



MOTORTRONICS™

Solid State AC Motor Control

VMX-agility™

IEC – QUICK START GUIDE

200-600V, 17 – 361Amps



OLED

Display Event History with Real Time Clock

3S

Smooth Start and Stop with Stable Acceleration and Deceleration

6

Operation Languages to choose from

OL

Motor Protection with Thermal Memory Feature

Connect

2 DI / 2 DO
Modbus RTU
USB

APPS

23 Pre-Loaded Applications to choose from

Fire Mode

Continue Running to Destruction in Emergency

Bypass

Internal Bypass is Standard on all Sizes

VMX-agility™ Quick Start Guide

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[Full User Manual (MAN-AGY-015) available from www.motortronics-uk.co.uk]

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Safety

Important information

Installers should read and understand the instructions in this guide prior to installing, operating, and maintaining the soft start. The following symbols may appear in this guide or on the soft start to warn of potential hazards or to draw attention to certain information.



Dangerous Voltage

Indicates the presence of a hazardous voltage which could result in personal injury or death.



Warning/Caution

Indicates a potential hazard. Any instructions that follow this symbol should be obeyed to avoid possible damage to the equipment, and personal injury or death.




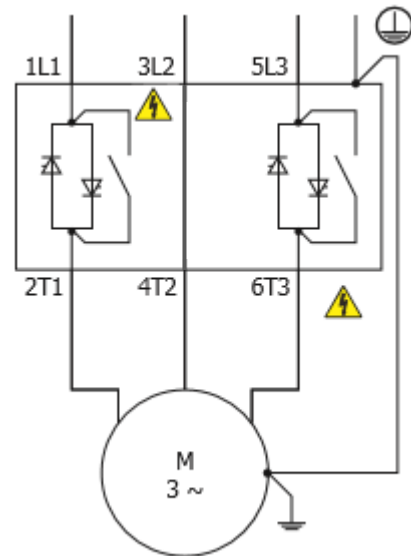
Protective Earth (Ground)

Indicates a terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault.

Caution Statements

The examples and diagrams in this manual are included solely for illustrative purposes. The information contained in this manual is subject to change at any time and without prior notice. In no event will responsibility or liability be accepted for direct, indirect, or consequential damages resulting from the use or application of this equipment.


VMX-agility™ soft starts contain dangerous voltages when connected to the mains supply. Only qualified personnel that have been completely trained and authorised, should carry out installation, operation, and maintenance of this equipment.
Installation of the soft start must be made in accordance with existing local and national electrical codes and regulations and have a minimum protection rating.
It is the responsibility of the installer to provide suitable grounding and branch circuit protection in accordance with local electrical safety codes.
This soft start contains no serviceable or re-usable parts.
The STOP function of the soft start does not isolate dangerous voltages from the output of the soft start. An approved electrical isolation device must be used to disconnect the soft start from the incoming supply before accessing electrical connections.



Installation

Mounting

Fix the unit to a flat, vertical surface using the mounting holes (or slots) on its baseplate. The mechanical outline diagrams, shown on Page 5-7, give the dimensions and mounting hole positions for each model. Ensure that:

- The orientation of the unit has the 'TOP' uppermost.
- The location allows adequate front access.
- You can view the screen.
- Do not install other equipment that generates significant heat close to the soft starter.

Requirements for an Enclosure

For a typical industrial environment, an enclosure would provide the following:

- A single location for the unit and its protection/isolation switchgear.
- The safe termination of cabling and/or busbars.
- Means to effect proper air flow through the enclosure.



Enclosure Ventilation

When fitting VMX-agility™ into a cabinet, ventilation must be provided if the heat output of the unit is greater than the cabinet will dissipate. The heat dissipated can be approximated with the formula:

Starting

Watts (VMX-agility™) = start current(A) x start time(s) x number of starts per hour/1800

Running

Watts (VMX-agility™) = 0.4 x running amps.

