Mechanical features

- Modular design
- Operating temperature
  0.12 kW to 75 kW:
  –10 °C to +50 °C
  (+14 °F to +122 °F)
  90 kW to 200 kW:
  0 °C to +40 °C
  (+32 °F to +104 °F)
- Compact housing as a result of high power density
- Easy cable connection, mains and motor connections are separated for optimum electromagnetic compatibility
- Detachable operator panels
- Screwless control terminals on detachable I/O board.

Performance features

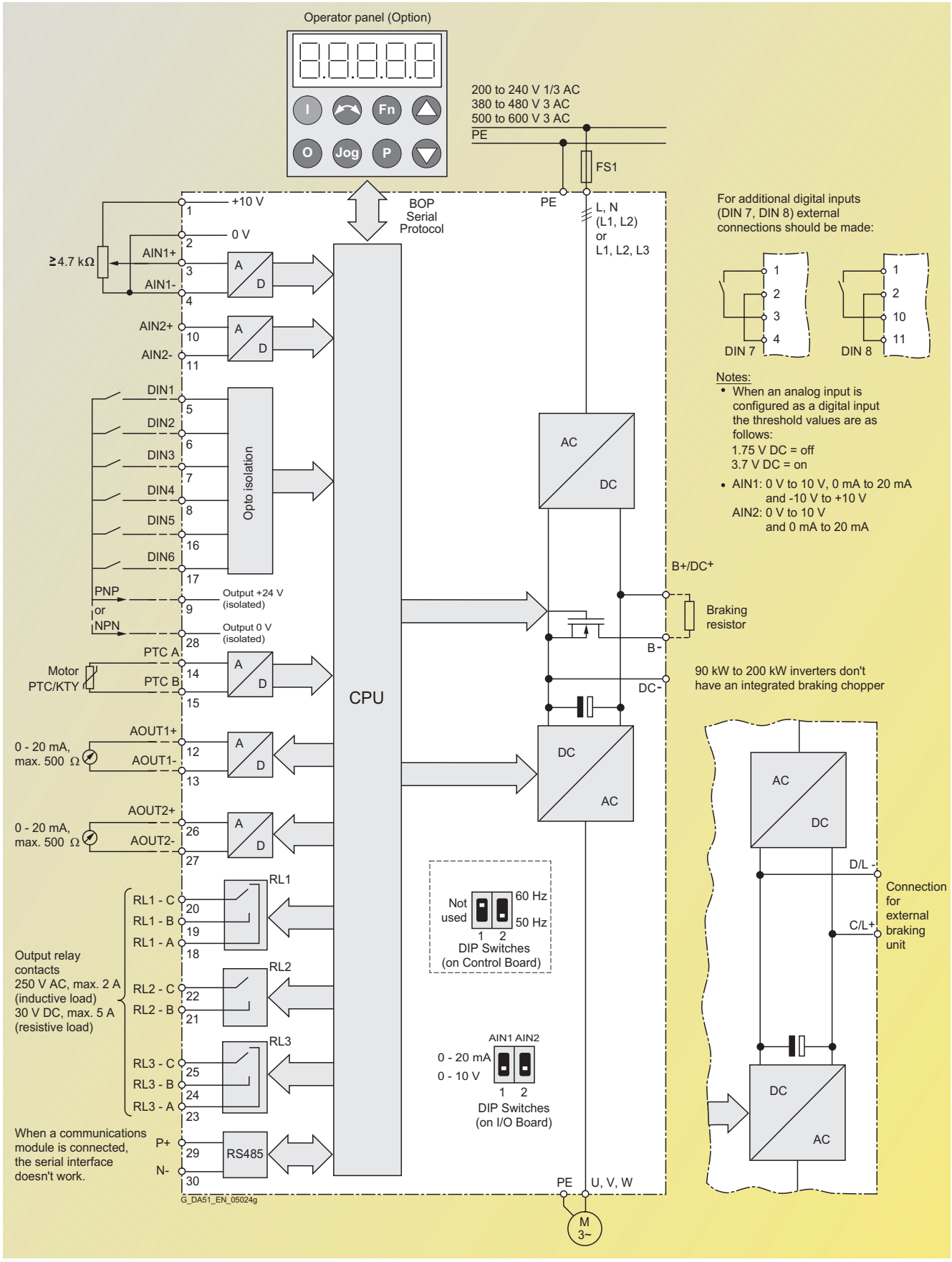
- Latest IGBT technology
- Digital microprocessor control
- High-quality Vector Control system
- Flux Current Control (FCC) for improved dynamic response and optimized motor control
- Linear *V/f* characteristic
- Quadratic *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- Torque control
- Flying restart
- Slip compensation
- Automatic restart following mains failure or fault
- User-definable function blocks for logic and arithmetic operations
- Kinetic buffering
- Positioning ramp down
- High-grade PID controller for simple internal process control (autotuning)
- Programmable acceleration/deceleration, 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using two high-resolution 10-bit analog inputs
- Compound braking for controlled rapid braking
- Integrated brake chopper (for 0.12 kW to 75 kW inverters)
- Four skip frequencies
- Removable “Y” capacitor for use on IT systems (with non-grounded mains supplies, the “Y” capacitor must be removed and an output choke installed).

