

# Servo Drive Selection Manual



## COMPANY PROFILE

CTB Co., Ltd. was established in 2008, focusing on the field of intelligent manufacturing, providing core components such as servo motors, torque motors, motorized spindles, and professional automation servo control solutions. The company has two wholly-owned subsidiaries, Beijing CTB technology Co., Ltd. (established in 2000) and Shandong CTB Intelligent Equipment Co., Ltd. (established in 2017).

The company is a national high-tech enterprise, a national specialized and innovative "little giant" enterprise, and a listed enterprise on the New Third Board. The company has been recognized as a "National Green Factory" and a "Smart Factory" in Beijing. It is a Beijing patent demonstration unit, a Beijing enterprise technology research and development institution, and a Beijing enterprise technology center.

The company's products include a full range of industrial automation products such as AC servo motors, AC servo drives, PLC, motion controllers, core functional components such as torque motors, motorized spindles, direct drive turntables. The core technology has reached the international advanced level, and key products can replace imported similar products, widely used in CNC machine tools, industrial robots, industrial automation and other fields.

The company has core technologies with independent intellectual property rights, over 300 patents and software copyrights, including more than 30 invention patents. Its servo control system technology is at the leading level in China, and it has mastered core technologies such as servo control space vector algorithm, control software development, servo drive design, servo motor electromagnetic design, and manufacturing processes.

The company has two intelligent equipment industrial parks in Beijing and Shandong, with a business area of 100000 square meters. Advanced equipment, strict management, sufficient production capacity, and strong production and supply capabilities. There are 30 offices nationwide, with a sales and service network covering the north and south of China, providing efficient and professional pre-sales, in sales, and after-sales services for our customers.



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# D18 Series AC Servo Drive

D18 Series Servo Drives are high-performance vector servo drives with abundant industrial bus interfaces. They are used to control IM servo motors, SPM servo motors and IPM servo motors.



High matching and high responsiveness make mechanical motion more flexible.



## Abundant bus interfaces

Mechatrolink-III, EtherCAT, ProfiNet, ModbusTCP.



## Applicable to various encoders

Applicable to various encoder feedback signals (TTL 1VPP BISS-C ENDAT2.2 SSI RESOLVER RS485).



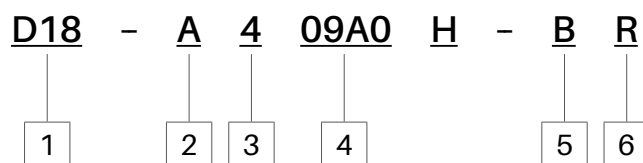
## High dynamic responsiveness

1 KHz speed response frequency, self-suppression of vibration, and self-learning of dynamic properties.

## Industrial Applications



## D18 Drive Model Description



| Code | Description               | Instructions                                                                                                                                 | Example Model                |
|------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1    | Product series            | D18: 18 series drive                                                                                                                         | 18 series drive              |
| 2    | Type of product           | A: I/O motherboard<br>B: Bus motherboard<br>G: High overload protection                                                                      | I/O motherboard              |
| 3    | Voltage rating            | 2: 200V<br>4: 400V<br>6: 600V                                                                                                                | 400 V                        |
| 4    | Rated current             | See 'Specifications'.                                                                                                                        | 9 A                          |
| 5    | Type of motherboard       | B: I/O interface with terminals<br>S: High density plug(CP18-S)<br>E: EtherCAT(CP18-E)<br>M: Mechatrolink-III(CP18-M)<br>P: Profinet(CP18-P) | I/O interface with terminals |
| 6    | Built in braking resistor | R: Built in braking resistor                                                                                                                 | Built in braking resistor    |

## Overall and Mounting Dimensions of D18 Drives

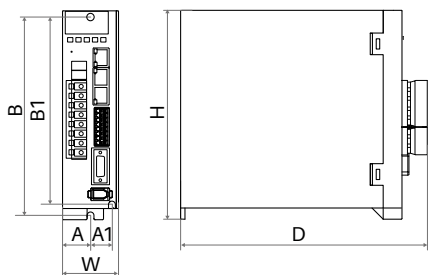


FIG. 1 (1.5~3.3A)

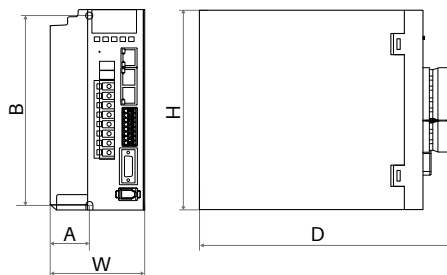


FIG. 2 (5.5~16A)

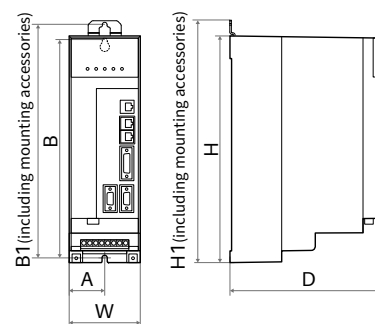


FIG. 3 (4~9A)

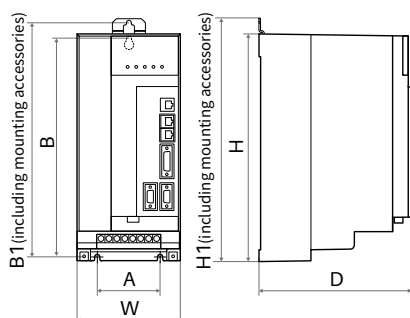


FIG. 4 (12~22A)

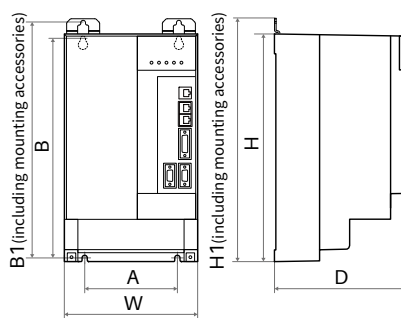


FIG. 5 (32~110A)

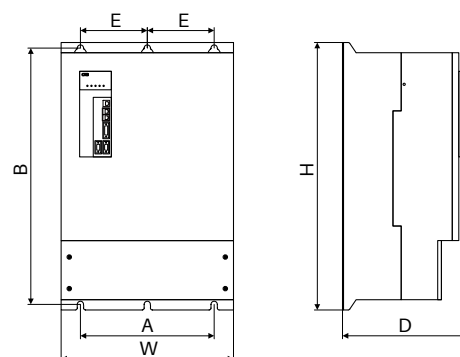


FIG. 6 (150~320A)

| Dimension<br>Model | A    | A1   | B     | B1    | W   | H   | H1   | D   | E   | Terminal<br>Screws | Mounting<br>Screws | Weight<br>(kg) | Remarks |
|--------------------|------|------|-------|-------|-----|-----|------|-----|-----|--------------------|--------------------|----------------|---------|
| D18-A(B)203A3      | 22.5 | 17.5 | 159.5 | 150.5 | 45  | 168 | -    | 200 | -   | Clamp width<br>3mm | M5                 | 1.5            | FIG. 1  |
| D18-A(B)209A5      | 31   | -    | 150   | -     | 75  | 160 | -    | 200 | -   | Clamp width<br>3mm | M5                 | 2.5            | FIG. 2  |
| D18-A(B)216A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)404A0      | 45.5 | -    | 276   | B+22  | 91  | 290 | H+19 | 194 | -   | Clamp width<br>3mm | M6                 | 3              | FIG. 3  |
| D18-A(B)406A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)409A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)412A0      | 80   | -    | 276   | B+22  | 132 | 290 | H+19 | 194 | -   | Clamp width<br>5mm | M6                 | 5              | FIG. 4  |
| D18-A(B)416A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)422A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)432A0      | 140  | -    | 319   | B+22  | 195 | 333 | H+19 | 194 | -   | M6                 | M6                 | 12             | FIG. 5  |
| D18-A(B)438A0      | 140  | -    | 330   | -     | 195 | 345 | -    | 236 | -   | M6                 | M6                 | 12             |         |
| D18-A(B)445A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)460A0      | 236  | -    | 376   | -     | 282 | 390 | -    | 260 | -   | M8                 | M8                 | 20             |         |
| D18-A(B)475A0      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)490A0      | 300  | -    | 376   | -     | 380 | 390 | -    | 260 | -   | M8                 | M8                 | 26             |         |
| D18-A(B)40110      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)40150      | 392  | -    | 376   | -     | 472 | 390 | -    | 260 | 196 | M10                | M8                 | 33             | FIG. 6  |
| D18-A(B)40180      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)40220      | 360  | -    | 690   | -     | 464 | 720 | -    | 335 | 180 | M10                | M10                | 90             |         |
| D18-A(B)40280      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |
| D18-A(B)40320      |      |      |       |       |     |     |      |     |     |                    |                    |                |         |

