

ERSSW06

MODEL

- Built-in by-pass
- Electronic motor protection
- Limits current inrush
- Limits line voltage drop
- International voltages (220 to 575V ac)
- Simplified electrical wiring
- Oriented Start-up
- 32 bits microprocessor
- Ambient temperature up to 55°C without derating

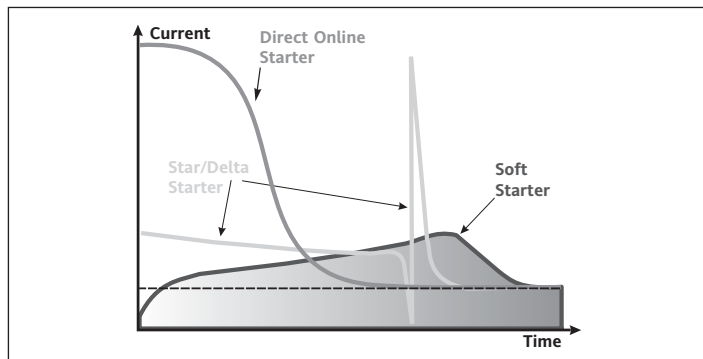


Soft-Starter Specification Sheet

ERSSW06 Series Soft-Starters are static starters, designed for the acceleration, deceleration and protection of three phase induction motors. The voltage control applied to the motor, by means of thyristor firing angle variation, allows smooth starting and stopping.

With proper variable adjustment it is possible to optimise the motor starting torque so that the starting current is as low as possible. Soft-Starters, microprocessor based and totally digital, are products with state-of-the-art technology and are produced to ensure the highest performance in the starting and stopping of induction motors, presenting themselves as a complete and low-cost solution.

The man-machine interface permits easy parameter adjustment, making easier start-up and operation. The incorporated "Pump Control" feature avoids pipeline water hammer.



Starting Methods Comparison

Main Applications

- Centrifugal Pumps/Alternative Pumps (Wastewater/Irrigation/Oil)
- Fans/Exhausts/Blowers
- Air Compressors/HVAC
- Mixers/Aerators
- Centrifuges
- Crushers/Grinders
- Wood Chippers
- Paper Refiners
- Rotating Kilns
- Saws and Planers (Wood)
- Ball Mills/Hammer Mills
- Load Transportation:
 - Conveyors/Belts/Chains – Roller Tables – Monorails
 - Escalators – Baggage Conveyors (Airports) – Bottling Line

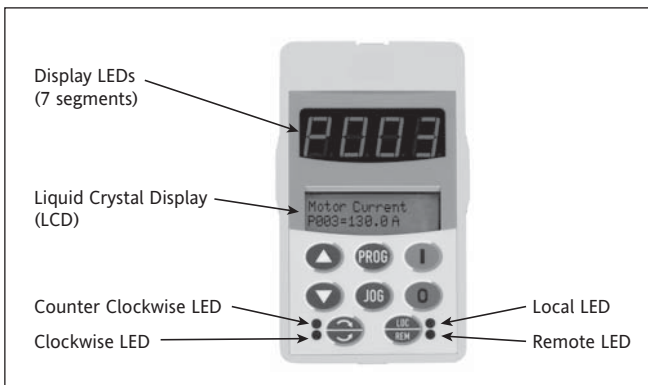


Features

- Incorporated electronic thermal relay
- Detachable human-machine interface with double display (LED/LCD)
- Kick-start function for heavy duty and functional loads with high starting torque
- Pump Control function for intelligent pumping systems
- Avoids pipeline water hammer
- Switched mode power supply with RFI filter (90 to 250V ac)
- Incorporated by-pass contactor (85 to 365A) reduces installation size and increases energy savings
- Thermal image back-up - i x t values
- Protection through voltage and current unbalance
- Over/under voltage and over/under current protection
- Motor PTC thermistor input

- Eliminates mechanical shock
- Stress reduction on couplings and other transmission devices (Gear Boxes, Sheaves, Belts, etc)
- Increases motor and mechanical parts life
- Multi-motor starting possibility (parallel or cascade)
- Easy operation, programming and troubleshooting through man-machine interface
- Possibility of 3 cables connection or 6 cables - inside Delta connection
- Surface Mounted Devices (SMD)
- Complying with International Standards: UL, cUL, CE, IRAM and C-Tick

Human-Machine Interface



Intelligent Interface

Double display, intelligent interface with LEDs (7 segments) and LCD (2 lines and 16 characters), that provide excellent long distance visualisation. The alphanumeric LCD display incorporates a detailed description of all the parameters and messages.

