



**FAIRFORD**  
ELECTRONICS

# *centris*



**Medium Voltage  
Solid State Starters**

**Advanced motor  
control, protection  
and monitoring in a  
reliable, field proven  
soft starter**

# centris

Expect peak performance from your critical medium voltage equipment when your motors are protected and controlled by Fairford Electronics Centris Soft Starters



**The power of performance in an unpredictable world the Centris Starter protects both your motor and your load.**

- Motor and starter protection is taken to a new level by combining a high-end motor protection relay with a heavy duty solid state starter.
- Flexible control features and selectable ramping profiles to match any application... no need to compromise performance.
- High level circuit isolation via fibre optics (standard on all units) for safety and power quality immunity.
- Sealed NEMA 12/IP55 enclosures are standard equipment, not an expensive option.

#### **Soft start & protect any AC motor**

The Centris Starter is designed to start AC motors in any fixed speed application. It provides maximum protection with "True Thermal Modelling," while allowing smooth, stepless control of acceleration and deceleration. The Centris Starter guarantees power control and protection for your most important assets.

#### **Heavy-duty attitude**

Highest rated power devices for maximum current carrying capacity. Rated at 500% for 60 seconds, the Centris Starter will never be the limiting factor in your application. Powerful sustained gate pulse ensures reliable SCR firing without reactors (unlike inferior pulse train designs that require a reactor to prevent SCR and motor damage).

#### **Experience where it counts**

With over 500,000 low voltage and medium voltage soft starters in operation, Fairford Electronics has the application expertise you need. No other soft starter manufacturer takes this product more seriously or has as much experience applying solid state starters. The **Centris Starter** is the pinnacle of product development and is recognized by users and OEMS around the world as the best Medium Voltage Soft Starter on the market today.

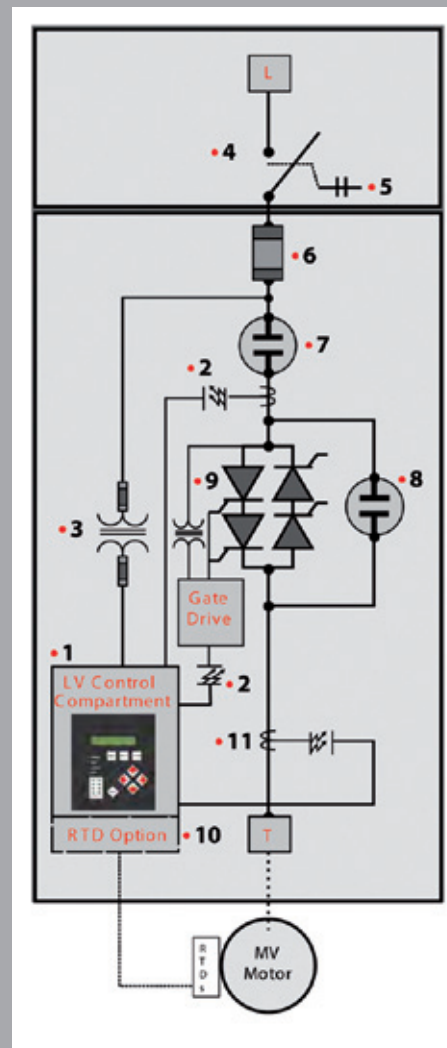
## Features and Benefits

1. Advanced motor protection relay and ramp features programmable via the keypad or a laptop computer.
2. Fibre optically isolated low voltage compartment with up to 110kV BIL rating for safety and reliability.
3. Built-in 120V control power transformer\*; voltage and current metering.
4. Load-break / fault-make rated disconnect switch with door safety interlocking.\*
5. Visible grounding bar for safe operation.
6. Coordinated motor fuses with blown fuse indicators.
7. Line isolation vacuum contactor.\*
8. Fully rated bypass contactor for increased thermal capacity and optional across-the-line starting.

