RENLE

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雷诺尔公众服务号

RENLE

Professional manufacturer of
Smart Grid · New Energy · Electric Drive

MV/ HV
SOLID SOFT STARTER

SUMMARY OF A SERIES
OF PRODUCT

Technical innovation benefits the world

Stock Code : 833586

雷诺尔

Shanghai RENLE
Science&Technology Co., Ltd.

Professional Manufacturer of Intelligent Grid and New Energy

Shanghai RENLE Science&Technology Co., Ltd.

Shanghai RENLE Science & Technology Co., Ltd is located in the High & New Technology Industrial Park of Jiading District, Shanghai, China. The company covers a total area of 100,000 square meters, including 85,000 square meters of workshops. Its products include HV/LV motor soft starter, HV/ LV frequency inverter, intelligent electricals, new-energy electricals, HV/LV complete equipment for electric power transmission distribution and so on. Its products are widely used in electric power, metallurgy, petroleum chemistry, military industry, mining, chemical industry, construction, light industry, pharmaceuticals, municipal construction, textile printing and dyeing, papermaking, rubber and plastic, electrified railway construction and other industries. Its products sell well in many countries and regions of the world.

The company products are used in many projects, such as Expo 2010 Shanghai China, 2008 Beijing Olympic Games, Yangshan Deepwater Port Project of Shanghai International Shipping Center, Shanghai Pudong Airport, Shanghai Hongqiao Airport, the Three Gorges Project, Gansu Satellite Launching Center,

Catalogue

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RNMZ Handcart Series
MV/ HV Solid Soft-Starting Device

P10–P12

RNMV-E Type (Handcart)
MV/ HV Solid Soft Starter

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RNMV-E Type (Regular)
MV/ HV Solid Soft Starter

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RNMV-KY Type (Ordinary Mining Type)
MV/ HV Solid Soft Starter

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RNMV-G Type
MV/ HV Solid Soft Starter

Introduction of MV/HV Solid Soft Starter

As an intelligent control device with international advanced level, MV/HV solid soft starter conducts an intelligent control of HV electrical equipment in smooth starting, parking, safety protection and monitoring. Its products include RNMZ handcart series MV/HV solid soft-starting device, RNMV-E Type MV/ HV Solid Soft Starter, RNMV-G MV/ HV Solid Soft Starter, RNMV-KY Ordinary Mine Type MV/ HV Solid Soft Starter and others.

Electrical Features

A qualified controlling system passed through the strict test of Electro Magnetic Compatibility, processes with a high anti-electromagnetic interference performance; has fully independent intellectual properties in soft starter controlling technology; is capable of providing free service for users in upgrading software control systems to ensure an advance place of its products and technology.

Negative feedback function: it adopts the dynamic fuzzy control concept to automatically adjust motor ' s starting time and torque according to the size of load torques, realizing smooth acceleration in motor. When motor speed reaches the rated working level, the bypass contactor shall automatically pull in, which solves an unmatched problem between man-made starting curve and load torque curve. Also known as a unique feature in MV/HV solid soft starter cabinet of our company compared to domestic peers.

Strong load adaptability, and has 3 ways of starting and controlling mode:

Current-limiting start: In starting, the current shall accelerate to a limited value, until the motor runs in full speed;

Voltage ramp start: a voltage ramp with current limiting function according to factory defaults shall be used in most occasions. The original value of torque shall be set to the one happens to drive the load before a smooth increase in voltage. The motor gets a smooth rise to full-speed operation in limited ramp time and starting current.

Pulse kick-start: it is mainly used in heavy load.

An option between free parking and soft parking: it can be used in many parking occasions, for example, erase a water hammer effect of the pump to meet special needs;

Text display function: a wide choice of all kinds of working conditions and languages displayed in LCD screen, both programming and faults shall be explanatory noted for easy operation.

System communication function: it has inbuilt communication ports. It enables the RS-485 and multipoint communication (an option between the communication protocol Modbus and Profibus) in remote terminals communicate directly with the upper PC machine to realize telecontrol, remote message and other functions.

