new generation of low-voltage motors. Innovative copper rotors create the best requisites for motors with high efficiencies. The new motors for EFF1 (High Efficiency) offer considerable energy savings and protect our environment.

The table shows an overview of the technical features of these motors. The presently available product range with ordering data, technical data and detailed explanations are provided in the new Catalog News D 81.1 N "Low-Voltage Motors – IEC Squirrel-Cage

Motors – New Generation 1LE1 – Frame Size 100 to 160" and

in the Internet under:
<http://www.siemens.com/motors>

IEC Squirrel-Cage Motors – new generation 1LE1	
Versions	Self-cooled energy-saving motors with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-cooled motors with increased output and: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Forced-air-cooled motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1)
Rated power	0.75 ... 22 kW
Frame sizes	100 L to 160 L
Type of construction	Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover With flange: IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 With standard flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Speed	750 ... 3000 rpm
Rated torque	9.9 ... 150 Nm
Rated voltages	All commonly used voltages
Designation	EU/CEMEP efficiency classification: EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPACT: 2-, 4-, 6-pole (available soon)
Degree of protection	IP55 as standard
Housing	Aluminum
Cooling type	Self-cooled: Frame size 100 L to 160 L (IC 411), Forced-air cooled: Frame size 100 L to 160 L (IC 416)
Temperature class	Temperature class 155 (F), utilized to temperature class 130 (B)
Approvals	CE



Examples, IEC squirrel-cage motors – new generation 1LE1, aluminum housing

Overview of distributed drive solutions – MICROMASTER 411 and COMBIMASTER 411 inverters

The MICROMASTER 411 and COMBIMASTER 411 inverters from Siemens are available as distributed drive solutions. The table provides an over-

view of the features of these products. The complete range of products together with ordering data, technical data and explanations are indicat-

ed in the Catalog DA 51.3 MICROMASTER 411 and COMBIMASTER 411. The latest information on MICROMASTER 411 and

COMBIMASTER 411 is available in the Internet under: <http://www.siemens.com/combimaster>

	MICROMASTER 411	COMBIMASTER 411
Main features	"The distributed inverter" for a wide range of drive applications – for simple individual applications from pumps and fans to multiple conveyor-belt drives in networked control systems.	
Output range	0.37 kW ... 3 kW	
Voltage range	3 AC 380 V ... 480 V	
Frame sizes/ unit sizes	CS B CS C	71 ... 100 90/100
Types of construction		IM B3 IM B5 IM V1 (without protective cover) IM V1 (with protective cover) IM B14 (with normal flange) IM B14 (with special flange) IM B35
Degree of protection	IP65	IP55
Other technical features	<ul style="list-style-type: none"> • V/f characteristic • Multipoint characteristic (programmable V/f characteristic) • FCC (flux current control) • Internal PI controller • 3 digital inputs • 1 analog input • 1 relay output • Compound braking for controlled rapid braking • ECOFAST versions with plug-in connectors for power-supply, communication interface and motor connections in order to enable fast and problem-free information exchange in applications where time is a critical factor. The ECOFAST versions are completely compatible with the ECOFAST technology systems. 	



Examples MICROMASTER 411



Examples COMBIMASTER 411

MICROMASTER 420/430/440

Appendix

Overview of NEMA motors

For compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico), we manufacture low-voltage motors acc. to the NEMA standard for a wide range of different application areas.

This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels: Our NEMA motor series provide the highest operating reliability and maximum service life.

Designed and manufactured for rugged operation, our NEMA motors conquer even the harshest industrial conditions strictly in accordance with the ISO 9001 international quality standard; with maximum performance, reliability and efficiency.

You will find the complete range of products together with ordering data, technical data and explanations in Catalog D 81.2 U.S./Canada on the Internet at <http://www.sea.siemens.com/motors>

	NEMA motors (NEMA = National Electrical Manufacturers Association)
Frame size	NEMA frame size 56 ... 449
Output range	0.25 HP ... 500 HP
Number of poles	2/4/6/8
Voltages	3 AC 230/460/575 V
Frequency	60 Hz, 50 Hz on request
Type of construction	Foot-mounted, D flange, C flange, P flange
Casing	Cast-iron, aluminium or steel depending on the version
Cooling method	Surface-cooling or internal ventilation depending on the version
Temperature class	F used acc. to B
Type spectrum	<p>General purpose motors</p> <ul style="list-style-type: none"> • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Standard motors for general industrial use • Aluminium or cast-iron case depending on the version <p>Severe duty motors</p> <ul style="list-style-type: none"> • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Cast-iron case • Motors for use under extremely difficult environmental conditions <p>Severe duty IEEE841 motors</p> <ul style="list-style-type: none"> • Efficiency levels required by IEEE that exceed the EPACT act • Motors with increased requirements for use in the petrochemical industry (according to IEEE841) • Cast-iron case <p>Explosion-proof motors</p> <ul style="list-style-type: none"> • Efficiency levels better than or equal to EPACT • Multi label according to Division 1, Class I, Group D and Class II, Groups F&G • Single label according to Division 1, Class I, Groups C&D



Example of NEMA motor, Severe Duty SD100, cast-iron case



Example of NEMA motor, General Purpose GP10A, aluminium case

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You can obtain in most cases a contact partner for

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- Training,
- Sales or
- Consultation/engineering.