## Standard Specifications and Performance Data

| D18-BXXXXX          |                              | 203A3                                                                                                                       | 209A5 | 216A0 | 404A0 | 406A0 | 409A0 | 412A0                                       | 416A0 | 422A0 | 432A0 | 438A0 |
|---------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|---------------------------------------------|-------|-------|-------|-------|
| Current (A)         |                              | 3.3                                                                                                                         | 9.5   | 16    | 4     | 6     | 9     | 12                                          | 16    | 22    | 32    | 38    |
| Power(kW)           |                              | 0.4                                                                                                                         | 1.1   | 2     | 1.5   | 2.2   | 3.7   | 5.5                                         | 7.5   | 11    | 15    | 18    |
| D18-BXXXX           |                              | 445A0                                                                                                                       | 460A0 | 475A0 | 490A0 | 40110 | 40150 | 40180                                       | 40220 | 40280 | 40320 |       |
| Current (A)         |                              | 45                                                                                                                          | 60    | 75    | 90    | 110   | 150   | 180                                         | 220   | 280   | 320   |       |
| Power (kW)          |                              | 22                                                                                                                          | 30    | 37    | 45    | 55    | 75    | 90                                          | 110   | 132   | 160   |       |
| Output              | Max. output voltage (V)      | Three-phase 200/220/240/260 V input voltage                                                                                 |       |       |       |       |       | Three-phase 380/400/415/440 V input voltage |       |       |       |       |
|                     | Max. output speed (rpm)      | 4-pole motor 15000 rpm, 500 Hz                                                                                              |       |       |       |       |       |                                             |       |       |       |       |
| Power supply        | Rated voltage, frequency     | Three-phase 200/220/240/260 V; 50/60 Hz                                                                                     |       |       |       |       |       | Three-phase 380/400/415/440 V; 50/60 Hz     |       |       |       |       |
|                     | Voltage fluctuation          | +10%, -15%                                                                                                                  |       |       |       |       |       |                                             |       |       |       |       |
|                     | Frequency fluctuation        | ±5%                                                                                                                         |       |       |       |       |       |                                             |       |       |       |       |
| Control features    | Mode of control              | Sinusoidal wave PWM, closed loop vector control                                                                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Max. speed range             | 1:15000                                                                                                                     |       |       |       |       |       |                                             |       |       |       |       |
|                     | Speed control accuracy       | ±0.1%                                                                                                                       |       |       |       |       |       |                                             |       |       |       |       |
|                     | Frequency setting resolution | Digital: 0.01 Hz; analog: double-polarity max. output frequency/2046                                                        |       |       |       |       |       |                                             |       |       |       |       |
|                     | Position control accuracy    | ±1 pulse                                                                                                                    |       |       |       |       |       |                                             |       |       |       |       |
|                     | Acceleration/deceleration    | 0-3000 s                                                                                                                    |       |       |       |       |       |                                             |       |       |       |       |
|                     | Brake                        | Dynamic braking, 125% rated torque; built-in braking unit                                                                   |       |       |       |       |       |                                             |       |       |       |       |
|                     | Overload capacity            | 30 s at 200% rated current                                                                                                  |       |       |       |       |       |                                             |       |       |       |       |
| I/O interfaces      | Digital input                | Up to 14 optocoupler isolated inputs, input methods: PNP, NPN optional                                                      |       |       |       |       |       |                                             |       |       |       |       |
|                     | Digital output               | Up to 6 optocoupler isolated outputs, 24V, 10mA                                                                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Analog input                 | 3 routes: 1 route: -10~10V 1 route: 0~10V1 Route: 0~10V or 4~20mA                                                           |       |       |       |       |       |                                             |       |       |       |       |
|                     | Relay output                 | 1×: one set of NO contacts; 250 VAC/30 VDC, 1 A                                                                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Fault output relay           | 1×: one set of NO/NC contacts; 250 VAC/30 VDC, 1 A                                                                          |       |       |       |       |       |                                             |       |       |       |       |
|                     | Encoder input interface      | 2×: motor encoder, incremental encoder, absolute encoder, intelligent encoder, external encoder                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Pulse input                  | 1×: directed pulse, orthogonal pulse (optional)                                                                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Encoder output interface     | 1×: 300 KHz max. output frequency, linear driverive output mode, RS422 standard                                             |       |       |       |       |       |                                             |       |       |       |       |
|                     | Bus interface                | EtherCAT、Profinet、Machatrolink-III、RS485                                                                                    |       |       |       |       |       |                                             |       |       |       |       |
| Controls            | Speed control                | Range: 0-30000 rpm; direction: CW, CCW; speed commands: analog, pulse frequency, multi-stage speed control, communication   |       |       |       |       |       |                                             |       |       |       |       |
|                     | Position control             | Auto zero return, reciprocating positioning, multi-point positioning                                                        |       |       |       |       |       |                                             |       |       |       |       |
|                     | Torque control               | Reeling control, swing control, torque control                                                                              |       |       |       |       |       |                                             |       |       |       |       |
|                     | Others                       | External encoder positioning, synchronous drive, hydraulic servo, PID control                                               |       |       |       |       |       |                                             |       |       |       |       |
| Protection          | Drive/motor over-current     | Independent detection of drive and motor over-current                                                                       |       |       |       |       |       |                                             |       |       |       |       |
|                     | Drive/motor overload         | Independent detection of drive and motor overload                                                                           |       |       |       |       |       |                                             |       |       |       |       |
|                     | Motor overheat               | Built-in motor overheat interface                                                                                           |       |       |       |       |       |                                             |       |       |       |       |
|                     | Low voltage/over-voltage     | Main circuit busbar voltage: over-voltage alarm output if higher than 800 V; under-voltage alarm output if lower than 400 V |       |       |       |       |       |                                             |       |       |       |       |
| Working environment | Working site                 | No dust, corrosive gases or combustible gases                                                                               |       |       |       |       |       |                                             |       |       |       |       |
|                     | Temperature                  | -10 to 45 °C                                                                                                                |       |       |       |       |       |                                             |       |       |       |       |
|                     | Humidity                     | <95%RH (non-condensing)                                                                                                     |       |       |       |       |       |                                             |       |       |       |       |
|                     | Vibration                    | Vibration frequency ≤20 Hz: 9.8 m/s2; 20 Hz ≤vibration frequency ≤50 Hz: 2 m/s2                                             |       |       |       |       |       |                                             |       |       |       |       |

# D18-G Series AC Servo Drives

D18-G series servo drives are the latest high-performance medium to highpower AC servo products developed by CTB. D18-G series servo drives have notonly excellent performance and ease of use of GH series, but the configuration and design are optimized for the severe and much powder working conditions of the press industry. The power ranges from 22kW to 450 kW. Combined with related communication interfaces and the host,it can realize joint operation of multiple servo drives.



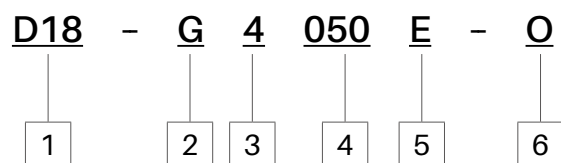
## Product Features

- 1、High IP rating: Overall IP rating of IP40, suitable for working conditions with much powder.
- 2、Excellent control: integrates position, speed, and torque control, supporting IM motors, SPM motors, and IPM motors.
- 3、High overload rating: Up to 2 times or more overload capacity.
- 4、Accurate control algorithm: Improve equipment process and processing efficiency.
- 5、Multiple modes of bus communication : supports bus communication such as Modbus TCP, EtherCat, Profinet, Mechatrolink III.
- 6、Strong compatibility: TTL、1VPP、BISS-C、ENDT2.2、SSI、RESOLVER、RS485.