9. Heavy duty SCR stack assemblies with ring transformer isolation for reliable SCR gate fixing.
10. RTD Option accepts up to 12 RTD inputs.
11. Zero sequence ground fault protection option.
12. Top entry, bottom exit with room for stress cones. Removable entry plates for easy connections.
13. NEMA 12/IP55 gasketed enclosure (NEMA 3R optional).

\*"Soft Start Only" model available for retrofit applications.

Does not include disconnect switch, line isolation contactor or CPT. Customer supplied line start panel required.



# centris – Advanced Protection

## All the features of a motor protection relay without the added cost

- **True Thermal Modelling** monitors the motor for excessive thermal conditions due to starting, running and even ambient conditions.
- **Retentive Thermal Memory** for continuous overload protection even after a complete power loss. When power is restored, the **Centris Starter** remembers the last thermal condition of the motor, observes the off time via a real-time clock and adjusts the thermal model accordingly.
- **Non-Volatile Memory** stores the thermal memory without the need for batteries.
- **True Time Thermal Tracking** adjusts the thermal model for different cooling rates based on motor temperature, running state or power loss.
- **Dynamic Reset Response** Reset is only allowed after the motor has sufficient thermal capacity for a successful restart.
- **Thermal Model Biasing** adjusts for heating effects of phase current imbalance or optional RTD inputs.

## Flexible Setup

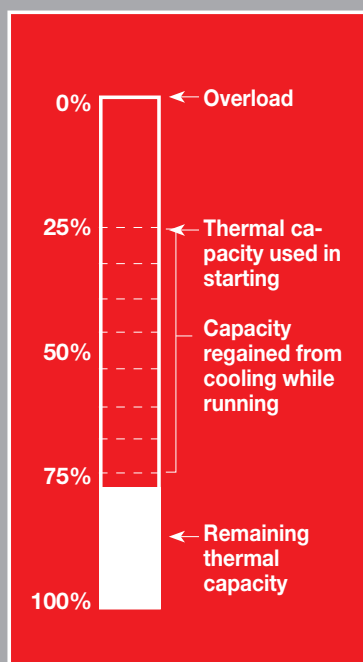
Choose the level of overload protection.

- **Programmable Trip Classes** selectable from IEC/NEMA Classes 5 - 30.
- **Dual Mode Protection** separate trip curves for start and run modes (example: Class 20 for start, Class 10 for run).
- **Warning Levels** can be programmed and assigned to one of six built-in output relays.
- **Custom Trip Curve** programmable based on the motor manufacturer's data or it can use a "Learned Overload Curve" that reflects normal running condition with a programmable trip bandwidth.
- **Remote or Automatic Overload Reset** can be activated for unattended operation

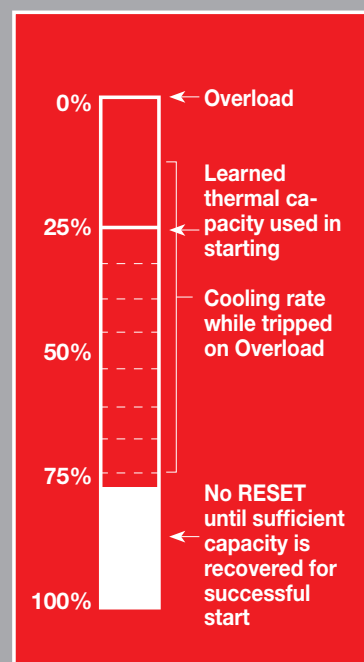
Every facility has equipment critical to its operation and productivity. This equipment is often controlled by medium voltage AC motors.

The Centris Soft Starter provides the highest standard of motor control and unsurpassed protection for these critical motor applications.

### Motor Thermal Model



### Dynamic Reset Response



# centris

The Centris Soft Starter provides the system protection features found in expensive “stand-alone” Motor Protection Relays, without costly add-on cards or discreet devices.

