L- SERIES MVE SOFT STARTER

Harcom

The power of medium voltage soft starting



RIGHT FROM THE START

L-Series MVE: Powerful and reliable

The MVE soft starter is a powerful and reliable solution for your medium voltage starting requirements.

Extensive personal safety features, an easy-to-use graphical interface, and comprehensive built-in motor/load protection make this a well balanced solution for your medium voltage needs. MVE brings together sophisticated soft start motor control functionality in a robust yet compact physical configuration.

MVE is available as a fullyfurnished cabinet, or we can retrofit MVE into your exisiting system. Turn-key MVE kit-type soft starters can be installed with minimal downtime. In addition to standard packages, we can supply a complete line-up to meet your requirements.

> Corrosion resistant hot-dip galvanized steel sheets

Optional internal power factor correction including capacitor, vacuum contactor, fuses and inrush current limiter

IEC type tested



Available in both

configuration

stand-alone and line-up

Robust hinges and handles for convenient and safe closure

Built-in locking on all compartment doors as standard

L-SERIES PANEL SPECIFICATIONS

- Rated voltage: 3.6 kV 17.5 kV
- Rated busbar current: 2000 A
- Rated short time withstand current / peak: 31.5 kA for 3 seconds / 82 kA
- Internal arc fault IAC classification: AFL 31.5 kA for 1 second
- Partition classification: PM
- Loss of service continuity: LSC2
- IP4X protection rating (IP54 optional)
- Ambient temperature: 50°C
- Altitude : < 1000 m (higher with derating)
- Ambient temp. (max): (-5) 0 50 °C (60 °C with derating)
- Colour painting: RAL7035 (other colours optional)

A flexible solution

Every application is different, and selecting the right starter for the job can sometimes seem like a daunting task. Variables such as altitude, ambient temperature, load and starts per hour all impact selection of the ideal motor starting solution. At AuCom, we employ sophisticated engineering tools to help you select the right MVE starter for your site conditions. No matter the application, you can trust our team of experienced motor control professionals to get your motor running smoothly.

A design based on standard components reduces the need for spare parts and simplifies support

An ultra-compact form factor supports vertical or horizontal integration of power electronics, saving valuable space



Individually removable phase arm design allows for simple installation, service or replacement

> Conformal coating on PCBs for protections in environments up to pollution degree 3

Shorter lead times owing to a design that lends itself to more automated manufactuing processes

TECHNICAL DATA

Motor voltage: Control voltages: Frequency: Starter current: Starting time (max): Ambient temp. (max): Maximum altitude: IP rating (power assembly): IP rating (controller): CT type: VT type: MV/LV isolation: Digital input: Relay output: Analogue output: Communications I/O:

2.3 - 13.8 kV 85 - 264 VAC or 90 - 350 VDC 50/60 Hz (autotrigger) 70 A - 1700 A 1 Sec - 30 Sec (180 Sec) (-5) 0 - 50 °C (60 °C with derating) 1000 m (higher with derating) IP00 IP54 / NEMA12 Standard MV CTs (adjustable ratio) APD (AuCom potential divider) type 100% fibre optic connection 3 fixed (start, stop, reset), 2 programmable (A, B) 4 fixed (line, bypass, PFC, PAPS), 3 programmable (A, B, C) 1 analogue output ModBus RTU, Modbus TCP, Profibus, Profinet, DeviceNet, Ethernet IP, USB



