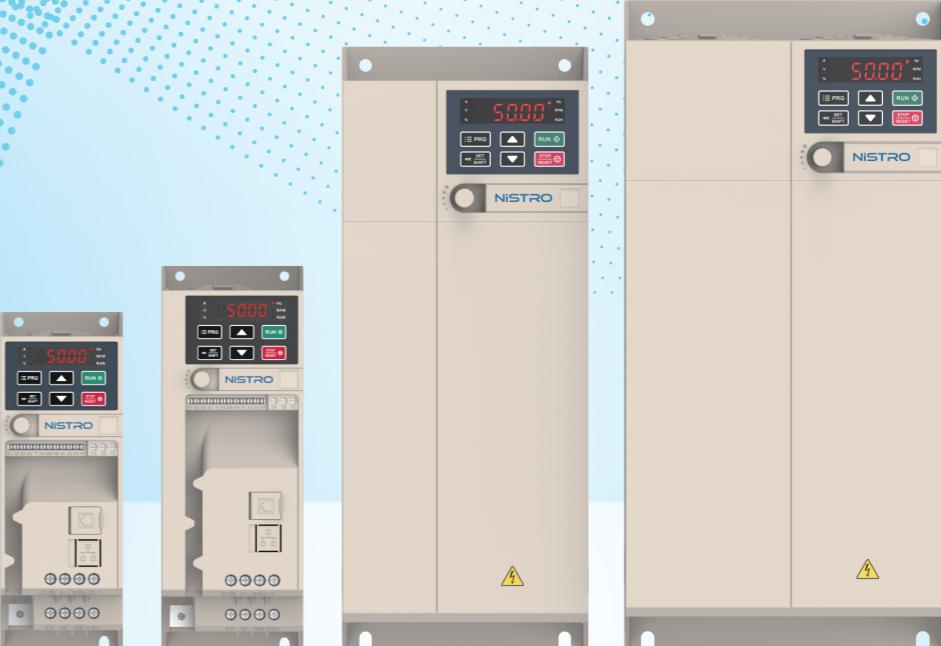


NiSTRO

GA20-Series General-purpose AC Drive



GA20 General-purpose AC Drive

GA20 series AC drives represent the newest technology from NISTRO's research, featuring their small size but high reliability and cost performance in the light of current market needs.

As a vector AC drive with book-like design, GA20 boasts easy installation, small volume, low temperature rise, high protection and favorable software performance among all of the other advantages.

With the advanced PLM R&D management system applied during the whole process, hardware, software, structure and testing process are all guaranteed since all the steps are three-dimensional, systematical and traceable. Every detail is meticulously developed thus our products are rigorous and refined.



Book-type design



Various installation methods



No derating while ambient temperature is up to 50°C



Hidden wires for easy routes



Isolated air ducts for both device heat dissipation and dust protection



Over voltage & over current suppression protection and wave-by-wave current limit protection



