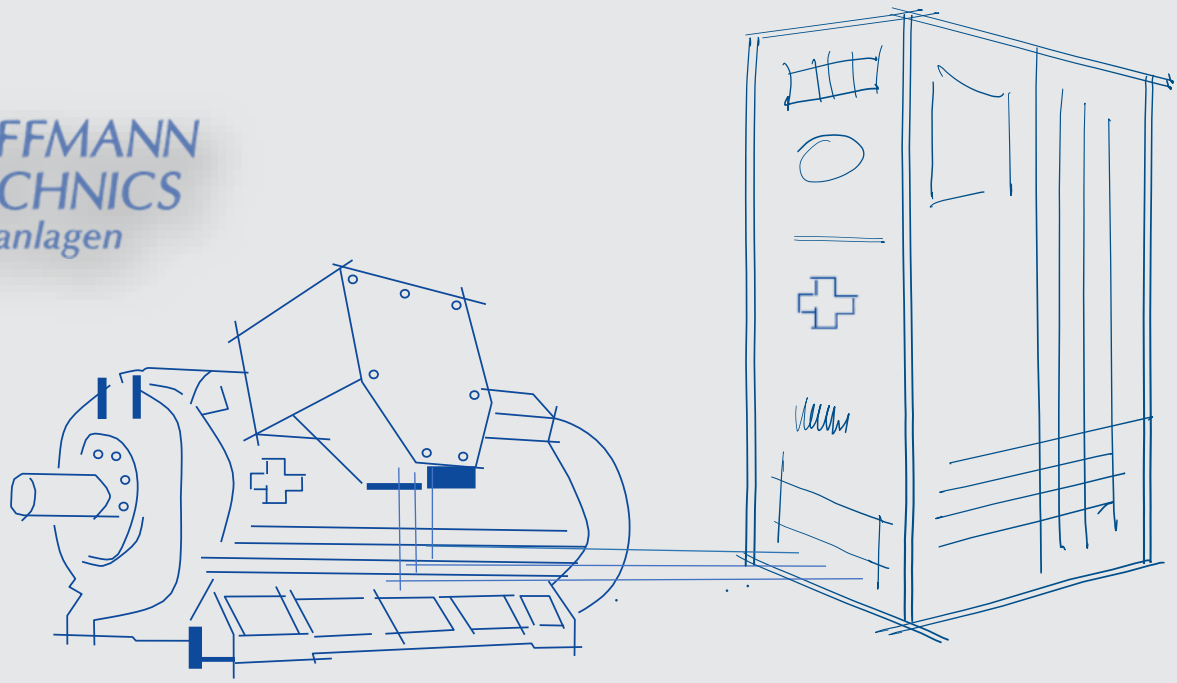
General Catalogue

MVS Series

Medium Voltage Soft Starter

Everything turns around quality



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About Us

We are an electric drive manufacturer established in 1958, offering over 60 years of experience in the electric drive field, producing low and high voltage three phase induction-asynchronous motors, synchronous motors explosion-proof motors, slip-ring motors, DC motors as well as medium voltage variable frequency drives and, soft starters, we also produce gearboxes and gearbox motors. All our products are conforming to the international standards concerning its parameters and dimensions. Products are manufactured according to the IEC standards and the ISO quality control regulations

Our electric drives and equipment are produced with a selection of the best quality components available to reach the top parameters with a high efficiency and energy savings.

Based on transmission electronic control technology, intelligent power distribution technology, data communication technology and information engineering technology, the company developed a batch of proprietary technology and fully integrated solution in industrial energy saving and intelligent manufacturing field. At present, the company has been awarded a total of 15 national patents, including 3 invention patents, 12 utility model patents. In addition, it has obtained 34 items of software copyright as well as 10 items of non-patented technology. In recent years, oriented by market applications, the company has established an integration of application systems based on the aforementioned patented technology platform, developed a series of industrial electric energy-saving system solutions as well as energy management system platform solutions with unique characteristics, and furthermore deeply developed industrial 4.0 digital factory intelligent manufacturing solution.

The business of the company mainly covers large energy industry enterprises in petrochemical industry, aviation equipment, ferrous metallurgy, coal mining, new energy power and so on. Relying on the advanced technology and products, as well as the close strategic cooperation with Siemens, ABB, GE and other excellent suppliers at home and abroad, the company has supplied various kinds of efficient electrical energy-saving system solutions and energy management system platform solutions for hundreds of domestic and foreign companies over the years.

