3-Phase electronic motor contactor (SMC 3 DOL Direct On Line)

- For Direct On Line start of 3 phase motors
- Rated operational voltage up to 600 VAC 50/60 Hz
- Rated operational current up to 15A AC-53
- Control voltage: 24-60VDC / 24-480VAC
- High number of start/stop operations/ hour
- LED Status indication
- Meets EN 60947-4-2 requirements
- Requires only 45 mm DIN

Zero cross switching

Item selection and technical specifications

Load ratings **AC-53** motor load stand. AC-4 motor load inching / plugging	Control voltage	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	Module-width
15AAC-53	24-60VDC / 24-480VAC	SMC 3 DA 2315 DOL	SMC 3 DA 4015 DOL	SMC 3 DA 6015 DOL	45mm

Output load specification

Operational current AC-53	15A	Min. operational current	50mA
Leakage current	5mAACmax.	Duty cycle	100%

Control terminal specifications

Control voltage	24-60 VDC/24-480 VAC	Control current / power max.	6mA/ 1.5 VA
Pick-up voltage max.	20.4 VAC / DC	Max. control voltage	510 VAC
Drop-out voltage min.	5 VAC / DC	Response time max.	1 cycle

Thermal specification

Power dissipation for continuous operation PDmax	2.2 W/A
Power dissipation for intermittent operation PD	2.2 W/A x dutycycle
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.

By 40°C	By 50°c	By 60°C
100% load Duty-cycle 100%	80% load Duty-cycle max. a.a	70% load Duty-cycle max. 0.65

Environment

Degree of protection	IP 20	Pollution degree	3

Approval

cUL Std No. 508
*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.

Insulation specifications

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

Utilisation Categories EN60947-4-2

Category AC - 53	Starting, switching off motors during running.
Category AC - 4	Starting, plugging, reversing the motor rapidly while the motor is running.
CategoryAC - 52a	Control of slipring motor stators
CategoryAC - 53a	Control of squirrel cage motor
Category AC - 58a	Control of hermetic refrigerant compressors with automatic resetting of overload releases

EMC

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

Mounting and cable wiring information

Mounting information see page 44 / Cable wiring see page 45

Dimensions (se also page 44)

Type	H	D	W
45 mm module	94 mm	128.1 mm	45 mm

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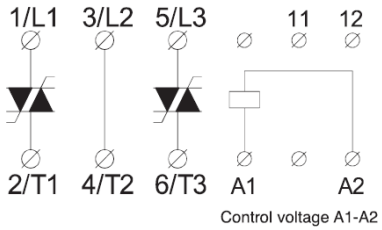
Wiring specifications

SMC 3 DA XX15 DOL

11-12: For UP62 or other wiring purposes



Short-circuit protection by circuit braker 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 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 gl/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 coordination type 2 protection.

b) Short-circuit protection by fuses

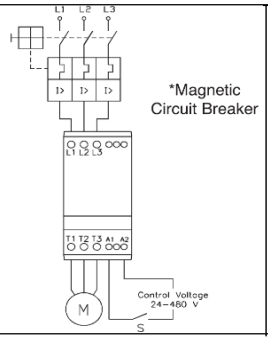
Type 1: SMC 3 DA XX15 DOL Type 2: SMC 3 DA XX15 DOL

Protection max. 50 A gUgG
Protection max. i2t of the fuse 1800 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

Overload Protection in Motor Control Reversing

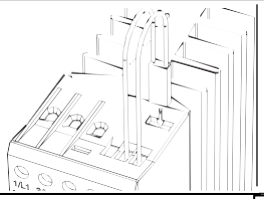


Overload protection of the motor is easily achieved by installing a manual thermal magnetic circuit breaker on the supply side of the motor.
The circuit breaker provides means for padlocking and the necessary clearance for use as a circuit isolator according to EN 60204-1.

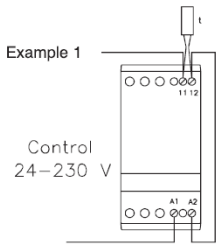
Adjust the current limit on the MCB according to the rated nominal current of the motor

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

Thermal overload protection (see also page 44)

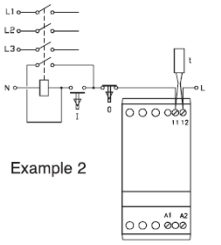


Optional thermal overload protection is possible by inserting a thermostat in a slot on the right hand side of the soft starter. Type number UP62



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.

Note:
A manual reset is necessary to restart this circuit.

SMC 3 DOL General application information

The SMC 3 DOL has been developed for cranes and other harsh applications where inching, jogging and plugging is frequently used and where a high number of operating cycles are essential. In such applications the lifetime of the equipment is normally limited by the short lifetime of the electromechanical contactor. Electromechanical contactors are not designed to switch off motors in locked rotor- or overload conditions where the current is 6 times the nominal operational current (AC-4). The servere arcing will burn the contact elements resulting in unreliable contact function. The Semiconductor Contactor will close the contacts in the zero crossing of the mains voltage and switch-Off will always occur in the zero crossing of the motor current in this way voltage kickback from the inductive motor windings is avoided. The lifetime, therefore, of the Semiconductoc Contactor will always be at least one decade longer than the electromechanical contactor.

Comparison of lifetime in different utilization categories

Utilization-categories	Typical applications	Electro-mechanical Contactor	Semiconductor Contactors SMC3DA....DOL
AC-52a	Control of slip-ring motors, starting, switching Off	0.7 Mill. Cycles	25 Mill. Cycles
AC-53a	Control of squirrel-cage motors, starting, switching Off	1.3 Mill. Cycles	25 Mill. Cycles
AC-4	Control of squirrel-cage motors, starting, plugging, inching	0.06 Mill. Cycles	5 Mill. Cycles