

Goodrive3000 Series

High Performance Vector Control Inverters

Your Trusted Industry Automation Solution Provider



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- | | | | | |
|-------------------------------|--|---------------------------------------|----------------------------|-----------------------------------|
| Industrial Automation: | • Frequency Inverter | • Servo & Motion Control | • Motor & Electric Spindle | • PLC |
| | • HMI | • Intelligent Elevator Control System | • Traction Drive | |
| Electric Power: | • SVG | • Solar Inverter | • UPS | • Online Energy Management System |
| | • New Energy Vehicle Electric Control System | | | |

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Y5/1-11 V1.0



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Professional
variable frequency drive technology
Focus
on industry applications
Expert
reliable design



Product Introduction

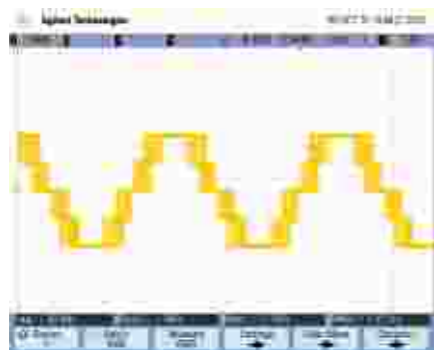
INVT Goodrive3000 series inverters are special products designed for motor loads at special voltage degree (1140V) in mine and oil industry; Advanced 3-level topological structure and AFE rectification technology, excellent motor drive performance and small impact to the grid. New modular design fully meets the special requirements of mining explosion-proof equipment, so the products are widely applied to belt conveyors, hoists, winches, aerial riding devices, emulsion pumps, etc.



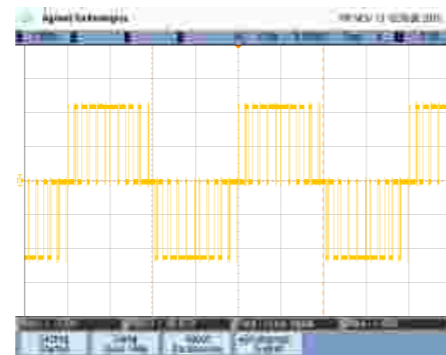
Professional Variable Frequency Drive Technology

Advanced 3-level Topological Structure

The output waveform is closer to the sine wave, du/dt reduces significantly.

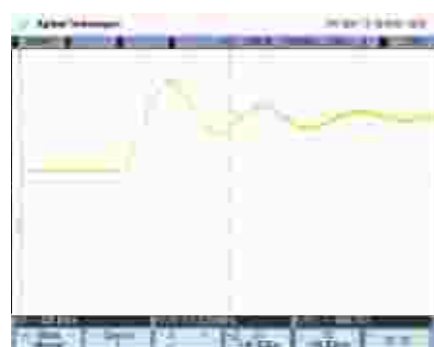


3-level output voltage waveform

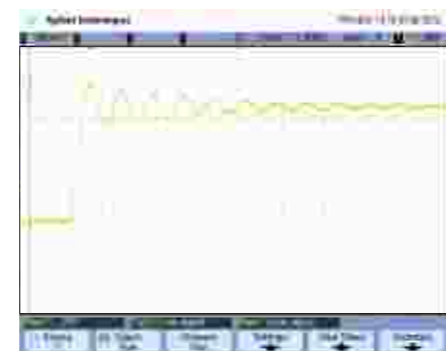


2-level output voltage waveform

- The motor runs more smoothly, reduce mechanical vibration caused by non-sinusoidal output waveforms, prolong motor service life
- Reduce output harmonic significantly, restrain conduction and radiation interference caused by the inverter, possess excellent EMC features
- Reduce user configuration costs effectively



3-level du/dt waveform



2-level du/dt waveform

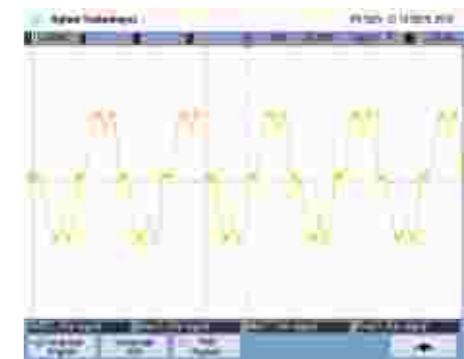
- Reduce impact voltage to the armature, protect motor insulation effectively
- Slow down electrocorrosion to motor bearings caused by axial current, prolong motor service life
- Reduce leakage current of the system, it runs safely and reliably

