VEDA IN DRIVES

Technical manual for
Low-voltage soft starters SFT20 series

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Safety and Warnings

1. Before operating the equipment to read this manual carefully. Installation, debugging should be strictly according to this instruction and by technicians.
2. Disconnect all power inputs before maintains.
3. Soft starter must be grounded to ensure reliable operation, safety and prevent accident.
4. Connecting capacitors or other power factor compensation equipments to output terminals is not allowed.
5. Once soft starter is in electrical circuit, its internal components and PCB board will take the same potential equal to the main circuit. A touch will cause severe injury or death.
6. Menu setting, testing or selection is prohibited in the course of soft start or soft stop operating; it may cause equipment failure or damage.
7. Bus line voltage should in the range of soft starter's rated voltage.
8. Earth connection is necessary.

Application

HPISD series of economical soft-start device (hereinafter referred to as starter) is the latest design and manufacture of another new series soft starters, improve and perfect the relevant control and protection. Use of this device can minimize the impact of mechanical and current, extended equipment lifespan. Modular design to facilitate use and maintenance of the product. The soft starter is suitable for heavy duty asynchronous motor of rated AC220-500v voltage, rated 8-840A current applications. The major feature of motor soft start is ramp-up current small, stable and reliable boot process, no shaking start and little impact to electricity. Ramp-up curve is changeable as per working conditions in order to reduce the impact, and reduce equipment requirements and initial investment.

The soft starter includes motor integrated protector which with a short circuit, overload, voltage loss phase, current loss phase protect function. There are different ramp-up methods and protection methods for choosing for different applications. This soft starter will replace reactor and other motor starter equipments, with much safer, high-tech, reliable working, fast and easy maintenance and long service lifespan.

The soft start also can be used in oil, metallurgy, open pit mine, seaport, coal mine, power plants and any other heavy or burden duty equipment reliably, which other device can not drag or difficult to boot .

Main technical paramete

- Rated voltage: 220~500v (consult manufacture for higher voltage)
- Rated frequency: 50/60hz
- Rated current: 18~840A
- Overload: 75~150%, 0~10s
- Pulse start: 80% Ue, 0~1s
- Control method: soft start, soft stop, pump control, pulse start.
- Many starts: 3~6 times/ hour
- Cooling way: natural cooling

Environment requirement

- Working temperature 0℃~+50℃
- Storage temperature -10℃~+70℃
- Air relative humidity is not higher than 95% (25℃)
- No shock, no vibration
- The altitude of working place should not higher than 2000m

Safety and Warnings

1、Before open control panel, make sure the mains power of soft starter was shut down; all indicators are off and wait at least 3 minutes.

2、Before re-wiring of main circuit and control circuit, make sure mains input was shut down.

3、Please check the voltage grade of soft starter before starting, otherwise will result in damage or person injury.

4、Only professional and certified technician is allowed to mount the wiring.

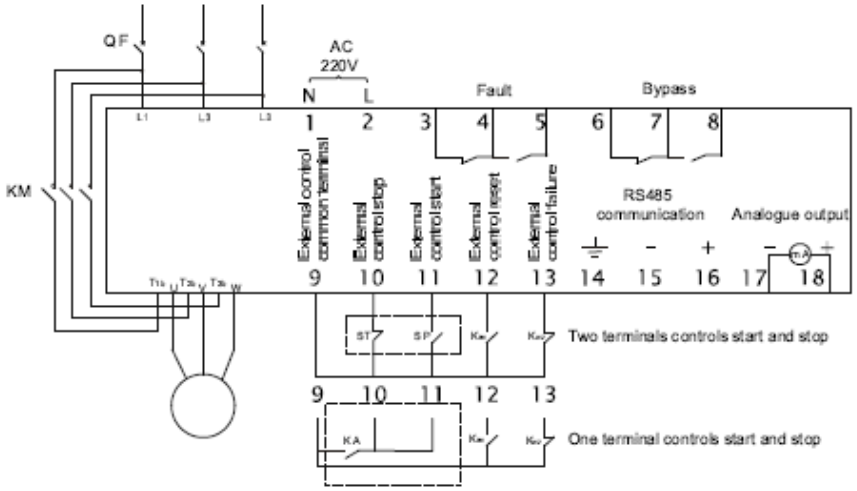
Featrure

- Ramp-up smooth and reliable, current small.
- Ramp-up curve is changeable as per working conditions
- Motor and starter protection: Short circuit, over voltage, under voltage, overload, phase loss, phase sequence, over current, ground fault, unbalanced current, motor temperature, too many starts and start inhibit time.
- Analogue output: motor working current.
- Different ramp up method and protection method as per different applications.
- RS485 terminal supports communication protocol.