Protection features

- 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
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Special direct connection for PTC or KTY to protect the motor
- Earth fault protection
- Short-circuit protection
- I^2t motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock.

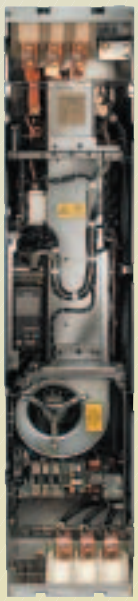
Circuit diagrams

General circuit diagram

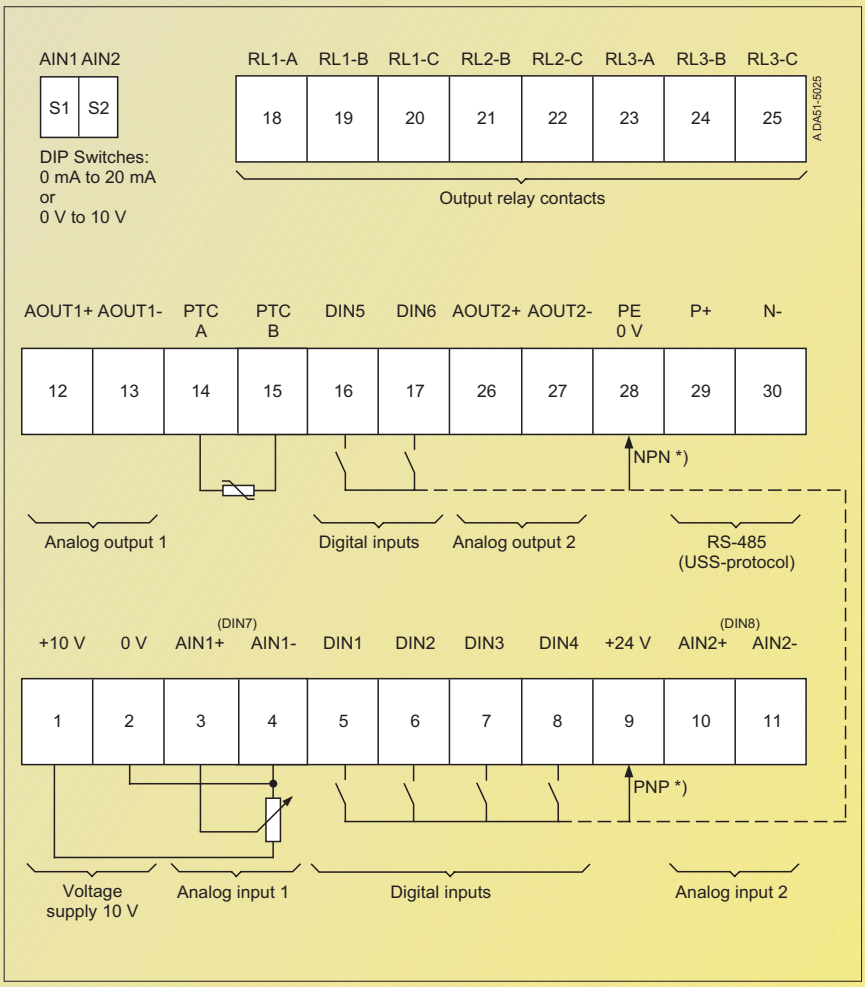


Terminal connection diagram

Example, frame size FX



View A



*) PNP or NPN possible

Technical data

MICROMASTER 440 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 % 3 AC 500 V to 600 V ± 10%	**CT** (constant torque) 0.12 kW to 3 kW 0.12 kW to 45 kW 0.37 kW to 200 kW 0.75 kW to 75 kW	**VT** (variable torque) – 5.5 kW to 45 kW 7.5 kW to 250 kW 1.5 kW to 90 kW
Input frequency		47 Hz to 63 Hz		
Output frequency	0.12 kW to 75 kW 90 kW to 200 kW	0 Hz to 650 Hz (in *V/f* mode) 0 Hz to 267 Hz (in *V/f* mode)	0 Hz to 200 Hz (in vector mode) 0 Hz to 200 Hz (in vector mode)	
Power factor		≥ 0.95		
Inverter efficiency		96 % to 97 %		
Overload capability – CT mode	0.12 kW to 75 kW 90 kW to 200 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 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 110 kW to 250 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 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 90 kW to 200 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) 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 with output choke	0.12 – 75 kW 90 – 250 kW	max. 50 m (shielded), max. 100 m (unshielded) max. 100 m (shielded), max. 150 m (unshielded) (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 90 kW to 200 kW	CT: –10 °C to +122.00 °F (+14 °F to +122 °F) VT: –10 °C to +40 °C (+14 °F to +104 °F) 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 90 kW to 200 kW	up to 1000 m above sea level without derating up to 2000 m above sea level without derating		
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		
Dimensions and weights (without options)		Frame size (FS) A B C D E F without filter F with filter FX GX	H x W x D, max. (mm) 173 x 73 x 149 202 x 149 x 172 245 x 185 x 195 520 x 275 x 245 650 x 275 x 245 850 x 350 x 320 1150 x 350 x 320 1400 x 326 x 356 1533 x 326 x 545	Weight, approx. (kg) 1.3 3.4 5.7 17 22 56 75 116 176

