

## Product data sheet

### Characteristics



#### General information:

|                              |                                       |
|------------------------------|---------------------------------------|
| Range of product             | MATRIX500                             |
| Product or component type    | High performance vector control drive |
| Product specific application | Complex, heavy duty                   |

|                          |                              |
|--------------------------|------------------------------|
| Component name           | Matrix500-04-037G/045P-3/B   |
| Motor power kW           | 37 kW at 45...480 V 3 phases |
| Motor power hp           | 37 hp at 45...480 V 3 phases |
| Power supply voltage     | 380...480 V (- 15...10 %)    |
| Network number of phases | 3 phases                     |

#### Line current

91 A for 380/400 V 3 phases 37kW /45 hp At 45 degree

86.45 A for 380/400 V 3 phases 37kW /45 hp At 50 degree

|                              |                                                                           |
|------------------------------|---------------------------------------------------------------------------|
| EMC filter                   | Integrated EMC C3 filter                                                  |
| Assembly style               | With heat sink                                                            |
| Apparent power               | kVA at 380 V 3 phases 132kW /160 hp                                       |
| Prospective line Isc         | <= 35 kA, 3 phases                                                        |
| Nominal output current       | 95 A                                                                      |
| Maximum transient current    | 136 A for 60 s 3 phases 37kW /45 hp<br>182 A for 2 s 3 phases 37kW /45 hp |
| Speed drive output frequency | 0.1...600 Hz                                                              |
| Nominal switching frequency  | 2.5 kHz                                                                   |

#### frequency

|                     |                                   |
|---------------------|-----------------------------------|
| Switching frequency | 2.5...16 kHz adjustable           |
|                     | 2.5...16 kHz with derating factor |

#### Complementary

|                               |                                                                                                                                                                                                                                 |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product destination           | Asynchronous motors/Synchronous (MATRIX 500)                                                                                                                                                                                    |
| Power supply voltage limits   | 360...480 V                                                                                                                                                                                                                     |
| Power supply frequency        | 50...60 Hz (- 5...5 %)                                                                                                                                                                                                          |
| Power supply frequency limits | 47.5...63 Hz                                                                                                                                                                                                                    |
| Speed range                   | 1...100 for asynchronous motor in open-loop mode, without speed feedback<br>1...1000 for asynchronous motor in closed-loop mode with encoder feedback<br>1...50 for synchronous motor in open-loop mode, without speed feedback |
| Speed accuracy                | +/- 0.01 % of nominal speed for 0.2 Tn to Tn torque variation in closed-loop                                                                                                                                                    |
| mode                          | with encoder feedback                                                                                                                                                                                                           |
| feedback                      | +/- 10 % of nominal slip for 0.2 Tn to Tn torque variation without speed                                                                                                                                                        |
| Torque accuracy               | +/- 10 % in open-loop mode, without speed feedback<br>+/- 3 % in closed-loop mode with encoder feedback                                                                                                                         |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transient overload                  | 150 % of nominal motor torque +/- 10 % for 60 s every 10 minutes<br>180 % of nominal motor torque +/- 10 % for 3s                                                                                                                                                                                                                                                                                                                                                                         |
| Braking torque                      | < 150 % with braking or hoist resistor<br>30 % without braking resistor                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Synchronous motor control profile   | Vector control without speed feedback/SVC                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Diagnostic                          | LED keypad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Output voltage                      | <= power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Insulation                          | Electrical between power and control                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Electrical connection               | AI1-/AI1+, AI2 , AO1, R1A, R1B, R1C, X1...X6, PWR terminal<br>2.5mm <sup>2</sup> / AWG 14<br>L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 terminal 4 x 185 mm <sup>2</sup><br>PC/-, PA/+ terminal 4 x 185 mm <sup>2</sup>                                                                                                                                                                                                                                                                           |
| Tightening torque                   | AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, X1...X6, PWR 0.6 N.m<br>L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 41 N.m / 360 lb.in<br>PC/-, PA/+ 41 N.m / 360 lb.in                                                                                                                                                                                                                                                                                                                                        |
| Supply                              | Internal supply for reference potentiometer (1 to 10 kOhm), 10.5 V DC +/- 5 % ,<br><= 10 mA for overload and short-circuit protection<br>Internal supply, 24 V DC , voltage limits 21...27 V, <= 200 mA for overload and<br>short-circuit protection                                                                                                                                                                                                                                      |
| <b>Analogue input number</b>        | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Analogue input type                 | AI1-/AI1+ bipolar differential voltage +/- 10 V DC, input voltage 24 V max , resolution 11 bits + sign<br>AI2 software-configurable current 0.....20 mA , impedance 242 Ohm, resolution 11 bits<br>AI2 software-configurable voltage 0.....10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits                                                                                                                                                                       |
| Linearity error                     | AI1-/AI1+, AI2 +/- 0.15 % of maximum value<br>AO1 +/- 0.2 %                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Analogue output number</b>       | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Analogue output type                | AO1 software-configurable logic output 10 V <= 20 mA<br>AO1 software-configurable current 0.....20 mA, impedance 500 Ohm, resolution 10 bits<br>AO1 software-configurable voltage 0.....10 V DC, impedance 470 Ohm, resolution 10 bits                                                                                                                                                                                                                                                    |
| <b>Discrete output number relay</b> | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Discrete output type                | R1A, R1B, R1C configurable relay logic NO/NC, electrical durability 100000 cycles                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Discrete input number</b>        | <b>7</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Discrete input type                 | X1...X5: programmable 24 V DC with level 1 PLC, impedance: 3500 Ohm<br>X6: switch-configurable 24 V DC with level 1 PLC, impedance: 3500 Ohm                                                                                                                                                                                                                                                                                                                                              |
| Acceleration and deceleration ramps | Automatic adaptation of ramp if braking capacity exceeded, by using resistor<br>Linear adjustable separately from 0.01 to 9000 s<br>S, U or customized                                                                                                                                                                                                                                                                                                                                    |
| Braking to standstill               | By DC injection                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Protection type                     | Drive against exceeding limit speed<br>Drive against input phase loss<br>Drive break on the control circuit<br>Drive input phase breaks<br>Drive line supply overvoltage<br>Drive line supply undervoltage<br>Drive overcurrent between output phases and earth<br>Drive overheating protection<br>Drive overvoltages on the DC bus<br>Drive short-circuit between motor phases<br>Drive thermal protection<br>Motor motor phase break<br>Motor power removal<br>Motor thermal protection |
| Insulation resistance               | > 1 MOhm at 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Frequency resolution                | Analog input 0.024/50 Hz<br>Display unit 0.1 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Communication port protocol         | Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Type of connector                   | 1 RJ45 for Modbus on front face<br>1 RJ45 for Modbus on terminal                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Physical interface                  | 2-wire RS 485 for Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Transmission frame                  | RTU for Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Transmission rate                   | 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal<br>9600 bps, 19200 bps for Modbus on front face                                                                                                                                                                                                                                                                                                                                                                           |

