

# S.A.F.E. Series | VMX

## Safer Access For Electricians

Motor Starting System 208 - 690VAC, 7.5 - 1000HP



Total safe main enclosure, no voltage with breaker off



- LED Voltage Detection System
- Line Surge Protection
- Low Voltage Box with 120 Vac limited energy
- Side Breaker Box with interlocked Flange Handle
- UL and IEC rated UL508 and IEC UL60947
- Direct on-line starting Contactor
- Redundant true thermal Motor overload protection
- Option NEMA rated Contactors
- Available in IEC 690 Vac
- Works in North America and European Union
- Modbus RTU Standard
- Touch Screen (Optional)

NEMA 4 / IP67 ENCLOSURE WITH OUTDOOR 3R KIT

# VMX S.A.F.E. Series

## The New Standard of Safety for Electricians

The VMX S.A.F.E. Series is the ultimate product in the market today for Low Voltage Control which allows a Service Engineer / Electrician to do the job safely with minimum PPE (Personal Protection Equipment).

### S.A.F.E VOLTAGE COMPARTMENTS

The S.A.F.E control has a low-voltage compartment which has limited energy 120 Vac signals available. All the control logic is in the isolated Low Voltage compartment along with a three phase 120 Vac test point for the primary voltage sensing and measuring. All keypads, meters, lights, relays and control logic are available in the low-voltage compartment. No need to open the high-voltage compartment to check control logic and status.

The 65 kA breaker at 480 Vac and surge device are located inside the side enclosure for safety. S.A.F.E. has a LED live voltage indicator connected to the output of the main breaker. The visual voltage indication would indicate the breaker is open and no voltage is present before entering the larger higher voltage Soft Start enclosure.

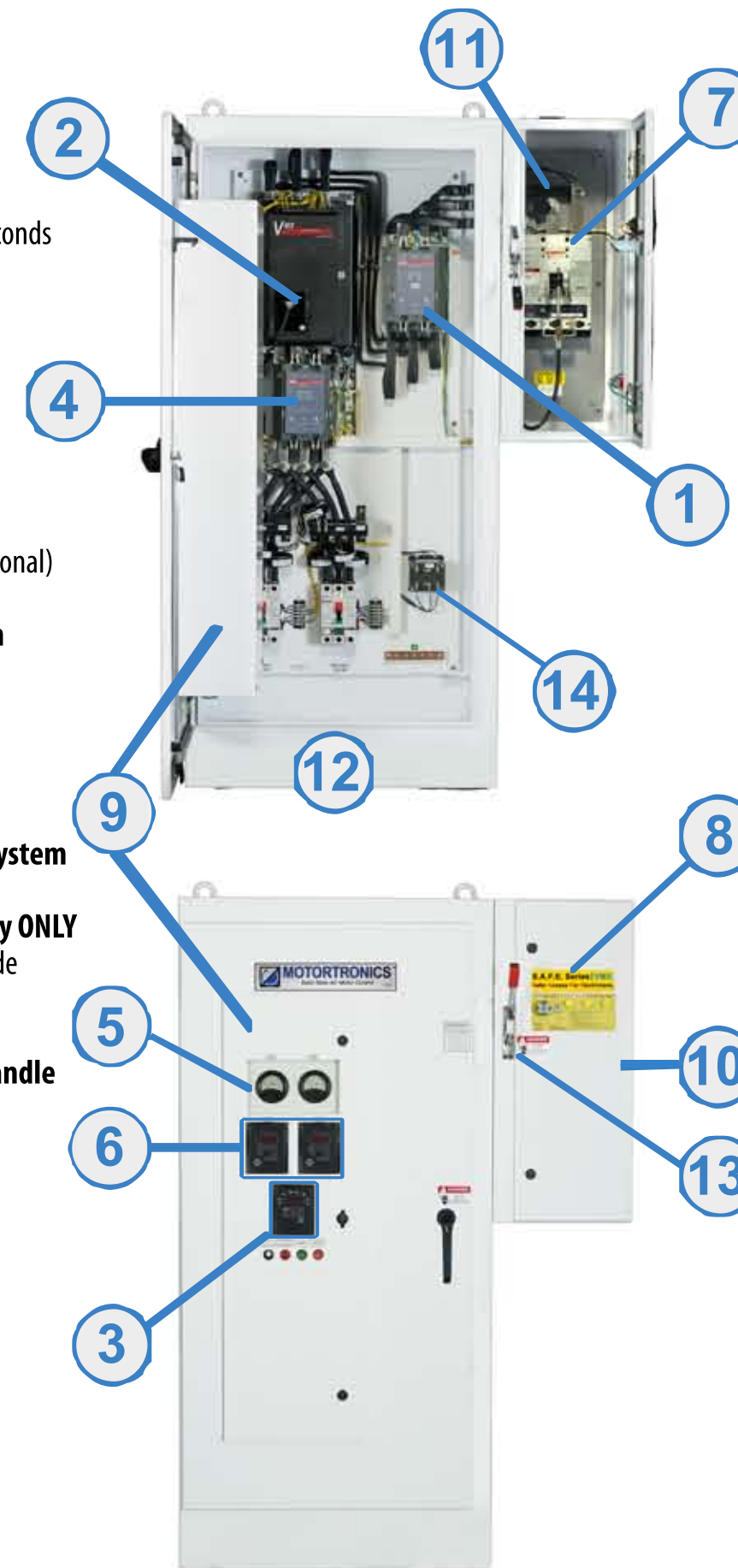
The service engineer or electrician can safely enter the large enclosure knowing that no voltage is present and limited PPE is required. An in-line isolation contactor is standard on all S.A.F.E. units so when the motor is off no voltage will be present on the motor leads. Safe for anyone working on the motor, equipment or soft starter control enclosure. Visual live line indication ensures the safety for all Service engineers and Electricians during lockout / tag out procedures.