Derating data

Pulse frequency

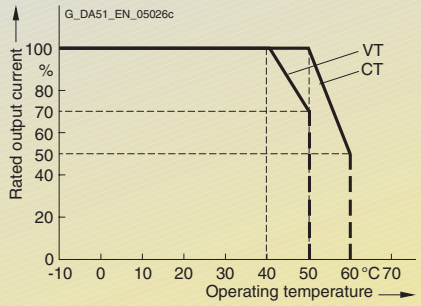
Output	Rated output current in A for a pulse frequency of						
kW	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
Mains voltage 1/3 AC 200 V							
0.12 to 5.5	Values correspond to the 4 kHz standard values. No derating, since 16 kHz standard.						
7.5	28.0	26.6	25.2	22.4	19.6	16.8	14.0
11	42.0	37.8	33.6	29.4	25.2	21.0	16.8
15	54.0	48.6	43.2	37.8	32.4	27.0	21.6
18.5	68.0	64.6	61.2	54.4	47.6	40.8	34.0
22	80.0	72.0	64.0	56.0	48.0	40.0	32.0
30	104.0	91.0	78.0	70.2	62.4	57.2	52.0
37	130.0	113.8	97.5	87.8	78.0	71.5	65.0
45	154.0	134.8	115.5	104.0	92.4	84.7	77.0
Mains operating voltage 3 AC 400 V							
0.37	1.3	1.3	1.3	1.3	1.3	1.2	1.0
0.55	1.7	1.7	1.7	1.6	1.5	1.4	1.2
0.75	2.2	2.2	2.2	2.0	1.8	1.5	1.3
1.1	3.1	2.9	2.8	2.5	2.2	1.9	1.6
1.5	4.1	3.7	3.3	2.9	2.5	2.1	1.6
2.2	5.9	5.6	5.3	4.7	4.1	3.5	3.0
3.0	7.7	6.9	6.2	5.4	4.6	3.9	3.1
4.0	10.2	9.2	8.2	7.1	6.1	5.1	4.1
5.5	13.2	11.9	10.6	9.2	7.9	6.6	5.3
7.5	19.0	18.1	17.1	15.2	13.3	11.4	9.5
11.0	26.0	23.4	20.8	18.2	15.6	13.0	10.4
15.0	32.0	30.4	28.8	25.6	22.4	19.2	16.0
18.5	38.0	34.2	30.4	26.6	22.8	19.0	15.2
22	45.0	40.5	36.0	31.5	27.0	22.5	18.0
30	62.0	58.9	55.8	49.6	43.4	37.2	31.0
37	75.0	67.5	60.0	52.5	45.0	37.5	30.0
45	90.0	76.5	63.0	51.8	40.5	33.8	27.0
55	110.0	93.5	77.0	63.3	49.5	41.3	33.0
75	145.0	112.4	79.8	68.9	58.0	50.8	43.5
90	178.0	–	–	–	–	–	–
110	205.0	–	–	–	–	–	–
132	250.0	–	–	–	–	–	–
160	302.0	–	–	–	–	–	–
200	370.0	–	–	–	–	–	–
Mains operating voltage 3 AC 500 V							
0.75	1.4	1.2	1.0	0.8	0.7	0.6	0.6
1.5	2.7	2.2	1.6	1.4	1.1	0.9	0.8
2.2	3.9	2.9	2.0	1.6	1.2	1.0	0.8
4.0	6.1	4.6	3.1	2.4	1.8	1.5	1.2
5.5	9.0	6.8	4.5	3.6	2.7	2.3	1.8
7.5	11.0	8.8	6.6	5.5	4.4	3.9	3.3
11.0	17.0	12.8	8.5	6.8	5.1	4.3	3.4
15.0	22.0	17.6	13.2	11.0	8.8	7.7	6.6
18.5	27.0	20.3	13.5	10.8	8.1	6.8	5.4
22	32.0	24.0	16.0	12.8	9.6	8.0	6.4
30	41.0	32.8	24.6	20.5	16.4	14.4	12.3
37	52.0	39.0	26.0	20.8	15.6	13.0	10.4
45	62.0	52.7	43.4	40.3	37.2	32.6	27.9
55	77.0	67.4	57.8	52.0	46.2	42.4	38.5
75	99.0	84.2	69.3	64.4	59.4	52.0	44.6

