

# **MLFB-Ordering data**

6SL3220-3YE40-0UP0



Client order no. : Order no. : Offer no. : Remarks:

Item no.: Consignment no. : Project :

Rated data			General tech. specifications	
Input			Power factor λ	0.90 0.95
Number of phases	3 AC		Offset factor cos φ	0.99
Line voltage	380 480 V +10 % -20 %		- Efficiency η	0.98
Line frequency	47 63 Hz		Sound pressure level (1m)	70 dB
Rated voltage	400V IEC	480V NEC	Power loss	1.550 kW
Rated current (LO)	107.00 A	91.00 A	Filter class (integrated)	Unfiltered
Rated current (HO)	94.00 A	80.00 A		
Output			EMC category (with accessories)	without
Number of phases	3 AC			
Rated voltage	400V IEC 480V NEC		Ambient conditions	
Rated power (LO)	55.00 kW	75.00 hp	Standard board coating type	Class 3C2, according to IEC 60721-3: 2002
Rated power (HO)	45.00 kW	50.00 hp		
Rated current (LO)	110.00 A	96.00 A	Cooling	Air cooling using an integrated fan
Rated current (HO)	90.00 A	77.00 A		
Rated current (IN)	113.00 A		Cooling air requirement	0.083 m³/s (2.931 ft³/s)
Max. output current	149.00 A		Installation altitude	1000 m (3280.84 ft)
Pulse frequency	4 kHz		Ambient temperature	
Output frequency for vector control	0 200 Hz		Operation	-20 45 °C (-4 113 °F)
			Transport	-40 70 °C (-40 158 °F)
Output frequency for V/f control	0 550 Hz		Storage	-25 55 °C (-13 131 °F)
			Relative humidity	
				95 % At 40 °C (104 °F), condensati

