



ABB Soft Starter

Medium Voltage Solid State Starters

5kV, 7kV and 15kV Class

Power and productivity
for a better world™



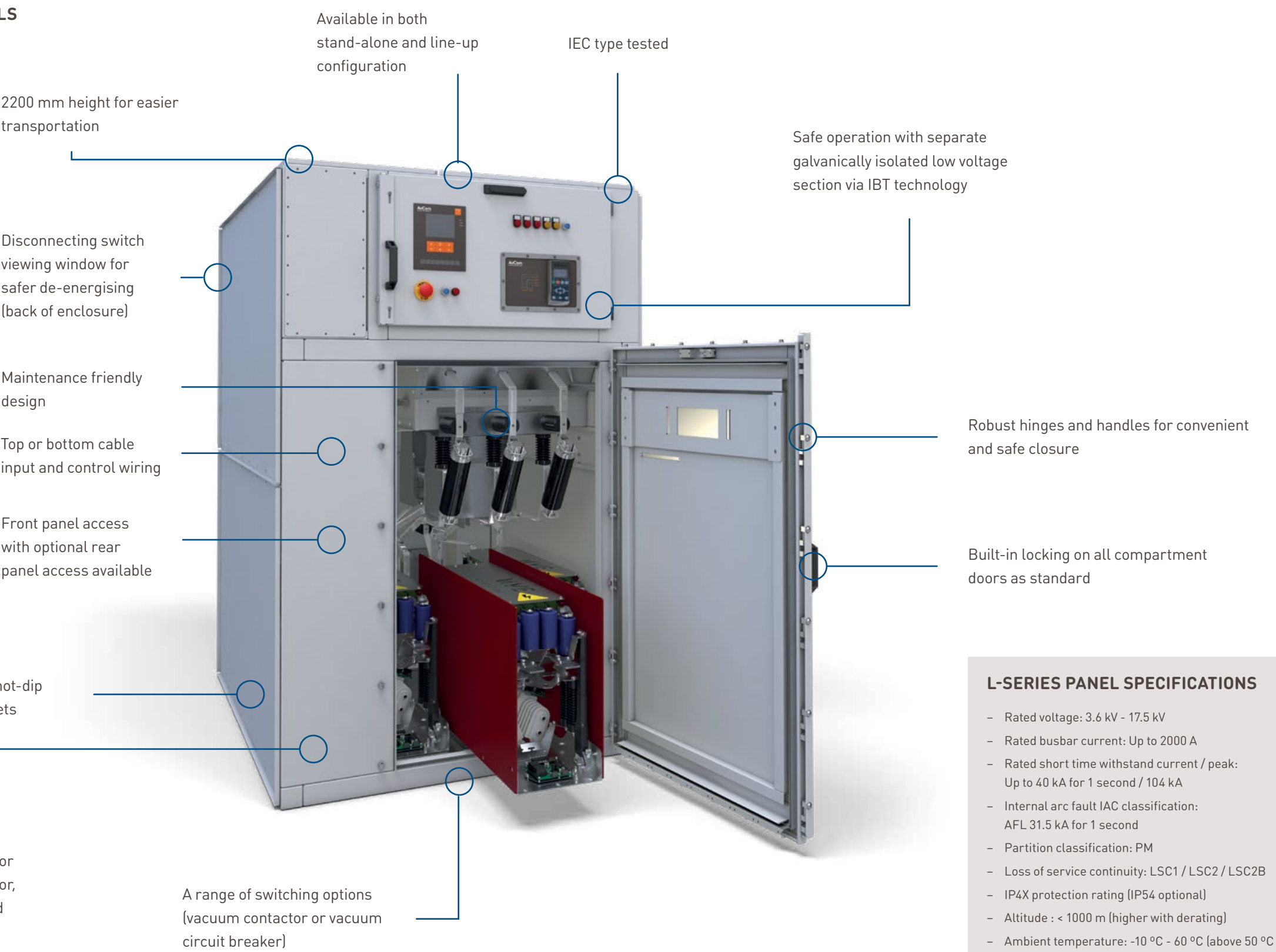
L-Series MVE

IEC TYPE TESTED SOFT STARTER PANELS

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 fully-furnished cabinet, or we can retrofit MVE into your existing 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.