Professional AFE Rectification Feedback



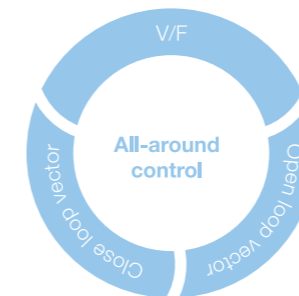
Input current waveform of IGBT controllable rectification (AFE rectification)

Low input harmonic, reduce interference to the grid



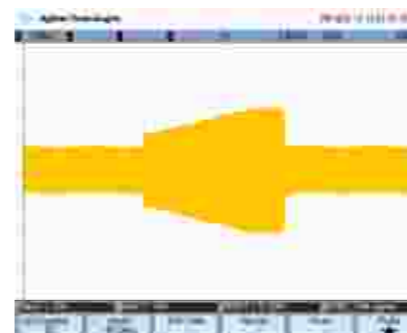
Input current waveform of uncontrollable rectification

All-around Control Modes



Excellent Drive Performance

High overload capacity and quick response



Sudden loading/unloading waveforms of asynchronous motors

Perfect Motor Autotuning

Built-in various motor autotuning modes

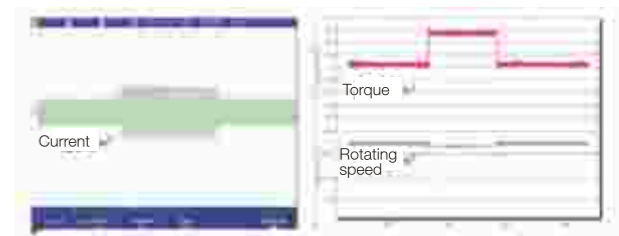
Rotating Autotuning

Before autotuning, decouple the motor from the load. The mode is suitable in the cases when high starting torque, speed and control accuracy are needed.

Static Autotuning

Before autotuning, input correct nameplate parameters of the motor without decoupling the motor from the load. The mode is suitable in the cases when the motor cannot decouple from the load, avoiding the device cannot perform rotation autotuning after installation.

Excellent Running Control Performance



100% of the rated load of asynchronous motors, suddenly loading/unloading current, torque and speed waveforms

Wide speed range / High accuracy / Smoothly braking

	Speed range	Starting torque	Speed control accuracy	Speed fluctuation
Close loop vector control	1:1000	0Hz/180%	±0.1% of Max. speed	±0.1%
Open loop vector control	1:100	0.5Hz/150%	±0.5% of Max. speed	±0.3%

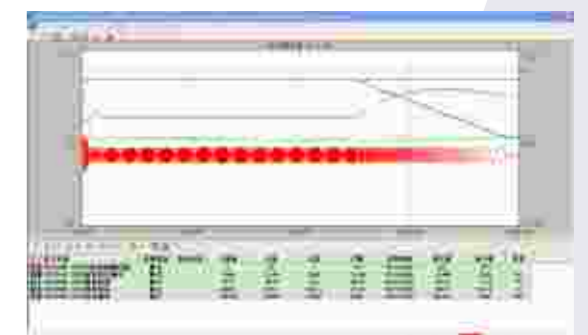
Diverse Human-machine Interfaces



LCD keypad



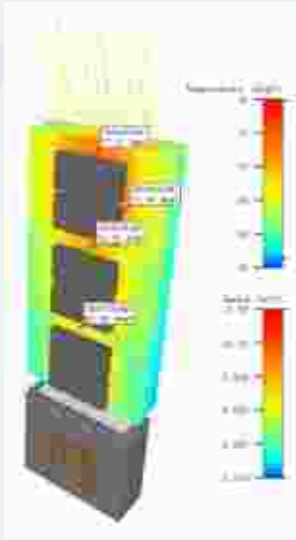
LED keypad



Interface of upper computer software

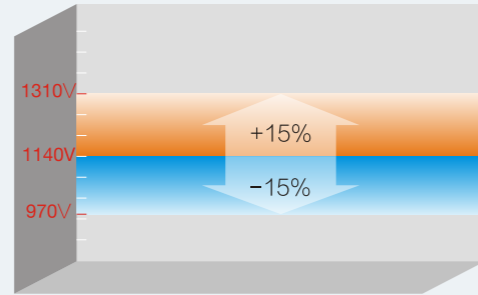
Reliable Designer

Advanced Thermal Simulation



Wide Input Voltage Range

Satisfy hash grid situations



Professional customized laminated busbar, compact structure, easy to maintain



Laminated busbar

Reduce stray induction and IGBT turn-off peak
Compact design, decrease the whole size
High reliability, more durable

