

High performance, efficient and reliable static soft starters

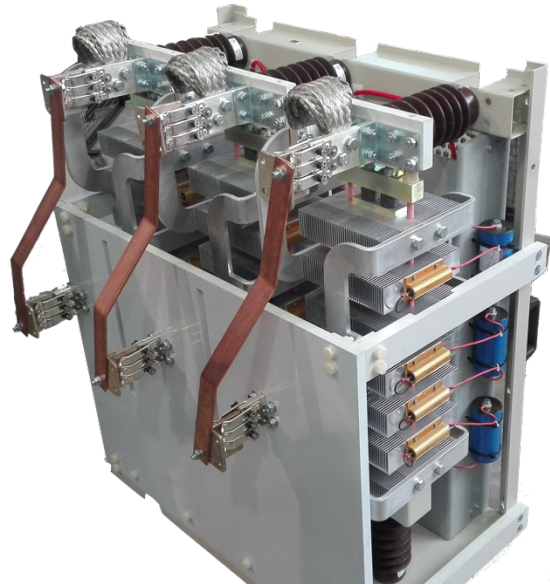
CESINEL ARES range of medium voltage soft-starters is designed to smoothly start and stop three-phase induction AC motors in fixed speed applications. Additionally, it provides a complete set of motor-protection functions. ARES soft-starters are design for excellent performance and reliability regardless of power condition, load condition, and the extremity of its environment.

Rated at 500% In for 60 seconds, the ARES motor soft-starter series employs one of the highest rated power electronics stacks in current-carrying capacity, providing exceptional reliability and performance. Additionally, it provides maximum protection including motor thermal modeling, while allowing smooth control of acceleration and deceleration with different control strategies depending on the load. This prevents mechanical shocks from the load and protects the motor against voltage dips or surges in the power supply.

ARES soft starters reduce the voltage applied to the motor at start and stop. As a consequence, motor current and torque are regulated for a smooth start. The motor voltage control is performed using the well-proven firing angle control of connected thyristors.

Standard features

- Built-in voltage and current metering.
- Compact design both top or bottom cable entry.
- Built-in bypass contactor.
- Motor fuses with blown fuse indicator.
- Complete optic-fiber based firing and status signals.
- 4 programmable relay outputs.
- Advanced commissioning, control and maintenance software.
- Optional cart-mounted power stacks for easier maintenance.
- Optional ModBus TCP or ModBus RS-485 communication protocols for PCS integration



Cart-mounted 2 MVA power stacks

Advanced features for complete motor protection

The ARES soft-starter DSP-based controller offers a complete set of motor protection functions. Each of the settings includes a warning and a trip threshold, with separate values for start and stop functions.

Protection function	IEEE / ANSI code
Under-voltage relay	27
Under-current / Under-power relay	37
Reverse current and current unbalance relay	46
Voltage phase sequence and voltage unbalance relay	47
Incomplete start sequence (rotor locked) relay	48
Motor thermal (I2t) relay	49
Instantaneous over current relay	50
Timed over current relay	51
Power factor relay	55
Over voltage relay	59
Notching or jogging (time between starts) relay	66
Mains frequency relay	81
Lockout relay	86

