



MOTORTRONICS™

Solid State AC Motor Control

V MX Series

Compact soft starter

*Ratings from 18 to 1250A
(up to 1200HP)*



Integrated bypass contractor
Advanced motor protection
Narrow-width for MCC mounting
Low-profile for use in pump panels
Remote keypad mounting
Unique built-in features

The control & protection you expect in an innovative soft starter design...

VMX Series

Compact soft starter

with the advantages of selectable control

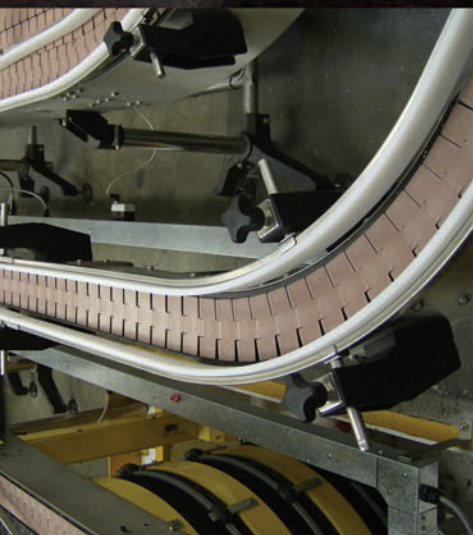
Flexibility of Control

Multiple ramp profiles, Pump-Flex™ Decel, process control timers and advanced motor protection make the VMX Series soft starter adaptable to a wide variety of AC motor applications... no need for add-on modules or costly auxiliary devices.

Compact packaging has become critical in more and more electrical installations. The VMX Series meets this need without compromising features and ratings.

By using a highly engineered packaging design and the latest generation microprocessor, all the control and protection features you need are in the VMX Series. Narrow and shallow dimensions are perfect for integrating the VMX Series into motor control centers (MCCs), pump control panels, and retrofit starter enclosures.

Choose the ramping method that works best for your load...

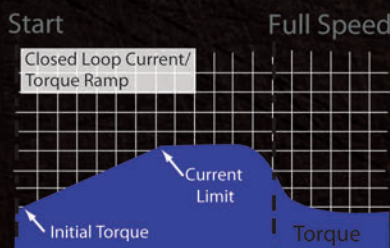


Pumps, Fans, Blowers & Conveyors

- Closed Loop Torque /Current (CLT™) Ramping provides a linear increase in output torque during acceleration.

It maximizes the available torque using an internal PID feedback loop, insuring a smooth, linear ramp up to full speed. Ideal for

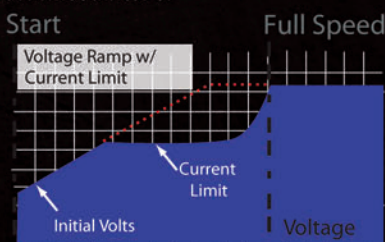
low pressure pumps where slight surges at the end of ramp may pose mechanical problems or on fans and mixers where blade warping can be an issue.



Compressors & Chillers

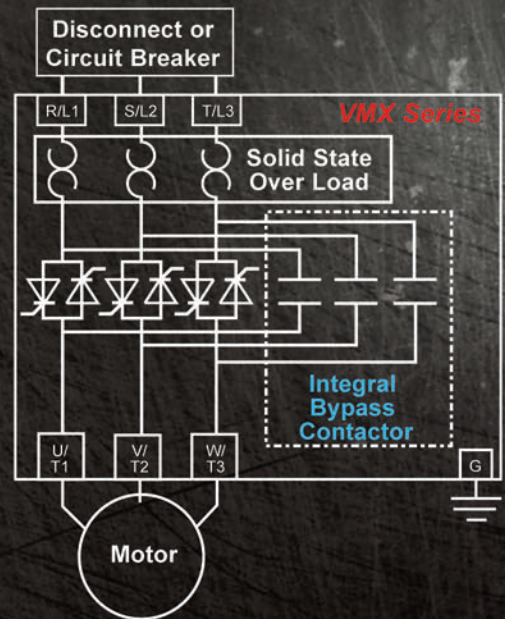
- Voltage Ramp with Current Limit for applications that need the smoothness of voltage ramping while maintaining the ability to start in limited power environments.

- For maximum motor power where the available power supply is severely limited, a Current Limit/Current Step start can be used.





Integral Bypass Contactors are standard on all sizes and provide maximum efficiency of panel space while maintaining the Motortronics reputation for being able to soft start most any load. The VMX Series is the only fully integrated, compact, world-class design offering uncompromised power and control capabilities.



