IC ELECTRONIC A/S

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Soft starter with integrated Motor Protection, Current and Voltage control 3 phases controlled with internal by-pass

Rated operational Voltage 400VAC
Frequency 45 ... 65Hz self detecting and corrective
Initial torque 20 ... 50%
Electronic motor protection Trip class 10
Adjustable I^2t setting for optimal motor protection
Phase sequence protection
Temperature protection internal
Ramping sequence with current limiting
Automatic reduction to optimum start current
Relay for fault signal
Relay for operating signal
LED- indications "ON": Power, ramping, bypassing, service, pause and stop.
LED- indications "FAULT": Over-/undercurrent, Stall, Voltage control, Frequency control, Motor connections, Main supply connections, Motor protection, Temperature control.
Spring clamp terminals for montage.
Automatic reset after failure.

Selection and technical specifications.

Product type	Rated operational voltage Ue	EAN Nr.	Rated operational current Ie	Control voltage Uc
SCL 33 DA 4015BP	400VAC	5705609002893	15A AC 58b	230VAC
SCL 33 DA 4025BP	400VAC	5705609002909	25A AC 58b	230VAC
SCL 33 DA 4035BP	400VAC	5705609002916	35A AC 58b	230VAC

Product description:

The Soft starter is 3 phase controlled and designed for starting and running compressor motors. The soft starter has current controlled ramping up and by-pass function.
The voltage control compensate for missing start torque at starting up ramping. The current measurement is also for I^2t calculation for protection of the motor. The motor protection has to be adjusted before starting up.
The soft starter has internal by-pass relays for bypassing the semiconductors when the motor is in full speed.

Any kind of failure cause stop and the soft starter will go into service mode until the failure is reset. The soft starter has also pause mode for protecting the semiconductors against overheating.
Alarm indication is provided through a red LED which signals the type of fault via a user-friendly flashing sequence.

Costumer Advantage:

Current reduction up to 65% peak, extend mechanical lifetime of the compressor.
Current reduction eliminates the voltage clips and light flickering.
Real RMS current measurement, for exact control of the current.
Mounting from the top and down.
Spring clamps for fast and easy mounting.
Internal motor protection (I^2t- metering, using class 10 trip curve) gives reduction in cost for external motor protection and wiring.
Individual adaptation.

Fault detections:

Over/under current : If the current cross the upper limit the soft starter will go into service mode to protect relays and motor. The failure is automatically reset.
: If the current is too low, the soft starter will go into service mode and stay until the failure is automatically reset.

Motor protection : The protection of the motor is continuously monitored and will trip according to trip class 10. The failure is automatically reset.
(Other trip classes can be integrated).

Stall : If the motor is stalling the current will raise and the motor protection will close down.
The failure is automatically reset.

Temperature control : If the temperature in the soft starter is detected to be under or over allowed temperature the soft starter will be in service mode and not be able to start until the temperature is in between the limits.

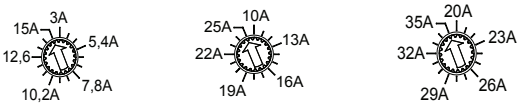
Frequency sequence : If the frequency is outside the area (45 … 65 Hz) it will not be able to start.
The soft starter will be in service mode until the failure is corrected and reset.

Hardware failure : If a hardware failure occur inside the soft starter. The soft starter will stop and go into pause mode. The failure can be reset manually but it will continue in the pause mode until the time is running out.

Reset (push button) : The reset will reset all failure. The pause will continue until end of time.
The motor will start if the start signal is activated, if not it will go into service mode.

The soft starter is active (motor not running) :
If the voltage drop below lower level the "Fault" alarm will occur and the soft starter will go into "Service" mode and wait until the voltage is over lower level.
If the voltage is above upper level the "Fault" alarm will occur and the soft starter will go into "Service" mode and wait until the voltage is below upper level.

Motor Protection Adjustment :
Adjust the motor current to In + 10% as maximum.



