# KDE

**BEST-POWER**

& High  performance vector control AC drive

& Industrial control solution provider

Innovation/Technology/High Quality

KDE GROUP
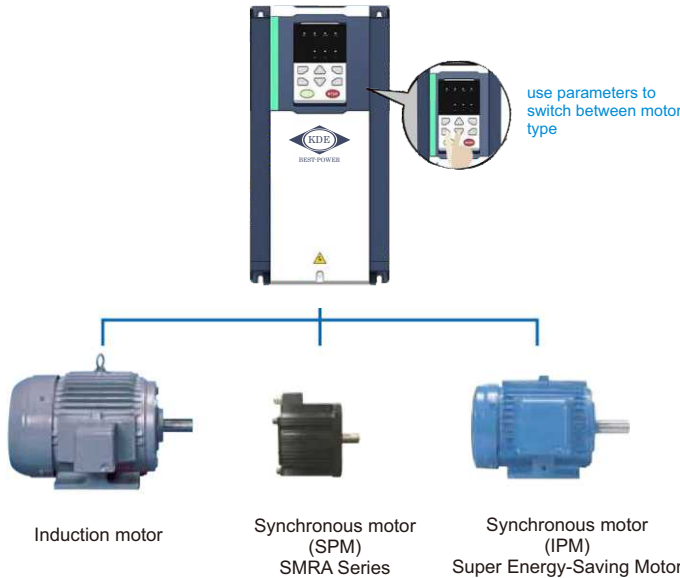
**KDE**
BEST-POWER

## Advanced motor control

### Advanced drive technology

▶ Capable of driving different types of motor. KDE500 series runs not only induction motors, but also synchronous motors lice IPM*1 and SPM*2 motors with high performance open and closed loop vector control.

▶ Minimize equipment needed for your business by using the same drive to run induction and synchronous motors.

∗1 Interior Permanent Magnet Motor (Motors with permanent magnets inserted into the rotor)

∗2 Surface Mounted Permanent Magnet Motor (Motors with permanent magnets mounted on the surface of the rotor)

use parameters to switch between motor type

Induction motor

Synchronous motor (SPM) SMRA Series

Synchronous motor (IPM) Super Energy-Saving Motor

### New Auto-tuning features

▶ Auto-Tuning features optimize drive parameters for operation with induction motors as well as synchronous motors to achieve the highest performance levels possible.

▶ Optimizing not only the drive and motor performance, but also automatically adjusts settings relative to the connected machinery.

▶ New Auto-Tuning methods. KDE500 continuously analyzes changes in motor characteristics during operation for highly precise speed control.

| Synchronous Motor | |
|---|---|
| Rotational Auto-Tuning | Applications requiring high starting torque, high speed, and high accuracy. |
| Stationary Auto-Tuning | Applications where the motor must remain connected to the load during the tuning process. |
| Line-to-Line Resistance Auto-Tuning | For tuning after the cable length between the motor and drive has changed, or when motor and drive capacity ratings differ. |
| Encoder Auto-Tuning | For running the motor at top efficiency all the time |

| Tuning the Load | |
|---|---|
| ASR*Tuning | Perfects responsiveness relative to the machine. Until now, this tuning procedure was fairly time consuming to set. |
| Inertia Tuning | Optimizes the drive's ability to decelerate the load. Useful for applications using Kinetic Energy Buffering Function and Feed Forward functions. |

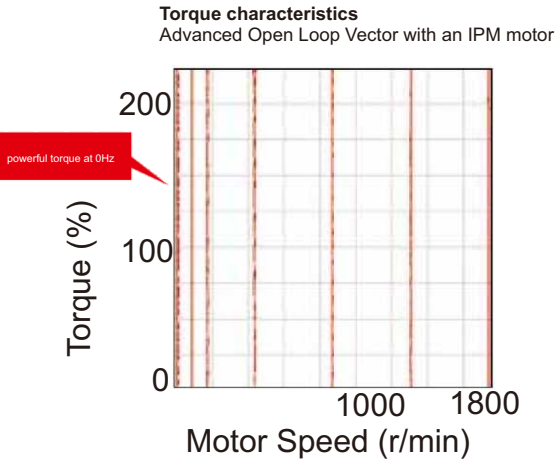### Positioning Capability without External Devices

▶ Use an IPM motor to perform position control – without motor feedback. Electrical saliency in IPM motors makes it possible to detect speed, direction and rotor position without the use of external feedback devices.

▶ Positioning functionality without a PLC. Visual programming in DriveWorcsEZ eliminates the need for external controllers by giving the user the power to create customized functions such as position control.

PLC

NO PG feedback needed
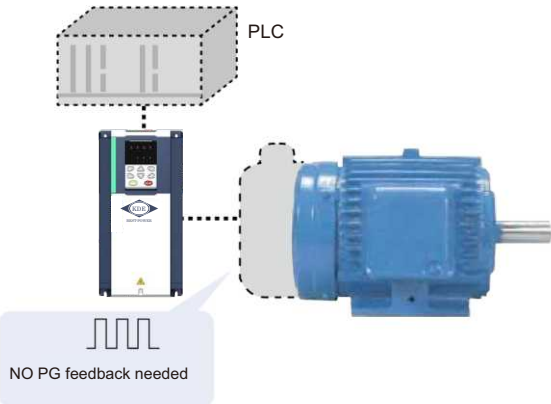
### Powerful Torque Characteristics

▶ Powerful torque at 0 Hz, without sensors or feedback devices. Until recently, sensorless control has been out of reach for synchronous motors.

▶ KDE500 series provides powerful starting torque algorithm without relying on pole sensors or motor feedbacc.

▶ High-performance current vector control achieves powerful starting torque with an induction motor.

Torque characteristics
Advanced Open Loop Vector with an IPM motor

powerful torque at 0Hz

200

Torque (%)

100

0

1000    1800
Motor Speed (r/min)

| Synchronous Motor | |
|---|---|
| Advanced Open Loop Vector for PM motors | 200% rated torque at 0 r/min*, speed range of 1:100* |
| Closed Loop Vector Control for PM motors | 200% rated torque at 0 r/min, speed range of 1:1500 |

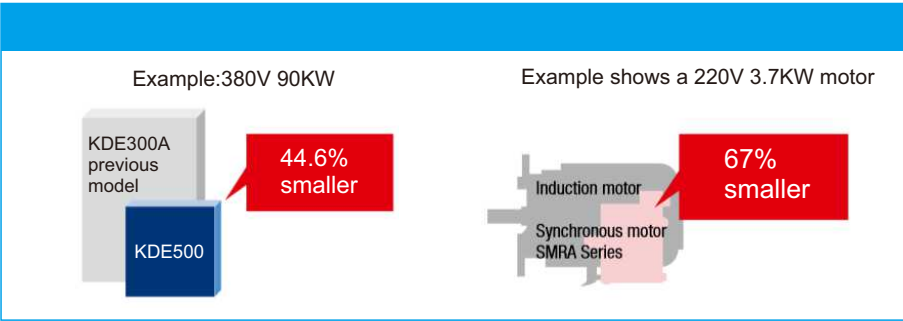| Induction motor | |
|---|---|
| Open Loop Vector Control | 200% rated torque at 0.3 Hz*, speed range of 1:200 |
| Closed Loop Vector Control | 200% rated torque at 0 r/min*, speed range of 1:1500 |

∗ only IPM motor

∗ Proper output torque depends on matching drive and motor capacity.

## Drive design & features

### Even more compact

▶ KDE continues to make applications even smaller by combining the compact designed drive with the light, efficient design of a synchronous motor.

▶ Use Side-by-Side installation for an even more compact setup.

▶ Finless models available*.