## Industrial Applications



## D18-G Drive Model Description



| Code | Description      | Instructions                                                                                                                                 | Example Model                  |
|------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1    | Product series   | Code of the servo drive series                                                                                                               | D18 Series servo drive         |
| 2    | Code of industry | G : High overload, high protection                                                                                                           | High overload, high protection |
| 3    | Voltage rating   | 2: 200V      4: 400V      6: 600V                                                                                                            | 400V                           |
| 4    | Rated current    | See 'Specifications'.                                                                                                                        | Rated current: 50 A            |
| 5    | Type of product  | T: I/O plug type: (pulse sequence, RS485 standard modbus)<br>M3: Mechatrolink III communication type<br>ET: EtherCat bus<br>PN: Profinet bus | EtherCAT bus                   |
| 6    | Export marking   | Domestic product: NONE      Export product: Letter 'O'                                                                                       | Export product                 |

## Overall and Mounting Dimensions of D18-G Drives

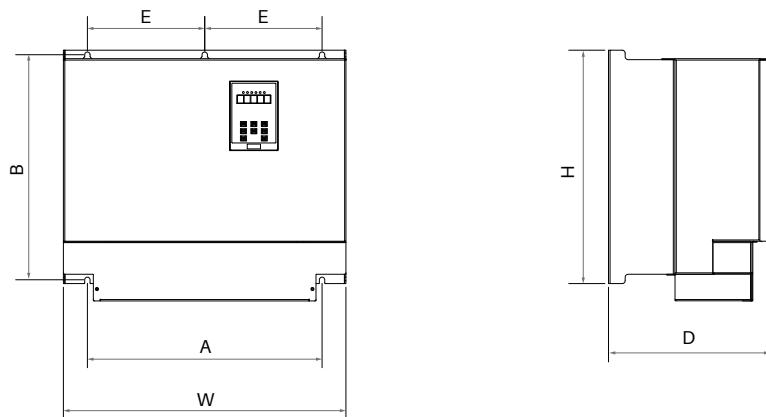


FIG. 1

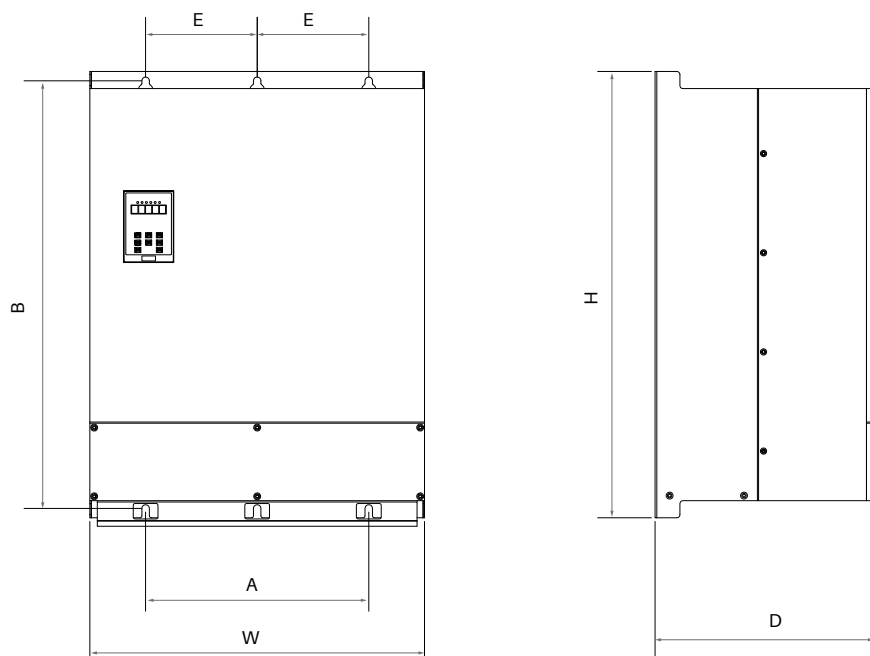


FIG. 2

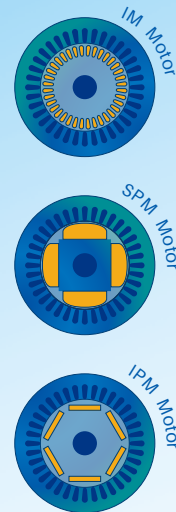
| Dimension<br>Model | A   | B    | W   | H    | D   | E   | Terminal<br>Screws | Mounting<br>Screws | Weight<br>(kg) | Remarks |
|--------------------|-----|------|-----|------|-----|-----|--------------------|--------------------|----------------|---------|
| D18-G4050          | 250 | 376  | 282 | 390  | 270 | —   | M8                 | M8                 | 20             | FIG. 1  |
| D18-G4075          |     |      |     |      |     |     |                    |                    |                |         |
| D18-G4090          | 340 | 376  | 380 | 390  | 270 | —   | M8                 | M8                 | 26             |         |
| D18-G4120          |     |      |     |      |     |     |                    |                    |                |         |
| D18-G4150          | 392 | 376  | 472 | 390  | 270 | 196 | M10                | M8                 | 33             |         |
| D18-G4220          |     |      |     |      |     |     |                    |                    |                |         |
| D18-G4320          | 360 | 690  | 540 | 720  | 380 | 180 | M12                | M10                | 90             | FIG. 2  |
| D18-G4450          |     |      |     |      |     |     |                    |                    |                |         |
| D18-G4600          | 500 | 1165 | 720 | 1200 | 435 | 250 | M12                | M16                | 130            |         |
| D18-G4750          |     |      |     |      |     |     |                    |                    |                |         |