Technical specifications:

Supply voltage specifications:

Rated operational voltage Ue (L1-L2-L3)	:	400VAC +15/- 15%
Rated AC frequency (self detecting and corrective)	:	45 …65Hz
Rated insulation voltage	:	660Vrms
Undervoltage alarm	:	300VAC
Overvoltage alarm	:	480 VAC

Control voltage specifications:

Control voltage Uc	:	230VAC +/- 15%
Control current	:	5mA
Max. control current for no operation	:	1,5W max
Drop-out voltage less than	:	90 VAC
Response time max.	:	Start 2000 msec
	:	Stop 200 msec

Insulation specifications:

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

Output specifications:

Utilization category	:	AC 58b with integrated by-pass contactor
Overload current profile 15/25/35A:	:	15A X-Tx: 6-1:300
	:	25A X-Tx: 6-1:300
	:	35A X-Tx: 6-1:300

General specifications

Initial torque	:	20 … 50%
Motor current nominal	:	3 … 15A; 10 … 25A; 20 … 35A;
Start current limit	:	35 …45% of LRA
LRA max.	:	66/100/140 A; automatic adjusted @ motor.

Semiconductor data

Product type	Rated operational current	I^2t	Short circuit protection
SCL 33 DA 4015BP	15A	610 A^2s	max.: 35A gl/gG
SCL 33 DA 4025BP	25A	1800 A^2s	max.: 63A gl/gG
SCL 33 DA 4035BP	35A	1800 A^2s	max.: 63A gl/gG

Indications (LED):

Ready mode	: The yellow LED is blinking steady slowly.
Run mode	: The yellow LED is light steady.
Pause mode	: The yellow LED is blinking steady fast.
Fault	: The yellow LED is flashing 10 times sequence and the red LED is flashing with a fault-code sequence.
Hardware failure	: The red LED is blinking with a fault-code sequence.

Fault:

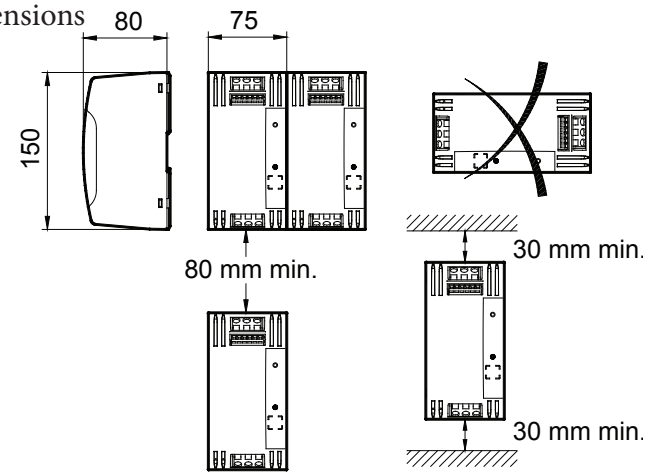
LED red (alarm signals via user friendly flashing sequence)

-	High voltage / low voltage / Voltage	(2)
-	High current / low current	(3)
-	Current not symmetrical	(3)
-	Motor protection (I^2t)	(3)
-	Stall	(4)
-	By-pass relay failure	(5)
-	High temperature / low temperature	(6)
-	Connection failure	(7)
-	Wrong phase sequence	(7)
-	Wrong frequency	(8)
-	Failure in soft starter	(9)

Environent:

Degree of protection	: IP 20
Pollution degree	: 3
Operating temperature	: -20º to 65ºC
Storage temperature	: -20º to 80ºC
Terminals	: Spring clamps

Dimensions



Housing material:

Self- extinguishing ABS/PC UL94V0 Halogen free

Colour: black

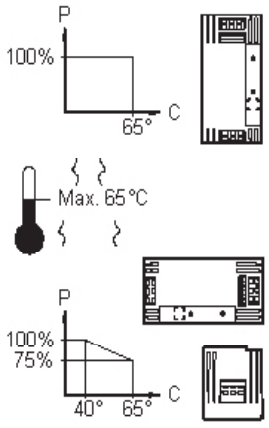
Integrated DIN-Rail connection

Terminal blocks:

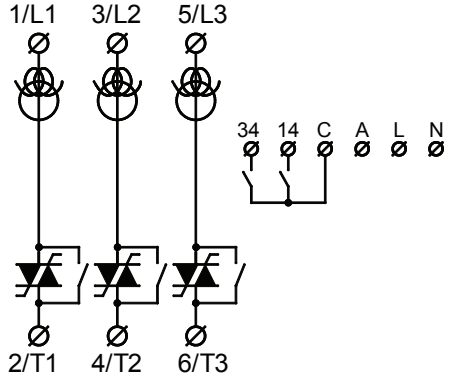
Spring clamps main-/motor connection 6 mm^2