Select the Language

The intelligent operation interface also gives the user of the product a choice, for his/her convenience, of programming language; reading and presentation of the parameters, and alphanumeric messages through the LCD display.

The advanced hardware and software capacity of the product gives the user various language options, for ease of use: Portuguese, English, German and Spanish.

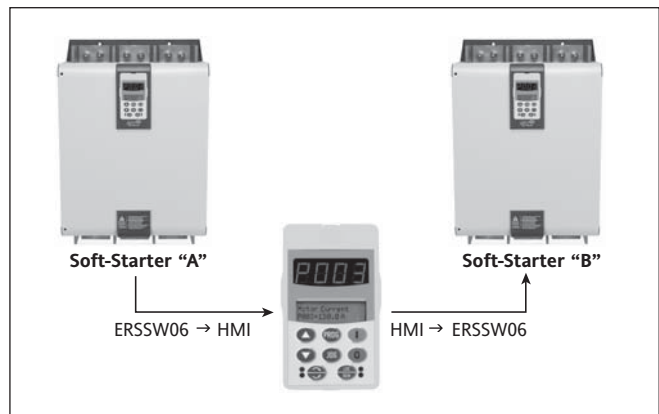
Remote Human-Machine Interface

for remote installation on panel door or machine console.











COPY Function

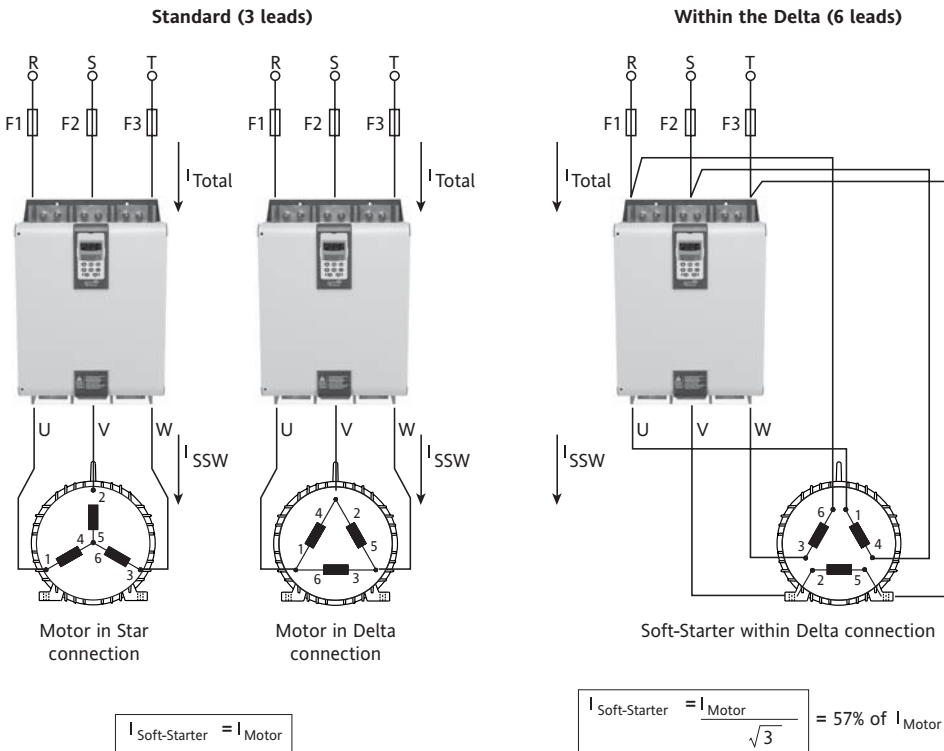
The Intelligent interface also incorporates the "Copy" function, that enables copying of parameters from one Soft-Starter to another, providing faster programming speed and reliability in applications for continuous manufacturing machines.