### S.A.F.E. PROTECTION FEATURES

All S.A.F.E. units come with flanged mount lockable breaker which interlocks with both the side safety breaker box and the main soft start enclosure. The VMX S.A.F.E. Series also comes with redundant motor protection. Should the customer need a little extra torque and want to start the motor across the line the contactor and a full digital redundant motor protective relay (Rx Series) is provided to protect the motor while performing an across the line start without the Soft Starter. Option NEMA contactors are also available for long life. Both the Soft Start VMX and the Rx relay utilize true thermal modeling to ensure optimal motor protection and performance. When safety, long life and reliability is key and only the best will do --- choose -- S.A.F.E. Series the ultimate protection for Engineers / Electricians and Equipment.

# VMX S.A.F.E. Features

- 1. In-Line Contactor**  
No dangerous output voltage when off
- 2. SSRV Heavy Duty**  
Ansi 500% rated for 60 seconds / 600 % for 30 seconds
- 3. Smart -Multiple Ramp Profiles**
- 4. Heavy duty Direct On Line Rated**  
In-line and bypass Contactors
- 5. Analog and Digital Metering**  
In both soft start and across-the-line modes  
Advanced digital metering with Smart Panel (Optional)
- 6. Advanced Dual Redundant Motor Protection**  
True thermal modeling
- 7. 65 kA Breaker tested at 480 Vac \***  
Service entrance rated
- 8. Live Line Indication LED Voltage Detection System**
- 9. Low Voltage Box with 120 Vac Limited Energy ONLY**  
Three Phase 120 Vac test point from metering grade  
Voltage Transformer
- 10. Side Breaker Box with Interlocked Flange Handle**  
both doors locked while breaker is on
- 11. Surge Device**
- 12. Dual Motor (Optional)**
- 13. Flange Breaker Handle**
- 14. Open Delta Potential Transformer**  
3 Phase 120 Vac for low voltage box



# Advanced Motor Protection Features

### Overload Protection Method

Real-time Motor Thermal Modeling uses current sensors and microprocessor to continuously calculate motor temperature.

### Learned Dynamic Reset

Overload Trip will not reset unless motor has regained enough thermal capacity based on learned motor starting profiles.

