



Figure similar

### MLFB-Ordering data

6SL3210-1KE13-2UF2

Client order no. :

Order no. :

Offer no. :

Remarks :

Item no. :

Consignment no. :

Project :

| Rated data  | General tech. specifications  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
|---|---|---|--------------------|---|--|---|---------------------------|-------------------------------------|---------------------------|-----------------------------|---|---------------------------|--------------------|------------------------------|--------------------|----------------------------|--------------------|------------------------------|---------------------|------------|-----------------|---------------------------|-------------------------------------|--------------|----------------------------------|--------------|--|---------|-------------------------------------|-------------------------|--------------------------|-----------------------|---------------------|-----------|-------------------------------|-----------|--------------------------------|---------|--------------------------------|----------------|--|
| <b>Input</b> <table> <tr> <td>Number of phases</td><td>3 AC</td></tr> <tr> <td>Line voltage</td><td>380 ... 480 V +10 % -20 %</td></tr> <tr> <td>Line frequency</td><td>47 ... 63 Hz</td></tr> <tr> <td>Rated current (LO)</td><td>4.10 A</td></tr> <tr> <td>Rated current (HO)</td><td>3.20 A</td></tr> </table>   | Number of phases  | 3 AC  | Line voltage       | 380 ... 480 V +10 % -20 %   | Line frequency   | 47 ... 63 Hz                              | Rated current (LO)        | 4.10 A                              | Rated current (HO)        | 3.20 A                      | <table> <tr> <td>Power factor <math>\lambda</math></td><td>0.70 ... 0.85</td></tr> <tr> <td>Offset factor <math>\cos \varphi</math></td><td>0.95</td></tr> <tr> <td>Efficiency <math>\eta</math></td><td>0.97</td></tr> <tr> <td>Sound pressure level (1m)</td><td>49 dB</td></tr> <tr> <td>Power loss</td><td>0.05 kW</td></tr> <tr> <td>Filter class (integrated)</td><td>Unfiltered</td></tr> </table> | Power factor $\lambda$    | 0.70 ... 0.85      | Offset factor $\cos \varphi$ | 0.95               | Efficiency $\eta$          | 0.97               | Sound pressure level (1m)    | 49 dB               | Power loss | 0.05 kW         | Filter class (integrated) | Unfiltered                          |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Number of phases  | 3 AC  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Line voltage  | 380 ... 480 V +10 % -20 %   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Line frequency  | 47 ... 63 Hz  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated current (LO)  | 4.10 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated current (HO)  | 3.20 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Power factor $\lambda$  | 0.70 ... 0.85   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Offset factor $\cos \varphi$  | 0.95  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Efficiency $\eta$   | 0.97  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Sound pressure level (1m)   | 49 dB   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Power loss  | 0.05 kW   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Filter class (integrated)   | Unfiltered  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| <b>Output</b> <table> <tr> <td>Number of phases</td><td>3 AC</td></tr> <tr> <td>Rated voltage</td><td>400 V</td></tr> <tr> <td>Rated power IEC 400V (LO)</td><td>1.10 kW</td></tr> <tr> <td>Rated power NEC 480V (LO)</td><td>1.50 hp</td></tr> <tr> <td>Rated power IEC 400V (HO)</td><td>0.75 kW</td></tr> <tr> <td>Rated power NEC 480V (HO)</td><td>1.00 hp</td></tr> <tr> <td>Rated current (LO)</td><td>3.10 A</td></tr> <tr> <td>Rated current (HO)</td><td>2.20 A</td></tr> <tr> <td>Rated current (IN)</td><td>3.20 A</td></tr> <tr> <td>Max. output current</td><td>4.40 A</td></tr> <tr> <td>Pulse frequency</td><td>4 kHz</td></tr> <tr> <td>Output frequency for vector control</td><td>0 ... 240 Hz</td></tr> <tr> <td>Output frequency for V/f control</td><td>0 ... 550 Hz</td></tr> </table> | Number of phases  | 3 AC  | Rated voltage      | 400 V   | Rated power IEC 400V (LO)  | 1.10 kW                                   | Rated power NEC 480V (LO) | 1.50 hp                             | Rated power IEC 400V (HO) | 0.75 kW                     | Rated power NEC 480V (HO)   | 1.00 hp                   | Rated current (LO) | 3.10 A                       | Rated current (HO) | 2.20 A                     | Rated current (IN) | 3.20 A                       | Max. output current | 4.40 A     | Pulse frequency | 4 kHz                     | Output frequency for vector control | 0 ... 240 Hz | Output frequency for V/f control | 0 ... 550 Hz | <b>Ambient conditions</b> <table> <tr> <td>Cooling</td><td>Air cooling using an integrated fan</td></tr> <tr> <td>Cooling air requirement</td><td>0.005 m³/s (0.177 ft³/s)</td></tr> <tr> <td>Installation altitude</td><td>1000 m (3280.84 ft)</td></tr> </table> <b>Ambient temperature</b> <table> <tr> <td>Operation</td><td>-10 ... 40 °C (14 ... 104 °F)</td></tr> <tr> <td>Transport</td><td>-40 ... 70 °C (-40 ... 158 °F)</td></tr> <tr> <td>Storage</td><td>-40 ... 70 °C (-40 ... 158 °F)</td></tr> </table> <b>Relative humidity</b> <table> <tr> <td>Max. operation</td><td>95 % At 40 °C (104 °F), condensation and icing not permissible</td></tr> </table> | Cooling | Air cooling using an integrated fan | Cooling air requirement | 0.005 m³/s (0.177 ft³/s) | Installation altitude | 1000 m (3280.84 ft) | Operation | -10 ... 40 °C (14 ... 104 °F) | Transport | -40 ... 70 °C (-40 ... 158 °F) | Storage | -40 ... 70 °C (-40 ... 158 °F) | Max. operation | 95 % At 40 °C (104 °F), condensation and icing not permissible |