Keypad Functions

-  Starts the Soft-Starter
-  Stops the Soft-Starter
Errors reset in the Soft-Starter
-  Increases the parameter number or its content
-  Decreases the parameter number or its content
-  Switches the display between the parameter number and its content (position/content) for programming
-  While pressed the motor is run at JOG speed
-  FWD/REV key. When pressed reverses the direction of rotation with auxiliary of external contactors
-  Selects the soft starter operating mode defining the commands and references as Local or Remote

Connection Options (Soft-Starter — Motor)



Motor	6 Cable Connection
220/380V	220V
380/660V	380V
400/690V	400V
415V	415V
440/760V	440V
525V	525V
575V	575V
220/380/440/760V	220/440V

IMPORTANT:

- 1 In the standard start-up (3 leads) the motor can be connected either in Star or Delta.
- 2 For the same motor power, in the connection type within the delta of the motor (6 leads), the Soft-Starter is 43% smaller than the one necessary in a standard connection (3 leads). With the Soft-Starter within the delta of the motor, one can start a motor with a power 73% greater than in the standard connection (3 leads).
- 3 For the start-up type within the delta of the motor (6 leads), the supply transformer should have the secondary connected in star and grounded.

Accessories and Peripherals

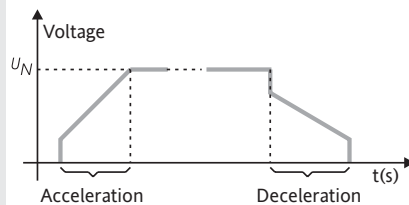
Interconnection cables for remote interface CAB-HMI-SSW06-X

Cable length (X):
1; 2; 3; 5; 7.5m.
Special cables with larger sizes on request



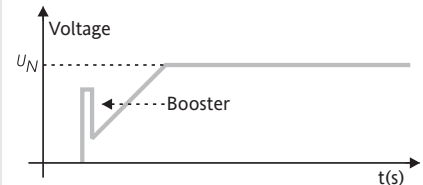
Main Functions

Ramps



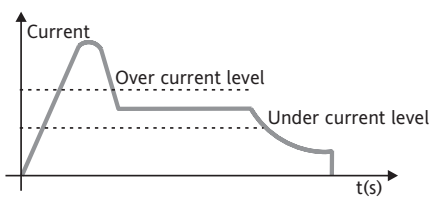
Allows smooth acceleration and deceleration. In the acceleration a pedestal voltage can be adjusted. In the deceleration a step down voltage can be adjusted. Deceleration ramp avoids pump water hammer.

Kick-Start



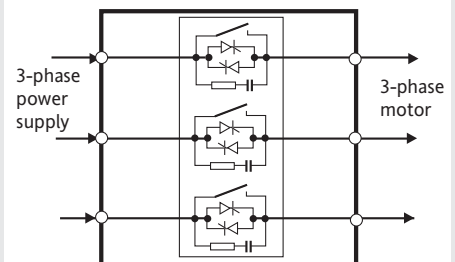
Initial voltage pulse which generates a torque peak necessary to start high break-away torque loads.

Under/Over Current Protection



Adjustable maximum and minimum current levels for complete motor protection. Undercurrent protection is ideal to protect pumps running at no load.

Built-in By Pass



Built-in By-pass minimises the power losses and heat dissipation at the thyristors, providing space reduction and energy saving.