Implementation of standards

- GB 311, 1-1997 Insulation coordination for high voltage transmission and distribution equipment
- GB3906-2006 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5 kV
- GB/T 13422-1992 Semiconductor converters—Electrical test methods
- GB/T 3859.1-1993 Semiconductor convertors—Specification of basic requirements
- GB/T 3859, 2-1993 Semiconductor convertors—Application guide
- GB 4208-2008 Degrees of protection provided by enclosure (IP code)
- IEC-60298 Alternating-current metal-enclosed switchgear and controlgear for rated voltages of 1kV ~ 52 kV
- IEC 60470 High-voltage alternating current contactors
- IEC 61000 Electromagnetic compatibility (EMC)
- JB/Z102 Special environment condition—Technical requirements of high-voltage apparatuses for plateau
- GB/T 11022-1989 Common specifications for high-voltage switchgear and controlgear standards

Implementation of standards of RNMV-KY Ordinary Mining HV Soft-Start Controller

- GB/T 12173-2008 Mining electrical apparatus for nonhazardous area
- JB/T 10251-2001 AC Power & Electronic Motor Soft Starters
- GB/T 3859, 1-1993 Semiconductor convertors-Specification of basic requirements
- GB/T 3797-2005 Electrical control assemblies
- DLT 593-2006 Common specifications for high-voltage switchgear and controlgear standards
- DLT 404-2007 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5 kV
- GB/T 14808-2001 High-voltage alternating current contactors and contactor-based motor starters
- GB 1207-2006 Inductive voltage transformers
- GB 1208-2006 Current transformer

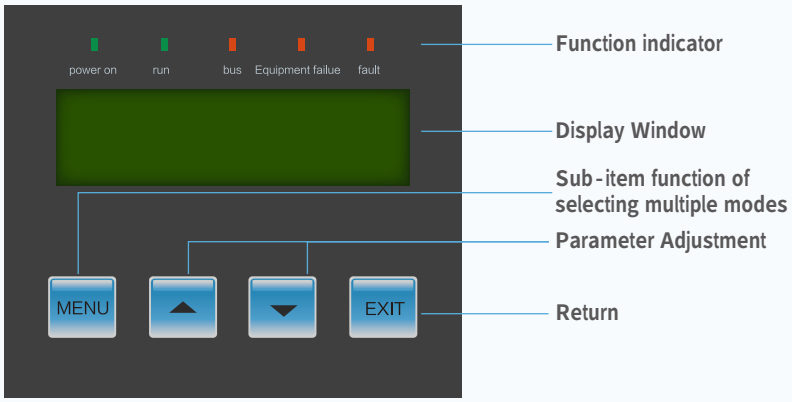
Applications

It is widely used in the squirrel-cage AC asynchronous and synchronous motors of power system, machinery manufacturing, cement production, metallurgy, mining, oil extraction, chemical industry, water treatment and others. It is used for MV/ HV motor start, control, protect and soft-stop as three phase voltage of 3KV~10KV.

Service Environment (Industry Standard and Environment Parameters)

- Ambient air temperature: no more than +50°C, and the average temperature in 24 hours shall be no higher than +45°C and no lower than -20°C. With clean air and a relative humidity of no more than 50% in the highest temperature of +50°C, and a relative higher humidity in lower temperature, for example, 90% of humidity in an no condensation environment of +20°C.
- An altitude of no more than 2000m, otherwise an extra agreement shall be made.
- It shall be used in places of no fire, explosion, heavy dust, chemical corrosion or violent shocks;
- The soft starting device shall be delivered and stored in the following temperature: -25°C~+55°C, no more than +70°Cin less than 24 hours. (If the above conditions of use failed to be satisfied, the user shall negotiate with the manufacturer.)

Human-machine Interface



➢ Abundant operating languages:

In order to benefit users in their using habits and operations, RENLE Company especially designs the humane operation interface displayed in both Chinese and English.

Operation Interface	
LCD display	A LCD operation interface displayed in both Chinese and English
Keyboard	4 Touch buttons used for programming and parameter setting
Status display	5 LED lights of power display, starting operation, bus, device fault and motor fault
Serial Interface	
Communication protocol	A choice between Modbus and Profibus
Communication Port	RS-485
Function	Observe the running status, control the motor start and stop, etc.

