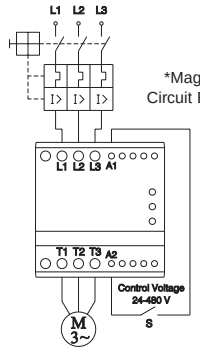
Application, adjustment hints and general specifications for SMC 3 & 33

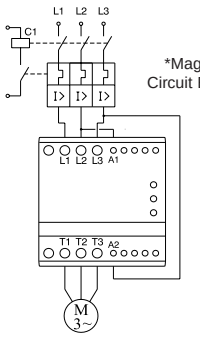
Input controlled soft-start



When the control input is switched to the ON-state (S closed) the motor controller will soft start the motor according to the settings of the ramp-up time and initial torque adjustments.
When the control input is switched to the Off-state (S open) the motor will be switched Off instantaneously only if the Ramp-Down time is adjusted to 0.
With any other setting the motor will be soft stopped according to the settings of the Ramp-Down time adjustment.

*Use UL approved Magnetic Circuit Breaker or UL specified back-up fuse type K5 or H Class

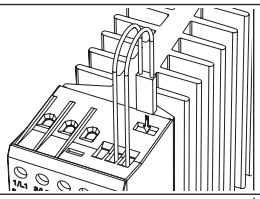
Line controlled soft-start



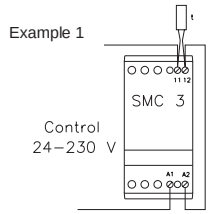
When the contactor C1 is switched to the ON-state, the motor controller will soft start the motor according to the settings of the ramp-up time and initial torque adjustments.
When the contactor C1 is switched to the OFF-state, the motor will be switched Off instantaneously.
In this application the contactor will have no load during making operation. The contactor will carry and break the nominal motor current when switching off.

*Use UL approved Magnetic Circuit Breaker or UL specified back-up fuse type K5 or H Class

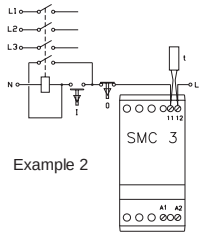
Thermal overload protection (see also page 36)



Optional thermal overload protection is possible by inserting a thermostat in a slot on the right hand side of the soft starter. Type number UP62



The thermostat can be connected in series with the control circuit of the soft starter.
When the temperature of the heatsink exceeds 90°C the soft starter will switch Off.
Note:
When the temperature has dropped approx. 30°C the soft starter will automatically be switched on again.



The thermostat is connected in series with the control circuit of the main contactor.
When the temperature of the heatsink exceeds 90°C the main contactor will switch Off.
A manual reset is necessary to restart this circuit.

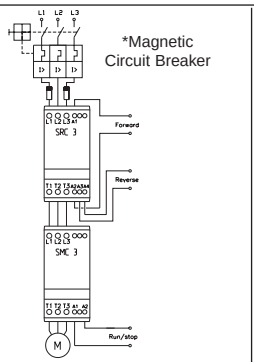
EMC

These components meets the requirements of the product standard EN60947-4-2 and is CE marked according to this standard.

Dimensions (see also page 36)

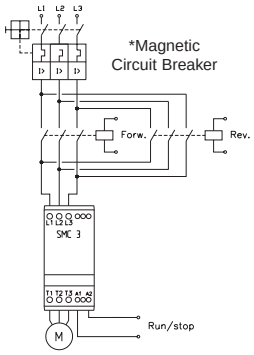
Type	H	D	W
22.5 mm module	94 mm	123.1 mm	22.5 mm
45 mm module	94 mm	128.1 mm	45 mm
90 mm module	94 mm	128.1 mm	90 mm
180 mm module	140 mm	144.8 mm	180 mm

Combining Reversing Electronic Contactor & Soft Starter



Soft-reversing of motors up to 10A
A Soft-Reversing of a motor can easily be achieved by connecting a reversing relay to the Soft Starter. The reversing relay type SRC 3 DX will determine the direction of rotation Forward or Reverse and the Soft Starter type SMC 33 DA XXXX will perform soft-starting and soft-stopping of the motor.
If soft-stop is not required the application can be simplified by connecting the control circuit of the Soft Starter to the main terminals as shown under Line Controlled Soft-Start. A delay of approx. 0.5 sec. between forward and reverse control signal must be allowed to avoid influence from the voltage generated by the motor during turn Off.

Combining reversing mechanical contactor & soft starter



Soft-reversing of motors up to 85A
A Soft-Reversing of motors can easily be achieved when the motor load exceeds 10A by connecting a mechanical reversing contactor to the Soft Starter. The reversing contactor will determine the direction of rotation forward or reverse and the Soft Starter type SMC3/33DA will perform soft-starting and soft-stopping of the motor.
If the contactors are always switched in no load conditions the lifetime of the contactors will normally exceed 10 million cycles.

Insulation specifications

Rated insulation voltage	Ui 660 Volt
Rated impulse withstand voltage	Uimp. 4 kVolt
Installation catagory	III

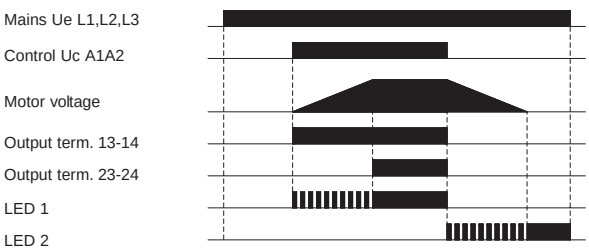
Environment

Degree of protection	IP 20	Pollution degree	3

*These products has been designed for class A equipment. Use of the product in domestic environments may cause radio interference, in which case the user may be required to employ additional mitigation methods.

