

# ASA 4.0 Advanced

SOFT STARTER

## QUICK SETUP

Issued on 10/05/21

R. 02

- 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.
- Enertronica 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 Enertronica Santerno.
- Enertronica Santerno assumes no responsibility for the consequences resulting by the use of non-original spare parts.
- Enertronica 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.
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# 1 About this manual

**CAUTION**

This manual provides information to assist in installing and operating the soft starter in simple applications. For more detailed information, contact your local supplier for the full user manual.

**WARNING**

Indicates a hazard that may cause personal injury or death.

**CAUTION**

Indicates a hazard that may damage the equipment or installation.

**NOTE**

Provides helpful information.

## 1.1 Disclaimer

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.

Failure to follow the information and instructions in this manual will void the warranty.

# 2 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 equipment, 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.

**NOTE**

The ASA 4.0 Advanced is not user serviceable. The unit should only be serviced by authorised service personnel. **Unauthorised tampering with the unit will void the product warranty.**

**FOR YOUR SAFETY**

- The STOP function of the soft starter does not isolate dangerous voltages from the output of the starter. The soft starter must be disconnected by an approved electrical isolation device before accessing electrical connections.
- Soft starter protection features apply to motor protection only. It is the user's responsibility to ensure safety of personnel operating machinery.
- The soft starter is a component designed for integration within an electrical system; it is therefore the responsibility of the system designer/user to ensure the system is safe and designed to comply with relevant local safety standards.

## 2.1 Electrical shock risk



### **WARNING – ELECTRICAL SHOCK HAZARD**

The voltages present in the following locations can cause severe electric shock and may be lethal:

- AC supply cables and connections
- Output cables and connections
- Many internal parts of the starter



### **SHORT CIRCUIT**

The equipment is not short circuit proof. After severe overload or short circuit, the operation of the equipment 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 equipment to provide proper grounding and branch circuit protection according to local electrical safety codes.

## 2.2 Unexpected operation



### **WARNING – ACCIDENTAL STARTS**

In some installations, accidental starts may pose an increased risk to safety of personnel or damage to the machines being driven. In such cases, it is recommended that the power supply to the soft starter is fitted with an isolating switch and a circuit-breaking device (eg power contactor) controllable through an external safety system (eg emergency stop, fault detector).



### **WARNING – STARTER MAY START OR STOP UNEXPECTEDLY**

The ASA 4.0 Advanced will respond to control commands from various sources, and could start or stop unexpectedly. Always disconnect the soft starter from mains voltage before accessing the starter or load.



### **WARNING – DISCONNECT MAINS BEFORE ACCESSING STARTER OR LOAD**

The soft starter has built-in protections which can trip the starter in the event of faults and thus stop the motor. Voltage fluctuations, power cuts and motor jams may also cause the motor to trip.

The motor could restart after the causes of shutdown are rectified, which may be dangerous for personnel. Always disconnect the soft starter from mains voltage before accessing the starter or load.



### **CAUTION – MECHANICAL DAMAGE FROM UNEXPECTED RESTART**

The motor could restart after the causes of shutdown are rectified, which may be dangerous for certain machines or installations. In such cases, it is essential that appropriate arrangements are made against restarting after unscheduled stops of the motor.

## 2.3 Avertissements à l'attention des clients canadiens



### **AVERTISSEMENT**

L'icône AVERTISSEMENT ci-contre signale les informations concernant des risques pouvant entraîner des blessures graves, voire mortelles. Pour votre sécurité, veuillez consulter les avertissements sur cette page ou demander une copie du présent manuel en français auprès de votre distributeur local.

**AVERTISSEMENT – RISQUE DE CHOC ÉLECTRIQUE**

Les zones suivantes sont soumises à des tensions pouvant provoquer des risques de chocs électriques graves, voire mortels :

- Raccordement et câbles d'alimentation AC
- Câbles et raccordements de sortie
- De nombreuses pièces internes du démarreur

**PAR SÉCURITÉ**

- La fonction STOP du démarreur progressif n'isole pas des tensions dangereuses de la sortie du démarreur. Le démarreur progressif doit être déconnecté par un dispositif d'isolement électrique approprié avant d'accéder aux connexions électriques.
- Les fonctions de protection du démarreur progressif ne concernent que la protection du moteur. Il relève de la responsabilité de l'utilisateur d'assurer la sécurité des personnes travaillant sur les machines.
- Le démarreur progressif est un appareil conçu pour s'intégrer dans un système électrique ; il relève donc de la responsabilité du concepteur ou de l'utilisateur de veiller à ce que ce système soit sûr et conçu selon les normes de sécurité locales en vigueur.

**AVERTISSEMENT – DÉMARRAGES ACCIDENTELS**

Dans certaines installations, des démarrages accidentels peuvent provoquer un risque supplémentaire pour la sécurité des personnes ou endommager les machines contrôlées. Dans de tels cas, il est recommandé de doter l'alimentation du démarreur progressif d'un interrupteur d'isolement et d'un coupe-circuit (par exemple, un disjoncteur) contrôlable à partir d'un système de sécurité externe (par exemple, un arrêt d'urgence, un détecteur de défaut).

**AVERTISSEMENT – LE DÉMARREUR PEUT DÉMARRER OU S'ARRÊTER À TOUT MOMENT**

Le démarreur progressif répond aux commandes de contrôle de différentes origines et peut par conséquent démarrer ou s'arrêter à tout moment. Toujours déconnecter le démarreur de la tension secteur avant d'accéder au démarreur ou à la charge.

**AVERTISSEMENT – DÉCONNECTER L'ALIMENTATION PRINCIPALE AVANT D'ACCÉDER AU DÉMARREUR OU À LA CHARGE**

Le démarreur progressif comporte des protections intégrées qui peuvent déclencher des mises en sécurité dans l'éventualité de défauts et ainsi arrêter le moteur. Des fluctuations de tension, des coupures d'alimentation et des blocages du moteur peuvent produire des mises en sécurité de celui-ci.

Le moteur pourrait redémarrer une fois que les causes de l'arrêt ont été résolues, ce qui pourrait mettre en danger le personnel. Toujours déconnecter le démarreur de la tension secteur avant d'accéder au démarreur ou à la charge.

**AVERTISSEMENT**

Ne pas appliquer la tension du secteur au démarreur tant que tout le câblage n'est pas terminé.

**AVERTISSEMENT**

Toujours appliquer la tension de commande avant (ou en même temps que) la tension secteur.



**AVERTISSEMENT**

Lors du raccordement de l'ASA 4.0 Advanced en connexion 6 fils, toujours installer un contacteur principal ou un disjoncteur magnéto-thermique à bobine de déclenchement.



**AVERTISSEMENT**

Si l'entrée de démarrage est fermée lorsque la tension de commande est appliquée, le démarreur tentera d'effectuer un démarrage.