Technical index

Main technical indexes in unique function	
Load type	Three-phased squirrel-cage AC asynchronous and synchronous motors
AC voltage	3kV, 3.3kV, 6kV, 6.6kV, 10kV AC-15%~+10%
Insulation voltage	Line voltage: 3000V, 6000V, 10000V
	Insulation voltage: 18000V, 25000V, 42000V
Overload capacity	Continuity: 125% of controller nominal value
	Overload: 500% 60 Seconds
Frequency	50Hz/60Hz±2Hz Auto choice
Main circuit Components	(12 SCRS, 18SCRS OR 30SCRS Depends on the models)
SCR Peak reverse voltage	13000V~32500V(Decided by model)
Phase sequence	RNMV is allowed to operate under any phase and sequence
Instantaneous overvoltage protection	dv/dt Absorb network
Cooling	Natural cooling
Bypass	It has the bypass vacuum contactor which can directly start capacity. When the rated current is over 450A, fixed vacuum circuit breaker shall be adopted.
Ambient Conditions	Cabinet temperature: 0°C~50°C(32°C-122°C); Base temperature 0°C-50°C, (-20°C-50°C an option of a heater)
	Altitude of no more than 2000 meters, a relative humidity of 5%-95%; reduced capacity shall be adopted for the altitude of over 2000 meters.
Control way	The user provides 2 or 3 line of 220 VAC or 220VDC, 1000VA.
Auxiliary relay	C-type dry relay, 5-10A 250V, one programmable interlock relay, one bypass relay, one fault output
	Relay
Motor Protection	
Current	Two-phase timing, inverse-time limit over-current protection (limiting time quick-acting relay, limited to Type G, over-current)
	Two-phase negative sequence timing, inverse-time over-current protection (negative sequence limiting time quick-acting relay, limited to Type G, negative sequence over-current)
Overload	Motor shaft lock protection & Overload alarm
Temperature	Protection from the temperature relay (Over temperature & temperature rise)
Protection for soft-start	
Temperature	Protection for the SCR components; it shall trip when the temperature is higher than 85°C.
Protection for over-time starting	It shall trip when the starting time is more than 120 seconds.
Input Phase Loss	Any one loss in the three-phase power shall cause motor failure and alarm.
Starting times in an hour	No than 6 times of starting in an hour; minimum starting interval: 5 minutes

RNMZ Handcart Series

MV/ HV Solid Soft Starter

Product Overview

A complete RNMZ includes power module, control module, thyristor module, motor protection module, communication module and so on.

The control core of RNMZ series product is microprocessor (CPU), which starts and protects the motor.

CPU controls the SCR to conduct phase angle trigger control, lowering the voltage on motor, then controls the voltage on motor and increases the motor torque of the smooth current until motor runs in full speed. The above way of starting can lower the inrush current of motor, reducing the impact on power grid and motor itself. Meanwhile, it also reduces the mechanical impacts on motor loading device, prolonging device service life and reducing motor breakdown.

Model Explanation

RNMZ — □ □ – □

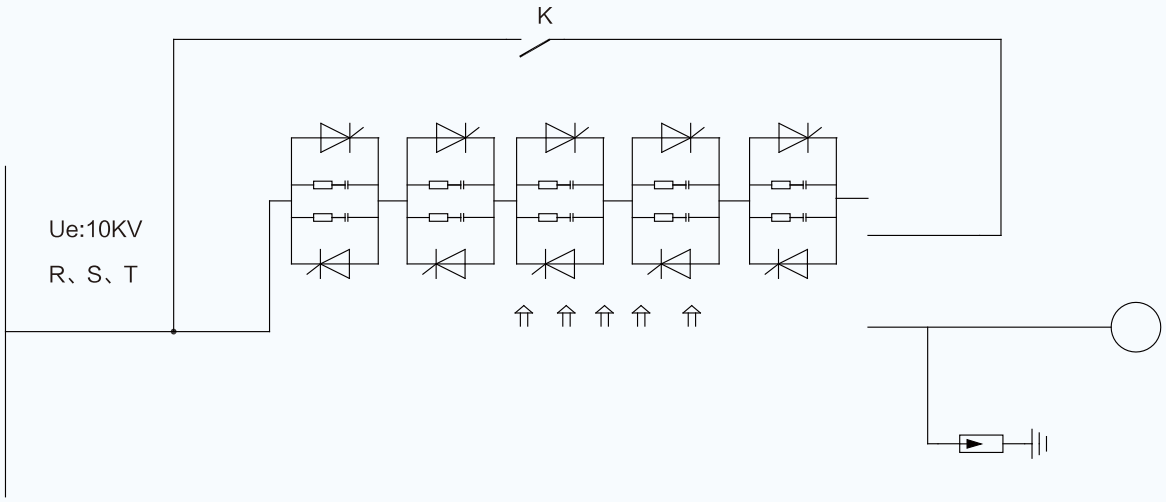
- Blank (No bus) /M (modbus)/ P (profibus)
- Current level Note 1
- Voltage level Note 2
- Code for RENLE ' s starting device: Handcart HV/ MV Solid Soft Starting Device Series

Remark:

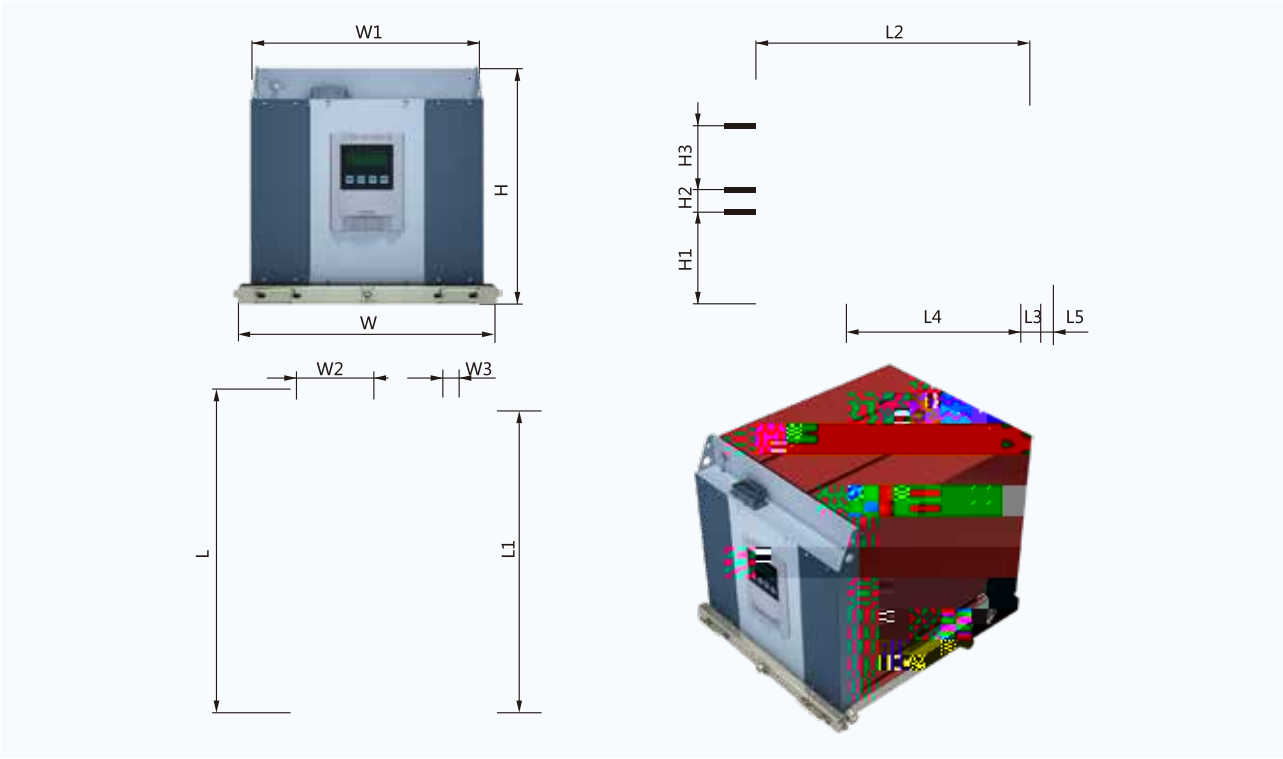
Soft starting device current level: 120A, 230A, 370A

Soft starting device voltage level: (-15%-+10%)

Nominal value	30	33	60	66	100
Application range	3KV	3.3KV	6KV	6.6KV	10KV


K
Ue:10KV
R、S、T

Product Overview



Model	Size (mm)													
	W	W1	W2	W3	L	L1	L2	L3	L4	L5	H	H1	H2	H3
Z1	652	600	194	40	765.5	745	714.5	55	450	32.7	615	195	60	274
Z2	652	600	194	40	865.5	845	814.5	55	530	32.7	615	195	60	274

Model Selection Table for RNMZ Handcart MV/ HV Solid Soft Starting Device

Physical Structure	Product Model	Current Level +8% (A)	Voltage Level (KV)	Maximum Adaptive Motor Power (KW)
Z1	RNMZ-30120-M/P	120	3	550
	RNMZ-33120-M/P		3.3	600
	RNMZ-60120-M/P		6	1150
	RNMZ-66120-M/P		6.6	1200
	RNMZ-100120-M/P		10	1850
	RNMZ-30230-M/P	230	3	1050
	RNMZ-33230-M/P		3.3	1150
	RNMZ-60230-M/P		6	2100
	RNMZ-66230-M/P		6.6	2300
	RNMZ-100230-M/P		10	3500
Z1	RNMZ-30370-M/P	370	3	1650
	RNMZ-33370-M/P		3.3	1850
	RNMZ-60370-M/P		6	3300
	RNMZ-66370-M/P		6.6	3600
	RNMZ-100370-M/P		10	5450

RNMV-E Type (Handcart)

MV/ HV Solid Soft Starter

Product Overview

RNMV-E (handcart) MV/ HV soft starter shall be used with an inlet cabinet with a vacuum circuit breaker. As for the starting cabinet embedded HV motor protection system (Type G) and protection system with no quick-break (type E), users can choose according to their own situation.

Performance

The use of fiber parallel trigger ensures each SCR trigger at the same time, namely synchronism in the SCR trigger, making the motor start smoothly.

