- 15V0078B1 -

ASAB

ADVANCED SOFT STARTER
QUICK SETUP GUIDE

Issued on 01/03/10
R. 00

- This manual is integrant and essential to the product. Carefully read the instructions contained herein as they provide important hints for use and maintenance safety.
- This device is to be used only for the purposes it has been designed to. Other uses should be considered improper and dangerous. The manufacturer is not responsible for possible damages caused by improper, erroneous and irrational uses.
- Elettronica Santerno is responsible for the device in its original setting.
- Any changes to the structure or operating cycle of the device must be performed or authorized by the Engineering Department of Elettronica Santerno.
- Elettronica Santerno assumes no responsibility for the consequences resulting by the use of non-original spare parts.
- Elettronica Santerno reserves the right to make any technical changes to this manual and to the device without prior notice. If printing errors or similar are detected, the corrections will be included in the new releases of the manual.
- Elettronica Santerno is responsible for the information contained in the original version of the Italian manual.
- The information contained herein is the property of Elettronica Santerno and cannot be reproduced. Elettronica Santerno enforces its rights on the drawings and catalogues according to the law.

Contents

SANTERNO
CARRARO GROUP

Elettronica Santerno S.p.A.
S.S. Selice, 47 – 40026 Imola (BO) Italy
Tel. +39 0542 489711 – Fax +39 0542 489722
www.santerno.com sales@santerno.com

1 Caution Statements

Caution Statements cannot cover every potential cause of equipment damage but can highlight common causes of damage. It is the installer's responsibility to read and understand all instructions in this manual prior to installing, operating or maintaining the soft starter, to follow good electrical practice including applying appropriate personal protective equipment and to seek advice before operating this equipment in a manner other than as described in this manual.

The examples and diagrams in this manual are included solely for illustrative purposes. The information contained in this manual is subject to change at any time and without prior notice. In no event will responsibility or liability be accepted for direct, indirect or consequential damages resulting from the use or application of this equipment.

WARNING - ELECTRICAL SHOCK HAZARD
ASAB soft starters contain dangerous voltages when connected to mains voltage. Only a competent electrician should carry out the electrical installation. Improper installation of the motor or the soft starter may cause equipment failure, serious injury or death. Follow this manual and local electrical safety codes.

SHORT CIRCUIT
ASAB soft starters are not short circuit proof. After severe overload or short circuit, the operation of the soft starter should be fully tested by an authorised service agent.

GROUNDING AND BRANCH CIRCUIT PROTECTION
It is the responsibility of the user or person installing the soft starter to provide proper grounding and branch circuit protection according to local electrical safety codes.

This manual provides brief information to assist in installing and operating the ASAB in simple applications. For comprehensive information on installing and operating the ASAB, refer to the ASAB User Manual (available from www.santerno.com).

2 Introduction

The ASAB is an advanced digital soft start solution for motors from 7 kW to 800 kW. ASAB soft starters provide a complete range of motor and system protection features and have been designed for reliable performance in the most demanding installation situations.

2.1 Feature List

Extensive starting and stopping options
- AAC Adaptive Acceleration Control
- Constant current
- Current ramp
- Timed voltage ramp soft stop
- Brake

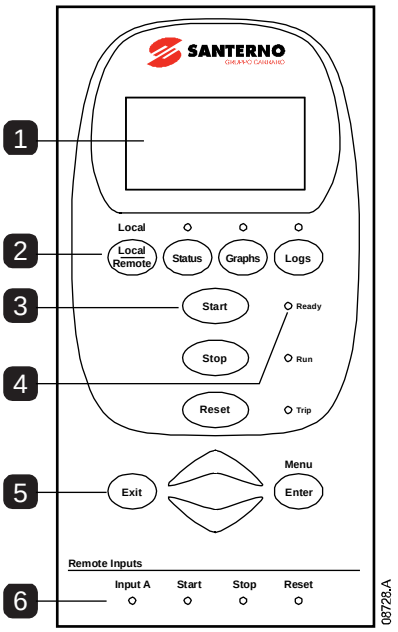
Models for all connection requirements
- 23 A to 1600 A (nominal)
- 200 VAC to 525 VAC
- 380 VAC to 690 VAC
- Internally bypassed options
- In-line or inside delta connection (auto-detect)

