

Soft Starters and Motor Controller






Functions

- ✓ Soft start
- ✓ Soft stop
- ⚡ Phase imbalance or phase loss
- 🔥 Overtemperature
- (R) Phase sequence

- Lower maintenance cost.
- No pressure surge when using pumps and compressors. Reduces hammering.
- Less current and voltage drop during start up. Allows for reduced power supply contracts.
- Mechanical dimensioning can be optimised.
- Simplified automation.
- Assembly, setting, installation, commissioning and maintenance are made easy by the compact design.
- Reduces start and stop torque, eliminating mechanical problems.
- Additional cooling is not necessary thanks to the bypass built-in relay.
- Substitutes the conventional contactors: one for direct start-up and three for star-delta start-up.

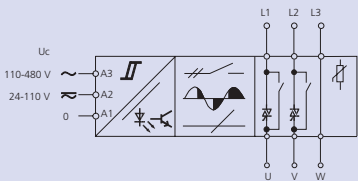
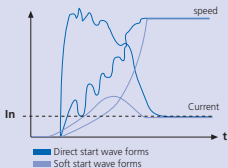
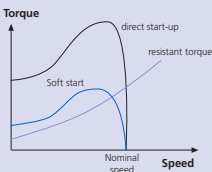
ES



Functions							  	
Models			ES 400-3	ES 400-12	ES 400-25		ES 400-45	
Nominal voltage	50/60 Hz	V±15%	400		400		400	
Maximum current	A		3	12	25		45	
Motor power	kW		1,1	5,5	11		22	
	HP		1,5	7,5	15		30	
Code no.			41803	41812	41825		41845	

Characteristics		
Control voltage (±15%)	A1-A2 = 24-100 Vac,dc / A1-A3 = 110-480 Vac	
Degree of protection	IP20	
Operating temperature	-20°C +50°C	
Standards and approvals	IEC947-4-2 UL, CSA and CE mark	

Indications	ES 400-3	ES 400-12	ES 400-25	ES 400-45
Supply	green	green	green	POWER ON green
Ramps	yellow	yellow	yellow	RAMPING yellow
Bypass relay	yellow	yellow	yellow	BYPASS yellow
Semiconductors overtemperature			red	OVERHEAT flashing red
Motor overtemperature (PTC)				OVERHEAT continuous red
Phase loss				φ LOSS red
Phase sequence				φ WRONG red
Adjustments	ES 400-3	ES 400-12	ES 400-25	ES 400-45
Start torque (% of nominal torque)	0 - 85%		5 - 50%	
Start-up time	0,5 - 5 s		0,5 - 10 s	
Stop time	0,5 - 5 s		0,5 - 20 s	



- For three-phase induction motors of up to 22 kW / 400 V.
- Built in heat dissipater and electro-mechanical bypass relay.
- Substitutes the conventional contactors with a greater operating life. One in direct start-up and three in star-delta start-up.

Operation

These units represent the best protection against the premature ageing of motors and mechanical items.

Sudden starts and stops, that can produce damages in the bearings and gears of the motors, are eliminated.

They prevent frequent faults and objects falling onto conveyer belts.

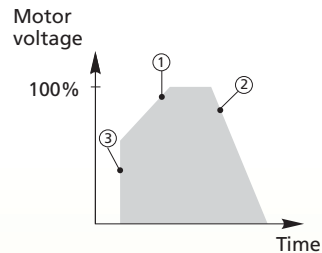
They reduce mechanical impact in motors, axles, gears and belts, significantly prolonging the operating life of the controlled units.

An electronic circuit with semiconductors starts the motor without using the contacts. Hence these do not withstand sparks or erosion.

When the minimal voltage of the motor is reached the semiconductors are bypassed by the relay contacts. Thanks to this technology, the ES starters have a longer operating life than conventional contactors.

They are easy to install and control. They can operate by means of an external control signal, such as a programmable automaton.

Potentiometer setting



- ① Ramp up time: RAMP UP.
 - ② Ramp-down time: RAMP DOWN.
 - ③ Par: INITIAL TORQUE.
- Voltage when ramp-up begins.

Potentiometers ① ② and ③

- Initially set potentiometers ① and ② to maximum.
- Connect the supply and set potentiometer ③ so that the motor begins to rotate as soon as the supply is applied.
- Set the ramp-up and ramp-down times to the desired value.

Mode of Operation

a) Change from on line direct start to soft start:

- 1) Cut off the cable from the motor and insert the ES starter.
- 2) Connect the control input to two of the input lines. Set the potentiometers according to the settings mode.
- 3) Reconnect the power supply.

On connecting C1, the starter performs a soft motor start. On disconnecting C1, the motor stops, the starter resets to zero and after 0.5 seconds a new soft start up may be performed. (fig. 1 and fig. 4)

b) Soft Start / Soft Stop (fig. 2 and fig. 3)

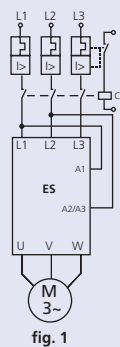
When S1 is closed (connection diagram), the soft motor start is realised according to the potentiometers setting of initial t and % torque.

When S1 is open the soft stop is realised in accordance with the ramp down potentiometer setting.

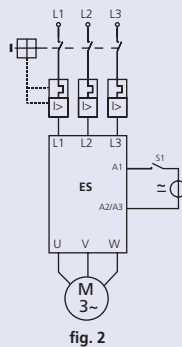
Connection diagram

ES 400-3, 12 and 25

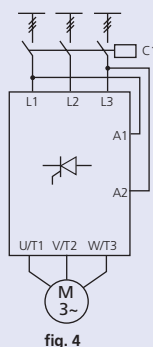
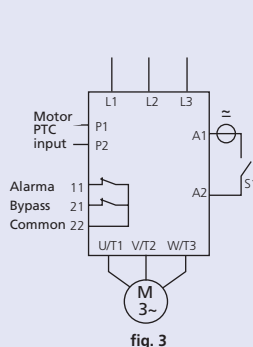
Soft start



Soft start / soft stop



ES 400-45



Applications

For three-phase motors in applications such as:

- Pumps.
- Cold compressors.
- Conveyor belts, lifting devices, etc.
- Mixers.
- Fans, extractor fans and blowers.
- Garage doors and elevators.
- Concrete mixers.
- Palletizer devices, etc.