## Standard Specifications and Performance Data

| Model:D18-G4XXX     |                              | 4050                                                                                                                        | 4075 | 4090 | 4120 | 4150 | 4220 | 4320 | 4450 | 4600 | 4750 |
|---------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|
| Rated current (A)   |                              | 50                                                                                                                          | 75   | 90   | 120  | 150  | 220  | 320  | 450  | 600  | 750  |
| Max. current (A)    |                              | 80                                                                                                                          | 120  | 180  | 240  | 300  | 360  | 500  | 700  | 900  | 1200 |
| Output              | Max. output voltage (V)      | Three-phase 200/220/240/260 V input voltage      Three-phase 380/400/415/440 V input voltage                                |      |      |      |      |      |      |      |      |      |
|                     | Max. output speed            | 4-pole motor: 15000 rpm, 500 Hz                                                                                             |      |      |      |      |      |      |      |      |      |
| Power supply        | Rated voltage, frequency     | Three-phase 200/220/240/260 V; 50/60 Hz      Three-phase 380/400/415/440 V; 50/60 Hz                                        |      |      |      |      |      |      |      |      |      |
|                     | Voltage fluctuation          | +10% , -15%                                                                                                                 |      |      |      |      |      |      |      |      |      |
|                     | Frequency fluctuation        | ±5%                                                                                                                         |      |      |      |      |      |      |      |      |      |
| Control features    | Mode of control              | Sinusoidal wave PWM, closed loop vector control                                                                             |      |      |      |      |      |      |      |      |      |
|                     | Max. speed range             | 1: 15000                                                                                                                    |      |      |      |      |      |      |      |      |      |
|                     | Speed control accuracy       | ±0.1%                                                                                                                       |      |      |      |      |      |      |      |      |      |
|                     | Frequency setting resolution | Digital: 0.01 Hz; analog: double-polarity max. output frequency/2046                                                        |      |      |      |      |      |      |      |      |      |
|                     | Position control accuracy    | ±1 PULSE                                                                                                                    |      |      |      |      |      |      |      |      |      |
|                     | Acceleration/deceleration    | 0 ~ 3000s                                                                                                                   |      |      |      |      |      |      |      |      |      |
|                     | Brake                        | Dynamic braking, 125% rated torque; built-in braking unit                                                                   |      |      |      |      |      |      |      |      |      |
|                     | Overload capacity            | 30 s at 200% rated current                                                                                                  |      |      |      |      |      |      |      |      |      |
| I/O interfaces      | Digital input                | Up to 14 optocoupler isolated inputs, input methods: PNP, NPN optional                                                      |      |      |      |      |      |      |      |      |      |
|                     | Digital output               | Up to 6 optocoupler isolated outputs, 24V, 10mA                                                                             |      |      |      |      |      |      |      |      |      |
|                     | Analog input                 | 3 routes: 1 route: -10~10V 1 route: 0~10V1 Route: 0~10V or 4~20mA                                                           |      |      |      |      |      |      |      |      |      |
|                     | Relay output                 | 1×: one set of NO contacts; 125 VAC/30 VDC, 1 A                                                                             |      |      |      |      |      |      |      |      |      |
|                     | Fault output relay           | 1×: one set of NO/NC contacts; 125 VAC/30 VDC, 1 A                                                                          |      |      |      |      |      |      |      |      |      |
|                     | Encoder input interface      | 2×: incremental encoder, intelligent encoder                                                                                |      |      |      |      |      |      |      |      |      |
|                     | Pulse input                  | 1×: directed pulse, orthogonal pulse (optional)                                                                             |      |      |      |      |      |      |      |      |      |
|                     | Encoder output interface     | 1×: 300 KHz max. output frequency, linear driverive output mode, RS422 standard                                             |      |      |      |      |      |      |      |      |      |
|                     | Bus interface                | EtherCAT、ProfiNet、Mechatrolink III、RS485                                                                                    |      |      |      |      |      |      |      |      |      |
| Controls            | Speed control                | Range: 0-30000 rpm; direction: CW, CCW; speed commands: analog, pulse frequency, multi-stage speed control, communication   |      |      |      |      |      |      |      |      |      |
|                     | Position control             | Auto zero return, reciprocating positioning, multi-point positioning                                                        |      |      |      |      |      |      |      |      |      |
|                     | Torque control               | Reeling control, swing control, torque control                                                                              |      |      |      |      |      |      |      |      |      |
|                     | Others                       | External encoder positioning, synchronous drive, hydraulic servo, PID control                                               |      |      |      |      |      |      |      |      |      |
| Protection          | Drive/motor over-current     | Independent detection of drive and motor over-current                                                                       |      |      |      |      |      |      |      |      |      |
|                     | Drive/motor overload         | Independent detection of drive and motor overload                                                                           |      |      |      |      |      |      |      |      |      |
|                     | Motor overheat               | Built-in motor overheat interface                                                                                           |      |      |      |      |      |      |      |      |      |
|                     | Low voltage/over-voltage     | Main circuit busbar voltage: over-voltage alarm output if higher than 800 V; under-voltage alarm output if lower than 400 V |      |      |      |      |      |      |      |      |      |
| Working environment | Working site                 | No dust, corrosive gases or combustible gases                                                                               |      |      |      |      |      |      |      |      |      |
|                     | Temperature                  | -10 ~ 45°C                                                                                                                  |      |      |      |      |      |      |      |      |      |
|                     | Humidity                     | <95%RH (non-condensing)                                                                                                     |      |      |      |      |      |      |      |      |      |
|                     | Vibration                    | Vibration frequency ≤20 Hz: 9.8 m/s <sup>2</sup> ; 20 Hz ≤vibration frequency ≤50 Hz: 2 m/s <sup>2</sup>                    |      |      |      |      |      |      |      |      |      |

# MBS Series Four Quadrant Multi Transmission AC Servo Drive

The MBS series four quadrant multi transmission AC servo drive is a high-quality, multifunctional, and low-noise AC servo drive developed and produced by CTB Co., Ltd. The MBS series AC servo drive can conveniently control the position, speed, acceleration, and output torque of various AC servo motors.



## Product Features

- 1、Equipped with dual 32-bit CPUs and rich control function modules, it can achieve control functions for various machine tools.
- 2、The standard control interface can be easily connected to various CNC systems at home and abroad, allowing the functions of the CNC system to be fully utilized.
- 3、Machine tools equipped with MBS series AC servo drives will exhibit extraordinary torque characteristics, acceleration and deceleration characteristics, accuracy characteristics, and efficiency characteristics, and can easily achieve functions such as accurate stop, C-axis, rigid tapping, electronic shifting, and multi axis synchronization.

## Industrial Applications



## MBS Drive Model Description

**MBS** - **A** **4** **030**

1
2
3
4

| Code | Description     | Instructions                             | Example Model                  |
|------|-----------------|------------------------------------------|--------------------------------|
| 1    | Product series  | <b>MBS:</b> MBS series drive             | MBS series drive               |
| 2    | Type of product | <b>A:</b> Rectifying unit (Power module) | Rectifying unit (Power module) |
| 3    | Voltage rating  | <b>4:</b> 400V<br><b>6:</b> 600V         | 400V                           |
| 4    | Power code      | See 'Specifications'.                    | 30KW                           |

**MBS** - **B** **4** **45A0** **D** - **E**

1
2
3
4
5
6

| Code | Description         | Instructions                             | Example Model                 |
|------|---------------------|------------------------------------------|-------------------------------|
| 1    | Product series      | <b>MBS:</b> MBS series drive             | MBS series drive              |
| 2    | Type of product     | <b>B:</b> Inverter unit (Driver module)  | Inverter unit (Driver module) |
| 3    | Voltage rating      | <b>4:</b> 400V<br><b>6:</b> 600V         | 400V                          |
| 4    | Rated current       | See 'Specifications'.                    | 45A                           |
| 5    | number of axes      | <b>D:</b> 2 axes<br><b>S:</b> 1 axes     | 2 axes                        |
| 6    | Type of motherboard | <b>E:</b> EtherCAT<br><b>P:</b> ProfiNet | EtherCAT                      |

## Overall and Mounting Dimensions of MBS Drives

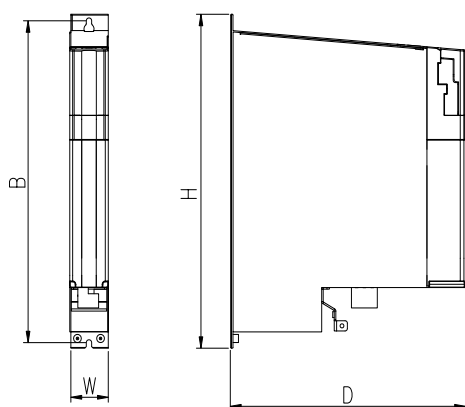


FIG. 1

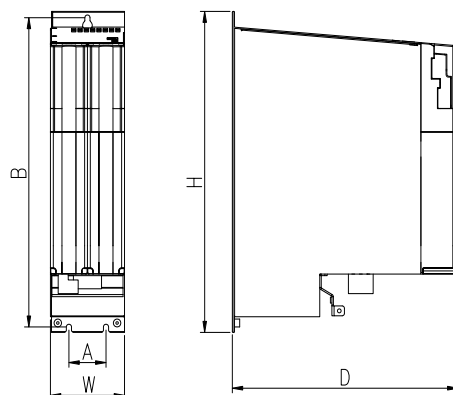


FIG. 2

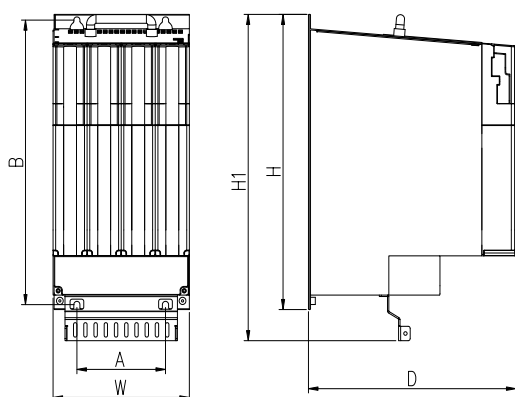


FIG. 3

|               | Dimension       | A         | B   | W   | H   | D   | H1  | Terminal<br>Screws | Mounting<br>Screws | Weight<br>(kg) | Remarks |
|---------------|-----------------|-----------|-----|-----|-----|-----|-----|--------------------|--------------------|----------------|---------|
|               | Model           |           |     |     |     |     |     |                    |                    |                |         |
| Inverter unit | MBS-B404A0      | —         | 395 | 50  | 410 | 305 | —   | Clamp width<br>3mm | M6                 | 6.2            | FIG.1   |
|               | MBS-B406A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B409A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B412A0      | 50        | 395 | 100 | 410 | 305 | -   | Clamp width<br>5mm | M6                 | 8.8            | FIG.2   |
|               | MBS-B416A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B422A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B432A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B438A0      | 100       | 395 | 150 | 410 | 305 | 455 | M8                 | M6                 | 10             | FIG.3   |
|               | MBS-B445A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B460A0      | 130       | 395 | 200 | 410 | 305 | 455 | M8                 | M8                 | 10.3           |         |
|               | MBS-B475A0      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B490A0      | 200       | 395 | 300 | 410 | 305 | 455 | M10                | M8                 | 19.5           |         |
|               | MBS-B40110      |           |     |     |     |     |     |                    |                    |                |         |
|               | MBS-B40150      |           |     |     |     |     |     |                    |                    |                |         |
|               | Rectifying unit | MBS-A4030 | 100 | 395 | 150 | 410 | 305 | 455                | M8                 | M6             | 10      |
| MBS-A4045     |                 | 130       | 395 | 200 | 410 | 305 | 455 | M8                 | M8                 | 10.3           |         |
| MBS-A4090     |                 | 200       | 395 | 300 | 410 | 305 | 455 | M10                | M8                 | 19.5           |         |