- Over Current /Electronic Shear Pin trip and alarm safeguards your motor and equipment. Protects against jammed loads, sand in pumps, detects worn out blades, etc.
- Under Current/Load trip and alarm sensing detects an underloaded motor due to shaft/belt breakage or loss of prime in pumping systems.
- Dual Mode Short Circuit Trip (exclusive “toe-in-the-water” circuit) pre-checks the motor to prevent starting into a shorted load. In the Run mode, it becomes an “electronic fuse” tripping faster than most fuses and circuit breakers.
- Phase Rotation, Phase Loss and Current Imbalance Protection
- Under Voltage, Over Voltage and Line Frequency trips and alarms protect against power problems from the utility or generator.

## Ground Fault Option

Zero Sequence ground fault protection can be provided to protect equipment from damage due to faulty grounded conductors or motor windings.

Separate High (fast) and Low (slower) trip points and alarm levels are available to help prevent nuisance trips. The ground fault protection CT uses a fibre optic connection for safety isolation.

## RTD Input Option for Precise Thermal Management

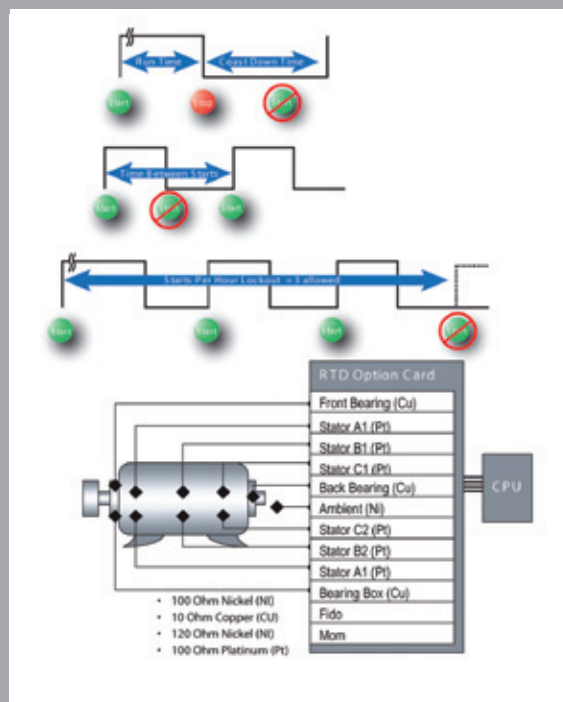
Thermally biased, programmable RTD inputs can be multiple types and can be individually named. Each RTD can be assigned to an output relay with different values for alarm or trip. Temperatures are recorded to the fault history and can be used to activate warning or trip relays based on setpoints.

12 RTD inputs can be configured in software to match the RTD material used and can be monitored at the keypad or remotely.

## Real-time Clock Features

- Coast Down/Back Spin Lockout (programmable up to 60 minutes) prevents a start attempt when the motor/load is backspinning when the motor is turned off.
- Elapsed Time Metering indicates run time for scheduled maintenance or trouble shooting help.
- Time Between Starts Lockout eliminates motor and equipment damage caused by repeated start commands.
- Time and Date Stamping of faults for precise recording of what happened when.
- Starts-per-Hour Lockout/Short Cycle Timer allows you to program the maximum number of starts per hour and provides a programmed “wait time” (0 - 60 minutes) between start attempt

ANSI / IEE	System/Protection Features	Standard
19	Reduced voltage soft starts	✓
27	Under voltage	✓
37	Undercurrent	✓
46	Current imbalance	✓
47	Phase rotation	✓
48	Locked rotor / incomplete sequence	✓
49	I <sup>2</sup> t electronic motor overload	✓
50	Instantaneous electronic over current trip	✓
51	Over current	✓
55	Power factor trip	✓
59	Over voltage protection	✓
66	Starts per hour and time between starts	✓
81	Frequency variance	✓
86	Lockout / start inhibit	✓
50N/51G/N	Ground fault detection, instantaneous and current	Optional
49/38	Stator and bearing RTD protection	Optional
14	Speed switch and tachometer trip	Optional



# centris The perfect start.

Choose the acceleration ramp that is best for your application with the flexibility of microprocessor based ramp control.

## Pumps, Fans, Blowers & Conveyors

- Closed Loop Torque (CLT™) using PID algorithms is ideal for deep well pumps or systems where the load conditions change from one start to the next.
- Linear Speed Ramping can be achieved by adding a tachometer feedback signal from the motor.