WIRING OF SOFT STARTER

The series wiring includes main circuit and control circuit. Different choice according to different working conditions.

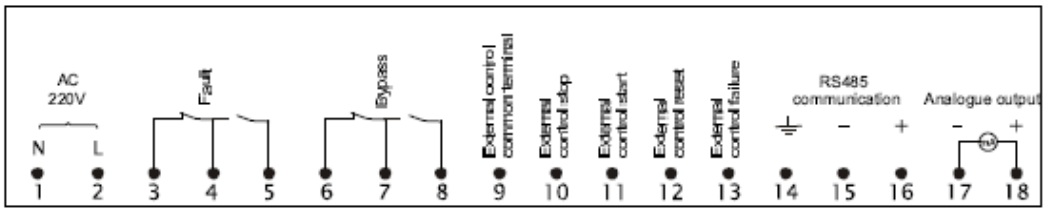
1、The standard mounting wiring as below



2、Direction of output terminals of main circuit

Terminals mark	Introduction
L1、L2、L3	3 phase AE input terminals
T1b、T2b、T3b	External matched bypass contactor 3phase output terminals
U、V、W	Input terminals of motor

3、Wiring of multifunction control terminals as below



WIRING OF SOFT STARTER

4、Function description of control circuit terminals

Code	Name	Terminal function directions	Factory default value
1; 2	Control power	Control power input terminal	AC 220V±10%
3; 4;5	Fault	3-4：N/C；4-5：N/O	fault output (the factory setting value of F7.05 is 6)
6;7;8	Bypass	Full power with bypass output terminals	Unchangable
9	External control common terminal	Multifunction input common terminal	The common port of terminal 1、2、3、4
10	External control stop	Multifunction input terminal 1	External control stop command input (the factory setting value of F7.03 is 6)
11	External control start	Multifunction input terminal 2	External control working command input (the factory setting value of F7.02 is 5)
12	External control reset	Multifunction input terminal 3	External control reset input (the factory setting value of F7.01 is 1)
13	External control failure	Multifunction input terminal 4	External control fault N.C. close input (the factory setting value of F7.00 is 3)
14;15;16	RS485 communication	Communication terminal	Fixed function, can't change
17;18	4-20mA	Analogue current output terminal	Fixed function, can't change

Remarks：

Due to the terminal 13 is external fault interlock input terminal, should short-circuit terminal 9 with terminal 13 correctly, otherwise will have external input fault alarm. As well, this soft starter have to connect a matched external bypass contactor.

Soft starter strong and weak electricity technology and earthing requirement.

1、Wiring technical requirement

In order to avoid electrical magnetic mutual interference of strong and weak electricity while working, control cable, power cable, motor cable should be mounted separately and the distance among them should be as far as possible.(the distance between power cable and control cable ≥40cm;the distance between control cable and signal cable ≥15cm） Especially cable mounted parallelly and extending to far away. The signal cable should square cross when the signal cables cross the power cable.

2、Earthing requirement

We generally recommend the exclusive earth electrode, but common earth electrode is also allowed.

Control panel and LCD introduction

Menu — Menu

Select — Press this key can check the subparameter (subparameter name, factory setting value, value range of sub parameter).

▲ — Increase the parameter of flicker cursor

▼ — Decrease the parameter of flicker cursor

Reset — Fault reset /back to initial menu while parameter setting and press this key to emergency stop during the soft starting procedures.