| Number of phases  | 3 AC  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated voltage   | 400 V   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated power IEC 400V (LO)   | 1.10 kW   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated power NEC 480V (LO)   | 1.50 hp   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated power IEC 400V (HO)   | 0.75 kW   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated power NEC 480V (HO)   | 1.00 hp   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated current (LO)  | 3.10 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated current (HO)  | 2.20 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Rated current (IN)  | 3.20 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Max. output current   | 4.40 A  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Pulse frequency   | 4 kHz   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Output frequency for vector control   | 0 ... 240 Hz  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Output frequency for V/f control  | 0 ... 550 Hz  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Cooling   | Air cooling using an integrated fan   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Cooling air requirement   | 0.005 m³/s (0.177 ft³/s)  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Installation altitude   | 1000 m (3280.84 ft)   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Operation   | -10 ... 40 °C (14 ... 104 °F)   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Transport   | -40 ... 70 °C (-40 ... 158 °F)  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Storage   | -40 ... 70 °C (-40 ... 158 °F)  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Max. operation  | 95 % At 40 °C (104 °F), condensation and icing not permissible  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| <b>Overload capability</b> <table> <tr> <td>Low Overload (LO)</td><td>150 % base load current IL for 3 s, followed by 110 % base load current IL for 57 s in a 300 s cycle time</td></tr> <tr> <td>High Overload (HO)</td><td>200 % base load current IH for 3 s, followed by 150 % base load current IH for 57 s in a 300 s cycle time</td></tr> </table>  | Low Overload (LO)   | 150 % base load current IL for 3 s, followed by 110 % base load current IL for 57 s in a 300 s cycle time | High Overload (HO) | 200 % base load current IH for 3 s, followed by 150 % base load current IH for 57 s in a 300 s cycle time | <b>Closed-loop control techniques</b> <table> <tr> <td>V/f linear / square-law / parameterizable</td><td>Yes</td></tr> <tr> <td>V/f with flux current control (FCC)</td><td>Yes</td></tr> <tr> <td>V/f ECO linear / square-law</td><td>Yes</td></tr> <tr> <td>Sensorless vector control</td><td>Yes</td></tr> <tr> <td>Vector control, with sensor</td><td>No</td></tr> <tr> <td>Encoderless torque control</td><td>No</td></tr> <tr> <td>Torque control, with encoder</td><td>No</td></tr> </table> | V/f linear / square-law / parameterizable | Yes                       | V/f with flux current control (FCC) | Yes                       | V/f ECO linear / square-law | Yes   | Sensorless vector control | Yes                | Vector control, with sensor  | No                 | Encoderless torque control | No                 | Torque control, with encoder | No                  |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Low Overload (LO)   | 150 % base load current IL for 3 s, followed by 110 % base load current IL for 57 s in a 300 s cycle time |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| High Overload (HO)  | 200 % base load current IH for 3 s, followed by 150 % base load current IH for 57 s in a 300 s cycle time |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| V/f linear / square-law / parameterizable   | Yes   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| V/f with flux current control (FCC)   | Yes   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| V/f ECO linear / square-law   | Yes   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Sensorless vector control   | Yes   |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Vector control, with sensor   | No  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Encoderless torque control  | No  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |
| Torque control, with encoder  | No  |   |                    |   |  |   |                           |                                     |                           |                             |   |                           |                    |                              |                    |                            |                    |                              |                     |            |                 |                           |                                     |              |                                  |              |  |         |                                     |                         |                          |                       |                     |           |                               |           |                                |         |                                |                |  |