Rely on MVE

	Feature	Benefit
	Quick Application Setup	Easy commissioning
	Multi-language Graphical Display	Ease of use and comm
	Dual Motor Set	Allows for two differe
	Starting and Stopping Options	Makes the MVE soft st
	Simulation Mode	Fast and easy testing of the need for a mains s
	Real-time Performance Graph	Real-time graphs of m illustrate how your mo
	Diagnostic Tool	Recorded waveforms of operation
_	LV/MV Isolation via IBT Technology	AuCom IBT Interface E system and HMI from t environment
	LV Motor Test	Conduct factory testin or supply
	Secondary Injection Testing	Allows full testing of m Omicron
_	Complete Motor Protection	A wide range of protec ensure that your equip demanding environme
	DOL+ Mode	Protects your motor e
-	Advanced Thermal Modelling	Intelligent thermal mo calculate motor tempe start successfully
_		



nunication

nt starting and stopping motor data sets

arter suitable for all applications

during installation and commissioning without supply or motor

notor performance and current quickly and clearly otor is performing

can help diagnose conditions interfering with

Board Technology isolates the core starter control the MV power section, creating a safer work

ng without the need for a medium voltage motor

notor protections via an external system such as

ction features including ground fault protection pment can operate safely even in the most ents

ven while operating in bypass mode

odelling allows the soft starter to dynamically erature and determine whether the motor can



Take control from the start

Medium voltage installations are complex enough without making the starter hard to use as well. MVE is packed with features designed to make your life easier, including real-language feedback messages, so you don't have to look up codes to know what's happening.

Built-in monitoring and indicators, and extensive on-board input and output functionality reduce the need for space and avoid the cost of auxiliary equipment, while simplifying installation. Real-time graphs of motor operating performance and current quickly and clearly illustrate exactly how your motor is performing. No fuss, no trouble - a smoother start in every sense.

The MVE controller features simple, plain language feedback on the soft starter's operation and events — no need for trip code look-ups.

METERING FUNCTIONALITY:

- Motor current
- Motor voltage
- Mains frequency
- Motor pf
- Motor kW
- Motor HP
- Motor temperature
- kWh
- Hours run
- Real-time graphs





Protection functionality

Description	Built-in Protection	ANSI Code
Maximum start time	Excess start time	48
Too many starts	Restart delay and dynamic thermal model	66
Undercurrent	Undercurrent	37
Load Increase (alarm)	High current frequency output	51L
Overcurrent - jam	Excess start time, electronic shearpin	51R
Overcurrent - short	Shorted SCR, electronic shearpin	50
Thermal overload	Thermal overload - dynamic model	49/51
Current imbalance	Current imbalance	46
Undervoltage	Undervoltage	27
Overvoltage	Overvoltage	59
Phase loss	Phase loss	47
Phase sequence	Phase sequence	47
Ground fault	Ground fault	50G
Communications failure	Communications failure	85
Internal failure	Internal failure	85
Ext. fault 1/code - 1	Auxiliary trip A	94/95
Ext. fault 1/code - 2	Auxiliary trip B	94/95
Motor overtemperature	Thermistor protection*	23
Stator winding overtemperature	Thermistor protection*	49
Under power	Power Loss	32

* RTD Relay is an optional extra.



Arc fault

An arc fault is a high power discharge of electricity between two or more conductors. Such arc events can reach temperatures of over 10,000 °C — hot enough to liquefy ceramics, plastics and metal.

During an arc event, the arc fault causes a sudden increase in pressure, followed by an expansion and emission phase and, finally, a thermal phase. This combination of pressure and heat can blast debris and combustible gas outward with extreme force.

The internal pressure against the weakest points of the enclosure (e.g. windows, hinges and joints) can destroy an electrical enclosure and may cause serious or fatal injury to nearby personnel.

Arc faults can occur for a number of reasons including overvoltage, faulty insulation, mechanical failure or failure of a fuse.

Due to the significant risk of serious injury or death that an arc fault presents, responsible specifiers should ensure that they require all switchgear to meet the IEC 62271-200 standard.

L-SERIES ARC FAULT PROTECTION

If an arc event occurs within an AuCom L-Series panel, the arc fault is contained by solid locking doors and heavy double layer compartment panels.

During the emission phase, the pressure is safely released using discharge flaps on the top of the panel (or optional ducts), which direct the explosion upwards or vent it safely outside.