Advanced Management System and Lab Assurance

- The only CNAS National Laboratory in domestic inverter industry
- The only Inverter Engineering Technology R&D Center in Shenzhen
- The only one company labeling TUV-MARK in the field of domestic industrial control
- The only one manufacturer awarded ACT qualification by TUV-SUD in the field of domestic industrial control
- Southeast University-INVT United R&D Center on Electric Drive



Environment reliability lab



EMC lab



Electrical performance lab



Mechanical reliability lab



Components lab

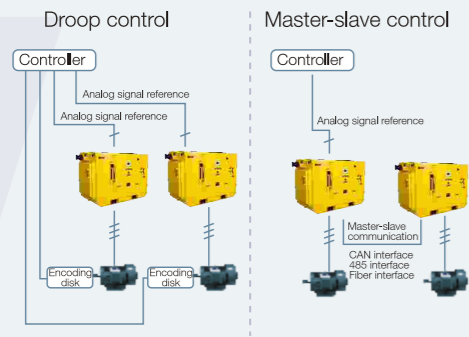


Safety lab

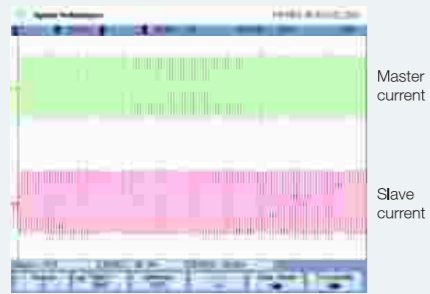
Focus On Industry Applications

One-stop Service

Multi-motor Power Balancing Operation



Goodrive3000 series inverters are embedded with droop control mode, master-slave control mode and facilitate multi-motor power balance



Current waveforms of the master and slave

Powerful Braking Solution



4-quadrant operation energy can be directly fed back to the grid for braking

Rich Network Configuration

Provide various communication networks and Fieldbus optional cards



IP20 and IP54 (high protection degree) Model Use the Same Module and Cabinet

Special EMC Filter



- Special design for spectrum characteristics under inverter drive
- High insertion loss
- Actual load test of the inverter
- Optional grounding methods
- Low leakage current



Before adding EMC filter After adding EMC filter



IP20

IP54



- Provide mature applications and comprehensive solutions
- Provide complete technical consulting service, meet the relevant standards in coal mines
- Provide EMC integrated solutions
- Provide relevant accessories of explosion-proof inverters

Applications



Belt conveyor

Designed for special voltage degree, Goodrive3000 medium voltage inverters can be applied to up/down/shrinkable belt conveyors and are suitable for severe atmospheres under coal mines. The products can be used in master-slave control of multi-motors.

Application equipment:
up/down belt conveyors

Product series:
Goodrive3000-01 series
Goodrive3000-11 series



Scraper conveyor

Focusing on scraper conveyors at special voltage degree in coal industry, Goodrive3000 medium voltage inverters realize soft start and stop, reduce chain breakage and become much better in control performance than traditional soft start.

Product series:
Goodrive3000-01 series

The mine hoist runs up or down. In up-going process, the inverter drives the motor and converts electric energy into potential energy and kinetic energy; in down-going process, the motor will enter into power generation state when deceleration braking and the mine car runs down, and then Goodrive3000 inverter will feedback the energy generated by the motor to the grid.

Product series:
Goodrive3000-11 series



Mine hoist

The mine cableway is used for facilitating transporting workers in mines, including up or down movement. In up-going process, the inverter drives the motor and converts electric energy into potential energy and kinetic energy; in down-going process, the motor will enter into power generation state when deceleration braking and the mine car runs down, and then Goodrive3000 inverter will feedback the energy generated by the motor to the grid.

