Soft Starter Pump Motor Controller.

Handbook

Content

Ⅰ. **Instruction of faceplate and function:**

1. Auxiliary voltage indicator lamp.
2. Running indicator lamp.
3. Run and finish indicator lamp.
4. Error indicator lamp. (Overload、Loss phase、Motor seize、Over heating、Low load)
5. Start torque indicator lamp. (100%~500%)
6. Start time indicator lamp. (1~40 Sec.)
7. Stop time indicator lamp. (1~60Sec.)
8. The top cover and below cover can be according to the instruction press and push open.

Introduction:

1. Power: (Indication light ON when connecting with auxiliary power (AC1, AC2), 220 VAC 50/60Hz (auto-judging).

2. Running: Indication light ON in starting, running, and soft-stopping.

3. Run: Indication light ON when starting done.

4. Error: Including indication lights of

〝Overload〞 : When the motor overstep the rated current, SMC-P starts protection.

〝Loss Phase 〞 : Main power supply loss of one-phase or two-phase or three-phase power.

〝Motor Block〞 : Motor of a foreign body clog, causing the current increase, can not function properly.

〝Overheat of SMC-P〞 : SMC-P heat sink temperature reaches 80 to 90℃, exceed the security value.

〝low-load〞 : Motor lack of water can be transported.

5. Start torque: Adjustment of torque when motor starting.

6. Start time: Adjustment of motor start time to decide the time of full-starting.

7. Stop time: Time adjustment of motor soft-stop to decide the time of motor stopping.

Q & A

Q: How to reset if error light ON and the trouble had been removed?
A: Please check error light of condition of overload, loss phase, motor block, overheat of SMC-P or low-load, then removed the error, and press reset key.
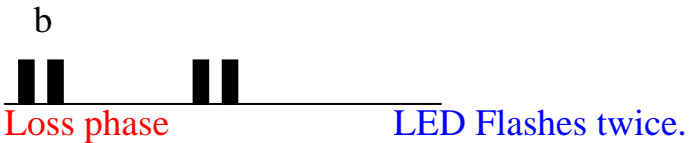
Abnormal light illustration:
There are five type protections in the machine.
Under to illustration:

a

1.

Overload   LED Flashing once.

The breakdown clearing explaining: Please consult page 16~19.

b

2.

Loss phase   LED Flashes twice.

The breakdown clearing explaining: Please check whether there is power input in the electric three phases of source , and check whether to install the mistake in proper order in motor load or not.

3.

Motor block   LED Flashes three times.

The breakdown clearing explaining: Whether checking the motor has things that are seize, whether checking the motor has things that are seize, or the piping has phenomenon of shaking while starting, can jump seize state , Please consult page.15 setting torque control.

4.

Over heating   LED Flashes four times.

The breakdown clearing explaining: When install in the control box, please make a window on up side and down side in order to cool air in from down side, and hot air out from up side, and please place the filter net on up side to prevent the dust or waste in, and clean the filter net regularly to avoid the filter net block.

5.

c

Low load   LED Flashes five times.

a: Times of cycle is 0. 25 Sec.

b: Times of cycle is 0. 25 Sec.

c: One abnormal time of cycle is 3 Sec.
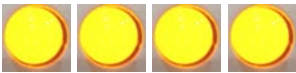
There is normal.   There are abnormal.

Show the light: Overload
（Glimmering time is 3 sec. till next glimmering.）

Show two times lights: Loss phase
(Glimmering every 0.25 sec. till error removed.)

Show three times lights: Motor block

Show four times lights: Over heating

Show five times lights: Low load no setting when ex-factory, please adjust various function settings of SW1 if protection of low-load necessary. Please read the instruction at P.11 and P.12 for reference.

II. General characteristic

1. This controller offers 3 sets of output contact : output contact when starting, output contact when running done, and output contact of system error.
2. Diagnosis of LED : There' CT electronic detecting protector with the protection of overload, under phase, motor block, machine overheat, low-load (water shortage).
3. the movement of cooling fan can stabilize the temperature, the heat sink will run at 55℃, and stop at 45℃, and this can extend 2 ~ 3 times use-life of heat sink.
4. This product offers loop design of BY PASS.
5. This product tally with the standard of CE, IEC60947-4-2, IEC60947-4-1, etc.
6. The SMC-P softstarter is the first compact softstarter. It is developed in close cooperation with customers to ensure that the product solves all the important needs of the customers.

The SMC-P softstarter is ideal for any applications where space is limited, but where advanced functionality still is required. It is suitable for most of the common applications such as pumps, fans, compressors, conveyor belts and more.

7. Easy

One of the most important features of any electrical device is that it is easy to set up and easy to use. The SMC-P softstarter is equipped with an easy-to-use four sets DIP switch and faceplate have three knobs.

8. Reliable

The SMC-P softstarter is not only designed to ensure an exceptional reliability. It has also been equipped with features to ensure that the whole operation is kept reliable. As an example, torque control eliminates water hammering and thereby greatly reduces the mechanical stress on pump systems and provides a more reliable operation with less downtime.

9. Efficient

Knowing what the customer want, it has been possible to design a softstarter that really fulfils the needs of the customers, without adding unwanted complexity. This gives excellent value for money and together with the by-pass for energy saving makes the SMC-P softstarter a very efficient choice.

10. Protect

Overload protect.
Loss Phase protect.
Motor block protect.
Overheat protect of SMC-P.
Low-load protect.

III. Inside structural illustration.

1. The electric current multiple of the overload (SW3 Red) establishes.

2. The amperage of electric current of the overload (SW4 Red) establishes.

3. Control way: AC1, AC2, OPEN, NO,COM,NC。

4. The torque controlling (SW1 Blue)。

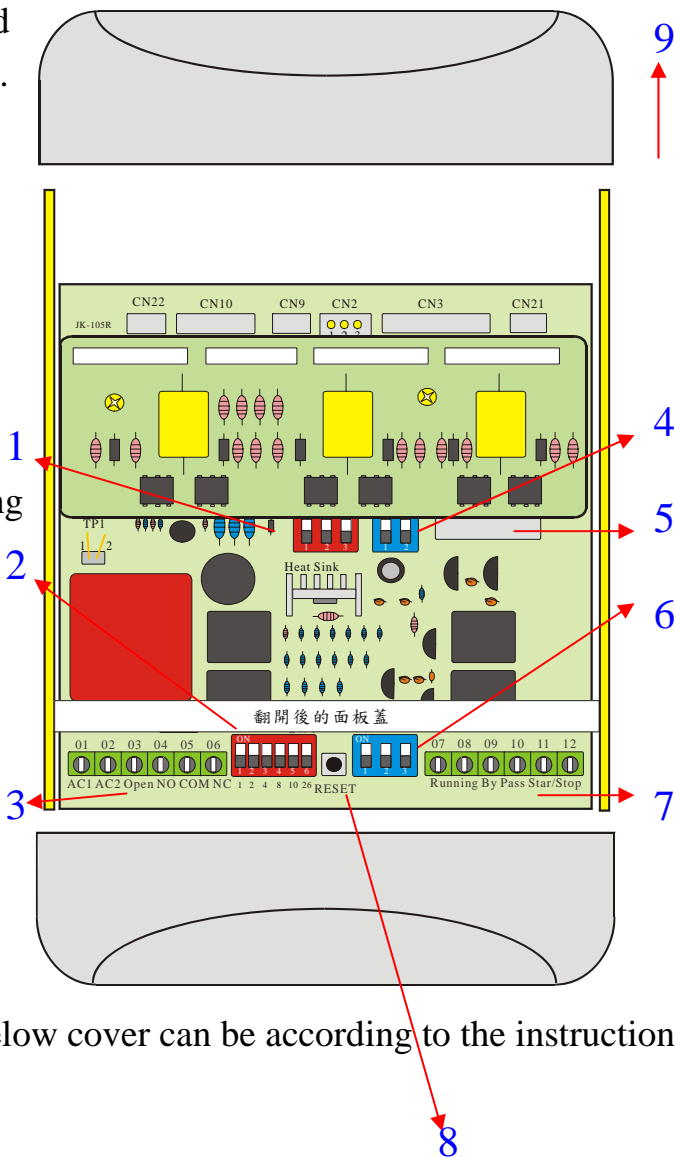5. The faceplate is inserted the line seat。

6. Starting Way (SW2 Blue)。

7. Control way: Running, By Pass, Start/Stop。

8. Reset。

9. The top cover and below cover can be according to the instruction press and push open.

IV. Technical specification:

Main power voltage:	208~220/380~440/460~480 VAC ± 10%
Auxiliary voltage:	220VAC ± 10% (Leave the factory standard, If need to alter it for 110VAC, please tell business personnel first.)
Start way:	Dry contact point. (Add it in 11and 12 these and two points)
Work frequency:	50 ~ 60 Hz ±5%
Highest peak pressure proof:	600VAC, 1200VAC ~ 1600 VAC
Start time:	1 ~ 40 Sec
Start torque:	100% ~ 500%
Stop time:	1 ~ 60 Sec
Work around temperature:	-10℃ ~ 45℃
Relative humidity:	93 % RH without dew.

Please check motor HP and rated current; please choose the value higher if both are different.

Example : Rated current of motor 220V/2HP is 9A, please use 220V/3HP SMC920030-P soft starter.

V. Choice the model

Rated current	Rated voltage 208~220VAC	HP	Rated voltage 380~440VAC	HP	Rated current	Rated voltage 460~480VAC	HP	P
7A			SMC930030-P	3HP	7A	SMC940050-P	5HP	1
10A	SMC920030-P	3HP	SMC930050-P	5HP	10A	SMC940075-P	7.5HP	1
15A	SMC920050-P	5HP	SMC930075-P	7.5HP	15A	SMC940100-P	10HP	1
22A	SMC920075-P	7.5HP	SMC930100-P	10HP	22A	SMC940150-P	15HP	1
28A	SMC920100-P	10HP	SMC930150-P	15HP				1
35A			SMC930200-P	20HP	28A	SMC940200-P	20HP	2
42A	SMC920150-P	15HP	SMC930250-P	25HP	35A	SMC940250-P	25HP	2
55A	SMC920200-P	20HP	SMC930300-P	30HP	42A	SMC940300-P	30HP	2
70A	SMC920250-P	25HP	SMC930400-P	40HP	55A	SMC940400-P	40HP	3
82A	SMC920300-P	30HP	SMC930500-P	50HP	70A	SMC940500-P	50HP	3
105A	SMC920400-P	40HP	SMC930600-P	60HP	82A	SMC940600-P	60HP	3
135A	SMC920500-P	50HP	SMC930750-P	75HP	105A	SMC940750-P	75HP	4
155A	SMC920600-P	60HP	SMC931000-P	100HP	135A	SMC941000-P	100HP	4
185A	SMC920750-P	75HP	SMC931250-P	125HP	155A	SMC941250-P	125HP	5
250A	SMC921000-P	100HP	SMC931500-P	150HP	185A	SMC941500-P	150HP	5
280A			SMC931750-P	175HP	250A	SMC941750-P	175HP	5
300A	SMC921250-P	125HP	SMC932000-P	200HP	280A	SMC942000-P	200HP	6
360A	SMC921500-P	150HP	SMC932500-P	250HP	300A	SMC942500-P	250HP	6
420A	SMC921750-P	175HP	SMC933000-P	300HP	360A	SMC943000-P	300HP	6
					420A	SMC943500-P	350HP	6
500A	SMC920500A-P		SMC930500A-P		500A	SMC940500A-P		7
560A	SMC920560A-P		SMC930560A-P		560A	SMC940560A-P		8
620A	SMC920620A-P		SMC930620A-P		620A	SMC940620A-P		8
750A	SMC920750A-P		SMC930750A-P		750A	SMC940750A-P		8
930A	SMC920930A-P		SMC930930A-P		930A	SMC940930A-P		8
1100A	SMC921100A-P		SMC931100A-P		1100A	SMC941100A-P		8

P.1

P.2

P.3

P.4

P.5

P.6

P.7

P.8

Size: www.jaki.com.tw/download2-e

P.10

VI. Installation Attention of SMC-P.

1. Ventilation and cooling : SMC-P must be operated at the place well ventilated and cool, and pay attention to the room temperature not rise over 50℃ and less than -10℃.
2. This product is designed to start 20 times/hr., if the starter times over the 20 times/hr., please improve the level of soft starter to use, because the heat sink's temperature will over to 85℃. This will result in temperatures in excess of silicon-controlled rectifier to reduce the life or cause failure.
3. Please check and make sure the right wiring sequence when give the power to machine test : input end is R.S.T., output end is U.V.W. The trouble caused by error wiring of input and output should not include in our guarantee.
4. SMC-P soft start must be installed at the place well ventilated and cool, so please pay attention to the air flow direction when install, and keep at least 10 cm with other tools or instrument to cool.
5. The top and bottom of the control box should open the mouth for cool air enter through bottom mouth and hot air out from top mouth; and please add filter net on the mouth to avoid dust and impurities stuck the mouth; and clean the filter net regularly. (figure 1 at page 15)
6. Please add fan if the temperature in the box over 45℃ to improve air circulation and keep the temperature in the box under 45℃, and this will give the best running.
7. The setting of full load current is designed as 380V of ex-factory for our product of 380-480V, please let's know and change the settings in advance if install in the place with 440 ~ 480V. Otherwise it'll lose the meaning to overload without overload protection, therefore please pay attention to the settings.
8. The rated current of our soft start is in accordance with TECO four-pole motor's current. To the motor used; please check the rated current listed in the catalogue if full-load current is different from TECO motor's load current (over 10%). 1 level must be rose to work when actual current is over 10%.
9. The soft start can't work if it has input auxiliary power (220VAC or 110VAC) only without main power input.
10. Load (motor) starter can't be controlled by soft start time knob (Start fast) when the big difference generated between soft start overload current settings and actual running current.

Examples: Motor 380VAC/ 10HP current is 20A.

Overload set value is 40A; this situation has no protection to the motor, lead to an instant when it starters up at full load condition, no soft-starter function. This time need to adjust the overload protection setting values to the normal state. Details on page 13.

Please confirm again the voltage used is same as the auxiliary power marked on soft start when installation (eg : 220V can't be used for 380V……..and so on.), and all load current can't be over soft start's rated current.

Please install the condenser next to soft start's R.S.T. when install soft start if the motor itself has the condenser to improve power factor, because the soft start trouble will be caused by installing condensor next to U.V.W.

（The trouble caused by error installing soft start next to U.V.W. is not included in our guarantee.）

Error connection of capacitor.