After many years' development, the company has possessed systematic design ability, system integration, project implementation and O&M service ability on fully integrated solutions specific to diversified fields, Under the overall background of manufacturing globalization, as well as transformation from large-scale to efficiency, Hoffmann Technnics has been increasing independent innovation capability, promoting fully integrated digital solutions, and developing to high-end service provider of digital factory intelligent manufacturing solutions through capitalization operation, integration of human resources and scientific and technological innovation acceleration.

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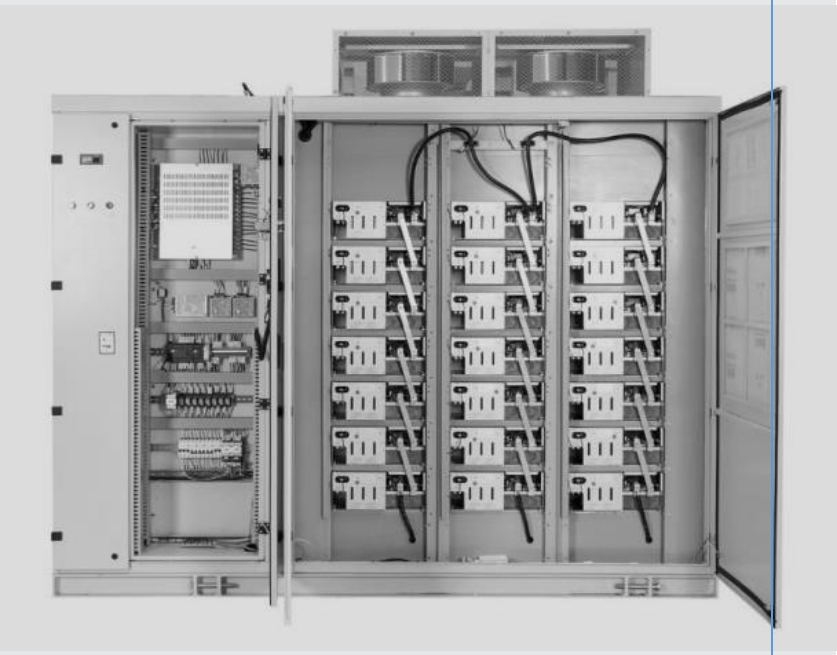
Prolog

Hoffmann's Medium Voltage Soft Starter is a new high-tech electrical equipment, designed based on the third generation DSP and modern power electronic control technology. The equipment is specialized for medium voltage large electrical machine, offer optimal soft starter method for voltage reduction and current-limiting.

Product Feature:

Hoffmann MVS series, a digital micro computerized soft starter for medium-voltage AC motor, which uses advanced single chip microcomputer, PLC controller, coloured man-machine interface touch screen, high voltage semiconductor power electronic devices and modern control technology to form a new type of solid state product to start and to protect the running of high voltage motor. In addition to the excellent starting function.

This product also has complete comprehensive protection function for the motor running, which can ensure that electrical and mechanical rotating equipment operates safely and reliably at various circumstances. Compared with other types of high voltage motor soft starter (such as liquid resistance type), soft starter costs less energy in the process of starting. Therefore it has obvious energy saving effect, and can be started frequently. At the same time, since soft starter is a solid state device, it can work for a long-term without maintenance, small in size, easy to move, having good vibration resistance and other significant advantages.



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Various starting method:

1. Initial voltage of starting can be set flexibly according to the actual situation and demand of the equipment. The lowest set point is 15% of the supply voltage, the highest is 90%.Thus the motor has a larger starting torque and smaller starting current which reduces the requirement of power grid capacity required by equipment operation and saves the investment of related equipment. It reduce the impact stress to motor itself and to transmission machinery which can prolong the service life of motor and transmission machinery.

2. The initial start voltage, start time and starting current limit can be set in the upper part of the colour LCD touch screen, while the soft stop deceleration time can be freely set according to the requirements of the load characteristics, in order to meet the soft start and stop working conditions of various equipment and motors.

3. Multiple starting modes (reduced voltage starting and constant current starting) can be used to satisfy the possible demands of all kinds of equipment's starting.