Spring clamps control 2,5 mm^2

Mounting instructions



Wiring specifications



L1; L2; L3: Main supply

T1; T2; T3: Motor connection

A : Control voltage 230VAC -

C – 14 : For control of start/stop function

C – 34 : Fault signal relay

N (A2) : Neutral -

L : Phase 230VAC -

Motor Protection:

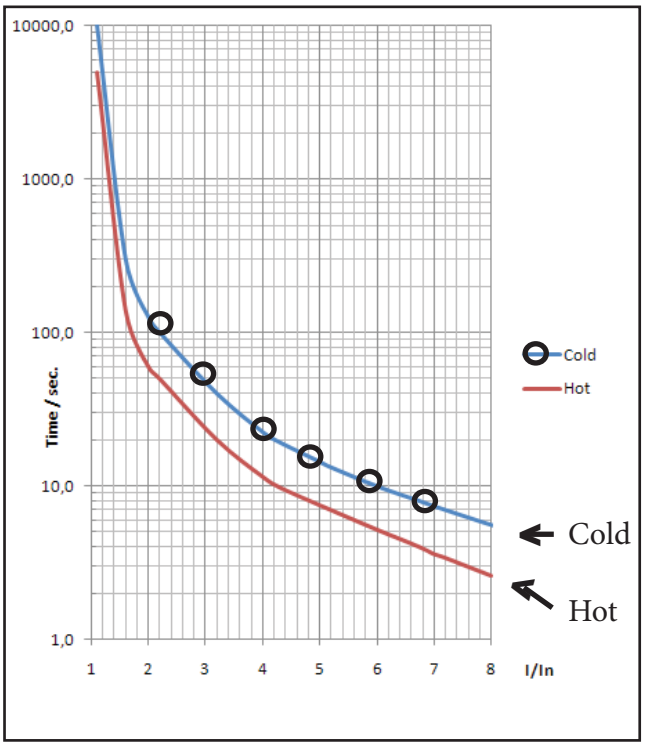
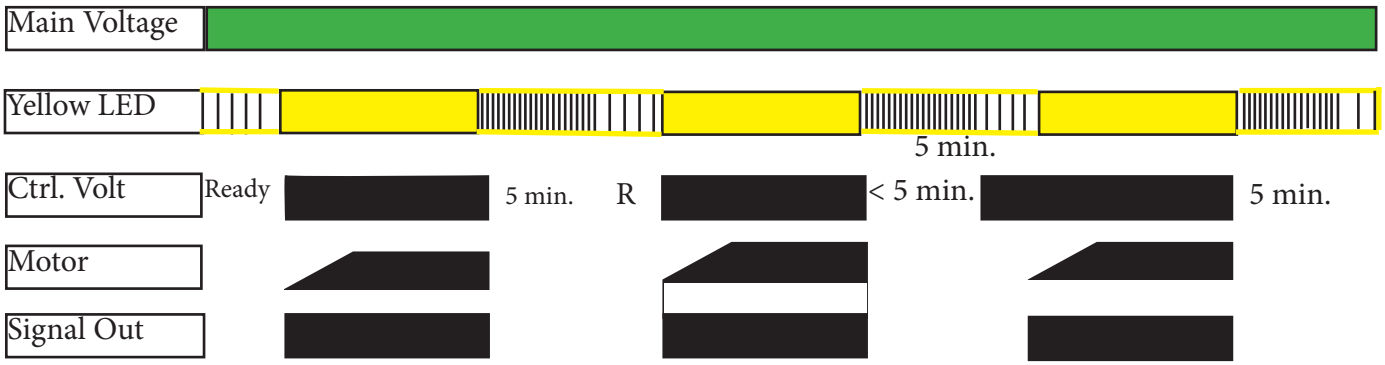


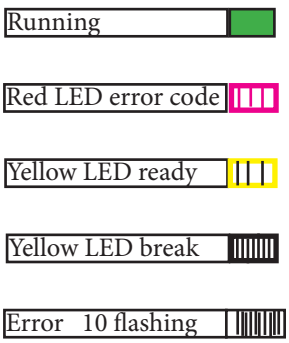
Figure: Electronic Motorprotection Class 10.

The internal electronic motorprotection is automatically temperature compensated. The motor protections acts exactly as an external motor protection circuit breaker.

