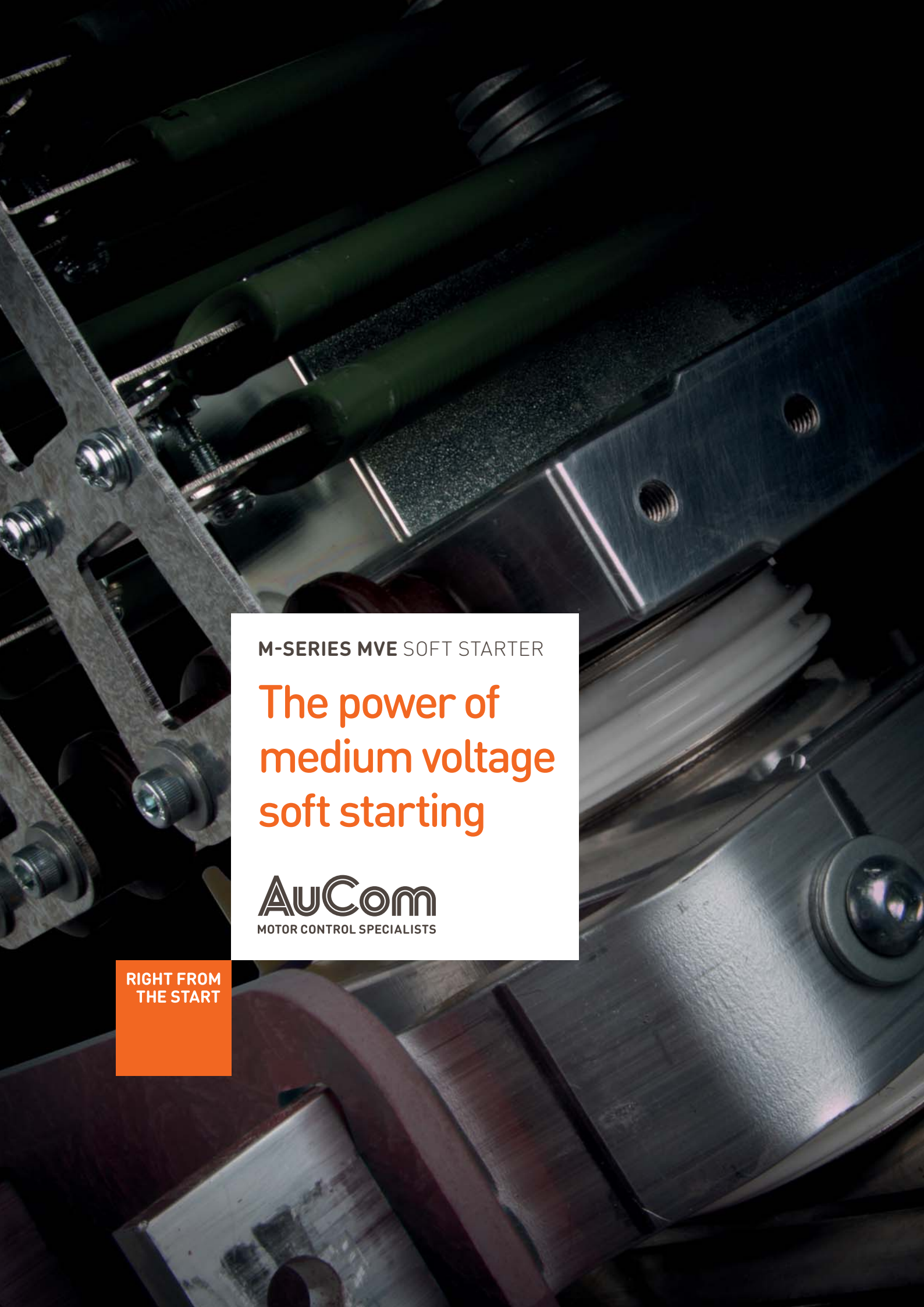


**M-SERIES MVE** SOFT STARTER

# The power of medium voltage soft starting

AuCom
MOTOR CONTROL SPECIALISTS

RIGHT FROM THE START

# M-Series MVE

**IEC STYLE SOFT STARTER PANELS**

AuCom's M-Series MVE medium voltage soft starters are an integrated solution for motor control and protection. MVE starters combine advanced soft start and soft stop functionality with extensive motor and system protection, plus a user-friendly interface and complete commissioning diagnostics.