4. Complete motor running protection function, to ensure the equipment's safe operation, with its protective functions as :
   A. Alarm for over voltage of input power supply
   B. Alarm for under voltage of input power supply
   C. Alarm for phase loss of input power supply
   D. Alarm for motor overload by inverse time protection
   E. Alarm for current imbalance of MV motor
   F. Alarm for excess startup time of the motor
   G. Alarm for the bypass contactor fault
   H. Alarm for residual current of the equipment
   I. Alarm and display for short circuited SCR of three-phase main line
   J. Alarm for instantaneous trip caused by short circuit (which can be calibrated as 0.1-2.5 times current of CT scale)

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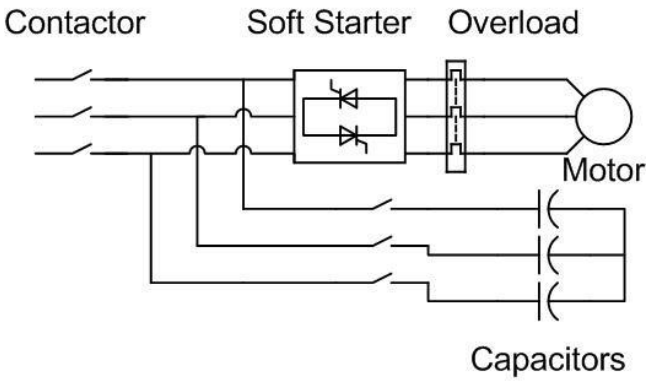
5. During the operation soft starter displays: three-phase current of motor, the residual current of the line and motor, the voltage of power supply, and the accumulated run time of the motor. Not being affected by power loss, it's easy to learn about the equipment's total run time and to conduct regular maintenance.

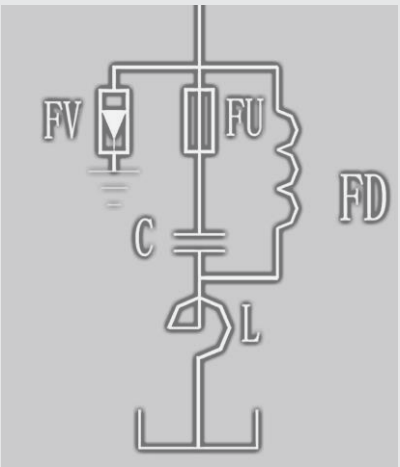
6. The running parameters are all displayed on coloured HMI with English text, which is easy to set parameters. It can provide Profibus-DP communication interface according to user's requirements, to communicate with remote monitor computer's networking of higher level, and to realize the remote control.

Power factor compensation

Solid state power factor compensation capacitor banks available as optional. The static PFC application can be integrated to the soft starter cabinet (limited power range) or can be supply with separated cabinet from the soft starter.

Static Power Factor correction capacitors are connected indirect to the busduct of the soft starter. In case that the soft starter is used, the capacitors are controlled by a separate contactor. The capacitor contactor is only switched on when the soft starter output voltage has reached line voltage.





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Main applications

Heavy industrial applications:

- Crusher, Grinder, Escalator
- Gas pump, Heat pump, Centrifugal pump
- Elevating gear, mine lifting

Pumps:

- Reduced starting current, no pulse reflection.
- Minimised hydraulic shock in pipelines and inside the pump during start and stop.
- Minimised mechanical stress on motor shaft.

Conveyor belts:

- Controlled soft start without mechanical shocks, e.g. bottles on a belt do not fall over during starting, minimised belt stretch, reduced counterbalance stress.
- Controlled stop without mechanical shock (soft stop).
- Optimum start performance even with varying starting loads (e.g. coal conveyors start loaded or unloaded).
- Extended mechanical lifetime.

Compressors and fans

- Reduced mechanical shock extends the life of the compressor, couplings and motor.
- Limited start current enables large compressors and large fans to be started when maximum power capacity is limited.
- Extends coupling life time of the fan drive.
- Phase rotation protection prevents operation in reverse direction.

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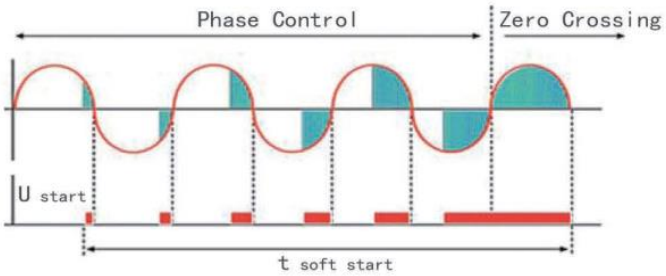
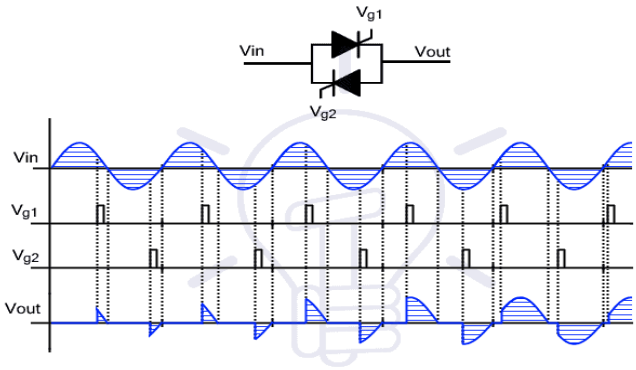
Technical introduction