## Compressors & Chillers

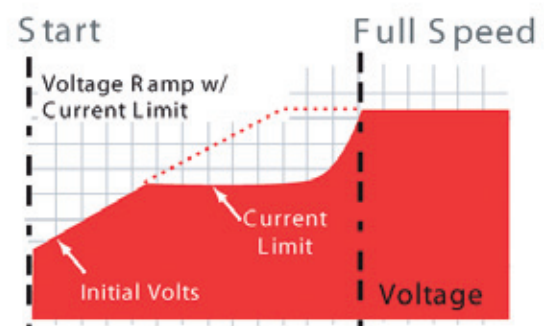
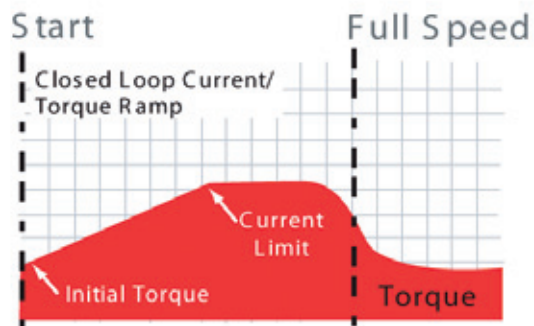
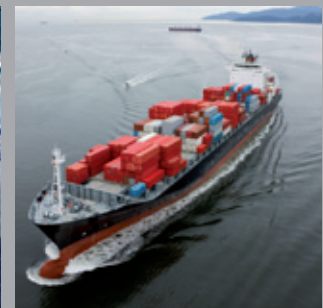
- Voltage Ramp with Current Limit for applications that need the smoothness of voltage ramping while maintaining the ability to start in limited power environments.
- For maximum motor power where the available power supply is severely limited, a Current Limit/Current Step start can be used.

## Process Machinery

- The Jog function can be used in initial machine setup. Apply just enough voltage/torque to rotate the motor shaft without accelerating to full speed.
- Dual ramps are built-in, allowing for different load conditions and ramping requirement.

## Generator Powered & Mobile Equipment

- Protect the integrity of your process even when power conditions are less than perfect.
- Reliable SCR firing even during frequency drift that may occur with portable equipment or backup generators.
- No need for reactors, regardless of motor lead length or system capacity



# centris Pump-Flex™ CONTROL

## Custom acceleration Curves

Can be programmed to match your pump and hydraulic conditions. Select up to eight time and torque points for smooth acceleration of your pump without surges or undue motor thermal stress. Three selectable custom curves can be programmed to accommodate changing load/pump conditions or for different processes.

## Pump-Flex™ Deceleration Control

Is a standard feature of the Centris start and a key reason for choosing Fairford Electronics solid state soft starters over other more traditional methods of motor control.

## Experience the difference - Pump-Flex™ Deceleration

A gradual reduction in the output torque of your pump motor is provided when a stop signal is initiated. When the motor output reaches a point where the check valve can be safely and gently closed, the Pump-Flex™ circuit automatically turns itself off. No need for external timers or auxiliary controls.

## Maximize performance

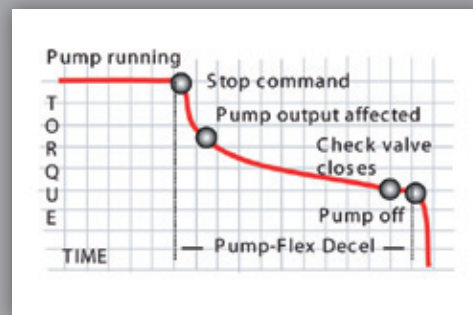
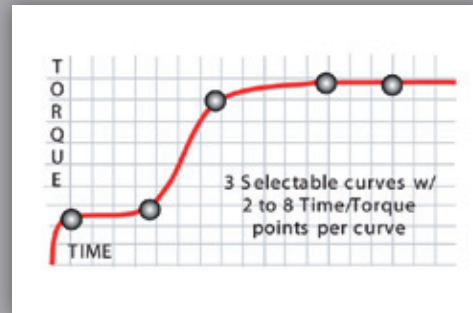
Since no two pumps or pump applications are exactly the same, the flexible settings of Pump-Flex™ deceleration control allow you to tailor the output to precisely match your application requirements.