電容器 Capacitor
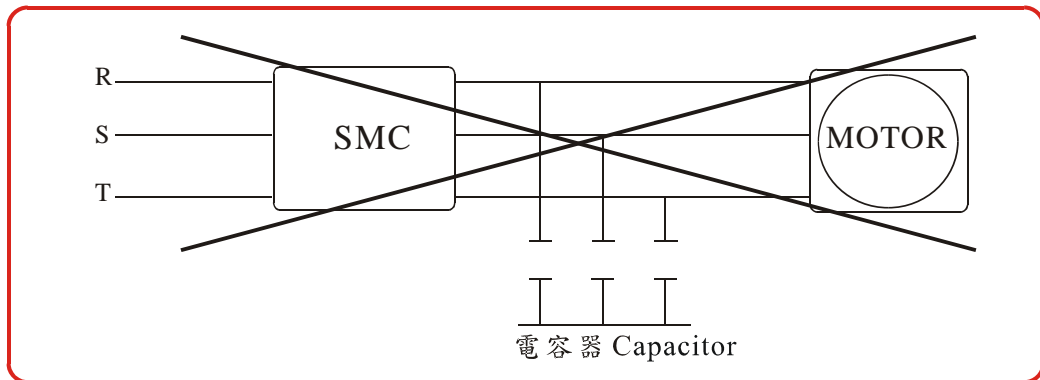
Right connection of condenser

Capacitor
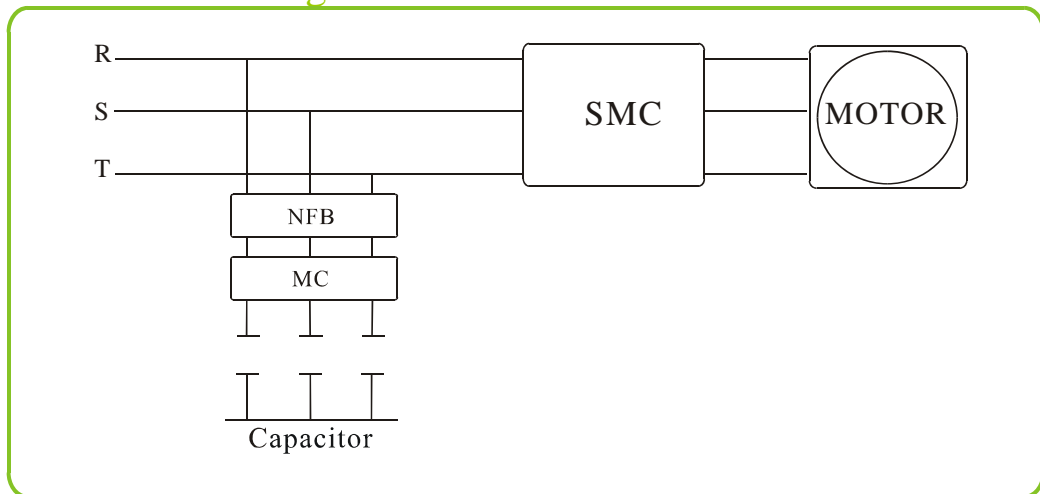
Warning :
For the security of maintainers, please OFF the power before check or disassembly the protection module mentioned above; please change a new one if he module failure, and maintain regularly.

VII.   Application and setting

1. Application of SMC-P for pump : This product is designed specially for water pump with water hammer caused, suitable to water system of building pumping, sewage, waste water, farmland, factory, …..etc., the effect will be more excellent when lift is higher.

2. The torque and time will be adjusted depend on motor load type. It can be classified as big load inertia and small load inertia.   We recommend setting the initial settings as start torque value – 260% and starting time - 20 sec. when we don't know the load value, and add or reduce torque with actual running.

3. In any condition, the soft start will running with full pressure when motor arrives full-speed running.

Motor start slow or fast depends on the adjustment of start torque.
The time of motor's full-pressure start depends on the adjustment of start time.
The stop time of motor soft start depends on the adjustment of stop time.

Soft start pump motor controller in the operation, all the features of the settings are nullity, please complete before starting to set or set to restart.

Start Torque

START TORQUE   (P.1)

Start Time

START TIME   (P.2)
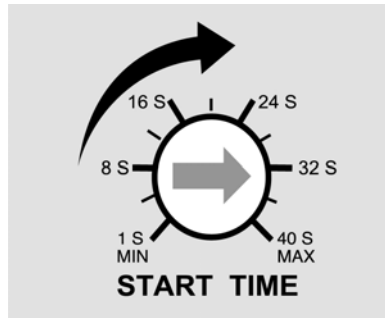
Stop Time

STOP TIME   (P.3)

VIII.   The overload electric current adjust and explain.

As " soft start pump motor controller " start rapidly or stop the phenomenon rapidly when using, the reason:

1. Pump motor operates in the electric current and is smaller than soft start pump motor controller and establish more than 30% of electric current.
2. The motor is smaller much than soft start pump motor controller in load while operating.
   E.G.: Motor load is 1HP, soft start pump motor controller is 10HP.
3. It is the same as motor load to use soft start pump motor controller, but the motor operates the electric current and soft start pump motor controller and establishes the electric current and differs by more than 30%.

While finding that there are above-mentioned reasons. Need to adjust soft start pump motor controller overload electric current and establishing the parameter.

SW3: The electric current multiple of the overload.

SW1: The torque controlling.

SW4: The amperage of electric current of the overload.

SW2:

Please watch Page.12.

Settings of various functions (SW2)

1. Slope start:
Push down 1, (1 OFF).

SW2
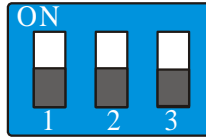
You can refer to page 25 of the curve description.

2. Limit current start:
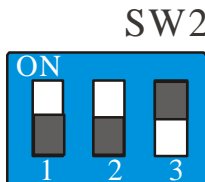Push up 1, (1 ON).

SW2
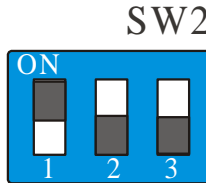
You can refer to page 25 of the curve description.

3. Limit current start
& Kick Start
Push up 1 and 2(1,2 ON).

SW2
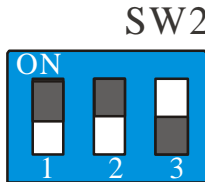
You can refer to page 25 of the curve description.

4. Low load check
Push up 3, (3 ON),
push down (3 OFF)
cancel function.

SW2

Motor lack of water check.

Annotate 1: "DIP 3" setting low load, the turn up inspect low load.

Details of the location:

Kick Start function open.
When the motor starts early will be 1sec. full load starter, and then the original set the slope of the start or limit current starts to complete the soft start the action. This function will not usually be used to, because the slope starter to meet varied of environments.

Limit current function open.
This function will not usually be used to, because the slope starter to meet varied of environments.
This function depends on the starter torque settings, example: Start torque adjustment to 300% (12 o'clock), but time must be a maximum of 40 seconds, the motor (380VAC/20HP) full load of 30A, maximum current only to 90A.
(2) adjusted to 400% starting torque (2 o'clock), but time must be a maximum of 40 seconds, the motor (380VAC/20HP) full load of 30A, maximum current only to 120A.

Low load check open.
If the load not enough of water, this low-load protection function can help motor will not idle, protect the motor and let the staff know that load without water pumping.

ON

1   2   3

SW2

Low load check close.

Kick Start function close.

Slope function open.
Slope starter model and Limit current starter model just only can be choose one model.
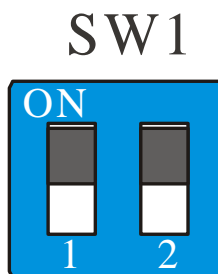This function applies to varied of environmental load, soft starter and soft stop.

The torque controlling: If the motor has situation of shaking while starting, need to adjust switches (SW1), switches establishes the way as follows:
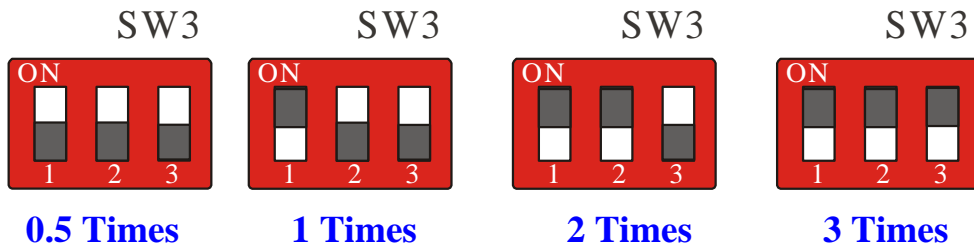
SW1:

Have not established.
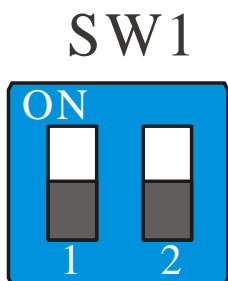
SW1

ON

| 1 | 2 |

Established.

SW1

ON

| 1 | 2 |

Torque starter mode: when the motor starts to vibrate, resulting in SMC-P to differentiate the overload protection, turn on this function can be normal starter the motor, SMC-P no erroneous differentiate, resulting in protection mode.

The electric current multiple of the overload (SW3) establishes the way as follows:

SW3 — 0.5 Times SW3 — 1 Times SW3 — 2 Times SW3 — 3 Times

7-4. The amperage of electric current of the overload (SW4) establishes the way as follows:

SW4

Ampere   1 2 4 8 10 26

Constant summation "Annotate 1".
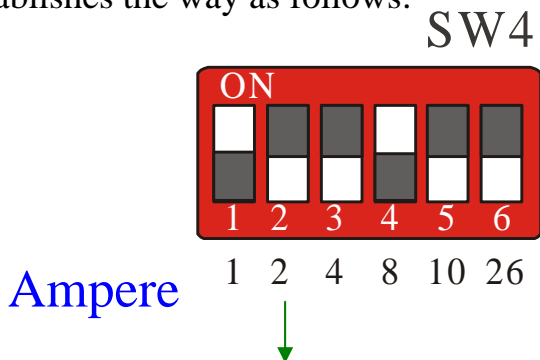
Annotate 1: If you measure V phase full load electric current it is 30A, must be multiplied by safety coefficient of 1.2 times, equal 36A, go to setting overload amperage. Like picture above.

Annotate 2: The aforesaid setting and is only suitable for using under 220V/40HP and 380V/75HP, if exceed horsepower of this range, please get in touch with the distributor or our company technical staff as quickly as possible.

1. Ampere setting of soft start overload current is as follows:

ON (up) 2A+4A+8A=14A

2. Please check ex-factory standard overload current setting list at page.17 of manual for reference.

IX. Ex-factory standard overload current setting

HP	220V	Multiple	380V	Multiple	440V	Multiple	480V	Multiple
3HP	22A/ 11A	1/2	18A/9A	1/2				
5HP	36A/ 18A	1/2	24 A /12A	1/2	20A/10A	1/2	18A/9A	1/2
7.5 HP	26 A	1	34 A /17A	1/2	28A/14A	1/2	26A/13A	1/2
10 HP	34 A	1	48A/24A	1/2	40A/20A	1/2	36A/18A	1/2
15 HP	32A/ 64A	2	28 A	1	24A	1	42A/21A	1/2
20 HP	36A/ 72A	2	38 A	1	32A	1	30A	1
25 HP	38A/ 76A	2	48 A	1	40A	1	36A	1
30 HP	44A/ 88A	2	30A/60A	2	24A/48A	2	44A	1
40 HP	40A/120A	3	39A/78A	2	32A/64A	2	28A/56A	2
50 HP	36A/144A	Fixed 4 time	44A/88A	2	40A/80A	2	36A/72A	2
60 HP	42A/168A	Fixed 4 time	48A/96A	2	44A/88A	2	38A/76A	2
75 HP	36A/216A	Fixed 6 time	44A/132A	3	40A/120A	3	36A/108A	3
100 HP	46A/276A	Fixed 6 time	42A/168A	Fixed 4 time	38A/152A	Fixed 4 time	44A/132A	3
125 HP	46A/322A	Fixed 7 time	34A/204A	Fixed 6 time	30A/180A	Fixed 6 time	28A/168A	Fixed 6 time
150 HP	48A/384A	Fixed 8 time	40A/240A	Fixed 6 time	36A/216A	Fixed 6 time	32A/192A	Fixed 6 time
175 HP	46A/460A	Fixed 10 time	44A/308A	Fixed 7 time	40A/280A	Fixed 7 time	36A/252A	Fixed 7 time
200 HP			48A/336A	Fixed 7 time	44A/308A	Fixed 7 time	38A/266A	Fixed 7 time
250 HP			48A/384A	Fixed 8 time	44A/352A	Fixed 8 time	38A/304A	Fixed 8 time
300 HP			46A/460A	Fixed 10 time	42A/420A	Fixed 10 time	38A/380A	Fixed 10 time
500A/ 250KW			43A/516A	Fixed 12 time				
560A/ 280KW			41A/574A	Fixed 14 time				
620A/ 315KW			45A/630A	Fixed 14 time				
750A/ 355KW			42A/672A	Fixed 16 time				
930A/ 450KW			42A/840A	Fixed 20 time				
1100A/ 500KW			47A/940A	Fixed 20 time				

Example: 380VAC/300HP, setting overload value: 46A/460A Fixed 10 time.

46A/460A = Setting ampere is 46A, Multiplied by a fixed multiple: 10 times/ Equal to 460A
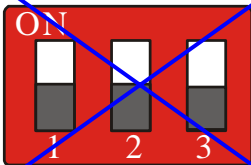
Fixed 10 time

SW4

2A+8A+10A+26A = 46A
2(2A), 4(8A), 5(10A) and 6(26A)
Two, four, five and six pin push up, equal 46 ampere.

1 2 4 8 10 26 Ampere

SW3

Fixed 10 time, therefore, this DIP switch no function, because this multiple has written to the CPU, there's no way to adjust.

Propose that motor overload electric current value setting the way:
1. Please that data plate label to fully load with electric current value multiply by 1.1 times setting for with motor.
2. If does not know that the motor is fully loaded with electric current value, please measure motor S phase with clamp meters, electric current value got is multiply by 1.2 times and setting.

The motor has not overloaded or has been fully loaded with, could use this explanation.

⚠ **Matter needing attention:** Use SMC-P, need to pay attention to the motor not to exceed specified electric current value that SMC-P permit while operating electric current value, if overload to use, our company will refuse to guarantee.

