

DS7 Series soft start controller



Compact design, high functionality for soft starting applications

With a focus on small size and ease of installation, the Eaton DS7 line of reduced-voltage solid-state soft start controllers is designed to meet your needs for reliable and efficient soft starting. Designed to control the acceleration and deceleration of three-phase motors, the DS7 Series is available for current ranges from 4 to 180A.

Soft on the wallet, strong on the torque

The reduced-voltage soft starter has become increasingly established as an alternative to the wye-delta starter. With a focus on compact size and ease of commissioning, the Eaton DS7 line of reduced-voltage solid-state soft start controllers is an ideal choice for safe, dependable soft starting.

With an asymmetrical control method, startup is soft but at a higher torque value than other available solutions. Designed for typical applications such as pumps, fans and small conveyors, the compact DS7 Series is a reliable choice.

Soft starting: the modern alternative to wye-delta starters

The electronic soft starter fulfills the need for an impact-free rise in torque and a significant reduction in maximum current during the start phase.

This helps to prevent/eliminate:

- Impacting of cog edges in the gearbox
- Water hammer in pipe systems
- Slipping of V-belts
- Jitter with conveyor systems

The smallest soft start controller in its performance class, the DS7 Series is the perfect option for upgrading existing systems that may currently be using wye-delta, autotransformers or across-the-line NEMA® and IEC starters. Now you can get the benefits of soft starting without having to change enclosure sizes or to add additional assemblies—saving you time and money.

This algorithm suppresses the formation of an elliptical rotating field, which leads to irregular acceleration of the motor and unnecessarily extends acceleration times. On DS7 Series devices, an asymmetric trigger control is active during the start and stop ramp.



Asymmetrical control: it does not get any softer

An asymmetrical trigger control developed by Eaton (PCT/EP00/12938, 19.12.2000) makes it possible to achieve truly *soft* starts. It avoids DC current components that normally result on a two-phase controlled soft starter.

SmartWire-DT

DS7 with SmartWire-DT interface completely eliminates the need for conventional control wiring. This has several advantages:

- No incorrect wiring
- Faster wiring
- Cost saving

The interface can be used to send control commands to the DS7 SmartWire-DT and change and diagnose its parameter configuration; in addition, the control electronics can be powered via the SmartWire-DT cable.

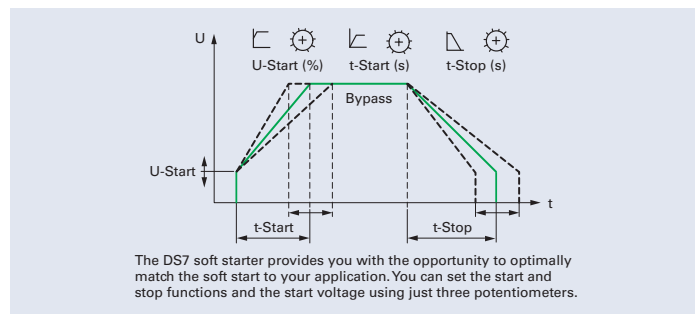
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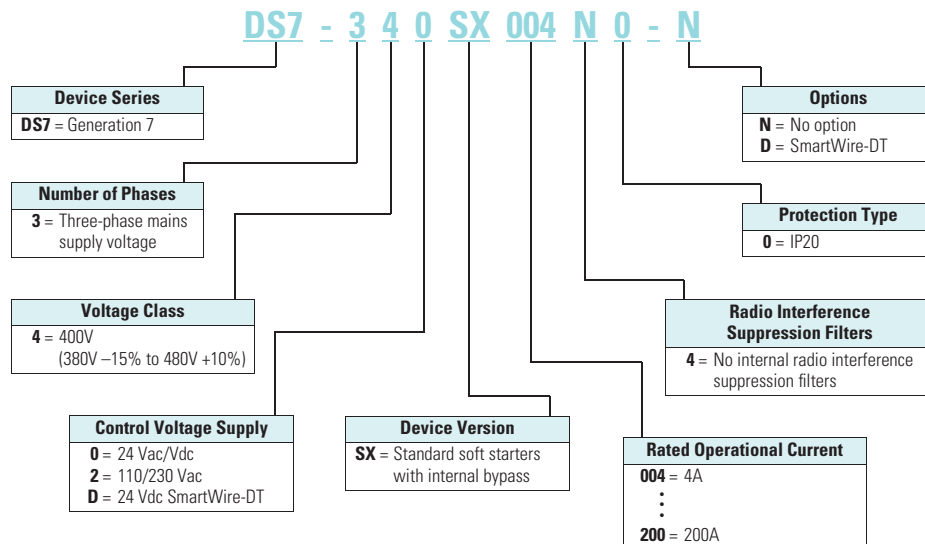
Features and benefits

- Run bypass mode greatly reduces internal heating created by the power dissipation across the SCRs and directly connects the motor to the line, improving system efficiency
- Less heat minimizes enclosure size and cooling requirements, and maximizes the life of all devices in the enclosure
- LED displays device status and provides fault indication
- Variable ramp times and voltage control (torque control) settings provide unlimited starting configurations for flexibility
- Soft stop control suits applications where an abrupt stop of the load is not acceptable; soft acceleration and deceleration reduces wear on belts, gears, chains, clutches, shafts and bearings (refer to the graph and dials on the right)
- Minimizes the peak inrush current stress on the power system; peak starting torque can be managed to diminish mechanical system wear and damage
- 120/230 Vac control voltage; 24 Vac/Vdc control voltage is also available for personnel and equipment safety

- Auxiliary relays indicate status of the soft start controllers; the TOR relay is active until motor stop command is received and/or the soft start controller detects a fault condition, and the RUN relay is active during the start ramp, bypass and stop ramp
- The simple addition of an overload relay—the Eaton C440, XTOB or XTOE—gives the DS7 soft start controller overload protection, while limited control wiring makes installation quick and easy
- Seamless integration with Eaton manual motor protectors (MMP) (4–32A) (see large image to the right) giving the DS7 Series overload and line interruption capability
- Installation of the optional cooling fan for DS7 (4–32A only) increases the thermal operating range of the unit, even when an MMP is attached. Installation is quick and simple while bringing additional cooling to the SCRs to enhance service life and reliability (refer to the two pictures on the right)
- The DS7 Series has enhanced protection capability that includes detecting improper mains connection, improper motor connection, SCR fault, heat sink / under temperature, bypass engagement faults, over temperature warning and more
- All DS7 frame sizes can be configured for single-phase operation at 200–480 Vac main voltages



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Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

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