TABLE OF SPECIFICATION

Line Voltage	Soft-Starter ERSSW06			Voltage (V)	Maximum Motor				Size
	Model (electronic: 90-250V ac)	I nominal (A)			3-wires connection (3 cables)		Inside Delta Connection (6 cables)		
		Ta=0-45°C	Ta=0-55°C		Ta=0-55°C		Ta=0-55°C		
					HP	kW	HP	kW	
220/230/240/380/400/415/440/460/480/525/575V	ERSSW06.85	85	85	230	30	22	50	37	2
	ERSSW06.130	130	130		50	37	75	55	2
	ERSSW06.170	170	170		60	45	100	75	3
	ERSSW06.205	205	205		75	55	125	90	3
	ERSSW06.255	255	255		100	75	150	110	4
	ERSSW06.312	312	312		125	90	200	150	4
	ERSSW06.365	365	365		150	110	250	185	4
	ERSSW06.85	85	85	400	50	37	75	55	2
	ERSSW06.130	130	130		75	55	125	90	2
	ERSSW06.170	170	170		125	90	200	150	3
	ERSSW06.205	205	205		150	110	250	185	3
	ERSSW06.255	255	255		175	130	300	220	4
	ERSSW06.312	312	312		200	150	350	260	4
	ERSSW06.365	365	365		250	185	400	300	4
	ERSSW06.85	85	85	525	75	55	125	90	2
	ERSSW06.130	130	130		125	90	200	150	2
	ERSSW06.170	170	170		150	110	300	220	3
	ERSSW06.205	205	205		175	130	350	260	3
	ERSSW06.255	255	255		250	185	400	300	4
	ERSSW06.312	312	312		270	200	500	370	4
	ERSSW06.365	365	365		350	260	600	450	4
	ERSSW06.85	85	85	575	75	55	150	110	2
	ERSSW06.130	130	130		125	90	200	150	2
	ERSSW06.170	170	170		150	110	300	220	3
	ERSSW06.205	205	205		200	150	350	260	3
	ERSSW06.255	255	255		250	185	450	330	4
	ERSSW06.312	312	312		300	220	550	400	4
	ERSSW06.365	365	365		350	260	650	475	4

Models



TECHNICAL SPECIFICATION

Power Supply

Voltage	220/230/240/380/400/415/440/460/ 480/525/575V (+10 %, -15%)
Frequency	50/60 Hz (±10%)
Electronic	Switched mode power supply with RFI filter (90-250V ac)/Fan 110 or 220V only for frame size 4

Enclosure

Metallic cabinet	IP 00
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Control

Method	Motor voltage variation (three-phase induction motor)
Power supply	Switched mode
CPU	32 bits RISC Microprocessor

Starting Duty Cycle (10starts/Hour)

Normal	300% (3 x Inom.) during 30s
Heavy	450% (4.5 x Inom.) during 30s with 33% rated current reduction

Inputs

Digital	6 programmable isolated inputs 24V dc
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Outputs

Relay	3 programmable outputs 250V ac/2A: (02 x NO) + (01 x NO + NC - Fault indication)
Analogues	1 programmable output (14 bits) 0-10V dc 1 programmable output (14 bits) 0-20mA or 4-20mA

Safety

Protections	Over voltage Under voltage Output over current (motor) Immediate over current at motor output Motor overload – i ² t Thyristors over temperature/ Heat sink Phase sequence External Fault	Phase loss power supply Motor phase loss Thyristor fault CPU Error (Watchdog) Programming error Serial communication error Self diagnose error HMI-ERSSW06-LCD communication error Open by-pass contact Overcurrent before the By-pass Immediate by-pass overcurrent
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Functions/Resources

Standards	Built-in operator interface detachable with double display LED + LCD (HMI-SSW06-LCD) Programming enabling password LCD display Language selection: Portuguese, English, Spanish and German Local/Remote operation selection Fault self-diagnosis PUMP CONTROL function (Water hammer protection for pumps) COPY function (Soft-Starter → HMI or HMI → Soft-Starter) Soft starter integrated by-pass contactor (Models 85 to 365A) Serial Interface RS-232 Motor PTC thermistor input
Programmable line voltage	220-575V ac
Prog initial (pedestal) voltage	25-90% of line voltage
Prog acceleration ramp	1-299 s
Prog deceleration ramp	OFF, 2-299 s
Prog step down voltage for deceleration	100-40% of nominal voltage
Prog starting current limit	OFF, 150-500% of motor rated current
Prog immediate overcurrent	0-99% of motor rated current
Prog immediate overcurrent time	OFF, 0-99 s
Prog immediate undercurrent	0-99% of motor rated current
Prog immediate undercurrent time	OFF, 1-99 s
Prog starting torque boost in voltage or current (KICK-START)	Level: 30-50% of line voltage Level: 300-700% of soft starter rated current Duration: 1-10 s
Prog fault auto-reset	OFF, 1-600 s
Prog motor thermal memory	
Prog auto-reset	OFF, 1-600 s

Motor thermal overload protection class	0 (inactive); 5; 10; 15; 20; 25; 30; 35; 40; 45
motor service factor	0 (inactive); 0.8-1.50
Optionals	Cable for keypad remote connection (1; 2; 3; 5 and 7.5m) Serial interface RS485
Additional	CAB-HMI SSW06-X CSI-2