Example: motor is 380V/3HP, setting ampere is 18A, and multiple is 0.5 time equal 9A:

SW4
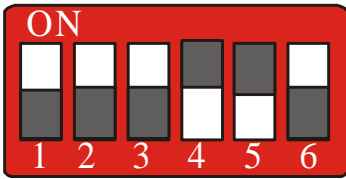
8A+10A= 18A

4(8A) and 5(10A)   Five and six pin push up, equal 18 ampere.

1   2   4   8   10 26   Ampere

SW3
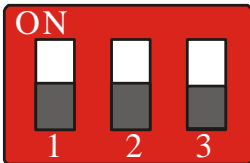
One, two and three pin needs push down, and then multiple 0.5 time function is open.

18A × 0.5 time = 9A

【Please confirm motor isn't overload or full load first according to this setting.】

Warning : Please pay attention to motor's running current never be over than rated current limited of soft start itself when use pump soft start. It doesn't include in our guarantee if overload.

Explanation of Installation :   Fig.1:

Please install the product with this direction, in order to let cool air enter from bottom, and hot air comes out from top. Please add filter net to avoid dust or impurities blocked if the control box has holes, and clean the net regularly to avoid the net blocking.
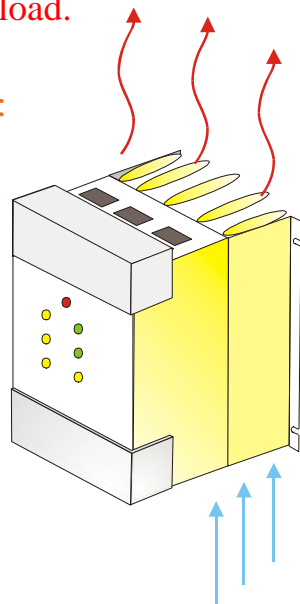
X. Control way.
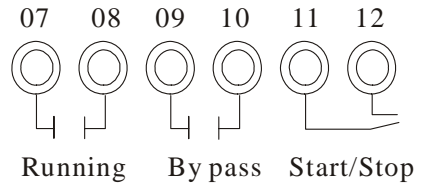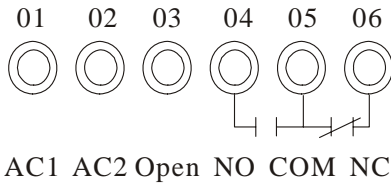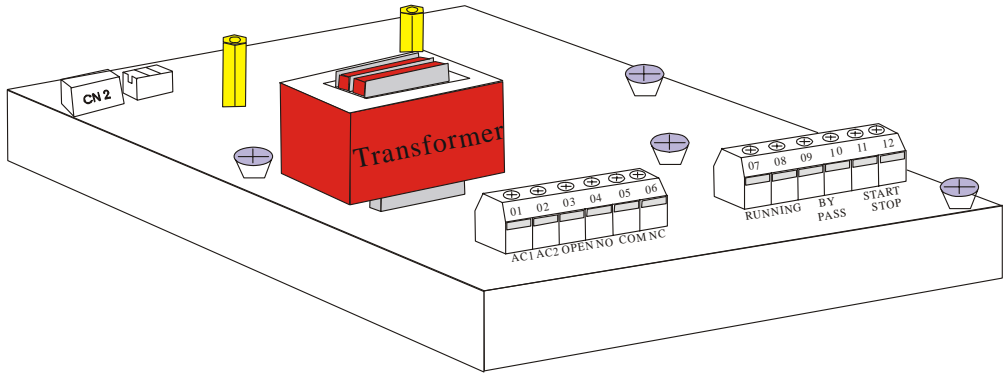
9-1.AC1、AC2（01、02）：Connect with 220VAC auxiliary power.

9-2.Open（03）：Empty.

9-3.NO、COM、NC（04、05、06）：Error output contact (capacity of output contact 240VAC/5A)

9-4.Running（07、08）：Output contact will be close often from open often when soft start starts running, it also can be output contact of remote monitoring.

9-5.By Pass（09、10）：The output contact will be close often from open often when soft start done, it also can be used of by pass.

9-6.Start / Stop（11、12）：Contacts of start and stop, input contact of soft start starting, open close is stop running, and close often I start running.

⚠ Annotate 1: The capacity of item 3, 4, 5 output contact is 240VAC/5A.

P.24

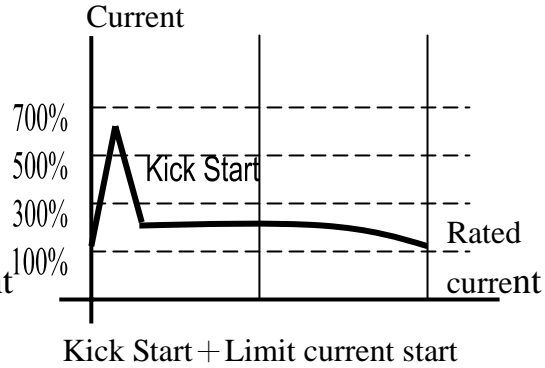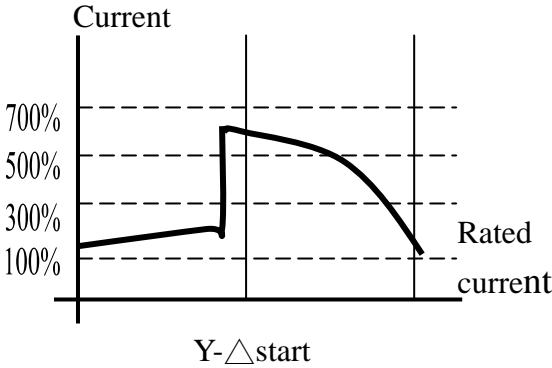# XI. Diagram of soft pump starting and stopping.

Direct kick-start

Inertia stop

SMC Start pume

SMC Stop pump

Y-△ Start pressuring decline

(Starting zone)   (Operating zone)   (Stop zone)

Flow volume

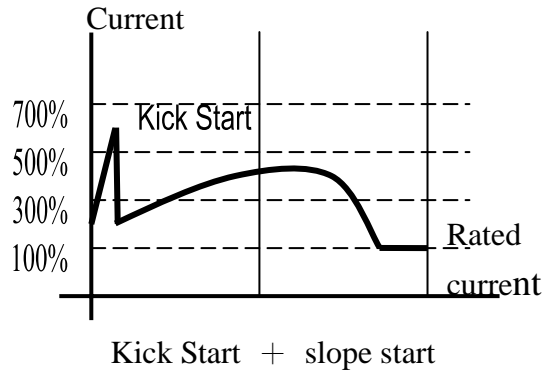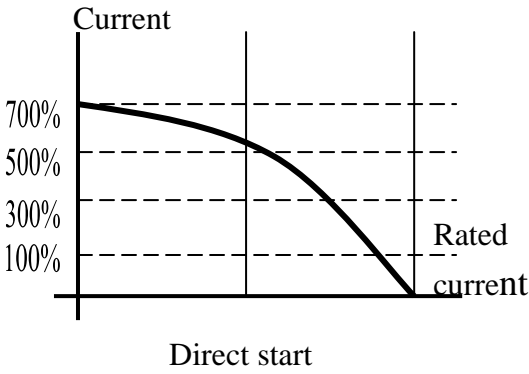Time (Minutes)

- - - - - - - - Direct kick-start / Inertia stop

— — — - - - Y-△ Start pressure decline / Inertia stop

———————— SMC Start pump / SMC Stop pump

XII.

Comparison between SMC, direct starting, Y-△ start current:

Current

700%
500%
300%
100% — — — — — — — — — Rated
current

Direct start

Current

700% — — Kick Start — — —
500%
300%
100% — — — — — — — — Rated
current

Kick Start + slope start

Current

700%
500%
300%
100% — — — — — — — Rated
current

Y-△start

Current

700%
500% — Kick Start
300%
100% — — — — — — — Rated
current

Kick Start＋Limit current start

Current

700%
500%
300%
100% — — — — — — — — Rated
current
90   **50   2.5   0 SLIP**
Reactor tart

Current

700%
500%
300%
100% — — — — — — — Rated
current

Slope start   speed (RPM)

P.26

XII. General control diagram suggested:

Water tray only of alternating running control diagram (1 to 1) recommended of SMC pump.

SMC-P Soft Start Pump Motor Controller
AC1, AC2: Input 220VAC auxiliary voltage. FS 61F: liquid surface controller.
G4Q: Ratchet Relay. CS: auto/manual switch.
All contacts are dry contact.

MC isolation switch and By Pass, a motor versus to a soft starter, running alternately proposed control charts.
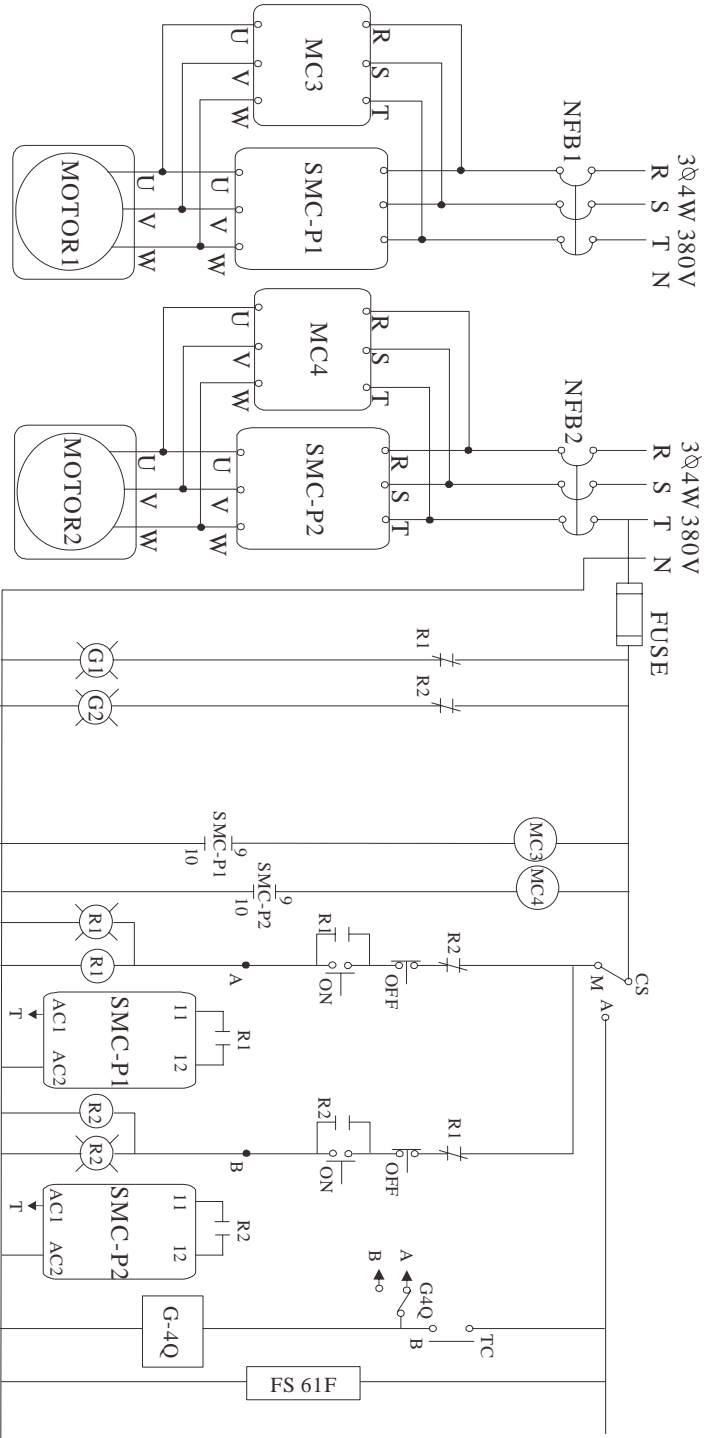
By Pass, a motor versus to a soft starter, running alternately proposed control charts.

SMC-P Soft Start Pump Motor Controller
AC1, AC2: Input 220VAC auxiliary voltage. FS 61F: liquid surface controller.
G4Q: Ratchet Relay. CS: auto/manual switch.
All contacts are dry contact.

P.29

XIII. Environment characteristic.

13-1.

Operation position:	Indoor without dust and corrosive air.
Work position:	Vertical.
Relative humidity:	Over 45% ，93% RH without dew.
Work's temperature:	-10℃ ~ under 45℃.
Frequency:	50Hz or 60Hz , auto-adjust.
Power , voltage 3 ϕ :	220VAC ± 10% 380VAC ± 10% 440VAC ± 10% 460~480VAC ± 10%
Vibration:	Under 0.5G
Height:	Under 1,000m.
Voltage directed on motor:	200V～240V, 380V～440V, 460V～480V.

XIV. Attention.

1. This product has the function if overload protection. Please check voltage of motor, (ex: 220V, 380V, 440V…etc.) and full voltage of motor listed similar as the voltage listed in our catalogue (in principle, error can be -20%~+5%), and write on the order if plan to raise the class in order to setting before leaving the plant, or also can as overload protector by yourself.

E.G.: Please let's know what you use SMC100HP in motor 75HP or add overload protector.

2. Concerning our product of 380v~440V, the 380v is full current standard setting when leaving the plant, please let's know what you use 440v. In order to, change setting before leaving the plant. Otherwise, the overload function will lose efficacy. It become without overload protection. When you use it, you should pay attention reference of manual.

3. Our company SMC-P electric current setting value, environment temperature is less than 45℃ in Centigrade, can operate for a long time. But need to pay attention if motor starting times are high frequently, the SMC-P must raise one level.

⚠ Annotate 1: An hour is started 20 or more times or heat sink temperature exceeds 85℃ Centigrade, need upgrading.

XV.   Guarantee of product

We guarantee that our products are conformed to each specification list on the manual; the product can be operating normally with suitable and proper installation.

Warranty : one year from the date of production.　We shall offer free maintenance if our product has any flaw certainly within warranty period.　The warranty doesn't include error installation, man-made damage, and the damage caused by irresistible natural disasters.

This guarantee offer repair guarantee of the product only, not includes other damage caused by any direct or indirect accidents.

Model:	☐ SMC92☐☐☐☐☐-P ☐ SMC93☐☐☐☐☐-P		
Serial umber:	S/N:		
Installation date:	Month:	Date:	Year:
Distributor:			

English Edition v08. 11

August.30.2011 Made.

Soft Starter Pump Motor Controller of

Multi-Function Series.