MVE uses voltage dividing resistors connected to the IBT board for maximum measurement accuracy

Easy to service.
The MVE power section's modular design simplifies the disassembly process, making servicing much easier. Each phase arm is separate and can be individually removed for maintenance if required.
AuCom supplies a purpose-built lifting tool to make phase arm installation safe and easy.



# A world of experience

The MVE soft starter is the latest iteration of AuCom's industry tested medium voltage soft start platform.

By integrating motor protection with soft start and soft stop control, the M-Series MVE provides a simple and cost effective solution for most major applications.

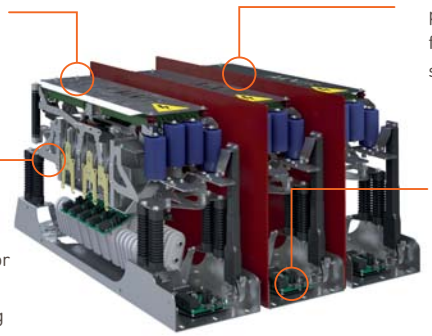
| | Water / Wastewater | Power generation | Pulp / Paper | Chemical / Petrochemical | Mining | Cement / Stone | Wood processing | Building technology | Marine / Off shore | Industry / Production |
|---|---|---|---|---|---|---|---|---|---|---|
| Pump | ■ | ■ | ■ | ■ | | | | ■ | ■ | ■ |
| Fan/Blower/Aerator | ■ | ■ | | ■ | ■ | ■ | | ■ | | ■ |
| Compressor | | ■ | | ■ | | | | ■ | ■ | ■ |
| Chiller | | | | ■ | | | | ■ | ■ | ■ |
| Refiner | | | ■ | | | | ■ | | | |
| Extruder | | | | ■ | | | | | | |
| Centrifuge | | | | ■ | | | | | | ■ |
| Mill crusher | | ■ | | | ■ | ■ | | | | |
| Hacker | | | ■ | | | | ■ | | | |
| Conveyor | | ■ | | | ■ | ■ | | | | ■ |
| Roller | | ■ | | | | | | | | ■ |
| Rotating converter | | ■ | | | | | | ■ | ■ | ■ |
| Bow thruster | | | | | | | | | ■ | |
| Main propulsion | | | | | | | | | ■ | |

# Powerful and reliable

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 affect 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

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



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

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

## TECHNICAL DATA

| | |
|---|---|
| Motor voltage: | 2.3 - 13.8 kV ± 10 % (maximum 11 kV in |
| M-Series panel) Control voltages: | 85 - 264 VAC or 90 - 350 VDC |
| Frequency: | 50 ± 15 % Hz (autotrigger) |
| Shorted current: | 25kA/2s |
| Starting time (max): | 1 second – 30 seconds (180 seconds) |
| Ambient temp. (max): | -10 °C to 60 °C (above 50 °C with derating) |
| Supply voltage: | 3phase - 6kV(+10%,-15%) |
| IP rating (power assembly): | IP00 |
| IP rating (controller): | IP54 / NEMA12 |
| CT type: | Standard MV CTs (adjustable ratio) .Direct mesuare on busbar |
| VT type: | EPT type |
| MV/LV isolation: | 100% fibre optic connection |
| Digital input: | 3 fixed (start, stop, reset), 2 programmable (A, B) |
| Relay output: | 4 fixed, 3 programmable (A, B, C) |
| Analog output: | 1 analog output |
| RTD input : | 6 input ( optional ) |
| Communications I/O: | 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 communication |
| Dual Motor Set | Allows for two different starting and stopping motor data sets |
| Starting and Stopping Options | A range of starting methods including current based torque control make the MVE soft starter suitable for all applications |
| Simulation Mode | Support simulation run mode, protection mode, analog output |
| Real-time Performance Graph | Real-time graphs of motor performance and current quickly and clearly illustrate how your motor is performing |
| Diagnostic Tool | Recorded waveforms can help diagnose conditions interfering with operation |
| LV/MV Isolation via IBT Technology | AuCom IBT Interface Board Technology isolates the core starter control system and HMI from the MV power section, creating a safer work environment |
| LV Motor Test | Conduct factory testing without the need for a medium voltage motor or supply |
| Secondary Injection Testing | Allows full testing of motor protections via an external system such as Omicron |
| Complete Motor Protection | A wide range of protection features including ground fault protection ensure that your equipment can operate safely even in the most demanding environments |
| DOL+ Mode | Protects your motor even while operating in bypass mode |
| Overload operation | In continuous running mode, overload factor >150% withstands 850% for 3 seconds |
| Advanced Thermal Modelling | Intelligent thermal modelling allows the soft starter to dynamically calculate motor temperature and determine whether the motor can start successfully |