Inputs and outputs
- Remote control inputs (3 x fixed, 1 x programmable)
- Relay outputs (3 x programmable)
- Analog output
- DeviceNet, Modbus or Profibus communication modules (optional)

Easy-to-read display with comprehensive feedback
- Multi-language feedback
- Multiple status screens and performance graphs
- Date and time stamped event logging
- Operational counters (number of starts, hours run, kWh)
- Performance monitoring (current, voltage, power factor, kWh)
- User-programmable monitoring screen

Customisable protection
- Motor overload
- Excess start time
- Undercurrent
- Instantaneous overcurrent
- Current imbalance
- Mains frequency
- Input trip
- Motor thermistor
- Power circuit
- Phase sequence

3 The Keypad



1	Four-line display for status and programming details.
2	Display control buttons: Local/Remote: Toggle between Local and Remote control Status: Open the status displays and scroll between different status screens Graphs: Open the performance graphs and scroll between different graph screens Logs: Open the logs
3	Soft starter local control buttons: **START**: Start the motor and enter local control mode. **STOP**: Stop the motor (only active in Local mode). **RESET**: Reset a trip (Local mode only).
4	Starter status LEDs.
5	Menu navigation buttons: **EXIT**: Exit the menu or parameter, or cancel a parameter change **MENU/STORE**: Enter a menu or parameter, or save a parameter change ▲ ▼: Scroll to the next or previous menu or parameter, change the setting of the current parameter or scroll through the status or graph screens.
6	Remote input LEDs. When on: **INPUT A**: Programmable input A is active **START**: The remote start input is active **STOP**: The remote stop input is active **RESET**: The remote reset input is active

3.1 Starter Status LEDs

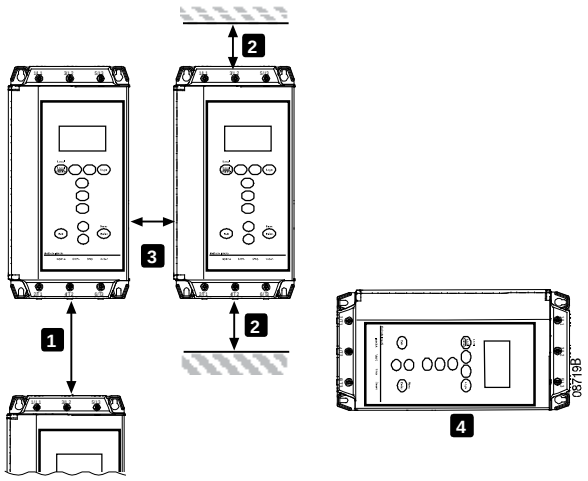
LED name	On	Flash
Ready	The motor is stopped and the starter is ready to start.	The motor is stopped and the starter is waiting for the Restart Delay (parameter 5A) or Motor Temperature Check (parameter 4F).
Run	The motor is in run state (receiving full voltage).	The motor is starting or stopping.
Trip	The starter has tripped.	The starter is in warning state.
Local	The starter is in Local control mode.	--
Status	The status screens are active.	--
Graphs	The graph screens are active.	The graph has been paused.
Logs	The logs menu is open.	--

If the starter is in Remote control mode, the Local LED will be off.

If all LEDs are off, the starter is not receiving control voltage.