Shift — Move flicker cursor to another

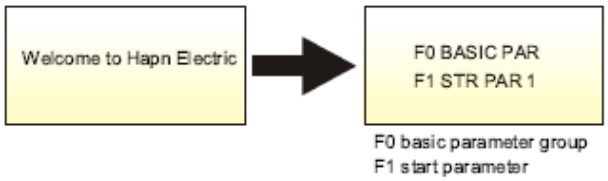
Start — Press this key to start soft starter

Stop — Press this key to stop soft starter

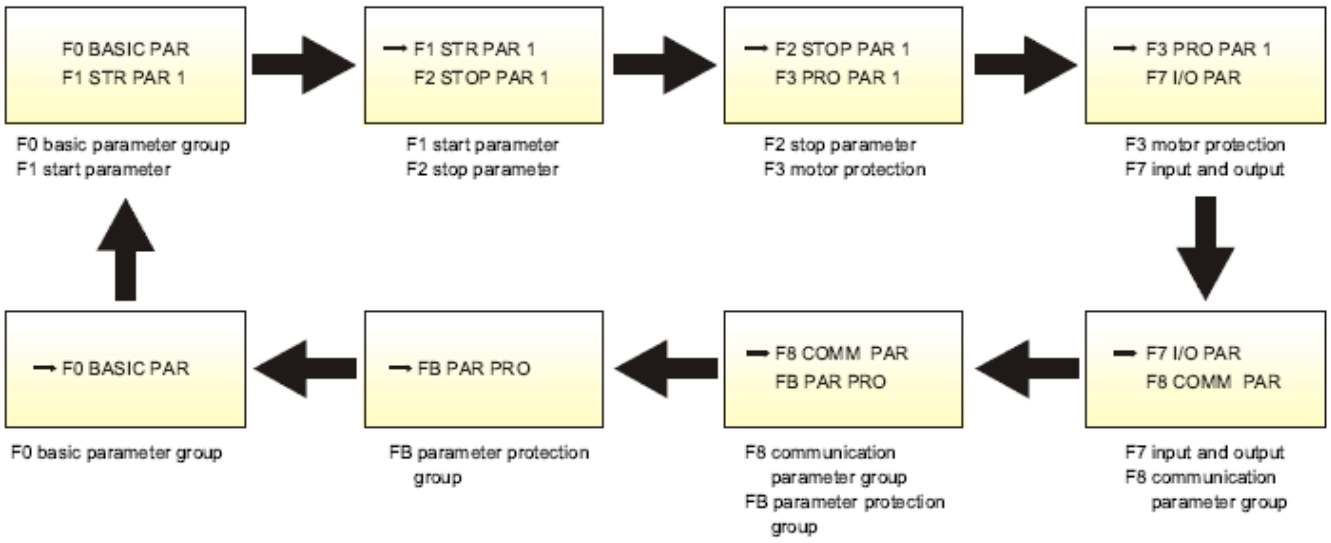
PARAMETER DESCRIPTION

The HPISD economical type soft starter totally goes to eight main parameter groups:F0~F3,F7,F8,FB,FC. Each main parameter group includes sub-parameters.On the LCD interface, the first line describes the names of sub-parameters, thesecond line indicates the default value and scope of the sub-parameter.To switch the digit position by pressing Shift key. Using ▲ or ▼ increases or reduces values.