Handbook

Content

I. Instruction of faceplate and function

1. Auxiliary voltage indicator lamp.
2. Running, stopping indicator lamp./ Error.1 indicator lamp.
3. Run and finish indicator lamp.
4. Error.2 indicator lamp. (Overload、Loss phase、Motor seize、Over heating、Low load)
5. Start torque (100%~500%)
6. Start time (0S.~40S.)
7. Stop time (0S.~60S.)
8. The top cover and below cover can be according to the instruction press and push open.

Introduction:

1. Power: (Indication light ON when connecting with auxiliary power
   (AC1, AC2), 220 VAC 50/60Hz (auto-judging).

2. Running: Indication light ON in starting, running, and
   soft-stopping.

   Error.1: Including indication lights of:

   〝Reverse phase protection〞   : When the input power phase
   sequence error, SMC-PH
   starts protection.

   〝Three phase disequilibrium protection〞 : When the three- phase
   difference between running
   current 30% or 40%
   SMC-PH starts protection.
   (difference between Value of
   30% and 40% can be
   adjusted)page.

   〝Thyristor short circuit protection〞   : When the silicon controlled
   rectifier suffered the impact
   of power surges or abnormal,
   resulting in short circuit,
   SMC-PH starts protection.

   〝No power protection〞   : When the power not have input
   the SMC-PH R,S,T phases,
   SMC-PH starts protection.

   〝Soft-start can not complete starter〞 : If the soft-start time set to 20
   seconds, but the soft-start
   process in pass of 20 seconds,
   has not yet reached full load,
   SMC-PH starts protection.

3. Run: Indication light ON when starting done.

4. Error.2: Including indication lights of:

〝Overload〞 : When the motor overstep the rated current, SMC-P starts protection.

〝Loss Phase 〞 : Main power supply loss of one-phase or two-phase or three-phase power.

〝Motor Block〞 : Motor of a foreign body clog, causing the current increase, can not function properly.

〝Overheat of SMC-P〞 : SMC-P heat sink temperature reaches 80 to 90℃, exceed the security value.

〝low-load〞 : Motor lack of water can be transported.

5. Start torque: Adjustment of torque when motor starting.
6. Start time: Adjustment of motor start time to decide the time of full-starting.
7. Stop time: Time adjustment of motor soft-stop to decide the time of motor stopping.

⚠ Q & A

Q: Q: How to reset if error1 or error 2 light ON and the trouble had been removed?

A: ERROR.1: Please check error light of condition of Reverse phase protection, Three phase disequilibrium protection, Thyristor short circuit protection, No power protection, or Failed to start protection, then removed the error, and press reset key.

ERROR.2: Please check error light of condition of overload, under phase, block, overheat, or low-load, then removed the error, and press reset key.

Abnormal light illustration:
The error.1 there is five type protections in the machine.
Under to illustration:

1.

a

Reverse phase protection. LED Flashing once.

When the R, S, T phase sequence error, SMC-PH start protection.

2.

b

Three phase unbalanced protection.   LED Flashes twice.

When the three-phase power(R,S   S,T   R,T) difference 10%,
SMC-PH start protection..

3.

Thyristor short circuit protection.   LED Flashes three times.

If Thyristor overload, short circuit, SMC-PH start protection.

4.

No power protection.   LED Flashes four times.

Power did not enter the SMC-PH, star protection.

5.

c

Soft-start can not complete starter   LED Flashes five times.

If the soft-start time set to 20 seconds, but the soft-start process in pass of 20

seconds, has not yet reached full load, SMC-PH starts protection.

a: Times of cycle is 0. 25 Sec.

b: Times of cycle is 0. 25 Sec.

c: One abnormal time of cycle is 3 Sec.

Instruction of error light:

This controller has 10 protection systems show as follows:
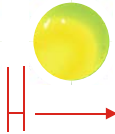
Running/Error.1
Light OFF when no error happened.

Running/Error.1
Light ON, and glimmered as 5 phases when error happened.

Glimmering once: Reverse phase protection

(Glimmering time is 3 sec. till next glimmering.)

Glimmering twice: Three phase unbalanced protection.

(Glimmering every 0.25 sec. till error removed.)

Glimmering 3 times:Thyristor short circuit protection.
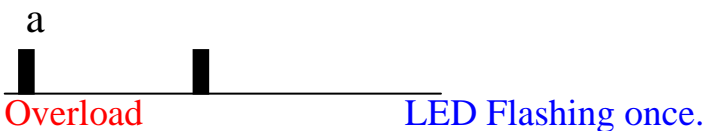
Glimmering 4 times:No power protection.

Glimmering 4 times:Soft-start can not complete starter

Abnormal light illustration:
There are five type protections in the machine.
Under to illustration:

1.

a

Overload LED Flashing once.

The breakdown clearing explaining: Please consult page 16~19.

2.

b

Loss phase LED Flashes twice.

The breakdown clearing explaining: Please check whether there is power input in the electric three phases of source , and check whether to install the mistake in proper order in motor load or not.

3.

Motor block LED Flashes three times.

The breakdown clearing explaining: Whether checking the motor has things that are seize, whether checking the motor has things that are seize, or the piping has phenomenon of shaking while starting, can jump seize state , Please consult page.15 setting torque control.

4.

Over heating LED Flashes four times.

The breakdown clearing explaining: When install in the control box, please make a window on up side and down side in order to cool air in from down side, and hot air out from up side, and please place the filter net on up side to prevent the dust or waste in, and clean the filter net regularly to avoid the filter net block.

5.

c

Low load LED Flashes five times.

⚠ a: Times of cycle is 0. 25 Sec.

b: Times of cycle is 0. 25 Sec.
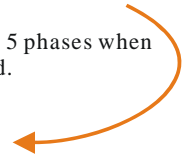
c: One abnormal time of cycle is 3 Sec.

Error.2
Light OFF when no error happened.

Error.2
Light ON, and glimmered as 5 phases when error happened.

Glimmering once : protection of overload.

(Glimmering time is 3 sec. till next glimmering.)

Glimmering twice : protection of loss phase.

(Glimmering every 0.25 sec. till error removed.)

Glimmering 3 times : Protection of motor block.

Glimmering 4 times : Protection of product overheat.

Glimmering 5 times : Protection of low-load, no setting when ex-factory , please adjust various function settings of SW1 if protection of low-load necessary. Please read the instruction at P.13 for reference.

General characteristic.

1. This controller offers 3 sets of output contact : output contact when starting, output contact when running done, and output contact of system error.

2. Diagnosis of LED : There' CT electronic detecting protector with the protection of Reverse phase protection, Three phase disequilibrium protection, Thyristor short circuit protection, No power protection, Soft-start can not complete starter, overload, under phase, motor block, machine overheat and low-load (water shortage).

3. the movement of cooling fan can stabilize the temperature, the heat sink will run at 55℃, and stop at 45℃, and this can extend 2 ~ 3 times use-life of heat sink.

4. This product offers loop design of BY PASS.

5. This product tally with the standard of CE, IEC60947-4-2, IEC60947-4-1, etc.

6. The SMC-PH softstarter is the first compact softstarter. It is developed in close cooperation with customers to ensure that the product solves all the important needs of the customers.

The SMC-PH softstarter is ideal for any applications where space is limited, but where advanced functionality still is required. It is suitable for most of the common applications such as pumps, fans, compressors, conveyor belts and more.

7. Easy

One of the most important features of any electrical device is that it is easy to set up and easy to use. The SMC-PH softstarter is equipped with an easy-to-use four sets DIP switch and faceplate have three knobs.

8. Reliable

The SMC-PH softstarter is not only designed to ensure an exceptional reliability. It has also been equipped with features to ensure that the whole operation is kept reliable. As an example, torque control eliminates water hammering and thereby greatly reduces the mechanical stress on pump systems and provides a more

reliable operation with less downtime.

9. Efficient

Knowing what the customer want, it has been possible to design a softstarter that really fulfils the needs of the customers, without adding unwanted complexity. This gives excellent value for money and together with the by-pass for energy saving makes the SMC-PH softstarter a very efficient choice.

10. Protect

Reverse phase protection.

Three phase disequilibrium protection.

Thyristor short circuit protection.

No power protection.

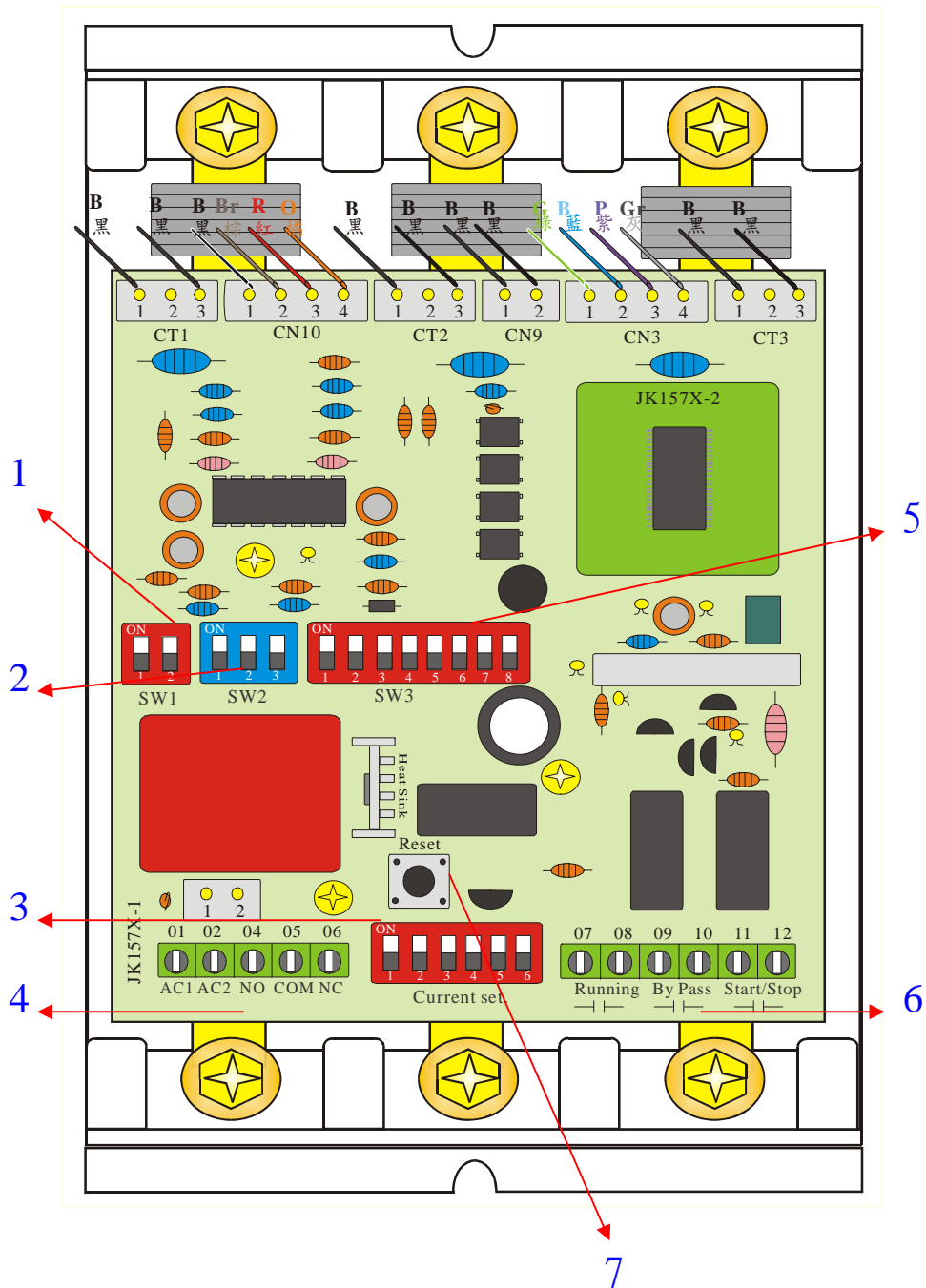Soft-start can not complete starter.

Overload protect.

Loss Phase protect.

Motor block protect.

Overheat protect of SMC-PH.

Low-load protect.

Inside structure illustration.220VAC/3~10HP, 380VAC/3~15HP

1. Start-up mode is set (SW1 Red): Slope start, Limit current start and Kick Start.

2. Starting torque and protection function choose (SW2 Blue): Torque controlling, Low load check and Check the reverse.

3. The amperage of electric current of the overload (SW4 Red) set: Overload protection, amperage settings to adjust.

4. Control way: AC1, AC2, NO, COM, NC.

5. (SW3 Red) Check the 3 phases disequilibrium, Check the thyristor short circuit protection and setting the value of protection.