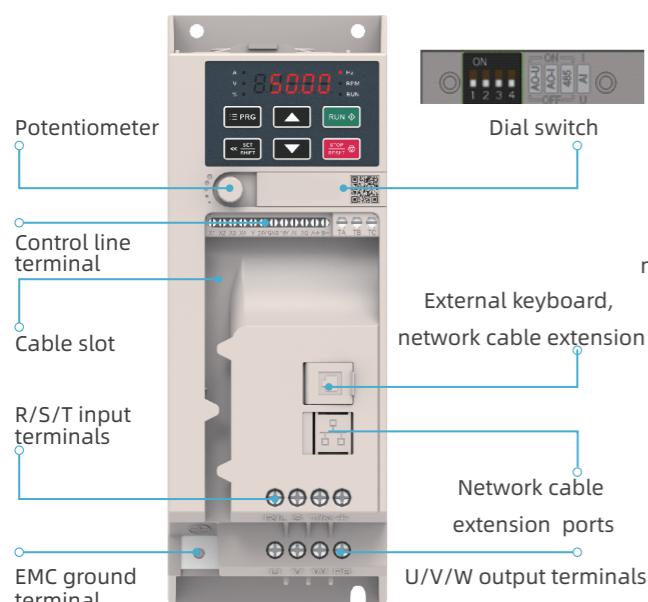
Convenient group network expansion



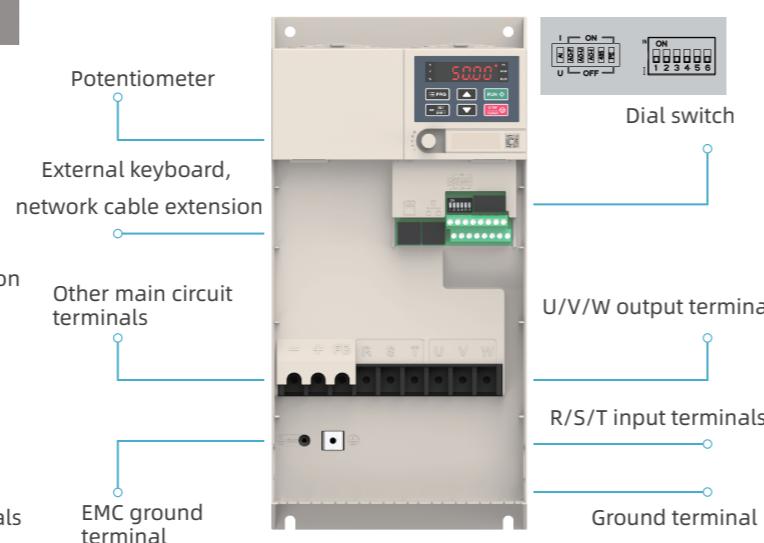
Smaller size for more functions

Structural Features

0.4kW-5.5kW interface

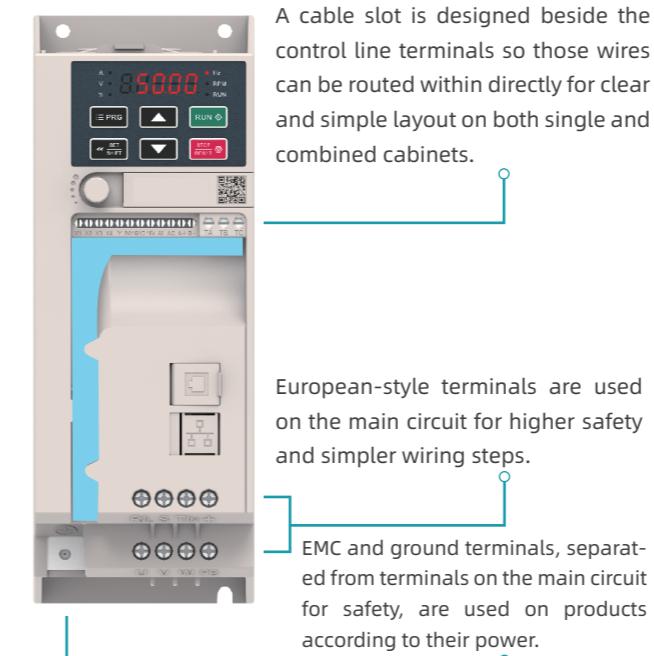


7.5kW-22kW interface



Wiring terminals

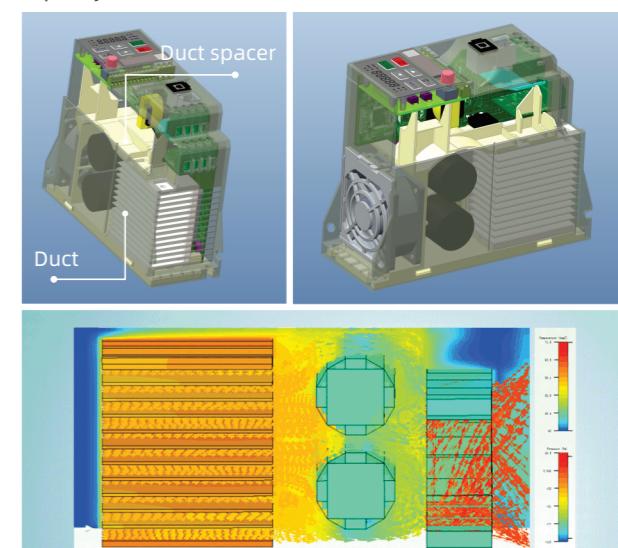
The terminal layout of GA20 VFD is simple and beautiful, with a deep sense of craftsmanship.