4 Installation

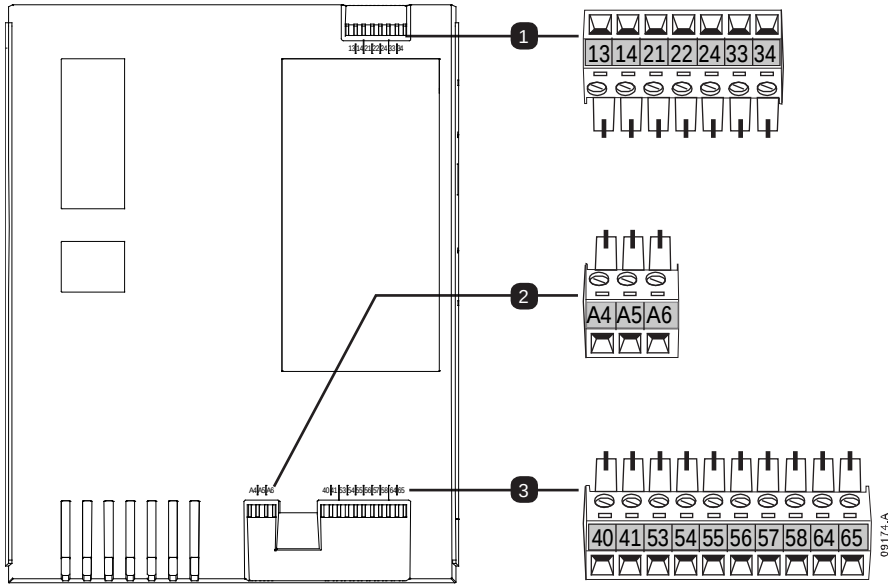
4.1 Physical Installation



1	ASAB-0023B ~ ASAB-0255C: Allow 100 mm (3.94 inches) between soft starters. ASAB-0380C ~ ASAB-1600C: Allow 200 mm (7.88 inches) between soft starters.
2	ASAB-0023B ~ ASAB-0220B: Allow 50 mm (1.97 inches) between the soft starter and solid surfaces. ASAB-0255C: Allow 100 mm (3.94 inches) between the soft starter and solid surfaces. ASAB-0380C ~ ASAB-1600C: Allow 200 mm (7.88 inches) between the soft starter and solid surfaces.
3	Soft starters may be mounted side by side with 50 mm (1.97 inches) clearance.
4	The soft starter may be mounted on its side. Derate the soft starter's rated current by 15%.

4.2 Control Terminals

Control terminations use 2.5mm^2 plug-in terminal blocks. Unplug each block, complete the wiring, then reinsert the block.



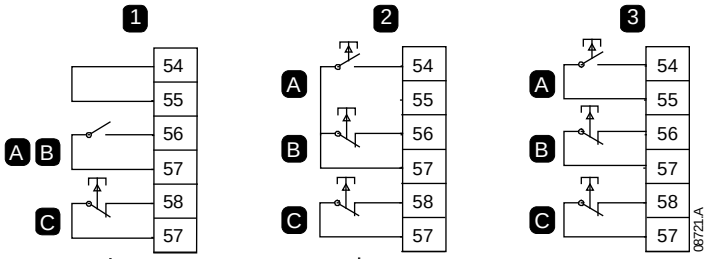
1	Relay outputs
13, 14	Relay output A
21, 22, 24	Relay output B
33, 34	Relay output C
2	Control voltage (model dependent)
A5, A6	110~120 VAC
A4, A6	220~240 VAC
A5, A6	24 VAC/VDC

3	Inputs and outputs
54, 55	Start
56, 57	Stop
58, 57	Reset
53, 55	Programmable input A
64, 65	Motor thermistor input
40, 41	Analog output
55, 41	24 VDC output

NOTE
If you are not using a thermistor, do not short terminals 64, 65.

4.3 Control Wiring

The ASAB has three fixed inputs for remote control. These inputs should be controlled by contacts rated for low voltage, low current operation (gold flash or similar).



1	Two-wire control
2	Three-wire control
3	Four-wire control
A	Start
B	Stop
C	Reset

CAUTION
Do not apply voltage to the control input terminals. These are active 24 VDC inputs and must be controlled with potential free contacts.