6. Control way: Running, By Pass, Start / Stop.

7. Reset.

220VAC/15HP~1100A, 380VAC/20HP~1100A
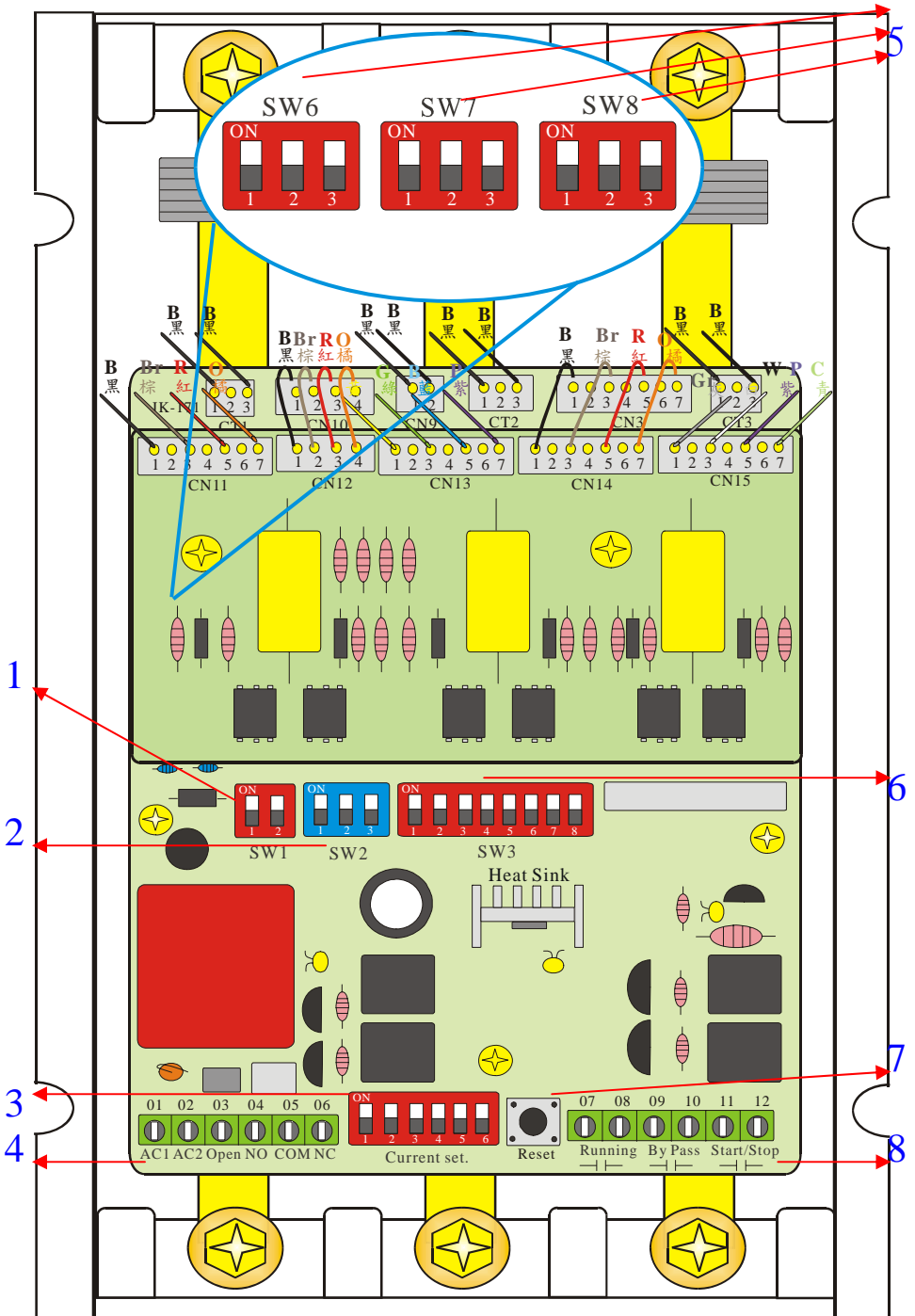
1. Start-up mode is set (SW1 Red): Slope start, Limit current start and Kick Start.

2. Starting torque and protection function choose (SW2 Blue): Torque controlling, Low load check and Check the reverse.

3. The amperage of electric current of the overload (SW4 Red) set: Overload protection, amperage settings to adjust.

4. Control way: AC1, AC2, Open, NO, COM, NC.

5. The electric current multiple of the overload setting (R phase SW6, S phase SW7, T phase SW8, Red).

6. (SW3 Red) Check the 3 phases disequilibrium, Check the thyristor short circuit protection and setting the value of protection.

7. Reset.

8. Control way: Running, By Pass, Start / Stop.

Technical Specification.

Main power:208 ~ 220 VAC / 380 ~ 480 VAC ± 10% 。

Auxiliary voltage: 220 VAC ±10 % 【offer 110VAC for choice, please tell salesman if necessary.】

Starting model: dry contact 【11, 12 two contacts】

Working frequency: 50 ~ 60 Hz ± 5 %

Peak pressure: 600V or 1200V ~ 1600 VAC

Start Time: 1~40Sec.

Start Torque: 100%~500%

Stop Time: 1~60Sec.

Room temperature of working: -10°C ~50°C

Max. Relative humidity: 93% without water drop concealed.

⚠ Please check motor HP and rated current; please choose the value higher if both are different.

Example : Rated current of motor 220V/2HP is 9A, please use 220V/3HP SMC920030-PH soft starter.

Choice the model

Rated current	Rated voltage			
	208~220VAC	HP	380~480VAC	HP
7A			SMC930030-PH	3HP
10A	SMC920030-PH	3HP	SMC930050-PH	5 HP
15 A	SMC920050-PH	5 HP	SMC930075-PH	7.5 HP
22 A	SMC920075-PH	7.5 HP	SMC930100-PH	10 HP
28 A	SMC920100-PH	10 HP	SMC930150-PH	15 HP
35A			SMC930200-PH	20 HP
42A	SMC920150-PH	15 HP	SMC930250-PH	25 HP
55A	SMC920200-PH	20 HP	SMC930300-PH	30 HP
70A	SMC920250-PH	25 HP	SMC930400-PH	40 HP
82A	SMC920300-PH	30 HP	SMC930500-PH	50 HP
105A	SMC920400-PH	40 HP	SMC930600-PH	60 HP
135A	SMC920500-PH	50 HP	SMC930750-PH	75 HP
155A	SMC920600-PH	60 HP	SMC931000-PH	100 HP
185A	SMC920750-PH	75 HP	SMC931250-PH	125 HP
250A	SMC921000-PH	100 HP	SMC931500-PH	150 HP
280A			SMC931750-PH	175 HP
300A	SMC921250-PH	125 HP	SMC932000-PH	200HP
360A	SMC921500-PH	150 HP	SMC932500-PH	250HP
420A	SMC921750-PH	175 HP	SMC933000-PH	300HP
500A	SMC920500A-PH	500A	SMC930500A-PH	500A
560A	SMC920560A-PH	56A	SMC930560A-PH	56A
620A	SMC920620A-PH	620A	SMC930620A-PH	620A
750A	SMC920750A-PH	750A	SMC930750A-PH	750A
930A	SMC920930A-PH	930A	SMC930930A-PH	930A
1100A	SMC921100A-PH	1100A	SMC931100A-PH	1100A

V.   Installation Attention of SMC-PH.

1. Ventilation and cooling : SMC-PH must be operated at the place well ventilated and cool, and pay attention to the room temperature not rise over 50℃ and less than -10℃.

2. This product is designed to start 20 times/hr., if the starter times over the 20 times/hr., please improve the level of soft starter to use, because the heat sink's temperature will over to 85℃. This will result in temperatures in excess of silicon-controlled rectifier to reduce the life or cause failure.

3. Please check and make sure the right wiring sequence when give the power to machine test : input end is R.S.T., output end is U.V.W.   The trouble caused by error wiring of input and output should not include in our guarantee.

4. SMC-PH soft start must be installed at the place well ventilated and cool, so please pay attention to the air flow direction when install, and keep at least 10 cm with other tools or instrument to cool.

5. The top and bottom of the control box should open the mouth for cool air enter through bottom mouth and hot air out from top mouth; and please add filter net on the mouth to avoid dust and impurities stuck the mouth; and clean the filter net regularly. (figure 1 at page 15)

6. Please add fan if the temperature in the box over 45℃ to improve air circulation and keep the temperature in the box under 45℃, and this will give the best running.

7. The setting of full load current is designed as 380V of ex-factory for our product of 380-480V, please let's know and change the settings in advance if install in the place with 440 ~ 480V. Otherwise it'll lose the meaning to overload without overload protection, therefore please pay attention to the settings.

8. The rated current of our soft start is in accordance with TECO four-pole motor's current.   To the motor used; please check the rated current listed in the catalogue if full-load current is different from TECO motor's load current (over 10%).   1 level must be rose to work when actual current is over 10%.

9. The soft start can't work if it has input auxiliary power (220VAC or 110VAC) only without main power input.

10. Load (motor) starter can't be controlled by soft start time knob (Start fast) when the big difference generated between soft start overload current settings and actual running current.

Examples: Motor 380VAC/ 10HP current is 20A.
Overload set value is 40A; this situation has no protection to the motor, lead to an instant when it starters up at full load condition, no soft-starter function. This time need to adjust the overload protection setting values to the normal state.

⚠

⚠

Error connection of capacitor.
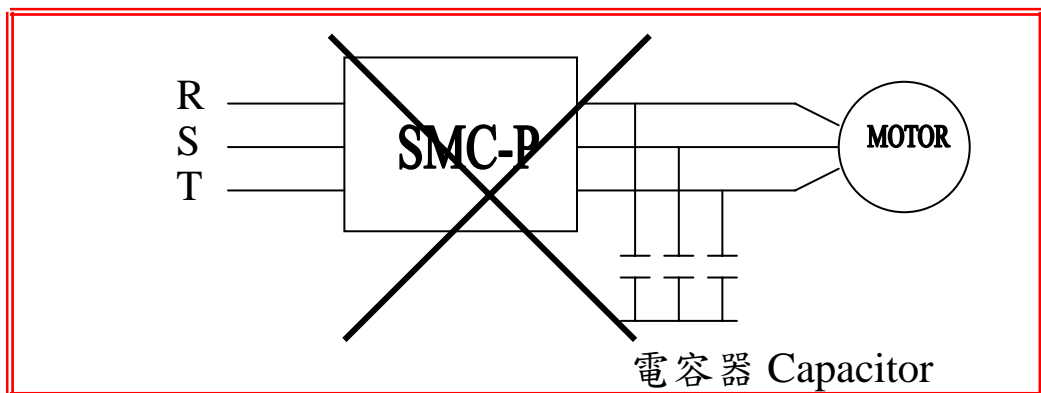
R
S
T

SMC-P

MOTOR

電容器 Capacitor

Right connection of condenser

R
S
T

SMC-P

MOTOR

電容器 Capacitor

VII. Application and Setting:

1. Application of SMC-P for pump : This product is designed specially for water pump with water hammer caused, suitable to water system of building pumping, sewage, waste water, farmland, factory, …..etc., the effect will be more excellent when lift is higher.

2. The torque and time will be adjusted depend on motor load type. It can be classified as big load inertia and small load inertia.   We recommend setting the initial settings as start torque value – 260% and starting time - 20 sec. when we don't know the load value, and add or reduce torque with actual running.

3. In any condition, the soft start will running with full pressure when motor arrives full-speed running.

Motor start slow or fast depends on the adjustment of start torque. The time of motor's full-pressure start depends on the adjustment of start time.
The stop time of motor soft start depends on the adjustment of stop time.

Soft start pump motor controller in the operation, all the features of the settings are nullity, please complete before starting to set or set to restart.

Start Torque

(Photo.1)

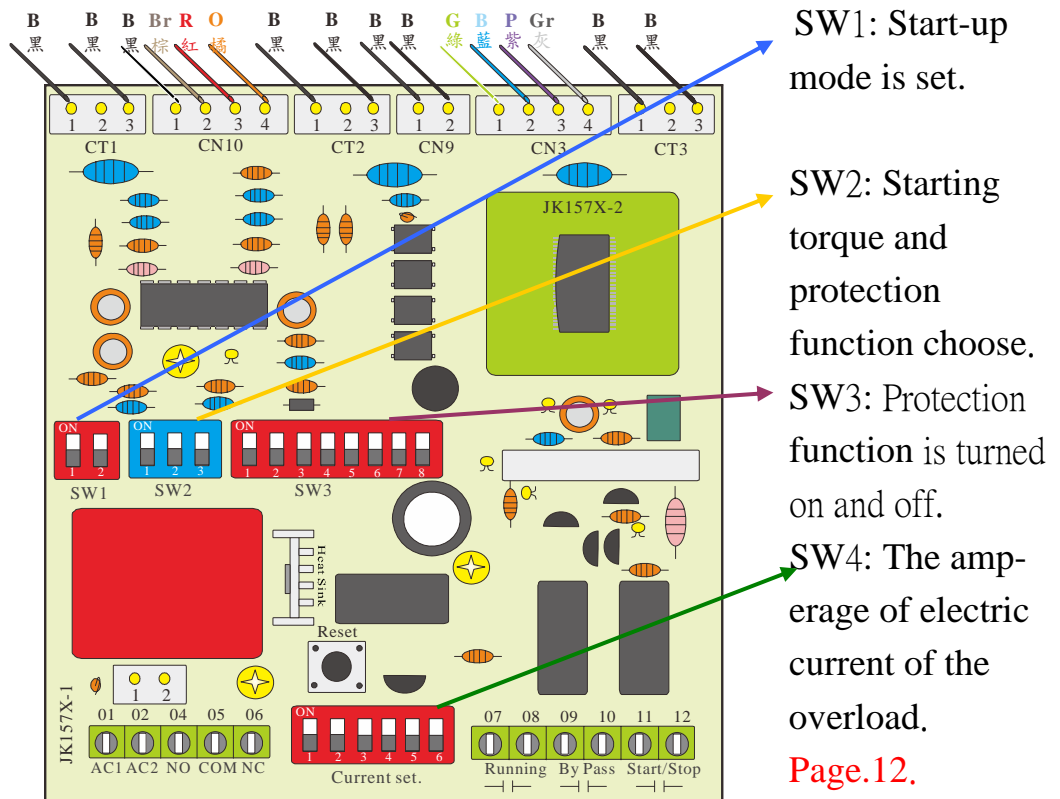### Start Time

(Photo.2)

Stop Time

(Photo.3)

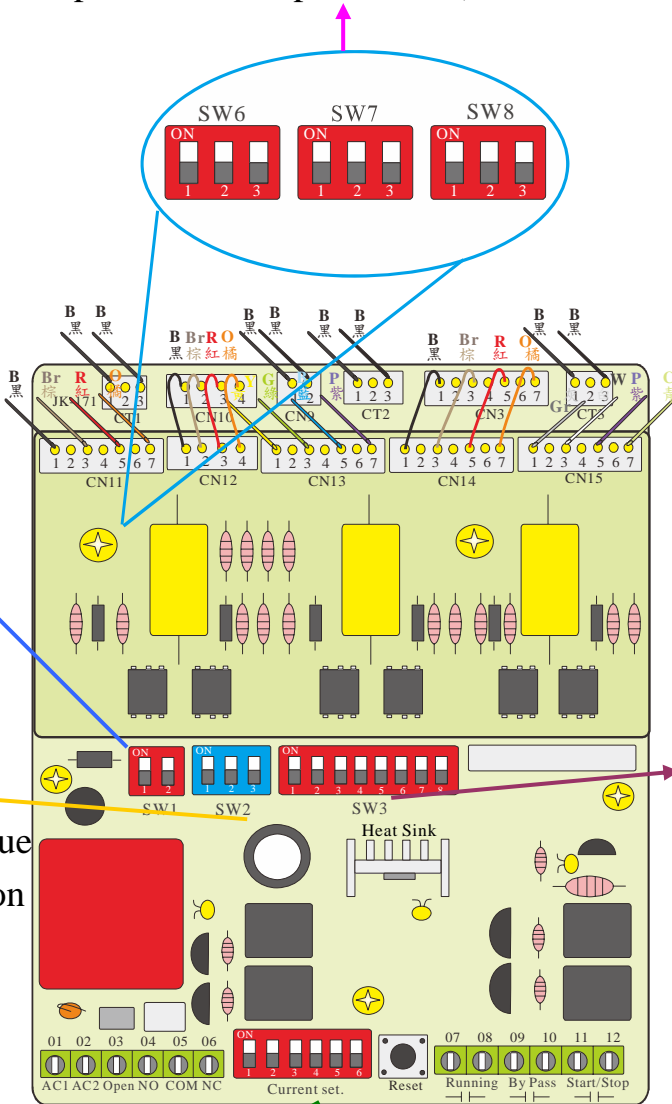# The overload electric current adjust and explain.