Protective designs

High protection: completely independent air ducts and scientific layout inside to meet the requirements of heat dissipation of high-power consumption components and dust proof of sensitive components;

High temperature resistance: scientific design of air ducts to quicken heat dissipation and slower temperature rise enabling usage under ambient temperature 50 °C without capacity reduction.

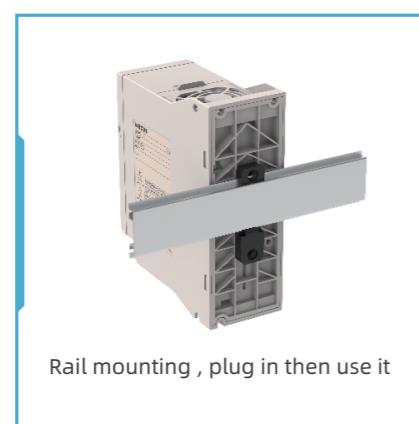


Installation methods

Support penetration installation (wall installation, embedded installation); Adapt to various installation environments



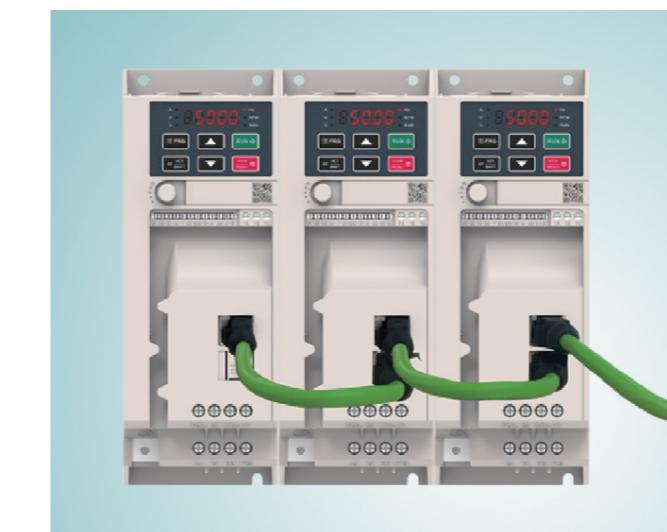
Side by side installation,
no need to reserve clearance



Rail mounting , plug in then use it



Side mounting supported when
vertical space is insufficient



Communication extensions

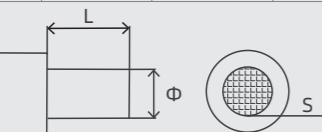
RS485 (standard) and CAN communication (OPT) are supported through the extension ports so customers can simply connect cables to them. All is convenient and clean.

Control terminal wiring specifications

| Rational parameters | Power range | Strip length (mm) | Wire gauge (AWG) | Screw |
|---------------------|-------------|-------------------|------------------|-------|
| Specification | 0.4kW~5.5kW | 4-5 | 20~14 | M2 |
| | 7.5kW~22kW | 6-7 | 26~14 | M3 |

Main circuit terminal wiring specifications

Power range: 0.4kW ~ 5.5kW

| | GA20 power level | Wire diameter (mm) | Wire cross-sectional area (mm) | Strip length (mm) |
|------------------------|--|--------------------|--------------------------------|-------------------|
| Main circuit terminal | 0.4kW-2.2kW | 0.25-2.5 | 0.05-5.2 | 7-8 |
| | 4kW-5.5kW | 0.5-2.5 | 0.2-5.2 | 6-8 |
| Wire stripping diagram |  | | | |