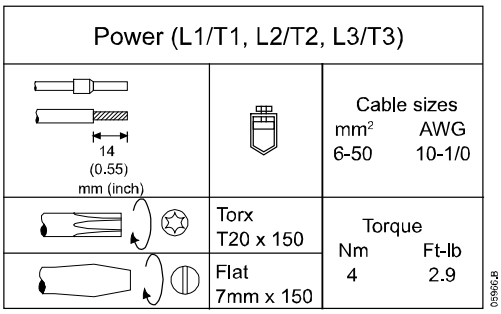
Cables to the control inputs must be segregated from mains voltage and motor cabling.

4.4 Power Terminations

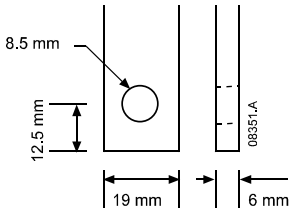
Use only copper stranded or solid conductors, rated for 75 ºC.

NOTE
Some units use aluminium bus bars. When connecting power terminations, we recommend cleaning the surface contact area thoroughly (using an emery or stainless steel brush) and using an appropriate jointing compound to prevent corrosion.

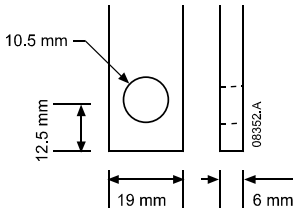
ASAB-0023B~ASAB-0105B



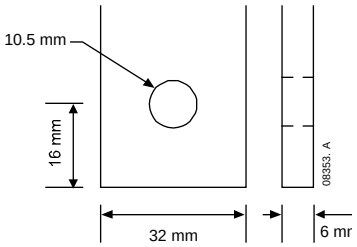
ASAB-0145B
8.5 Nm (6.3 ft-lb)



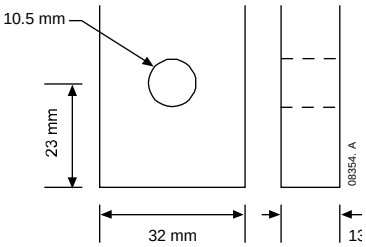
ASAB-0170B~ASAB-0220B
8.5 Nm (6.3 ft-lb)



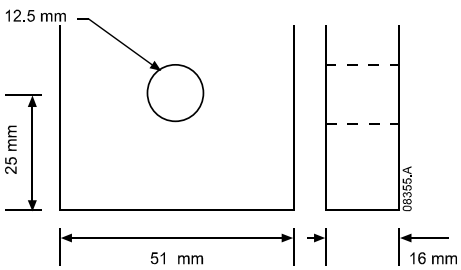
ASAB-0255C
17 Nm (12.5 ft-lb)