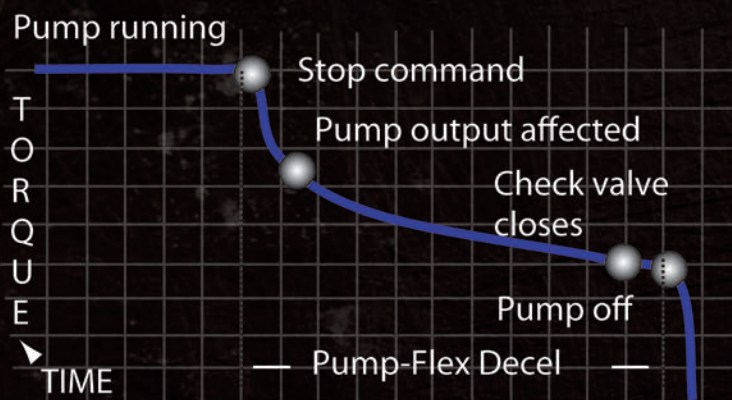
VMX Series

Compact soft starter

unique built-in features

Eliminate the damaging effects of "Water Hammer" 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.

Since no two pumps or pump applications are exactly the same, the flexible settings of Pump-Flex™ decel control allow you to tailor the output to precisely match your application requirements. No need for external timers or auxiliary controls.



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 shock wave, often referred to as "Water Hammer," is no longer a problem when you use Pump Flex™ decel control.

Minimize maintenance costs & downtime By gradually reducing motor torque using Pump-Flex™ decel control, the 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.

The VMX Series also includes...

Process Control Timer Ideal for irrigation pumps when a specific amount of water needs to be pumped even if a power failure or a fault trip occurs during operation

- 24 hour/ 7 day Time Clock Controller Built-in time clock with selectable days-to-minute feature
- Batch Process Timer Run for a set time after starting, even after power outage

Metering

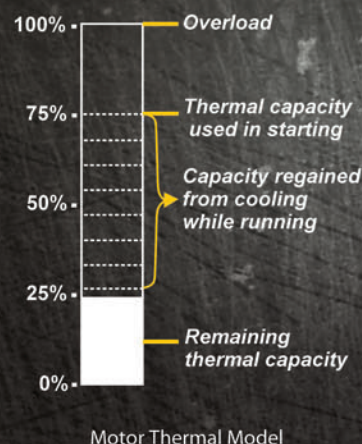
Elapsed time meter, run cycle counter, remaining lock-out time and fault history for maximum control and status of your pumps or processes.

World-class motor & system protection...

Separate Start & Run Overload Protection Two programmable overload trip curves allow for the thermal capacity required to start the load, while providing more closely matched overload protection during the run time.

Real-Time Thermal Modeling

a dynamic thermal register continuously calculates motor operating temperature even when your motor is not running. Knows when the motor is cool enough for a successful restart.



✓ **Equipment ground fault trip and monitoring** (residual current method)

✓ **PTC thermistor input** for use on motors with embedded PTC temperature sensors

✓ **Current imbalance trip** and biasing of the thermal register

✓ **Phase loss protection** based on current and voltage

✓ **Electronic shear pin trip** (overcurrent) with trip delay

✓ **Load loss trip** (under current) with trip delay

✓ **Phase rotation protection**

✓ **Pre-start shorted load protection** checks for motor lead or winding damage

V^{MX} Series

Compact soft starter

In a soft starter that is easy to install

Unique, Compact Design

- Narrow width for MCC (motor control center) mounting
- Integrated bypass contactor
- Low profile for use in pump panels & other shallow enclosures
- Remote mount keypad capability
- Generous power terminal landing pads
- Pull apart control terminals for easy assembly & wiring
- Built-in features eliminate adding discreet devices
- Process control timers, metering, decel control, communications, and more



Remote Mount Keypad Option

Remotely mount the keypad and display up to 10 feet from the base unit, with NEMA 1 or NEMA 4/12 bezels

Retentive Thermal Memory

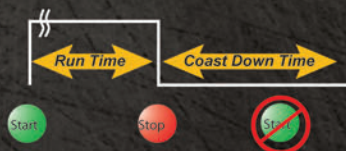
Remembers the motor thermal condition even in the event of a power loss or blackout. Extrapolates motor temperatures using a real-time clock.

Dynamic Reset Capacity

Overload will not reset until thermal capacity in the motor is sufficient for a successful restart. Starter learns and retains this information from previous starts.