> We've been producing type tested medium voltage panels for more than 10 years. Put to the test in some of the world's most demanding applications, you can have confidence in the safety of the L-Series MVE right from the start.

C Independent, acception tecting particip	Memory Monitory of The Area USING	IPH
TYPE TEST	REPORT	
NO 07626-18-0022 AuCon Bectenics Ltd 123 Wright: Road PO Sex 80208 Chistoruth 8440 NEW 21ALAND		CARA
AuCon MCS Criteri & Co KC Bonsgstable 6 48324 Senderhortt CBRANY		1010.08
AuConi Bectronica Lad		MARINETURE
Metal-encoded, amintulated, AC, me	dum-vollage switchgear	107-08407
L/Series MVE		798
PH Test unit MME Soft Stater		1854 NO.
Rated votage Rated housersy Rated normal current Rated peak withstand current Rated shothtme interstand current Rated shothtme interstand current reternal arc carcification	4 12 W 5 50,60 H 6 80,82 K 6 80,82 K 5 515 K 6 80,82 K 6 80,80 K 7 80	Auto Onen en Ine Cuent
IEC 63271-300-2011-10 IEC 63271-1-3017-07		BORMATNE DOCLARENT
Test under conditions of arcing due 50 Hz and at a celling height of 39 also valid for a rated frequency of 60	to an internal fault at a frequency o 1935 mm above the floor This test i His	NANCE OF TELTS HERPORNED
9 January 2018		put or test
The takings of the test object reliab proved. The tests have been MASSED	ed to the scope of lest nave been	TER NEWS
R. Developed to the second sec	CKRSOM Ye network Dates	



Fully type tested

AuCom L-Series panels are fully type tested according to IEC 62271-200:

- Short time withstand current
- Peak withstand current
- Internal arc fault (IAC classification: AFL 31.5 kA for 1 second)
- Dielectric test on main and auxiliary circuits
- IP rating
- Temperature rise test related to 50 °C ambient temperature and main circuit resistance

Certificates are available from AuCom upon request.



Knowledge is power

We don't just get you started - we're committed to keeping you running smoothly too. Our dedicated diagnostic tools simplify support and maintenance.

DIAGNOSTICS

The MV Diagnostic Board is a data acquisition and recording board that is provided as standard with all AuCom MV products.

The MV Diagnostic Board records waveforms that can help diagnose problems with the starter's installation or operation, including:

- Excessive supply impedance (voltage sag and SCR conduction angle)
- Generator set frequency stability at on/off load transitions
- Disconnection of non-conduction fibre optic connections
- A shorted SCR or welded bypass (can be isolated to individual phases)
- Presence or absence of an MV supply
- Supply quality issues (harmonics)
- Gate drive failures



MV Diagnostic Board

DETAILED EVENT LOG

The 99-place event log records time-stamped details of operation and performance, making it easier than ever to track how your motor is performing.

An eight position trip log records trip states and operating conditions at the time of trip, including:

- Phase currents and voltages
- Mains frequency
- Starter state
- Time & date

AUCOM TECHNICAL DATASHEET

Our medium voltage soft start specialists use advanced proprietary tools to specify the ideal AuCom medium voltage solution for your application. We provide a detailed technical datasheet including calculations for motor starting, heat dissipation, supply capacity, transformer & cable voltage drops, and selection of fuses and power factor correction.



Even safer with **IBT** technology

AuCom Interface Board Technology (IBT), a unique concept within the medium voltage soft starter market, separates the core starter control system (including the starter's HMI and complex, time critical algorithmic processing) from the medium voltage power section.

100% GALVANIC ISOLATION

The interface board is located in a separate, dedicated section of the internal arc tested medium voltage compartment. Fibre optic wires connect the control and power sections of the starter through the interface board, eliminating the need for any copper wiring and providing complete galvanic isolation of the low voltage compartment.