## Rectifying unit Standard Specifications and Performance Data

| MBS-AXXXXX          |                           | A4030                                                                                                                       | A4045 | A4090 |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------|-------|
| Current (A)         |                           | 60                                                                                                                          | 90    | 180   |
| power (Kw)          |                           | 30                                                                                                                          | 45    | 90    |
| Max.Current (A)     |                           | 120                                                                                                                         | 200   | 360   |
| Power supply        | Rated voltage, frequency  | Three-phase 400/600V; 50/60Hz                                                                                               |       |       |
|                     | Voltage fluctuation       | ±15 %                                                                                                                       |       |       |
|                     | Frequency fluctuation     | ±3%                                                                                                                         |       |       |
| Control features    | Mode of control           | 120° PWM                                                                                                                    |       |       |
|                     | Max. overload time        | 1.5 times rated current for 1min                                                                                            |       |       |
| I/O interfaces      | Digital input             | 4 optocoupler isolated inputs, input methods: PNP, NPN optional                                                             |       |       |
|                     | Digital output            | 1 optocoupler isolated outputs, 24V, 10mA                                                                                   |       |       |
|                     | Fault output relay        | 1×: one set of NO contacts; AC250V/DC30V, 1A                                                                                |       |       |
|                     | Bus interface             | RS485                                                                                                                       |       |       |
| Feedback method     | Automatic feedback method | Determine whether to provide feedback based on the feedback voltage threshold set by the user                               |       |       |
|                     | Manual feedback method    | After providing Enable, Always in a feedback state                                                                          |       |       |
| Protection          | Drive over-current        | Independent detection of drive over-current                                                                                 |       |       |
|                     | Drive overload            | Independent detection of drive overload                                                                                     |       |       |
|                     | Low voltage/over-voltage  | Main circuit busbar voltage: over-voltage alarm output if higher than 800 V; under-voltage alarm output if lower than 400 V |       |       |
| Working environment | Working site              | No dust, corrosive gases or combustible gases                                                                               |       |       |
|                     | Temperature               | -10 to 45 °C                                                                                                                |       |       |
|                     | Humidity                  | <95%RH (non-condensing)                                                                                                     |       |       |
|                     | Vibration                 | Vibration frequency ≤20 Hz: 9.8 m/s <sup>2</sup> ; 20 Hz ≤vibration frequency ≤50 Hz: 2 m/s <sup>2</sup>                    |       |       |

## Inverter unit Standard Specifications and Performance Data

| MBS-BXXXXX          |                              | B404A0                                                                                                                      | B406A0 | B409A0 | B412A0                                      | B416A0 | B422A0 | B432A0 |
|---------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------|--------|---------------------------------------------|--------|--------|--------|
| Current (A)         |                              | 4                                                                                                                           | 6      | 9      | 12                                          | 16     | 22     | 32     |
| Capacity (KVA)      |                              | 1.5                                                                                                                         | 2.2    | 3.7    | 5.5                                         | 7.5    | 11     | 15     |
| MBS-BXXXX           |                              | B438A0                                                                                                                      | B445A0 | B460A0 | B475A0                                      | B490A0 | B40110 | B40150 |
| Current (A)         |                              | 38                                                                                                                          | 45     | 60     | 75                                          | 90     | 110    | 150    |
| Capacity (KVA)      |                              | 18                                                                                                                          | 22     | 30     | 37                                          | 45     | 55     | 75     |
| Output              | Max. output voltage (V)      | Three-phase 200/220/240/260 V input voltage                                                                                 |        |        | Three-phase 380/400/415/440 V input voltage |        |        |        |
|                     | Max. output speed (rpm)      | 4-pole motor 15000 rpm, 500 Hz                                                                                              |        |        |                                             |        |        |        |
| Power supply        | Rated voltage, frequency     | Three-phase 200/220/240/260 V; 50/60 Hz                                                                                     |        |        | Three-phase 380/400/415/440 V; 50/60 Hz     |        |        |        |
|                     | Voltage fluctuation          | + 10% , - 15%                                                                                                               |        |        |                                             |        |        |        |
|                     | Frequency fluctuation        | ±5%                                                                                                                         |        |        |                                             |        |        |        |
| Control features    | Mode of control              | Sinusoidal wave PWM, closed loop vector control                                                                             |        |        |                                             |        |        |        |
|                     | Max. speed range             | 1： 15000                                                                                                                    |        |        |                                             |        |        |        |
|                     | Speed control accuracy       | ±0.1%                                                                                                                       |        |        |                                             |        |        |        |
|                     | Frequency setting resolution | Digital: 0.01 Hz                                                                                                            |        |        |                                             |        |        |        |
|                     | Position control accuracy    | ±1 PULSE                                                                                                                    |        |        |                                             |        |        |        |
|                     | Acceleration/ deceleration   | 0 ~ 3000s                                                                                                                   |        |        |                                             |        |        |        |
|                     | Brake                        | Dynamic braking, 125% rated torque; built-in braking unit                                                                   |        |        |                                             |        |        |        |
|                     | Overload capacity            | 30 s at 200% rated current                                                                                                  |        |        |                                             |        |        |        |
| I/O interfaces      | Digital input                | 4 optocoupler isolated inputs, input methods: PNP, NPN optional                                                             |        |        |                                             |        |        |        |
|                     | Digital output               | 1 optocoupler isolated outputs, 24V, 10mA                                                                                   |        |        |                                             |        |        |        |
|                     | Fault output relay           | 1×: one set of NO/NC contacts; 250 VAC/30 VDC, 1 A                                                                          |        |        |                                             |        |        |        |
|                     | Encoder input interface      | 2×: motor encoder, incremental encoder, absolute encoder, intelligent encoder, external encoder                             |        |        |                                             |        |        |        |
|                     | Pulse input                  | 1×: directed pulse, orthogonal pulse (optional)                                                                             |        |        |                                             |        |        |        |
|                     | Bus interface                | EtherCAT、ProfiNet、Machatrolink-III、RS485                                                                                    |        |        |                                             |        |        |        |
| Controls            | Speed control                | Range: 0-30000 rpm; direction: CW, CCW; speed commands: analog, pulse frequency, multi-stage speed control, communication   |        |        |                                             |        |        |        |
|                     | Position control             | Auto zero return, reciprocating positioning, multi-point positioning                                                        |        |        |                                             |        |        |        |
|                     | Torque control               | Reeling control, swing control, torque control                                                                              |        |        |                                             |        |        |        |
|                     | Others                       | External encoder positioning, synchronous drive, hydraulic servo, PID control                                               |        |        |                                             |        |        |        |
| Protection          | Drive/motor over-current     | Independent detection of drive and motor over-current                                                                       |        |        |                                             |        |        |        |
|                     | Drive/motor overload         | Independent detection of drive and motor overload                                                                           |        |        |                                             |        |        |        |
|                     | Motor overheat               | Built-in motor overheat interface                                                                                           |        |        |                                             |        |        |        |
|                     | Low voltage/over-voltage     | Main circuit busbar voltage: over-voltage alarm output if higher than 800 V; under-voltage alarm output if lower than 400 V |        |        |                                             |        |        |        |
| Working environment | Working site                 | No dust, corrosive gases or combustible gases                                                                               |        |        |                                             |        |        |        |
|                     | Temperature                  | - 10 ~ 45℃                                                                                                                  |        |        |                                             |        |        |        |
|                     | Humidity                     | <95%RH (non-condensing)                                                                                                     |        |        |                                             |        |        |        |
|                     | Vibration                    | Vibration frequency ≤20 Hz: 9.8 m/s2; 20 Hz ≤vibration frequency ≤50 Hz: 2 m/s2                                             |        |        |                                             |        |        |        |

# PCS Series Press Drive Controllers

The PCS series drive control integrated cabinet is a new integrated cabinet product specially developed for servo presses. It integrates control and drive, and can achieve motion control of the entire servo press and high-performance vector control of HPM series permanent magnet synchronous motors and YH series slider motors. According to the tonnage of the press, it can be flexibly combined (single cabinet, multiple cabinets). The integrated cabinet integrates various electrical peripherals in a three-dimensional manner, making it easy for customers to deliver and apply in an integrated manner.