Use the following formula to determine the fan requirement. An allowance has been incorporated into the formula so that the figure for Q is the air delivery in the fan suppliers' data.

$$Q = (4 \times W_t / (T_{max} - T_{amb}))$$

Q = Volume of air (cubic metres per hour-m³/h)

W_t = Heat produced by the unit and all other heat sources within the enclosure (Watts) T_{max} = Maximum permissible temperature within the enclosure (40°C for a fully rated VMX-agility™)

T_{amb} = Temperature of the air entering the enclosure (°C) [to work in CFM, substitute °F for °C. Q is now in CFM]

Altitude Derate

Altitude above sea level 1000m (3281ft). Above 1000m derate by 1% of VMX-agility™ i.e. per 100m (328ft) to a maximum altitude of 2000m (6562ft).

Ambient Temperature Derate

-20°C (-4°F) to 40°C (104°F). Above 40°C derate linearly by 2% of VMX-agility™ i.e. per °C to a maximum of 60°C (140°F).

Installation (continued)

Handling

The VMX-agility™ soft start range comprises 3 frame sizes, with various weights and dimensions. See pages 5-7 for further information.

Prior to installing the VMX-agility™ unit, the installer should carry out a risk assessment. If considered appropriate, a suitable handling device should be used.

Do not lift the VMX-agility™ unit by attachment to the 3-phase terminal connections or busbars.

WARNING

HANDLING AND LIFTING HAZARD

Ensure the area below any equipment is clear of all personnel and property.

Failure to follow this practice may result in death, serious injury, or damage to equipment.

Accessories

The following accessories have been developed and tested for use with the agility range of soft starts:

VMX-AGY-012 Remote keypad for VMX-AGY-101 to VMX-AGY-305. Provides remote functionality for up to 32 soft starter units.

VMX-AGY-021 100Vac – 240Vac power supply. Provides mains voltage control power and digital control functionality. **For use with VMX-AGY-101 to VMX-AGY-305.**

VMX-AGY-030 Cooling fan accessory for VMX-AGY-101 to VMX-AGY-113 only. Increases the number of starts per hour (see page 20).

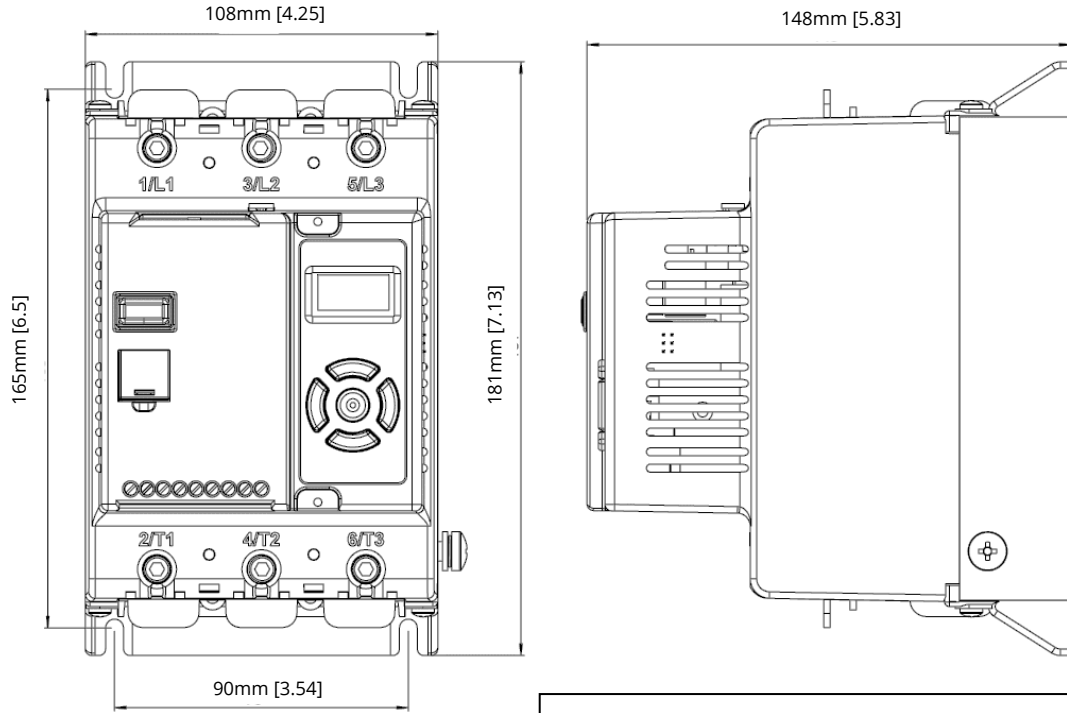
VMX-AGY-031 Cooling fan accessory for VMX-AGY-201 to VMX-AGY-209 only. Increases the number of starts per hour (see page 20).