### Phase Loss/Sequence Protection

Trips on any phase under 20% of Voltage. Sequence selectable A-B-C, C-A-B or Off

### Over Voltage Trip

Any phase voltage over trip level  
Of or 1-10% of set voltage, w/1-20 sec. delay

### Load Monitor (True Motor Power)

Under or Over kW trip or alarm  
Off, or 20-100% motor kW, w/1-20 sec. delay

### Equipment Ground Fault Protection

Electronic Residual current protection method, no additional CTs needed  
Setting: Off, 5-90% of CT w/1-60 sec. delay

### Starts-per-Hour Lockout

Programmable maximum starts-per-hour to prevent exceeding motor limits.  
Setting: Off or 0-10 start / Hr

### Retentive Thermal Memory

Remembers the thermal condition of the motor even if control power is lost. Thermal Register is adjusted for Off-Time when power is resumed.

### Programmable Service Factor

Service Factor setting automatically adjusts other settings to compensate.  
Adjustment Range: 1.0-1.15 SF

### Over-Current Trip

Electronic Shear-Pin / Shock Relay  
Setting: Off or 50-300% FLA w/1-20 sec. delay

### Under Voltage Trip on Startup

Off, or 1-30% of set voltage  
1-180 second startup time

### Power Factor Monitor

Leading or Lagging PF, trip or alarm  
Off, or 0.01-1.00, lead or Lag w/1-20 sec. delay

### Short Circuit / Shorted Load

Peak Current quick trip (electronic fuse)  
Trip level: Off or 800-1400% FLA, with .1-.5 sec. delay

### Minimum Time Between Starts

Used with or without Start-per-Hour protection to prevent short cycling of motor  
Setting: Off or 1-60 minutes between starts

### Dual Overload Curve Settings for RV Start

Start Curve can be set to Class 5-30  
Run Curve can be set to Class 5-30  
Automatic Full Speed detection and change over

### Current Imbalance Protection

Provides monitoring of phase-to-phase current levels and trips if imbalance exceeds setting.  
Setting: Off or 1-30% FLA w/1-20 sec. delay

### Under-Current Trip

Load-Loss /Loss of Prime protection  
Setting: Of or 10-90% FLA w/1-60 sec. delay

### Under Voltage Trip at Full Speed

Off, or 1-30% of set voltage  
1-20 second trip delay

### Frequency Monitor

Over or Under programmed frequency  
Trip Setting: Off, or 1-10Hz, w/1-20 sec. delay

### Restart Delay Timer

Programmable delay for restarting after a power failure for use in multiple installations.  
Setting: 0-999 sec.

### Coast-Down Timer

Back Spin or Anti-Wind Milling protection  
Prevents Restart after Stop Command  
Time Setting: Off or 1-60 min.

### AVAILABLE OPTIONAL FEATURES

- Motorized Remote Control Breaker
- Analog Amperage or Voltage Meter
- Msmart Touch Screen
- Hand Rails for Marine Applications
- NEMA Rated Contactors
- Electric Motor Heater for Damp Environments = No Strip Heaters to Fail - "MWH"
- Cabinet Heaters
- Ground Fault - Zero Sequence Current Transformer
- Dual Motor Option with Motor Protection
- GFI Safety Receptacle Plug in Low Enclosure
- NEMA 4X - 304 Stainless Steel Enclosure
- Low Voltage LED Lighting for Low Voltage Enclosure

Single Universal Smart HMI Panel for all Motortronics devices with support for 8 languages (Optional Msmart Touch Screen)

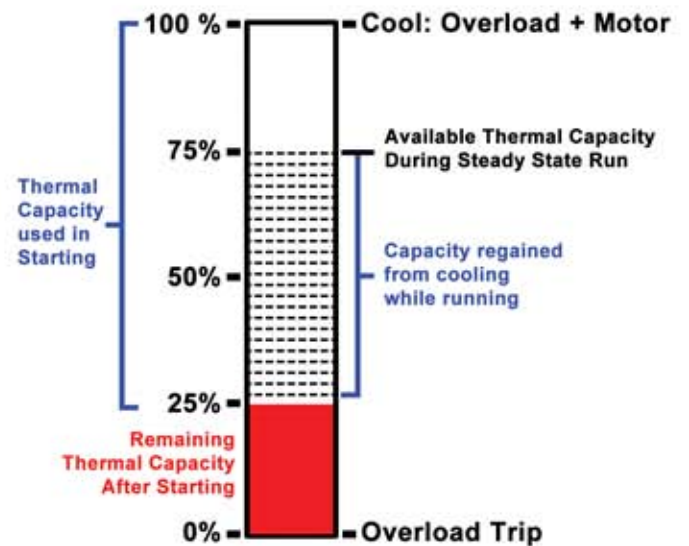


\* Contact Factory to confirm SCCR/Isc Ratings and other voltage Ratings.