### Overload capability

### Low Overload (LO)

110% base load current IL for 60 s in a 300 s cycle time

### High Overload (HO)

150% x base load current IH for 60 s within a 600 s cycle time

Max. operation

and icing not permissible



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Degree of protection	Marshani dak		<u></u>	Figure similar	
Number   Size   FSE   Will linear / square-law / parameterizable   Yes	Mechanical data		Closed-loop control techniques		
Net weight         27 kg (59,52 lb)         V/f with flux current control (FCC)         Yes           Width         275 mm (10,83 in)         YES           Height         551 mm (21,69 in)         Yes           Depth         248 mm (9,76 in)         Yes           Inputs / outputs           Standard digital inputs         Torque control, with encoder         No           Communication           Switching level: 0→1         11 V         Communication         PROFIBUS OP           Switching level: 1→0         5 V         Communication         PROFIBUS OP           Max. Inrush current         15 mA         Signal cable           Fail-safe digital inputs         Conductor cross-section         0.15 1.50 mm²           Number         1         Conductor cross-section         0.15 1.50 mm²           Poligital outputs         Line side         Version         screw-type terminal           Number as relay changeover contact         2         Version         Screw-type terminal           Number as relay changeover contact         2         Conductor cross-section         25.00 70.00 mm²           Number as relay changeover contact         2         Conductor cross-section         25.00 70	Degree of protection	IP20 / UL open type	V/f linear / square-law / parameter	<b>zable</b> Yes	
Width         27 kg (95.52 fb)         Vif ECO linear / square-law         Yes           Width         275 mm (10.83 in)         Yes           Height         551 mm (21.69 in)         Yes           Depth         248 mm (9.76 in)         Yes           Encoderless torque control with sensor         No           No           Standard digital inputs         Communication           Number         6           Communication         PROFIBUS DP	Size	FSE			
Width 275 mm (10.83 in) Helght 551 mm (21.69 in) Depth 248 mm (9.76 in)  Inputs / outputs  Standard digital inputs  Number 6 Switching level: 0-1 111 V Switching level: 1-0 5 V Max. inrush current 15 mA  Fail-safe digital inputs  Number 1 1 Conductor cross-section (AWG 6 AWG 310)  Number 1 1 Conductor cross-section (AWG 6 AWG 310)  Number as relay changeover contact 2  Output (resistive load) DC 30 V, 5.0 A  Analog / digital inputs  Number 2 (Differential input)  Number 2 (Differential input)  Switching threshold as digital inputs  Number 2 (Differential input)  Switching threshold as digital inputs  Number 3 (AWG 6 AWG 310)  Number 4 Version Screw-type terminals  Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 310)  Number 5 (Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 310)  Number 6 Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 310)  Number 7 Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 310)  Number 8 (AWG 6 AWG 310)  PC Link (for braking resistor)  Switching threshold as digital input  O-1 4 V  1-0 1.6 V  Analog outputs  Number 1 (Non-isolated output)	Net weight	27 kg (59.52 lb)			
Height 551 mm (21.69 in)  Depth 248 mm (9.76 in)  Inputs / outputs  Standard digital inputs  Number 6 Switching level: 0→1 11 V Switching level: 1→0 5 V Max. inrush current 15 mA  Fail-safe digital inputs  Number 1 Conductor cross-section 0.15 1.50 mm² (AWG 24 AWG 16)  Digital outputs  Number 2 Conductor cross-section 25 0.00 70.00 mm² (AWG 6 AWG 3/0)  Number as relay changeover contact 2  Output (resistive load) DC 30 V, 5.0 A  Conductor cross-section 25 0.00 70.00 mm² (AWG 6 AWG 3/0)  Number as transistor 0 Motor end  Analog / digital inputs  Number 2 (Differential input) Resolution 10 bit  Switching threshold as digital input  O-1 4 V I 1→0 1.6 V Analog outputs  Vector control, with sensor No Pcommunication  Yes  Communication PROFIBUS DP  Conductor cross-section 0.15 1.50 mm² (AWG 24 AWG 16)  Unshielded 25.00 70.00 mm² (AWG 6 AWG 3/0)  PROFIBUS DP  Communication PROFIBUS DP  Conductor cross-section 0.15 1.50 mm² (AWG 6 AWG 3/0)  Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 3/0)  Number 2 (Differential input) Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 3/0)  PC Link (for braking resistor)  Switching threshold as digital input  O-1 4 V I 1→0 1.6 V Analog outputs  Number 1 (Non-isolated output)	Width	275 mm (10.83 in)			
Depth   248 mm (9.76 in)   Encoderless torque control   Yes	Height	551 mm (21.69 in)			
Standard digital inputs   No	Depth	248 mm (9.76 in)		No	
Number 6 Switching level: 0→1 11 V  Switching level: 1→0 5 V  Max. inrush current 15 mA  Fail-safe digital inputs  Number 1 1 Conductor cross-section 0.15 1.50 mm² (AWG 24 AWG 16)  Digital outputs  Number as relay changeover contact 2  Output (resistive load) DC 30 V, 5.0 A  Conductor cross-section 25.00 70.00 mm² (AWG 30)  Number as transistor 0 Motor end  Analog / digital inputs  Number 2 (Differential input) Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 30)  Switching threshold as digital input  DC 10 bit Fee connection 25.00 70.00 mm² (AWG 6 AWG 30)  Switching threshold as digital input  DC 11 k (for braking resistor)  Max. motor cable length  1-0 1.6 V  Analog outputs  Number 1 (Non-isolated output)	Inputs / out	tputs	Encoderless torque control	Yes	
Switching level: 0-1 11V  Switching level: 1-0 5 V  Max. inrush current 15 mA  Fail-safe digital inputs  Number 1 1 Conductor cross-section 0.15 1.50 mm² (AWG 24 AWG 16)  Digital outputs Line side  Version screw-type terminal 25.00 70.00 mm² (AWG 6 AWG 3/0)  Number as relay changeover contact 2 Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 3/0)  Number as transistor 0 Motor end  Analog / digital inputs  Number 2 (Differential input) Conductor cross-section 25.00 70.00 mm² (AWG 6 AWG 3/0)  Resolution 10 bit Switching threshold as digital input  Switching threshold as digital input  0-1 4 V  Analog outputs  Number 1 (Non-isolated output)  Number 1 (Non-isolated output)  Number 1 (Non-isolated output)	Standard digital inputs		Torque control, with encoder	No	
Switching level: 0-1 111   Switching level: 1-0 5 V	Number	6			
Switching level: 1→0       5 V         Max. inrush current       15 mA         Signal cable         Fail-safe digital inputs         Number       1       Conductor cross-section       0.15 1.50 mm² (AWG 24 AWG 16)         Digital outputs       Line side         Number as relay changeover contact       2       Version       screw-type terminal         Output (resistive load)       DC 30 V, 5.0 A       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Number as transistor       0       Motor end         Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input         0→1       4 V       Max. motor cable length         1→0       1.6 V       Shielded       200 m (656.17 ft)         Analog outputs       1 (Non-isolated output)       Unshielded       300 m (984.25 ft)	Switching level: 0→1	11 V	Communication		