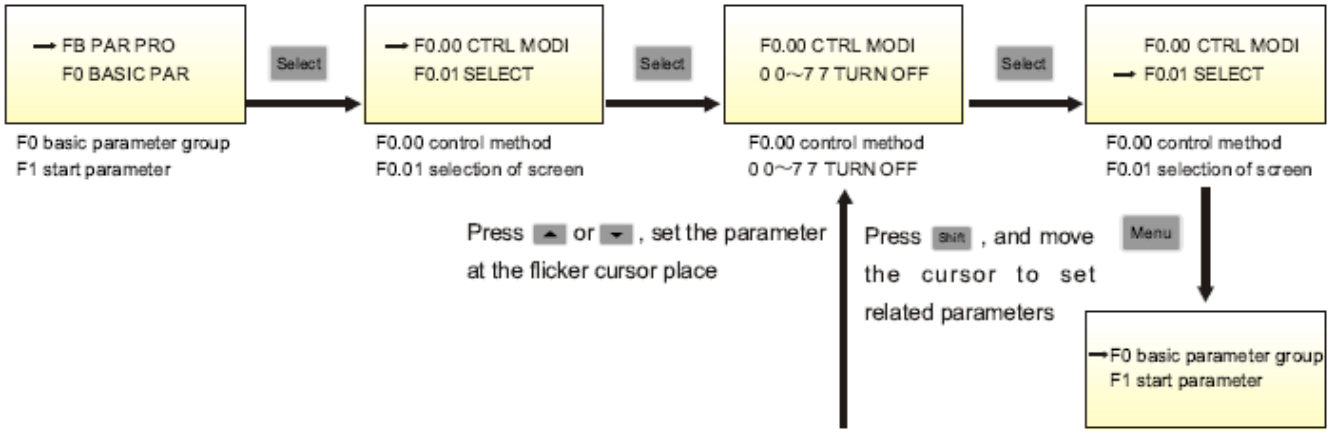
After power-on, the picture of start-up will be displayed on the LCD screen, subsequently the main interface content will come out.



Pressing ▲ or ▼ may circularly switch the content of every group screen, the process of switching is as follows,



E.g. setting of sub-parameters



SUB-PARAMETERS OF PARAMETER GROUP

F0 BASIC PAR	Basic parameter group	F1 STR PAR 1	F1 Start parameter	F2 STOP PAR 1	Stop parameter	F3 PRO PAR 1	Motor protection
F0.00 CTRL MODI 0 0~77 TURN OFF	Control method	F1.00 STR MODE 1 SCOPY:0~3	Start method	F2.00 S STOP · V 30% 20~75%Ue	Soft stop voltage	F3.00 OL LEVEL 2 SCOPE:0~4	Overload grade
F0.01 SELECT 1 0~6	Selection of screen	F1.01 KTD CUR 400A 1~5000A	Rating current	F2.01 S STOP · T 5s 0~60s	Soft stop time	F3.01 OC PRO 500% 0~600% LE	Over current protection
F0.02 STOP 0 0:OFF 1:ON	Stop function	F1.02 CUR LIMI 300% 150~450%	Current limit			F3.02 OC TIME 1S 0~60S	Over current time
F0.03 DEBUG 1 0:DEBUG 1:NORMAL	Debug mode	F1.03 INI VOLT 30% 20~75%Ue	Initial voltage			F3.03 IN LOSS 1 0:OFF 1:ON	Input phase loss
F0.04 LANGUAGE 0 0: CN 1:E	Language set	F1.04 STR TIME	Initial time			F3.04 OUT LOSS 1 0:OFF 1:ON	Output phase loss
F0.12 BACKL IGH 180S 0~9999S	Backlight time	F1.05 STR TE 150% 0~250%	Initial torque			F3.05 SEQ PRO 0 0:OFF 1:ON	Phase sequence protection
		F1.06 STEP VOLT 80% 20~100%U	Trip voltage			F3.06 UV PRO 330V 1~5000V	Under voltage protection
		F1.07 STEP T 0ms 0~1000s	Trip time			F3.07 UV TIME 2S 0~60S	Under voltage time
		F1.08 STR DELA 1S 0~1200s	Start delay			F3.08 OV RPO 1300V 1~5000V	Over voltage protection
		F1.09 INTERLOCI 0S 0~1200s	Interlock delay			F3.09 OV TIME 2S 0~60S	Over voltage time
		F1.15 OF TIME 0S 0~9999	Over frequency time			F3.10 OT PRO 85℃ 0~120℃	Over temperature protection
						F3.11 OT TIME 2S 0~60S	Over temperature time
						F3.12 MAX STR 10% 10~100%	Max start time
						F3.15 UNBALA 10% 10~100%	Unbalance
						F3.16 UNBALA T 1S 0~60S	Unbalance time
						F3.17 ELE FUSE 750% 200~1200	Shear pin
						F3.18 FUSE TIME 8MS 0~9999	Shear pin time

SUB-PARAMETERS OF PARAMETER GROUP