Description

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, scaleable) 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

Note:

See Appendix for standards.

Technical data

MICROMASTER 420 inverter

Mains voltage and power ranges	1 AC 200 V to 240 V ± 10 % 3 AC 200 V to 240 V ± 10 % 3 AC 380 V to 480 V ± 10 %	0.12 kW to 3 kW 0.12 kW to 5.5 kW 0.37 kW to 11 kW		
Power frequency	47 Hz to 63 Hz			
Output frequency	0 Hz to 650 Hz (limitation to 550 Hz in production to comply with legal requirements) [1]			
Power factor	≥ 0.95			
Inverter efficiency	96 % to 97 % (Further information is available on the Internet at: http://support.automation.siemens.com/WW/view/en/22978972)			
Overload capability	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s			
Inrush current	Less than rated input current			
Control method	Linear *V/f*-characteristic; quadratic *V/f* characteristic; multipoint characteristic (programmable *V/f* characteristic); flux current control (FCC)			
Pulse frequency	16 kHz (standard with 1/3 AC 230 V) 4 kHz (standard with 3 AC 400 V) 2 kHz to 16 kHz (in 2 kHz steps)			
Fixed frequencies	7, programmable			
Skip frequency ranges	4, programmable			
Setpoint resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog			
Digital inputs	3 fully programmable isolated digital inputs; switchable PNP/NPN			
Analog input	1, for setpoint or PI controller (0 V to 10 V, scaleable or for use as 4th digital input)			
Relay outputs	1, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load)			
Analog output	1, programmable (0 mA to 20 mA)			
Serial interfaces	RS-485, optional RS-232			
Motor cable lengths without output choke without output choke	 max. 50 m (shielded) max. 100 m (unshielded) see variant dependent options			
Electromagnetic compatibility	Inverter available with internal EMC filter Class A; available as options are EMC filters to EN 55 011, Class A or Class B			
Braking	DC braking, compound braking			
Degree of protection	IP20			
Operating temperature	–10 °C to +50 °C (+14 °F to +122 °F)			
Storage temperature	–40 °C to +70 °C (–40 °F to +158 °F)			
Relative humidity	95 % (non-condensing)			
Installation altitude	Up to 1000 m above sea level without derating			
Standard SCCR (Short Circuit Current Rating) [2]	10 kA			
Protection features for	• Undervoltage • Overvoltage • Overload • Earth faults • Short circuit • Stall prevention • Locked motor protection • Motor overtemperature • Inverter overtemperature • Parameter interlock			
Compliance with standards	UL, cUL, CE, c-tick			
CE marking	Conformity with low-voltage directive 73/23/EEC			
Cooling-air volumetric flow required, dimensions and weights (without options)	Frame size (FS) A B C	Cooling-air volumetric flow required (l/s)/(CFM) 4.8/10.2 24/51 54.9/116.3	H x W x D (mm) 173 x 73 x 149 202 x 149 x 172 245 x 185 x 195	Weight, approx. (kg) 1.0 3.3 5.0

CFM: Cubic Feet per Minute

1) For further information see http://support.automation.siemens.com/WW/view/en/107669667

2) Applies to industrial control cabinet installations to NEC article 409/UL 508A.