As " soft start pump motor controller " start rapidly or stop the phenomenon rapidly when using, the reason:

1. Pump motor operates in the electric current and is smaller than soft start pump motor controller and establish more than 30% of electric current.
2. The motor is smaller much than soft start pump motor controller in load while operating.
   E.G.: Motor load is 1HP, soft start pump motor controller is 10HP.
3. It is the same as motor load to use soft start pump motor controller, but the motor operates the electric current and soft start pump motor controller and establishes the electric current and differs by more than 30%.

While finding that there are above-mentioned reasons. Need to adjust soft start pump motor controller overload electric current and establishing the parameter.

SW1: Start-up mode is set.

SW2: Starting torque and protection function choose.

SW3: Protection function is turned on and off.

SW4: The amp-erage of electric current of the overload.

Page.12.

SW6, 7 and 8: The electric current multiple of the overload setting (R phase SW6, S phase SW7, T phase SW8).

SW6   SW7   SW8

ON   ON   ON
1 2 3 1 2 3 1 2 3

B B   B B   B B   B B
黑 黑   黑 黑 黑 黑   黑 黑
        B BrR O
        黑棕红橘
B   B Br R O   W P
黑 Br R O   黑 棕 红 橘   紫
   棕 红 橘
        G   P   C
        绿   紫   电
  JK171 CT1   CN10   CN9   CT2   CN3   G CT3
1 2 3 1 2 3 4 1 2 3 4 5 6 7 1 2 3 1 2 3 5 6 7 1 2 3

1 2 3 4 5 6 7 1 2 3 4 1 2 3 4 5 6 7 1 2 3 4 5 6 7 1 2 3 4 5 6 7
CN11   CN12   CN13   CN14   CN15

SW1: Start-up mode is set.

SW2: Starting torque and protection function choose.

SW3: Protection function is turned on and off.

ON   ON   ON
1 2   1 2 3 1 2 3 4 5 6 7
SW1   SW2   SW3

Heat Sink

01 02 03 04 05 06
AC1 AC2 Open NO COM NC

ON
1 2 3 4 5 6
Current set.

Reset

07 08 09 10 11 12
Running By Pass Start/Stop

SW4: The amperage of electric current of the overload.

Starting Way. (SW1, SW2, SW3)

1. Slope start:
Push down 1, (1 OFF).

2. Limit current start:
Push up 1, (1 ON).

You can refer to page 25 of the curve description.
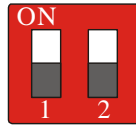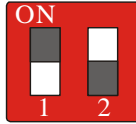
3. Kick Start:
Push up 2(2 ON).
push down (2 OFF)
cancel function.
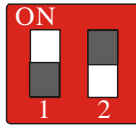
4. The torque controlling:
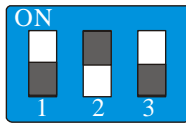Push up 1, (1 ON),
push down (1 OFF)
cancel function.
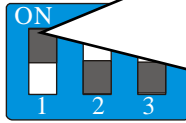
Torque starte mode: when the motor starts to vibrate, resulting in SMC-PH to differentiate the overload protection, turn on this function can be normal starter the motor, SMC-PH no erroneous differentiate, resulting in protection mode.

5. Low load check:
Push up 2, (2 ON),
push down (2 OFF)
cancel function.

Motor lack of water check.

6. Check the reverse:
Push up 3, (3 ON),
push down (3 OFF)
cancel function.
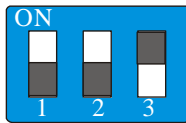
Limit current function open.
This function will not usually be used to, because the slope starter to meet varied of environments. This function depends on the starter torque settings, example: Start torque adjustment to 300% (12 o'clock), but time must be a maximum of 40 seconds, the motor (380VAC/20HP) full load of 30A, maximum current only to 90A.
(2) adjusted to 400% starting torque (2 o'clock), but time must be a maximum of 40 seconds, the motor (380VAC/20HP) full load of 30A, maximum current only to 120A.

Kick Start function open.
When the motor starts early will be 1sec. full load starter, and then the original set the slope of the start or limit current starts to complete the soft start the action. This function will not usually be used to, because the slope starter to meet varied of environments.

ON

1   2

SW1
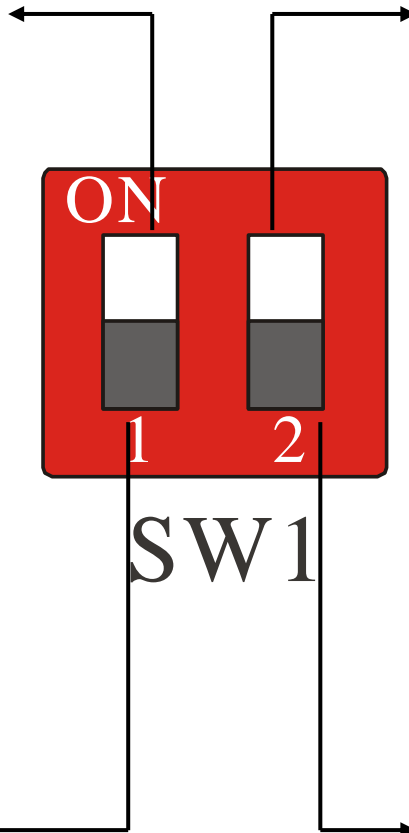
Slope function open.
Slope starter model and Limit current starter model just only can be choose one model. This function applies to varied of environmental load, soft starter and soft stop.

Kick Start function close.

The torque controlling: If the motor has situation of shaking while starting, need to adjust switches (SW2).

Torque starter mode: when the motor starts to vibrate, resulting in SMC-P to differentiate the overload protection, turn on this function can be normal starter the motor, SMC-PH no erroneous differentiate, resulting in protection mode.

Low load check open.
If the load not enough of water, this low-load protection function can help motor will not idle, protect the motor and let the staff know that load without water pumping.

Check the reverse
When the power phase sequence error, this function can provide protection, the motor will not be reversed.

ON

1 2 3

SW2

Low load check close.

Check the reverse close.

Torque controlling function close.

7. Check the 3 phases disequilibrium:
Push up 1, (1 ON),
push down (1 OFF), cancel function.

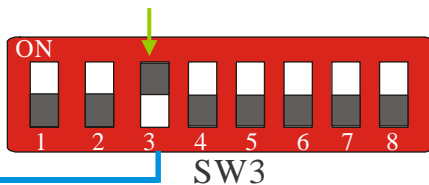SW3
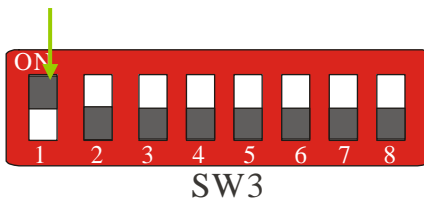
8. Check the Thyristor short circuit protection:
Push up 2, (2 ON),
push down (2 OFF), cancel function.

SW3
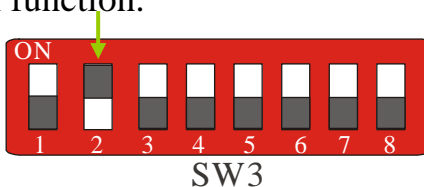
9. Set the percentage of three-phase unbalanced:
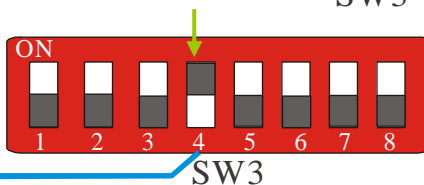
SW3

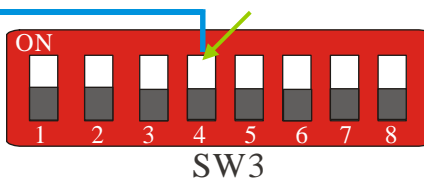30%: push up 3, (3 ON)

40%: push down 3, (3 OFF)

SW3
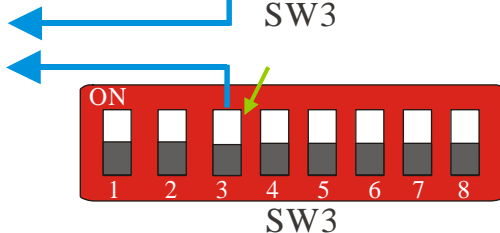
10. Setting block time:
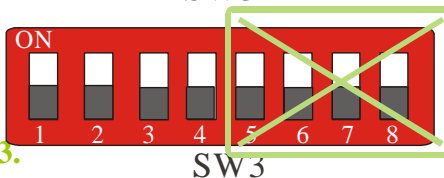Block check time 6 sec.:
push up 4, (4 ON)

SW3

Block check time 2 sec.:
push down 4, (4 OFF)

SW3

11. **Setting for the original factory, please don't move to dip switch 5 , 6 , 7 , 8 of SW3.**

SW3

Instruction of overload current setting.

The reasons of soft start for pump motor producing fast start, fast stop are as follows:

1. Motor operation current I smaller than oft start's current set over 30%. (Because overload setting too high)

2. Motor load used is smaller so much than soft start.
   (Eg : motor load is 1HP, and soft start is 10HP.)

3. Actual motor load is same soft start, but the difference between motor running current set and soft start is over 30%.

Must adjust overload current of soft start same as 1.2 times of full load current of motor S phases running.

Propose that motor overload electric current value setting the way:

1. Please that data plate label to fully loaded with electric current value multiply by 1.1 times setting for with motor.

2. If does not know that the motor is fully loaded with electric current value, please measure motor S phase with clamp meters, electric current value got is multiply by 1.2 times and setting.

【The motor has not overloaded or has been fully loaded with, could use this explanation.】

Matter needing attention: Use SMC-P, need to pay attention to the motor not to exceed specified electric current value that SMC-P permit while operating electric current value, if overload to use, our company will refuse to guarantee.

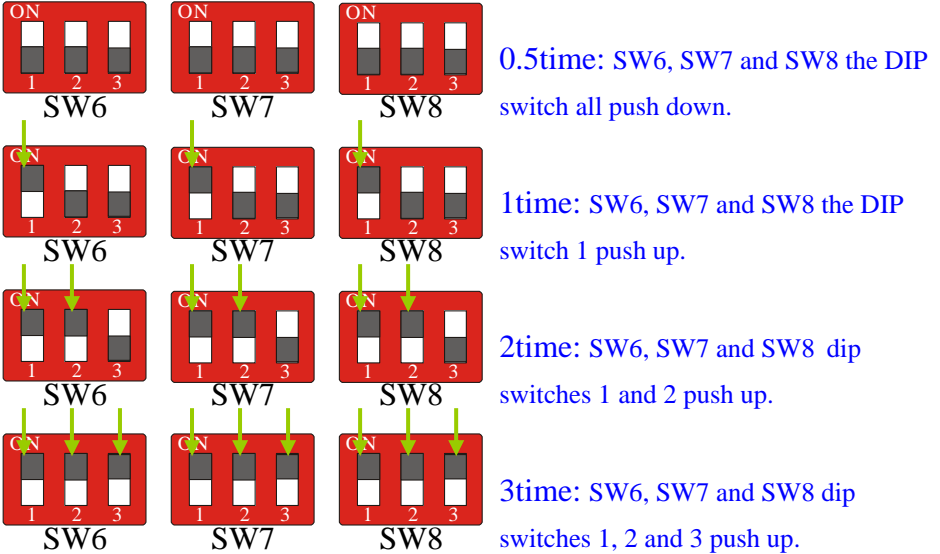# Ex-factory standard overload current setting

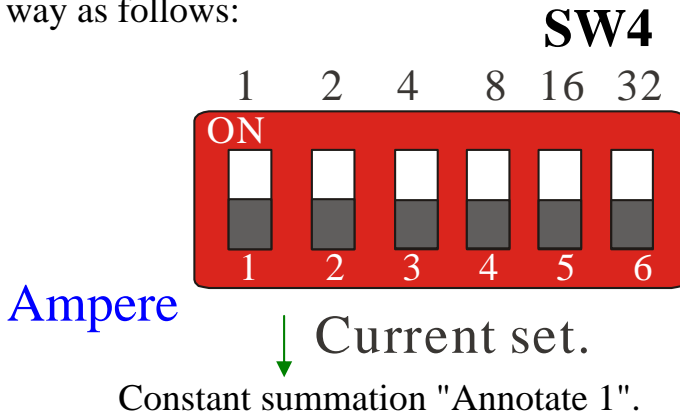| HP	220V	Multiple	380V~480V	Multiple
3HP	22A/11A	Fixed 0.5 time	16A/8A	Fixed 0.5 time
5 HP	36A/18A	Fixed 0.5 time	22A/11A	Fixed 0.5 time
7.5 HP	26A	Fixed 1 time	32A/16A	Fixed 0.5 time
10 HP	34A	Fixed 1 time	44A/22A	Fixed 0.5 time
15 HP	32A/ 64A	2	26A	Fixed 1 time
20 HP	36A/ 72A	2	38 A	1
25 HP	38A/ 76A	2	48 A	1
30 HP	44A/ 88A	2	30A/60A	2
40 HP	40A/120A	3	39A/78A	2
50 HP	36A/144A	Fixed 4 time	44A/88A	2
60 HP	42A/168A	Fixed 4 time	48A/96A	2
75 HP	36A/216A	Fixed 6 time	44A/132A	3
100 HP	46A/276A	Fixed 6 time	42A/168A	Fixed 4 time
125 HP	46A/322A	Fixed 7 time	34A/204A	Fixed 6 time
150 HP	48A/384A	Fixed 8 time	40A/240A	Fixed 6 time
175 HP	46A/460A	Fixed 10 time	44A/308A	Fixed 7 time
200HP			48A/336A	Fixed 7 time
250HP			48A/384A	Fixed 8 time
300HP			46A/460A	Fixed 10 time
500A/ 250KW			43A/516A	Fixed 12 time
560A/ 280KW			41A/574A	Fixed 14 time
620A/ 315KW			45A/630A	Fixed 14 time
750A/ 355KW			42A/672A	Fixed 16 time
930A/ 450KW			42A/840A	Fixed 20 time
1100A/ 500KW			47A/940A	Fixed 20 time

※ Multiples of the green boxes and blue boxes are fixed, immobile multiple, can not adjust.

