

## Soft Starter (SMC 3 / SMC 32 two controlled phases)



- Rated operational voltage up to 600 VAC 50/60Hz
- Rated operational current up to 25A/30A
- 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                       | Item number by<br>208-240VAC 50/60Hz<br>Line Voltage | Item number by<br>400-480VAC 50/60Hz<br>Line Voltage | Item number by<br>550-600VAC 50/60Hz<br>Line Voltage | Ramp-<br>Up / Down<br>adjustment                                       | Torque<br>adjustment                                                                                    | Module-<br>width                             |
|------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Items with built-in by-pass relays |                                                      |                                                      |                                                      | Ramp-up<br>time<br>0.5 - 10 sec.<br>Ramp-down<br>time<br>0.5 - 10 sec. | 0- 85% adjustable<br>of nominal torque<br>with selectable<br>kick start 200ms<br>(break loose function) | 22.5mm<br><br>22.5mm<br><br>45mm<br><br>45mm |
| 3.5A AC-53b                        | SMC 3 DA 2303                                        | SMC 3 DA 4003 <sup>415V</sup>                        | SMC 3 DA 6003                                        |                                                                        |                                                                                                         |                                              |
| 3.5A AC-53b                        |                                                      | SMC 3 DA 4803 <sup>480V</sup>                        |                                                      |                                                                        |                                                                                                         |                                              |
| 15A AC-53b                         |                                                      | SMC 32 DA 4015BP <sup>415V</sup> *                   |                                                      |                                                                        |                                                                                                         |                                              |
| 15A AC-53b                         |                                                      |                                                      |                                                      |                                                                        |                                                                                                         |                                              |
| Items for 100% duty-cycle (AC-53a) |                                                      |                                                      |                                                      | Ramp-up /<br>Ramp down<br>time 0.5 - 20 sec.                           |                                                                                                         | 45mm<br><br>90mm<br><br>90mm<br><br>90mm     |
| 15A AC-53a                         | SMC 3 DA 2315                                        | SMC 3 DA 4015                                        | SMC 3 DA 6015                                        |                                                                        |                                                                                                         |                                              |
| 25A AC-53a                         | SMC 3 DA 2325                                        | SMC 3 DA 4025                                        | SMC 3 DA 6025                                        |                                                                        |                                                                                                         |                                              |
| 25A AC-53a                         | SMC 3 DA 2325BP                                      | SMC 3 DA 4025BP                                      | SMC 3 DA 6025BP                                      |                                                                        |                                                                                                         |                                              |
| 27A AC-53b w. by-pass              | SMC 3 DA 2325BP                                      | SMC 3 DA 4025BP*                                     | SMC 3 DA 6025BP                                      |                                                                        |                                                                                                         |                                              |

### Output current profile

|                                                                     |                     |                                                                      |                                                                                                                       |
|---------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>SMC 3 DA XX03 / SMC 32 DA XX15BP AC-53b</b>                      | More info. page 45  | <b>SMC 3 DA XX25BP AC-53a / AC-53b</b>                               | More info. page 45                                                                                                    |
| Overload current profile XX03 (with internal by-pass relay)         | X-Tx:4-10 : 110     | Overload current profile (without by-pass contactor)                 | X-Tx:6-5 : 100-120                                                                                                    |
| Overload current profile XX15BP (with internal by-pass relay)       | X-Tx:8-3 : 110      | Overload current profile (with by-pass contactor)                    | X-Tx:5-5 : 30                                                                                                         |
| Overload relay trip class                                           | 10 or 10A           | Overload relay trip class                                            | 10 or 10A                                                                                                             |
| <b>SMC 3 DA XX15/25 AC-53a</b>                                      | More info. page 45  | <b>SMC 3 DA 4025BP</b>                                               | *Note: External by-pass contactor shall be used for bypassing the soft starter during running by 30A/15kW load @400V. |
| Overload current profile                                            | X-Tx:8-3 : 100-3000 |                                                                      |                                                                                                                       |
| Overload relay trip class                                           | 10 or 10A           |                                                                      |                                                                                                                       |
| SMC 3: Leakage current: 5mA ACmax. / Min. operational current: 50mA |                     | SMC 32: Leakage current: 5mA ACmax. / Min. operational current: 50mA |                                                                                                                       |

### Control voltage specifications

|                                                         |                 |
|---------------------------------------------------------|-----------------|
| Control voltage by line voltage 208-240VAC <b>A1-A2</b> | 24 - 230 VAC/DC |
| Control voltage by line voltage 400-600VAC <b>A1-A2</b> | 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      |