Vérifier que l'entrée de démarrage/arrêt est ouverte avant d'appliquer la tension de commande.

### 3 System design

#### 3.1 Feature list

**Streamlined setup process**

- Configuration profiles for common applications
- Built-in metering and inputs/outputs

**Easy to understand interface**

- Multi-language menus and displays
- Descriptive option names and feedback messages
- Real-time performance graphs

**Supports energy efficiency**

- IE3 compatible
- 99% energy efficient when running
- Soft start technology avoids harmonic distortion

**Extensive range of models**

- 24 A~1250 A (nominal)
- 200~525 VAC
- 380~690 VAC
- Bypassed or continuous options
- In-line or inside delta connection

**Extensive input and output options**

- Remote control inputs (2 x fixed, 2 x programmable)
- Relay outputs (2 x fixed, 2 x programmable)
- Analog output

**Versatile starting and stopping options**

- Scheduled start/stop
- Adaptive Control
- Constant Current
- Current Ramp
- Pump Clean
- Timed voltage ramp soft stop
- Coast To Stop
- DC Brake
- Soft Brake
- Reverse Direction

**Customisable protection**

- Motor overload
- Excess Start Time
- Undercurrent/Overcurrent
- Underpower/Overpower
- Undervoltage/Overvoltage
- Current imbalance
- Input Trip
- Motor thermistor

**Optional features for advanced applications**

- Smart cards
- Communication options: DeviceNet, Ethernet/IP, Modbus RTU, Modbus TCP, Profibus, Profinet
- Ground fault protection

### 3.2 Model code

ASA4.0-A



Control voltage 12 = 110~120 VAC or 220~240 VAC 14 = 24 VAC/VDC
---

Mains voltage 5 = 200~525 VAC 7 = 380~690 VAC
---

Bypass B = internally bypassed C = non-bypassed (continuous connection)
---

Nominal current rating
------------------------

## 4 Installation



### WARNING

Do not apply mains voltage to the starter until all wiring is complete.



### WARNING

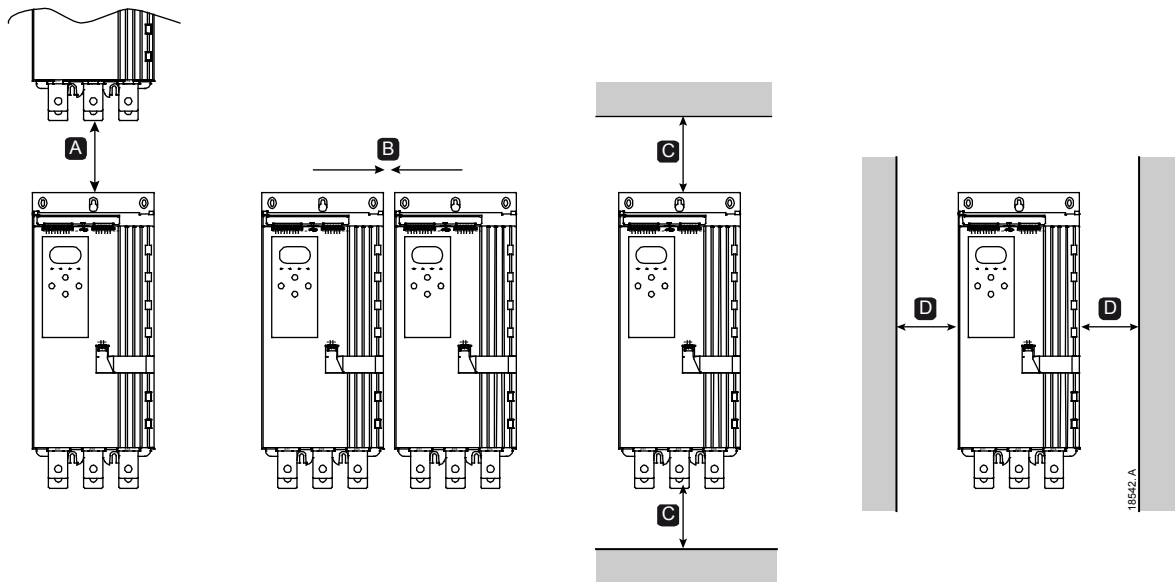
Always apply control voltage before (or with) mains voltage.

### 4.1 Setup procedure overview

1. Mount the soft starter.
2. Connect control wiring.
3. Apply control voltage to the starter.
4. Configure your application:
  1. Press **MENU/ENTER** to open the menu.
  2. Press **MENU/ENTER** to open the Quick Setup menu.
  3. Scroll through the list to find your application, then press **MENU/ENTER** to begin the configuration process.
5. If your application is not listed in Quick Setup:
  1. Press **RESET/EXIT** to return to the Menu.
  2. Use ▼ to scroll to Main Menu and press **MENU/ENTER**.
  3. Scroll to Motor Details and press **MENU/ENTER**, then press ▼ then **MENU/ENTER** to edit parameter 1B *Motor Full Load Current*.
  4. Set parameter 1B to match the motor's full load current (FLC).
  5. Press **MENU/ENTER** to save the setting.
6. Close the Menu by pressing **RESET/EXIT** repeatedly.
7. (Optional) Use the built-in simulation tools to check that the control wiring is connected correctly.
8. Power off the soft starter.
9. Connect the motor cables to starter output terminals 2/T1, 4/T2, 6/T3.
10. Connect mains supply cables to starter input terminals 1/L1, 3/L2, 5/L3.

The soft starter is now ready to control the motor.

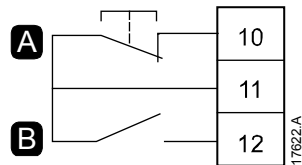
## 4.2 Physical installation



Between starters		Solid surfaces	
A	B	C	D
> 100 mm (3.9 inch)	> 10 mm (0.4 inch)	> 100 mm (3.9 inch)	> 10 mm (0.4 inch)

## 4.3 Start/stop

The ASA 4.0 Advanced requires two-wire control.



<b>A</b>	Reset
<b>B</b>	Start/Stop



### WARNING

If the start input is closed when control voltage is applied, the starter will attempt to start.

Check that the start/stop input is open before applying control voltage.