L-SERIES PANEL SPECIFICATIONS

- Rated voltage: 3.6 kV - 17.5 kV
- Rated busbar current: Up to 2000 A
- Rated short time withstand current / peak: Up to 40 kA for 1 second / 104 kA
- Internal arc fault IAC classification: AFL 31.5 kA for 1 second
- Partition classification: PM
- Loss of service continuity: LSC1 / LSC2 / LSC2B
- IP4X protection rating (IP54 optional)
- Altitude : < 1000 m (higher with derating)
- Ambient temperature: -10 °C - 60 °C (above 50 °C with derating)
- Colour painting: RAL7035 (other colours optional)

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. 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.

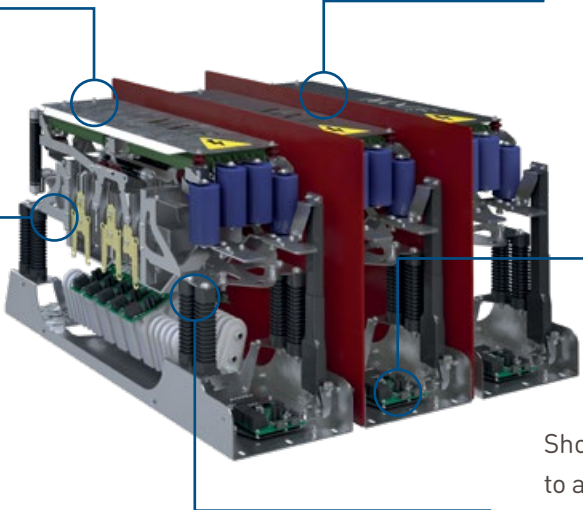
A design based on standard components reduces the need for spare parts and simplifies support

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 protection in environments up to pollution degree 3

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



TECHNICAL DATA	
Motor voltage:	2.3 - 13.8 kV
Control voltages:	85 - 264 VAC or 90 - 350 VDC
Frequency:	45/66 Hz (autotrigger)
Starter current:	70 A - 1700 A
Starting time (max):	1 Sec - 30 Sec (180 Sec)
Ambient temperature:	-10 °C to 60 °C (above 50 °C with derating)
Maximum altitude:	1000 m (higher with derating)
IP rating (power assembly):	IP00
IP rating (controller):	IP54 / NEMA12
CT type:	Standard MV CTs (adjustable ratio)
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 (line, bypass, PFC, PAPS), 3 programmable (A, B, C)
Analog output:	1 analog output
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	Fast and easy testing during installation and commissioning without the need for a mains supply or motor
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	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
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

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.



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 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.

INDEPENDENT, ACCREDITED TESTING STATION - MEMBER LABORATORY OF IEC AND IEC/TC 4		
IPH BERLIN		
TYPE TEST REPORT		
NO. 07626-18-0022		
AuCom Electronics Ltd 129 Wingate Road P.O. Box 80208 Christchurch 8140 NEW ZEALAND		
CLIENT		
AuCom MCC GmbH & Co. KG Borsigstraße 6 48924 Sanderhorst GERMANY		
TESTED FOR		
AuCom Electronics Ltd		
MANUFACTURER		
Metal-enclosed air-insulated AIC, medium-voltage switchgear		
TEST OBJECT		
L-Series MVE		
TYPE		
IPH Test unit MVE Soft Starter		
SERIAL NO.		
Rated voltage	U _n 12 kV	RATED CHARACTERISTICS
Rated frequency	f 50/60 Hz	CHARTERED BY THE
Rated normal current	I _n 630 A	CLIENT
Rated peak withstand current	I _p 80/82 kA	
Rated short-time withstand current	I _t 31.5 kA	
Rated duration of short-circuit	t _c 3 s	
Internal arc classification	IAC AFL 31.5 kA 1s	
IEC 62271-200:2011+10		NORMATIVE
IEC 62271-1:2017-07		DOCUMENT
Test under conditions of arcing due to an internal fault at a frequency of 50 Hz and at a ceiling height of 9500 mm above the floor. This test is also valid for a rated frequency of 60 Hz.		RANGE OF TESTS
9 January 2018		PERFORMED
The ratings of the test object related to the scope of test have been proved. The tests have been PASSED.		TEST RESULT
H. ZIMMBAUER HEAD OF CENTRE OF COMPETENCE High-Power-Engineering Berlin, 29 January 2018		
C. KRUSCHKA TEST ENGINEER IN CHARGE		
IPH BERLIN		
DAKKS		

