Description

Application

The MICROMASTER 440 inverter is suitable for a variety of variable-speed drive applications. Its flexibility provides for a wide spectrum of applications. These also include cranes and hoisting gear, high-bay warehouses, production machines for food, beverages and tobacco, packaging machines etc.; i.e. applications which require the frequency inverter to have a higher functionality and dynamic response than usual.

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 440 inverter has a modular design. The operator panels and modules can be easily exchanged.

International standards

- The MICROMASTER 440 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 440 inverter has the CE marking
- acc. to UL and cUL certified
- c-tick

Note:

- See Appendix for standards.

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Six programmable isolated digital inputs
- Two scaleable analog inputs (0 V to 10 V, 0 mA to 20 mA) can also be used as a 7th/8th digital input
- Two programmable analog outputs (0 mA to 20 mA)
- Three programmable relay outputs (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation thanks to high pulse frequencies, adjustable (observe derating if necessary)
- Complete protection for motor and inverter.

Options (overview)

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

Technical data

MICROMASTER 440 inverter

Mains voltage and power ranges		**CT** (constant torque)	**VT** (variable torque)
	1 AC 200 V to 240 V ± 10 %	0.12 kW to 3 kW	–
	3 AC 200 V to 240 V ± 10 %	0.12 kW to 45 kW	5.5 kW to 55 kW
	3 AC 380 V to 480 V ± 10 %	0.37 kW to 200 kW	7.5 kW to 250 kW
	3 AC 500 V to 600 V ± 10 %	0.75 kW to 75 kW	1.5 kW to 90 kW
Input frequency		47 Hz to 63 Hz	
Output frequency	0.12 kW to 75 kW	0 Hz to 650 Hz (in *V/f* mode)	0 Hz to 200 Hz (in vector mode)
		(Limitation to 550 Hz in production to comply with legal requirements) [1])	
	90 kW to 200 kW	0 Hz to 267 Hz (in *V/f* mode)	0 Hz to 200 Hz (in vector mode)
Power factor		≥ 0.95	
Inverter efficiency		0.12 kW to 75 kW: 96 % to 97 %; 90 kW to 200 kW: 97 % to 98 % (Further information is available on the Internet at: http://support.automation.siemens.com/WW/view/en/22978972)	
Overload capability – CT mode	0.12 kW to 75 kW	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s and 2 x rated output current (i.e. 200 % overload capability) for 3 s, cycle time 300 s	
	90 kW to 200 kW	Overload current 1.36 x rated output current (i.e. 136 % overload capability) for 57 s, cycle time 300 s and 1.6 x rated output current (i.e. 160 % overload capability) for 3 s, cycle time 300 s	
– VT mode	5.5 kW to 90 kW	Overload current 1.4 x rated output current (i.e. 140 % overload capability) for 3 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s	
	110 kW to 250 kW	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 1 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 59 s, cycle time 300 s	
Inrush current		not higher than rated input current	
Control method		Vector control, torque control, linear *V/f* characteristic; quadratic *V/f* characteristic; Multipoint characteristic (programmable *V/f* characteristic); flux current control (FCC)	
Pulse frequency	0.12 kW to 75 kW	4 kHz (standard); 16 kHz (standard with 230 V inverters 0.12 kW to 5.5 kW) 2 kHz to 16 kHz (in 2 kHz steps)	
	90 kW to 200 kW	2 kHz (standard with VT mode); 4 kHz (standard with CT mode) 2 kHz to 4 kHz (in 2 kHz steps)	
Fixed frequencies		15, programmable	
Skip frequency ranges		4, programmable	
Setpoint resolution		0.01 Hz digital; 0.01 Hz serial; 10 bit analog	
Digital inputs		6 fully programmable isolated digital inputs; switchable PNP/NPN	
Analog inputs		2 programmable analog inputs • 0 V to 10 V, 0 mA to 20 mA and –10 V to +10 V (AIN1) • 0 V to 10 V and 0 mA to 20 mA (AIN2) • both can be used as 7th/8th digital input	
Relay outputs		3, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load)	
Analog outputs		2, programmable (0/4 mA to 20 mA)	
Serial interfaces		RS-485, optional RS-232	
Motor cable lengths	without output choke	0.12 – 75 kW: max. 50 m (shielded), max. 100 m (unshielded) 90 – 250 kW: max. 200 m (shielded), max. 300 m (unshielded)	
	with output choke	see variant dependent options	
Electromagnetic compatibility (see Selection and Ordering Data)		EMC filter, Class A or Class B to EN 55 011 available as an option Inverter with internal filter Class A available	
Braking		Resistance braking with DC braking, compound braking, integrated brake chopper (integrated brake chopper only with 0.12 kW to 75 kW inverters)	
Degree of protection		IP20	
Operating temperature (without derating)	0.12 kW to 75 kW	CT: –10 °C to +50 °C (+14 °F to +122 °F) VT: –10 °C to +40 °C (+14 °F to +104 °F)	
	90 kW to 200 kW	0 °C to +40 °C (+32 °F to +104 °F)	
Storage temperature		–40 °C to +70 °C (–40 °F to +158 °F)	
Relative humidity		95 % (non-condensing)	
Installation altitude	0.12 kW to 75 kW	up to 1000 m above sea level without derating	
	90 kW to 200 kW	up to 2000 m above sea level without derating	
Standard SCCR (Short Circuit Current Rating) [2])		FSA, FSB, FSC: 10 kA FSD, FSE, FSF, FSFX, FSGX: 65 kA	
Protection features for		Undervoltage, overvoltage, overload, earth faults, short-circuits, stall prevention, locked motor protection, motor over-temperature, inverter overtemperature, parameter change protection	
Compliance with standards		ⓤ, cⓤ, 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)	Cooling-air volumetric flow required (l/s)/(CFM)	H x W x D, max. (mm)	Weight, approx. (kg)
A	4.8/10.2	173 x 73 x 149	1.3
B	24/51	202 x 149 x 172	3.4
C	54.9/116.3	245 x 185 x 195	5.7
D	2 x 54.9/2 x 116.3	520 x 275 x 245	17
E	2 x 54.9/2 x 116.3	650 x 275 x 245	22
F without filter	150/317.79	850 x 350 x 320	56
F with filter	150/317.79	1150 x 350 x 320	75
FX	225/478.13	1400 x 326 x 356	116
GX	440/935	1533 x 326 x 545	174