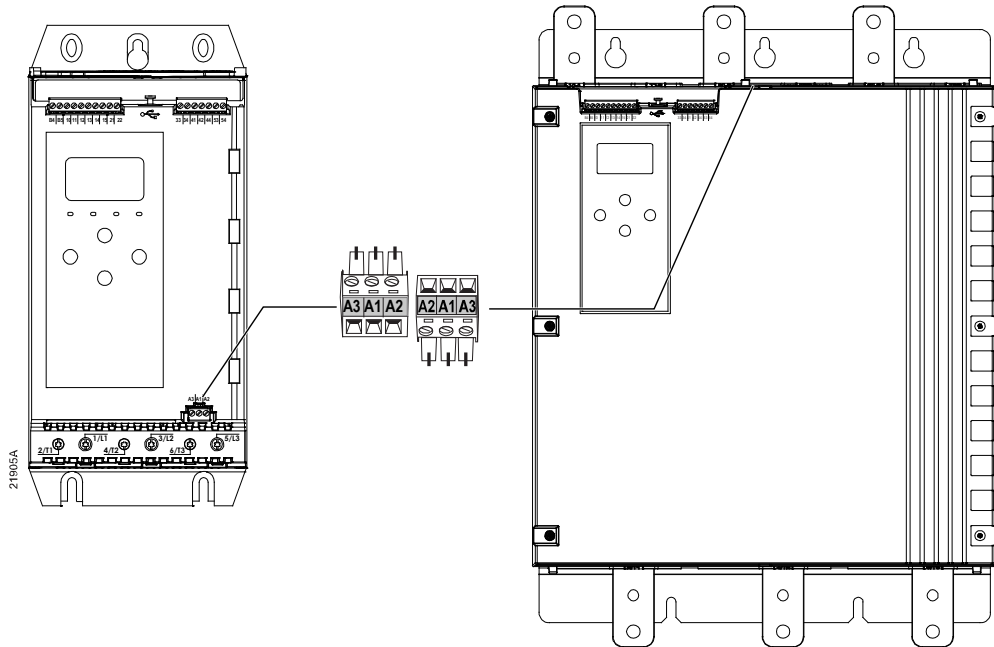


### NOTE

The ASA 4.0 Advanced will only accept commands from the control inputs if parameter 1A *Command Source* is set to Digital Input.



### 4.4 Control voltage




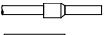
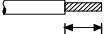
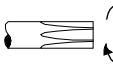

Connect the control supply according to the supply voltage being used.

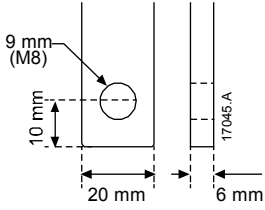
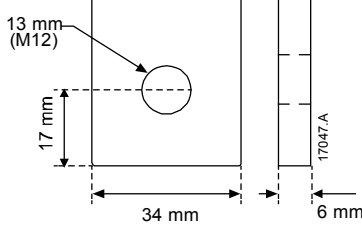
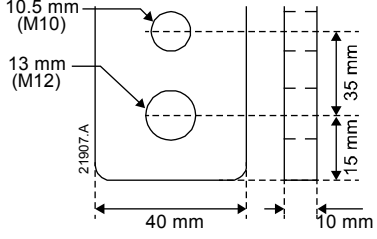
- ASA4.0-A xxxxX/x/12 (110~120 VAC): A1, A2
- ASA4.0-A xxxxX/x/12 (220~240 VAC): A2, A3
- ASA4.0-A xxxxX/x/14 (24 VAC/VDC): A1, A2

Install supplementary or branch overcurrent protection on the control circuit supply (A1, A2, A3), in accordance with the electrical code applicable at the installation location.

### 4.5 Power terminations

- Models ASA4.0-A 0024B~ASA4.0-A 0135B use cage clamps. Use only copper stranded or solid conductors, rated for 75 °C or higher.
- Models ASA4.0-A 0184B~ASA4.0-A 0580B use busbars at the bottom of the unit. Use copper or aluminium conductors, stranded or solid, rated for 60 °C/75 °C.
- Models ASA4.0-A 0835B~ASA4.0-A 1250B/ASA4.0-A 0735C~ASA4.0-A 1220C use busbars. Input terminals are at the top of the unit and output terminals are at the bottom.
- Models ASA4.0-A 0735C~ASA4.0-A 1220C have dedicated bypass terminals, if the soft starter will be installed with an external bypass contactor. The bypass busbars are at the top of the unit and are labeled T1B, T2B, T3B.

ASA4.0-A 0024B~ASA4.0-A 0135B	
 05866.E    1120.A	<p>Cable size: 6-70 mm<sup>2</sup> (AWG 10-2/0) Torque: 4 Nm (2.9 ft-lb)</p> <p>14 mm (0.55 inch)</p>
 10280.A   10281.A	<p>Torx T20 x 150</p> <p>Flat 7 mm x 150</p>

<b>ASA4.0-A 0184B~ ASA4.0-A 0250B</b>	<b>ASA4.0-A 0352B~ ASA4.0-A 0580B</b>	<b>ASA4.0-A 0835B~ASA4.0-A 1250B &amp; ASA4.0-A 0735C~ASA4.0-A 1220C</b>
<p>19 Nm (14.0 ft-lb)</p> 	<p>66 Nm (49.0 ft-lb)</p> 	<p>66 Nm (49.0 ft-lb)</p> 



**NOTE**

If the installation requires large diameter cables, it is possible to complete each termination with two smaller cables, one on each side of the busbar.



**NOTE**

When connecting power terminations, clean the surface contact area thoroughly (using an emery or stainless steel brush) and use an appropriate jointing compound to prevent corrosion.

**Wiring connectors**

Select a connector according to the wire size, material and your application requirements.

• **Models ASA4.0-A 0024B~ASA4.0-A 0580B**

A compression connector is recommended for models ASA4.0-A 0184B to ASA4.0-A 0580B. The recommended crimping tool is TBM8-750.

<b>Model</b>	<b>Example connector – aluminium cable</b>	<b>Example connector – copper cable</b>
ASA4.0-A 0184B	61162	60150
ASA4.0-A 0200B	61165	60156
ASA4.0-A 0229B	61171	60165
ASA4.0-A 0250B		
ASA4.0-A 0352B	61162	60150
ASA4.0-A 0397B	61165	60156
ASA4.0-A 0410B		60162
ASA4.0-A 0550B	61178	60171
ASA4.0-A 0580B		

• **Models ASA4.0-A 0835B~ASA4.0-A 1250B & ASA4.0-A 0735C~ASA4.0-A 1220C**

A terminal lug is recommended for models ASA4.0-A 0835B~ASA4.0-A 1250B and ASA4.0-A 0735C~ASA4.0-A 1220C. The recommended lug is TCAL125.