Selection and ordering data

MICROMASTER 420 inverter

Output		Rated input current [1]	Rated output current	Frame size	Order No.	
					MICROMASTER 420 without filter [3]	**MICROMASTER 420 with internal filter Class A [2]**
kW	hp	A	A	(FS)		
Mains operating voltage 1 AC 200 V to 240 V						
0.12	0.16	1.8	0.9	A	**6SE6420-2UC11-2AA1**	**6SE6420-2AB11-2AA1**
0.25	0.33	3.2	1.7	A	**6SE6420-2UC12-5AA1**	**6SE6420-2AB12-5AA1**
0.37	0.50	4.6	2.3	A	**6SE6420-2UC13-7AA1**	**6SE6420-2AB13-7AA1**
0.55	0.75	6.2	3.0	A	**6SE6420-2UC15-5AA1**	**6SE6420-2AB15-5AA1**
0.75	1.0	8.2	3.9	A	**6SE6420-2UC17-5AA1**	**6SE6420-2AB17-5AA1**
1.1	1.5	11.0	5.5	B	**6SE6420-2UC21-1BA1**	**6SE6420-2AB21-1BA1**
1.5	2.0	14.4	7.4	B	**6SE6420-2UC21-5BA1**	**6SE6420-2AB21-5BA1**
2.2	3.0	20.2	10.4	B	**6SE6420-2UC22-2BA1**	**6SE6420-2AB22-2BA1**
3.0	4.0	35.5	13.6	C	**6SE6420-2UC23-0CA1**	**6SE6420-2AB23-0CA1**
Mains operating voltage 3 AC 200 V to 240 V						
0.12	0.16	1.1	0.9	A	**6SE6420-2UC11-2AA1**	–
0.25	0.33	1.9	1.7	A	**6SE6420-2UC12-5AA1**	–
0.37	0.50	2.7	2.3	A	**6SE6420-2UC13-7AA1**	–
0.55	0.75	3.6	3.0	A	**6SE6420-2UC15-5AA1**	–
0.75	1.0	4.7	3.9	A	**6SE6420-2UC17-5AA1**	–
1.1	1.5	6.4	5.5	B	**6SE6420-2UC21-1BA1**	–
1.5	2.0	8.3	7.4	B	**6SE6420-2UC21-5BA1**	–
2.2	3.0	11.7	10.4	B	**6SE6420-2UC22-2BA1**	–
3.0	4.0	15.6	13.6	C	**6SE6420-2UC23-0CA1**	**6SE6420-2AC23-0CA1**
4.0	5.0	19.7	17.5	C	**6SE6420-2UC24-0CA1**	**6SE6420-2AC24-0CA1**
5.5	7.5	26.5	22.0	C	**6SE6420-2UC25-5CA1**	**6SE6420-2AC25-5CA1**
Mains operating voltage 3 AC 380 V to 480 V						
0.37	0.50	2.2	1.2	A	**6SE6420-2UD13-7AA1**	–
0.55	0.75	2.8	1.6	A	**6SE6420-2UD15-5AA1**	–
0.75	1.0	3.7	2.1	A	**6SE6420-2UD17-5AA1**	–
1.1	1.5	4.9	3.0	A	**6SE6420-2UD21-1AA1**	–
1.5	2.0	5.9	4.0	A	**6SE6420-2UD21-5AA1**	–
2.2	3.0	7.5	5.9	B	**6SE6420-2UD22-2BA1**	**6SE6420-2AD22-2BA1**
3.0	4.0	10.0	7.7	B	**6SE6420-2UD23-0BA1**	**6SE6420-2AD23-0BA1**
4.0	5.0	12.8	10.2	B	**6SE6420-2UD24-0BA1**	**6SE6420-2AD24-0BA1**
5.5	7.5	15.6	13.2	C	**6SE6420-2UD25-5CA1**	**6SE6420-2AD25-5CA1**
7.5	10.0	22.0	19.0	C	**6SE6420-2UD27-5CA1**	**6SE6420-2AD27-5CA1**
11	15.0	32.3	26.0	C	**6SE6420-2UD31-1CA1**	**6SE6420-2AD31-1CA1**

See Appendix for note on ordering.

All MICROMASTER 420 inverters are supplied with a Status Display Panel (SDP). A BOP, AOP or other options have to be ordered separately (see Pages 2/12 to 2/16).

Motors for MICROMASTER 420

Catalog D 81.1 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 420 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to Catalog D 81.2 U.S./Canada (see Appendix for overview) and to: http://www.sea.siemens.com/motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply U_{sc} = 2 % with reference to the inverter rated power and rated mains voltage of 240 V or 400 V without a line commutating choke.

2) Use of MICROMASTER inverters with internal filter is not permissible on non-grounded (IT) mains supplies.

3) Acc. to EMC EN 61800-3 generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.