CM680 SERIES

HIGH-PERFORMANCE
UNIVERSAL INVERTER

- BOOK-TYPE DESIGN
- MULTI-DRIVE & VERSATILE
- GREEN&HIGH-EFFICIENCY
- EASE OF USE AND RELIABILITY

CHANGSHA SUNYE ELECTRIC CO.,LTD.

COMPANY

INTRODUCTION

CHANGSHA SUNYE ELECTRICAL CO., LTD. (established in 2010) and Shenzhen Sunye Electrical Co., Ltd. (established in 2002) are national high-tech enterprises integrating the R&D, manufacturing, and sales of variable frequency drives, industry-specific all-in-one machines, servo drivers, and new energy products.

The company has purchased a land area of 30 acres in the National High-Tech Industrial Development Zone in Changsha to build its own industrial park with a total construction area of approximately 48,000 square meters. It boasts production lines and workshops covering 10,800 square meters, with an annual output value reaching up to 650 million yuan on average.

Sunye possesses independent intellectual property rights, with products passing national authoritative institution tests and certifications, obtaining multiple software copyrights and intellectual property certificates. Every year, a substantial amount of funds is invested in new technology and product R&D, with several patents or software copyrights being approved. The company owns core platform technologies such as construction hoist drivers, high-performance vector inverters, servos, and permanent magnet synchronous motor controls. Medium and low voltage inverters and servo drives are widely used in industries such as lifting machinery, stone processing, HVAC, machine tools, metal products, wire and cable, plastic packaging, printing and packaging, textile fiber, building materials, metallurgy, coal mines, municipal engineering, automotive, etc.

With the Sunye Industrial Park in Changsha as its R&D and production base and various offices as pivots, the company provides high-quality integrated services to customers across the country. Upholding the philosophy of "innovation, technology, strength," Sunye embodies the corporate spirit of "unity, progressiveness, pragmatism, innovation," adhering to the business principle of "sincerity and precision, coexistence of righteousness and profit," and follows the quality policy of "promoting total quality management and continuous quality improvement, striving for zero defects" to offer industry-leading products to customers.

Certificate of Quality Management system certification(ISO9001)

CE Certification Certificate

Over 100 patents have been granted in total

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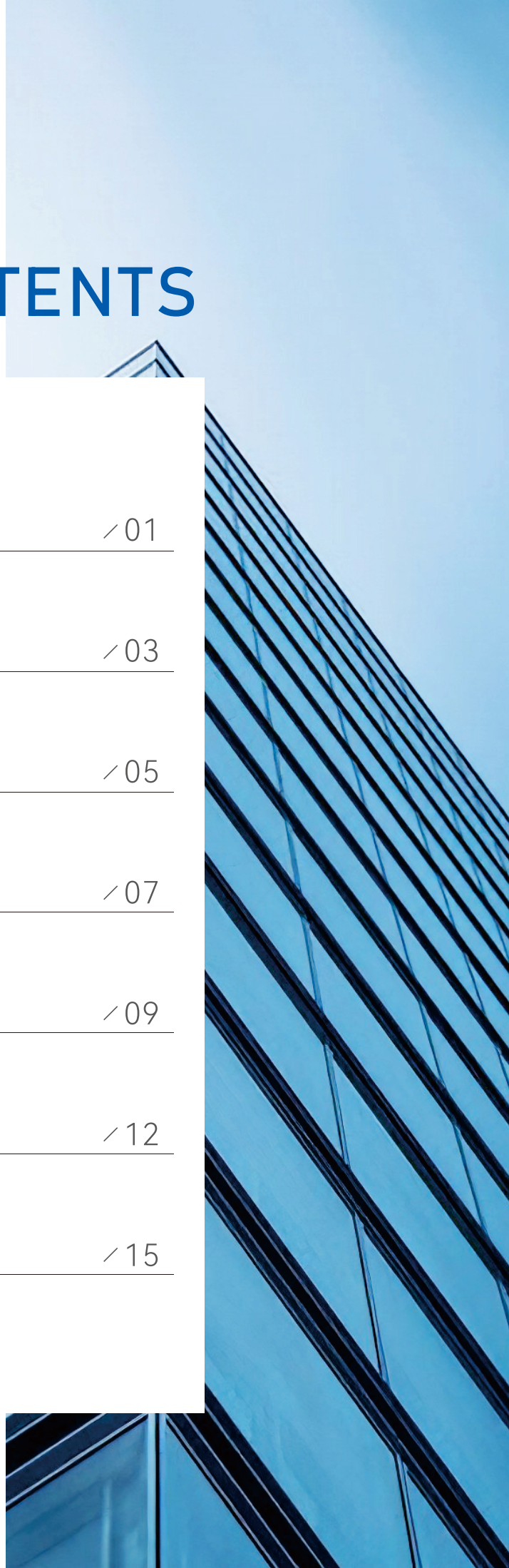
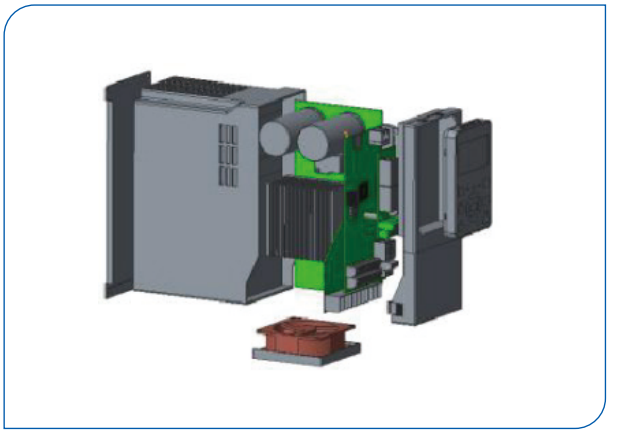


Book-type Design

All the CM680 VFDs are narrow-body devices(with the power density up by 20% and the footprint down by 30%)