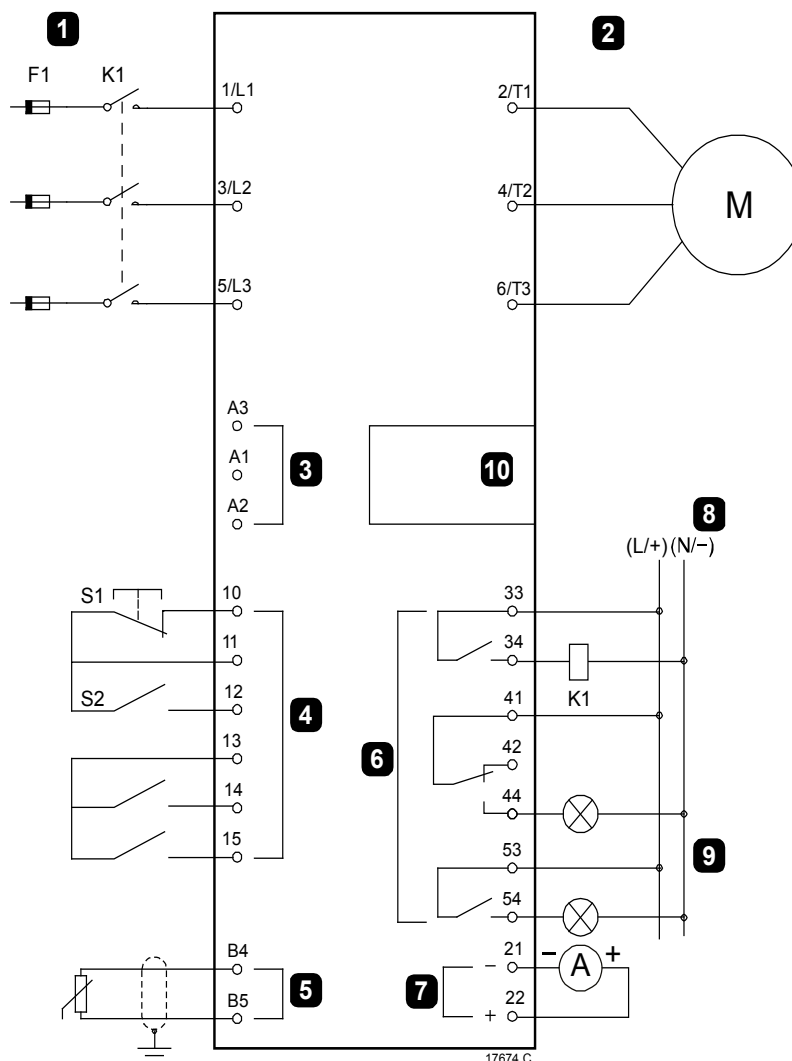
- To use a lug, models 0835B~1250B require busbar link ZZ0093900.
- To use a lug, models 0735C~1220C require busbar link ZZ0093901 and ZZ0093900.

## 4.6 Typical installation

### Internally bypassed installation

The soft starter is installed with a main contactor (AC3 rated). Control voltage must be supplied from the input side of the contactor.

The main contactor is controlled by the main contactor output (33, 34).



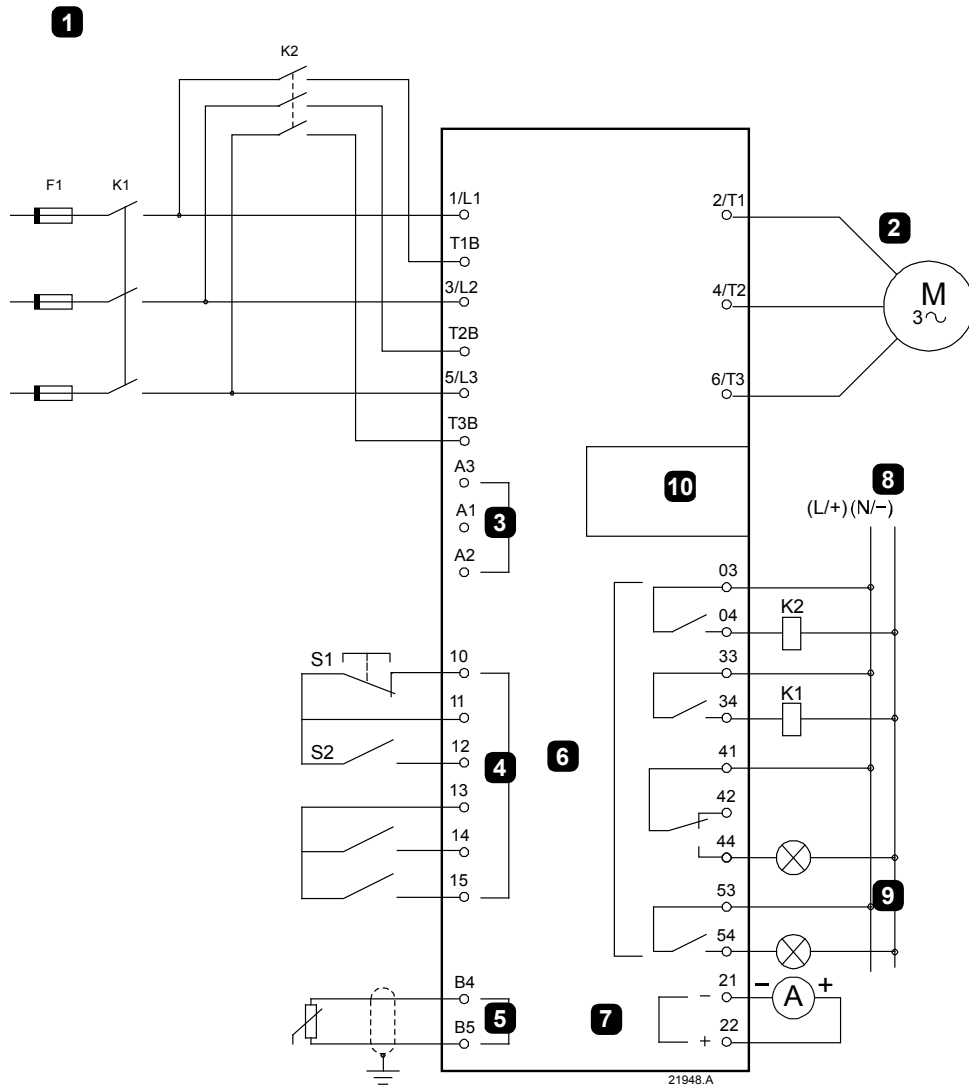
<b>1</b>	Three-phase supply
<b>2</b>	Motor
<b>3</b>	Control voltage (soft starter)
<b>4</b>	Digital inputs
<b>5</b>	Motor thermistor input
<b>6</b>	Relay outputs
<b>7</b>	Analog output
<b>8</b>	Control voltage (external equipment)
<b>9</b>	Pilot lamps
<b>10</b>	Communications / Smart card expansion port

K1	Main contactor
F1	Fuses or circuit breaker
10, 11 (S1)	Reset
11, 12 (S2)	Start/Stop
13, 14	Programmable input A (default = Input Trip (N/O))
13, 15	Programmable input B (default = Input Trip (N/O))
B4, B5	Motor thermistor input
33, 34	Main contactor output
41, 42, 44	Relay output A (default = Run)
53, 54	Relay output B (default = Run)
21, 22	Analog output

### Externally bypassed installation

The soft starter is installed with a main contactor (AC3 rated) and an external bypass contactor. To bypass the soft starter during run, use an external bypass contactor with an AC1 rating. To bypass the soft starter completely (to allow direct on-line starting if the starter is damaged), use an external bypass contactor with an AC3 rating.