    * Coming soon

Example:380V 90KW

Example shows a 220V 3.7KW motor

KDE300A previous model

KDE500

**44.6% smaller**

Induction motor

Synchronous motor SMRA Series

**67% smaller**

### Independent duct design

▶ Independent air duct design, effectively preventing dust entering inverter, causing short-circuit and other faults and improving reliability

▶ Use bigger air volume and long life cooling fan effectively reduces the internal temperature rise of the inverter and ensures reliable and stable operation of inverter.
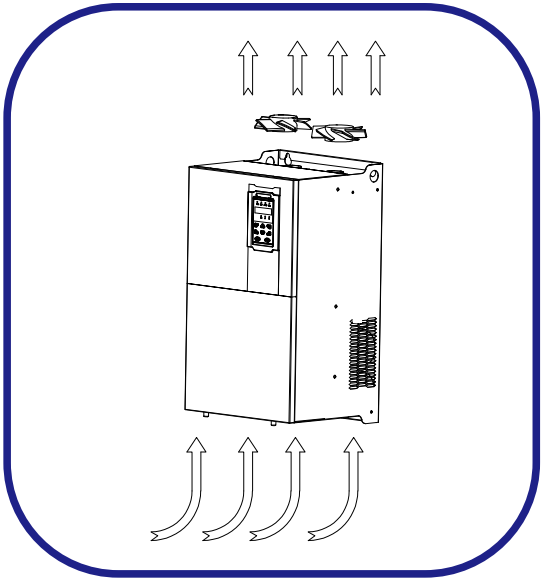
### Perfect protection system

▶ Designed for 10 years of maintenance-free operation.

▶ Cooling fan, capacitors, relays, and IGBTs have been carefully selected and designed for a life expectancy up to ten years.

    * Assumes the drive is running continuously for 24 hours a day at 80% load with an ambient temperature of 40℃

Designed for
**10 YEARS**
of mantenance-free operation

### High speed accuracy and wide speed range

▶ High speed accuracy and wide speed range
Steady speed accuracy: ±0.5% (SVC), ±0.02% (VC)
Speed range: 1:200 (SVC), 1:1000 (VC)
Heavy load overload capability:

▶ 110% rated current for long-term stable operation
150% rated current for 1 minute
180% rated current 10s

without load 50HZ speed wave<0.25%

100% load @ 50HZ speed wave<0.5%
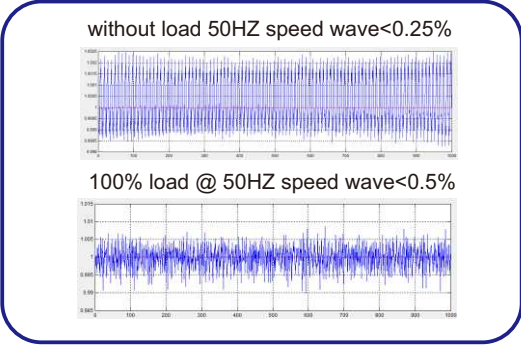
### High torque in low speed, fast response

▶ High torque in low speed, fast response
Load capacity in low speed:

▶ VF: 180%@0.50Hz
SVC: 180%@0.25Hz
VC: 200%@0.00Hz

High torque in low speed in SVC mode:
sudden 150% load and sudden load @0.25Hz
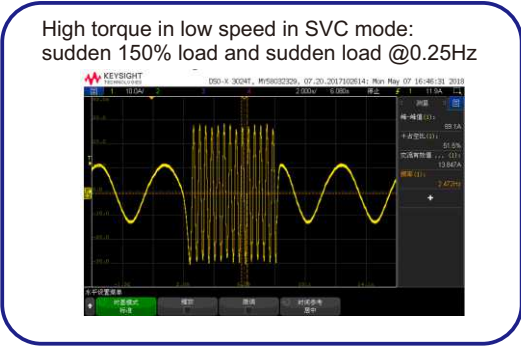
### Rapid response to impact loads

▶ When it meets with sudden load change, inverter can quickly restore the speed, reduce the speed fluctuation, and ensure the production stability and high quality finished products.

Load 0%->100%@50HZ

Load 100%->0%@50HZ
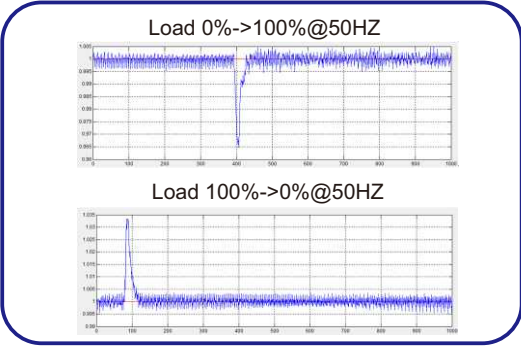
### Optimized SVC algorithm, stable operation in power generation

▶ At present, most of the inverters can not work stably under the SVC control mode (especially in the case of being reversed).

▶ KDE500 can run very well, and it achives great convenience in some special applications (such as tension control in rewinding and winding) .

Instant being dragged

Reverse dragging 5 minutes waveform

The towed motor is in: SVC control mode speed command: 1.00Hz, torque upper limit: 60%, reverse drag to -10.00Hz
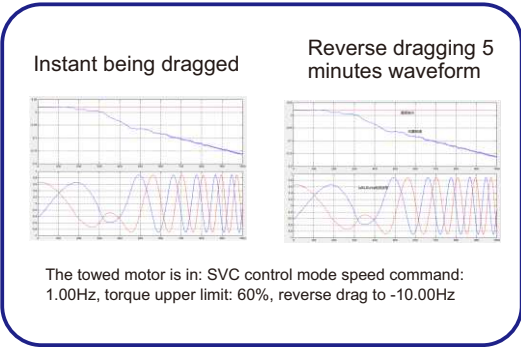
## Stable and reliable

### Deceleration over excitation function

▶ Accurate thermal simulation platform software ensures the reliability of thermal simulation.

▶ Each VFD500 inverter has undergone thermal simulation testing, and only the physical prototype is developed within the scope of the thermal simulation safety design requirements. After the actual test, the thermal simulation results are very close to the physical test results. In the limit test state, the thermal simulation can replace the actual load simulation and an additional layer of scientific thermal test.
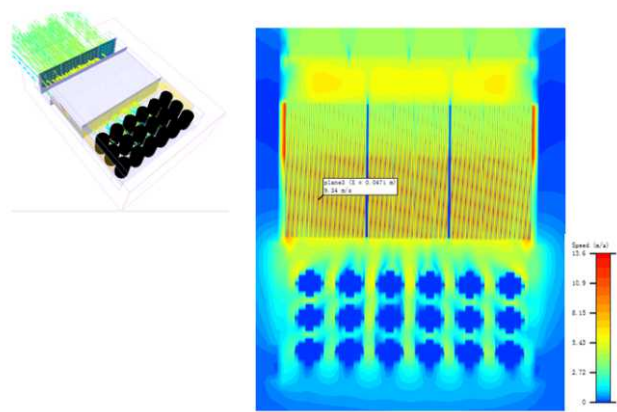
### Rigorous temperature rise test

▶ The whole machine temperature rise test uses the most severe cyclic overload test to meet the long-term reliable operation under extreme load conditions.

▶ Cyclic overload test: 1.5 times overload current for 1 minute, ambient current for 4 minutes, and 1.5 times operation for 1 minute at ambient temperature of 40°.

▶ This continuous cycle operation, 1 cycle for 5 minutes, until the system reaches the thermal equilibrium state, the whole machine is within the thermal design safety range.
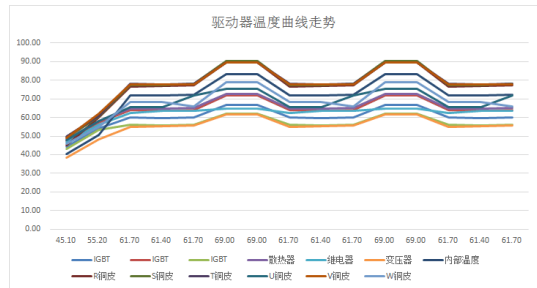
### Complete protection

▶ The whole series has output to ground short circuit protection, over current protection, drive overload protection, motor overload protection, drive over temperature protection, optional PT100/PT1000 motor over temperature protection.