Structure Features

It adopts the isolation setting of three rooms, namely the power component room, main control relay room, main circuit connection room.

Model Explanation

RN MV □ □-□

- Supplementary Feature Sequence: E (Handcart)
- Soft starting device current level (refer to remark ①)
- Soft starting device voltage level (refer to remark ②)
- MV/ HV Solid Soft Starter
- Manufacturer: Shanghai RENLE

Remark:
Soft starter current level: 120, 230, 370
Soft starter voltage level: (-15%~+10%)

Nominal value	30	33	60	66	100
Application range	3KV	3.3KV	6KV	6.6KV	10KV

RNMV MV/ HV Solid Soft Starter

(Stationary) - E (Regular)/ -KY (Ordinary Mining Type)

Structure features

The regular type adopts the Al-Zn alloy plate, and KY type is welded by cold-roll steel sheets.

Model Explanation

RN MV □ □–□

- Supplementary Feature Sequence: E (Handcart)
- Soft starting device current level (refer to remark ①)
- Soft starting device voltage level (refer to remark ②)
- MV/ HV Solid Soft Starter
- Manufacturer: Shanghai RENLE

Remark:

Type E Soft Starter Current Level: 120, 240, 370, 500, 800, 1000 and etc.

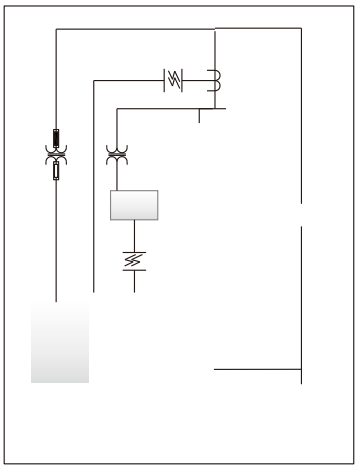
Type KY Soft Starter Current Level: 120, 240, 370

Soft Starter Current Level: (-15% ~ +10%)

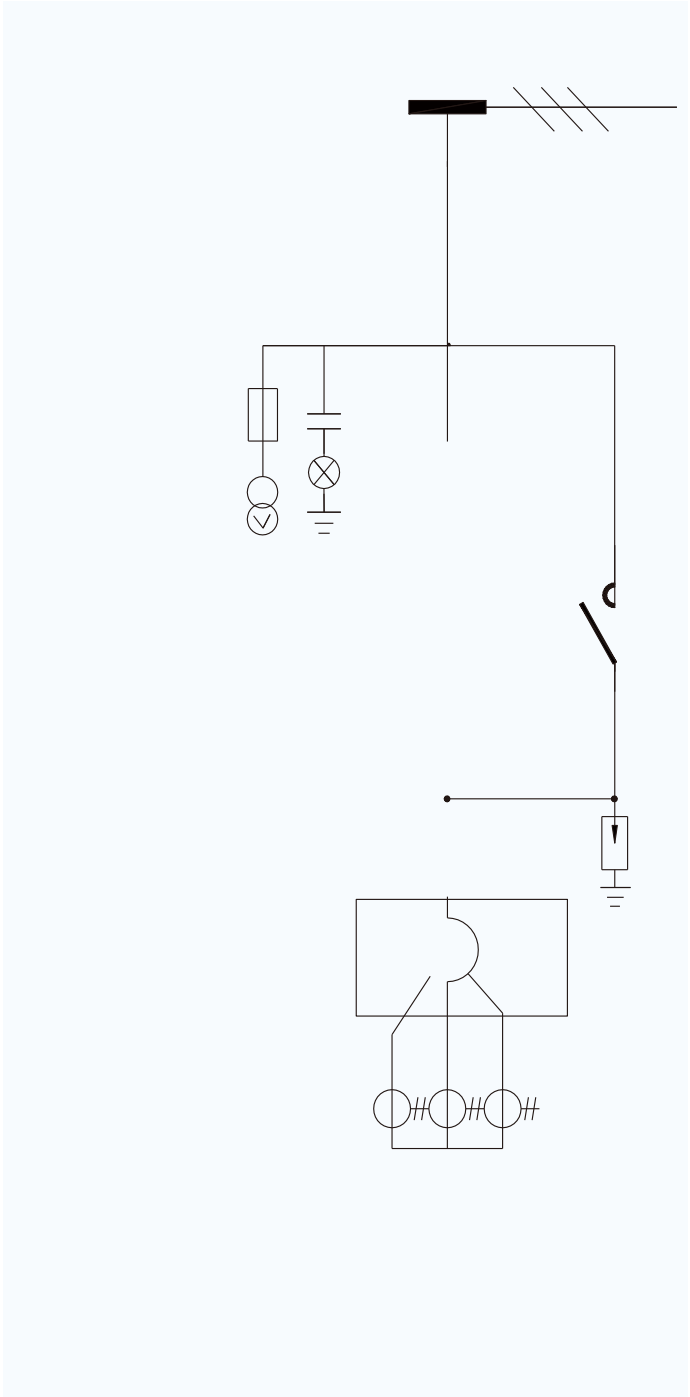
Nominal value	30	33	60	66	100
Application range	3KV	3.3KV	6KV	6.6KV	10KV