Fully type tested

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 on 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 L-Series MVE 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

TECHNICAL DATASHEET

Our medium voltage soft start specialists use advanced proprietary tools to specify the ideal medium voltage solution for your application. We can 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

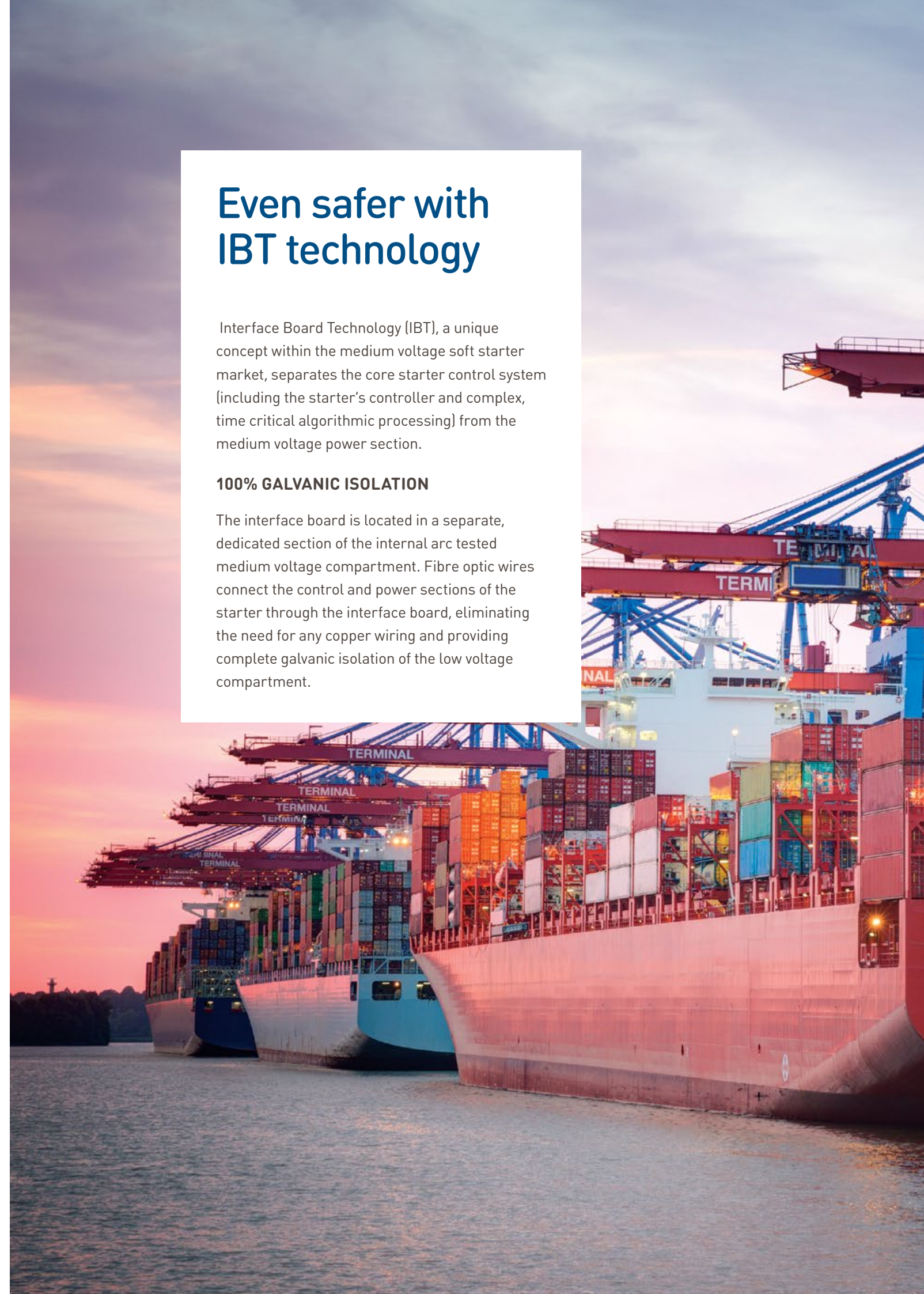
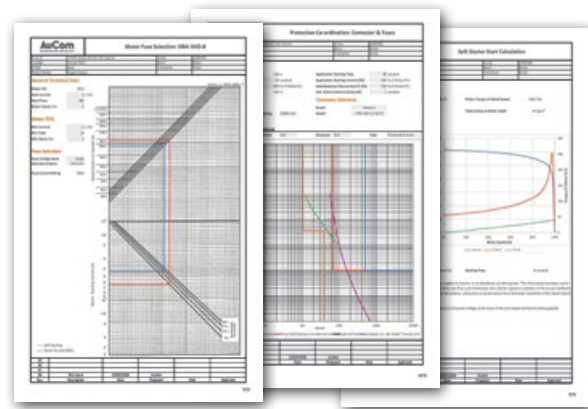
Interface Board Technology (IBT), a unique concept within the medium voltage soft starter market, separates the core starter control system (including the starter's controller and complex, time critical algorithmic processing) from the medium voltage power section.