▶ According to the type of fault, it can be set as fault free stop, fault deceleration stop, fault continue to run, and facilitate the on-site handling of emergency situations.

▶ Adopting multiple high-quality three-proof paint to enhance the environmental adaptability of the product. The three-proof paint adopts the automatic spraying process to ensure the uniformity of the thickness of the coating and the consistency of the batch.

## Powerful internal logic

1,Built-in up to 6 sets of delay functions, a wide variety of input sources, the output can be used as a variety of other built-in module inputs.
2,Built-in up to 4 sets of comparator units, any input, multiple comparison functions, the output can be used as a variety of other built-in module inputs.
3,Built-in up to 4 sets of logic units, arbitrary inputs, multiple logic operations, and outputs can be used as inputs for various other built-in modules.
4,The above modules can be used alone or in combination to achieve complex internal logic functions to meet various applications, saving peripheral equipment and wiring.
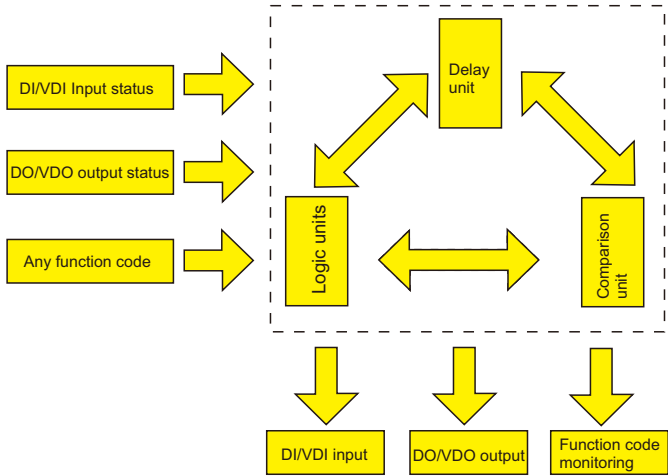
## Rich expansion function

▶ Standard ModbusRTU communication function, support for fieldbus such as Profibus-DP, CanOpen, etc.

▶ Supports incremental encoders and resolvers, where incremental encoders are compatible with differential encoders and open collector encoders.

▶ Support for IO expansion
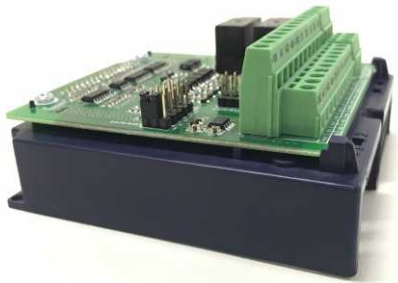
## Powerful debugging software

▶ Support online oscilloscope function

▶ Support parameter backup and download

▶ Support function parameter modification

▶ Support inverter software online upgrade
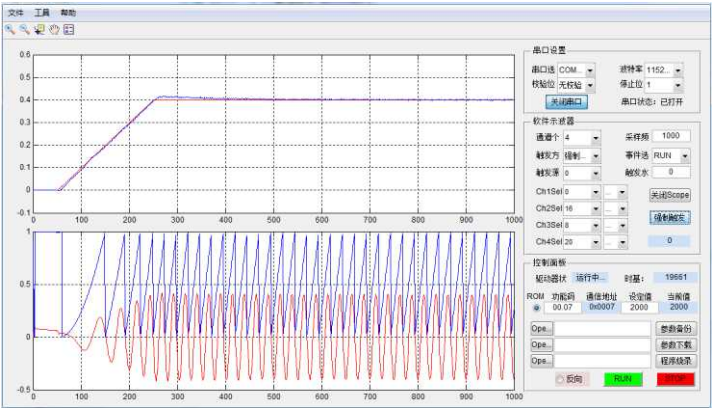
## Multifunctional and user friendly

### Deceleration over excitation function

▶    In many applications, the over-excitation function is set, the deceleration time is shortened by adjusting the motor output frequency and current, and the peripheral braking resistor and other accessories are reduced when the requirements for fast shutdown are met.

Deceleration overexcitation is valid

Deceleration over excitation is invalid
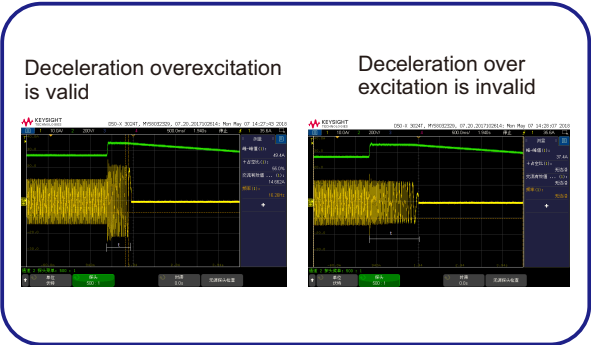
### Undervoltage stall function

▶    When the system is powered off instantaneously, the motor is controlled by the regenerative energy during deceleration to maintain the inverter running for a short period of time and reduce the risk of idling under the instability of the grid.

Undervoltage stall is invalid

Undervoltage stall is valid
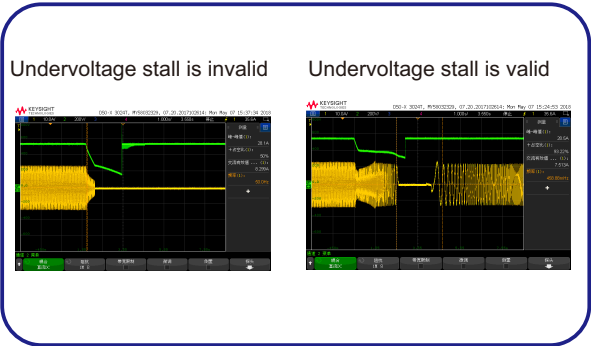
### Excellent speed tracking

▶ Non-impact smooth start for motors that do not stop rotating

Speed tracking current waveform
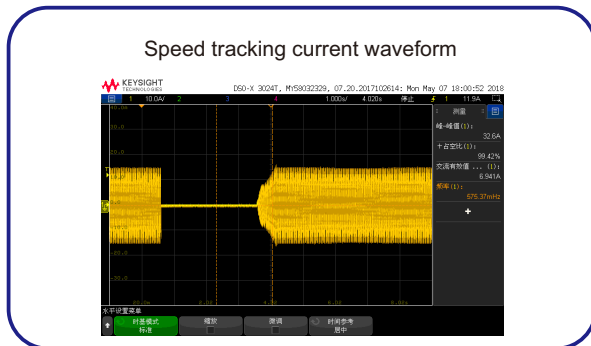
### Energy saving function

（1) It has excellent automatic energy saving function, only need to set the maximum energy saving target, as long as the operation meets the energy saving condition, it can enter the automatic skill state.

(2) By setting the VF function, it can realize the application of 1 drag and long distance control to meet the application of the transformation occasion.

