Soft Starter (SMC 33 / three controlled phases)

- Rated operational voltage up to 600 VAC 50/60Hz
- Rated operational current up to 86A (inside delta DBP)
- Output signal for By-Pass and Start/Stop
- Ramp Up and Down time adjustable
- Initial Torque adjustable with kick start
- Wide control voltage range
- Meets EN 60947-4-2 requirements
- High number of start/stop operations pr. hour. See data.

Item selection and technical specifications (see also motor table at page 11)

Load ratings [1]Inside delta configuration	Item number by 208-240VAC 50/60Hz Line Voltage	Item number by 400-480VAC 50/60Hz Line Voltage	Item number by 550-600VAC 50/60Hz Line Voltage	Ramp-Up / Down adjustment	Torque adjustment	Module-width
15A AC-53a	SMC 33 DA 2315	SMC 33 DA 4015	SMC 33 DA 6015			90 mm
15A AC-53a no by-pass	SMC 33 DA 2325BP	SMC 33 DA 4025BP	SMC 33 DA 6025BP			90 mm
27A AC-53b w. by-pass	SMC 33 DA 2325BP	SMC 33 DA 4025BP	SMC 33 DA 6025BP	Ramp-up time 0.5 - 30 sec.	0- 85% adjustable of norminal torque with selectable kick start 200ms (break loose function)	90 mm
35A AC-53a no by-pass	SMC 33 DA 2350BP*	SMC 33 DA 4050BP*	SMC 33 DA 6050BP*			180 mm
50A AC-53b w. by-pass	SMC 33 DA 2350BP*	SMC 33 DA 4050BP*	SMC 33 DA 6050BP*	Ramp-down time 0.5 - 60 sec.		180 mm
Items for Inside delta configuration						
[1]30A AC-53a no by-pass	SMC 33 DA 2340DBP	SMC 33 DA 4040DBP	SMC 33 DA 6040DBP			90 mm
[1]43A AC-53b w. by-pass	SMC 33 DA 2340DBP	SMC 33 DA 4040DBP	SMC 33 DA 6040DBP			90 mm
*[1]60A AC-53a no by-pass	SMC 33 DA 2385DBP*	SMC 33 DA 4085DBP*	SMC 33 DA 6085DBP*			180 mm
*[1]86A AC-53b w. by-pass	SMC 33 DA 2385DBP*	SMC 33 DA 4085DBP*	SMC 33 DA 6085DBP*			180 mm

Load specified with utilisation category AC-53a

SMC 33 DA XXXX **BP** AC-53a: No by-pass contactors is nessesary during running, shall be connected as inline confirguration

SMC 33 DA XXXX **DBP** AC-53a: No by-pass contactors is nessesary but motor shall be connected in an inside-delta confirguration

Load specified with utilisation category AC53b

SMC 33 DA XXXX **BP** AC-53b: By-pass contactor shall be used for bypassing the soft starter during running, shall be connected as inline confirguration

SMC 33 DA XXXX **DBP** AC-53b: By-pass contactor shall be used and motor connected in an inside-delta configuration

Output load specification (90mm module) more info page 45

Overload current profile AC-53a (without by-pass contactor)	X-Tx:6-5 : 100-120
Overload current profile AC-53b (with by-pass contactor)	X-Tx:5-5 : 30
Overload relay trip class AC-53a/AC53b	10 or 10A

Leakage current: 5mA ACmax.	Min. operational current: 50mA

Output load specification (180mm module) more info page 45

Overload current profile AC-53a (without by-pass contactor)	X-Tx:6-6 : 100-120
Overload current profile AC-53b (with by-pass contactor)	X-Tx:6-6 : 30
Overload relay trip class AC-53a/AC53b	10 or 10A

Leakage current: 5mA ACmax.	Min. operational current: 50mA

Control terminal specifications

Control voltage by line voltage 208-240VAC **A1-A2**	24 - 230 VAC/DC
Control voltage by line voltage 400-600VAC **A1-A2**	24 - 480 VAC/DC
Pick-up voltage max.	20.4 VAC/DC
Drop-out voltage min.	5 VAC/DC
Max. control current for no operation	1mA
Response time max.	70msec.
Control current / power max.	15mA / 2VA

Auxiliary contacts

Terminal: 13-14, AC SCR output for start/stop function,
Terminal: 23-24, AC SCR output for connection of by-pass contactor.