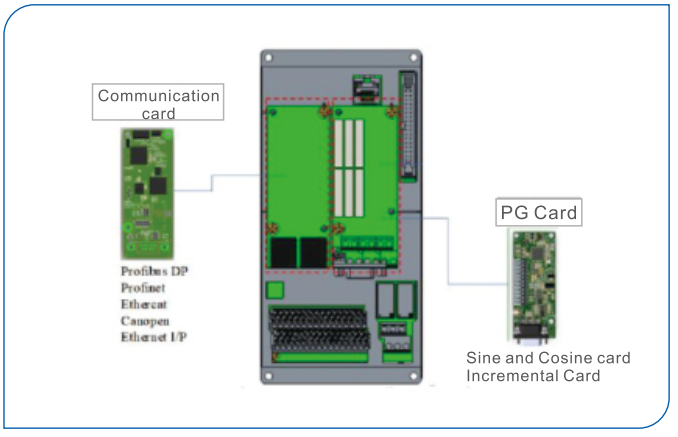
Each CM680 VFD has an independent vertical straight-through air duct for heat dissipation; multiple CM680 VFDs can be installed side by side to save the footprint



Multi-drive & Versatile

① Multiple motor control types such as SPM, IPM, SynRM, and IM are supported to meet the diversified motor needs of the customers

② Rich peripherals are available; multiple encoder cards, multiple bus cards (Profibus DP, CANopen, EtherCAT, Profinet, Ethernet IP, etc.), and multiple industrial application macros are supported; friendly human-machine interaction is provided



Green & High-efficiency

① Automatic energy saving control: it can improve the control efficiency for no-load motors in fans and water pumps and their no-load current values can be reduced by 30%

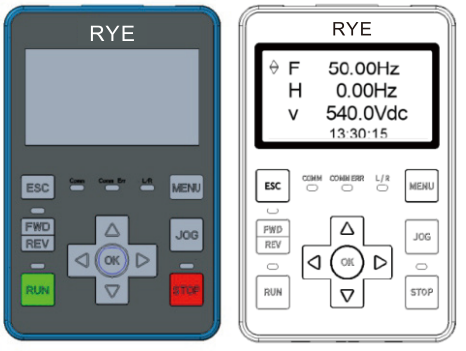
② Energy recovery control: the deceleration time can be shortened to increase the operational efficiency

Ease of Use and Reliability

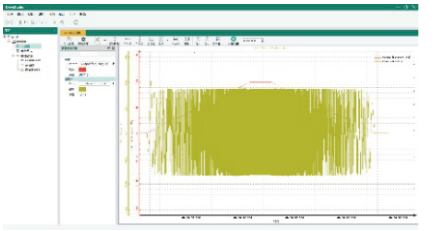
Standard-configuration LCD keypad; parameter classification; quick parameter copying; switching between Chinese and English interfaces

Monitoring software in host computer that monitors faults and the running status

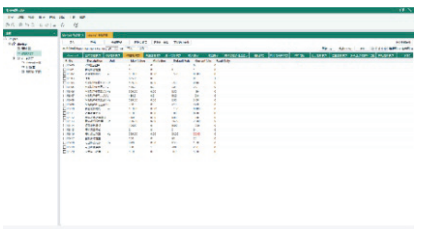
The STO safety protection function meeting the SIL2 safety design requirements is supported



LCD keypad



Monitoring software in host computer: waveform acquisition interface



Monitoring software in host computer: function code interface

VVC Control(Voltage Vector Control)

VVC control achieves precise regulation of motor torque and speed by adjusting the magnitude, frequency, and phase of the voltage vector. It is suitable for high-precision, high-dynamic, and complex working conditions.

Pumpjack Application

Ultra-fast Operational Capability

Ultra- low-speed operation: Supports open-loop zero-speed hovering of asynchronous motors and synchronous motors.

Ultra- high-speed operation: Default maximum frequency 599Hz, with support for higher frequencies (such as 2000Hz)It can be applied to industries such as fans, water pumps and cranes.

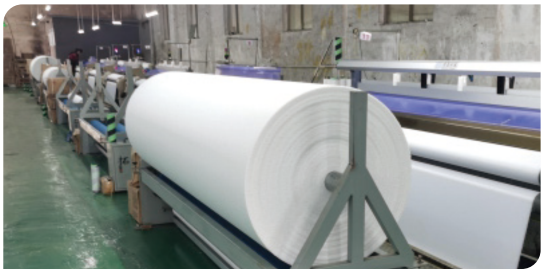
The high-speed mode can be applied to high-speed magnetic levitation fans

Tension Control

A tension control algorithm is embedded to eliminate the necessity of purchasing a tension controller when tension control is wanted

There are four available modes, including tension closed-loop speed mode, linear speed closed-loop speed mode, tension closed-loop torque mode, and tension open-loop torque mode

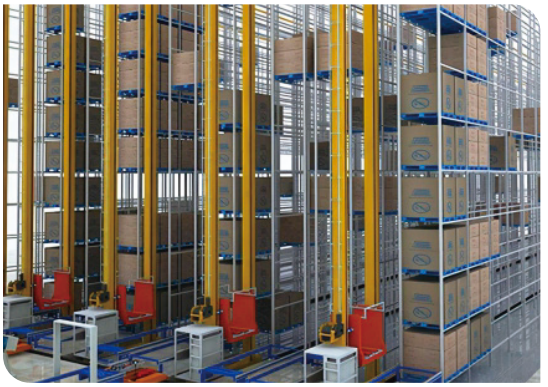
Tension control is implemented to allow the VFDs to be applicable for various relucance motors



Tension control is implemented to allow the VFDs to be applicable for rewinders

Position Control

① A position control algorithm, which incorporates two modes (homing and point-to-point ones), is embedded to provide the positioning function
② Point-to-point control: the location of the target is sent through communication, a pulse signal, etc. to implement the position control

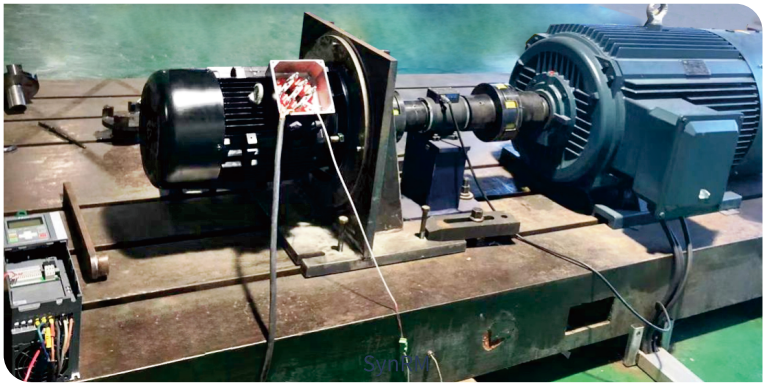


Position control is implemented to allow the VFDs to be applicable for various storage stackers