Output Voltage

Motor rated Voltage

Straight line V /F

2.0 power
1.7 power
1.3 power

Output frequenc

0

Motor rated frequency

Output voltage

Motor rated voltage

V3
V2
V1
V0

0  F0  F1  F2  F3  Motor rated frequency

Output frequency
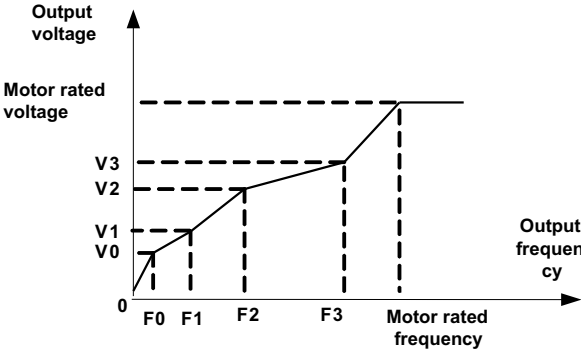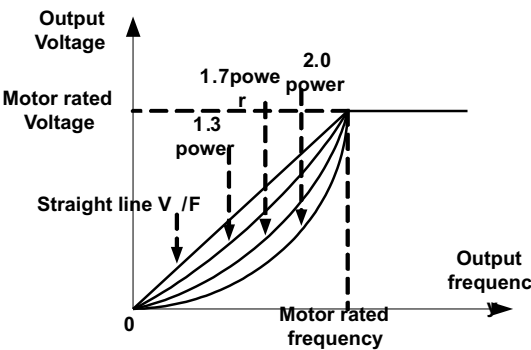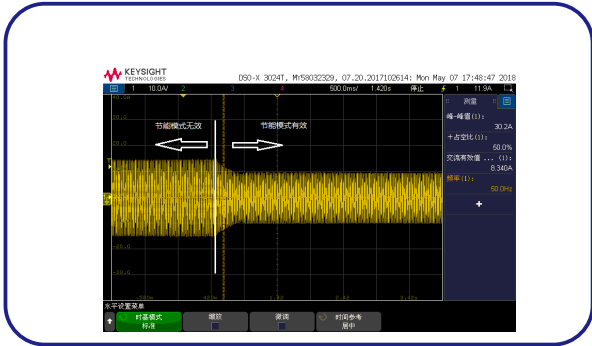
### User-friendly operation

（1）. 4 Keyboard modes: standard mode (-bSC-), user-defined mode (-USr-), check mode (-vrF-) and wizard mode (-GdE-), easy to switch.

MONITOR STATUS

42.54 → 50.00 → 110.3 → 53.8 → Monitoring volume 1

Monitoring volume 1  Monitoring volume 2  Monitoring volume 3  Monitoring volume 4

MENU CHOOSE STATE

-bSC-  -USr-  -vrF-  -GdE-  -bSC-

Standard mode  User-difined mode  Check mode  Wizard mode

COMMAND CODE

P0007  P0007  P0007  P0003

PARAMETER EDIT/VIEW STATUS

50.00  50.00  50.00  00

ESC  ENTER  [UP. DOWN. SHIFT]
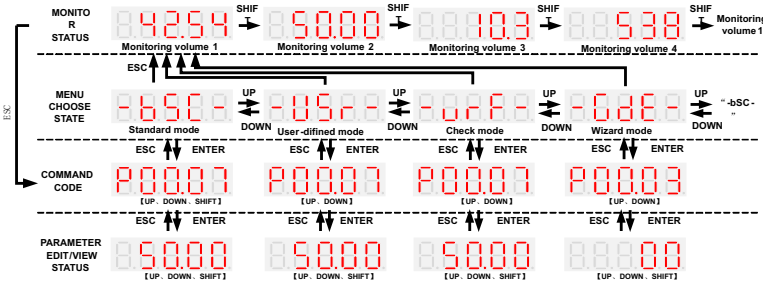
(2). Optional powerful LCD operator with parameter setting, parameter macro, monitoring, parameter copying, mobile phone Bluetooth, inverter program upgrade and other functions.

ESC  ENT  M.K  RUN  STOP
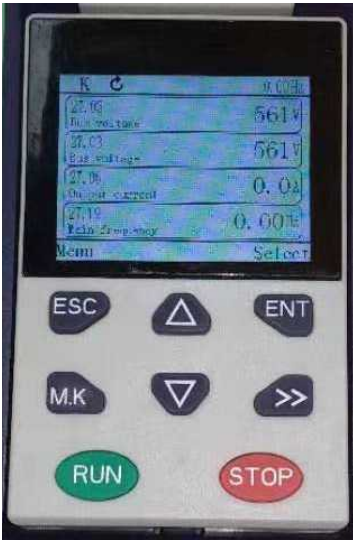
## General Technical Data

### Designation Rules

KDE500 - 4R0G/5R5P T4B

- B means breaking units
- Voltage Class(2-220V,4-380V,6-690V)
- Phase(T-Three Phase,S-Single Phase)
- Model Type and power rating (G-General Type,P-Fan and pupm Type)
- Product Series

### Appearance and Mounting Hole Dimension



| SIZE | Appearance and installation dimension（mm） | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | B2 | H | H1 | H2 | W | D | F d | Mounting |
| 0.75KW-4KW | 87 | 206.5 | / | 215 | / | / | 100 | 170 | ø5.0 | M4X16 |
| 5.5KW-7.5KW | 113 | 239.5 | / | 250 | / | / | 130 | 180 | ø5.0 | M4X16 |
| 11KW-15KW | 153 | 299 | / | 310 | / | / | 170 | 193 | Ø6.0 | M5X16 |
| 18.5KW-22KW | 165 | 350 | / | 370 | 335 | / | 210 | 205 | Ø6.0 | M5X16 |
| 30KW-37KW | 218 | 438 | / | 452.5 | 424 | / | 260 | 230 | Ø7.0 | M6X16 |
| 45KW-55KW | 250 | 535 | / | 555 | 520 | / | 320 | 275 | Ø10.0 | M8X20 |
| 75KW-90KW | 280 | 620 | / | 640 | 605 | / | 350 | 290 | Ø10.0 | M8X20 |
| 110KW | 280 | 695 | 915 | 715 | 660 | 935 | 370 | 313 | Ø11.0 | M8X25 |
| 132KW-160KW | 280 | 705 | 925 | 725 | 670 | 945 | 360 | 338 | Ø11.0 | M8X25 |
| 185KW-200KW | 360 | 795 | 1145 | 816 | 762 | 1166 | 490 | 358 | Ø11.0 | M10X25 |
| 220KW-250KW | 360 | 795 | 1145 | 816 | 762 | 1166 | 490 | 358 | Ø11.0 | M10X25 |
| | Flooring mounting:H2*W*D=1166*490*358 | | | | | | | | | |
| 280KW-315KW | 450 | 1045 | 1495 | 1075 | 1005 | 1560 | 550 | 450 | Ø13.0 | M12X30 |
| | Flooring mounting:H2*W*D=1560*550*450 | | | | | | | | | |
| 355KW-400KW | 630 | 1013 | 1425 | 1045 | 970 | 1495 | 730 | 450 | Ø13 | M12×30 |
| | Flooring mounting:H2*W*D=1495*730*450 | | | | | | | | | |
| 450KW-500KW | 660 | 1063 | 1505 | 1095 | 1020 | 1575 | 785 | 450 | Ø13 | M12×30 |
| | Flooring mounting:H2*W*D=1575*785*450 | | | | | | | | | |
| 560KW-710KW | Only for Flooring mounting:H2*W*D=1800x1080x500 | | | | | | | | | M12×30 |