Output specifications for 90mm module: AC SCR: 0.5A AC-14, AC15 24-230/480V AC 50-60Hz Fusing: gl/gG Max i^2t $72A^2S$

Output specifications for 180mm module: AC SCR: 1.0A AC-14, AC15 24-230/480V AC 50-60Hz Fusing: gl/gG Max i^2t $72A^2S$

Terminal: 11-12, have no connection with the internal circuit. Can be used in conjunction with a thermal overload protection or for other wiring purposes. See under general technical information.

Thermal specification

Power dissipation for continuous operation PDmax	3 W/A without BP
Power dissipation with semiconductor by-passed	5 W Max. with BP
Cooling method	Natural convection
Mounting	Vertical +/-30°
Operating temperature range EN 60947-4-2	-5°C to 40°C
Max. operating temperature with current derating	60°C
Storage temperature EN 60947-4-2	-20°C to 80°C

Operation in ambient temperatures exceeding 40°C is possible if the power dissipation is limited either by reducing the steady-state current or by reducing the duty-cycle of the soft starter as shown in the table. Max.cycle time 15min.
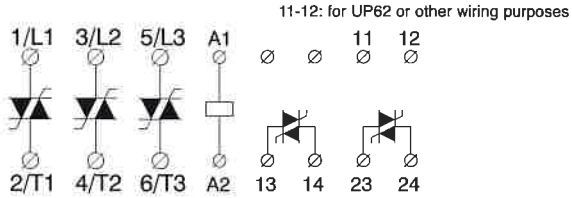
By 40°C	By 50°C	By 60°C
100% load Duty-cycle 100%	80% load Duty-cycle max. 0,8	70% load Duty-cycle max. 0,65

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Soft Starter (SMC 33 / three controlled phases)

Wiring specifications (90mm module)

11-12: for UP62 or other wiring purposes
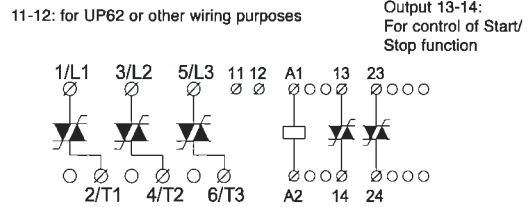
1/L1 3/L2 5/L3 A1   11   12

2/T1 4/T2 6/T3 A2   13 14 23 24

Control voltage A1-A2

Output 13-14:
For control of Start/
Stop function
**Do not include
SMC 33 DA XX15**

Output 23-24:
By end of ramp up time
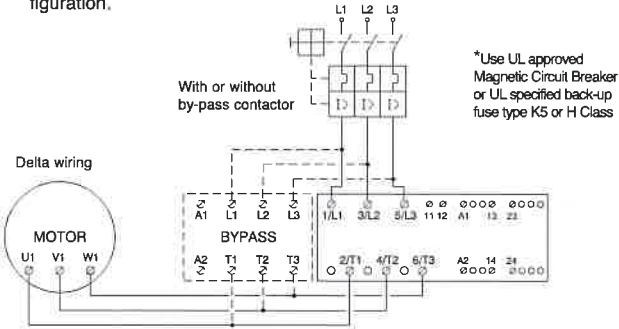for by-pass contactor
**Do not include
SMC 33 DA XX15**

Wiring specifications (180mm module)

11-12: for UP62 or other wiring purposes

Output 13-14:
For control of Start/
Stop function

1/L1 3/L2 5/L3 11 12 A1   13 23

2/T1 4/T2 6/T3   A2   14 24

Control voltage A1-A2
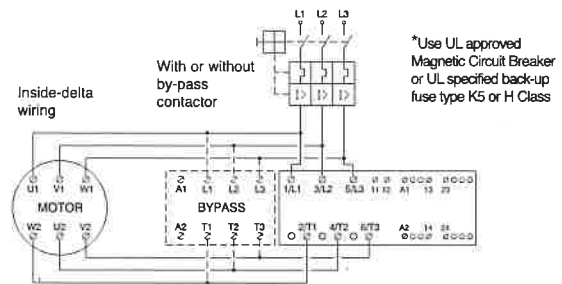
Output 23-24:
By end of ramp up time
for by-pass contactor

Wiring information: Delta configuration

Standard wiring of a softstarter
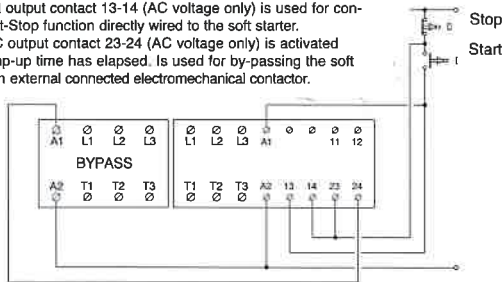to a 3-phase motor in delta con-
figuration.