Power range: 7.5kW~22kW

| Model | Main circuit terminal screw specifications (mm) | Recommended fixed torque (N·m) | Recommended copper core cable specifications mm ² (AWG) |
|----------------|---|--------------------------------|--|
| GA20-T3-7R5G-B | M4 | 1.2~1.5 | 6mm ² (9) |
| GA20-T3-011G-B | M4 | 1.2~1.5 | 10mm ² (7) |
| GA20-T3-015G-B | M5 | 2~3 | 10mm ² (7) |
| GA20-T3-018G-B | M5 | 2~3 | 16mm ² (5) |
| GA20-T3-022G-B | M5 | 2~3 | 16mm ² (5) |

Performance Characteristics

Over-voltage Suppression

When the bus voltage reaches or exceeds the bus overvoltage suppression point during the running, it will automatically adjust the operating frequency to suppress the bus voltage rise, thus ensuring that the AC drive does not cause over-voltage protection.

Keyboard operation

Keyboard operations of GA310 are still adopted here for quick start. External keyboards are applicable too to GA310-series products.



All-in-one keyboard



One-line display external keyboard
(Single keypad opening size: 60*36mm)



Dual-line display external keyboard
(Opening size: 119*70mm)

Under-voltage suppression

When the AC drive suddenly loses power during running, it will automatically adjust the operating frequency after the bus voltage drops to the under-voltage suppression point, thus ensuring that the drive will not report under-voltage faults due to the low bus voltage in a short time.

When the power supply is restored within the valid period of under-voltage suppression, this drive can continue to operate normally.



Comprehensive fault protection

The GA20 fault protection is more comprehensive and detailed, and it can find the problem more quickly and accurately in the event of an error.

| System fault | Drive overload | Non-zero sum of three phases | Parameter copy fault | Brake unit fault | Parameter setting fault |
|----------------|-------------------------------|----------------------------------|-------------------------------|---------------------------|-------------------------|
| Over current | CBC continuous occurs | Excessive U/V/W phase zero drift | Three phase output phase loss | Self-tuning fault | CPU timeout |
| Over voltage | Rectifier module overheat | Short circuit to ground | U/V/W phase output phase loss | Load protection | Parameter storage fault |
| Under voltage | Inverter module overheat | Fan short circuit | Input phase loss | Excessive speed deviation | Communication fault |
| Motor overload | Terminial start-up protection | PID feedback disconnection | External fault | Stall protection | |

Excellent control performance

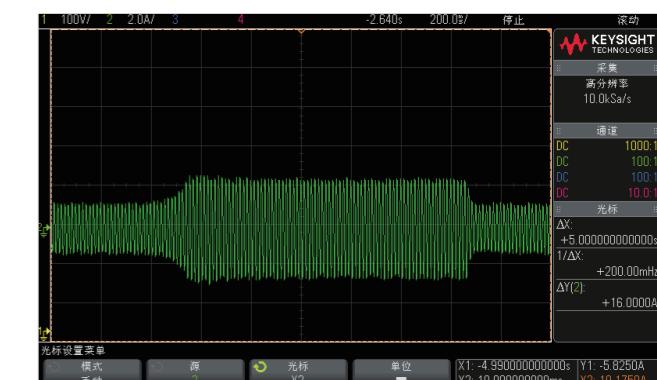
The GA20 is a high-performance AC drive that supports PG-free vector control in addition to the universal V/F control mode. It has excellent control performance and can adapt to more complex operating conditions.

| | |
|-----------------------------|---|
| Motor type | Asynchronous motors, synchronous motors |
| Motor control method | No PG V/F control, no PG vector control |
| Modulation method | Optimized space vector PWM modulation |
| Speed control range | No PG vector control, rated load 1:100 |
| Steady-state speed accuracy | No PG vector control:≤2% Rated synchronous speed |
| Starting torque | No PG vector control : 150% rated torque at 0.5Hz |
| Torque response | No PG vector control : < 20ms |
| Frequency accuracy | Digital setting: Max. frequency×±0.1%; Analog setting: Max. frequency×±0.2% |
| Frequency resolution | Digital setting 0.01Hz; Analog setting:Max.frequency×0.05% |

Over-current suppression

The overcurrent suppression function is to real-time monitor and automatically limit the load current during operation, it does not exceed the overcurrent suppression point, thus to prevent the fault trip caused by excessive current.