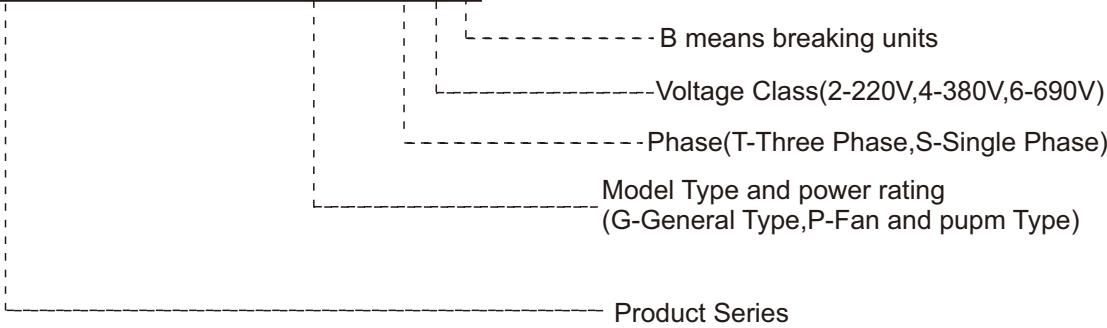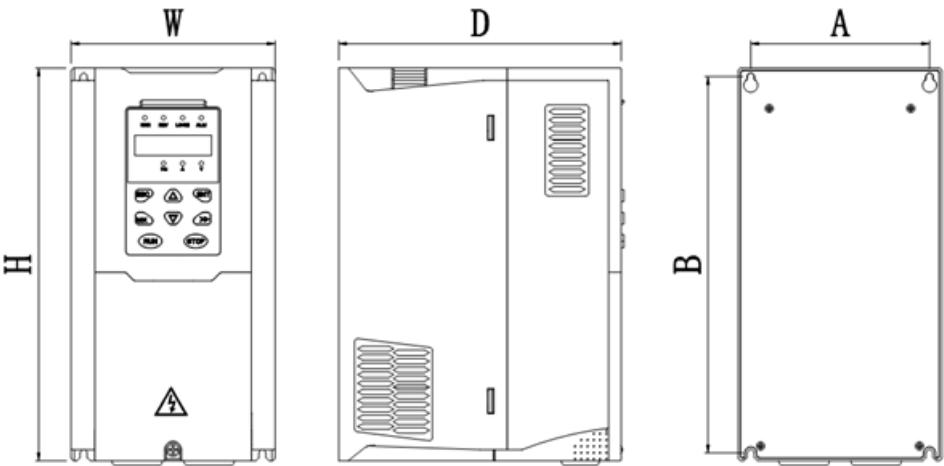| Model | Power capacity | Input current | Output current(A) | | Adaptable Motor | SIZE | Brake Unit |
|---|---|---|---|---|---|---|---|
| | | | Heavy | Light | | | |
| Three phase: 380-480V，50/60Hz | | | | | | | |
| KDE500-R75GT4B | 1.5 | 3.4 | 2.5 | 4.2 | 0.75 | SIZE A | Internal |
| KDE500-1R5GT4B | 3 | 5 | 4.2 | 5.6 | 1.5 | | |
| KDE500-2R2GT4B | 4 | 5.8 | 5.6 | 9.4 | 2.2 | | |
| KDE500-4R0G/5R5PT4B | 5.9 | 10.5 | 9.4 | 13.0 | 3.7 | | |
| KDE500-5R5G/7R5PT4B | 8.9 | 14.6 | 13.0 | 17.0 | 5.5 | SIZE B | |
| KDE500-7R5G/011PT4B | 11 | 20.5 | 17.0 | 23.0 | 7.5 | | |
| KDE500-011G/015PT4B | 17 | 26.0 | 25.0 | 31.0 | 11 | SIZE C | Internal |
| KDE500-015G/018PT4B | 21 | 35.0 | 32.0 | 37.0 | 15 | | |
| KDE500-018G/022PT4B | 24 | 38.5 | 37.0 | 45.0 | 18.5 | SIZE D | |
| KDE500-022G/030PT4B | 30 | 46.5 | 45.0 | 57.0 | 22 | | |
| KDE500-030G/037PT4 | 40 | 62.0 | 60.0 | 75.0 | 30 | SIZE E | option |
| KDE500-037G/045PT4 | 50 | 76.0 | 75.0 | 87.0 | 37 | | |
| KDE500-045G/055PT4 | 60 | 92.0 | 90.0 | 110.0 | 45 | SIZE F | |
| KDE500-055G/075PT4 | 75 | 113.0 | 110.0 | 135.0 | 55 | | |
| KDE500-075G/090PT4 | 104 | 157.0 | 152.0 | 165.0 | 75 | SIZE G | |
| KDE500-090G/110PT4 | 112 | 170.0 | 176.0 | 210.0 | 90 | | |
| KDE500-110G/132PT4 | 145 | 220.0 | 210.0 | 253.0 | 110 | SIZE H | |
| KDE500-132G/160PT4 | 170 | 258.0 | 253.0 | 304.0 | 132 | SIZE I | |
| KDE500-160G/185PT4 | 210 | 320.0 | 304.0 | 360.0 | 160 | | |
| KDE500-185G/200PT4 | 245 | 372.0 | 360.0 | 380.0 | 185 | SIZE J | |
| KDE500-200G/220PT4 | 250 | 380.0 | 380.0 | 426.0 | 200 | | |
| KDE500-220G/250PT4 | 280 | 425.0 | 426.0 | 465.0 | 220 | SIZE K | |
| KDE500-250G/280PT4 | 315 | 479.0 | 465.0 | 520.0 | 250 | | External |
| KDE500-280G/315PT4 | 350 | 532.0 | 520.0 | 585.0 | 280 | SIZE L | |
| KDE500-315G/355PT4 | 385 | 585.0 | 585.0 | 650.0 | 315 | | |
| KDE500-355G/400PT4 | 420 | 638.0 | 650.0 | 725.0 | 355 | SIZE M | |
| KDE500-400G/450PT4 | 470 | 714.0 | 725.0 | 820.0 | 400 | | |
| KDE500-450G/500PT4 | 530 | 800.0 | 820.0 | / | 450 | | |
| KDE500-500G/560PT4 | 580 | 880.0 | 900.0 | / | 500 | | |
| KDE500-560G/630PT4 | 630 | 950.0 | 980.0 | / | 560 | SIZE N | |
| KDE500-630GT4 | 710 | 1080 | 1120. | / | 630 | SIZE N | |
| KDE500-710GT4 | 790 | 1200 | 1260 | / | 710 | SIZE N | |
| Single phase :220V ,50/60HZ | | | | | | | |
| KDE500-R40GS2 | 1.3 | 6.0 | 3.2 | 5.6 | 0.4 | SIZE A | Inbuilt |
| KDE500-R75GS2 | 2.4 | 11.0 | 5.6 | 8.0 | 0.75 | SIZE A | |
| KDE500-1R5GS2 | 3.5 | 15.0 | 8.0 | 10.6 | 1.5 | SIZE A | |
| KDE500-2R2GS2 | 5.5 | 25.0 | 10.6 | 14.0 | 2.2 | SIZE A | |
| KDE500-4R0GS2 | 7.7 | 35.0 | 17.0 | 23.0 | 4.0 | SIZE B | |
| KDE500-5R5GS2 | 8.9 | 53.0 | 25.0 | 31.0 | 5.5 | SIZE C | |
| KDE500-7R5GS2 | 11 | 67.0 | 32.0 | 37.0 | 7.5 | SIZE C | |

## General Technical Data

| Item | | Specifiation |
|---|---|---|
| Input | Inuput Voltage | 1phase/3phase 220V：200V～240V<br>3 phase 380V-480V：380V～480V |
| | Allowed Voltage fluctuation range | -15%～10% |
| | Input frequency | 50Hz / 60Hz，fluctuation less than 5% |
| Output | Output Voltage | 3phase：0～input voltage |
| | Overload capacity | General purpose application：60S for 150% of the rated current<br>Light load application：60S for 120% of the rated current |
| Control | Control mode | V/f control<br>Sensorless flux vector control without PG card（SVC）<br>Sensor speed flux vector control with PG card (VC) |
| | Operating mode | Speed control、Torque control（SVC and VC） |
| | Speed range | 1:100 (V/f)<br>1:200( SVC)<br>1:1000 (VC) |
| | Speed control accuracy | ±0.5% (V/f)<br>±0.2% (SVC)<br>±0.02% (VC) |
| | Speed response | 5Hz(V/f)<br>20Hz(SVC)<br>50Hz(VC) |
| | frequency range | 0.00～600.00Hz(V/f)<br>0.00～200.00Hz(SVC)<br>0.00～400.00Hz(VC) |
| | Input frequency resolution | Digital setting: 0.01 Hz<br>Analog setting: maximum frequency x 0.1% |
| | Startup torque | 150%/0.5Hz(V/f)<br>180%/0.25Hz<br>180%/0Hz(VC) |
| | Torque control accuracy | SVC：within 5Hz10%，above 5Hz5%<br>VC:3.0% |
| | V/f curve | V / f curve type: straight line, multipoint, power function, V / f separation;<br>Torque boost support: Automatic torque boost (factory setting), manual torque boost |
| | Frequency giving ramp | Support linear and S curve acceleration and deceleration;<br>4 groups of acceleration and deceleration time, setting range 0.00s ～ 60000s |
| | DC bus voltage control | VdcMax Control: Limit the amount of power generated by the motor by adjusting the output frequency to avoid over-voltage trip;<br>VdcMin control: Control the power consumption of the motor by adjusting the output frequency, to avoid jump undervoltage fault |
| | Carrier frequency | 1kHz～12kHz(Varies depending on the type) |
| | Startup method | Direct start (can be superimposed DC brake); speed tracking start |
| | Stop method | Deceleration stop (can be superimposed DC braking); free to stop |