Product series:
Goodrive3000-11 series



Mine cableway



Emulsion pump

By real-time monitoring the pressure at the outlet of the emulsion pump, Goodrive3000 inverter will adjust its output frequency automatically and realize constant supply pressure and automatic emulsion preparation.

Product series:
Goodrive3000-01 series



Oil field

Goodrive3000 inverter can realize soft start and stop of electric submersible pump, prolong the service life of the pump, improve the power factor of the pump system, enhance energy saving effect, achieve continuous adjustment of current and voltage output, and make the system in the best working conditions.

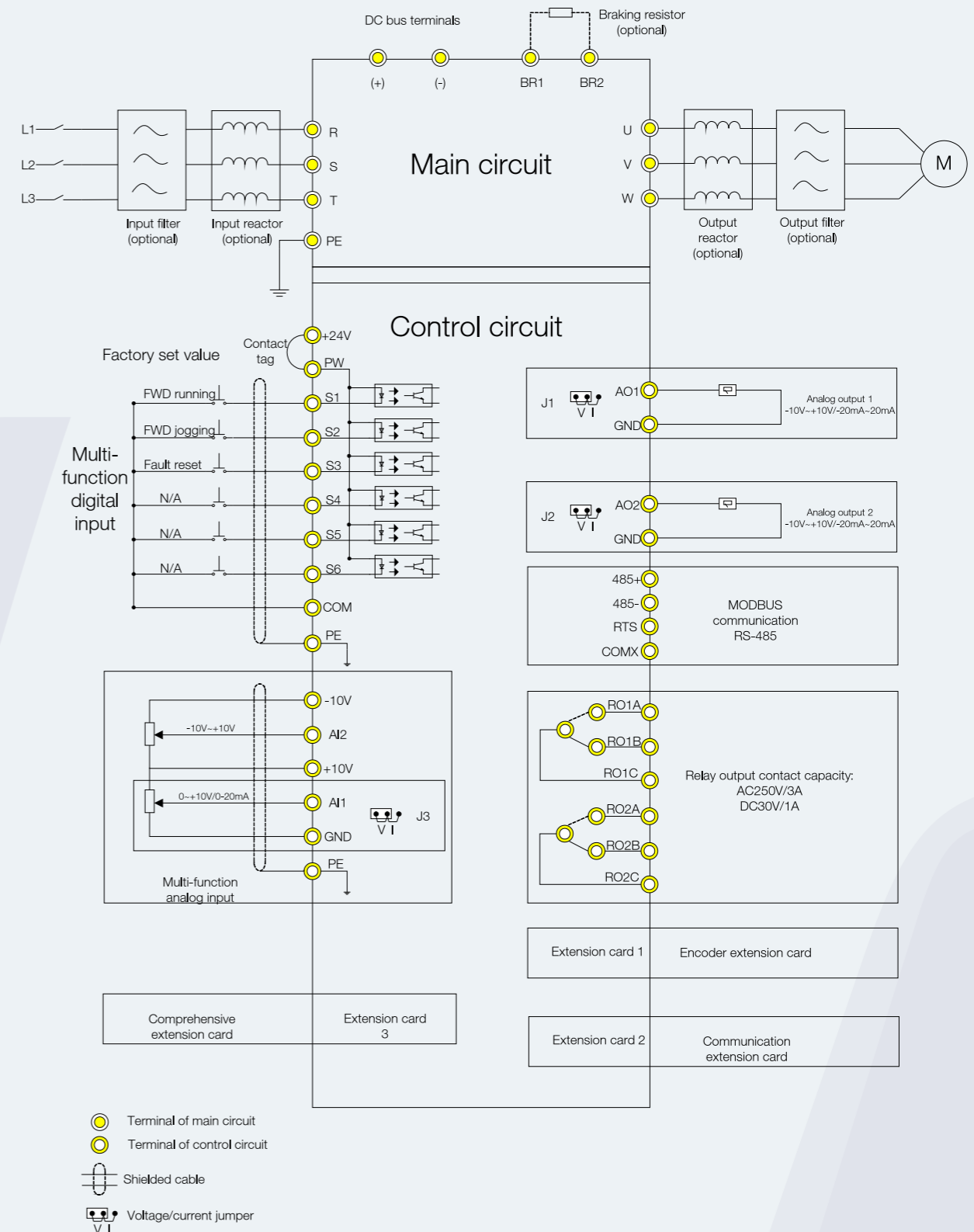
Application equipment:
Electric submersible pumps, pumping units