This function is especially used for some loads with large inertia or severe changes. The setting is only valid under V/F control, and the overcurrent suppression function under the vector control is always valid.



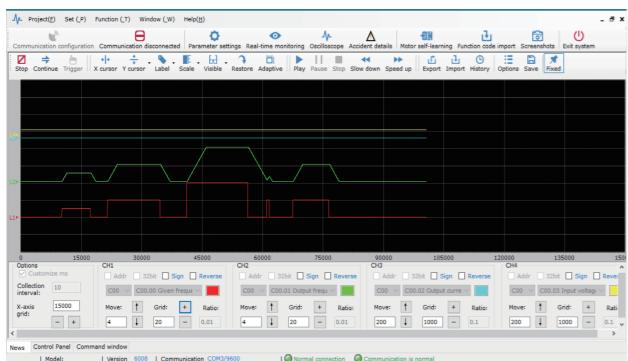
Wave-by-Wave current limit

The wave-by-wave current limit could limit the rise of current to a certain extent through the hardware protection, so that the current does not exceed the protection value of the AC drive to avoid any stopping due to over current fault.



Virtual oscilloscope

The GA20 has virtual oscilloscope software that can monitor four parameters at the same time. Users can monitor the operating parameters in real time on the computer through the virtual oscilloscope, which makes monitoring, debugging and troubleshooting more flexible.

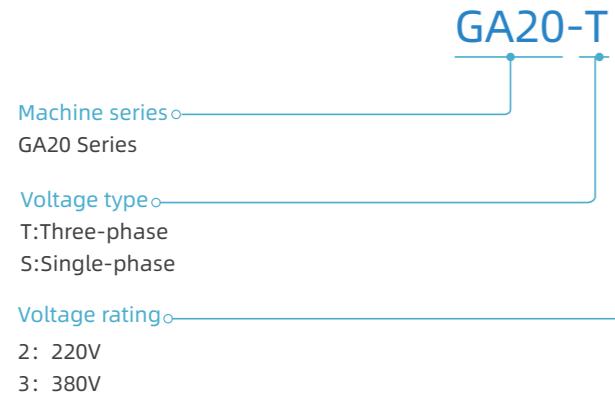


Firmware field upgrade

NISTRO firmware upgrade software provides great convenience for the field upgrade of GA20 firmware.

Model Description

GA20 model naming rules

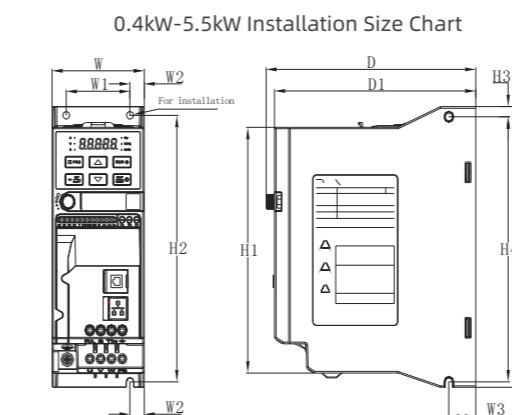


○Machine series
○Voltage type
○Voltage rating
○Accessory type
○Load type
○Adaptable motor power

Rated Output Current

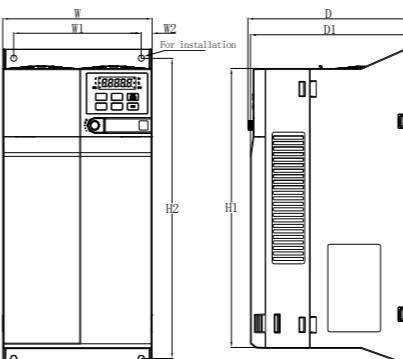
| Voltage | 220V | 380V |
|------------|-------------------------|------|
| Power (kW) | Rated output current(A) | |
| 0.4 | 2.5 | — |
| 0.75 | 4 | 3 |
| 1.5 | 7 | 4 |
| 2.2 | 10 | 5 |
| 4 | — | 9.5 |
| 5.5 | — | 13 |
| 7.5 | — | 17 |
| 11 | — | 25 |
| 15 | — | 32 |
| 18.5 | — | 38 |
| 22 | — | 45 |