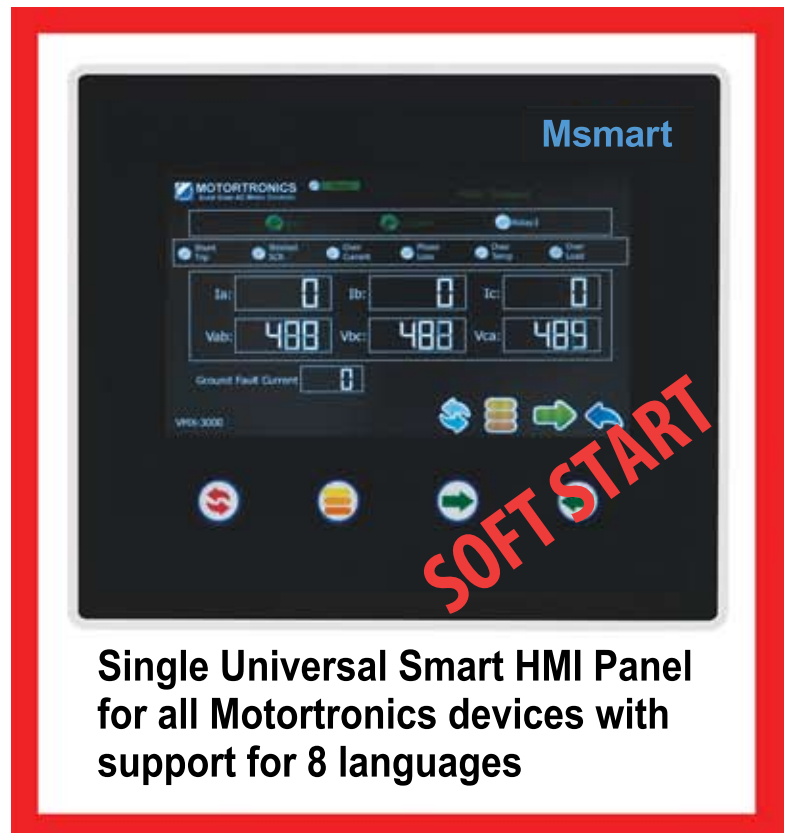


# Advanced Motor Protection

- ✓ **Real-Time Thermal Modeling**  
Continuously calculates motor operating temperature
- ✓ **Dynamic Reset Capacity**  
Knows when the motor is cool enough for a successful start
- ✓ **Separate Start & Run Overload Protection**  
For closely matched overload protection during start and run
- ✓ **Pre-start Shorted Load Protection**  
Checks for motor lead or winding damage before starting
- ✓ **Over Current Trip**  
Acts as an Electronic Shear Pin
- ✓ **Under Current Trip**  
Acts as a Load Loss Trip (broken belt monitor)
- ✓ **Phase Loss**  
Instantaneous tripping
- ✓ **Current Imbalance Trip**  
Adjustable level and time delay
- ✓ **Minimum Time Between Starts Lockout**  
Helps reduce utility demand charges
- ✓ **Coast Down Lockout**  
Inhibits Start attempts that could harm equipment
- ✓ **Starts per hour Lockout**  
Matches motor protection to motor or utility limits
- ✓ **Restart Delay**  
Allows for staggered starting of motors
- ✓ **Equipment Ground Fault**  
Residual Current type
- ✓ **Manual / Automatic Overload Reset**  
Match overload protection type to the application
- ✓ **Shorted SCR Lockout**  
Self Diagnostic