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.



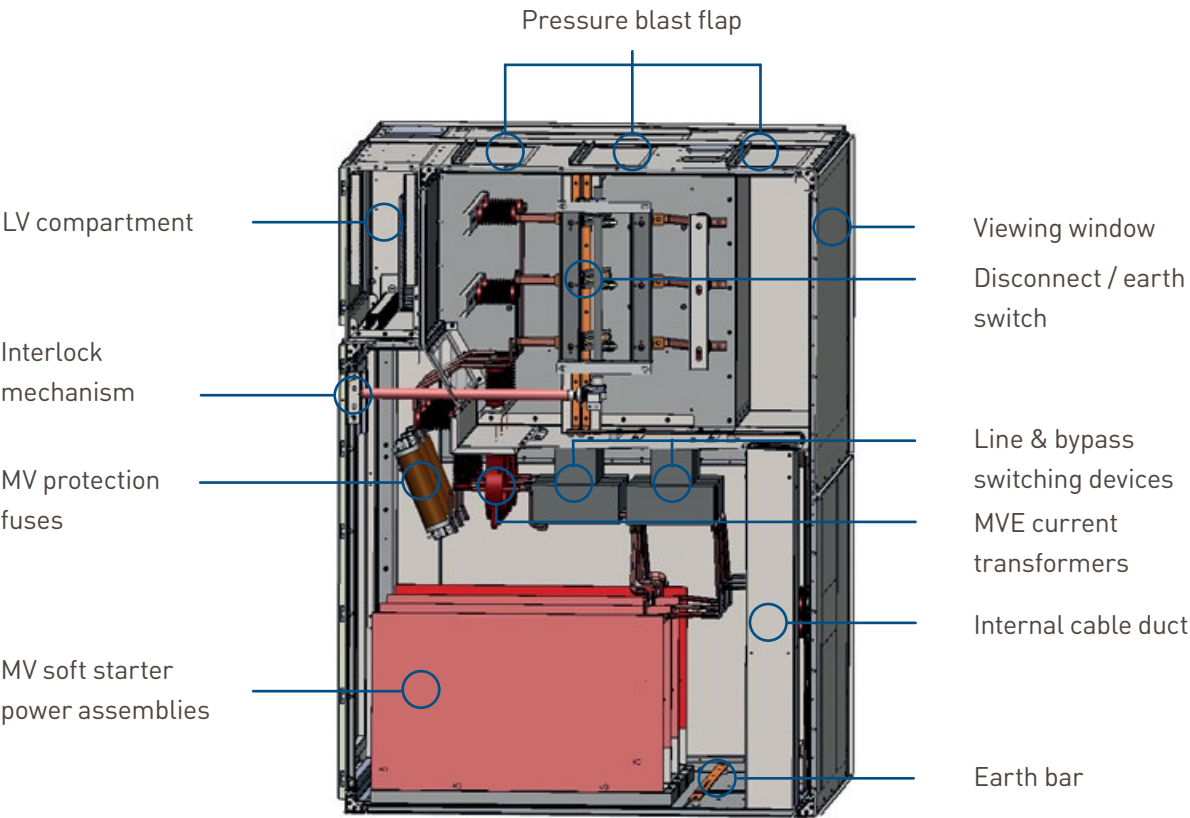
MV Diagnostic Board



Panel details

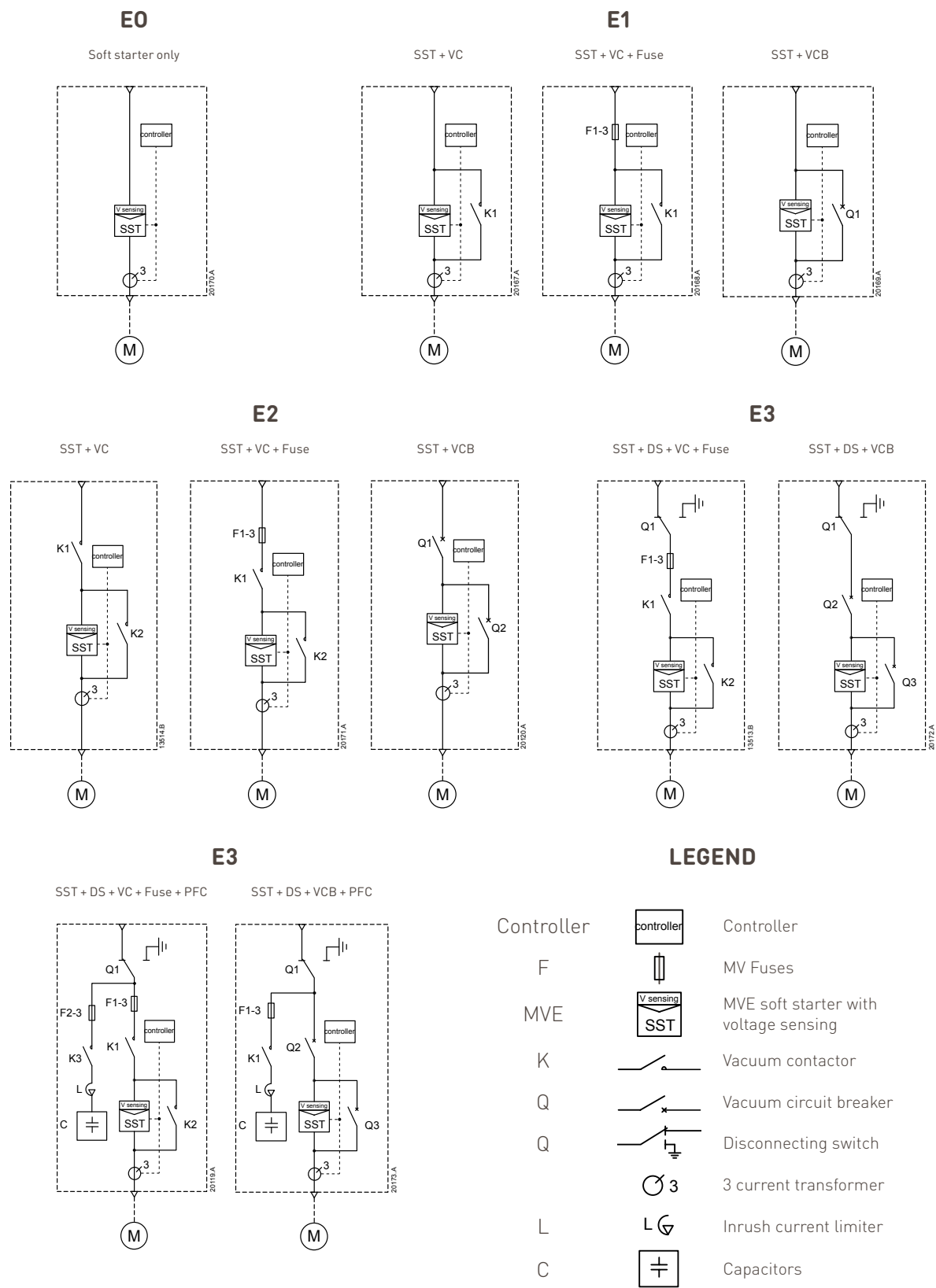
L-Series MVE panels are available in either IP4X or IP54 panels, with options for line and bypass devices, earthing and isolation switches. ABB can also design and build panels to meet particular specifications, and we offer full application engineering support at all stages of the design process.

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.