## General Technical Data

| Item | | Specifiation |
|---|---|---|
| function | Main control function | Jog control, droop control, up to 16-speed operation, dangerous speed avoidance, swing frequency operation, acceleration and deceleration time switching, VF separation, over excitation braking, process PID control, sleep and wake-up function, built-in simple PLC logic, virtual Input and output terminals, built-in delay relay, built-in comparison unit and logic unit, parameter backup and recovery, perfect fault record,　fault reset, two groups of motor parameters freely switch, software swap output wiring, terminals UP / DOWN |
| | Keypad | LED Digital keyboard and LCD keypad(option) |
| | communication | Standard:<br>MODBUS communication Option:Profibus-DP and CAN OPEN |
| | PG card | Incremental Encoder Interface Card (Differential Output and Open Collector), Rotary transformer Card |
| | Input terminal | standard:<br>5 digital input terminals, one of which supports high speed pulse input up to 50kHz;<br>2 analog input terminals, support 0 ~ 10V voltage input or 0 ~ 20mA current input;<br>Option card:<br>4 digital input terminals<br>2 analog input terminals.support-10V-+10V voltage input |
| | Output terminal | standard:<br>1 digital output terminal;<br>1 high-speed pulse output terminal (open collector type), support 0 ~ 50kHz square wave signal output;<br>1 relay output terminal (relay 2 is an option )<br>2 analog output terminals, support 0 ~ 20mA current output or 0 ~ 10V voltage output;<br>Option card: 4 digital output terminals |
| Protection | | Refer to Chapter 6 "Troubleshooting and Countermeasures" for the protection function |
| Environment | Installation location | Indoor, no direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt. |
| | Altitude | Lower than 1000 m |
| | Ambient temperature | -10°C~ +40°C (derated if the ambient temperature is between 40°C and 50°C) |
| | Humidity | Less than 95%RH, without condensing |
| | Vibration | Less than 5.9 m/s$^2$ (0.6 g) |
| | Storage temperature | -20°C ~ +60°C |
| others | Installation | Wall-mounted, floor-controlled cabinet, transmural |
| | Protection level | IP20 |
| | cooling method | Forced air cooling |

## General Technical Data

| Type | Terminal Symbol | Terminal Name | Terminal function description |
|---|---|---|---|
| Analog input voltage | +10V | Input voltage | 10.10V±1% |
| | | | Maximum output current:10mA，it provides power supply to external potentiometer with resistance range of 1KΩ~51KΩ |
| | GND | Ananog ground | Internal isolation from COM |
| | AI1 | Analog input1 | Input voltage:0~10V：Impedance 22KΩ，Maximum input voltage |
| | | | Input current:0~20mA：Impedance 500Ω，Maximum input current |
| | | | Through the jumper switch AI1 0 ~ 10V and 0 ~ 20mA analog input switch, the factory default voltage input. |
| | AI2 | Analog input 2 | Input voltage:0~10V：Impedance 22KΩ，Maximum input voltage |
| | | | Input current:0~20mA：Impedance 500Ω，Maximum input current |
| | | | Through the jumper switch AI1 0 ~ 10V and 0 ~ 20mA analog input switch, the factory default voltage input. |
| Analog input | AO1 | Analog output 1 | Output voltage:0~10V：Impedance ≥10KΩ |
| | | | Output current:0~20mA：Impedance 200Ω~500Ω |
| | | | Through the jumper switch AO1 0 ~ 10V and 0 ~ 20mA analog output switching, the factory default voltage output. |
| | AO2 | Analog output 2 | Output voltage:0~10V：Impedance ≥10KΩ |
| | | | Output current:0~20mA：Impedance 200Ω~500Ω |
| | | | Through the jumper switch AO1 0 ~ 10V and 0 ~ 20mA analog output switching, the factory default voltage output. |
| | GND | Ananog ground | Internal isolation from COM |
| Switch input | +24V | +24V current | 24V±10%，Internal isolation from GND |
| | | | Maximum output current：200mA |
| | | | To provide 24V power supply, generally used as a digital input and output terminal power supply and external sensor power |
| | PLC | Digital input terminal common | The factory default setting is connected PLC with +24V Terminal for on-off input high and low level switch |
| | | | When using the external signal to drive DI1~DI5, it will disconnect the connector slip of PLC with the +24V |
| | COM | +24V ground | Internal isolation from GND |
| | DI1~DI4 | Digital input terminal 1~4 | Optocoupler isolation, compatible with bipolar input |
| | | | Frequency range：0~200Hz |
| | | | Voltage range：10V~30V |
| | HDI | Digital input terminal /High-speed pulse input | Digital input terminal：same as DI1~DI4 |
| | | | Pulse input frequency input：0~50KHz |
| | | | Voltage range：10V~30V |

| Type | Terminal Symbol | Terminal Name | Terminal function description |
|---|---|---|---|
| Switch output | DO1 | Open collector output | Optocoupler isolation |
| | | | Voltage range：0V~24V |
| | | | Current range：0mA ~50mA |
| | HDO | Open collector output /High-speed pulse output | Open collector output：same as DO1 |
| | | | High-speed pulse output：0~50KHz |
| Relay output 1 | TA/TB/TC | Relay output | T1A-T1C：nomal close |
| | | | T1A-T1B：nomal open |
| | | | Contact rating：AC 250V，3A；DC 30V，1A |
| Relay output2 (optional) | T2A/T2BT2C | Relay output | T2A-T2C：nomal close |
| | | | T2A-T2B：nomal open |
| | | | Contact rating：AC 250V，3A；DC 30V，1A |
| 485 port | 485+ | 485 Positive differential signal | Baud rate： 1200/2400/4800/9600/19200/38400/57600/115200bps |
| | 485- | 485 Negative differential signal | |

## VFD500 Option Parts

| | | |
|---|---|---|
|  | triple Incremental PG card/open collector PG card/differeninal PG card/Rotary PG card | 1,A+/A-,B+/B-,Z+/Z- Pluse input 2,Max input Frequency:100KHz 3,PG power output:+15V 4,10KHz 7V Rms output,DB9 port,no frequency division output,resolution 12 digits |
| IO extension card  | 4 DI terminal 4 DO terminal 2 analog input | Coming soon |
| | IO board | 7 DI terminals ,2 AI  2 AO,2 Relay |
| Communication extension card | Canopen Profibus-DP | Coming soon |
|  | LCD keypad | removable and remote keypad extendable and 100m romote control support data copy function |

## Control Circuit and Main Circuit Wiring

Break resistance

breaker contactor

+ PB -

3 phase AC input
380V~ 50/60Hz

R/L1
S/L2
T/L3

KDE500

U
V
W

M

Main circuit

Control circuit

PG card

IO communication extension card

RS485 port

485+
485-

PC

Connector slip

PLC
+24V

Digital input 1 — DI1 FWD
Digital input 2 — DI2 REV
Digital input 3 — DI3
Digital input 4 — DI4
High speed pluse terminal — HDI (DI5)

COM
+10V

1～5k

Analog input
0～10V/0～20mA

AI1
GND
AI2
GND

AO1
AO2
GND

AO1、AO2 output:
0～10V/0～20mA

HDO

Open collector output2
High speed pluse output

COM

DO1

Open collector output1

COM

T1A
T1B
T1C

Relay output 1

T2A
T2B
T2C

Relay output 2 (optional)

Note:
shield Twisted cable

OFF OFF
485 AI1 AI2 AO1 AO2
OFF V V V V
ON ON
PE1 PE2
ON I I I I
Ground

+10V | AI1 | AO1 | 485+ | GND | DI1 | DI2 | DI3 | DI4 | HDI | T1/A | T1/B | T1/C
GND | AI2 | AO2 | 485- | COM | DO1 | HDO | COM | PLC | +24V | T2/A | T2/B | T2/C