RNMV-KY Type Protection Level: IP54

RNMV-E Type Protection Level: IP40



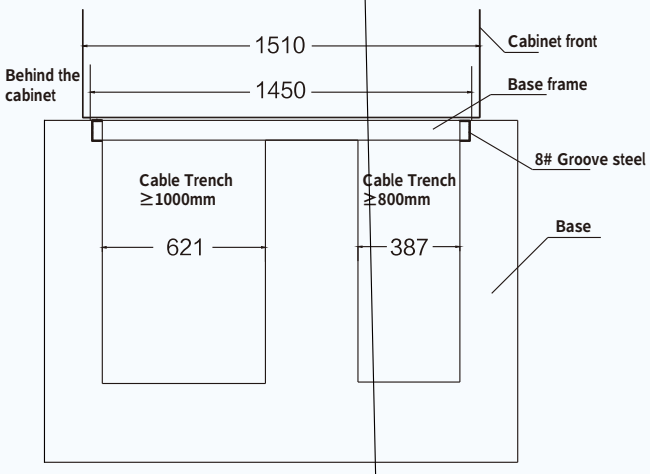
Schematic diagram of asynchronous and synchronous motor control



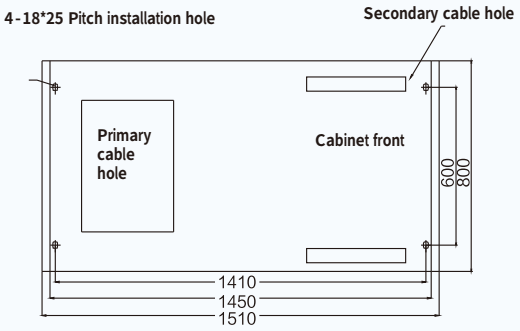
Note:

- Fuse
- Sampling voltage transformer
- Live display
- Vacuum contactor
- Current transformer
- This picture suits for squirrel-cage asynchronous motor.