Position control is implemented to allow the VFDs to be applicable for various machine tools

Synchronous Reluctance Motor Control

①Synchronous reluctance motors feature high robustness, high reliability, high efficiency, energy saving, wide speed range, and easy maintenance
②Compared with a conventional AC asynchronous motor, a SynRM has a rotor without any winding; therefore, it has higher efficiency due to no rotor copper loss
③Compared with a permanent maanet motor, a SynR has no permanent magent and accordingly lower cost; due to easy flux weakening and no demagnetization risk, such motors are more stable and more reliable



The synchronous reluctance motor control is implemented to allow the VFDs to be applicable for various reluctance motors

CM680 – 4T 4R0 G B

Identification	Product name
CM	General-purpose VFD

Identification	Voltage level
4T	Three-phase 380V-480V

Identification	Power level (kW)
4R0	4.0
...	...
450	450

Identification	Output AC inductor
None	None
(-L)	Optional output AC inductor

Identification	Brake unit
None	None
B	w/a Brake unit
(B)	Optional Brake unit

Identification	Applicable motor type
G	Heavy-duty or over-duty motor

* Nameplate identification and product model

Description:

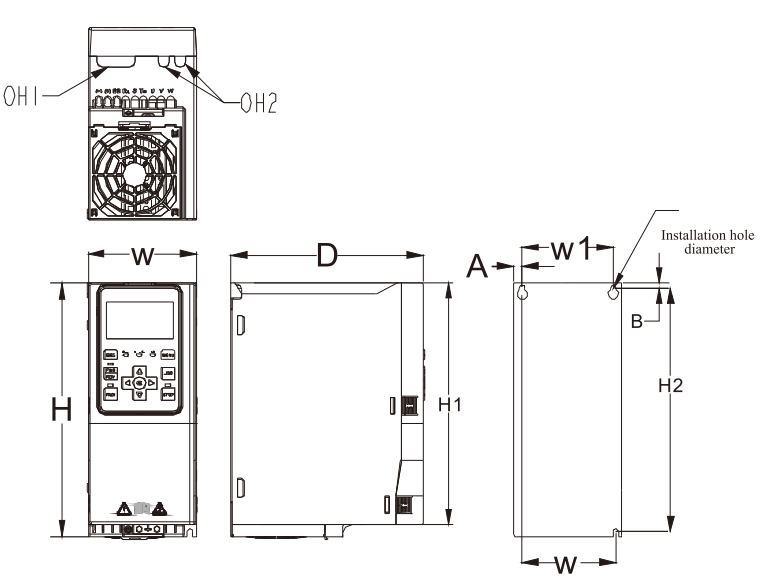
1.Three-phase 380V~480V,C2~C5 are not supported optional DC reactor; C6 and above are standard DC reactor.
2.Three-phase 380V~480V,C2~C4 are standard brake unit; C5~C7 are optional brake unit.
3.(-L) is an optional output AC reactor. C9 to C11 can be optionally equipped with a reactor base.

Models and Technical Parameters of CM680 VFDs

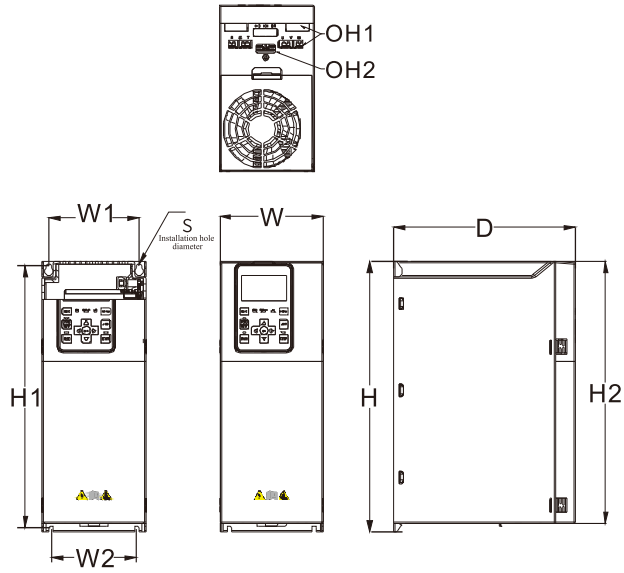
Identif-cation	VFD model	Input voltage(V)	Input current(A)	Output current(A)	Applicable motor(kW)
	CM680-4T4ROGB	Three-phase 380V-480V Range: -15%~+10%	11.4	9.0	4.0
C2	CM680-4T5R5GB		16.7	13.0	5.5
	CM680-4T7R5GB		21	17.0	7.5
C3	CM680-4T011GB		32	25.0	11.0
	CM680-4T015GB		41	32.0	15.0
	CM680-4T018GB		47	37.0	18.5
C4	CM680-4T022GB		56	45.0	22.0
	CM680-4T030GB		72	60.0	30.0
C5	CM680-4T037G(B)		88	75.0	37.0
	CM680-4T045G(B)		110	90.0	45.0
	CM680-4T055G(B)		106	110.0	55.0
C6	CM680-4T075G(B)		139	152.0	75.0
	CM680-4T093G(B)		165	176.0	93.0
C7	CM680-4T110G(B)		190	210.0	110.0
	CM680-4T132G(B)		230	253.0	132.0
C8	CM680-4T160G		276	304.0	160.0
	CM680-4T185G		314	340.0	185.0
	CM680-4T200G		346	380.0	200.0
C9	CM680-4T220G		380	426.0	220.0
	CM680-4T250G		435	465.0	250.0
	CM680-4T280G		478	520.0	280.0
C10	CM680-4T315G		534	585.0	315.0
	CM680-4T355G		598	650.0	355.0
C11	CM680-4T400G		672	725.0	400.0
	CM680-4T450G		742	820.0	450.0