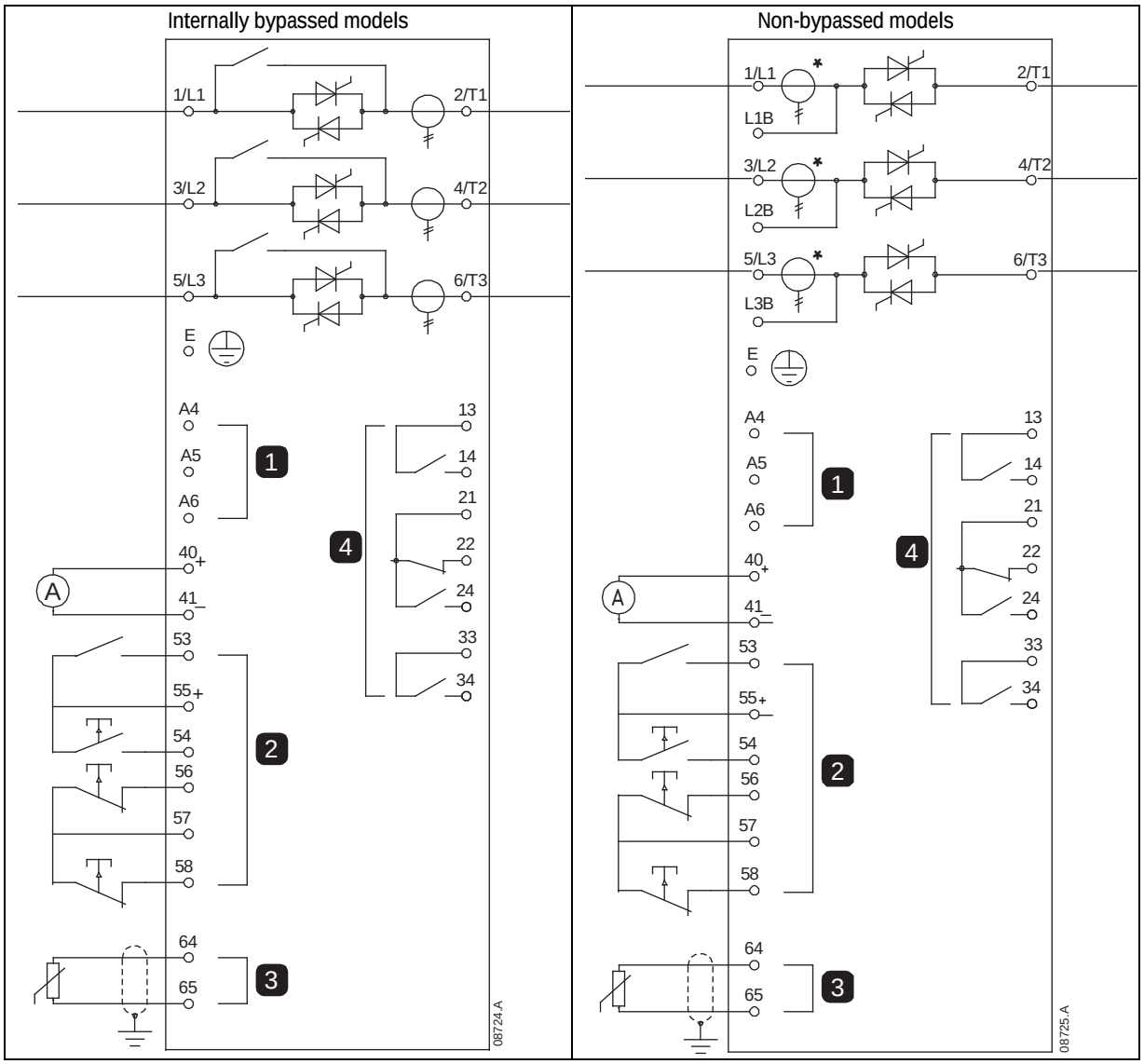
ASAB-0380C~ASAB-0930C
38 Nm (28.5 ft-lb)



ASAB-1200C~ASAB-1600C
58 Nm (42.7 ft-lb)



4.5 Schematic Diagrams



1	Control supply
2	Remote control inputs
3	Motor thermistor input
4	Relay outputs
40, 41	Analog output
41, 55	24 VDC output (200 mA)

54, 55	Start
56, 57	Stop
58, 57	Reset
53, 55	Programmable input A
13, 14	Relay output A
21, 22, 24	Relay output B
33, 34	Relay output C

NOTE
Different models require control voltage to different terminals:

- 12 (110~120 VAC) A5, A6
- 12 (220~240 VAC) A4, A6
- 14 (24 VAC/VDC) A5, A6

NOTE
* ASAB0255C current transformers are located on the output. Bypass terminals are labelled T1B, T2B and T3B.

5 How to configure the ASAB

1. Open the programming menu.
2. Scroll to Quick Setup Menu, then select your application.
3. Adjust each parameter to match your motor and application.

5.1 Programming Menu

You can access the Programming Menu at any time, including while the soft starter is running. Any changes to the start profile take effect after the next start.