L1 L2 L3

With or without
by-pass contactor

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

Delta wiring

MOTOR
U1 V1 W1

BYPASS
A1 L1 L2 L3   1/L1 3/L2 5/L3 11 12 A1 13 23
A2 T1 T2 T3   2/T1 4/T2 6/T3 A2 14 24

Wiring information: Inside-delta configuration

Inside-delta wiring of a softstarter to
a 3- phase motor.

L1 L2 L3

With or without
by-pass
contactor

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

Inside-delta
wiring

MOTOR
U1 V1 W1
W2 U2 V2

BYPASS
A1 L1 L2 L3   1/L1 3/L2 5/L3 11 12 A1 13 23
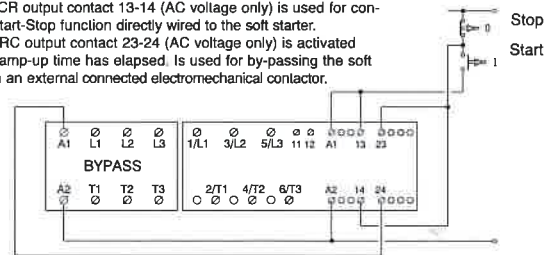A2 T1 T2 T3   2/T1 4/T2 6/T3 A2 14 24

Wiring example Start/Stop - By-pass (90 mm modul)

Auxiliary SCR output contact 13-14 (AC voltage only) is used for con-
trolling a Start-Stop function directly wired to the soft starter.
Auxiliary SRC output contact 23-24 (AC voltage only) is activated
when the ramp-up time has elapsed. Is used for by-passing the soft
starter with an external connected electromechanical contactor.

Stop
Start

BYPASS
A1 L1 L2 L3   L1 L2 L3 A1   11 12
A2 T1 T2 T3   T1 T2 T3 A2 13 14 23 24

Wiring example Start/Stop - By-pass (180 mm modul)

Auxiliary SCR output contact 13-14 (AC voltage only) is used for con-
trolling a Start-Stop function directly wired to the soft starter.
Auxiliary SRC output contact 23-24 (AC voltage only) is activated
when the ramp-up time has elapsed. Is used for by-passing the soft
starter with an external connected electromechanical contactor.

Stop
Start

BYPASS
A1 L1 L2 L3   1/L1 3/L2 5/L3 11 12 A1 13 23
A2 T1 T2 T3   2/T1 4/T2 6/T3 A2 14 24

Short-circuit protection by circuit breaker or fuses

Two type of short-circuit protection can be used:
a) Short-circuit protection by circuit breaker.
b) Short-circuit protection by fuses.

Short-circuit protection is divided into 2 levels **Type 1 or Type 2**

Co-ordination Type1: Short-circuit protects the installation

Co-ordination Type 2: Short-circuit protects the installation and the semi-
conductors inside the motor controller

a) Short-circuit protection
Co-ordination type 1 will be obtained when using magnetic circuit breakers
or standard gl/Gl fuses.
Co-ordination type 2 will be obtained when using semiconductor fuses.
When using semiconductor fuses the SCR will not be damaged due to
transients and short circuits. The table indicates suitable fuses for co-
ordination type 2 protection.

b) Short-circuit protection by fuses

Type 1: SMC 33 DA XX15	Protection max. 50 A gL/gG
Type 1: SMC 33 DA XX25 BP	Protection max. 80 A gL/gG
Type 1: SMC 33 DA XX40 DBP	Protection max. 80 A gL/gG
Type 1: SMC 33 DA XX50 BP	Protection max. 125 A gL/gG
Type 1: SMC 33 DA XX85 DBP	Protection max. 125 A gL/gG
Type 2: SMC 33 DA XX15	Protection max. i²t of the fuse 1800 A²S
Type 2: SMC 33 DA XX25 BP	Protection max. i²t of the fuse 6300 A²S
Type 2: SMC 33 DA XX40 DBP	Protection max. i²t of the fuse 6300 A²S
Type 2: SMC 33 DA XX50 BP	Protection max. i²t of the fuse 25300 A²S
Type 2: SMC 33 DA XX85 DBP	Protection max. i²t of the fuse 25300 A²S

**Fuses from e.g. Ferraz, Siba, Bussmann can
be used as short-circuit protection Type 2**

More information concerning Co-ordination Type 2 see page 45

Approval

cUL Std No. 508 (Not approved SMC 33 DA XX50BP and
SMC 33 DA XX85DBP)

Application, adjustment hints and general specifications

See page 10-11 / 44-45