Operating Interface (HMI-SSW06-LCD)

Command	Start/Stop, Reset and Programming Increment and decrement parameters and its content
Display readings	Output current (Soft-Starter) - (% of soft starter rated current) Output current (Motor) - (Amps) Output current (Motor) - (% of motor rated current) Line frequency (0-99.9Hz) Line Voltage(0-999V ac) Soft starter output voltage - (0 - 999V ac) Load active power – (kW) Load apparent power – (kVA) Soft starter status Digital and analogue I/Os status Load Cos (φ) – (0.00-0.99) Energised time Enabled time Four last faults back-up Soft starter firmware version Motor thermal protection – (0-250) Current indication in each phase R-S-T Line voltage indication R-S/S-T/T-R

Ambient Conditions

Temperature	0-55°C (Models from 85-365A) standard operation at rated current
Humidity	20-90%, non condensing
Altitude current	0-1000m: standard operation at rated 1000-4000m: with output current reduction of 1%/100m, above 1000m

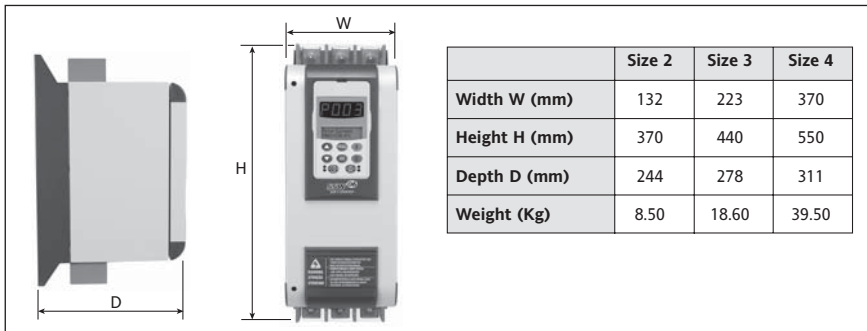
Finishing

Colour	Cover: Opaque Gray Cabinet: Opaque Blue
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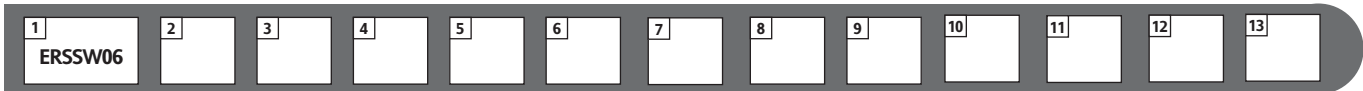
Conformities/Standards

Safety	UL 508 Standard – Industrial Control
Equipment	
Low Voltage	EN 60947-4-2 Standard; LVD 73/23/EEC – Low Voltage Directive
EMC	EMC directive 89/336/EEC – Industrial Environment
UL (USA) / cUL (Canada)	Underwriters Laboratories Inc. – USA (Pending)
CE (Europe)	Phoenix Test-Lab / Alemanha (Pending)
IRAM (Argentina)	Instituto Argentino de Normalización (Pending)
C-Tick (Australia)	Australian Communications Authority (Pending)

DIMENSIONS



ORDER CODE



1	2	3	4	5	6	7	8	9	10	11	12	13
ERSSW06												
1 Basic Product	2 Rated Output Current		4 Supply Voltage		5 Manual Language		7 Degree of Protection		10 Fieldbus Communication Cards		11 Special Hardware	
ERSSW06 Soft-Starter Line ERSSW06	0085 85A 0130 130A 0170 170A 0205 205A 0255 255A 0312 312A 0365 365A		2257 220-575V ac 220/230/240/380/400/415/ 440/460/480/525/575V		P Portuguese E English S Spanish		Blank Standard (see Technical Data Table) SI Without HMI		Blank Standard (no extra card) PD Optional KFB - PD card (Profibus DP) DVN Optional KFB - DN card (DeviceNet)		Blank Standard	
3 Power Supply	6 Product Version		8 Human Machine Interface (HMI)		9 Expansion Cards		12 Special Software		13 End of Code			
T Three phase	S Standard O With options		Blank Standard (with HMI LEDs +LCD) SI Without HMI		Blank Standard A1 Optional CSI-2 (RS485)		Blank Standard		Blank Standard		Z Digit indicating code end	

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