The electric current multiple of the overload setting the way as follows(SW6,SW7,SW8):

0.5time: SW6, SW7 and SW8 the DIP switch all push down.

1time: SW6, SW7 and SW8 the DIP switch 1 push up.

2time: SW6, SW7 and SW8 dip switches 1 and 2 push up.

3time: SW6, SW7 and SW8 dip switches 1, 2 and 3 push up.

The amperage of electric current of the overload (SW4) establishes the way as follows:

SW4

Ampere

Current set.

Constant summation "Annotate 1".

1. Ampere setting of soft start overload current is as follows:

   ON (up) 2A+4A+8A=14A

2. Please check ex-factory standard overload current setting list at page.17 of manual for reference.

Example: 380VAC/300HP, setting overload value: 46A/460A Fixed 10 time.

46A/460A = Setting ampere is 46A, Multiplied by a fixed multiple: 10 times/ Equal to 460A
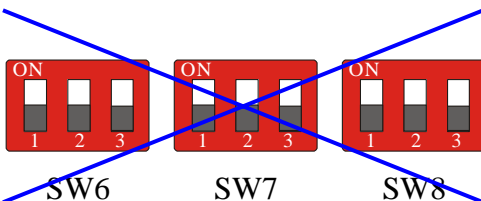
Fixed 10 time.

SW4

2A+4A+8A+32A = 46A
2(2A), 3(4A), 4(8A) and 6(32A)
Two, three, four and six pin push up, equal 46 ampere.

| 1 | 2 | 4 | 8 | 16 | 32 |

Ampere

SW6   SW7   SW8

Fixed 10 time, therefore, this DIP switch no function, because this multiple has written to the CPU, there's no way to adjust.

**Propose that motor overload electric current value setting the way:**

1. Please that data plate label to fully load with electric current value multiply by 1.1 times setting for with motor.

If does not know that the motor is fully loaded with electric current value, please measure motor S phase with clamp meters, electric current value got is multiply by 1.2 times and setting.

The motor has not overloaded or has been fully loaded with, could use this explanation.

⚠ **Matter needing attention:** Use SMC-PH, need to pay attention to the motor not to exceed specified electric current value that SMC-PH permit while operating electric current value, if overload to use, our company will refuse to guarantee.

Example: motor is 380V/3HP, setting ampere is 16A, and multiple is 0.5 time equal 8A:
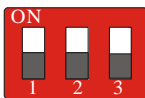
SW4
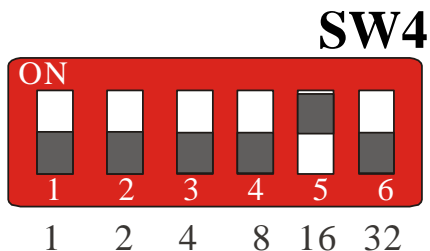
16A= 16A
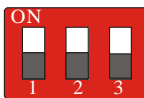
5(16A)　Five pin push up, equal 16 ampere.
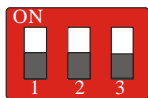
SW6　　SW7　　SW8

One, two and three pin needs push down, and then multiple 0.5 time function is open.

16A × 0.5 time = 8A

【Please confirm motor isn't overload or full load first according to this setting.】

Warning : Please pay attention to motor's running current never be over than rated current limited of soft start itself when use pump soft start. It doesn't include in our guarantee if overload.

Explanation of Installation :
Please install the product with this direction, in order to let cool air enter from bottom, and hot air comes out from top. Please add filter net to avoid dust or impurities blocked if the control box has holes, and clean the net regularly to avoid the net blocking.
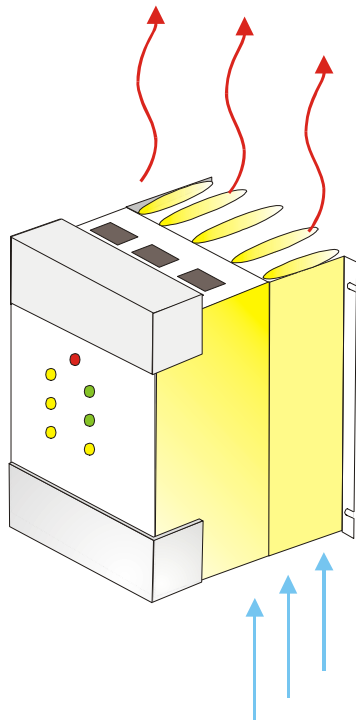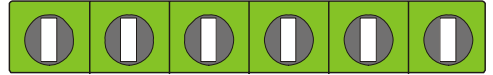
Control way.

220VAC/3~10HP, 380VAC/3~15HP

01	02	04	05	06
AC1	AC2	NO	COM	NC

07	08	09	10	11	12
Running		By Pass		Start/Stop	

220VAC/15HP~1100A, 380VAC/20HP~1100A
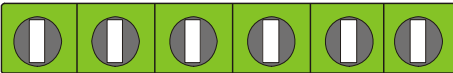
01	02	03	04	05	06
AC1	AC2	Open	NO	COM	NC

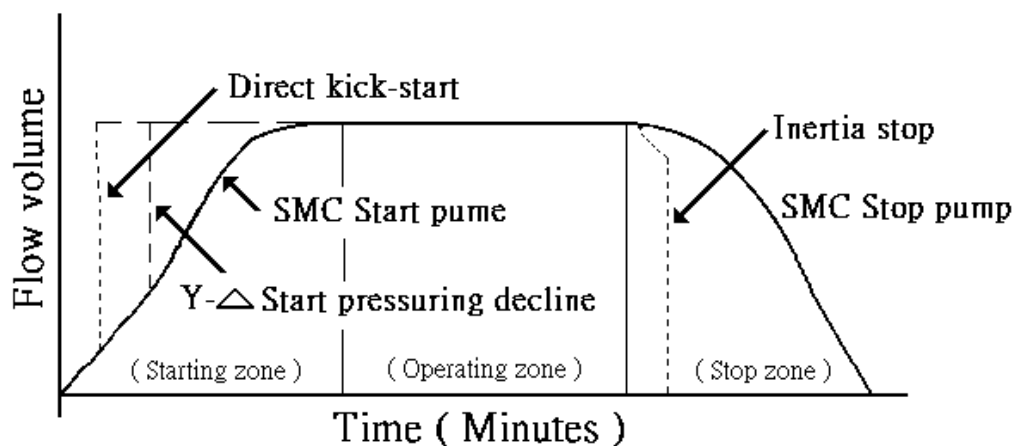| 07	08	09	10	11	12
Running		By Pass		Start/Stop	

1. AC1、AC2(1, 2): Connect with 220VAC auxiliary power.

2. NO、COM、 NC(4, 5, 6,): Error output contact (capacity of output contact 240VAC/5A)

3. RUNNING(7, 8): Output contact will be close often from open often when soft start starts running, it also can be output contact of remote monitoring.

4. BY PASS(Run，9, 10): The output contact will be close often from open often when soft start done, it also can be used of by pass.

5. START/STOP(11、12): Contacts of start and stop, input contact of soft start starting, open close is stop running, and close often I start running.

The capacity of item 3, 4, 5 output contact is 240VAC/5A.
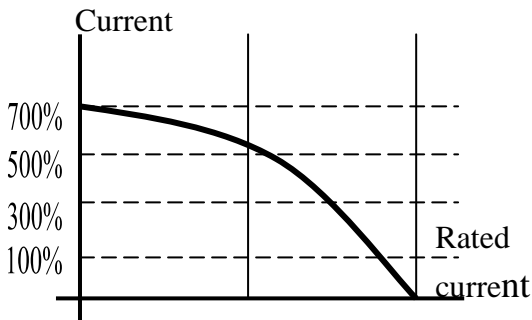
Diagram of soft pump starting and stopping.

Flow volume (vertical axis)

Direct kick-start

Inertia stop

SMC Start pume

SMC Stop pump

Y-△ Start pressuring decline

(Starting zone)   (Operating zone)   (Stop zone)

Time (Minutes)
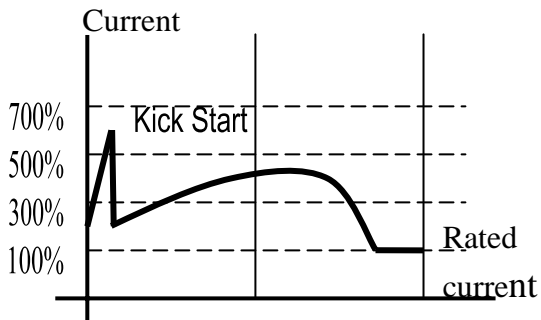
- - - - - - - - -   Direct kick-start / Inertia stop

— — — ---   Y-△ Start pressure decline / Inertia stop

————————   SMC Start pump / SMC Stop pump

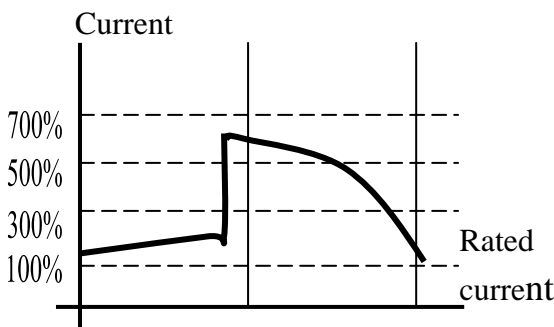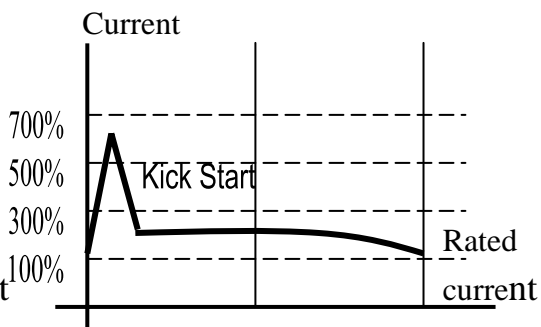Comparison between SMC, direct starting, Y-△ start current:

Current

700%
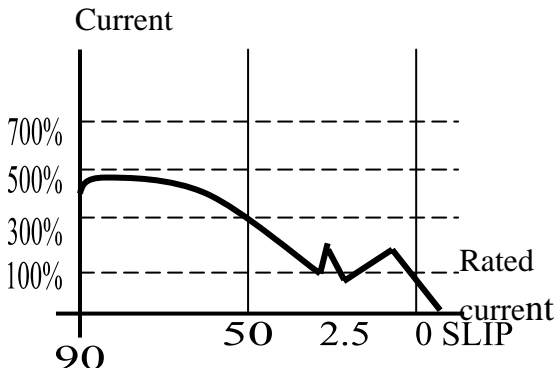500%
300%
100%

Rated
current

Direct start

Current

700%
500%
300%
100%

Kick Start

Rated
current

Kick Start ＋ slope start

Current

700%
500%
300%
100%

Rated
current

Y-△start

Current

700%
500%
300%
100%

Kick Start

Rated
current

Kick Start＋Limit current start

Current

700%
500%
300%
100%

50   2.5   0 SLIP
90
Reactor tart

Rated
current
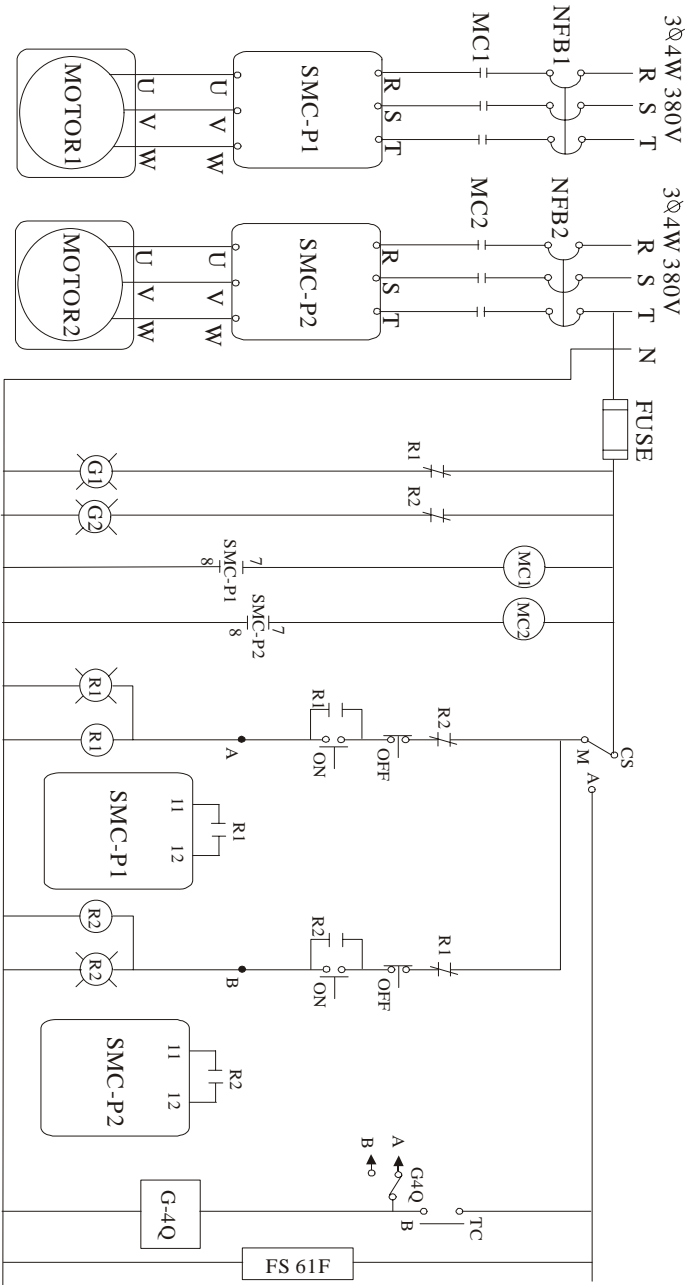
Current

700%
500%
300%
100%

Rated
current

Slope start   speed (RPM)
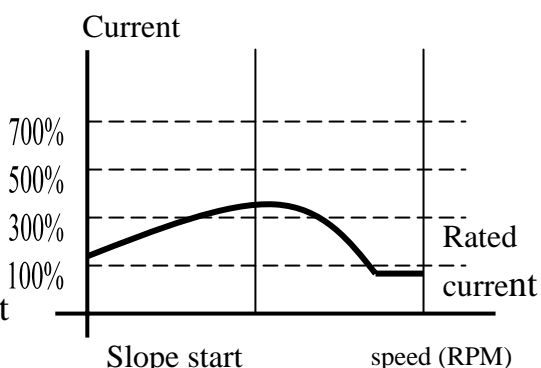
General control diagram suggested:

Water tray only of alternating running control diagram (1 to 1) recommended of SMC pump.
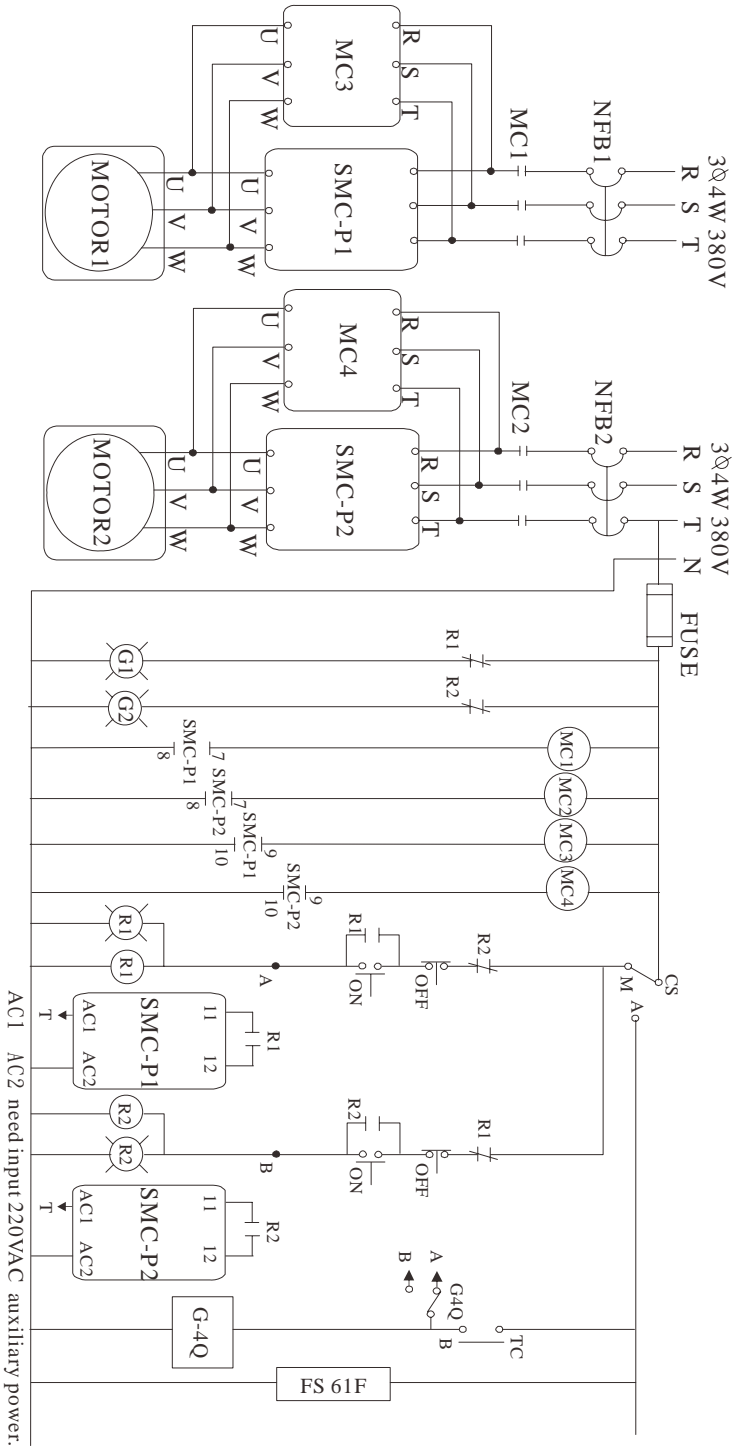

SMC-PH Soft Start Pump Motor Controller
AC1, AC2: Input 220VAC control voltage. FS 61F: liquid surface controller.
G4Q: Ratchet Relay. CS: auto/manual switch
All contacts are dry contact

MC isolation switch and By Pass, a motor versus to a soft starter, running alternately proposed control charts.
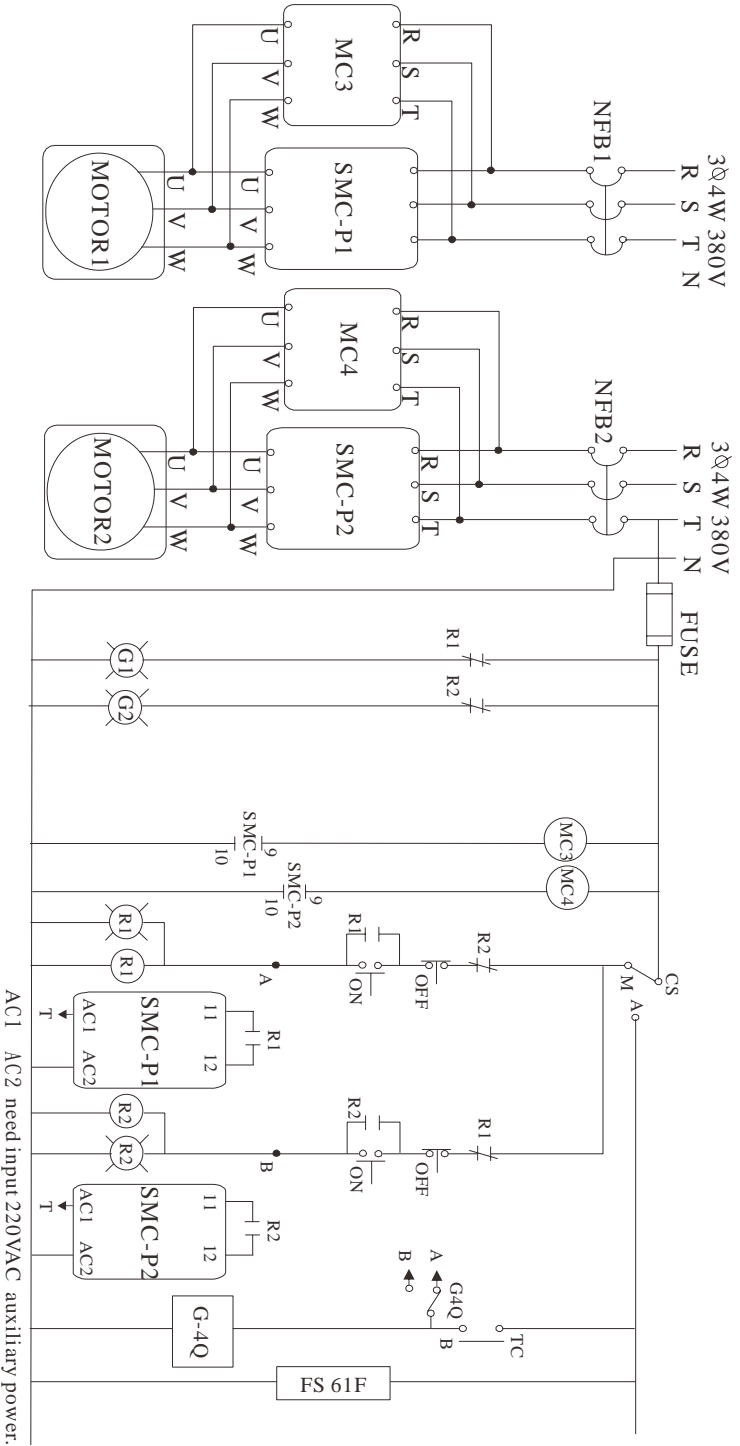

SMC-PH Soft Start Pump Motor Controller
AC1, AC2: Input 220VAC auxiliary voltage. FS 61F: liquid surface controller.
G4Q: Ratchet Relay. CS: auto/manual switch.
All contacts are dry contact.

By Pass, a motor versus to a soft starter, running alternately proposed control charts.

SMC-P Soft Start Pump Motor Controller
AC1, AC2: Input 220VAC auxiliary voltage. FS 61F: liquid surface controller.
G4Q: Ratchet Relay. CS: auto/manual switch.
All contacts are dry contact.

Environmental characteristics.

Operation position	No corrosive gas and dust
Working position	Vertical
Relative humidity	Over 45%, 93% RH without dew.
Room temperature of working	$-10°C \sim$ under $45°C$
Frequency	50Hz or 60Hz , auto-adjust.
3Ø power, voltage	208~220VAC$^+_-$10% 380~480VAC$^+_-$10%
vibration	Under 0.5G
Height	Under 1,000m
Voltage indicated on motor nameplate	200~240V， 380~440V，460~480V

Attention.

1. This product has the function if overload protection. Please check voltage of motor, (ex: 220V, 380V, 440V…etc.) and full voltage of motor listed similar as the voltage listed in our catalogue (in principle, error can be -20%~+5%), and write on the order if plan to raise the class in order to setting before leaving the plant, or also can as overload protector by yourself.

E.G.: Please let's know what you use SMC100HP in motor 75HP or add overload protector.

2. Concerning our product of 380v~440V, the 380v is full current standard setting when leaving the plant, please let's know what you use 440v. In order to, change setting before leaving the plant. Otherwise, the overload function will lose efficacy. It become without overload protection. When you use it, you should pay attention reference of manual.

3. Our company SMC-P electric current setting value, environment temperature is less than 45℃ in Centigrade, can operate for a long time. But need to pay attention if motor starting times are high frequently, the SMC-P must raise one level.

Annotate 1: An hour is started 20 or more times or heat sink temperature exceeds 85℃ Centigrade, need upgrading.

Guarantee of product

We guarantee that our products are conformed to each specification list on the manual; the product can be operating normally with suitable and proper installation.
Warranty : one year from the date of production.   We shall offer free maintenance if our product has any flaw certainly within warranty period.   The warranty doesn't include error installation, man-made damage, and the damage caused by irresistible natural disasters.

This guarantee offer repair guarantee of the product only, not includes other damage caused by any direct or indirect accidents.
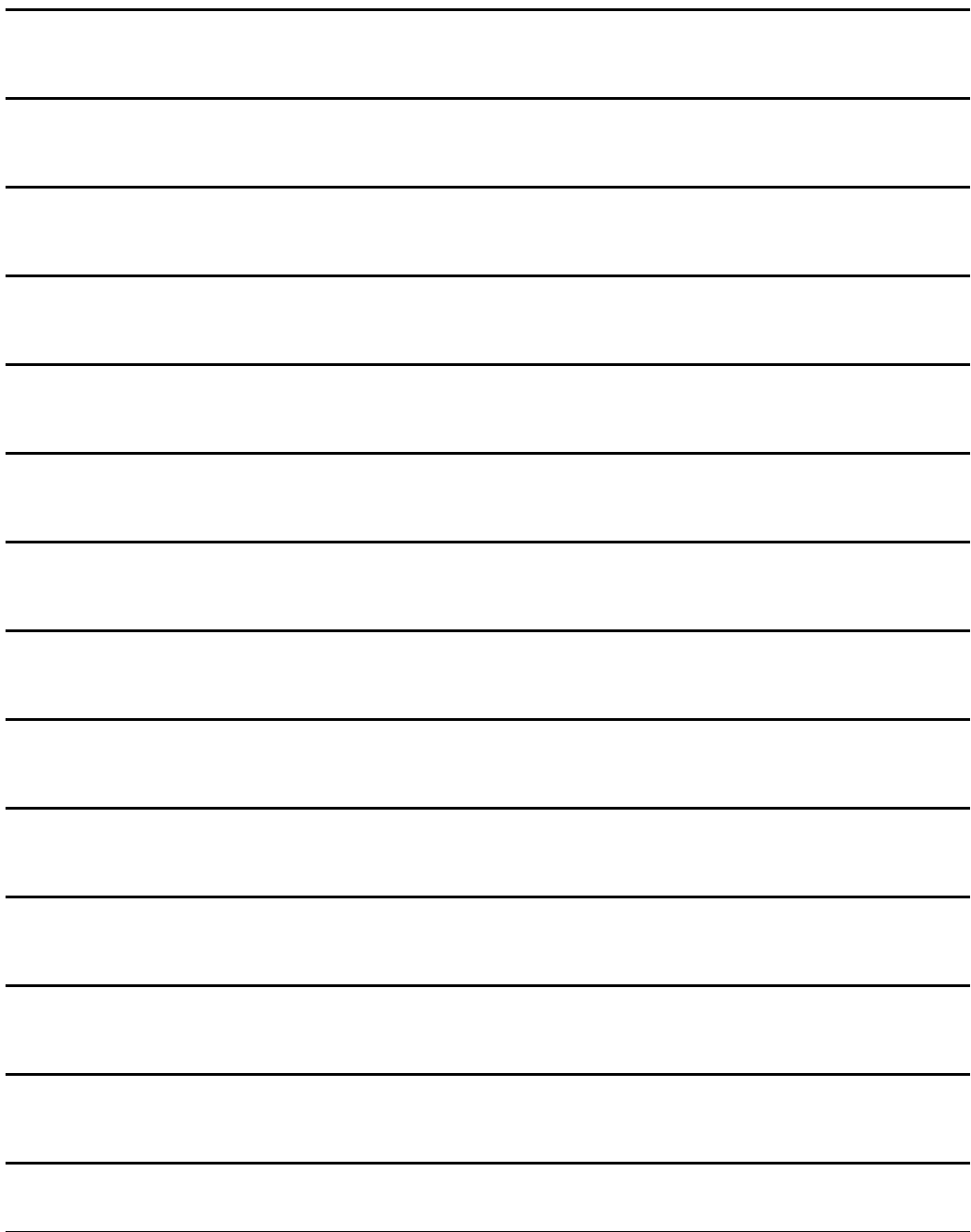
Model:	☐ SMC92☐☐☐☐☐-PH ☐ SMC93☐☐☐☐☐-PH		
Serial umber:	S/N:		
Installation date:	Month:	Date:	Year:
Distributor:			

English Edition v10. 11

October. 05. 2011

Notebook Columns

列印方法先印:

這三張的反面再印:

每次調整列印的顯示比例:
　　　　　　　　　每張紙所含頁數:2 頁
　　　　　　　　　配合紙張調整大小:A4