## Product Features

1. Control circuit: Integrated high-performance motion controller, including all curve processes of servo press, connected to the main driver and slider driver through bus communication. Equipped with an energy management system, it fully considers electromagnetic interference issues while saving space.
2. Drive circuit: adopting high-performance vector control technology, low-speed high torque output, with good dynamic characteristics and super overload capacity. The main drive device and slider drive device have user background software monitoring, Profinet, EtherCAT communication bus functions optional, supporting multiple encoder types, rich and powerful combination functions, and stable performance. Equipped with emergency braking circuit and quick discharge circuit as standard. At the same time, it is equipped with an ECO energy-saving mode to achieve the best energy-saving effect.

## Industrial Applications



## PCS10 Drive Model Description

PCS   10   CSE   -   48/32   D   4   500   -   04   M   E   5   -   072   -   S1

1   2   3   4   5   6   7   8   9   10   11   12   13

| Code | Description         | Instructions                                                                                                                                 | Example Model                                  |
|------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 1    | Product series      | PCS: code of cabinet type products for the press industry                                                                                    | Press controller                               |
| 2    | Type of cabinet     | 10: Drive controller (size: 2100×900×650, double door)                                                                                       | 10                                             |
| 3    | Type of product     | C: Control unit   S: Drive unit   E: Energy storage unit                                                                                     | Control unit +Drive unit+Energy storage unit   |
| 4    | I/O quantity        | 48: 8-point digital input ×6   32: 8-point digital input ×4                                                                                  | 48-point digital input /32-point digital input |
| 5    | Type of motherboard | C: CP18G-IO   D: CP18G                                                                                                                       | CP18G                                          |
| 6    | Voltage rating      | 4: AC 3PH 380V   6: AC 3PH 695V                                                                                                              | 400V                                           |
| 7    | Peak current        | 180A   240A   270A   360A   500A                                                                                                             | Peak current: 500A                             |
| 8    | Slider Servo drive  | 03: Rated current3A   08: Rated current8A<br>13: Rated current13A   NONE : NONE                                                              | Rated current4A                                |
| 9    | Smart card          | M: MEZ2M Smart card   NONE : NONE                                                                                                            | MEZ2M Smart card                               |
| 10   | Bus type            | T: I/O plug type: (pulse sequence, RS485 standard modbus)<br>M3: Mechatrolink III communication type<br>ET: EtherCat bus<br>PN: Profinet bus | EtherCAT bus                                   |
| 11   | Encoder             | 5: The signal mode of the main motor encoder is smart car                                                                                    | Smart card                                     |
| 12   | Energy storage unit | 072: Capacity 72mF   216: Capacity 216mF                                                                                                     | Capacity 72mF                                  |
| 13   | Star sealing        | S1: Single motor   S2: Double motors                                                                                                         | Single motor                                   |

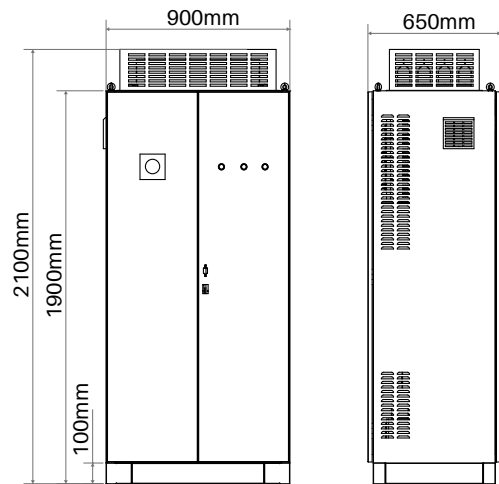
## PCS20 Drive Model Description

**PCS** **20** **CSE** - **48/32** **D** **4** **1500** - **13** **M** **E** **5** - **360** - **S1** **SC**

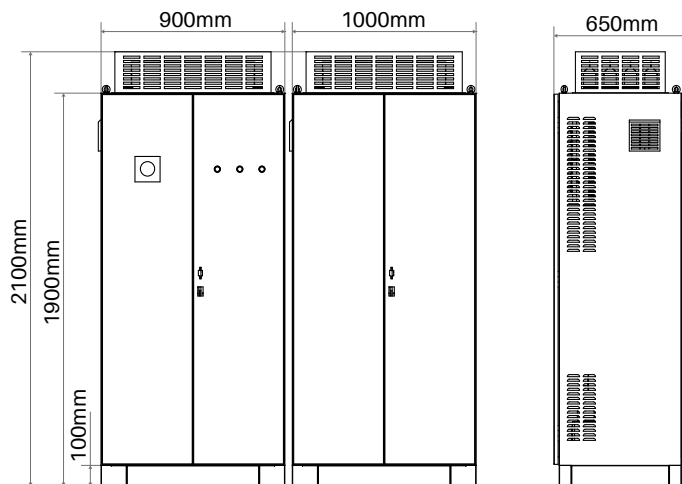
1 2 3 4 5 6 7 8 9 10 11 12 13 14

| Code | Description              | Instructions                                                                                                                                                       | Example Model                                  |
|------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 1    | Product series           | PCS: code of cabinet type products for the press industry                                                                                                          | Press controller                               |
| 2    | Type of cabinet          | 20: combinatorial: Control unit +Drive unit+Energy storage unit<br>(control unit size: 2100*900*650, double door)<br>(drive unit size: 2100*1000*650, double door) | 20                                             |
| 3    | Type of product          | C: Control unit S: Drive unit E: Energy storage unit                                                                                                               | Control unit +Drive unit+Energy storage unit   |
| 4    | I/O quantity             | 48: 8-point digital input *6 32: 8-point digital input *4                                                                                                          | 48-point digital input /32-point digital input |
| 5    | Type of motherboard      | C: CP18G-IO D: CP18G                                                                                                                                               | CP18G                                          |
| 6    | Voltage rating           | 4: AC 3PH 380V 6: AC 3PH 695V                                                                                                                                      | 400V                                           |
| 7    | Peak current             | 1 drive unit: 700A、900A、1200A、1500A<br>2 drive unit: 1800A、2400A、3000A                                                                                             | Peak current 1500A<br>(drive unit)             |
| 8    | Slider Servo Drive       | 03: Rated current3A 08: Rated current8A<br>13: Rated current13A NONE : NONE                                                                                        | Rated current 13A                              |
| 9    | Smart card               | M: MEZ2M Smart card None: None                                                                                                                                     | MEZ2M Smart card                               |
| 10   | Bus type                 | T: I/O plug type: (pulse sequence, RS485 standard modbus)<br>M3: Mechatrolink III communication type<br>ET: EtherCAT bus<br>PN: Profinet bus                       | EtherCAT bus                                   |
| 11   | Encoder                  | 5: The signal mode of the main motor encoder is smart card                                                                                                         | Smart card                                     |
| 12   | Energy storage unit      | 072: Capacity 72mF 216: Capacity 216mF<br>288: Capacity 288mF 360: Capacity 360mF                                                                                  | Capacity 360mF                                 |
| 13   | Star sealing             | S1: Single motor S2: Double motors                                                                                                                                 | Single motor                                   |
| 14   | Synchronization function | SC: Dual drive synchronization function<br>None: No dual drive synchronization function                                                                            | Dual drive synchronization function            |