Max. inrush current  Max. inrush current  Number  1 Conductor cross-section  0.15 1.50 mm² (AWG 24 AWG 16)  Digital outputs  Line side  Version  Screw-type terminal  Output (resistive load)  DC 30 V, 5.0 A  Conductor cross-section  0.25.00 70.00 mm² (AWG 3/0)  Number as transistor  Output (resistive load)  DC 30 V, 5.0 A  Conductor cross-section  Conductor cross-section  Screw-type terminals  Version  Screw-type terminals  Ocnductor cross-section  Conductor cross-section  Conductor cross-section  Screw-type terminals  DC link (for braking resistor)  Switching threshold as digital input  O→1  4 V  Max. motor cable length  1→0  Analog outputs  Number  1 (Non-isolated output)  Unshielded  300 m (984.25 ft)	Switching level: 1→0	5 V	Communication	PROFIBUS DP	
Fail-safe digital inputs       Signal cable         Number       1       Conductor cross-section       0.15 1.50 mm² (AWG 24 AWG 16)         Digital outputs       Line side         Number as relay changeover contact       2       Version       screw-type terminal         Output (resistive load)       DC 30 V, 5.0 A       Motor end       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Number as transistor       0       Motor end       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input         0→1       4 V       Max. motor cable length         1→0       1.6 V       Shielded       200 m (656.17 ft)         Analog outputs       1 (Non-isolated output)       Unshielded       300 m (984.25 ft)	-	15 mA	Connections		
Number       1       Conductor cross-section       0.15 1.50 mm² (AWG 24 AWG 16)         Digital outputs       Line side         Version       screw-type terminal         Output (resistive load)       DC 30 V, 5.0 A       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Number as transistor       0       Motor end         Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input       PE connection       Screw-type terminals         0→1       4 V       Max. motor cable length         1→0       1.6 V       Shielded       200 m (656.17 ft)         Analog outputs       Unshielded       300 m (984.25 ft)		13 IIIA	Signal cable		
Digital outputs       Line side         Number as relay changeover contact       2       Version       screw-type terminal         Output (resistive load)       DC 30 V, 5.0 A       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Number as transistor       0       Motor end         Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input         0→1       4 V       Max. motor cable length         1→0       1.6 V       Max. motor cable length         Analog outputs       Shielded       200 m (656.17 ft)         Number       1 (Non-isolated output)		1	Conductor cross-section		
Number as relay changeover contact       2       Version       screw-type terminal         Output (resistive load)       DC 30 V, 5.0 A       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Number as transistor       0       Motor end         Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input       PE connection       Screw-type terminals         0→1       4 V       Max. motor cable length         1→0       1.6 V       Shielded       200 m (656.17 ft)         Analog outputs       Unshielded       300 m (984.25 ft)		•	Line side	(/WG 24 //WG 10)	
Output (resistive load)  DC 30 V, 5.0 A  Conductor cross-section  Motor end  Motor end  Version  Screw-type terminals  Number  2 (Differential input)  Conductor cross-section  25.00 70.00 mm² (AWG 3/0)  Conductor cross-section  25.00 70.00 mm² (AWG 6 AWG 3/0)  Conductor cross-section  Conductor cross-section  PC link (for braking resistor)  Switching threshold as digital input  PE connection  Screw-type terminals  Max. motor cable length  1 → 0  Analog outputs  Number  1 (Non-isolated output)  Unshielded  300 m (984.25 ft)					
Output (resistive load)       DC 30 V, 5.0 A       Conductor cross-section       (AWG 6 AWG 3/0)         Number as transistor       0       Motor end         Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       10 bit       DC link (for braking resistor)         Switching threshold as digital input         0→1       4 V       Max. motor cable length         1→0       1.6 V       Shielded       200 m (656.17 ft)         Analog outputs       Unshielded       300 m (984.25 ft)	Number as relay changeover contact	2	Version	screw-type terminal	
Analog / digital inputs       Version       Screw-type terminals         Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Resolution       DC link (for braking resistor)         Switching threshold as digital input       PE connection       Screw-type terminals         Max. motor cable length       Shielded       200 m (656.17 ft)         Analog outputs       Unshielded       300 m (984.25 ft)	Output (resistive load)	DC 30 V, 5.0 A	Conductor cross-section		
Number       2 (Differential input)       Conductor cross-section       25.00 70.00 mm² (AWG 6 AWG 3/0)         Besolution       10 bit         DC link (for braking resistor)         PE connection       Screw-type terminals         Max. motor cable length         Shielded       200 m (656.17 ft)         Unshielded       300 m (984.25 ft)	Number as transistor	0	Motor end		
Resolution  10 bit  DC link (for braking resistor)  Switching threshold as digital input  0→1 4 V  1→0 1.6 V  Analog outputs  PE connection  Max. motor cable length  Shielded 200 m (656.17 ft)  Unshielded 300 m (984.25 ft)	Analog / digital inputs		Version	Screw-type terminals	
Resolution DC link (for braking resistor)   Switching threshold as digital input PE connection Screw-type terminals   0→1 4 V Max. motor cable length   1→0 1.6 V Shielded 200 m (656.17 ft)   Analog outputs Unshielded 300 m (984.25 ft)	Number	2 (Differential input)	Conductor cross-section	(4)440 5 41440 040)	
Switching threshold as digital input     PE connection     Screw-type terminals       0→1     4 V     Max. motor cable length       1→0     1.6 V     Shielded     200 m (656.17 ft)       Analog outputs       Number     1 (Non-isolated output)   Unshielded	Resolution	10 bit	DC link (for braking resistor)	( و	
0→1 4 V  1→0 1.6 V  Shielded 200 m (656.17 ft)  Analog outputs  Number 1 (Non-isolated output)  Max. motor cable length  Shielded 200 m (656.17 ft)  Unshielded 300 m (984.25 ft)	Switching threshold as digital in	put			
1.6 V  Shielded 200 m (656.17 ft)  Analog outputs  Unshielded 300 m (984.25 ft)	0→1	4 V		Screw-type terminals	
Analog outputs  Unshielded 200 m (656.17 ft)  Unshielded 300 m (984.25 ft)			Max. motor cable length		
Number 1 (Non-isolated output) 300 m (984.25 ft)		1.5 v	Shielded	200 m (656.17 ft)	
	Analog outputs		Unshielded	300 m (984.25 ft)	
PTC/ KTY interface	Number	1 (Non-isolated output)			
TO KIT III. III.	PTC/ KTY interface				