	Item	Specification
Main control functions	Maximum output frequency	599.00Hz
	Carrier frequency	7.5kW and below:2kHz～15kHz 11kW～93kW:2kHz～10kHz 110kW～450kW:2kHz～6kHz Automatic carrier frequency adjustment can be done accordingto the load characteristics
	Input frequency resolution	Digital setting:0.01Hz; analog setting:maximum frequency×0.025%
	Control mode	Asynchronous motors:V/F,VVC,SVC,and FVC Permanent magnet motors:SVC,WC,and FVC
	Starting torque	SVC:150%;FVC:180%
	Speed regulation range	SVC:1:200;FVC:1:1000
	Speed stability accuracy	SVC:≤±0.5%; FVC:≤±0.02%
	Torque response	Torque step response < 20ms
	Torque accuracy	SVC:±10%; FVC:±5%
	Overload capacity	150%of rated current(60s)
	Torque boost	Automatic and manual torque boost modes are included
	V/F curve	Multi-point V/F curve;1.5-power V/F curve;square V/F curve
	Acceleration and deceleration curve	Linear or S-shaped acceleration/deceleration modes:there are four groupsof acceleration/deceleration time values Acceleration/ deceleration time range:0.00s～600.00s or 0.0s～6000.0s
	DC braking	Start DC braking and shutdown DC braking are included (0.0s～60.0s)
	Jog control	Jog frequency range:0.00Hz～599.00Hz; Jog acceleration/deceleration time range:0.00s～600.00s or 0.0s～6000.0s
	Tension control	Four control modes are included:tension closed-loop speed mode,linear speed closed-loop speed mode,tension closed-loop torque mode,and tension open-loop torque mode
	Multi-speed running	Up to 16-speed running can be realized through terminals
	Built-in PID	Can easily realize closed-loop process control
Personal-ized functions	Peripheral safety self-test	A safety test is performed on the peripherals to timely identify any problems,such as agrounding problem orashort-circuit,and improve the reliability of the system
	Common DC busbar function	A common DC bus can be shared by multiple VFDS
	JOG key	The JOG key on the operation panel can be used forjog running

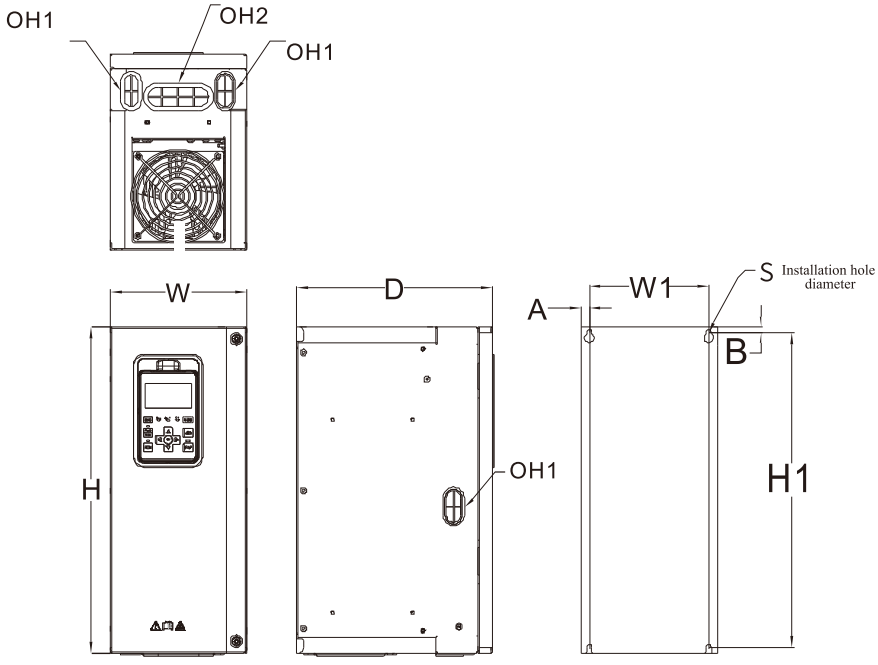
Item		Specification
Personalized function	Fast current limiting function	A quick current limiting algorithm is embedded to reduce the probability that an overcurrent fault happens to the VFD
	Motor parameter identification	Automatic motor parameteridentification
	Standardized panel extension cable	A constant voltage output can be maintained in case of grid voltage variations
	Communication buses	Support at least five types (Profnet/IP, CANopen, Profibus-DP, EtherCAT, Ethernet)
	Expansion function	I/O expansion card;Multiple bus communication expansion cards;PG cards(incremental sin/cos encoder cards)
	STO	Safe torque off in case of emergency
Operation	Frequency sources	Multiple frequency setting sources:operation panel setting,analog setting,control terminal setting,communication setting,etc.
	Auxiliary frequency sources	Multiple auxiliary frequency sources:operation panel setting, analogsetting,control terminal setting,communication setting,etc.;auxiliary frequency fine tuning and synthesis can be flexibly realized
	Universal terminals	Eight DI terminals (one high-speed terminal),three DO terminals(one high-speed terminal),and two relay output terminals,-Three AI terminals(one supporting PT100),two AO terminals,two STOterminals,and one RS485 terminal
	Automatic acceleration/ deceleration	Automatic acceleration/deceleration time adjustment basedon the load torque
Display and panel operation	LCD display	Chinese and English are supported
	LCD parameter copying	Quick parameter copying can be accomplished on the LCD panel
Protections and options	Protection functions	Motor short-circuit detection,input/output phase loss protection,overcurrent protection,overvoltage protection,undervoltage protection,overtemperature protection,overload protection,etc.
	Options	Brake assembly
Environment	Use place	Indoor, free from direct sunlight, dust,corrosive gas, flammable gas, oil mist, water vapour,dripping water or salt, etc.
	Altitude	No derating is required for use below 1000m. For altitudes above 1000m, derating is 1% or 5 degree centigrade for every 100m increase. The maximum operating altitude is 2000m. Please contact the manufacturer if the altitude exceeds 2000m.
	Ambient temperature	'-10°C～50°C (C26IEC61800-5-1:2017When the ambient temperature is above 40 °C, the derating rate is reduced by 2% for every 1 °C increase)
	Humidity	<95%(RH),w/o water droplets
	Vibration	<5.9m/s^2(0.6g)
	Storage temperature	-20°C～+60°C
	Pollution degree	2
	Protection degree	IP20
Product standards	Applied safety standard	IEC61800-5-1:2017
	Applied EMC standard	IEC61800-3:2018