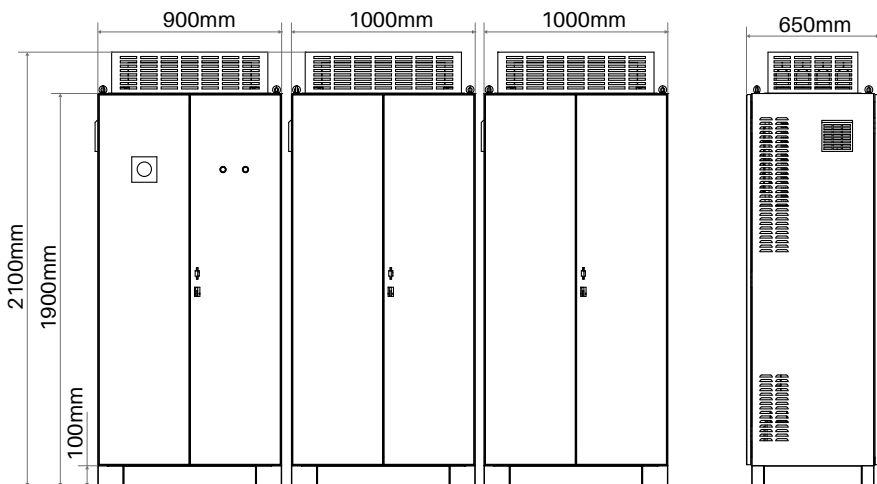
## Overall and Mounting Dimensions



**Configuration list for servo press machines with tonnage of 200 tons and below**



**Configuration list for servo press machines with tonnage of 200 tons and more than**



**Configuration list for Double Servo Motor Press Machine**

## Inverter unit Standard Specifications and Performance Data

| Model               |                                  | 200/300                                                                                                                                                                                                                                              | 400/600 | 600/900 | 800/1200 | 1000/1500 |
|---------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----------|-----------|
| Motor capacity (kW) |                                  | 100                                                                                                                                                                                                                                                  | 200     | 300     | 400      | 500       |
| Output              | Capacity (KVA)                   | 100                                                                                                                                                                                                                                                  | 200     | 300     | 400      | 500       |
|                     | Max. current (A)                 | 300                                                                                                                                                                                                                                                  | 600     | 900     | 1200     | 1500      |
|                     | Max. output voltage (V)          | Three-phase 380/440 V input voltage                                                                                                                                                                                                                  |         |         |          |           |
|                     | Max. output speed (rpm)          | 4-pole motor: 15000 rpm, 500 Hz                                                                                                                                                                                                                      |         |         |          |           |
| Power supply        | Rated voltage, frequency         | Three-phase 380/440 V; 50/60 Hz                                                                                                                                                                                                                      |         |         |          |           |
|                     | Voltage fluctuation              | 10%                                                                                                                                                                                                                                                  |         |         |          |           |
|                     | Frequency fluctuation            | 5%                                                                                                                                                                                                                                                   |         |         |          |           |
| Control features    | Mode of control                  | Closed loop control of speed/position and torque                                                                                                                                                                                                     |         |         |          |           |
|                     | Torque properties                | 200% rated torque output below basic frequency; accuracy: $\pm 5\%$                                                                                                                                                                                  |         |         |          |           |
|                     | Max. speed range                 | 1:15,000                                                                                                                                                                                                                                             |         |         |          |           |
|                     | Speed control accuracy           | $\pm 0.1\%$                                                                                                                                                                                                                                          |         |         |          |           |
|                     | Frequency setting resolution     | Digital: 0.01 Hz; analog: single-polarity, max. output frequency/4092; dual-polarity, max. output frequency/2046                                                                                                                                     |         |         |          |           |
|                     | Position control accuracy        | $\pm 1$ pulse                                                                                                                                                                                                                                        |         |         |          |           |
|                     | Acceleration/deceleration        | 0-3,000 s                                                                                                                                                                                                                                            |         |         |          |           |
|                     | Brake                            | Dynamic braking, 125% rated torque; built-in braking unit                                                                                                                                                                                            |         |         |          |           |
|                     | Overload capacity                | 30 s at 200% rated current                                                                                                                                                                                                                           |         |         |          |           |
| I/O interfaces      | Digital input                    | 2 Motor encoders, capable of receiving incremental encoder, resolver, sine cosine encoder, absolute encoder, intelligent encoder, external encoder                                                                                                   |         |         |          |           |
|                     | Digital output                   | 1 Maximum output frequency 300KHz, line drive output mode, RS422 standard                                                                                                                                                                            |         |         |          |           |
|                     | Bus interface                    | EtherCat, ProfiNet                                                                                                                                                                                                                                   |         |         |          |           |
| Controls            | Debugging mode (manual function) | used for debugging and adjusting the mechanical position in manual mode<br>① Slider jog up: Through this function, the slider jog up is achieved<br>② Slider jog lowering: Through this function, the slider jog lowering is achieved                |         |         |          |           |
|                     | Automatic mode                   | according to the set crankshaft mode, pressure maintaining mode, connecting rod mode, pendulum mode, etc; Free mode can preset various stamping curves and other production process requirements for safe operation stamping and continuous stamping |         |         |          |           |
|                     | Protection function              | a logical protection function designed to ensure the safety of personnel and equipment                                                                                                                                                               |         |         |          |           |
|                     | Monitoring display               | ① Real time display of motor current, crankshaft angle, slider displacement, etc<br>② Real time display of alarm information<br>③ Real time display of IO status                                                                                     |         |         |          |           |
|                     | Hand wheel function              | By operating the hand wheel, the slider can be moved slightly                                                                                                                                                                                        |         |         |          |           |
| Protection          | Drive/motor over-current         | Independent over-current detection of drive and motor                                                                                                                                                                                                |         |         |          |           |
|                     | Drive/motor overload             | Independent overload detection of drive and motor                                                                                                                                                                                                    |         |         |          |           |
|                     | Motor overheat                   | Built-in motor overheat interface                                                                                                                                                                                                                    |         |         |          |           |
|                     | Low voltage/over-voltage         | Main circuit busbar voltage: over-voltage alarm output if higher than 800 V; under-voltage alarm output if lower than 400 V                                                                                                                          |         |         |          |           |
| Working environment | Working site                     | No dust, corrosive gases or combustible gases                                                                                                                                                                                                        |         |         |          |           |
|                     | Temperature                      | -10 to 45 °C                                                                                                                                                                                                                                         |         |         |          |           |
|                     | Humidity                         | <95%RH (non-condensing)                                                                                                                                                                                                                              |         |         |          |           |
|                     | Vibration                        | Vibration frequency $\leq 20$ Hz: 9.8 m/s <sup>2</sup> ; 20 Hz $\leq$ vibration frequency $\leq 50$ Hz: 2 m/s <sup>2</sup>                                                                                                                           |         |         |          |           |

# ECM Series Module Accumulators

The ECM series module energy storage device is a new type of energy storage device that comes with an RS485 communication interface. Combined with a super synchronous upper computer control system, it can achieve energy-saving data transmission and facilitate intuitive understanding of energy-saving effects. As an efficient energy storage device, it is widely used in important fields and links such as national defense and military industry, rail transportation, and potential energy recovery of lifting machinery.