|                     |                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|
| Data format         | 8 bits, 1 stop, even parity for Modbus on front face<br>8 bits, odd even or no configurable parity for Modbus on terminal |
| Number of addresses | 1...247 for Modbus                                                                                                        |
| Marking             | CE                                                                                                                        |
| Operating position  | Vertical +/- 10 degree                                                                                                    |
| Depth               | 390mm                                                                                                                     |
| Height              | 790mm                                                                                                                     |
| Width               | 290mm                                                                                                                     |
| Product weight      | 90 kg                                                                                                                     |
| Option card         | I/O extension card , Profinet , Profibus , Ethercat , Encoders                                                            |

## Environment

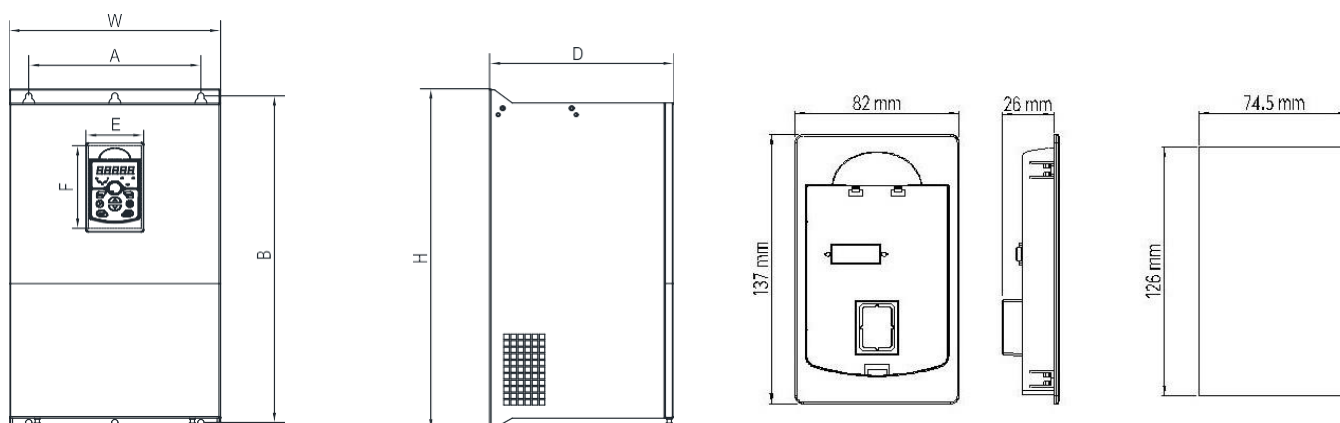
|                                       |                                                                                                                                                  |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise level                           | 35dB conforming to 86/188/EEC                                                                                                                    |
| Standards                             | EN 55011 class A group 2<br>EN 61800-3 environments 1 category C3<br>EN 61800-3 environments 2 category C3<br>EN/IEC 61800-3<br>EN/IEC 61800-5-1 |
| Product certifications                | CE<br>ISO9001                                                                                                                                    |
| IP degree of protection               | IP20                                                                                                                                             |
| Vibration resistance                  | 0.6 gn (f = 10...200 Hz) conforming to EN/IEC 60068-2-6<br>1.5 mm peak to peak (f = 3...10 Hz) conforming to EN/IEC 60068-2-6                    |
| Shock resistance                      | 4 gn for 11 ms conforming to EN/IEC 60068-2-27                                                                                                   |
| Relative humidity                     | 5...95 % without condensation conforming<br>5...95 % without dripping water conforming                                                           |
| Ambient air temperature for operation | -10...45 °C without derating 5% upto 50 Degree                                                                                                   |
| Ambient air temperature for storage   | -25...70 °C                                                                                                                                      |
| Operating altitude                    | <= 1000 m without derating<br>1000...3000 m with current derating 1 % per 100 m                                                                  |

## Installation

### 2.1 Product dimensions and installation dimensions

### 2. Bottom drag installation size of external operation

box (optional accessory)



| Model Type              | Installation Dimensions |        | Inverter Dimensions |        |        | Installation aperture (mm) |
|-------------------------|-------------------------|--------|---------------------|--------|--------|----------------------------|
|                         | A (mm)                  | B (mm) | H (mm)              | W (mm) | D (mm) |                            |
| MATRIX-04-O37G/045P-3/B | /                       | /      | 495                 | 255    | 221    | /                          |