(C2 ~ C3) 380V(4T) Schematic diagram of the plastics shell installation dimensions under 15kW



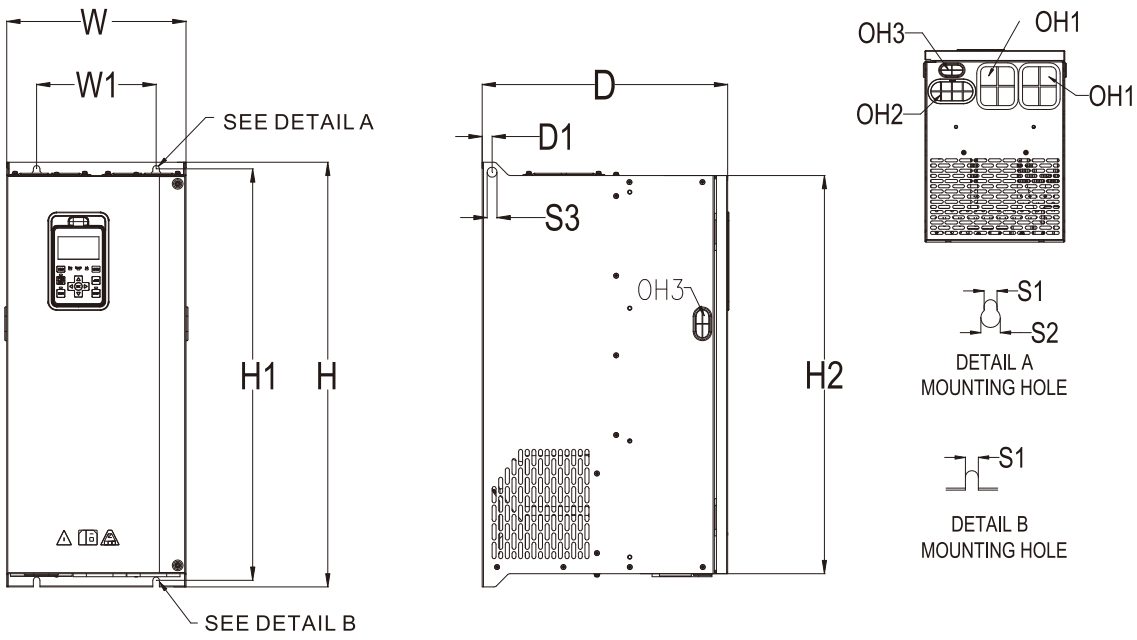
(C4) 380V(4T) Schematic Diagram of the Plastic shell Installation Dimensions of 18.5 to 30 kW



(C5) 380V(4T) Schematic Diagram of the Sheet Metal Chassis Installation Dimensions of 37 to 45 kW

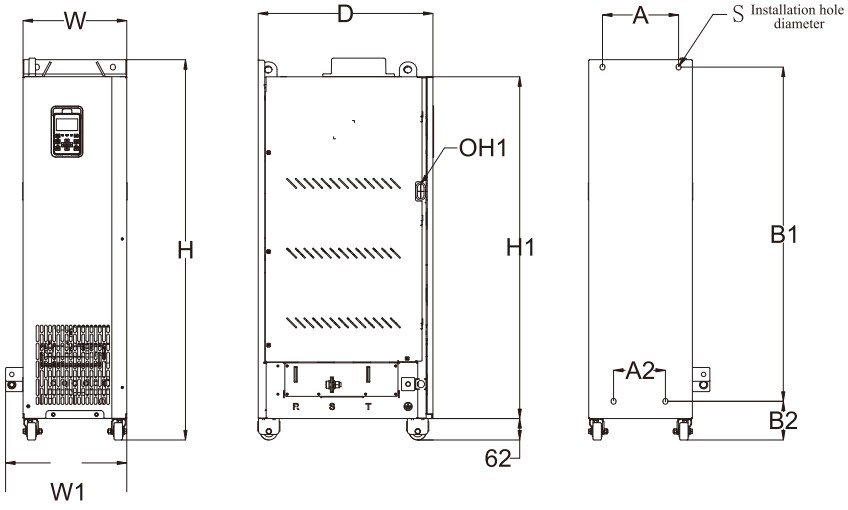
The external dimensions and installation hole position dimensions of CM680(C2~C5) (mm)

Structure	W	W1	W2	H	H1	H2	D	B	S Installation hole diameter	OH1 (Wiring hole)	OH2 (Wiring hole)	Net weight
C2	100	84	86	235	224	225	178	5	5	35*10	10*10	2kg
C3	118	100	102	320	307	308	200	6	6	35*10	10*10	3.5kg
C4	140	122	115	365	354	354	245	5.5	6	36*12	30*12	6kg
C5	180	158	×	430	416	×	260	7.5	7	46*23	85*30	13kg



(C6 ~ C8) 380V(4T) Schematic Diagram of the Installation Dimensions of 55 to 185kW

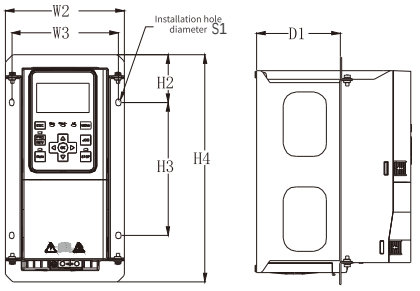
Structure	W	W1	H	H1	H2	D	D1	Installation hole diameter S1	S2	S3	OH1	OH2	OH3	Net weight
C6	250	170	593	573	553	362	15	9	14	15	70*80	Φ30	46*23	47.5kg
C7	270	180	640	620	600	370	15	10	15	15	70*80	85*38	46*23	49.5kg
C8	290	190	780	764	730	425	17.5	9	14	15	70*80	85*38	46*23	80.5kg