RNMV MV/ HV Soft Starter (Stationary) Installation Way

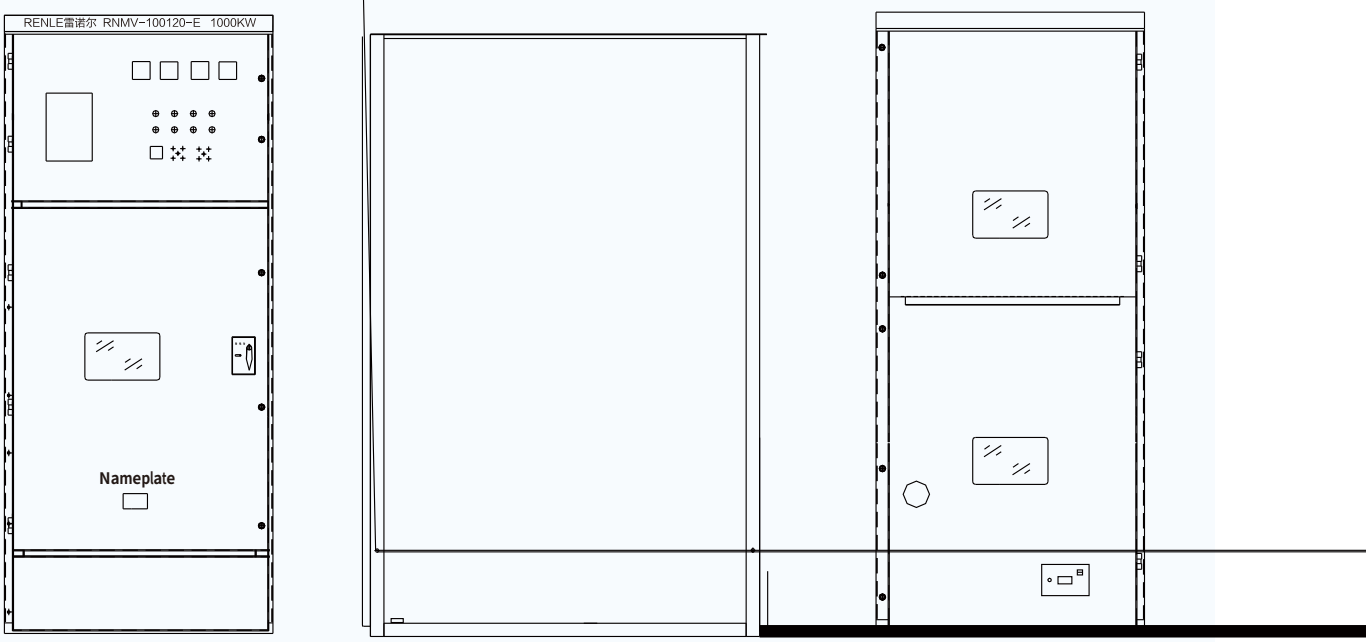


RNMV MV/ HV Soft Starter (Stationary) Installation Plan



RNMV MV/ HV Soft Starter ' s
Opening Hole Drawing at Bottom (Stationary)

RNMV MV/ HV Soft Starter (Stationary) Cabinet Body Schematic Diagram



Model Selection Table for RNMV MV/ HV Soft Starter (Stationary)

Current Level +8%(A)	Voltage Level (kV)	Maximum Adaptive Motor Power(kV)	Specification & Type	Size of Type E Model (H × W × D)	Size (Wall mounting installation)(H × W × D)
120	3	550	RNMV-30120	2300*800*1500	2300*1000*1500
	3.3	600	RNMV-33120	2300*800*1500	2300*1000*1500
	6	1150	RNMV-60120	2300*800*1500	2300*1000*1500
	6.6	1200	RNMV-66120	2300*800*1500	2300*1000*1500
	10	1850	RNMV-100120	2300*800*1500	2300*1000*1500
230	3	1050	RNMV-30230	2300*800*1500	2300*1000*1500
	3.3	1150	RNMV-33230	2300*800*1500	2300*1000*1500
	6	2100	RNMV-60230	2300*800*1500	2300*1000*1500
	6.6	2300	RNMV-66230	2300*800*1500	2300*1000*1500
	10	3500	RNMV-100230	2300*800*1500	2300*1000*1500
370	3	1650	RNMV-30370	2300*800*1500	2300*1000*1500
	3.3	1850	RNMV-33370	2300*800*1500	2300*1000*1500
	6	3300	RNMV-60370	2300*800*1500	2300*1000*1500
	6.6	3600	RNMV-66370	2300*800*1500	2300*1000*1500
	10	5450	RNMV-100370	2300*800*1500	2300*1000*1500
500	3	2200	RNMV-30500	2300*1000*1500	2300*1200*1660
	3.3	2500	RNMV-33500	2300*1000*1500	2300*1200*1660
	6	4500	RNMV-60500	2300*1000*1500	2300*1200*1660
	6.6	4850	RNMV-66500	2300*1000*1500	2300*1200*1660
	10	7500	RNMV-100500	2300*1000*1500	2300*1200*1660
800	3	3500	RNMV-30800	2300*1200*1500	2300*1400*1660
	3.3	3800	RNMV-33800	2300*1200*1500	2300*1400*1660
	6	7000	RNMV-60800	2300*1200*1500	2300*1400*1660
	6.6	7800	RNMV-66800	2300*1200*1500	2300*1400*1660
	10	12000	RNMV-100800	2300*1200*1500	2300*1400*1660
1000	3	4300	RNMV-301000	2300*1200*1500	2300*1400*1660
	3.3	4500	RNMV-331000	2300*1200*1500	2300*1400*1660
	6	8800	RNMV-601000	2300*1200*1500	2300*1400*1660
	6.6	9500	RNMV-661000	2300*1200*1500	2300*1400*1660
	10	14000	RNMV-1001000	2300*1200*1500	2300*1400*1660

Remark:

1. Bearing capacity of the soft starter: when a motor starts, the maximum starting time permitted is 15 seconds if the starting current is 5 times of the rated current one, 40 seconds for 4 times, and 70 seconds for 3 times; otherwise, please choose the product with higher power.
2. When the motor power is higher than the motor power, we shall choose the product with higher power.
3. If the motor power is within 2000kw, a differential protection box shall be added;
4. For the product with over 400A, all the bypass contactor shall adopt stationary vacuum circuit breaker instead.
5. The rated current of the soft starter shall be stated according to the rated current of user ' s motor.
6. An order shall be made after negotiation for the product type of over 14000kW.

RNMV-G (Three into One)

MV/ HV Solid Soft Starter

Structure and Feature

- The whole is composed of RNMZ handcart series MV/ HV solid soft starting device, circuit breaker, integrated protector, bypass contactor.
- Protection level of shell is 1P4X;
- The cabinet body is divided into four separate rooms: busbar isolation room, relay room, circuit breaker handcart room, and soft-start room.