- ✓ **Running short circuit trip** acts like a high speed "electronic fuse"
- ✓ **Shorted SCR lockout**, defeatable for "must run" situations
- ✓ **Bypass discrepancy monitoring** ensures the Bypass Contactor closes

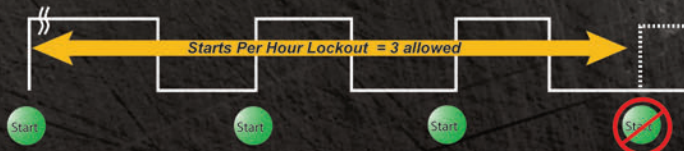
Back-spin timer ensures coast-down before restart



Minimum time between starts lock-out



Starts-per-hour lockout to prevent motor damage



- ✓ **Over temperature trip** keeps track of heat sink temperature to avoid SCR damage
- ✓ **Shunt trip** detects welded contactor or multiple shorted SCRs (when used with shunt trip breaker)

- ✓ **Remaining thermal capacity** metering, to predict overloads
- ✓ **Metering** of A, B, C phase and ground fault currents

V

MX Series

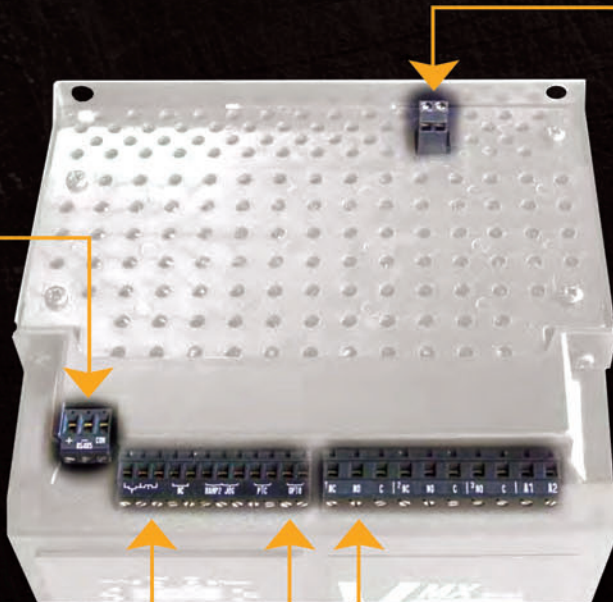
Compact soft starter

The features of
a protection relay at no additional cost!

Easy to wire & easy to use

Flexible Inputs & Outputs Put You in Control!

Easy access RS-485 comm port with Modbus RTU protocol built-in, no add-on communications module needed.



Simple control wiring:
2 or 3 wire Start/Stop, N.C. Interlock, PTC /E-Stop, Jog and Dual Ramp, all operated at 24VDC for safety.

Dedicated fault triac with opto-isolation for PLC interface or connecting to an external relay.

Emergency Bypass Input

simple contact closure allows for independent control of the Bypass contactor when emergency across-the-line starting is needed. (For applications requiring full voltage, line start capability, select model based on HD ratings shown on page 6).

3 dry contact relays:

2 FORM C and 1 FORM A, all fully programmable for over 30 functions including, Run, At Speed, End of Decel, nine other status indicators and 13 trip indicators, including an option to flash on certain faults.