General technical specifications

Voltage level	Un	Up to 3,0 kV	Up to 6,0 kV	Up to 9,0 kV	Up to 12,0 kV
Maximum motor electrical power	Pn	2.200 kW	4.100 kW	6.000 kW	7.600 kW
Maximum motor apparent power	Sn	2.754 kVA	5144 kVA	7.514 kVA	9.560 kVA
Maximum motor nominal current	In	530 A	495 A	482 A	460 A
Maximum motor starting current (120 s.)	Is	1.855 A	1.732 A	1.687 A	1.610 A
		350 % In	350 % In	350 % In	350 % In
Maximum overload capacity (60 s)		500% In	500% In	500% In	500% In
Operating frequency	fn	50 ±2/ 60 ±2 Hz	50 ±2/ 60 ±2 Hz	50 ±2/ 60 ±2 Hz	50 ±2/ 60 ±2 Hz
Number of SCRs		6	12	18	24
SCR Peak reverse voltage		8.500 V	8.500 V	9.500 V	9.500 V
Transient voltage protection			RC type snubber network		
Vacuum bypass contactor			Built-in standard in all models		
Standard operating temperature range:			0 to 45 °C		
Optional extended temperature range:			-20°C to 55 °C (subject to individual study)		
Operating humidity range:			5% to 95% non-condensing		
Operating altitude range:		0 to 1.200 m above sea level. Higher altitude possible subject to individual study			
Control voltage:		120 or 230 VAC single-phase			
1 min. power frequency insulation level	Ud	20	20	28	28
Impulse peak insulation level	Up	40	40	60	60
Motor protection functions					
Two-stage electronic overload curves		Starting: Programmable for NEMA Class 5 through 30 Run: Programmable for NEMA Class 5 through 30 when bypass contactor is closed			
Overload reset		Manual or timed (automatic)			
Thermal state memory		Overload circuit retains thermal condition of motor regardless of control power status; unit uses real- time clock to adjust for off time			
Dynamic reset capacity		Overload will not reset until thermal capacity in motor is enough for successful restart; starter learns & retains information by monitoring previous successful starts			
Phase current imbalance protection		Imbalance trip level: 5% to 30% current between any two phases; imbalance trip delay: 1 to 20 seconds			
Overcurrent protection		Trip Level: 100% to 300% of Motor FLA While Running, Not Starting or Off; Trip Delay: 1 to 20 Seconds			
Load loss trip protection		Undercurrent Trip Level: 10% to 90% of Motor FLA; Undercurrent Trip Delay: 1 to 60 Seconds			
Reverse rotation lockout timer		1 to 60 Minutes			
Starts per hour lockout timer		1 to 6 Successful starts per hour Off time between starts: 1 to 60 minutes between start attempts subject to motor thermal state			
HMI					
LCD screen		Alpha-numeric LCD display			
Keyboard		16 physical keys			
Status Indicators		Power, Run, Alarm, Trip, and Aux. Relays Led indicators			
Programmable outputs					
Type / Rating		NO+NC contacts. 5 A ,250 V ac			
Run Indication		Programmable			
At Speed Indication		Programmable			
Acceleration adjustments		Programmable ramp types: Voltage or Current Ramp (VR or CR); Starting Torque: 0% to 100% of Line Voltage (VR) or 0% to 300% of Motor FLA (CR); Ramp Time: 1 to 120 Seconds; Current Limit: 200% to 500%			
Dual-Ramp settings		Four Options: VR1+VR2; VR1+CR2; CR1+CR2; Cr1+VR2; Dual-Ramp Control: Ramp 1 = Default; Ramp 2 = Selectable via Dry Contact Input			
Deceleration Adjustments		Initial deceleration voltage level: 0% to 100% of Un Deceleration time: 1 to 90 Seconds			
Jog Setting		Voltage Jog: 5% to 75%			
Kick-Start Setting		Kick Voltage: 10% to 100%; Kick Time: 0.1 to 2.0 Seconds			
Fault Display		Shorted SCR, Phase-Loss, Shunt Trip, Phase- Imbalance Trip, Overload, Overtemperature, Overcurrent, Short Circuit, Load Loss, Under voltage, other trip			
Lockout Display		Coast Down Time, Starts Per Hour, Time Between Starts, or Any Lockout			
Metering and auxiliary information					
Standard metering functions		U L1-L2, U L2-L3, U L3-L1 (V), I L1, I L2, I L3, (A and % In), P (kW), S (kVA), PF			
Temperature readings		Up to 8 RTDs			
Motor thermal model		Estimated Temperature, Remaining thermal capacity			
Start data		Average starting time, Average starting current, time since last start			
Events		Last 100 events recorded with full time-stamped measurements			
Miscellaneous					
Available Communication protocols		Modbus RTU over RS485 / Modbus TCP over Ethernet; Profibus			
Local PC communications		USB			
Software functions		Operation status, motor protection functions and soft-starter configuration			
Internal memory type		Non-volatile flash memory			
Real time clock		Internal, powered by self-rechargeable battery. No replacement needed			