Utilizing the controllable conduction feature of thyristors and combine microelectronic technique the actual effective voltage value on motor stator is modified by controlling the thyristor's conduction angle (α), thus the motor starting current is reduced. Through phase control, the terminal voltage of the motor increases from setting start value to system supply voltage. In this manner, an optimal adjustment of starting current and starting torque is achieve according to drive condition.





MVS Technical features	MVS performance features	MVS Control Circuit
Patented electronic voltage measurement	Soft starter/soft stop	Multifunction programmable input/output (I/O)
Patented power unit structure design	Current-limiting, optimized torque and current control	Optoelectronic isolation controllable input
Innovative low voltage motor measurement	Pump control, pulse snap back starting	Three relay output 8A/250VAC - starting immediately - stop accelerate - fault can be programmed to "trip" or "safety trip"
Independent trigger test	Double adjustments: start/stop two different electrical performance motor or double speed motor	
Optical fiber trigger control system design		
Isolation between high voltage and low voltage control circuits	Compressor starting	
Perfect motor protection, high cost performance		0/4-20mA, 0-10VDC analog output
Easy installation and maintenance		

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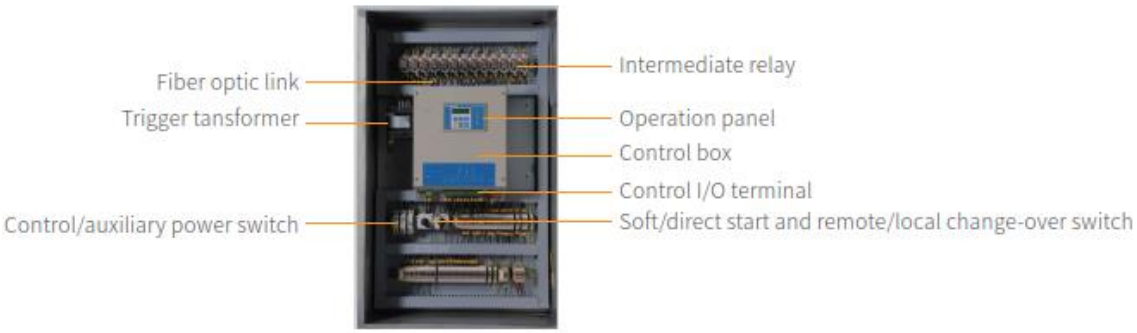
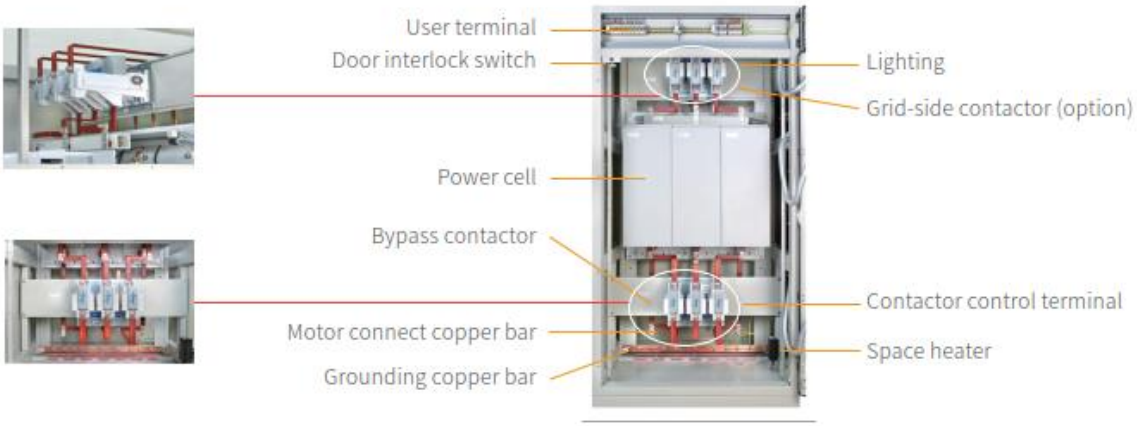
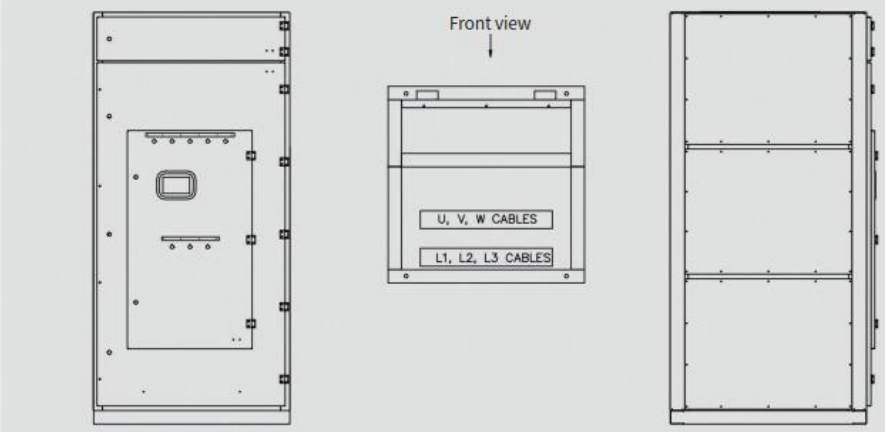
Product composition