## Widely applications

### Hoisting Industry
mine hoist,mining electric locomotive port hoist,builders' lift,pile driver,large crane motor,tower crane lifting

### Petroleum Industry
plunger pump,beam pumping unit,oil transfer pump,gas transmission pipeline system compressor

### Chemical Industry
vacuum kneader(agitator),dryer film blowing machine,plastic mill,pulverizer drafting device for short fiber,high speed spinning machine for chemical fiber feedstock pump for oil refinery,pump for cooking unit

### Power Industry
boiler blower,induced draft fan,boiler feeding pump,circulating water pump,low pressure drain pump,condensate pump,cooling water pump,mortar pump,coal feeder

### Textile Industry
Spinning machine,fagoting machine,pounding machine,knitting machine,centrifugal dehydrator,spinning frame,aeration machine for print works,tentering and thermo-fixing machine,high temperature dyeing machine,decorating machine,bleaching machine,dyeing jiggers

### Iron and steel industry
winding engine for iron-smelting blast furnace,dust removing blower for blast furnace,air blower for blast furnace gas blanketing blowing engine,roots blower for ditital thermometer,variable frequency exhaust fan for steel furnace roasting and purifing fan,hot rolling machine,cold tandem rolling mill,feeding system ,mill exhauster,vibrating sieving machine,wired drawing machine,winding machine,blender mixer,drying machin,slime pump,draining pump,water supply pump,unbender,pipemaking machine,ladle crane motor

### Heating System
constant pressure water supply system for boiler,mill exhauster,belt conveyer for coal,coal breaker,air blower,induced draft fan,cold-rolling mill

### Winding Machine
lithium battery winding machine,capacitor core winding machine,textile winding machine

### Pump
petroleum pump,metallurgical pump,chemical pump,fishing pump,mining pump,power pump,water conservance pump,sewage pump,food pump,brewing pump,pharmacy pump,beverage pump,fuel pump,condiment pump,paper pump,textitle pump,printing and dyeing pump,ceramic pump,paint conveyer pump,agricultural chemical pump....

### Commpressor
piston compressor,screw compressor,centrifugal compressor,linear compressor

### Conveyor Belt
belt-type conveyer,plate conveyer,car type conveyer,escalator,passenger conveyer,scraper conveyer,embedded scraper conveyer,bucket conveyer,bucket elevator,underslung conveyer,underslung conveyer

### Machine Tool industry
ncelectro-spindle,vertical lathe spindle,surface grinder spindle,boring machine spindle,sawing machine

### Injection Molding Machine
extruding machine,injection machine,dise refiner,internal mixer,granulate machine

### Fan Industry
centrifugal compressor,axial-flow compressor centrifugal blower,roots blower centrifugal fan,axial flow fan enke blower

## KDE500M AC Drive
## Open Loop General Purpose & Economical

### Features & Functions

- V/F & sensorless vector control
- Starting torque 150% at 0.25Hz in SVC
- HDI and HDO function
- Automatic torque boost
- Support LCD display
- Easy startup with simplified parameters
- 2-Independent S-ramps
- Vector/torque control
- Variable DC injection braking
- Energy saving
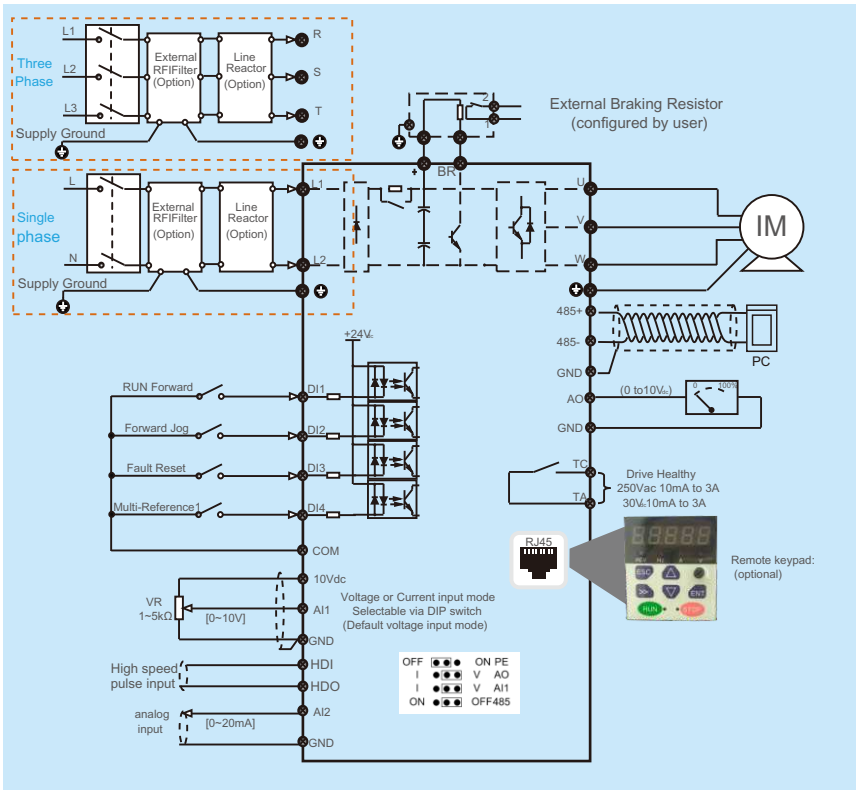- Self-definition parameter
- In-built dynamic braking unit

NEW
Internal EMC filter

Complies with EN61800-3
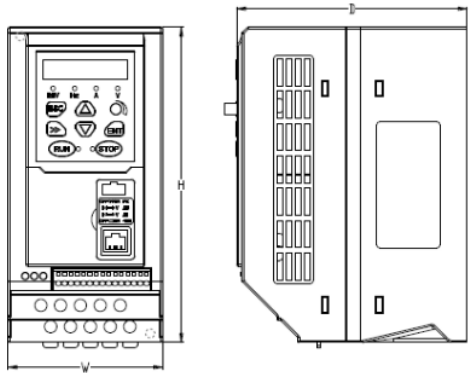Category C3
2nd Environment

NEW
output frequency 3000hz

Operation in high
ambient temperature
45°C avg

Enhanced reliability
protection against
humidity and pollution
dust

Onboard Comms Modbus RTU

### Widely applications

Pumping/ventilating/compressing

Centrifugal pumps Radial/axial fans Compressors

Moving

Conveyor belts Roller conveyors Chain conveyors

Processing

Mills Mixers Kneaders Crushers Agitators Centrifuges

### General Specifications

| Voltage Class | | Single-phase 220 Vac | | | | Three-phase 400 Vac | | | |
|---|---|---|---|---|---|---|---|---|---|
| Drive Model: VFD500M-R75GS2B | | S0.4B | S0.75B | S1.5B | S2.2B | T0.75B | T1.5B | T2.2B | T4.0B |
| Dimension | Height Width Depth | [H]: 145 mm [W]: 75 mm [D]: 115 mm | | [H]: 175 mm [W]: 86 mm [D]: 128 mm | | | | | |
| Drive Input | Rated input voltage | Single-phase 200 to 240 Vac, -15% to +10% | | | | Three-phase 380 to 480 Vac, -15% to +10% | | | |
| | Rated input current [A] | 6.9 | 12.2 | 17.0 | 21.0 | 4.7 | 5.5 | 6.5 | 11 |
| | Power capacity [kVA] | 1.2 | 2.1 | 3.1 | 4.1 | 1.5 | 3.0 | 4.0 | 5.9 |
| | Rated input frequency | 50/60 Hz, ±5% (47 to 63 Hz) | | | | | | | |
| Drive Output | Applicable motor [kW] | 0.4 | 0.75 | 1.5 | 2.2 | 0.75 | 1.5 | 2.2 | 4.0 |
| | Applicable motor [HP] | 0.5 | 1 | 2 | 3 | 1 | 2 | 3 | 5 |
| | Output Current [A] *4 | 2.8 | 4.5 | 8 | 10.6 | 2.5 | 4.2 | 5.6 | 9.4 |
| | Overload Capacity | 150% for 60 Sec & 180% for 3 Sec | | | | | | | |
| | Max. output voltage | 200 to 240 Vac (Proportional to input voltage) | | | | 380 to 480 Vac (Proportional to input voltage) | | | |
| | Max. output frequency | 3000 Hz | | | | | | | |
| Braking Resistor | Recommended power [kW] | 80 | 80 | 100 | 100 | 150 | 250 | 300 | 500 |
| | Recommended resistance [Ω] | ≥200 | ≥150 | ≥100 | ≥70 | ≥300 | ≥220 | ≥ 200 | ≥130 |
| Enclosure *5 | | IP 20 | | | | | | | |

*4 Carrier switching frequency 6 kHz at rated output current.
*5 Size A is natural cooling,Size B are fan coolingfan cooled.