Technical data

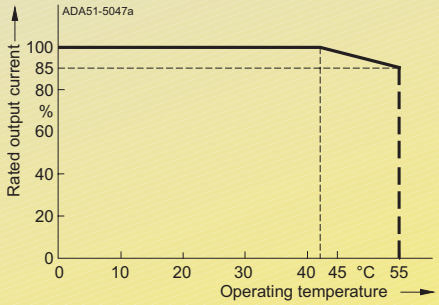
Derating data (continued)

Operating temperature

Inverter 0.12 kW to 75 kW



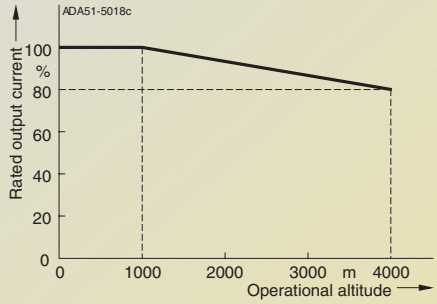
Inverter 90 kW to 200 kW



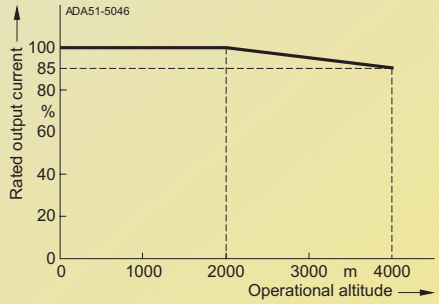
Installation height above sea level

Permissible output current
in % of the rated output current

Inverter 0.12 kW to 75 kW

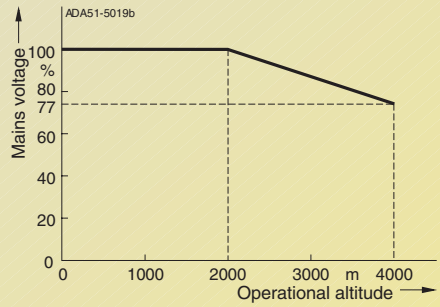


Inverter 90 kW to 200 kW

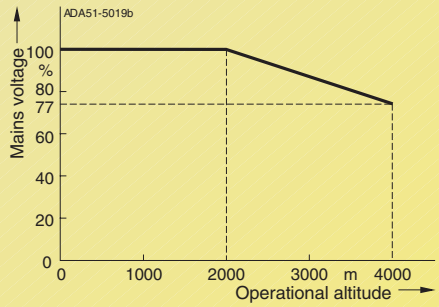


Permissible mains voltage
in % of the max. possible mains voltage

Inverter 0.12 kW to 75 kW



Inverter 90 kW to 200 kW



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	2.3	0.9	–	–	–	–	A	1.3	**6SE6440-2UC11-2AA1**
0.25	0.33	4.3	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	5.9	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	7.7	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	10.1	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	15.0	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2	18.6	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3	26.8	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4	35.9	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	2.2	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	3.0	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	3.9	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	5.2	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	7.6	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2.0	10.2	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3.0	14.1	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4.0	18.4	13.6	–	–	–	–	C	5.5	**6SE6440-2UC23-0CA1**
4.0	5.0	23.3	17.5	**5.5**	7.5	28.3	22	C	5.5	**6SE6440-2UC24-0CA1**
5.5	7.5	28.0	22	**7.5**	10	34.2	28	C	5.5	**6SE6440-2UC25-5CA1**
7.5	10	34.0	28	**11.0**	15	48.7	42	D	16	**6SE6440-2UC27-5DA1**
11.0	15	50.6	42	**15.0**	20	63.1	54	D	16	**6SE6440-2UC31-1DA1**