The Programming Menu contains three sub-menus:

Quick Setup Menu	Provides access to quick setup options for common applications.
Standard Menu	The Standard Menu provides access to commonly used parameters, allowing you to configure the ASAB to suit your application.
Extended Menu	The Extended Menu provides access to all the ASAB's programmable parameters, allowing experienced users to take advantage of advanced features.
Setup Tools	Setup Tools includes maintenance options to configure the ASAB's date and time or load a standard parameter set.

5.2 Standard Menu

The standard menu provides access to commonly used parameters, allowing the user to configure the ASAB as required for the application.

		Default Setting
1	Motor Details	
	1A *Motor Full Load Current*	Model dependent
2	Primary Start/Stop	
	2A *Start Mode*	Constant current
	2B *Current Limit*	350%
	2C *Initial Current*	350%
	2D *Start Ramp Time*	00:10 mm:ss
	2G *Excess Start Time*	00:20 mm:ss
	2H *Stop Mode*	Coast to Stop
	2I *Stop Time*	00:00 mm:ss
4	Protection Levels	
	4B *Phase Sequence*	Any sequence
	4C *Undercurrent*	20% FLC
	4D *Instantaneous Overcurrent*	400% FLC
	4E *Input A Trip*	Always Active
5	Protection Delays	
	5C *Undercurrent Delay*	00:05 mm:ss
	5D *Instantaneous Overcurrent Delay*	00:00 mm:ss
	5E *Input A Trip Delay*	00:00 mm:ss
	5F *Input A Initial Delay*	00:00mm:ss
6	Inputs	
	6D *Input A Function*	Motor Set Select
	6E *Input A Name*	Input Trip
7	Relay Outputs	
	7A *Relay A Function*	Main Contactor
	7B *Relay A On Delay*	00:00 mm:ss
	7C *Relay A Off Delay*	00:00 mm:ss
	7D *Relay B Function*	Run
	7E *Relay B On Delay*	00:00 mm:ss
	7F *Relay B Off Delay*	00:00 mm:ss
	7G *Relay C Function*	Trip
	7H *Relay C On Delay*	00:00 mm:ss
	7I *Relay C Off Delay*	00:00 mm:ss
	7J *Low Current Flag*	50% FLC
	7K *High Current Flag*	100% FLC
	7L *Motor Temperature Flag*	80% FLC

10	Display	
	10A *Language*	English
	10B *User Screen - Top Left*	Starter State
	10C *User Screen - Top Right*	Blank
	10D *User Screen - Bottom Left*	Hours Run
	10E *User Screen - Bottom Right*	Blank
	10J *Display A or kW*	Current

For a full list of all parameters in the ASAB Extended Menu, refer to the ASAB User Manual, available from www.santerno.com.

6 Operation

6.1 Start, Stop and Reset Commands

The soft starter can be controlled in three ways:

- using the buttons on the keypad
- via remote inputs
- via a serial communication link

The **LCL/RMT** button controls whether the ASAB will respond to local control (via the keypad) or remote control (via the remote inputs). Local control is only available in Local mode and remote control is only available in Remote mode. The LCL/RMT LED on the keypad is on when the soft starter is in local control mode and off when the soft starter is in remote control mode.

The ASAB can also be set to allow local control only or remote control only, using parameter 6A *Local/Remote*. The **STOP** button on the keypad is always enabled.

Control via the serial communication network is always enabled in local control mode, and can be enabled or disabled in remote control mode (refer to parameter 6B). Control via the serial communication network requires an optional communication module.

6.1.1 Using the Soft Starter to Control a Motor

To soft start the motor, press the **START** button on the keypad or activate the Start remote input. The motor will start using the start mode selected in parameter 2A.

To stop the motor, press the **STOP** button on the keypad or activate the Stop remote input. The motor will stop using the stop mode selected in parameter 2H.

To reset a trip on the soft starter, press the **RESET** button on the keypad or activate the Reset remote input.

To emergency stop the motor, press the local **STOP** and **RESET** buttons at the same time. The soft starter will remove power from the motor and open the main contactor, and the motor will coast to stop. Emergency stop can also be controlled via a programmable input.