Product series:
Goodrive3000-00 series
Goodrive3000-10 series
Goodrive3000-05 series
Goodrive3000-15 series

Technical Parameters

Product type	Goodrive3000-01 series	Goodrive3000-11 series
Input	Rated input voltage	AC 3PH 970V~1310V
	Rated input frequency	50Hz/60Hz, allowable range: 47~63Hz
	Efficiency	> 98%
	Input power factor	> 0.85
Output	Rated output voltage	0~input voltage
	Output frequency	0~400Hz
Running control feature	Control mode	V/F (with V/F separation), open loop vector, close loop vector
	Motor parameter autotuning	Support static and rotation autotuning
	Speed range	Close loop vector: 1:1000; open loop vector: 1:100
	Speed control accuracy	Close loop vector: $\pm 0.1\%$ of Max. speed; open loop vector: $\pm 0.5\%$ of Max. speed
	Speed fluctuation	$\pm 0.3\%$ (open loop vector); $\pm 0.1\%$ (close loop vector)
	Torque control accuracy	10% (open loop vector); 5% (close loop vector)
	Starting torque	0.5Hz 150% (open loop vector); zero frequency 180% (close loop vector)
	Overload capability	150% of rated current: 60s, 180% of rated current: 10s, 200% of rated current: 1s
	Important functions	Master-slave control, multi-step speed running, simple PLC, S curve ACC/DEC, fan running control, energy saving running, PID adjustment, MODBUS communication, droop control, torque control, switch between torque and speed control mode, restart after rotating speed tracking, etc.
	Peripheral interface	Analog input
Analog output		Standard 2: 2 (-10V~10V voltage or -20mA~20mA current)
Digital input		Standard 6 digital inputs: internal impedance 3,3k Ω
Digital output		Standard 1 open collector output: output frequency : 0~1kHz, OC output Standard 2 relay outputs: AC250V/3A, DC30V/1A
Communication		Standard 485 communication (MODBUS), optional CAN communication for master-slave control
Protection function	Various protection functions for motor: over-load, over-voltage, under-voltage, input phase loss, over-current, over-heat, over-voltage stalling, over-current stalling, short circuit, etc.	
Others	Keypad	Standard LCD keypad, optional LED keypad
	Temperature of the running environment	-10°C~+50°C, derating above 40°C
	Humidity	RH 5%~95%, no condensation
	Storage temperature	-40°C ~+70°C
	Altitude	< 1000m, if the sea level is above 1000m, please derate 1% for every additional 100m
Protective degree	IP00, IP20, IP54	

Wiring diagram



Product Selection

(If the value exceeds the rated data, please contact with SHENZHEN INVT ELECTRIC CO., LTD.)

Product model	Rated Power(kW)	Rated input current(A)	Rated output current(A)	Remark
Module products(protective degree IP00)				
2-quadrant inverters				
GD3000-01-055G-12	55	34	36	
GD3000-01-075G-12	75	47	50	
GD3000-01-090G-12	90	56	60	
GD3000-01-110G-12	110	68	73	
GD3000-01-132G-12	132	82	85	
GD3000-01-160G-12	160	98	104	
GD3000-01-200G-12	200	122	128	
GD3000-01-250G-12	250	150	160	
GD3000-01-315G-12	315	185	195	
GD3000-01-400G-12	400	235	250	
GD3000-01-500G-12	500	300	310	
GD3000-01-630G-12	630	380	395	
GD3000-01-800G-12	800	480	500	
GD3000-01-1000G-12	1000	600	620	
4-quadrant inverters				
GD3000-11-055G-12	55	30	36	
GD3000-11-075G-12	75	40	50	
GD3000-11-090G-12	90	49	60	
GD3000-11-110G-12	110	58	73	
GD3000-11-132G-12	132	70	85	
GD3000-11-160G-12	160	85	104	
GD3000-11-200G-12	200	106	128	
GD3000-11-250G-12	250	133	160	
GD3000-11-315G-12	315	168	195	
GD3000-11-400G-12	400	213	250	
GD3000-11-500G-12	500	265	310	
GD3000-11-630G-12	630	335	395	
GD3000-11-800G-12	800	425	500	
GD3000-11-1000G-12	1000	530	620	