Model Explanation

RN – MV – □ □ – G

- With HV Switch (Three into One)
- Soft starting device current level (See mark ①)
- Soft starting device voltage level (See mark ②)
- MV/ HV Solid Soft Starter
- Manufacturer: Shanghai RENLE

Remark:
Soft starting device current level:120, 230,370
Soft starting device voltage level: (-15%~+10%)

Nominal value	30	33	60	66	100
Application range	3KV	3.3KV	6KV	6.6KV	10KV

Model Selection Table for RNMV-G MV/HV Solid Soft Starter

Current Level +8%(A)	Voltage Level (kV)	Maximum Adaptive Motor Power(kV)	Specification & Type	Type G Size(kW)
120	3	550	RNMV-30120	2300*800*1510
	3.3	600	RNMV-33120	
	6	1150	RNMV-60120	
	6.6	1200	RNMV-66120	
	10	1850	RNMV-100120	
230	3	1250	RNMV-30230	
	3.3	1150	RNMV-33230	
	6	2100	RNMV-60230	
	6.6	2300	RNMV-66230	
	10	3500	RNMV-100230	
370	3	1650	RNMV-30370	2300*800*1510
	3.3	1850	RNMV-33370	
	6	3300	RNMV-60370	
	6.6	3600	RNMV-66370	
	10	5450	RNMV-100370	

Remark:

1. Bearing capacity of the soft starter: when a motor starts, the maximum starting time permitted is 15 seconds if the starting current is 5 times of the rated current one, 40 seconds for 4 times, and 70 seconds for 3 times; otherwise, please choose the product with higher power.
2. When the motor power is higher than the motor power, we shall choose the product with higher power.
3. If the motor power is within 2000kw, a differential protection box shall be added;
4. The rated current of the soft starter shall be stated according to the rated current of user ' s motor.
5. The plan of Three into One shall not be used into type G products of over 370A in rated current.

National Key Projects

Three Gorges Project

Beijing Olympic Rowing-Canoeing Park

Supporting Projects for the Beijing Olympic Games

Wukesong Indoor Stadium

Bureau of Government Offices Administration of the State Council

CCTV (China Central Television)

Beijing Capital International Airport

China Second Artillery Corps Missile Base

China Air-to-air Missile Research Centre

LA Air Force Radar Base

South-to-North Water Diversion

Zhejiang Huangqunan Expressway

Electricity Transmission from West to East China

West-East Natural Gas Transmission

Shanghai Maglev Rail Transit Station

Supporting Projects for Shanghai Expo

Shanghai Pudong International Airport

Shanghai Auto Museum

Extension Project for Shanghai Hongqiao Airport

Terminal Expanded for Hohhot Baita International Airport

Shenyang Olympic Sports Center

Beijing Nanyuan Airport

Yunnan 2409 Airforce Airport

Qingdao Olympic Sports Center

Jinan Olympic Sports Center

Extension Projects for Chengdu Shuangliu International Airport

Chongqing Olympic Sports Center

New Baiyun International Airport

Wuhan Tianhe Airport

Shanghai Metro Line 3

Chongqing International Conference Centre

Shanxi Wanjiazhai Yellow River Diversion Project

Qinghai Xiaoyou Mountain Ecological Project

Tianiin Badapian Heating Project

Shandong Heze Yellow River Diversion & Water Supply Project

Shanghai International Shipping Center Yangshan Deepwater Port

Xichang Satellite Launch Center

Guangxi Longtan Hydropower Project

Gansu Satellite Launch Center

Yunnan Honghe Nansha Hydropower Station

Datang International Power Generation Co., Ltd.

Guizhou Kailin Group Co., Ltd.

Inner Mongolia Shenhua Group

Jinshan Petrochemical Company

Shanghai Baost é el Group

Taizhou Petrochemical Company

Anshan Iron and Steel Group

Jilin Petrochemical Company

Wuhan Iron and Steel Group

Guangxi Liuzhou Chemical Industry

Capital Iron and Steel Company

Guangzhou Petrochemical Company

China Great Wall Aluminum Corporation

Luoyang Petrochemical Company

Guangxi Pingguo Aluminum Company

Yueyang Petrochemical Company

Guangxi Liuzhou Iron and Steel Group

Nanjing Petrochemical Company

Maanshan Iron and Steel

Beijing Yanshan Petrochemical Company

Shanxi Zhongyang Steel

Urumqi Petrochemical Company

Daqing Oilfield

Jinxi Petrochemical Company

Shengli Oilfield

Dushanzi Petrochemical Company

Liaohe Oilfield

Beijing Financial Street

Talimu Oilfield

Panda Museum in the Chengdu Ecological Park of Giant Panda

Karamay Oilfield

Qingdao Beihai Shipyard

Shaanxi Changqing Oilfield