7 Specifications

Supply

Mains voltage (L1, L2, L3)
- ASAB/xxxx/5 ..... 200 VAC ~ 525 VAC (± 10%)
- ASAB/xxxx/7 ..... 380 VAC ~ 600 VAC (± 10%) (in-line or inside delta connection)
- ASAB/xxxx/7 ..... 380 VAC ~ 690 VAC (± 10%) (earthed star supply system only)

Control voltage (A4, A5, A6)
- 12 ..... 110 ~ 120 VAC or 220 ~ 240 VAC (+ 10% / -15%), 600mA
- 14 ..... 24 VAC/VDC

Mains frequency ..... 45 Hz to 66 Hz
Rated insulation voltage to earth ..... 600 VAC
Rated impulse withstand voltage ..... 4 kV
Form designation ..... Bypassed or continuous, semiconductor motor starter form 1

Short circuit capability

Coordination with semiconductor fuses ..... Type 2
Coordination with HRC fuses ..... Type 1
- ASAB/0023B to ASAB/0220B ..... prospective current 65 kA
- ASAB/0255C to ASAB/0930C ..... prospective current 85 kA
- ASAB/1200C to ASAB/1600C ..... prospective current 100 kA

Electromagnetic capability (compliant with EU Directive 89/336/EEC)

EMC Emissions ..... IEC 60947-4-2 Class B and Lloyds Marine No 1 Specification
EMC Immunity ..... IEC 60947-4-2

Inputs

Input rating ..... Active 24 VDC, 8 mA approx
Start (54, 55) ..... Normally open
Stop (56, 57) ..... Normally closed
Reset (58, 57) ..... Normally closed
Programmable input (53, 55) ..... Normally open
Motor thermistor (64, 65) ..... Trip >3.6 kΩ, reset <1.6kΩ

Outputs

Relay Outputs ..... 10A @ 250 VAC resistive, 5A @ 250 VAC AC15 pf 0.3
Programmable outputs
- Relay A (13, 14) ..... Normally open
- Relay B (21, 22, 24) ..... Changeover
- Relay C (33, 34) ..... Normally open

Analog output (40, 41) ..... 0-20 mA or 4-20 mA (selectable)
- Maximum load ..... 600 Ω (12 VDC @ 20 mA)
- Accuracy ..... ± 5%

24 VDC output (55, 41) Maximum load ..... 200 mA
- Accuracy ..... ± 10%

Environmental

Protection
- ASAB/0023B ~ ASAB/0105B IP20
- ASAB/0145B ~ ASAB/1600C IP00

Operating temperature ..... -10 ˚C to 60 ˚C, above 40 ˚C with derating
Storage temperature ..... - 25 ˚C to + 60 ˚C
Operating altitude ..... 0 - 1000 m, above 1000 m with derating
Humidity ..... 5% to 95% Relative Humidity
Pollution degree ..... Pollution Degree 3
Vibration ..... IEC 60068-2-6

Heat dissipation

During start ..... 4.5 watts per ampere
During run
- ASAB/0023B ~ ASAB/0053B ..... ≤ 39 watts approx
- ASAB/0076B ~ ASAB/0105B ..... ≤ 51 watts approx
- ASAB/0145B ~ ASAB/0220B ..... ≤ 120 watts approx
- ASAB/0255C ~ ASAB/0930C ..... 4.5 watts per ampere approx
- ASAB/1200C ~ ASAB/1600C ..... 4.5 watts per ampere approx

Certification

CE ..... IEC 60947-4-2
C✓ ..... IEC 60947-4-2
UL/ C-UL ..... UL 508
ASAB/0023B ~ ASAB/0105B ..... IP20 & NEMA1, UL Indoor Type 1
ASAB/0145B ~ ASAB/1600C ..... IP00, UL Indoor Open Type
CCC (Pending)..... GB 14048-6
RoHS ..... Compliant with EU Directive 2002/95/EC
Marine (ASAB-0023B to ASAB-0220B only) ..... Lloyds Marine No 1 Specification

7.1 Model Code