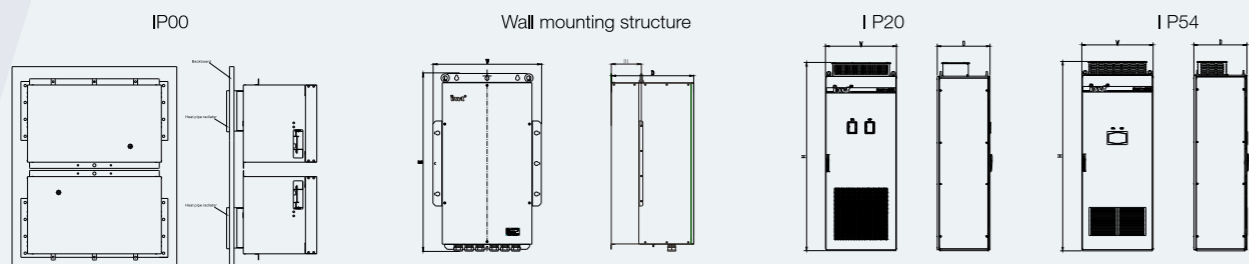
Product model	Rated Power(kW)	Rated input current(A)	Rated output current(A)	Remark
Standard air-cooling products (protective degree IP20/IP54)				
2-quadrant inverters □ indicates 00/05 series, can share parameters				
GD3000-□-055G-12	55	34	36	Wall mounting structure, W*H*D=500mm* 980.5mm*460mm
GD3000-□-075G-12	75	47	50	
GD3000-□-090G-12	90	56	60	
GD3000-□-110G-12	110	68	73	
GD3000-□-132G-12	132	82	85	
GD3000-□-160G-12	160	98	104	
GD3000-□-200G-12	200	122	128	
GD3000-□-250G-12	250	150	160	
GD3000-□-315G-12	315	185	195	
GD3000-□-400G-12	400	235	250	
GD3000-□-500G-12	500	300	310	
GD3000-□-630G-12	630	380	395	
GD3000-□-800G-12	800	480	500	
GD3000-□-1000G-12	1000	600	620	
4-quadrant inverters □ indicates 10/15 series, can share parameters				
GD3000-□-055G-12	55	30	36	Wall mounting structure
GD3000-□-075G-12	75	40	50	
GD3000-□-090G-12	90	49	60	
GD3000-□-110G-12	110	58	73	
GD3000-□-132G-12	132	70	85	
GD3000-□-160G-12	160	85	104	
GD3000-□-200G-12	200	106	128	
GD3000-□-250G-12	250	133	160	
GD3000-□-315G-12	315	168	195	
GD3000-□-400G-12	400	213	250	
GD3000-□-500G-12	500	265	310	
GD3000-□-630G-12	630	335	395	
GD3000-□-800G-12	800	425	500	
GD3000-□-1000G-12	1000	530	620	

The cabinet structure can be customized for standard air-cooling products

Model description

GD3000-11 - 400G - 12 - XXXX

Label	Name	Label	Power degree	Label	Voltage degree	Lot No.
GD3000-00	2-quadrant standard product(IP20)	075G	75kW	12	1140V	
GD3000-01	2-quadrant module product(IP00)	400G	400kW	23	2300V	
GD3000-10	4-quadrant standard product(IP20)			33	3300V	
GD3000-11	4-quadrant module product (IP00)					
GD3000-15	4-quadrant standard product(IP54)					
GD3000-05	2-quadrant standard product(IP54)					



Product model	Input reactor	Output reactor	Input filter	Output filter
4-quadrant inverters □ indicates 10/11/15 series, can share parameters				
GD3000-□-055G-12	*	25006-00395	FLT-P1250H-B	FLT-L1250H-B
GD3000-□-075G-12	*	25006-00395	FLT-P1250H-B	FLT-L1250H-B
GD3000-□-090G-12	*	25006-00395	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-110G-12	*	25006-00395	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-132G-12	*	25006-00072	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-160G-12	*	25006-00072	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-200G-12	*	25006-00072	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-250G-12	*	25006-00431	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-315G-12	*	25006-00431	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-400G-12	*	25006-00431	FLT-P12300H-B	FLT-L12300H-B
GD3000-□-500G-12	*	25006-00440	FLT-P12400H-B	FLT-L12400H-B
GD3000-□-630G-12	*	25006-00440	FLT-P12400H-B	FLT-L12400H-B
GD3000-□-800G-12	*	25006-00434	FLT-P12800H-B	FLT-L12800H-B
GD3000-□-1000G-12	*	25006-00434	FLT-P12800H-B	FLT-L12800H-B