Installation Size



| Drive model | Dimension(mm) | | | | Mounting dimensions (mm) | | | | Mounting aperture | | | |
|------------------|---------------|-----|-----|-----|--------------------------|----|----|-----|-------------------|-----|-----|------|
| | W | H | H1 | D | D1 | W1 | W2 | H2 | W3 | H3 | H4 | |
| GA20-T/S2-R40G-B | 65 | 177 | 155 | 148 | 142 | 45 | 10 | 168 | 19 | 6.5 | 167 | 3-M4 |
| GA20-T/S2-R75G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |
| GA20-T/S2-1R5G-B | 65 | 177 | 155 | 148 | 142 | 45 | 10 | 168 | 19 | 6.5 | 167 | 3-M4 |
| GA20-T/S2-2R2G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |
| GA20-T3-R75G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |
| GA20-T3-1R5G-B | 65 | 177 | 155 | 148 | 142 | 45 | 10 | 168 | 19 | 6.5 | 167 | 3-M4 |
| GA20-T3-2R2G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |
| GA20-T3-004G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |
| GA20-T3-5R5G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |

7.5kW-22kW Installation Size Chart



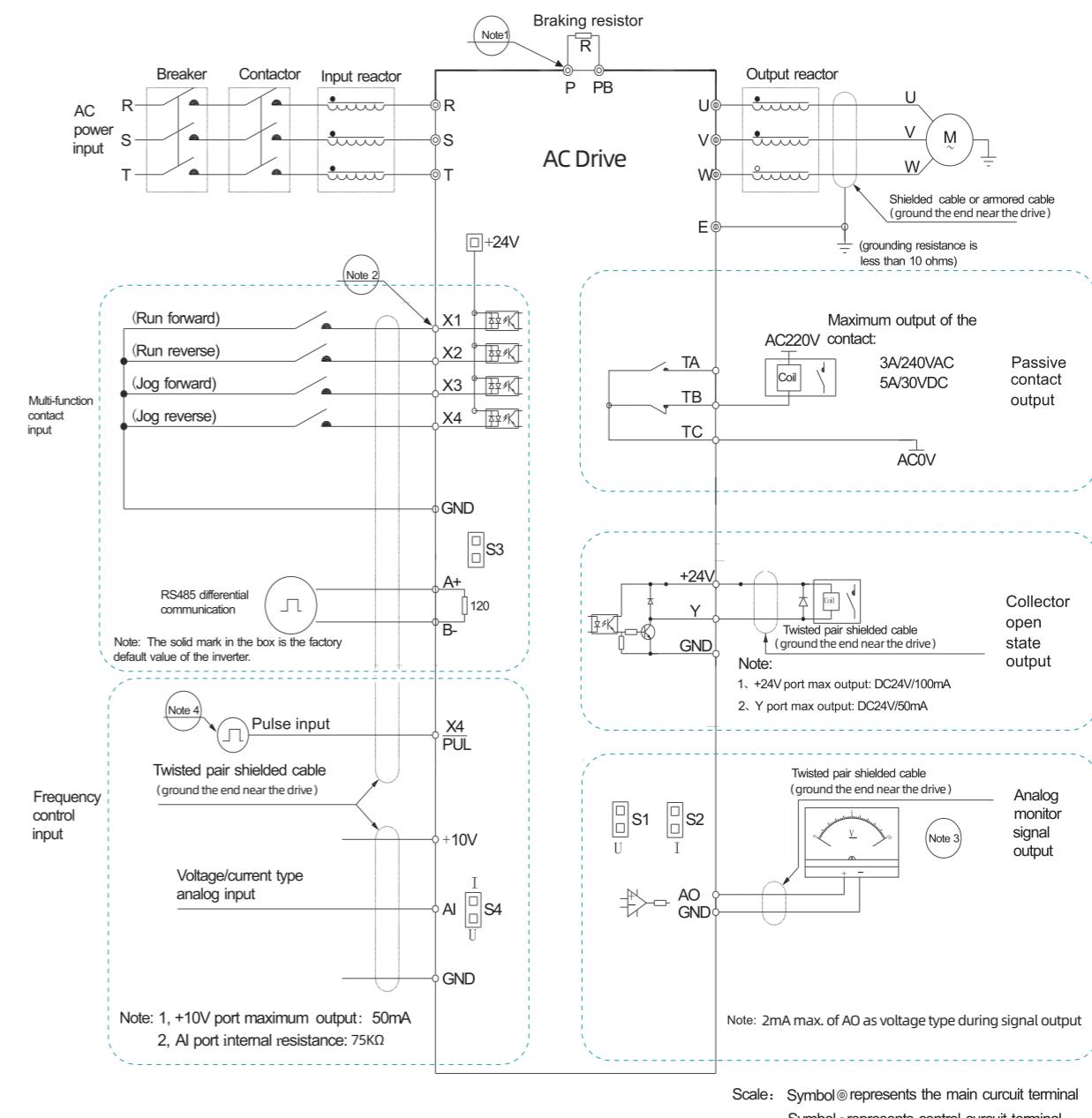
| Drive model | Dimension(mm) | | | | Mounting dimensions (mm) | | | | Mounting aperture | | | |
|----------------|---------------|-------|-------|-----|--------------------------|-----|------|-------|-------------------|----|----|----|
| | W | H | H1 | D | D1 | W1 | W2 | H2 | W3 | H3 | H4 | |
| GA20-T3-7R5G-B | 130 | 320 | 286 | 161 | 158 | 105 | 12.5 | 302 | - | - | - | M5 |
| GA20-T3-011G-B | 170 | 342.5 | 303.5 | 183 | 180 | 145 | 12.5 | 326.5 | - | - | - | M5 |