CFM: Cubic Feet per Minute

1) + 2) For footnotes, see next page.

MICROMASTER 440 inverter without filter [2])

CT (constant torque)				VT (variable torque)				MICROMASTER 440 without filter [2])		
Output		Rated input current [1])	Rated output current	Output		Rated input current [1])	Rated output current	Frame size	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A	(FS)	kg	
Mains voltage 1 AC 200 V to 240 V										
0.12	0.16	1.8	0.9	–	–	–	–	A	1.3	**6SE6440-2UC11-2AA1**
0.25	0.33	3.2	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	4.6	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	6.2	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	8.2	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	11.0	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2	14.4	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3	20.2	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4	35.5	13.6	–	–	–	–	C	5.5	**6SE6440-2UC23-0CA1**
Mains operating voltage 3 AC 200 V to 240 V										
0.12	0.16	1.1	0.9	–	–	–	–	A	1.3	**6SE6440-2UC11-2AA1**
0.25	0.33	1.9	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	2.7	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	3.6	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	4.7	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	6.4	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2.0	8.3	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3.0	11.7	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4.0	15.6	13.6	–	–	–	–	C	5.5	**6SE6440-2UC23-0CA1**
4.0	5.0	19.7	17.5	**5.5**	7.5	28.3	22	C	5.5	**6SE6440-2UC24-0CA1**
5.5	7.5	26.5	22	**7.5**	10	34.2	28	C	5.5	**6SE6440-2UC25-5CA1**
7.5	10	34.2	28	**11.0**	15	38.0	42	D	16	**6SE6440-2UC27-5DA1**
11.0	15	38.0	42	**15.0**	20	50.0	54	D	16	**6SE6440-2UC31-1DA1**
15.0	20	50.0	54	**18.5**	25	62.0	68	D	16	**6SE6440-2UC31-5DA1**
18.5	25	62.0	68	**22**	30	71.0	80	E	20	**6SE6440-2UC31-8EA1**
22	30	71.0	80	**30**	40	96.0	104	E	20	**6SE6440-2UC32-2EA1**
30	40	96.0	104	**37**	50	114.0	130	F	55	**6SE6440-2UC33-0FA1**
37	50	114.0	130	**45**	60	135.0	154	F	55	**6SE6440-2UC33-7FA1**
45	60	135.0	154	**55**	75	164.0	178	F	55	**6SE6440-2UC34-5FA1**
Mains operating voltage 3 AC 380 V to 480 V										
0.37	0.50	2.2	1.3	–	–	–	–	A	1.3	**6SE6440-2UD13-7AA1**
0.55	0.75	2.8	1.7	–	–	–	–	A	1.3	**6SE6440-2UD15-5AA1**
0.75	1.0	3.7	2.2	–	–	–	–	A	1.3	**6SE6440-2UD17-5AA1**
1.1	1.5	4.9	3.1	–	–	–	–	A	1.3	**6SE6440-2UD21-1AA1**
1.5	2.0	5.9	4.1	–	–	–	–	A	1.3	**6SE6440-2UD21-5AA1**
2.2	3.0	7.5	5.9	–	–	–	–	B	3.3	**6SE6440-2UD22-2BA1**
3.0	4.0	10.0	7.7	–	–	–	–	B	3.3	**6SE6440-2UD23-0BA1**
4.0	5.0	12.8	10.2	–	–	–	–	B	3.3	**6SE6440-2UD24-0BA1**
5.5	7.5	15.6	13.2	**7.5**	10	17.3	19	C	5.5	**6SE6440-2UD25-5CA1**
7.5	10	22.0	18.4	**11.0**	15	23.1	26	C	5.5	**6SE6440-2UD27-5CA1**
11.0	15	23.1	26	**15.0**	20	33.8	32	C	5.5	**6SE6440-2UD31-1CA1**
15.0	20	33.8	32	**18.5**	25	37.0	38	D	16	**6SE6440-2UD31-5DA1**
18.5	25	37.0	38	**22**	30	43.0	45	D	16	**6SE6440-2UD31-8DA1**
22	30	43.0	45	**30**	40	59.0	62	D	16	**6SE6440-2UD32-2DA1**
30	40	59.0	62	**37**	50	72.0	75	E	20	**6SE6440-2UD33-0EA1**
37	50	72.0	75	**45**	60	87.0	90	E	20	**6SE6440-2UD33-7EA1**
45	60	87.0	90	**55**	75	104.0	110	F	56	**6SE6440-2UD34-5FA1**
55	75	104.0	110	**75**	100	139.0	145	F	56	**6SE6440-2UD35-5FA1**
75	100	139.0	145	**90**	125	169.0	178	F	56	**6SE6440-2UD37-5FA1**

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 operating voltage of 240 V or 400 V without a line commutating choke.

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