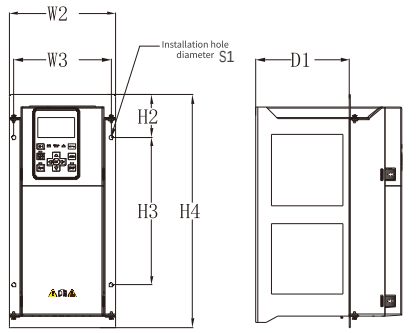
(C9 ~ C11) 380V(4T) Schematic Diagram of the Installation Dimensions of 200 to 450kW

Structure	W	H	W1	D	H1	A1	B1	B2	A2	OH1	Installation hole diameter S	Net weight
C9	300	1101	350	506	990	220	968	112	150	46*23	14*17	121.5kg
C10	340	1248	390	545	1135	246	1111	115	147	46*23	17*20	167.5kg
C11	340	1389	400	545	1286	246	1262	115	180	46*23	17*20	207.5kg

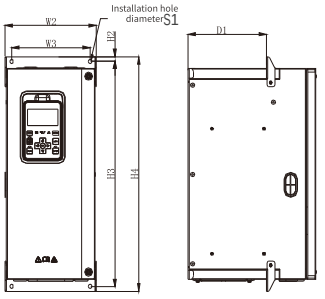
Wall-penetrating installation dimensions（C2-C8）



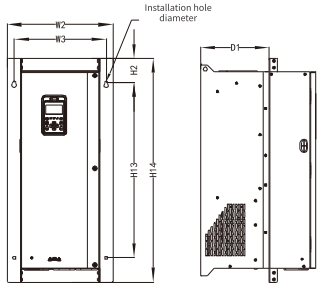
（C2—C3）The dimensions of the wall-penetrating installation holes for CM680 VFDs under 15kW



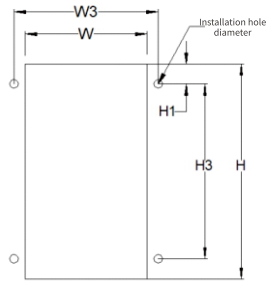
（C4）The dimensions of the wall-penetrating installation holes for CM680 VFDs 18.5 ~ 30kW



（C5）The dimensions of the wall-penetrating installation holes for CM680 VFDs 37 ~ 45kW

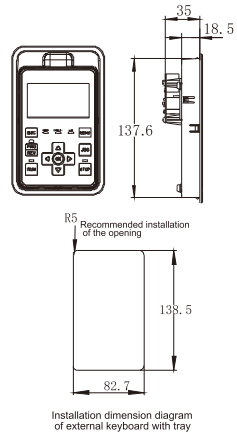


（C6—C8）The dimensions of the wall-penetrating installation holes for CM680 VFDs 55~ 185kW



Wall-penetrating installation diagram

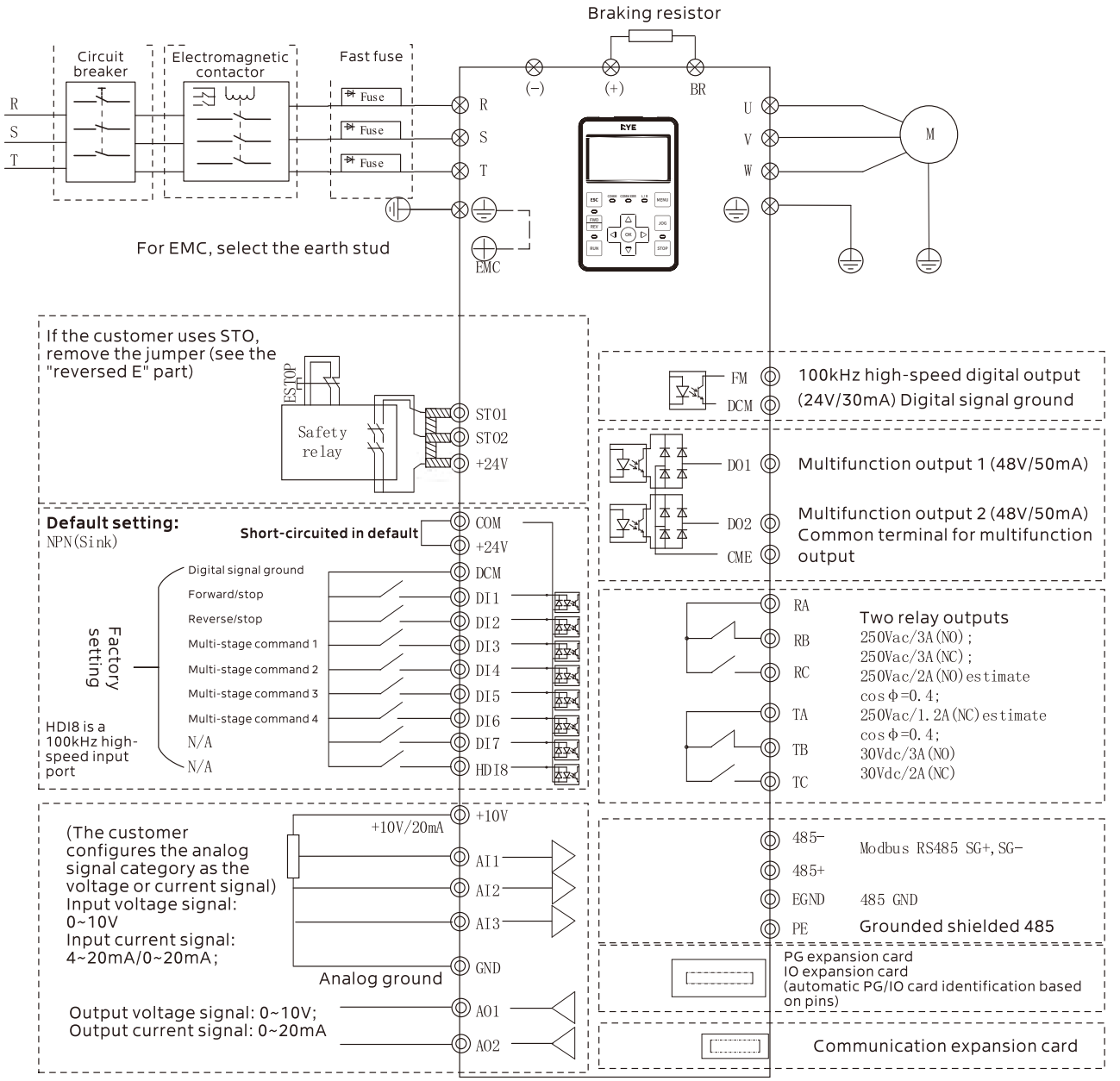
External keyboard installation dimension diagram