Input voltage: 350-800 VDC

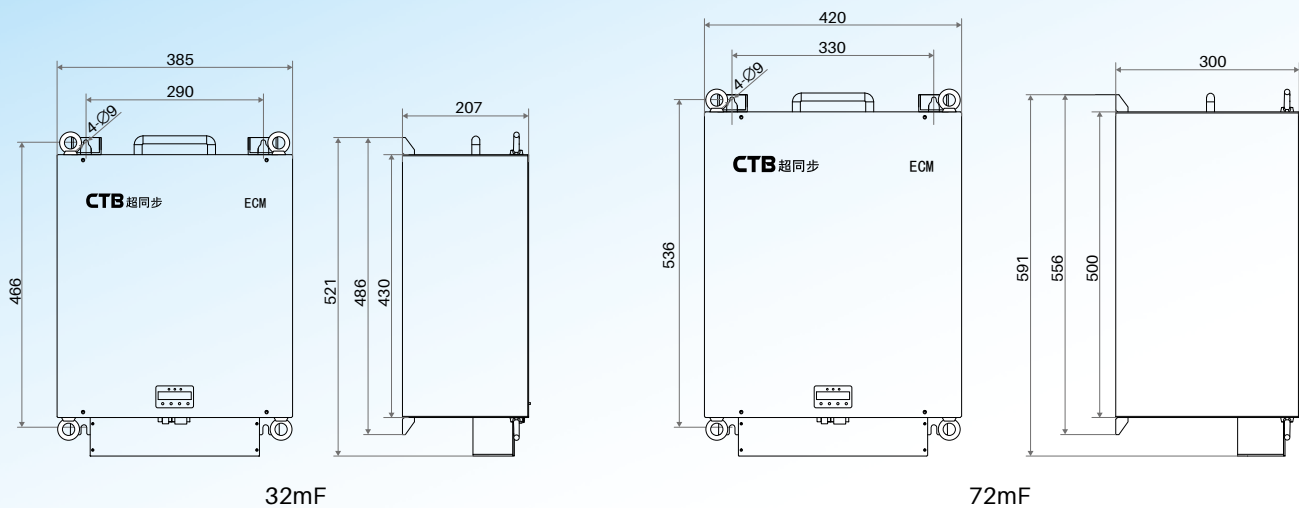
Spec.: 20 mF, 32 mF, 72 mF

## Product Features

- Short charging time
- Long life
- Good temperature properties
- Easy wiring
- Stable & reliable
- Green & environmental



## Overall dimensions



## Industrial Applications



## Configuration of Resistor and Resistance Box

| D18-XXXX       |                | 04A0                                  | 06A0 | 09A0 | 12A0 | 16A0 | 22A0 | 32A0 | 38A0 | 45A0 | 60A0 | 75A0 | 90A0            | 0110 | 0150 | 0180        | 0220 | 0280 | 0320 |
|----------------|----------------|---------------------------------------|------|------|------|------|------|------|------|------|------|------|-----------------|------|------|-------------|------|------|------|
| Brake resistor | Power (W)      | 200                                   | 300  | 800  | 1500 | 1500 | 1500 | 1500 | 2000 | 2000 | 2000 | 2000 | 2500            | 2500 | 2500 | 2500        | 2500 | 2500 | 2500 |
|                | Resistance (Ω) | 150                                   | 100  | 40   | 40   | 30   | 40   | 40   | 40   | 40   | 32   | 32   | 55              | 55   | 55   | 55          | 55   | 55   | 55   |
|                | Quantity       | 1                                     | 1    | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 2    | 4               | 4    | 4    | 6           | 6    | 8    | 8    |
|                | Type           | Ripple resistor or Al housed resistor |      |      |      |      |      |      |      |      |      |      | Ripple resistor |      |      |             |      |      |      |
| Resistance box |                | None                                  |      |      |      |      |      |      |      |      |      |      | 884×400×155     |      |      | 884×400×294 |      |      |      |

Brake Resistor Overall and Mounting Dimensions

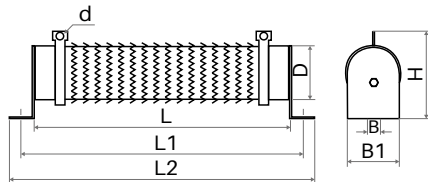


Fig.1

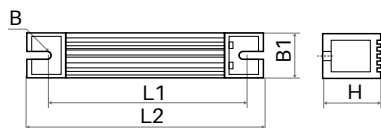


Fig.2

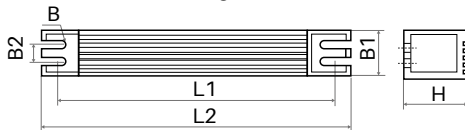


Fig.3

Resistance Box Overall and Mounting Dimensions

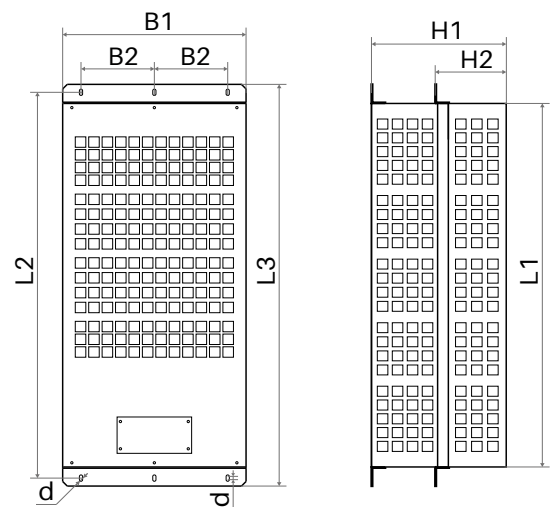


Fig.4

| Resistor Model       | Power (W)             | Resistance (Ω)  | Dimensions (mm) |                |                |                |                |                |                        | Incoming Line Hole DIA | Weight (kg) | Remarks |
|----------------------|-----------------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|------------------------|------------------------|-------------|---------|
|                      |                       |                 | L               | L1             | L2             | B              | B1             | B2             | H                      |                        |             |         |
| B200W/150R           | 200                   | 150             | 197             | 219            | 241            | 8              | 40             | /              | 87.3                   | 5.5                    | 0.43        | Fig.1   |
| B300W/100R           | 300                   | 100             | 284             | 306            | 328            | 8              | 40             | /              | 81                     | 5.5                    | 0.62        |         |
| B800W/40R            | 800                   | 40              | 324             | 346            | 368            | 8              | 50             | /              | 99                     | 6.5                    | 0.95        |         |
| B1500W/30R           | 1500                  | 30              | 414             | 439            | 464            | 8.5            | 60             | /              | 119                    | 6.5                    | 1.72        |         |
| B1500W/40R           | 1500                  | 40              | 414             | 439            | 464            | 8.5            | 60             | /              | 119                    | 6.5                    | 1.72        |         |
| B2000W/32R           | 2000                  | 32              | 509             | 534            | 559            | 8.5            | 60             | /              | 119                    | 6.5                    | 2.02        |         |
| B2000W/40R           | 2000                  | 40              | 509             | 534            | 559            | 8.5            | 60             | /              | 119                    | 6.5                    | 2.02        |         |
| B2500W/55R           | 2500                  | 55              | 599             | 624            | 649            | 8.5            | 60             | /              | 119                    | 6.5                    | 2.45        |         |
| L200W/150R           | 200                   | 150             | /               | 153            | 171            | 5.5            | 60             | /              | 30                     | 5.2                    | 0.46        | Fig.2   |
| L300W/100R           | 300                   | 100             | /               | 203            | 221            | 5.5            | 60             | /              | 30                     | 5.2                    | 0.62        |         |
| L800W/40R            | 800                   | 40              | /               | 388            | 406            | 5.5            | 61             | /              | 59                     | 5.2                    | 2.20        |         |
| L1500W/30R           | 1500                  | 30              | /               | 469            | 485            | 5.5            | 50             | 30             | 107                    | 6                      | 4.35        | Fig.3   |
| L1500W/40R           | 1500                  | 40              | /               | 469            | 485            | 5.5            | 50             | 30             | 107                    | 6                      | 4.35        |         |
| L2000W/40R           | 2000                  | 40              | /               | 536            | 550            | 5.2            | 100            | 80             | 50                     | 6                      | 4.90        |         |
| L2000W/32R           | 2000                  | 32              | /               | 536            | 550            | 5.2            | 100            | 80             | 50                     | 6                      | 4.90        |         |
| Resistance Box Model | Max. No. of Resistors | Dimensions (mm) |                 |                |                |                |                |                | Incoming Line Hole DIA | Weight (kg)            | Remarks     |         |
|                      |                       | L <sub>1</sub>  | L <sub>2</sub>  | L <sub>3</sub> | B <sub>1</sub> | B <sub>2</sub> | H <sub>1</sub> | H <sub>2</sub> | d                      |                        |             |         |
| 884×400×155          | 4                     | 800             | 849             | 884            | 400            | 160            | /              | 155            | 7                      | 22.5                   | Fig.4       |         |
| 884×400×294          | 8                     | 800             | 849             | 884            | 400            | 160            | 295            | /              | 7                      | 39                     |             |         |

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Due to constant technological improvements, texts, drawings and technical data in the manual may be changed without prior notice.