VMX Series

Compact soft starter

Ratings

Bypass Packages Available in NEMA 1, 4 and 12

VMX Series Soft Starter with Integral Bypass Contactor - NEMA & IEC Ratings

| Model Number | Adjustable Range (AMPS) | Max FLA | | Nominal Motor Rating (50/60 Hz) | | | | | | | | Nominal Motor Rating (50 Hz) | | | | | |
|--------------|-------------------------|---------|------|---------------------------------|-----|-----------|-----|-----------|------|-----------|------|------------------------------|------|-----------|------|-----------|------|
| | | | | Maximum HP/Voltage (NEMA) | | | | | | | | Maximum kW/Voltage (IEC) | | | | | |
| | | | | 200V / HP | | 230V / HP | | 460V / HP | | 575V / HP | | 220V / kW | | 380V / kW | | 415V / kW | |
| | | HD | SD | HD | SD | HD | SD | HD | SD | HD | SD | HD | SD | HD | SD | HD | SD |
| VMX-18-BP | 9 - 18 | 11 | 18 | 3 | 5 | 3 | 5 | 7.5 | 10 | 7.5 | 15 | 2.2 | 3.7 | 3.7 | 7.5 | 5.5 | 7.5 |
| VMX-28-BP | 14 - 28 | 21 | 28 | 5 | 7.5 | 5 | 7.5 | 15 | 20 | 15 | 25 | 5.5 | 7.5 | 7.5 | 11 | 7.5 | 11 |
| VMX-39-BP | 19 - 39 | 27 | 39 | 7.5 | 10 | 7.5 | 10 | 20 | 25 | 20 | 30 | 7.5 | 11 | 11 | 18.5 | 11 | 18.5 |
| VMX-48-BP | 24 - 48 | 40 | 48 | 10 | 10 | 10 | 15 | 25 | 30 | 25 | 40 | 11 | 11 | 18.5 | 22 | 18.5 | 22 |
| VMX-62-BP | 31 - 62 | 45 | 62 | 10 | 15 | 15 | 20 | 30 | 40 | 30 | 60 | 11 | 15 | 22 | 30 | 22 | 30 |
| VMX-78-BP | 39 - 78 | 55 | 78 | 15 | 20 | 20 | 25 | 40 | 50 | 40 | 75 | 15 | 18.5 | 22 | 37 | 30 | 37 |
| VMX-92-BP | 46 - 92 | 68 | 92 | 20 | 25 | 25 | 30 | 50 | 60 | 50 | 75 | 18.5 | 22 | 30 | 45 | 37 | 45 |
| VMX-112-BP | 56 - 112 | 80 | 112 | 25 | 30 | 30 | 40 | 50 | 75 | 50 | 100 | 22 | 30 | 37 | 55 | 45 | 55 |
| VMX-150-BP | 75 - 150 | 96 | 150 | 30 | 40 | 30 | 50 | 60 | 100 | 60 | 125 | 22 | 45 | 45 | 75 | 55 | 75 |
| VMX-160-BP | 80 - 160 | 125 | 160 | 40 | 50 | 40 | 60 | 75 | 125 | 75 | 150 | 30 | 45 | 55 | 75 | 55 | 75 |
| VMX-210-BP | 105 - 210 | 156 | 210 | 50 | 60 | 60 | 75 | 100 | 150 | 125 | 200 | 45 | 55 | 75 | 110 | 75 | 110 |
| VMX-275-BP | 138 - 275 | 220 | 275 | 60 | 75 | 75 | 100 | 150 | 200 | 150 | 250 | 55 | 75 | 110 | 132 | 110 | 150 |
| VMX-361-BP | 181 - 361 | 248 | 361 | 75 | 125 | 100 | 125 | 200 | 300 | 200 | 350 | 75 | 110 | 132 | 185 | 132 | 200 |
| VMX-450-BP | 225 - 450 | 400 | 450 | 125 | 150 | 125 | 150 | 250 | 350 | 300 | 450 | 110 | 132 | 200 | 220 | 220 | 250 |
| VMX-550-BP | 275 - 550 | 480 | 550 | 150 | 150 | 200 | 200 | 400 | 450 | 500 | 500 | 132 | 160 | 250 | 285 | 265 | 305 |
| VMX-600-BP | 300 - 600 | 600 | 600 | 200 | 200 | 250 | 250 | 500 | 500 | 600 | 600 | 185 | 185 | 300 | 315 | 330 | 330 |
| VMX-882-BP | 431 - 862 | 690 | 862 | 250 | 250 | 250 | 300 | 500 | 600 | 600 | 700 | 200 | 250 | 360 | 450 | 380 | 475 |
| VMX-900-BP | 450 - 900 | 800 | 900 | 250 | 300 | 300 | 350 | 600 | 700 | 600 | 900 | 220 | 275 | 420 | 470 | 440 | 500 |
| VMX-1006-BP | 503 - 1006 | 960 | 1006 | 300 | 350 | 350 | 400 | 700 | 800 | 900 | 1000 | 255 | 310 | 475 | 525 | 500 | 555 |
| VMX-1250-BP | 625 - 1250 | 1080 | 1250 | 350 | 450 | 450 | 450 | 900 | 1000 | 1000 | 1200 | 330 | 385 | 565 | 655 | 600 | 695 |

Notes:

1. Data is based on NEC Table 430-150, full load current three phase motors. Size soft starter based on actual motor nameplate FLA.
2. Heavy Duty Rating (HD): 500% capacity for 60 seconds, 1.15 S.F., Line start (A-T-L) full voltage bypass (except VMX-1250 - BP which is shunt rated only)
3. Standard Duty Rating (SD): 500% capacity for 20 seconds, 1.0 S.F., shunt rated bypass. Add "-N" to the Model Number for NEMA1 or "-E" for NEMA12

Specifications

Power Components

6 SCRs in inverse parallel pairs for full phase angle soft start control (1600V PIV)
RC snubber for dv/dt protection of each SCR pair

Line Voltage Range

200 to 600 VAC, 3 phase +10% -15% , 50/60Hz

Current Ratings

18 - 1250A depending on unit selection
Range of each unit is 50-100% of max current rating