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Panel Details

L-Series MVE panels are available in either IP4X or IP54 panels, with options for line and bypass devices, earthing and isolation switches. AuCom can also design and build panels to meet particular specifications, and we offer full application engineering support at all stages of the design process.

For customers who prefer to build their own panels, MVE soft starters can be supplied in IP00 format or as a kit for local assembly. Multi-motor solutions are also available for coordinated control of up to four motors.



	Height (mm)	Width (mm)		Depth (mm)		
		E1/E2	E3	E1/E2	E3	E3 + PFC
L-MVE-XXXX-V02					1/00	1/00
L-MVE-XXXX-V03		100	0	1000		
L-MVE-XXXX-V04	2200	1000		1200	1400	1600
L-MVE-XXXX-V06						
L-MVE-XXXX-V11		1150	1400	1400	16	00
L-MVE-XXXX-V13		1400	1600	1600	18	00

Configurations







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A solution for any application

X - MVE - X X X X - V	X X - SC X X - E X - F	X - L X - B X - PF X
PANEL TYPE L = L-Series IEC standard M = M-Series IEC standard P = P-Series NEMA standard	SHORT CIRCUIT LEVEL SC16 = 16 kA SC20 = 20 kA SC25 = 25 kA SC31 = 31.5 kA	BYPASS SWITCHING DEVICE B0 = Without bypass switching device B1 = Fixed bypass vacuum contactor
CURRENT RATING @ AC53b 4-30 : 1770 0070 = 70 A 0700 = 700 A*	SC40 = 40 kA SC50 = 50 kA	B2 = Withdrawable bypass vacuum contactor* B3 = Fixed bypass vacuum circuit breaker
0110 = 110 A 0800 = 800 A* 0200 = 200 A 0900 = 900 A* 0220 = 220 A 1000 = 1000 A* 0250 = 250 A 1100 = 1100 A* 0300 = 300 A 1200 = 1200 A*	E0 = soft starter in panel only E1 = soft starter + bypass device E2 = soft starter + line device + bypass device	B4 = Withdrawable bypass vacuum circuit breaker*
0400 = 400 A 1300 = 1200 A* 0450 = 450 A 1400 = 1400 A* 0500 = 500 A 1500 = 1500 A* 0540 = 540 A 1400 = 1400 A*	E3 = soft starter + disconnector switch + line device + bypass device	
0600 = 600 A* 1700 = 1700 A*	FUSE	PFU = Without PFC PF1 = With PFC*

SUPPLY VOLTAGE

V02 = 2300 VAC 50/60 Hz V03 = 3300 VAC 50/60 Hz V04 = 4160 VAC 50/60 Hz V06 = 6600 VAC 50/60 Hz V11 = 11000 VAC 50/60 Hz* V13 = 13800 VAC 50/60 Hz*

LINE SWITCHING DEVICE

F0 = Without fuse

F1 = With fuse

L0 = Without line switching device

L1 = Fixed line vacuum contactor

- L2 = Withdrawable line vacuum contactor*
- L3 = Fixed line vacuum circuit breaker
- L4 = Withdrawable line vacuum circuit breaker*

*Not applicable to M-Series panel type

Other solutions

AuCom offers a complete range of soft starters. Whether you need a simple product for starting only, or a comprehensive motor control package you can trust AuCom to offer a product to match.

	Soft Start	Motor Protection	Current Range	Voltage Range
CSXi	٠	٠	≤ 200 A	≤ 575 VAC
EMX3	٠	٠	< 1600 A	< 690 VAC
EMX4	٠	٠	≤ 580 A	< 690 VAC
MVX	٠	٠	≤ 450 A	≤ 15 kV

A world of experience

	Water / Wastewater	Power generation	
Pump			
Fan/Blower/Aerator			
Compressor			
Chiller			
Refiner			
Extruder			
Centrifuge			
Mill crusher			
Hacker			
Conveyor			
Roller			
Rotating converter			
Bow thruster			
Main propulsion			





The soft start specialists

At AuCom our focus is exclusively on soft starters. We provide a range of industry leading products utilising the latest technology.