*UL:Use thermal overload protection as required by the National Electric Code. When protected by a non-time delay K5 or H Class fuse, rated 266% of motor FLA, this device is rated for use on a circuit capable of delivering not more than 5,000 rms. symmetrical amperes, 600 V maximum. Maximum surrounding temperature 40°C.

Functional diagram



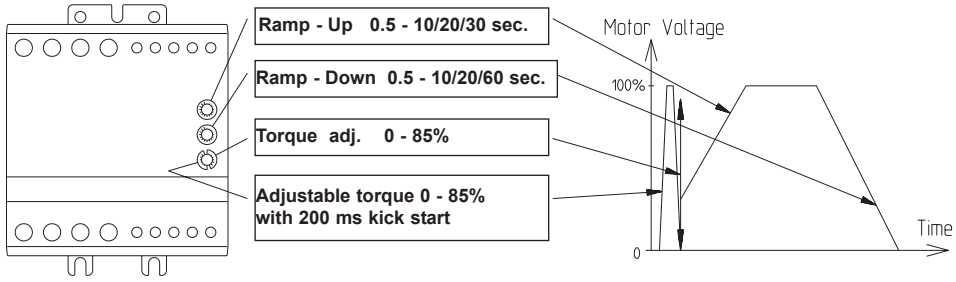
Output: Terminal 13-14 Start -Stop
For control of Start-Stop function directly wired to the soft starter
Output: Terminal 23-24 By-Pass
For signalling Full-On state. By-Pass in AC-53b operation
Note: When both LED's are flashing, no connection to the motor (SMC 3 only),
Note: When both LED's are flashing, one phase is missing (SMC 33 only),

Mounting and cable wiring information

Mounting information see page 36
Cable wiring see page 37

Application, adjustment hints and general specifications for SMC 3 & 33

How to adjust ramp times and initial torque



A. Ramp-Up time and initial torque (standard load)

A1) Set the *Ramp-Up* switch to maximum.

A2) Set the *Ramp-Down* switch to minimum.

A3) Set the *Initial Torque* switch to minimum.

A4) Apply control signal for a few seconds.
If the load does not rotate immediately increment the *Initial Torque* and try again. Repeat until the load starts to rotate immediately on start-up.

A5) Adjust *Ramp-Up* time to the estimated start time (scale is in seconds) and start the motor.

A6) Decrease the *Ram-Up* time until mechanical surge is observed during start.

A7) Increase the time one step to eliminate the surge.

B. Kick-Start / Break loose. High inertia loads.

If it is not possible to reach a time sufficient for the application (step A7) it may be necessary to kick-start the load.

B1) Set the *Ramp-Up* switch to maximum.

B2) Set the *Ramp-Down* switch to minimum.

B3) Set the *Initial Torque* switch to minimum Kick-start torque.

B4) Apply control signal for a few sec. If the load stops right after the 200 ms "kick" increment the initial torque and try again. Repeat until the load continues to rotate after the "kick"

B5) Adjust *Ramp-Up* time to the desired start time (the scale is in seconds) and start the motor.

C. Ramp-Down time. E.g. Pump loads

Follow procedure A or B to set *Ramp-Up* and *initial torque*

C1). Set the *Ramp-Down* switch to maximum.

C2) Switch off the control voltage and observe any mechanical surges on the load. If none decrement *Ramp-Down* switch and try again. Repeat until mechanical surges on the load is observed.

C3) Increase the time one step to eliminate the surge.

Note:

a) Control of the motor torque is achieved by acting on the motor voltage. The motor speed depends on the torque produced by the motor and the load on the motor shaft.

b) A motor with little or no load will reach full speed before the voltage has reached its maximum value.

c) The soft starter will read time and torque settings in the off state. Repeated starts may trip the motor protection relay.

d) Make sure NOT to set the rotary switches in between positions as this corrupts the time and torque adjustment. Use screwdriver 2 mm x 0.5 mm

Typical motor current by different line voltages

kW	HP	220-230 VAC	380-400 VAC	415 VAC	440 VAC	460-480 VAC	600 VAC
0.37	0.5	1.8 A	1 A	1 A	1 A	1 A	1 A
0.55	0.75	2.75 A	1.6 A	1.5 A	1.4 A	1.4 A	1.1 A
0.75	1	3.5 A	2 A	2 A	1.7 A	1.7 A	1.3 A
1.1	1.5	4.4 A	2.6 A	2.5 A	2.4 A	2.4 A	1.8 A
1.5	2	6.1 A	3.5 A	3.5 A	3.1 A	3 A	2.3 A
2.2	3	8.7 A	5 A	5 A	4.5 A	4.4 A	3.4 A
3	4	11.5 A	6.6 A	6.5 A	5.8 A	5.6 A	4.3 A
4	5	14.5 A	8.5 A	8.3 A	8 A	7.8 A	6 A
5.5	7.5	20 A	11.5 A	11 A	10.4 A	10 A	7.7 A
7.5	10	27 A	15.5 A	14 A	13.7 A	13 A	10 A
11	15	39 A	22 A	21 A	20 A	19 A	15 A
15	20	52 A	30 A	28 A	26 A	25 A	20 A
18.5	25	64 A	37 A	35 A	33 A	32 A	25 A
22	30	75 A	43 A	40 A	38 A	36 A	28 A
30	40		58 A	54 A	52 A	50 A	38 A
37	50		70 A	64 A	61 A	59 A	45 A
45	60		83 A	78 A	75 A	73 A	56 A