VMX-AGY-061 – Terminal Shroud. Please refer to MAN-AGY-025.

Installation (continued)

Dimensions VMX-AGY-101 to VMX-AGY-113

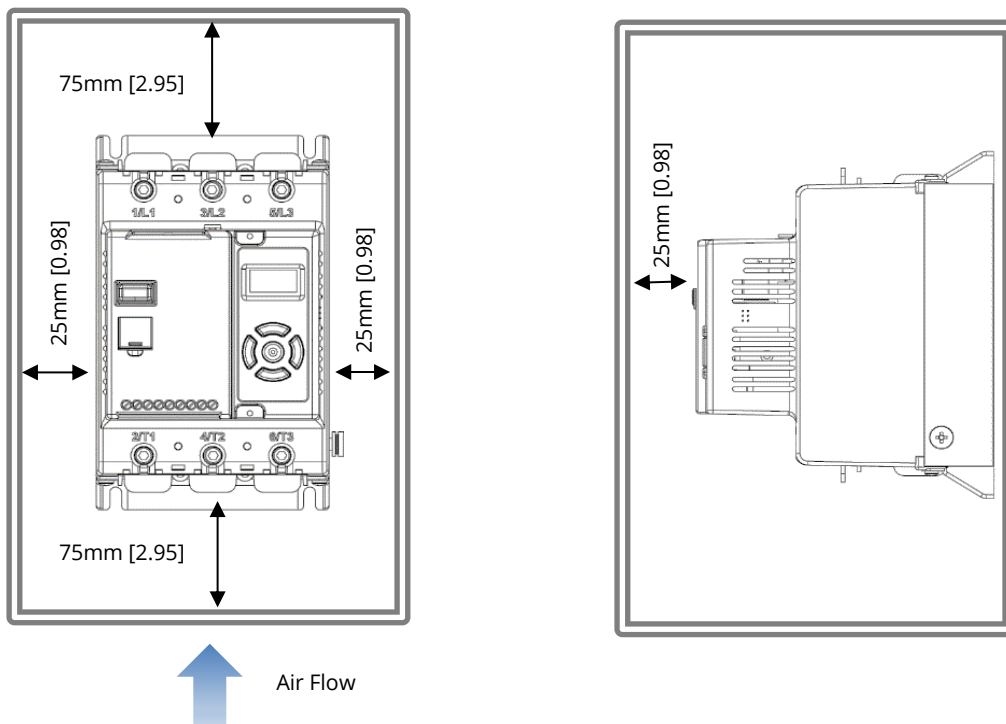
[] = inch



Weight 1.97kg (4.2lb)

Note: VMX-agility™ may be horizontally mounted with deration. See Horizontal Mounting Rating Tables