## Advanced Metering and Control with Msmart Touch Screen (Optional)

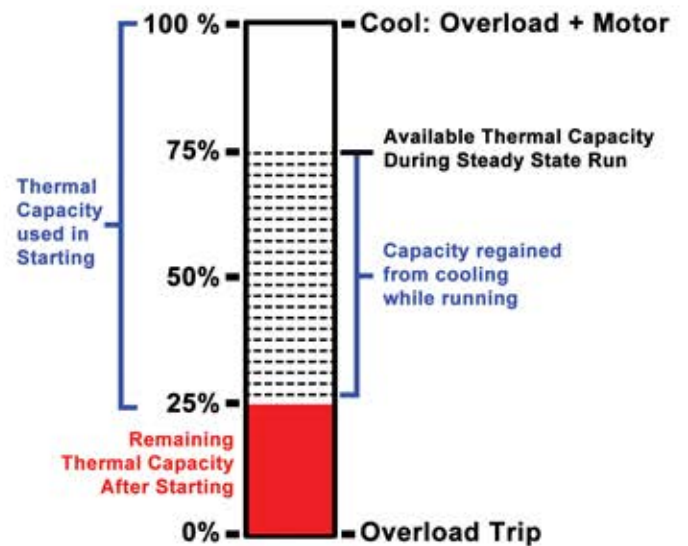


Single Universal Smart HMI Panel  
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# VMX S.A.F.E. Series



# VMX S.A.F.E. Available Models

## Ratings

Model Number	Max Amps <sup>(1)</sup>	Nominal Motor Rating				690V kW	Enclosure Size	Circuit Breaker
		208V HP	240V HP	480V HP	575V HP			
VMX2-SAFE-21-FS	25	7.5	7.5	15	15-20	C/F	2 ¼	40A FS
VMX2-SAFE-27-FS	34	10	10	25	30	C/F	2 ¼	50A FS
VMX2-SAFE-40-FS	42	10	15	30	30	C/F	2 ¼	60A FS
VMX2-SAFE-45-CB	54	15	20	40	50	C/F	2 ¼	100A CB
VMX2-SAFE-55-CB	68	20	25	50	60	C/F	2 ¼	100A CB
VMX2-SAFE-68-CB	80	25	30	60	75	C/F	2 ¼	100A CB
VMX2-SAFE-96-CB	96	30	30	75	75	C/F	2 ¼	150A CB
VMX2-SAFE-125-CB	130	40	50	100	75	C/F	2 ¼	250A CB
VMX2-SAFE-135-CB-NS4*	135	-	50	100	100	C/F	2 ¼	250A CB
VMX2-SAFE-156-CB	180	60	60	150	150	132	2 ¼	250A CB
VMX2-SAFE-220-CB	192	60	75	150	150	140	2 ¼	400A CB
VMX2-SAFE-270-CB-NS5*	270	-	100	200	200	C/F	2 ¼	400A CB
VMX2-SAFE-230-CB	250	75	100	200	250	185	2 ¼	400A CB
VMX2-SAFE-248-CB	312	100	125	250	300	220	2 ¼	600A CB
VMX2-SAFE-400-CB	361	125	150	300	300	250	2 ¼	600A CB
VMX2-SAFE-540-CB-NS6*	540	-	200	400	400	C/F	2 ¼	800A CB
VMX2-SAFE-480-CB	480	150	200	400	500	400	2 ¼	800A CB
VMX2-SAFE-600-CB	590	200	200	500	600	485	2 ¼	800A CB
VMX2-SAFE-690-CB	722	250	300	500	600	500	3	1200A CB
VMX2-SAFE-800-CB	750	-	300	600	600	500	3	1200A CB
VMX2-SAFE-810-CB-NS7*	810	-	300	600	600	C/F	3	1200A CB
VMX2-SAFE-960-CB	960	300	400	800	900	900	3	1200A CB
VMX2-SAFE-1215-CB-NS8*	1215	-	450	900	900	C/F	3	1600A CB
VMX2-SAFE-1080-CB	1080	350	450	900	1,000	1000	3	1600A CB

\* Contact factory for SCCR/Isc ratings

1 – Always confirm Motor FLA is less than Max AMP  
2 – 690 Vac products are kW rated and IEC

VMX S.A.F.E. DIMENSIONS (H x W x D in inches)

Frame Size	Main Lug Only	CBS (Side Box)
2 ¼	72" x 33.5" x 28.41"	72" x 48.77" x 28.41"
3	90" x 60" x 28.41"	90" x 60" x 28.41"

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