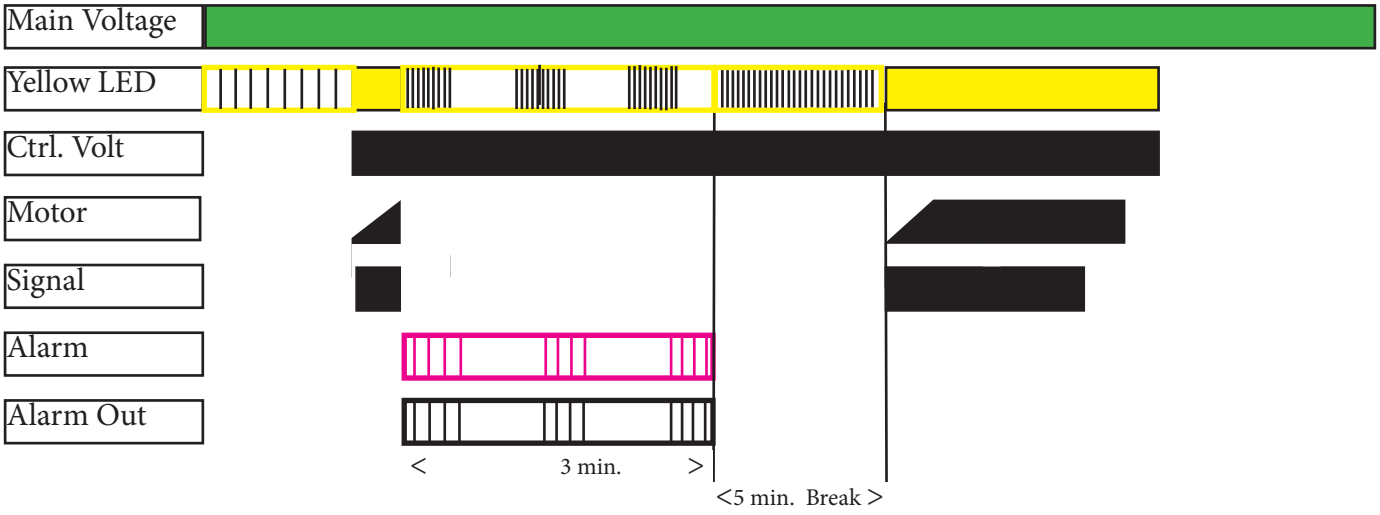
Mode of Operation:

Normal Conditions

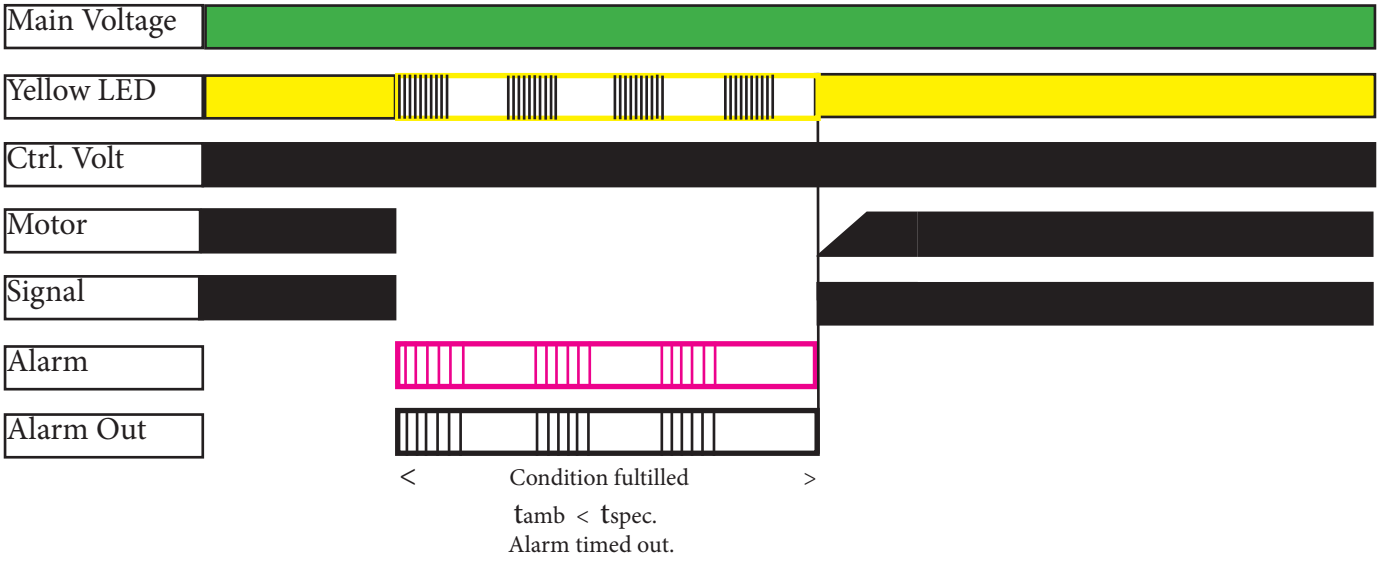




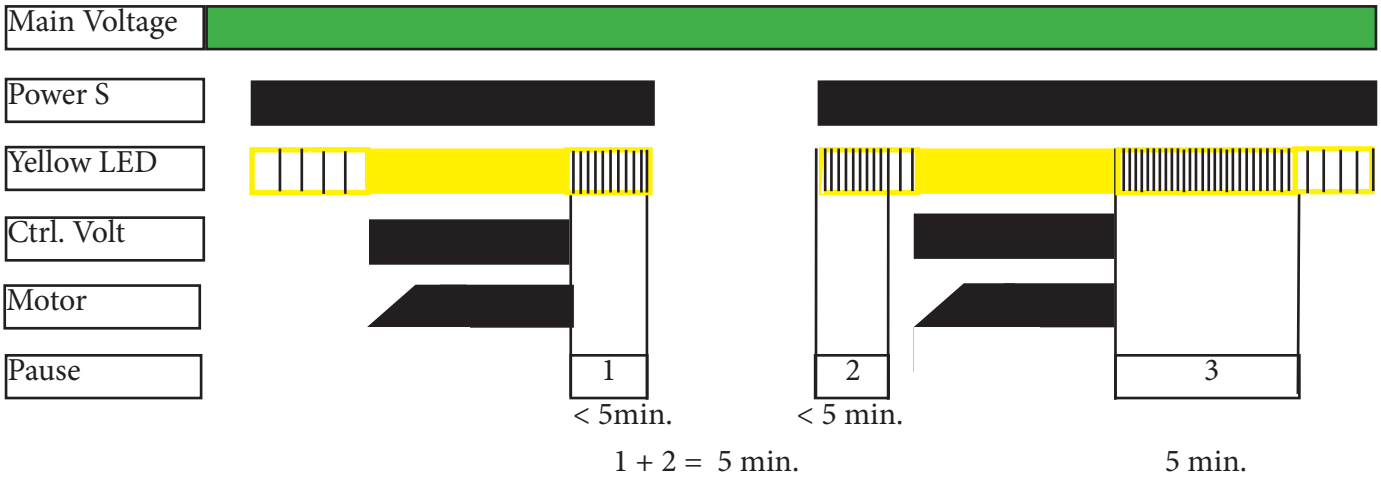
Locked Rotor/Fault (4)



High Temperature/Fault (6)



Break/Normal



Standards

Restrictions of hazardous substances		RoHs Compliant
CE Marking	LVD	EN 60947-4-2
	EMC: Immunity	EN 61000-6-4
	Emission	EN 61000-6-2
Electrostatic Dicharge ESD		
	Immunity	EN 61000-4-2 8kV, Air discharge 4kV, Contact
Electrical fast transient/ Burst Immunity		EN 61000-4-4
	Output	4kV
	Input	4kV
Electrical Surge Immunity		EN 61000-4-5
	Output, line to line	1kV
	Output, line to earth	2kV
	Input, line to line	1kV
	Input, line to earth	2kV
Radiated Radio Frequency Immunity		EN 61000-4-3 3V/m, 80-1000MHz
Conducted Radio Frequency Immunity Voltage dips & interference		EN 61000-4-6 3V/m, 0,15-80MHz IEC/EN 61000-4-11
Radio interference field emissions (radiated)		CISPR 11 IEC/EN 55011, ClassB
Radio interference voltage emissions (conducted)		CISPR 11 IEC/EN 55011,ClassB
Harmonics		IEC 61000-3-2

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Specifications are subject to change without notice (2014.07.30).