# 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


Clear, easy to read, programmable screen
Four-line with graph

Start, stop, reset, local/remote push buttons

Shortcut buttons for quick access to common tasks

Multilingual controller with a choice of eight languages

Status LEDs for immediate feedback

Intuitive interface and menu structure for easy setup, with multi-level password protection

IP54 keypad mounted on cabinet exterior



# Protection functionality

| Description | Built-in Protection | Eq. ANSI Code |
|---|---|---|
| Maximum start time | Excess start time | 48 |
| Too many starts | Restart delay and dynamic thermal model | 66 |
| Undercurrent | Undercurrent | 37 |
| Overcurrent - jam (Locked rotor, load increase) | Instantaneous/time-delay overcurrent | 50/51/51R |
| Overcurrent - short (short circuit) | Instantaneous/time-delay overcurrent (stage 2) | 50/51 |
| Checking or Interlocking relay | Shorted SCR | 3 |
| 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 |
| Power loss | Power loss | 32 |
| Ground fault | Ground fault | 50G |
| Mains frequency | Frequency check, frequency variation | 81 |
| External communications failure | Communications failure | 85 |
| Internal communications failure | Internal failure | 85 |
| Ext. fault 1/code - 1 | Auxiliary trip A | 94/95 |
| Ext. fault 2/code - 2 | Auxiliary trip B | 94/95 |
| Motor overtemperature | Thermistor protection* | 23 |
| Stator winding overtemperature | Thermistor protection* | 49 |

* RTD Relay is an optional extra.

# 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

### DETAILED EVENT LOG

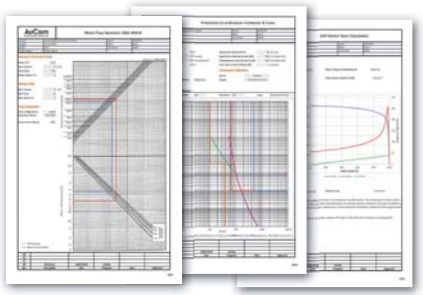
The 99-place event log records time-stamped details of operation and performance, making it easier than ever to track how your motor is performing.

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

Support download log and event to csv files using software

MV Diagnostic Board





# 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 controller 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.

# 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 on 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.



# We have high standards

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 for use in power installation |
| **IEC 60060-1** | High voltage test techniques |
| **IEC 60071-1** | Insulation coordination - Part 1: Definitions, principles and rules |
| **IEC 60071-2** | Insulation coordination - Part 2: Application guide |
| **IEC 60270** | High voltage test techniques - Partial discharge measurements |
| **IEC 60282-1** | High voltage fuses - Part 1: Current-limiting fuses |
| **IEC 60529** | Degrees of protection provided by enclosures (IP Rating and Tests) |
| **IEC 61000-6-2** | Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments |
| **IEC 61000-6-4** | Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Emission standard for industrial environments |
| **IEC 62271-1** | High-voltage switchgear and control gear - Part 1: Common specifications |
| **IEC 62271-100** | High-voltage switchgear and control gear - Part 100: High-voltage alternating-current circuit breakers |
| **IEC 62271-102** | High-voltage switchgear and control gear - Part 102: Alternating current disconnectors and earthing switches |
| **IEC 62271-105** | High-voltage switchgear and control gear - Part 105: Alternating current switch-fuse combinations |
| **IEC 62271-106** | Alternating current contactors, contactor-based controllers and motor-starters |
| **IEC 62271-200** | High-voltage switchgear and control gear - Part 200: AC metal-enclosed switchgear and control gear for rated voltages above 1kV and up to and including 52 kV |