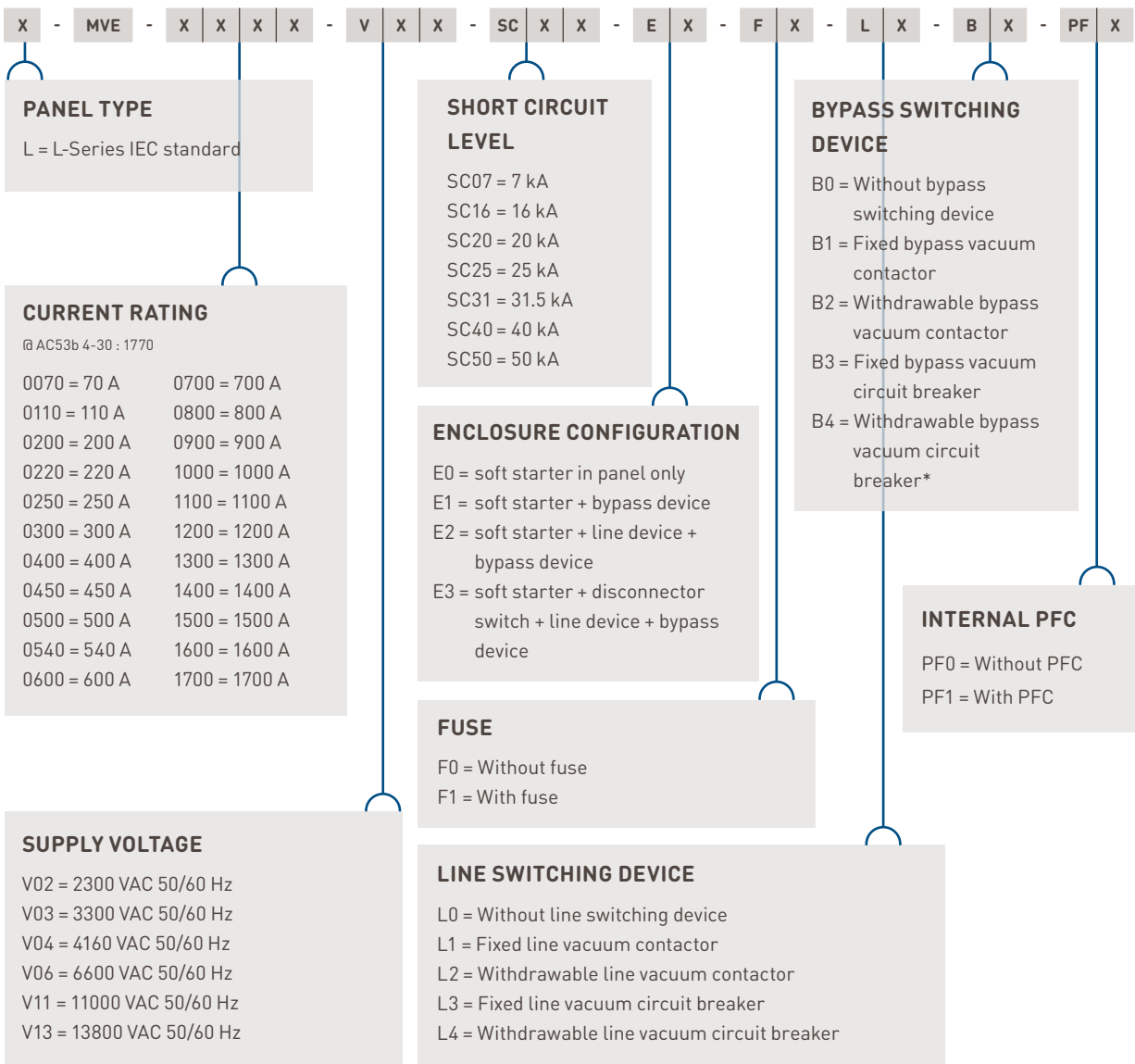


	Height (mm)	Width (mm)		Depth (mm)	
		E1/E2	E3	E1/E2	E3
L-MVE-XXXX-V02	2200	1000	1000	1200	1600
L-MVE-XXXX-V03					
L-MVE-XXXX-V04		1150	1400	1400	1600
L-MVE-XXXX-V06					
L-MVE-XXXX-V11					
L-MVE-XXXX-V13		1400	1600	1600	1800

Configurations



A solution for any application



We have high standards

All MVE products are 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 MVE soft starter is designed and manufactured to the following standards:

EN 50178:1998	Electronic equipment for use in power installation
GB3906	AC metal enclosed switchgear (China)
IEC 60071-1	Insulation coordination - Part 1: Definitions, principles and rules
IEC 60071-2	Insulation coordination - Part 2: Application guide
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

Contact us

For more information please contact your local ABB representative or visit:

www.abb.com

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