Low voltage compartment (standard configuration)



Medium voltage compartment





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Technical Features

Basic information	
Load type	Three-phase medium voltage squirrel-cage asynchronous motor, synchronous motor
AC Voltage	3kV, 3.3kV, 6kV, 6.6kV, 10kV ,11kV,13.8kV AC -10%~+10%
Frequency	50/60±2Hz
Main circuit	12SCRS、18SCRS、30SCRS、36SCRS (depends on model)
SCR reverse peak voltage	13000V~39000V（depends on model）
Phase sequence	Allow operation in all phase
Instant overvoltage protection	du/dt absorb network
Cooling	Air cooling
Bypass	Equip direct starting capacity bypass vacuum contactor, when rated current over 400A use stationary disconnector.
Working condition	-10 ºC~+50 ºC
	Altitude <1000m (5%~95% relative humidity); altitude>1000m (derating)
Control power supply	110-240V + 10%/-15%, 50/60 Hz (standard)
	110-220VDC (optional)
Assistant relay	3 line dry contact 8A, 250V, 2000VA relay, function respectively are:
	- Immediately relay (when soft starter send signal, contactor location changed)
	- Fault relay (open when fault occurrence)
	- Starting over relay (when starting over, after 0-120s delayed, contactor location changed

Motor Protection	
Overload	Inverse time limit, current range: 75%-150%
	Trip delayed: 1-10s
Current unbalance	Unbalance trip standard: 10-100% any two phases
	Trip delayed: 1-60s
Overcurrent	Range: 100%-850%FLA, trip delayed: 0-5s
Undercurrent	Range: 20%-90%FLA, trip delayed：1-40s
Overvoltage	Range: 110%-125%Un (line voltage)
	Delayed: 1-10s
Under/no voltage	Under voltage range: 50%-90% Un（line voltage)
	Under voltage delayed: 1-10s， no voltage delayed: 0-120s
Phase lose	Trip delayed: 0-120s
Ground fault	Fault current range: 10%-100%FLA
	Ground trip delayed: 1-60s
Overlong starting time	Trip when starting time over setting value range: 1-250s
Over temperature	Trip when power cell over temperature
Power on but unstart	Trip when main circuit power on 30s but no starting signal
Deceleration time	Trip when two starting intervals less setting time
	Setting time: 0-90s
Number of starts/hr	Range: <= 6 times

Serial Interface	
Communication protocol	MODBUS 1）
Communication interface	RS485
Functions	Parameter setting, running data and condition monitoring.