Use the main contactor output (33, 34) to control the main contactor. Use the bypass contactor output (03, 04) to control the external bypass.



1	Three-phase supply
2	Motor
3	Control voltage (soft starter)
4	Digital inputs
5	Motor thermistor input
6	Relay outputs
7	Analog output
8	Control voltage (external equipment)

K1	Main contactor
K2	Bypass contactor (external)
F1	Fuses or circuit breaker
10, 11 (S1)	Reset
11, 12 (S2)	Start/Stop
13, 14	Programmable input A (default = Input Trip (N/O))
13, 15	Programmable input B (default = Input Trip (N/O))
B4, B5	Motor thermistor input
33, 34	Main contactor output

9	Pilot lamps
10	Communications / Smart card expansion port

41, 42, 44	Relay output A (default = Run)
53, 54	Relay output B (default = Run)
03, 04	Bypass contactor output
21, 22	Analog output

## 4.7 Quick setup

The Quick Setup Menu makes it easy to configure the soft starter for common applications. The starter guides you through the most common installation parameters, and suggests a typical setting for the application. You can adjust each parameter to suit your exact requirements.

All other parameters remain at default values. To change other parameter values or review the default settings, use the menu (refer to *Parameter list* for details).

Always set parameter 1B *Motor Full Load Current* to match the motor's nameplate full load current.

Application	Start Mode	Start Ramp Time (seconds)	Initial Current (%)	Current Limit (%)	Adaptive Start Profile	Stop Mode	Stop Time (seconds)	Adaptive Stop Profile
Pump Centrifugal	Adaptive Control	10	200	500	Early accel.	Adaptive Control	15	Late decel.
Pump bore	Adaptive Control	3	200	500	Early accel.	Adaptive Control	3	Late decel.
Pump Hydraulic	Constant Current	2	200	350	n/a	Coast To Stop	n/a	n/a
Fan Damped	Constant Current	2	200	350	n/a	Coast To Stop	n/a	n/a
Fan Undamped	Constant Current	2	200	450	n/a	Coast To Stop	n/a	n/a
Compressor Screw	Constant Current	2	200	400	n/a	Coast To Stop	n/a	n/a
Compressor Recip	Constant Current	2	200	450	n/a	Coast To Stop	n/a	n/a
Conveyor	Constant Current	5	200	450	n/a	Coast To Stop	n/a	n/a
Bow thruster	Constant Current	5	100	400	n/a	Coast To Stop	n/a	n/a
Bandsaw	Constant Current	2	200	450	n/a	Coast To Stop	n/a	n/a

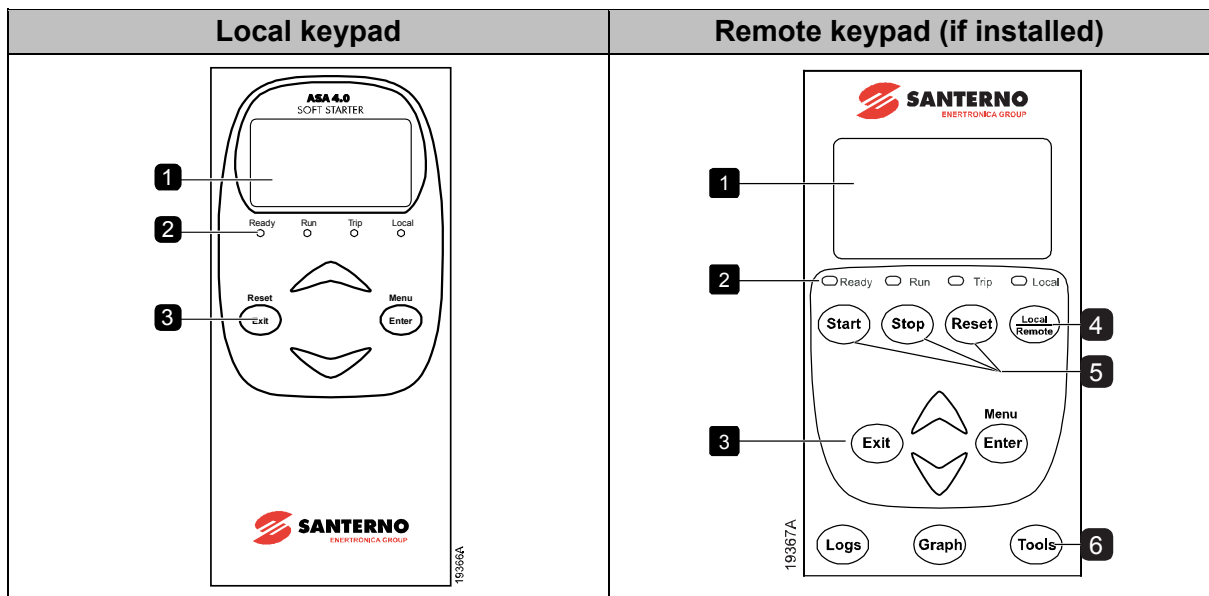


### NOTE

The Adaptive Start and Stop Profile settings only apply when using Adaptive Control. The settings are ignored for all other start and stop modes.

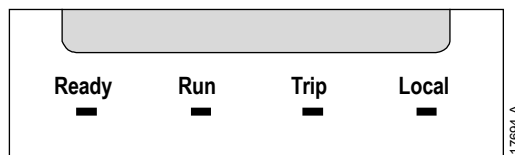
## 5 Keypad and feedback

### 5.1 The keypad



1	Four-line display for status and programming details.
2	Status LEDs
3	Menu navigation buttons: <b>RESET/EXIT:</b> Exit the menu or parameter, or cancel a parameter change. On the local keypad, this button also resets a trip. <b>MENU/ENTER:</b> Enter a menu or parameter, or save a parameter change. <b>▲ ▼:</b> Scroll to the next or previous menu or parameter, change the setting of the current parameter or scroll through the status screens.
4	Shortcut to the command source menu in Setup Tools.
5	Soft starter local control buttons
6	Shortcut buttons for quick access to common tasks. <b>LOGS:</b> Open the Logs Menu. <b>GRAPHS:</b> Select which graph to view, or pause/restart the graph (hold longer than 0.5 seconds) <b>TOOLS:</b> Open the Setup Tools.