## Eliminate the damaging effects of “Water Hammer”

When traditional electro-mechanical motor controls are used, motor torque is immediately lost when the power is turned off. The fluid that is flowing through the system, and the kinetic energy associated with it, immediately reverses direction. To prevent the reverse flow, a check valve typically is slammed shut, trapping the kinetic energy in the piping system. This creates a shockwave often referred to as “Water Hammer.”

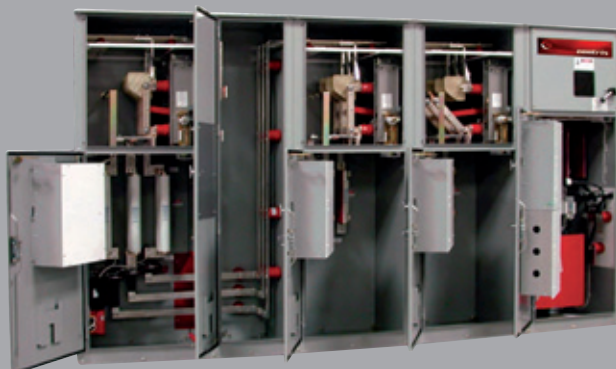
## Minimize maintenance costs & downtime

By gradually reducing motor torque using Pump-Flex™ deceleration control, this potentially destructive pump output pressure is allowed to slowly dissipate in the system during the stopping process. Check valves close gently and other fluid system components including pipes, valves, flanges, couplings and hangers are no longer subjected to the shock and destructive potential of water hammer.



# centris Customised Line-Ups

The standard Class E-2 Centris Starter design can be packaged as a “building- wide solution”. Medium voltage MCC line-ups or stand-alone starters customised to meet your application needs.



- Main disconnects
- Main-tie-mains
- Incoming line sections
- Transformer feeders
- Across-the-line starters
- VFD bypass isolation
- Coordinated key interlock
- Multiple motors on one starter
- PFC capacitor control
- Reversing or 2-speed motors
- SCADA communications
- Cone valve logic control
- Conveyor controls
- PLC Logic

# centris – Designed to your project specification

## Medium Voltage Control Centres

Typical 5kV MCC options:

Incoming/pull sections	18", 24" or 36" wide
Busbars	800A, 1200A, or 2000A Tin plated copper Braced for 78kA fault withstand

Safety key interlocks

Main fused disconnects 400A, 600A or 1200A

Auxiliary across-the-line starters - Emergency

Control sections 24" or 36" wide

Feeder switches 400A, 600A or 1200A

Protection relays and other accessories

Low voltage transformers

AC drive bypass isolation

PLC logic control

Power factor correction capacitor controls

Custom packaging with draw-out switch gear

Contact factory for 7kV and 15kV application requirements.

## Speciality Motor Applications

**Synchronous Exciter** The Centris Starter can be integrated with synchronous exciters in both brush and brushless packages.

**Wound Rotor** Apply the exact rotor resistance needed for your application, while soft starting the stator with the Centris Starter.

**Reversing or 2 speed** Controls can be built-in, or the Centris Starter can be retrofitted behind existing 2 speed controllers.

**Inching /Spotting Control** For low speed load positioning to line up access ports, test blade positions, etc.

**Multiple Motor** Control and protect multiple motors from one soft start

**4160V, 1000A Soft Starter with Synchronous Controller for 10,000 HP gas compressor.**



**4160V, multi-motor Soft Starter designed to simultaneously start (3) 600HP conveyor motors.**





# centris Advanced Integration

**Specifically designed for ease of integration into automated systems, the Centris Starter offers communications and flexible I/O as standard.**

## Flexible I/O

- 120Vac control power input accepts long control circuit runs without the need for interposing relays
- 8 programmable relay outputs for control flexibility without the need for external auxiliary relays or add-on cards
- 2 programmable analog outputs (0 - 10Vdc or 4 - 20mA)