Filter



Reactor

1. The filter is selected according to the corresponding model or rated current in the table. If the inverter is from other manufacturers, adjust and select according to the rated current.
2. "*" indicates standard, without the need of independent selection.

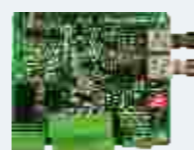
Accessory Selection-Filter, Reactor

Filter, Reactor Selection Table

Product model	Input reactor	Output reactor	Input filter	Output filter
2-quadrant inverters □ indicates 00/01/05 series, can share parameters				
GD3000-□-055G-12	25006-00298	25006-00395	FLT-P1250H-B	FLT-L1250H-B
GD3000-□-075G-12	25006-00298	25006-00395	FLT-P1250H-B	FLT-L1250H-B
GD3000-□-090G-12	25006-00298	25006-00395	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-110G-12	25006-00298	25006-00395	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-132G-12	25006-00438	25006-00072	FLT-P12100H-B	FLT-L12100H-B
GD3000-□-160G-12	25006-00438	25006-00072	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-200G-12	25006-00438	25006-00072	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-250G-12	25006-00210	25006-00431	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-315G-12	25006-00210	25006-00431	FLT-P12200H-B	FLT-L12200H-B
GD3000-□-400G-12	25006-00210	25006-00431	FLT-P12300H-B	FLT-L12300H-B
GD3000-□-500G-12	25006-00441	25006-00440	FLT-P12400H-B	FLT-L12400H-B
GD3000-□-630G-12	25006-00441	25006-00440	FLT-P12400H-B	FLT-L12400H-B
GD3000-□-800G-12	25006-00435	25006-00434	FLT-P12800H-B	FLT-L12800H-B
GD3000-□-1000G-12	25006-00435	25006-00434	FLT-P12800H-B	FLT-L12800H-B

Accessory Selection-Extension Card

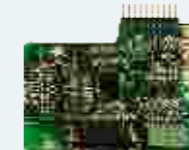
Name	Model	Order No.	Description
General extension card	EC-ZH100-05	17001-01520	I/O interface: (DI*2, HDI*1, HDO*1) Relay output interface*1 CAN communication interface Optical fiber communication interface Motor temperature detection interface (PT100/PT1000)
Incremental encoder card	EC-PG101-05	11023-00014	5V incremental ABZ encoder, support differential input, Max. 200kHz;
	EC-PG101-12	11023-00003	12V-15V incremental ABZ encoder, support differential, OC and push-pull input, Max. 100kHz;
	EC-PG101-24	11023-00004	24V incremental ABZ encoder, support differential, OC and push-pull input, Max. 100kHz;
Rotary encoder card	EC-PG104-05	11023-00009	Support pulse/direction differential input, Max. 500kHz, support 5V differential frequency division output
Communication extension card	EC-TX103	11023-00001	PROFIBUS + Ethernet
	EC-TX105	11023-00013	CANOPEN + Ethernet



General extension card



Incremental encoder card



Rotary encoder card



Communication extension card

Leakage current lock and components of discharge circuit

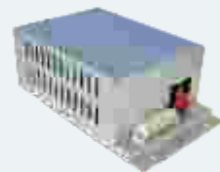
conform with 1140V/660V safety standards, lock with the input power supply and detect the grounding impedance of the inverter output to ensure the reliability .



Selection to the voltage		
Voltage degree	With package	Without package
660V	LFD-10-06-A	LFD-00-06-A
1140V	LFD-10-12-A	LFD-00-12-A

Components of the fan protection circuit

be developed independently to protect the components from phase loss, overtemperature, overcurrent and so on .