### AC auxiliary contacts / SMC 3 DA XX25BP

#### Auxiliary specifications:

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

**Load specifications:** AC SCR: 0.5A AC-14, AC15 24-230/480VAC 50-60Hz  
Fusing: gl/gG Max  $i^2t$  72A<sup>2</sup>S

**General for 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 general technical information.

### Common thermal specifications

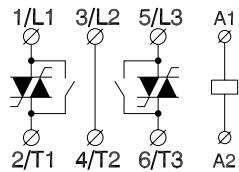
|                                                  |                    |                                                                                                                                                                                                                                                                                                    |                              |                               |
|--------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|
| Power dissipation for continuous operation PDmax | 2 W/A without BP   | 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.<br>Note: SMC 3 DA XX03 / SMC 32 DA XX15BP see page 45. |                              |                               |
| Power dissipation with semiconductor by-passed   | 4 W Max.           |                                                                                                                                                                                                                                                                                                    |                              |                               |
| Cooling method                                   | Natural convection | By 40°C                                                                                                                                                                                                                                                                                            | By 50°C                      | By 60°C                       |
| Mounting                                         | Vertical +/-30°    | 100% load Duty-cycle 100%                                                                                                                                                                                                                                                                          | 80% load Duty-cycle max. 0.8 | 70% load Duty-cycle max. 0.65 |
| Operating temperature range EN 60947-4-2         | -50°C to 40°C      |                                                                                                                                                                                                                                                                                                    |                              |                               |
| Max. operating temperature with current derating | 60°C               |                                                                                                                                                                                                                                                                                                    |                              |                               |
| Storage temperature EN 60947-4-2                 | -20°C to 80°C      |                                                                                                                                                                                                                                                                                                    |                              |                               |

\* NOT cUL APPROVED

# Soft Starter (SMC 3 / SMC 32 two controlled phases)

## Wiring specifications

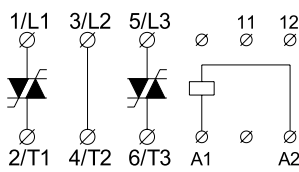
### SMC 3 DA XX03 SMC 32 DA XX15BP



Control voltage A1-A2

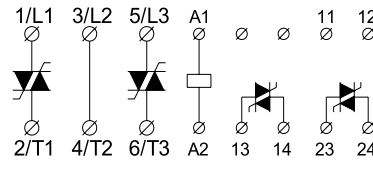
### SMC 3 DA XX15/25

11-12: for UP62 or other wiring purposes



### SMC 3 DA XX25 BP

11-12: for UP62 or other wiring purposes



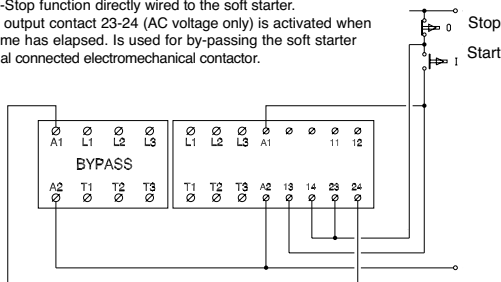
Control voltage A1-A2

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

Output 23-24:  
By end of ramp up time  
for by-pass contactor

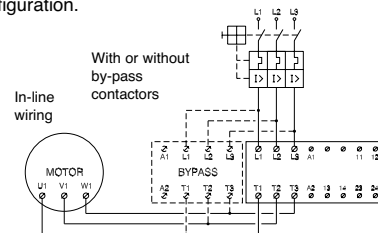
## Wiring example Start/Stop-By-pass (SMC 3 DA XX25 BP)

Auxiliary SCR output contact 13 - 14 (AC voltage only) is used for controlling 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.



## Motor wiring with or without by-pass (SMC 3 DA XX25 BP)

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



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

## Short-circuit protection by circuit breaker or fuses

Two type of short-circuit protection can be used:

- Short-circuit protection by circuit breaker.
- Short-circuit protection by fuses.

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

**Co-ordination Type 1:** 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 gI/GI 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 3 DA XX03     | Protection max. 25 A. gL/gG       |
| Type 1: SMC 32 DA XX15 BP | Protection max. 50 A. gL/gG 63A T |
| Type 1: SMC 3 DA XX15     | Protection max. 50 A. gL/gG 63A T |
| Type 1: SMC 3 DA XX25     | Protection max. 80 A. gL/gG 63A T |
| Type 1: SMC 3 DA XX25 BP  | Protection max. 80 A. gL/gG 63A T |

|                           |                                                          |
|---------------------------|----------------------------------------------------------|
| Type 2: SMC 3 DA XX03     | Protection max. $i^2t$ of the fuse 72 A <sup>2</sup> S   |
| Type 2: SMC 32 DA XX15 BP | Protection max. $i^2t$ of the fuse 1800 A <sup>2</sup> S |
| Type 2: SMC 3 DA XX15     | Protection max. $i^2t$ of the fuse 1800 A <sup>2</sup> S |
| Type 2: SMC 3 DA XX25     | Protection max. $i^2t$ of the fuse 6300 A <sup>2</sup> S |
| Type 2: SMC 3 DA XX25 BP  | Protection max. $i^2t$ of the fuse 6300 A <sup>2</sup> S |

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 32 DA XX15BP)

## Application, adjustment hints and general specifications

See page 10-11 / 44-45

## Dimensions (see also page 44)

| Type           | H     | D        | W       |
|----------------|-------|----------|---------|
| 22.5 mm module | 94 mm | 123.8 mm | 22.5 mm |
| 45 mm module   | 94 mm | 128.1 mm | 45 mm   |
| 90 mm module   | 94 mm | 128.1 mm | 90 mm   |