Figure similar

### MLFB-Ordering data

6SL3210-1KE13-2UF2

| Mechanical data      |                     |
|----------------------|---------------------|
| Degree of protection | IP20 / UL open type |
| Size                 | FSAA                |
| Net weight           | 1.40 kg (3.09 lb)   |
| Width                | 73 mm (2.87 in)     |
| Height               | 173 mm (6.81 in)    |
| Depth                | 160 mm (6.30 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 |
|--------|---|

### Digital outputs

|                                    |                |
|------------------------------------|----------------|
| Number as relay changeover contact | 1              |
| Output (resistive load)            | DC 30 V, 0.5 A |
| Number as transistor               | 1              |
| Output (resistive load)            | DC 30 V, 0.5 A |

### Analog / digital inputs

|            |                        |
|------------|------------------------|
| Number     | 1 (Differential input) |
| Resolution | 10 bit                 |

### Switching threshold as digital input

|     |       |
|-----|-------|
| 0→1 | 4 V   |
| 1→0 | 1.6 V |

### Analog outputs

|        |                         |
|--------|-------------------------|
| Number | 1 (Non-isolated output) |
|--------|-------------------------|

### PTC/ KTY interface

|  |
|--|
| 1 motor temperature sensor input, sensors that can be connected: PTC, KTY and Thermo-Click, accuracy ±5 °C |
|--|

| Communication |  |
|---------------|--|
|---------------|--|

|               |                       |
|---------------|-----------------------|
| Communication | PROFINET, EtherNet/IP |
|---------------|-----------------------|

| Connections |  |
|-------------|--|
|-------------|--|

### Signal cable

|                         |                                       |
|-------------------------|---------------------------------------|
| Conductor cross-section | 0.15 ... 1.50 mm² (AWG 24 ... AWG 16) |
|-------------------------|---------------------------------------|

### Line side

|         |                         |
|---------|-------------------------|
| Version | Plug-in screw terminals |
|---------|-------------------------|

|                         |                                       |
|-------------------------|---------------------------------------|
| Conductor cross-section | 1.00 ... 2.50 mm² (AWG 18 ... AWG 14) |
|-------------------------|---------------------------------------|

### Motor end

|         |                         |
|---------|-------------------------|
| Version | Plug-in screw terminals |
|---------|-------------------------|

|                         |                                       |
|-------------------------|---------------------------------------|
| Conductor cross-section | 1.00 ... 2.50 mm² (AWG 18 ... AWG 14) |
|-------------------------|---------------------------------------|

### DC link (for braking resistor)

|         |                         |
|---------|-------------------------|
| Version | Plug-in screw terminals |
|---------|-------------------------|

|                         |                                       |
|-------------------------|---------------------------------------|
| Conductor cross-section | 1.00 ... 2.50 mm² (AWG 18 ... AWG 14) |
|-------------------------|---------------------------------------|

|                   |                 |
|-------------------|-----------------|
| Line length, max. | 15 m (49.21 ft) |
|-------------------|-----------------|

|               |                          |
|---------------|--------------------------|
| PE connection | On housing with M4 screw |
|---------------|--------------------------|

### Max. motor cable length

|          |                  |
|----------|------------------|
| Shielded | 50 m (164.04 ft) |
|----------|------------------|

|            |                   |
|------------|-------------------|
| Unshielded | 100 m (328.08 ft) |
|------------|-------------------|

| Standards |  |
|-----------|--|
|-----------|--|

|                           |                           |
|---------------------------|---------------------------|
| Compliance with standards | UL, cUL, CE, C-Tick (RCM) |
|---------------------------|---------------------------|

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



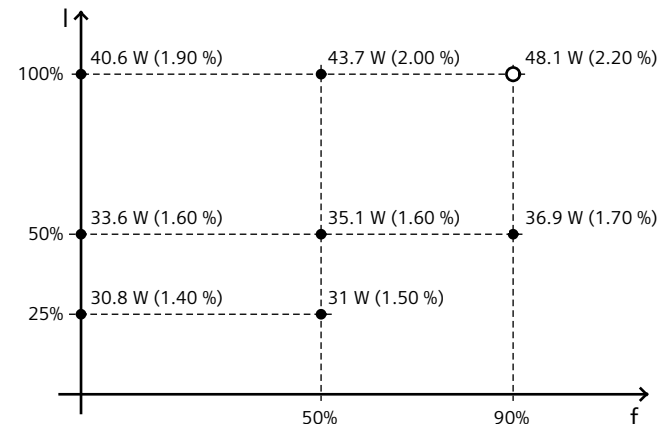
Figure similar

MLFB-Ordering data

6SL3210-1KE13-2UF2

Converter losses to IEC61800-9-2\*

|  |         |
|--|---------|
| Efficiency class                                     | IE2     |
| Comparison with the reference converter (90% / 100%) | 27.30 % |



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

The diagram shows the losses for the points (as per standard IEC61800-9-2) 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.

\*converted values