### 5.2 Starter status LEDs



LED name	On	Flashing
Ready	The motor is stopped and the starter is ready to start.	The motor is stopped and the starter is not ready to start: <ul style="list-style-type: none"> <li>waiting for the <i>Restart Delay</i> (parameter 5P)</li> <li>the thermal models indicate the starter and/or motor are too hot to start safely</li> <li>the reset input (10, 11) is open</li> </ul>

LED name	On	Flashing
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 being controlled via a remote keypad.	–

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

## 6 Operation

### 6.1 Start, stop and reset commands

The ASA 4.0 Advanced can be started and stopped via the digital inputs, remote keypad, communication network, smart card or scheduled auto-start/stop. The command source can be set via the setup tools, or using parameter 1A *Command Source*.

- The ASA 4.0 Advanced will only accept Start and Reset commands from the designated command source.
- The ASA 4.0 Advanced will accept Stop commands from the designated command source, but can be forced to stop by opening the reset input, or by opening the start/stop input during an auto-start/stop cycle.
- The programmable input can be used to override the selected command source (refer to parameter 7A *Input A Function*).

## 7 Parameter list

	Parameter Group	Default Setting
<b>1</b>	<b>Motor Details</b>	
1A	<i>Command Source</i>	Digital Input
1B	<i>Motor Full Load Current</i>	Model dependent
1C	<i>Motor kW</i>	0 kW
1D	<i>Locked Rotor Time</i>	00:10 (mm:ss)
1E	<i>Locked Rotor Current</i>	600%
1F	<i>Motor Service Factor</i>	105%
1G	<i>Reserved</i>	
<b>2</b>	<b>Motor Start/Stop</b>	
2A	<i>Start Mode</i>	Constant Current
2B	<i>Start Ramp Time</i>	00:10 (mm:ss)
2C	<i>Initial Current</i>	200%
2D	<i>Current Limit</i>	350%
2E	<i>Adaptive Start Profile</i>	Constant Acceleration
2F	<i>Kickstart Time</i>	000 ms
2G	<i>Kickstart Level</i>	500%
2H	<i>Jog Torque</i>	50%
2I	<i>Stop Mode</i>	TVR Soft Stop
2J	<i>Stop Time</i>	00:00 (mm:ss)
2K	<i>Adaptive Stop Profile</i>	Constant Deceleration
2L	<i>Adaptive Control Gain</i>	75%
2M	<i>Multi Pump</i>	Single Pump

Parameter list

	<b>Parameter Group</b>	<b>Default Setting</b>
2N	<i>Start Delay</i>	00:00 (mm:ss)
2O	<i>DC Brake Torque</i>	20%
2P	<i>DC Brake Time</i>	00:01 (mm:ss)
2Q	<i>Brake Current Limit</i>	250%
2R	<i>Soft Brake Delay</i>	400 ms
<b>3</b>	<b>Motor Start/Stop 2</b>	
3A	<i>Motor Full Load Current-2</i>	Model dependent
3B	<i>Motor kW-2</i>	0 kW
3C	<i>Start Mode-2</i>	Constant Current
3D	<i>Start Ramp Time-2</i>	00:10 (mm:ss)
3E	<i>Initial Current-2</i>	200%
3F	<i>Current Limit-2</i>	350%
3G	<i>Adaptive Start Profile-2</i>	Constant Acceleration
3H	<i>Kickstart Time-2</i>	000 ms
3I	<i>Kickstart Level-2</i>	500%
3J	<i>Jog Torque-2</i>	50%
3K	<i>Stop Mode-2</i>	TVR Soft Stop
3L	<i>Stop Time-2</i>	00:00 (mm:ss)
3M	<i>Adaptive Stop Profile-2</i>	Constant Deceleration
3N	<i>Adaptive Control Gain-2</i>	75%
3O	<i>Multi Pump-2</i>	Single Pump
3P	<i>Start Delay-2</i>	00:00 (mm:ss)
3Q	<i>DC Brake Torque-2</i>	20%
3R	<i>DC Brake Time-2</i>	00:01 (mm:ss)
3S	<i>Brake Current Limit-2</i>	250%
3T	<i>Soft Brake Delay-2</i>	400 ms
<b>4</b>	<b>Auto-Start/Stop</b>	
4A	<i>Auto-Start/Stop Mode</i>	Disable
4B	<i>Run Time</i>	00:00 (hh:mm)
4C	<i>Stopped Time</i>	00:00 (hh:mm)
4D	<i>Sunday Mode</i>	Start/Stop Disable
4E	<i>Sunday Start Time</i>	00:00 (hh:mm)
4F	<i>Sunday Stop Time</i>	00:00 (hh:mm)
4G	<i>Monday Mode</i>	Start/Stop Disable
4H	<i>Monday Start Time</i>	00:00 (hh:mm)
4I	<i>Monday Stop Time</i>	00:00 (hh:mm)
4J	<i>Tuesday Mode</i>	Start/Stop Disable
4K	<i>Tuesday Start Time</i>	00:00 (hh:mm)
4L	<i>Tuesday Stop Time</i>	00:00 (hh:mm)
4M	<i>Wednesday Mode</i>	Start/Stop Disable
4N	<i>Wednesday Start Time</i>	00:00 (hh:mm)
4O	<i>Wednesday Stop Time</i>	00:00 (hh:mm)
4P	<i>Thursday Mode</i>	Start/Stop Disable



	<b>Parameter Group</b>	<b>Default Setting</b>
4Q	<i>Thursday Start Time</i>	00:00 (hh:mm)
4R	<i>Thursday Stop Time</i>	00:00 (hh:mm)
4S	<i>Friday Mode</i>	Start/Stop Disable
4T	<i>Friday Start Time</i>	00:00 (hh:mm)
4U	<i>Friday Stop Time</i>	00:00 (hh:mm)
4V	<i>Saturday Mode</i>	Start/Stop Disable
4W	<i>Saturday Start Time</i>	00:00 (hh:mm)
4X	<i>Saturday Stop Time</i>	00:00 (hh:mm)
<b>5</b>	<b>Protection Levels</b>	
5A	<i>Current Imbalance</i>	30%
5B	<i>Current Imbalance Delay</i>	00:03 (mm:ss)
5C	<i>Undercurrent</i>	20%
5D	<i>Undercurrent Delay</i>	00:05 (mm:ss)
5E	<i>Overcurrent</i>	400%
5F	<i>Overcurrent Delay</i>	00:00 (mm:ss)
5G	<i>Undervoltage</i>	350 V
5H	<i>Undervoltage Delay</i>	00:01 (mm:ss)
5I	<i>Overvoltage</i>	500 V
5J	<i>Overvoltage Delay</i>	00:01 (mm:ss)
5K	<i>Underpower</i>	10%
5L	<i>Underpower Delay</i>	00:01 (mm:ss)
5M	<i>Overpower</i>	150%
5N	<i>Overpower Delay</i>	00:01 (mm:ss)
5O	<i>Excess Start Time</i>	00:20 (mm:ss)
5P	<i>Restart Delay</i>	00:10 (mm:ss)
5Q	<i>Starts per Hour</i>	0
5R	<i>Phase Sequence</i>	Any Sequence
<b>6</b>	<b>Protection Actions</b>	
6A	<i>Auto-Reset Count</i>	0
6B	<i>Auto-Reset Delay</i>	00:05 (mm:ss)
6C	<i>Current Imbalance</i>	Soft Trip and Log
6D	<i>Undercurrent</i>	Soft Trip and Log
6E	<i>Overcurrent</i>	Soft Trip and Log
6F	<i>Undervoltage</i>	Soft Trip and Log
6G	<i>Overvoltage</i>	Soft Trip and Log
6H	<i>Underpower</i>	Log Only
6I	<i>Overpower</i>	Log Only
6J	<i>Excess Start Time</i>	Soft Trip and Log
6K	<i>Input A Trip</i>	Soft Trip and Log
6L	<i>Input B Trip</i>	Soft Trip and Log
6M	<i>Network Communications</i>	Soft Trip and Log
6N	<i>Remote Keypad Fault</i>	Soft Trip and Log
6O	<i>Frequency</i>	Soft Trip and Log