AC Supply Voltage

User supplied 120VAC +10% -15% tolerance, 60Hz
Optional 240VAC 50Hz control available

Start/Stop Control Choices

2-wire Run-Stop using dry contacts
3-wire Start/Stop with built-in seal in contact
N.C. Interlock input (dry contact) for remote devices

Ramp Control Choices (4 built-in)

Voltage Ramp
Voltage Ramp with Current Limit
CLT© Closed Loop Torque Ramp (Current Ramp)
Current Step (current limit only)
Ramp times adjustable 1 - 120 seconds
Current Limit adjustable 200 - 600% of FLA

Dual Ramps

Select via dry contact closure between any combinations of the above

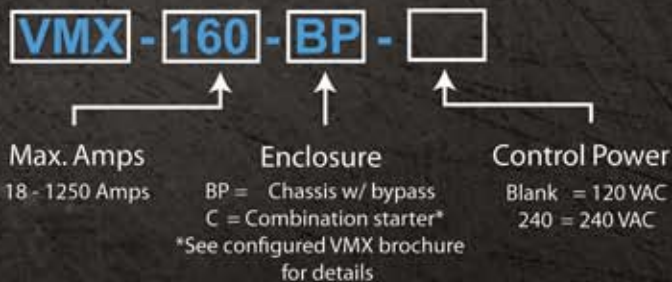
Jog

Dry contact closure selects a non-ramping Jog function at an adjustable torque level

Kick Start

10 - 100% starting torque for 0.1 - 2 seconds

Dimensions & Shipping Weights



Bypass Packages Available in NEMA 1, 4 and 12

| Model Number | H inches (mm) | W inches (mm) | D inches (mm) | Shipping Weight Approx lbs (kg) |
|------------------------------|------------------|------------------|------------------|---------------------------------------|
| VMX-18-BP thru VMX-48-BP | 8.85 (225) | 8.00 (203) | 6.65 (169) | 13 (5.9) |
| VMX-62-BP thru VMX-112-BP | 14.00 (355.6) | 8.00 (203) | 6.65 (169) | 23 (10.4) |
| VMX-150-BP thru VMX-160-BP | 19.00 (482.6) | 8.00 (203) | 6.65 (169) | 40 (18) |
| VMX-210-BP | 28.1 (713.7) | 12.5 (317.5) | 9.1 (231) | 130 (59) |
| VMX-275-BP | | | | 140 (63.5) |
| VMX-361-BP thru VMX-450-BP | | | | 145 (65.8) |
| VMX-550-BP thru VMX-600-BP | 29.50 (749.3) | 12.5 (317.5) | 9.1 (231) | 165 (74.8) |
| VMX-862-BP thru VMX-900-BP | 44.25 (1124) | 25.5 (647.7) | 11.86 (301.3) | Contact Factory |
| VMX-1006-BP thru VMX-1250-BP | 50.77 (1289.6) | 25.5 (647.7) | 13.28 (337.3) | |

Note: Dimensions and weights are for reference only and are subject to change.

Pump-Flex™ Deceleration Ramp

Fully adjustable to match field conditions:
Begin Decel setting, 0 - 100% of line voltage
Decel ramp time, 1 - 60 seconds
End Decel setting (Off), 0 - 1% of Begin setting

Restart Delay Timer (Sequential Start Delay)

Programmable time delay 1 - 999 seconds after loss of control power for staggered restarts

Time Clock Controller

24 hour/7 day time clock to provide automatic start
Up to 7 start events per day
Select operation from 1 through 7 days per week
Run time determined by process control timer

RS-485 Serial Communications

Up to 247 starters per link
Modbus RTU protocol built-in

Process Control Timer (choice of either)

Minimum Run (Batch) Timer

1 - 999 minutes
Runs until time expires, resets only if expired
Resumes and finishes if stopped or power is lost

Permissive Run Timer

1 - 999 minutes
Only allows operation during active run time

Operator Interface

Tactile feedback keypad
Easy to read LED display
Run and fault status indicators





World Class Products & Service

Other soft starter products available from Motortronics



VMX "Configured" Soft Starter

- Combination starter with built-in circuit breaker
- NEMA 12 (IP54) enclosure
- "Smart Door" operator panel
 - Programming
 - Diagnostics
 - Metering
 - Pilot lights, pushbuttons and switches
- Control power transformer
- Terminal strip for customer interface



Medium Voltage Soft Starter MVC Plus Series

- 2.3 to 15kV
- Ratings up to 1500A
- Advanced motor protection
- Heavy duty design
- Stand alone units or custom lineups
- Specialty motor applications
 - multi-motor
 - synchronous
 - and more...

CORPORATE HEADQUARTERS

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