## Communication Ready Built-in comm ports

- RS-232 for one on one communications with a PC
- RS-485 for multi-drop communications with Modbus RTU protocol as standard

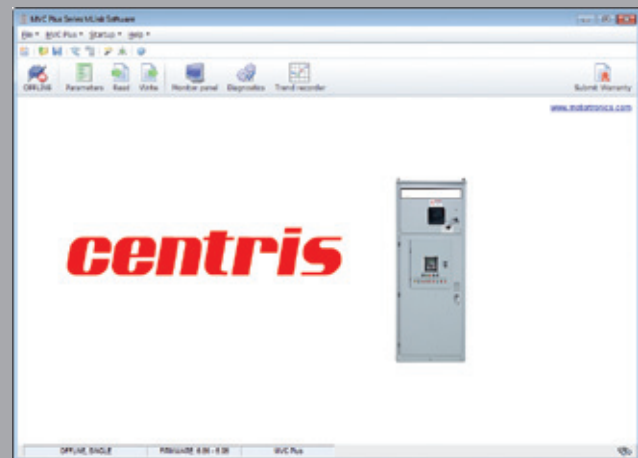
## Centris MLink Commissioning Software

The Centris MLink Windows® based software offers users the ability to program, startup and trouble-shoot the Centris Starter via the built-in RS485 connection. The Centris MLink reduces startup time and allows for commissioning data to be backed up and e-mailed directly from the software. Other features include:

- Parameter editing and commissioning
- E-mail and Export commissioning data directly from the software
- Parameter compare functions
- Parameter settings export to popular file format (PDF, XLS, RTF, etc...)
- Application Setup Wizard
- Visual Programming, point and click on visual terminal strip
- Monitor Panel with 4 programmable signals
- Trend-recorder with 6 programmable channels, storage, triggering and playback mode
- Status and Diagnostics Panel for quick drive status and fault history overview
- Communication connection for serial and USB
- Comprehensive help and product user manual
- Multi-drop network support for trend-recorder, monitor and diagnostics panel
- Demo modes for all interactive functions
- Automatic Software Updates

## Communication Options - Remote Monitoring

## Centris MLink Software



## Centris MLink Monitor Panel



Available communication options for the Centris Starter include DeviceNet, Profibus, Ethernet (Modbus/TCP-IP) and several others. The Centris Starter can also be used in combination with the VirtualSCADA® VS1 remote monitoring device allowing for monitoring the Centris Starter via a standard web-browser or for use with the VirtualSCADA® VS2 for communication over Ethernet