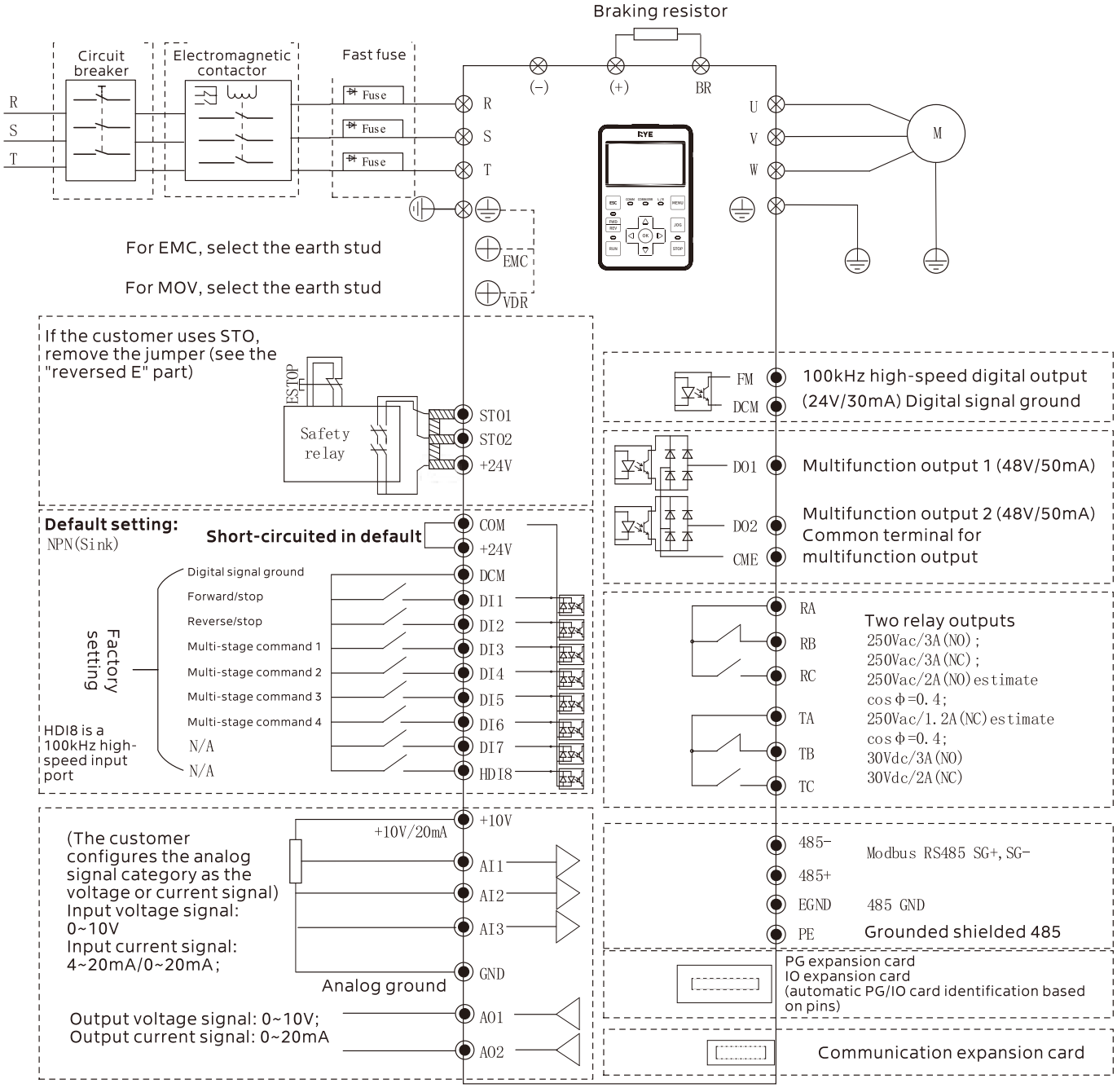
The Dimensions of the Wall-penetrating Installation Holes for CM680 VFDs under 185kW

Model	Installation hole position			The through-wall opening size		Installation hole diameter
	W3(mm)	H1(mm)	H3(mm)	H(mm)	W(mm)	S1(mm)
CM680-4T4R0GB	124	41.5	155	241	108	φ5
CM680-4T5R5GB						
CM680-4T7R5GB						
CM680-4T011GB	142	43.5	240	327	126	φ6
CM680-4T015GB						
CM680-4T018GB	165	53.5	250	368	148	φ7
CM680-4T022GB						
CM680-4T030GB						
CM680-4T037GB CM680-4T037G	160	11	458	440	185	φ7
CM680-4T045GB CM680-4T045G						
CM680-4T055GB CM680-4T055G	287	22	553	597	254	φ10
CM680-4T075GB CM680-4T075G						
CM680-4T093GB CM680-4T093G						
CM680-4T110GB CM680-4T110G	300	72	500	644	274	φ10
CM680-4T132GB CM680-4T132G						
CM680-4T160G	330	67	650	784	294	φ10
CM680-4T185G						