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Motor Power Range	Soft Starter Type（3.3/4.16KV)	Thyristor Current（A）	Bypass Type	Weight（Kg）	Dimension(mm)
0-500KW	MVS1000-4-500	400	Contactor	700kg	1000*1500*2300
501-1000KW	MVS1000-4-1000	400	Contactor	700kg	1000*1500*2300
1001-1600KW	MVS1000-4-1600	800	Contactor	720kg	1000*1500*2300
1601-2000KW	MVS1000-4-2000	800	Circuit Breaker	750kg	1000*1500*2300
2001-2500KW	MVS1000-4-2500	1200	Circuit Breaker	850kg	1400*1650*2300
2501-3150KW	MVS1000-4-3150	1200	Circuit Breaker	850kg	1400*1650*2300
3151-3500KW	MVS1000-4-3600	1900	Circuit Breaker	950kg	1600*1700*2300
3501-4000KW	MVS1000-4-4000	2800	Circuit Breaker	1200kg	1600*1700*2300

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Motor Power Range	Soft Starter Type（6/6.6KV)	Thyristor Current（A）	Bypass Type	Weight（Kg）	Dimension(mm)
0-500KW	MVS1000-7.2-500	400	Contactor	720kg	1000*1500*2300
501-1000KW	MVS1000-7.2-1000	400	Contactor	720kg	1000*1500*2300
1001-1600KW	MVS1000-7.2-1600	800	Contactor	750kg	1000*1500*2300
1601-2000KW	MVS1000-7.2-2000	800	Contactor	750kg	1000*1500*2300
2001-2500KW	MVS1000-7.2-2500	1200	Contactor	800kg	1400*1650*2300
2501-3150KW	MVS1000-7.2-3150	1200	Circuit Breaker	850kg	1400*1650*2300
3151-3500KW	MVS1000-7.2-3600	1900	Circuit Breaker	950kg	1600*1700*2300
3501-4000KW	MVS1000-7.2-4000	1900	Circuit Breaker	950kg	1600*1700*2300
4001-5000KW	MVS1000-7.2-5000	1900	Circuit Breaker	950kg	1600*1700*2300
5001-6300KW	MVS1000-7.2-6300	2800	Circuit Breaker	1200kg	1600*1700*2300

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Motor Power Range	Soft Starter Type（10/11KV)	Thyristor Current（A）	Bypass Type	Weight（Kg）	Dimension(mm)
0-500KW	MVS1000-12-500	400	Contactor	750kg	1000*1500*2300
501-1000KW	MVS1000-12-1000/	400	Contactor	750kg	1000*1500*2300
1001-1600KW	MVS1000-12-1600	400	Contactor	750kg	1000*1500*2300
1601-2000KW	MVS1000-12--2000	800	Contactor	800kg	1000*1500*2300
2001-2500KW	MVS1000-12--2500	800	Contactor	800kg	1000*1500*2300
2501-3150KW	MVS1000-12-3150	800	Contactor	800kg	1000*1500*2300
3151-3500KW	MVS1000-12-3600	800	Circuit Breaker	850kg	1000*1500*2300
3501-4000KW	MVS1000-12-4000	1200	Circuit Breaker	950kg	1400*1650*2300
4001-5000KW	MVS1000-12-5000	1200	Circuit Breaker	950kg	1400*1650*2300
5001-6300KW	MVS1000-12-6300	1900	Circuit Breaker	1200kg	1600*1700*2300
6301-8000KW	MVS1000-12-8000	1900	Circuit Breaker	1200kg	1600*1700*2300
8001-10000KW	MVS1000-12-10000	2800	Circuit Breaker	1500kg	1600*1700*2300