1 motor temperature sensor input, sensors that can be connected: PTC, KTY and Thermo-Click, accuracy  $\pm 5~^{\circ}\text{C}$ 

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## **MLFB-Ordering data**

660.7 W (0.87 %)

481.8 W (0.63 %)

50%

25%

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836.9 W (1.10 %)

90%



Figure similar

# Converter losses to EN 50598-2\* Efficiency class IE2 Comparison with the reference converter (90% / 47.90 % 100%) 100% 1386.1 W (1.82 %) 1713.1 W (2.25 %)

732.0 W (0.96 %)

512 W (0.67 %)

Standards

Compliance with standards

UL, cUL, CE, C-Tick (RCM), EAC, KCC, SEMI F47, REACH

F47, REACI

**CE** marking

EMC Directive 2004/108/EC, Low-Voltage Directive 2006/95/EC

The percentage values show the losses in relation to the rated apparent power of the converter.

50%

The diagram shows the losses for the points (as per standard EN 50598) of the relative torque generating current (I) over the relative motor stator frequency(f). The values are valid for the basic version of the converter without options/components.

# Operator panel: Intelligent Operator Panel (IOP-2)

Screen		Ambient conditions		
Display design	play design LCD colors		Ambient temperature during	
Screen resolution		Operation	0 50 °C (32 122 °F)	
	320 x 240 Pixel		55 °C only with door mounting kit	
Mechanical data		Storage	-40 70 °C (-40 158 °F)	
Degree of protection	IP55 / UL type 12	Transport	-40 70 °C (-40 158 °F)	
Net weight	0.13 kg (0.30 lb)	Relative humidity at 25°C di	uring	
Width	70.0 mm (2.76 in)	Max. operation	95 %	
Height	106.85 mm (4.21 in)			
Depth	19.65 mm (0.77 in)	Approvals		
<b>r</b>		Certificate of suitability	CE, cULus, EAC, KCC, RCM	

<sup>\*</sup>converted values