You start by selecting a

- Country,
- Product or
- Sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

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Appendix

A&D in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

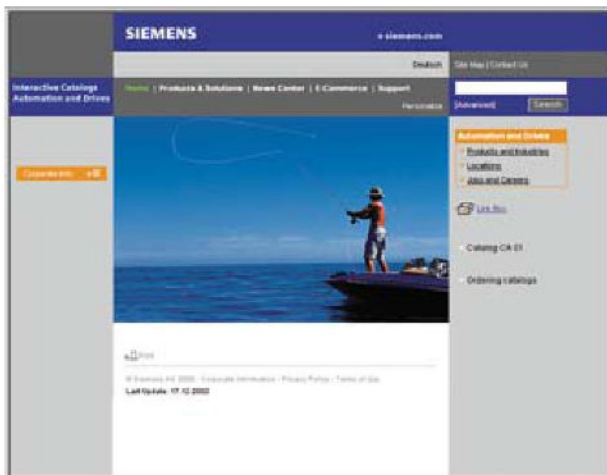
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

<http://www.siemens.com/automation>

you will find everything you need to know about products, systems and services.

Product selection using the Offline Mall of Automation and Drives



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

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Information on the Offline Mall CA 01 can be found in the Internet under

<http://www.siemens.com/automation/ca01>

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Easy shopping with the A&D Mall



The A&D Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

<http://www.siemens.com/automation/mall>



In the face of harsh competition you need optimum conditions to keep ahead all the time: a strong starting position, a sophisticated strategy and team for the necessary support – in every phase.

Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and commissioning to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online support



The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

<http://www.siemens.com/automation/service&support>

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Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Phone: +49 (0)180 50 50 222
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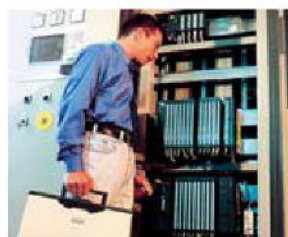
Technical consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right to the creation of the automation solution.¹⁾

Configuration and software engineering

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.¹⁾

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With service on site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
Phone: +49 (0)180 50 50 444¹⁾
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In the United States, call toll-free:

Phone: +1 800 333 7421

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In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

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SPARESonWeb is a web-based tool for selecting the spare parts available for the SINAMICS system. After you have registered and entered the serial number and order number, the spare parts available for the relevant unit are displayed.

The delivery state for specific orders can be displayed for all shipped SINAMICS products.

<http://workplace.automation.siemens.com/sparesonweb>

¹⁾ For country-specific telephone numbers go to our Internet site at: <http://www.siemens.com/automation/service&support>

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When ordering, a different digit from the one specified may be present as a result of further technical development.

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Appendix

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

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The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

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General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.

The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products.

An exact explanation of the metal factor and the text of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
(for customers based in Germany)
- 6ZB5310-0KS53-0BA1
(for customers based outside Germany)

or download them from the Internet
<http://www.siemens.com/automation/mall>
 (Germany: A&D Mall Online-Help System)

Export regulations

The products listed in this catalog may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog:

AL	<p>Number of the <u>German Export List</u></p> <p>Products marked other than "N" require an export license.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "AL" <u>not equal to "N"</u> are subject to a European or German export authorization when being exported out of the EU.</p>
ECCN	<p><u>Export Control Classification Number</u></p> <p>Products marked other than "N" are subject to a reexport license to specific countries.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "ECCN" <u>not equal to "N"</u> are subject to a US re-export authorization.</p>

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_ohne MZ/En 05.09.06

Catalogs of the Automation and Drives Group (A&D)

Further information can be obtained from our branch offices listed
in the appendix or at www.siemens.com/automation/partner

Automation and Drives		<i>Catalog</i>	
Interactive catalog on CD-ROM and on DVD			
• The Offline Mall of Automation and Drives		CA 01	
Automation Systems for Machine Tools			
SINUMERIK & SIMODRIVE		NC 60	
SINUMERIK & SINAMICS		NC 61	
Drive Systems			
<u>Variable-Speed Drives</u>			
SINAMICS G110/SINAMICS G120		D 11.1	
Inverter Chassis Units			
SINAMICS G120D			
Distributed Frequency Inverters			
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