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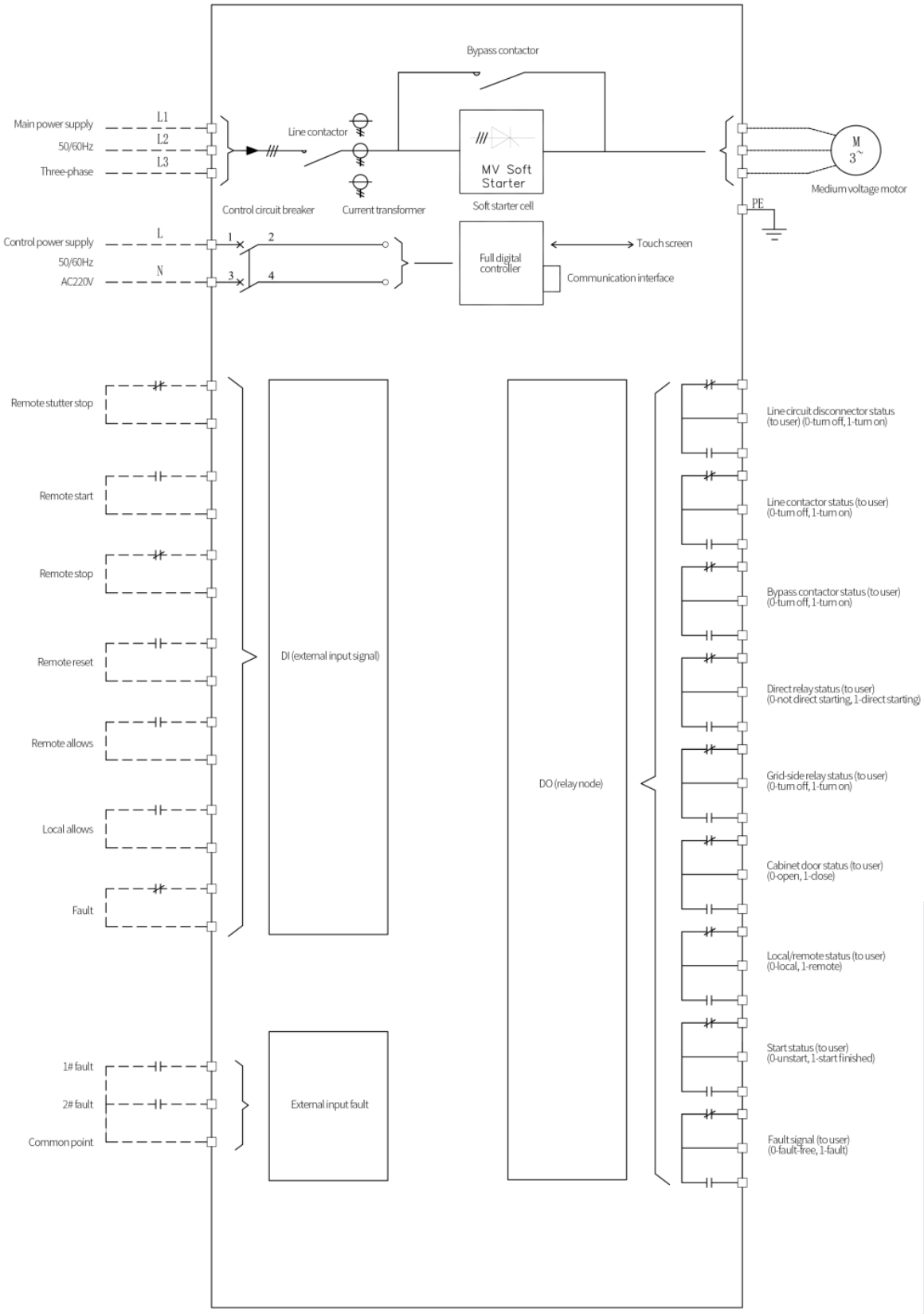
Standard Wiring Diagram