| GA20-T3-015G-B | 170 | 342.5 | 303.5 | 183 | 180 | 145 | 12.5 | 326.5 | - | - | - | M5 |
| GA20-T3-018G-B | 170 | 342.5 | 303.5 | 183 | 180 | 145 | 12.5 | 326.5 | - | - | - | M5 |
| GA20-T3-022G-B | 170 | 342.5 | 303.5 | 183 | 180 | 145 | 12.5 | 326.5 | - | - | - | M5 |

Control Terminal Parameters

| | Type | Terminal symbol | Maximum input/output capacity |
|------------------------|---------------------------------|--|--|
| Control line terminals | Power terminals | +10V-GND | DC10V, 50mA |
| | | +24V -GND (0.4kW-5.5kW power range) +24V -COM (7.5kW- 22kW power range) | DC24V, 100mA |
| | Analog input | AI-GND | 1. DC0V-10V 2. 0mA~20mA |
| | Digital input | X1~X4-GND (0.4kW-5.5kW power range) X1~X4-COM (7.5kW- 22kW power range) | 1.High level: 10~30V 2.Low Level: 0~5V 3.X4 (PUL): 100KHz |
| | Analog output | AO-GND | 1.DC 0V~10V 2.DC 0mA~20mA |
| | Digital output | Y - GND (0.75kW-5.5kW) Y - COM (7.5kW-22kW) | Open collector output 1.DC 0V~30V 2.DC 0mA~50mA |
| | Relay normally open terminals | TA-TC | Contact drive capability 1.240VAC , 3A |
| | Relay normally closed terminals | TB-TC | 2.30VDC , 5A |
| | RS485 communication terminals | A+ | RS485 communication interface: Select by dipswitch whether to connect terminal resistor |



Terminal Wiring



*For GA20 series, 0.4kW~5.5kW AC drives, COM and GND terminals are integrated and combined as GND terminals externally;
For 7.5kW~22kW AC drives, COM and GND terminals are both present.

Applications