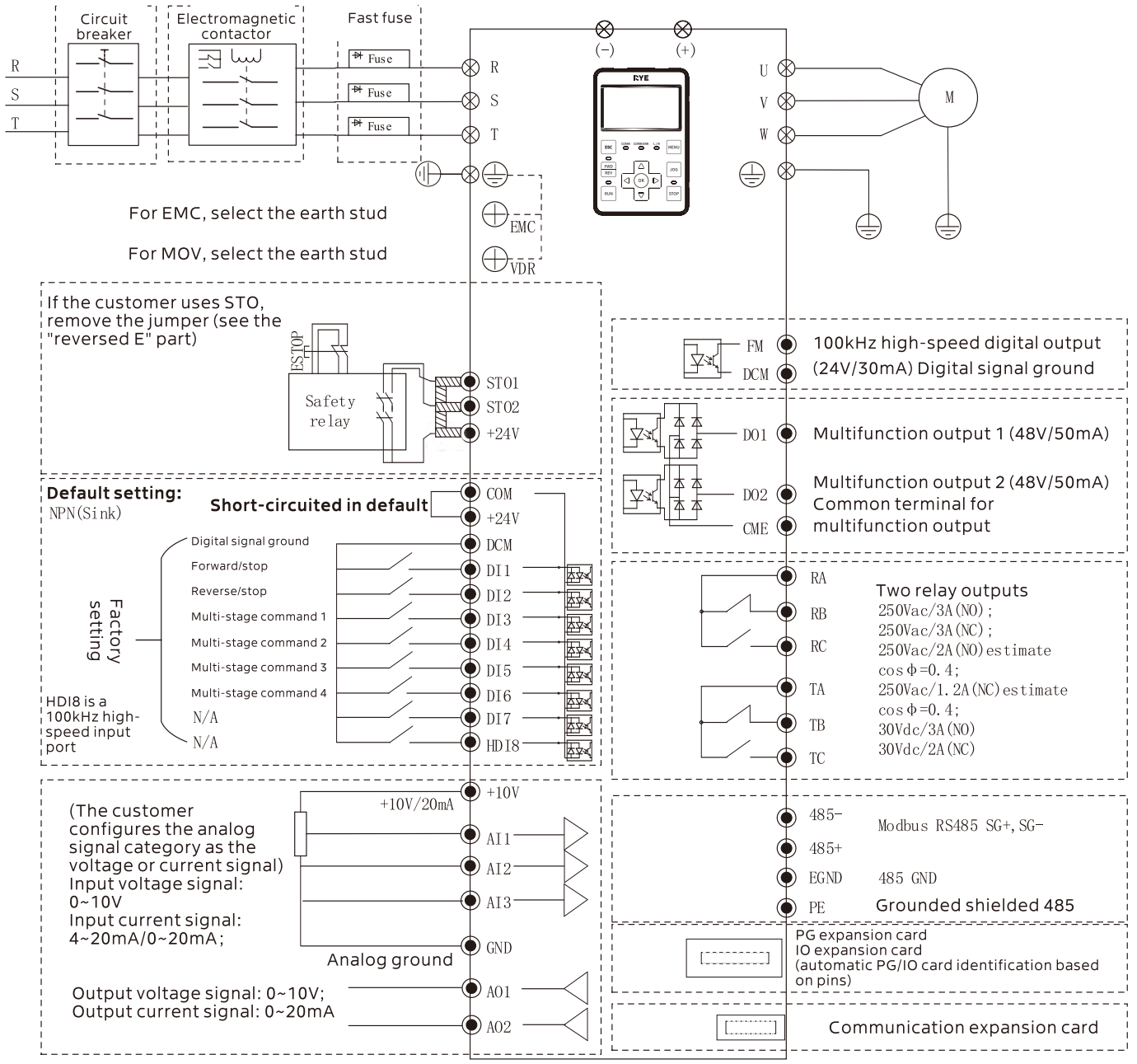
4.0kW~7.5kW Three-phase VFDs



11kW~132kW Three-phase VFDs



160kW~450kW Three-phase VFDs



Inductors (Input DC Inductor and Output AC Inductor)

① Input DC inductor: improves the input-side power factor of the VFD and suppresses higher harmonic currents

② Output AC inductor: increases the effective transmission distance of the VFD suppresses output harmonic currents, increases the output high-frequency impedance, and effectively suppresses dv/dt.

Input DC inductor

Output AC inductor

Braking Resistor

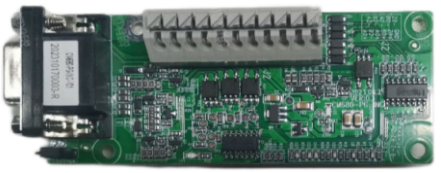
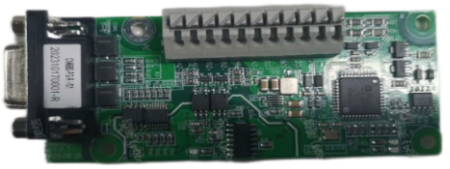
The resistance is used to consume the regenerated energy of the motor so as to shorten the deceleration time; for ⩽ 30kW CM680 series VFDs, the resistance is a standard-configuration part; for 37kW~132kW CM680 seriesVFDs, the resistance is an optional part

EMC Filter

Input filter: suppresses the pulses from the VFD through the input power cable Electromagnetic interferences into a public power grid

Install the filter as close as possible to the input terminal of the VFD

Functional module expansion cards

Type	Model	Description	
Encoder card	EMH-PG1	ABZ encoder card	
	EMH-PG2	Rotary encoder card	
commu-nication bus card	EMH-OP	CANopen communication expansion card	
	EMH-DP	PROFIBUS-DP communication expansion card	
	EMH-PN	PROFINET Industrial Ethernet commu-nication expan-sion card	
	EMH-EN	EtherNet/IP Industrial Ethernet commu-nication expan-sion card	
	EMH-EC	EtherCAT Indus-trial Ethernet communication expansion card	

The appearance, color, and parameters of the products listed in this book are for reference only. The actual products provided by the company shall prevail.
The company reserves the right to modify or cancel the parameters and information in this book at any time without prior notice.
The company reserves the final right of interpretation for this manual.

Official Public Account

Official Website

CHANGSHA SUNYE ELECTRIC CO.,LTD.

HotLine:0731-89932666 400-0755-731
E-mail : Sales@cssunye.com; info@cssunye.com
WhatsAPP:+8619317463675 / +8613868795229
Address : No.669, xinsheng road, yuelu district, changsha city, china
Website :www.cssunye.com en.cssunye.com