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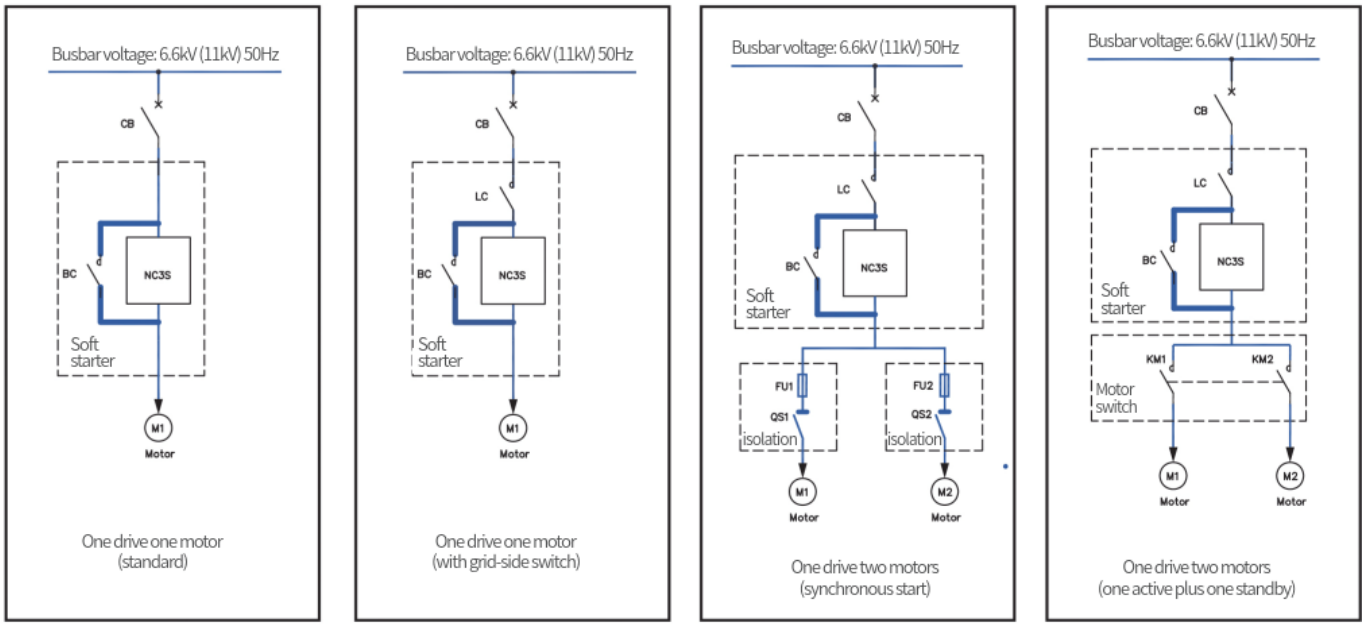
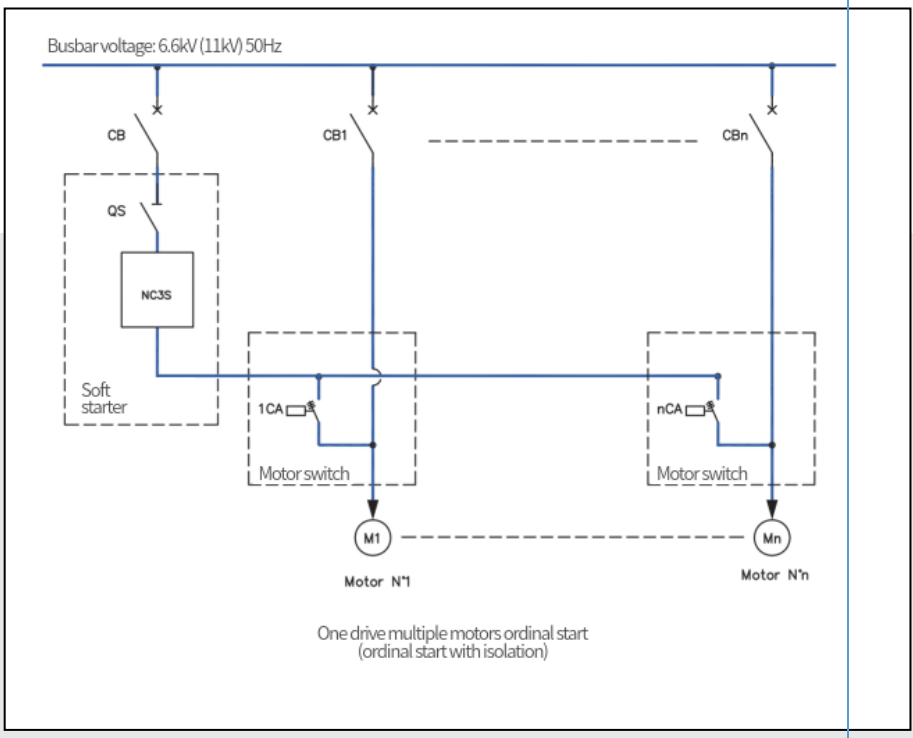
Various Primary System Diagrams



Description:

1.CB, CB1…CBn are mains side high voltage vacuum circuit disconnector (user supplied)
2.Supply scope in the dotted box
3.LC is grid-side contactor within cabinet
4.BC is bypass contactor within cabinet
5. FU1, FU2: high voltage fuse; QS1, QS2: high voltage disconnection switch
6. QS: inlet wire disconnection switch
7. KM1, KM2: motor switch contactor
8. N: number of motors



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Why HOFFMANN Technics?

30 years market experiences

Competitive price
Competitive delivery time

Tailor made and customized solutions

International references and experiences

High Efficiency
Low cost operation

Professional Engineering and After sales team

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Hoffmann advantages

Highly customized:

Hoffmann Technics AG recommend the most suitable configurations according to the application requirements, we supply highly customized products.
Input & Output voltage
Input & Output frequency
Output current
Hundreds of options

Hoffmann's advanced technologies:

Low harmonic
High Power factor
Low du/dt
Strong overload capacity
Enhanced spinning load capacity
Resonance avoidance
Automatically derate according to the altitude and temperature

Reasonable and reliable design:

Mini-series (800kw@6.6kV, 1400Kw@11kV)
Compact design, high power density, compared with world top class brands, Hoffmann Soft starters have 10-15% smaller size.
Core PCB is a single six-layer type one, single board means better EMC performance, less dust, less heating, less point of failure.

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