Parameter list

	<b>Parameter Group</b>	<b>Default Setting</b>
6P	<i>Phase Sequence</i>	Soft Trip and Log
6Q	<i>Motor Overtemperature</i>	Soft Trip and Log
6R	<i>Motor Thermistor Circuit</i>	Soft Trip and Log
6S	<i>Shorted SCR Action</i>	3-Phase Control Only
6T	<i>Battery/Clock</i>	Soft Trip and Log
<b>7</b>	<b>Inputs</b>	
7A	<i>Input A Function</i>	Input Trip (N/O)
7B	<i>Input A Trip</i>	Operating Only
7C	<i>Input A Trip Delay</i>	00:00 (mm:ss)
7D	<i>Input A Initial Delay</i>	00:00 (mm:ss)
7E	<i>Input B Function</i>	Input Trip (N/O)
7F	<i>Input B Trip</i>	Operating Only
7G	<i>Input B Trip Delay</i>	00:00 (mm:ss)
7H	<i>Input B Initial Delay</i>	00:00 (mm:ss)
7I	<i>Reset/Enable Logic</i>	Normally Closed (N/C)
7J	<i>Input A Name</i>	Input A Trip
7K	<i>Input B Name</i>	Input B Trip
<b>8</b>	<b>Relay Outputs</b>	
8A	<i>Relay A Function</i>	Run
8B	<i>Relay A On Delay</i>	00:00 (mm:ss)
8C	<i>Relay A Off Delay</i>	00:00 (mm:ss)
8D	<i>Relay B Function</i>	Run
8E	<i>Relay B On Delay</i>	00:00 (mm:ss)
8F	<i>Relay B Off Delay</i>	00:00 (mm:ss)
8G	<i>Low Current Flag</i>	50%
8H	<i>High Current Flag</i>	100%
8I	<i>Motor Temperature Flag</i>	80%
8J	<i>Main Contactor Time</i>	400 ms
<b>9</b>	<b>Analog Output</b>	
9A	<i>Analog Output A</i>	Current (% FLC)
9B	<i>Analog A Scale</i>	4-20 mA
9C	<i>Analog A Maximum Adjustment</i>	100%
9D	<i>Analog A Minimum Adjustment</i>	000%
<b>10</b>	<b>Display</b>	
10A	<i>Language</i>	English
10B	<i>Temperature Scale</i>	Celsius
10C	<i>Graph Timebase</i>	30 seconds
10D	<i>Graph Maximum Adjustment</i>	400%
10E	<i>Graph Minimum Adjustment</i>	0%
10F	<i>Current Calibration</i>	100%
10G	<i>Adjustment Lock</i>	Read & Write
10H	<i>User Parameter 1</i>	Current
10I	<i>User Parameter 2</i>	Motor Voltage

<b>Parameter Group</b>		<b>Default Setting</b>
10J	<i>User Parameter 3</i>	Mains Frequency
10K	<i>User Parameter 4</i>	Motor pf
10L	<i>User Parameter 5</i>	Motor Power
10M	<i>User Parameter 6</i>	Motor Temperature (%)
<b>11</b>	<b>Pump Clean</b>	
11A	<i>Reverse Torque</i>	20%
11B	<i>Reverse Time</i>	00:10 (mm:ss)
11C	<i>Forward Current Limit</i>	100%
11D	<i>Forward Time</i>	00:10 (mm:ss)
11E	<i>Pump Stop Mode</i>	Coast To Stop
11F	<i>Pump Stop Time</i>	00:10 (mm:ss)
11G	<i>Pump Clean Cycles</i>	1
<b>12</b>	<b>Communications Card</b>	
12A	<i>Modbus Address</i>	1
12B	<i>Modbus Baud Rate</i>	9600
12C	<i>Modbus Parity</i>	None
12D	<i>Modbus Timeout</i>	Off
12E	<i>Devicenet Address</i>	0
12F	<i>Devicenet Baud Rate</i>	125kB
12G	<i>Profibus Address</i>	1
12H	<i>Gateway Address</i>	192
12I	<i>Gateway Address 2</i>	168
12J	<i>Gateway Address 3</i>	0
12K	<i>Gateway Address 4</i>	100
12L	<i>IP Address</i>	192
12M	<i>IP Address 2</i>	168
12N	<i>IP Address 3</i>	0
12O	<i>IP Address 4</i>	2
12P	<i>Subnet Mask</i>	255
12Q	<i>Subnet Mask 2</i>	255
12R	<i>Subnet Mask 3</i>	255
12S	<i>Subnet Mask 4</i>	0
12T	<i>DHCP</i>	Disable
12U	<i>Location ID</i>	0
<b>20</b>	<b>Advanced</b>	
20A	<i>Tracking Gain</i>	50%
20B	<i>Pedestal Detect</i>	80%
20C	<i>Bypass Contactor Delay</i>	100 ms
20D	<i>Model Rating</i>	Model dependent
20E	<i>Screen Timeout</i>	1 minute
20F	<i>Motor Connection</i>	Auto-detect
20G	<i>External Bypass</i>	Disable
20H	<i>Shunt Trip Mode</i>	Disable