Fan selection to the power		
Fan quantity*power	Model with package	Model without package
1*0.25kW	FB-R25-4D-A-1	FB-R25-4D-A-0
2*0.25kW	FB-R25-4S-A-1	FB-R25-4S-A-0
1*0.55kW	FB-R55-4D-A-1	FB-R55-4D-A-0
1*1.1kW	FB-1R1-4D-A-1	FB-1R1-4D-A-0
2*1.1kW	FB-1R1-4S-A-1	FB-1R1-4S-A-0

Intrinsic safety circuit modules

Intrinsic safety circuit modules are combined by our own intrinsic safety power supply and IS series safety barriers, easy to select

Application range: general for all series			
Model	Channels	Performance parameters	Remark
IS-AS-EX	Switch input: 4 Switch output:1 Analog input:1 Analog output:1	Analog input Signal at dangerous side (0-10v/0-20mA) Signal at safe side (0-10v) Analog output Signal at dangerous side (0-10v/0-20mA)	Including intrinsic safety power supply
IS-ASF-EX	Switch input: 4 Switch output:1 Analog input:1 Analog output:1 Frequency conversion:1	Signal at safe side (0-10v/0-20mA) Switch input: switch input, transistor input Switch output: collector output Frequency conversion Signal at dangerous side (frequency signal input) Signal at safe side (1-10v)	



Safety barriers

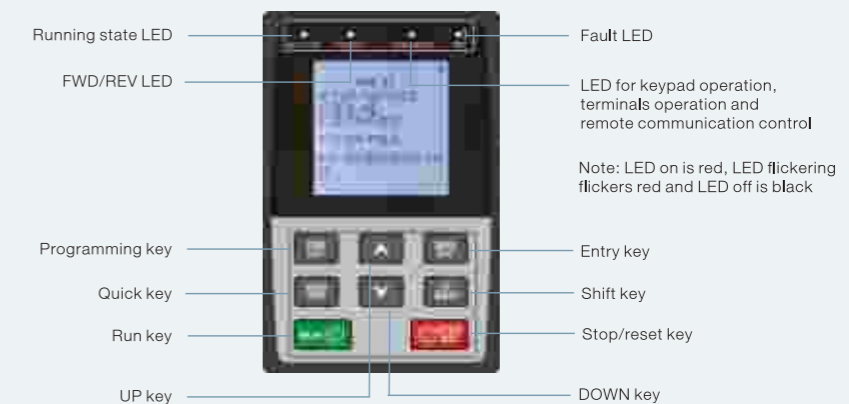
Our own isolated safety barriers are of high reliability and safety, have achieved explosion-proof certification and can be widely used in explosion-proof inverters.



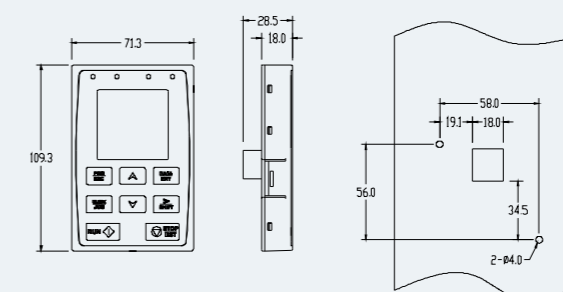
As a complement of intrinsic safety circuit modules, use with the modules		
Model	Channels	Performance parameters
IS-A2100-EX	Analog input:1 Analog output:1	Analog input: signal at dangerous side (0-10v/0-20mA) ; signal at safe side (0-10v) Analog output: signal at dangerous side (0-10v/0-20mA) ; signal at safe side (0-10v/0-20mA)
IS-S5000-EX	Switch input: 4 Switch output:1	Switch input: switch input, transistor input Switch output: collector output
IS-F1100-EX	Frequency conversion:1	Signal at dangerous side (frequency signal input) Signal at safe side (1-10v)

Keypad

Name	Model	Order No.	Selection	Description	Characteristics
LCD keypad	GD3000-LCD-REC	11022-00045	Standard	8 independent keys, 4 state LEDs	Easy to operate, Chinese-English display, 10-line high-definition display, parameter copy function, compatible with LED keypad in dimension
LED keypad	GD3000-LED-JP-05	11022-00017	Optional	8 independent keys, 1 digital potentiometer, 4 state LEDs, 3 unit LEDs	Easy to operate, 5-figure display, parameter copy function



LCD keypad (standard)



Note: LED keypad is compatible with LCD keypad in dimension.