15.0	20	64.9	54	**18.5**	25	80.2	68	D	16	**6SE6440-2UC31-5DA1**
18.5	25	83.0	68	**22**	30	96.0	80	E	20	**6SE6440-2UC31-8EA1**
22	30	100.0	80	**30**	40	127.0	104	E	20	**6SE6440-2UC32-2EA1**
30	40	140.0	104	**37**	50	171.0	130	F	55	**6SE6440-2UC33-0FA1**
37	50	177.0	130	**45**	60	206.0	154	F	55	**6SE6440-2UC33-7FA1**
45	60	204.0	154	–	–	–	–	F	55	**6SE6440-2UC34-5FA1**
Mains operating voltage 3 AC 380 V to 480 V										
0.37	0.50	1.5	1.3	–	–	–	–	A	1.3	**6SE6440-2UD13-7AA1**
0.55	0.75	1.9	1.7	–	–	–	–	A	1.3	**6SE6440-2UD15-5AA1**
0.75	1.0	2.4	2.2	–	–	–	–	A	1.3	**6SE6440-2UD17-5AA1**
1.1	1.5	3.7	3.1	–	–	–	–	A	1.3	**6SE6440-2UD21-1AA1**
1.5	2.0	4.8	4.1	–	–	–	–	A	1.3	**6SE6440-2UD21-5AA1**
2.2	3.0	6.5	5.9	–	–	–	–	B	3.3	**6SE6440-2UD22-2BA1**
3.0	4.0	8.6	7.7	–	–	–	–	B	3.3	**6SE6440-2UD23-0BA1**
4.0	5.0	11.6	10.2	–	–	–	–	B	3.3	**6SE6440-2UD24-0BA1**
5.5	7.5	15.6	13.2	**7.5**	10	20.2	19	C	5.5	**6SE6440-2UD25-5CA1**
7.5	10	22.0	19	**11.0**	15	29.0	26	C	5.5	**6SE6440-2UD27-5CA1**
11.0	15	32.3	26	**15.0**	20	39.0	32	C	5.5	**6SE6440-2UD31-1CA1**
15.0	20	38.5	32	**18.5**	25	45.2	38	D	16	**6SE6440-2UD31-5DA1**
18.5	25	47.1	38	**22**	30	54.7	45	D	16	**6SE6440-2UD31-8DA1**
22	30	56.3	45	**30**	40	74.8	62	D	16	**6SE6440-2UD32-2DA1**
30	40	78.0	62	**37**	50	91.0	75	E	20	**6SE6440-2UD33-0EA1**
37	50	95.0	75	**45**	60	111.0	90	E	20	**6SE6440-2UD33-7EA1**
45	60	122.0	90	**55**	75	143.0	110	F	56	**6SE6440-2UD34-5FA1**
55	75	148.0	110	**75**	100	190.0	145	F	56	**6SE6440-2UD35-5FA1**
75	100	188.0	145	**90**	125	223.0	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} = 1 % with reference to the inverter rated power and rated mains operating voltage of 240 V or 400 V without a line commutating choke.

When a line commutating choke is used, the specified values are reduced in the case of 200 V–240 V to between 55% to 70% and in the case of 380 V–480 V to between 70% and 80%.

2) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.