### General Connection Diagram

Three Phase
L1
L2
L3
Supply Ground

Single phase
L
N
Supply Ground

External RFIFilter (Option)
Line Reactor (Option)

External Braking Resistor (configured by user)

IM

PC

485+
485-
GND
AO
GND
TC
TA

Drive Healthy
250Vac 10mA to 3A
30V,10mA to 3A

RUN Forward
Forward Jog
Fault Reset
Multi-Reference1

+24V
DI1
DI2
DI3
DI4
COM
10Vdc

VR 1~5kΩ [0~10V]
AI1
GND

OFF    ON PE
I    V    AO
I    V    AI1
ON    OFF485

High speed pulse input
HDI
HDO

analog input [0~20mA]
AI2
GND

Voltage or Current input mode
Selectable via DIP switch
(Default voltage input mode)

R J45

Remote keypad: (optional)

### Dimension

Size  A:145*75*115mm
Size  B:175*86*128mm

### Remote Keypad  (optional)

Model: MDKE8 (LED type )
Dimension: 116Hx76Wx40D(mm)
Protection level: IP20
Matching Cable Model:
MDCAB        3.0m (included)
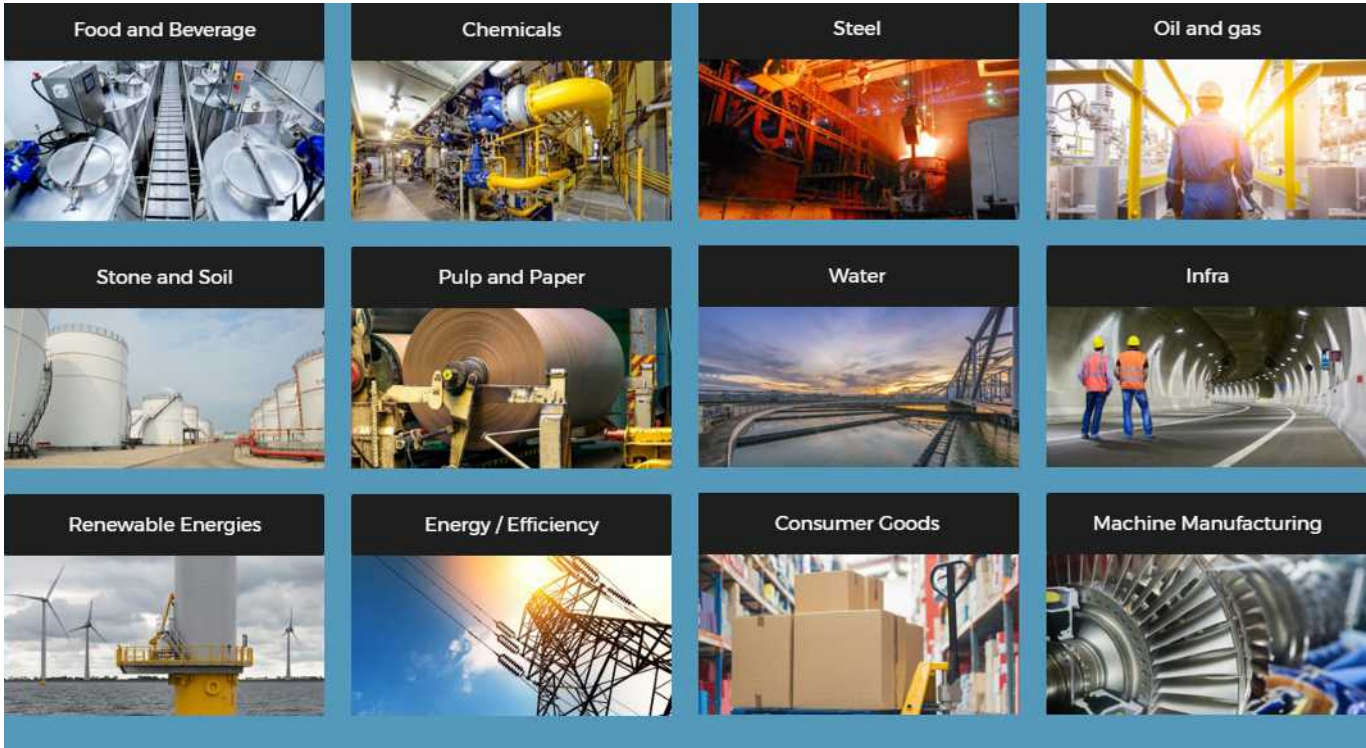
speed potentiometer(single turn)

**KDE**
**BEST-POWER**

## Model reference

## Product Features

Intelligent digital motor online soft starter equipment system with the complete protection function,extend the service life of the system,reduce the cost of system cost,improve the reliability of system and compatible with all the functions of starting equipment;It is a new ideal alternative Traditional Triangle Starter for star and self-coupling decompression Starter

## Application industry

| Food and Beverage | Chemicals | Steel | Oil and gas |
| Stone and Soil | Pulp and Paper | Water | Infra |
| Renewable Energies | Energy / Efficiency | Consumer Goods | Machine Manufacturing |

## Product Details

**Intelligent motor control start**
S6000 will make you control motor and you can choose best soft start to control motor as per your specific application and S6000 Provide double close loop and Current ramp start for some high precision application

**Easy Installation**
S6000 will help you save room in control panel around 70% no need bypass contactors and reduce around 30% costs(cables and labor costs)

**Detachable Terminal connector**
Adopt pluggable terminal connector, easy to remove and easy to assemble for easy connecting cables

**Innovational Ventilation**
High speed fans and Radiation grille and 360 degree ventilation When soft starter run, fans will work in high speed and Fans will And when soft start stop, Fans will be intelligently stop within minutes

## Key advantages

1,Six group parameters convenient in one soft starter to different power motors load.

2,Dynamic fault recording function and Inspecting motor feedback to realize closed loop control to give best motor start up in different conditions and different loads.

3,A variety of ways starting:voltage RAMP starting way can get the maximum output torque;Current limiting can Realize Biggest Limitations of the Start soft starting current.

4,Reliable quality Assurance:using computer simulation design;SMT Production process;Electromagnetic Compatibility Excellent Performance;High temperature aging,Vibration Test before Delivery of the machine.

5,Perfect and Reliable Protection function:Loss of Voltage,less Voltage,over Voltage Protection;Overheating,too long starting time;Input phase Lost,lost ouptput phase,three phase imbalance;starting over current,overload and load protection short circuit,etc.

6,Modbus monitoring dynamic control starter,easy networking.

7,LCD screen can display parameter code,state and error.

High-speed fan — Wall mounted hook
Grill
Detachage Panel — LCD Display
Operation Panel
RS485
Removeable terminals
Grill — High conduction go terminal

Current Limit Starting mode — Current Trip
Voltage Starting mode — Voltage Trip
Current Ramp — Protection Level
Double Close Loop — Primary Protection / Light load Protection / Standard Protection / Over load Protection / Senior Protection