Parameter list

	<b>Parameter Group</b>	<b>Default Setting</b>
<b>30</b>	<b>Pump Input Configuration</b>	
30A	<i>Pressure Sensor Type</i>	None
30B	<i>Pressure Units</i>	kPa
30C	<i>Pressure at 4 mA</i>	0
30D	<i>Pressure at 20 mA</i>	0
30E	<i>Flow Sensor Type</i>	None
30F	<i>Flow Units</i>	litres/second
30G	<i>Flow at 4 mA</i>	0
30H	<i>Flow at 20 mA</i>	0
30I	<i>Units per Minute at Max Flow</i>	0
30J	<i>Pulses per Minute at Max Flow</i>	0
30K	<i>Units per Pulse</i>	0
30L	<i>Depth Sensor Type</i>	None
30M	<i>Depth Units</i>	metres
30N	<i>Depth at 4 mA</i>	0
30O	<i>Depth at 20 mA</i>	0
<b>31</b>	<b>Flow Protection</b>	
31A	<i>High Flow Trip Level</i>	10
31B	<i>Low Flow Trip Level</i>	5
31C	<i>Flow Start Delay</i>	00:00:500 (mm:ss:ms)
31D	<i>Flow Response Delay</i>	00:00:500 (mm:ss:ms)
<b>32</b>	<b>Pressure Protection</b>	
32A	<i>High Pressure Trip Level</i>	10
32B	<i>High Pressure Start Delay</i>	00:00:500 (mm:ss:ms)
32C	<i>High Pressure Response Delay</i>	00:00:500 (mm:ss:ms)
32D	<i>Low Pressure Trip Level</i>	5
32E	<i>Low Pressure Start Delay</i>	00:00:500 (mm:ss:ms)
32F	<i>Low Pressure Response Delay</i>	00:00:500 (mm:ss:ms)
<b>33</b>	<b>Pressure Control</b>	
33A	<i>Pressure Control Mode</i>	Off
33B	<i>Start Pressure Level</i>	5
33C	<i>Start Response Delay</i>	00:00:500 (mm:ss:ms)
33D	<i>Stop Pressure Level</i>	10
33E	<i>Stop Response Delay</i>	00:00:500 (mm:ss:ms)
<b>34</b>	<b>Depth Protection</b>	
34A	<i>Depth Trip Level</i>	5
34B	<i>Depth Reset Level</i>	10
34C	<i>Depth Start Delay</i>	00:00:500 (mm:ss:ms)
34D	<i>Depth Response Delay</i>	00:00:500 (mm:ss:ms)
<b>35</b>	<b>Thermal Protection</b>	
35A	<i>Temperature Sensor Type</i>	None
35B	<i>Temperature Trip Level</i>	40

	Parameter Group	Default Setting
<b>36</b>	<b>Pump Trip Action</b>	
36A	<i>Pressure Sensor</i>	Soft Trip and Log
36B	<i>Flow Sensor</i>	Soft Trip and Log
36C	<i>Depth Sensor</i>	Soft Trip and Log
36D	<i>High Pressure</i>	Soft Trip and Log
36E	<i>Low Pressure</i>	Soft Trip and Log
36F	<i>High Flow</i>	Soft Trip and Log
36G	<i>Low Flow</i>	Soft Trip and Log
36H	<i>Flow Switch</i>	Soft Trip and Log
36I	<i>Well Depth</i>	Soft Trip and Log
36J	<i>RTD/PT100 B</i>	Soft Trip and Log
<b>40</b>	<b>Ground Fault</b>	
40A	<i>Ground Fault Level</i>	0 A
40B	<i>Ground Fault Delay</i>	00:01 (mm:ss)
40C	<i>Ground Fault Trip Active</i>	Operating Only
40D	<i>Ground Fault Action</i>	Soft Trip and Log
40E	<i>Ground Fault CT Ratio</i>	2000:1

## 8 Specifications

### 8.1 General Technical Data

- **Supply**

Mains voltage (L1, L2, L3)

ASA4.0-A xxxxX/5/xx ..... 200~525 VAC (± 10%)

ASA4.0-A xxxxX/7/xx ..... 380~690 VAC (± 10%)

Control voltage (A1, A2, A3)

ASA4.0-A xxxxX/x/12 (A1, A2) ..... 110~120 VAC (+10%/-15%), 600 mA

ASA4.0-A xxxxX/x/12 (A2, A3) ..... 220~240 VAC (+10%/-15%), 600 mA

ASA4.0-A xxxxX/x/14 (A1, A2) ..... 24 VAC/VDC (± 20%), 2.8 A

Mains frequency ..... 50 Hz~60 Hz (±5 Hz)

Rated insulation voltage ..... 690 VAC

Rated impulse withstand voltage ..... 6 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

- **Electromagnetic capability (compliant with EU Directive 2014/35/EU)**

EMC Immunity ..... IEC 60947-4-2

EMC Emissions ..... IEC 60947-4-2 Class B

- **Inputs**

Input rating ..... Active 24 VDC, 8 mA approx

Motor thermistor (B4, B5) ..... Trip >3.6 kΩ, reset <1.6 kΩ

- **Outputs**

Relay outputs ..... 10 A @ 250 VAC resistive, 5A @ 250 VAC AC15 pf 0.3

Main contactor (33, 34) ..... Normally open

## Specifications

Bypass contactor (03, 04)	Normally open
Relay output A (41, 42, 44)	Changeover
Relay output B (53, 54)	Normally open
Analog output (21, 22)	
Maximum load	600 $\Omega$ (12 VDC @ 20 mA)
Accuracy	$\pm 5\%$

### • Environmental

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

### Protection

ASA4.0-A 0024B~ASA4.0-A 0135B	IP20
ASA4.0-A 0184B~ASA4.0-A 1250B	IP00
ASA4.0-A 0735C~ASA4.0-A 1220C	IP00

### • Heat dissipation

During Start	4.5 watts per ampere
During Run (Bypassed)	
ASA4.0-A 0024B~ASA4.0-A 0052B	$\leq 35$ watts approx
ASA4.0-A 0064B~ASA4.0-A 0135B	$\leq 50$ watts approx
ASA4.0-A 0184B~ASA4.0-A 0250B	$\leq 120$ watts approx
ASA4.0-A 0352B~ASA4.0-A 0580B	$\leq 140$ watts approx
ASA4.0-A 0835B~ASA4.0-A 1250B	$\leq 180$ watts approx
During Run (Non-bypassed)	
ASA4.0-A 0735C~ASA4.0-A 1220C	4.5 watts per ampere

### • Motor overload protection

Default: The default settings of parameters 1D, 1E and 1F provide Motor Overload Protection: Class 10, Trip Current 105% of FLA (full load amperage) or equivalent.

### • Operational life (internal bypass contacts)

.....	100 000 operations
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### • Certification

CE	EN 60947-4-2
C-UL	CAN/CSA-C22.2 N° 60947-1-13, CAN/CSA-C22.2 N° 60947-4-2-14
UL	UL 60947-4-2
ASA4.0-A 0024B~ASA4.0-A 1250B	UL Listed
ASA4.0-A 0735C~ASA4.0-A 1220C	UL Listed

## 8.2 Disposal instructions



Equipment containing electrical components may not be disposed of together with domestic waste.

It must be collected separately as electrical and electronic waste according to local and currently valid legislation.