# centris Technical Highlights

<b>Type of Load</b>	3-phase medium voltage AC induction or synchronous motors			
<b>AC Supply Voltage</b>	2300, 3300, 4160, 6000/7200V, 11-15kV VAC +10% to -15%, 50/60 Hz line voltages			
<b>HP Ratings</b>	Up to 10,000 HP @ 7.2kV (1500 Amps) Up to 20,000 HP @ 15kV (800 Amps) Contact Fairfield Electronics for higher rating requirements			
<b>Overload Rating</b>	AC53b 600-30-60m			
<b>Power Circuits</b>	Series strings of SCR power modules (1, 2 or 3 matched pairs of SCRs per phase depending on voltage rating)			
<b>SCR Peak Inverse Voltage</b>	<b>Line Voltage</b>	<b>PIV Rating</b>	<b>Line Voltage</b>	<b>PIV Rating</b>
	2300	6500	6500	19500
	3300	9000	6900-7200	26000
	4160	13000	11000	27000
	6000	18000	13-15kV	39500
<b>BIL Rating</b>	2300V - 7200V 60kV 11000 - 15000V (110kV)			
<b>Transient Voltage Protection</b>	dv/dt circuits (1 per SCR pair)			
<b>Vacuum Bypass Contactor</b>	Standard on all models, line start rated			
<b>Ambient Operating Conditions</b>	0 - 50°C (82° F to 122° F) (Optional -20° to 50° C with heaters) 5 - 95% relative humidity 0 - 3300 ft (1000m above sea level without derating)			
<b>Digital Control Unit (DCU)</b>	Programmable keypad/operator with 2 lines x 20 character backlit LCD display. Status/Alarm LEDs (indicate: Power, Run, Alarm, Trip, Aux 1 - 8)			
<b>Auxiliary Contacts</b>	Multiple Form C contacts rated 5A @ 250VAC max. 6 fully programmable relays (including fail-safe operation) 5 dedicated relays (fault, at-speed, etc.)			
<b>Programmable Features</b>	Motor FLA, service factor, insulation class Dual Ramp Adjustments - Two independent settings for: - Initial Torque 0 - 100% of nominal torque, voltage or current - Current Limit 200 - 600% of motor FLA - Acceleration Time 1 - 120 seconds Power Ramp Function Three Custom Curves Via plotted torque/time axis points Pump-Flex™ Deceleration 1 - 60 seconds with begin & end torque adj Kick Start 0.1 - 2.0 seconds (10 - 100% voltage) Tach Feedback (option) Closed loop speed ramp			
<b>Motor and Starter Protection</b>	Electronic Overload	Phase Imbalance	Short Circuit Detection	Over / Under Voltage
	Phase Loss	Phase Reversal	Over / Under Current	Shorted SCR / Shunt Trip
	Starter Over-Temp	Starts per Hour Lockout	RTD Input (Option)	Coast Down Lockout
				Time between starts
				Ground Fault (Option)
<b>Statistical Data</b>	Elapsed run time, last start time, average starting current, stores history of up to 60 events (data includes date & time, phase & ground fault current). Also displays time-to-trip, remaining inhibit time and starts/hour values			
<b>Metering (Voltage &amp; Current)</b>	Percent of FLA, phase currents, kVAR, kVA, kW, power factor, demand, avg. start current, remaining thermal register, thermal capacity to start, measured capacity to start, time since last start, line frequency, phase order, RTD values (optional).			
<b>Enclosure</b>	NEMA 12 with 3R optional (not for direct sun applications), top and bottom entrance plates, 11 gauge steel, ASA #61 gray powder coated paint.			
<b>Communications</b>	RS485 with Modbus RTU protocol or RS232 with windows interface.			

Ratings				Standard CEN Class E2 Soft Starter				Optional Soft Start Only			
Volts	Max. Amps	Nominal Max. HP	KW	Model	NEMA 12/3R			Model	NEMA 12/3R		
					H	W	O		H	W	O
2300	200	800	500	CEN-23200-E-SWG	92	36	30	CEN-23200-E	92	36	30
	400	1500	1000	CEN-23400-E-SWG		36		CEN-23400-E			
	600	2500	1900	CEN-23600-E-SWG		72		CEN-23600-E			
3300	200	1000	600	CEN-33200-E-SWG	92	36	30	CEN-33200-E	92	36	30
	400	1800	1200	CEN-33400-E-SWG		36		CEN-33400-E			
	600	3000	2200	CEN-33600-E-SWG		117		CEN-33600-E			
4160	200	1250	1000	CEN-41200-E-SWG	92	36	30	CEN-41200-E	92	36	30
	400	2500	2000	CEN-41400-E-SWG		36		CEN-41400-E			
	600	5000	3750	CEN-41600-E-SWG		117		CEN-41600-E			
6000 / 72000	200	2500	2000	CEN-60200-E-SWG	92	36	30	CEN-60200-E	92	36	30
	400	5000	3750	CEN-60400-E-SWG		72		CEN-60400-E			
	600	7500	5600	CEN-60600-E-SWG		117		CEN-60600-E		72	
11 - 15KV	300	7500	5700	CEN-130300-E-SWG	Contact factory			Contact factory			
	600	15000	11000	CEN-130600-E-SWG							

# centris



For more information on how the Centris from Fairford Electronics can reduce your running costs and lower maintenance bills contact your local distributor.

[www.fairford.com/centris](http://www.fairford.com/centris)



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