A dedicated medium voltage laboratory with full manufacturing and on-site testing facility provides selectable voltage sources from 2.3 kV to 13.8 kV, pump load, electronically controlled test load and synchronous motor testing capabilities.

TESTING AND VERIFICATION

Our comprehensive MV testing routine is designed to guarantee that our products are safe and reliable. This process involves:

- Functional testing of each individual phase arm
- Functional testing of each 3 phase arm block
- Dielectric testing to ensure safety
- Full testing of all logic controls
- A full operational test

We also offer factory acceptance testing (FAT) and third party test audits upon request.

THE PROOF IS IN THE POWER UP

All AuCom MV starters run a motor at rated voltage before they leave the factory so we're sure that you're getting the performance we promised.

FULL TRACEABILITY

Automated testing routines verify operational performance and record results so that all necessary information is readily available in the rare event that things don't go as planned.

THIRD PARTY CALIBRATION

Third party calibration professionals carry out regular calibration of all our equipment including test and measurement fixtures.



AuCom is accredited to ISO9001:2000, with all products designed and tested to international standards. All of our products are thoroughly tested in certified facilities and in the field before release, and every soft starter is tested before leaving the factory.

The AuCom MVE soft starter is designed and manufactured to the following standards:

EN 50178:1998	Electronic equipment fo
IEC 62271-1	High-voltage switchgea
	specifications
IEC 62271-100	High-voltage switchgea
	alternating-current cire
IEC 62271-102	High-voltage switchgea
	current disconnectors
IEC 62271-200	High-voltage switchgea
	enclosed switchgear ar
	and up to and including
IEC 61000-6-2	Electromagnetic compa
	standards - Immunity f
IEC 61000-6-4	Electromagnetic compa
	standards - Emission s
IEC 62271-106	Alternating current con
	motor-starters.
IEC 60529	Degrees of protection p
	Tests)
GB3906	AC metal enclosed swit
IEC60071-1	Insulation coordination
IEC 60071-2	Insulation coordination
IEC 60282-1	High voltage fuses - Pa
IEC 62271-105	High-voltage switchgea
	current switch-fuse co



- or use in power installation ar and control gear - Part 1: Common
- ar and control gear Part 100: High-voltage cuit breakers
- ar and control gear Part 102: Alternating and earthing switches
- ar and control gear Part 200: AC metal-
- nd control gear for rated voltages above 1kV 52 kV
- atibility (EMC) Part 6-2: Generic or industrial environments
- atibility (EMC) Part 6-2: Generic
- tandard for industrial environments
- tactors, contactor-based controllers and

provided by enclosures (IP Rating and

tchgear (China)

- Part 1: Definitions, principles and rules
- Part 2: Application guide
- rt 1: Current-limiting fuses
- ar and control gear Part 105: Alternating mbinations

The future starts with AuCom

We develop motor control products for industrial applications across the world. Our focus on research and development, as well as manufacturing, supply and support, ensures that when you choose to work with AuCom, you're working with a global leader. Almost 40 years of experience added to our expertise and ability means you can rely on us to get it right from the start.

OUR APPROACH

We start with a challenge or application, working with you to define and develop a solution that's not only fit for purpose today, but fully supported into tomorrow.

OUR PEOPLE

The power behind our success doesn't rely on our innovative products alone. Our people play a pivotal role. That's why, with AuCom, it's always personal. Combining dedication and experience with ability and passion, we don't just listen more closely, we draw on the breadth of our expertise to better understand your unique requirements and offer real solutions and ongoing support.

OUR PARTNERS

We choose partners that are experts, not only in soft start and motor control, but in understanding the needs of their industry. We work closely with our partners to ensure customers receive only the best support and advice.







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RIGHT FROM THE START

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