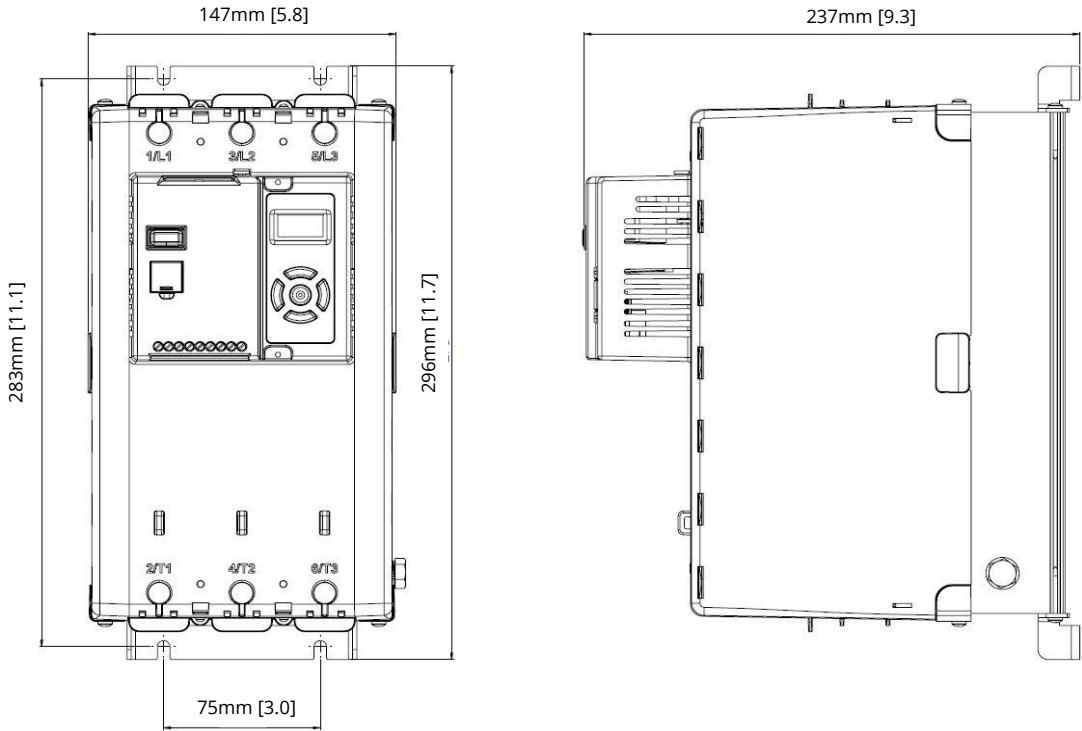
Fitting



Installation (continued)

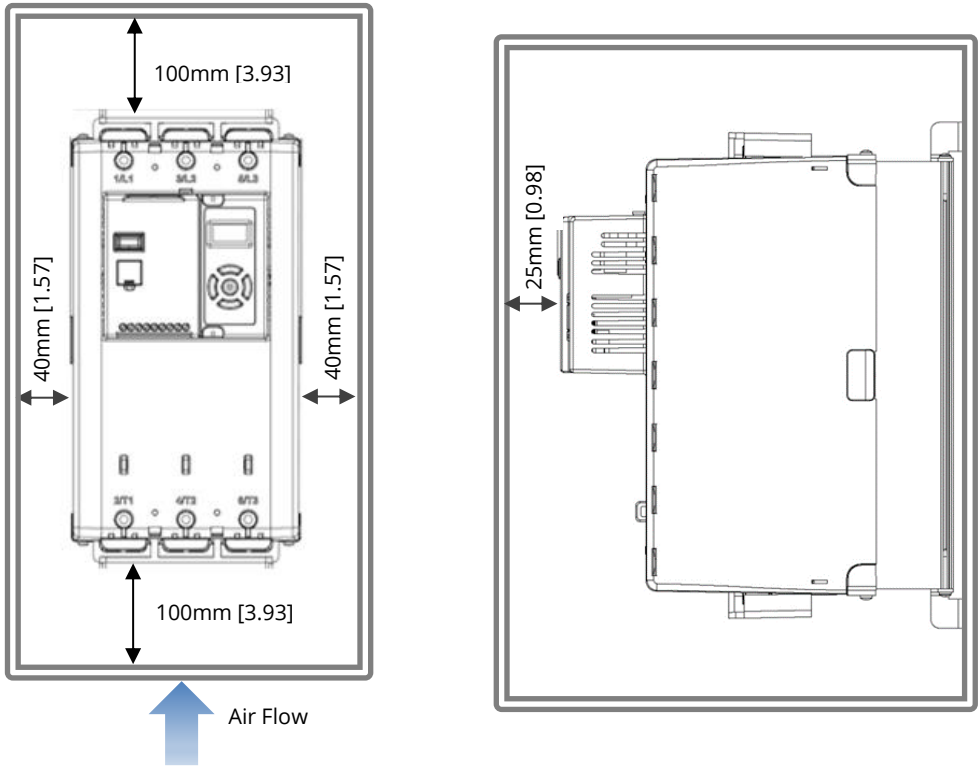
Dimensions VMX-AGY-201 to VMX-AGY-209

[] = inch



Weight 6 kg [13.22lb]

Fitting

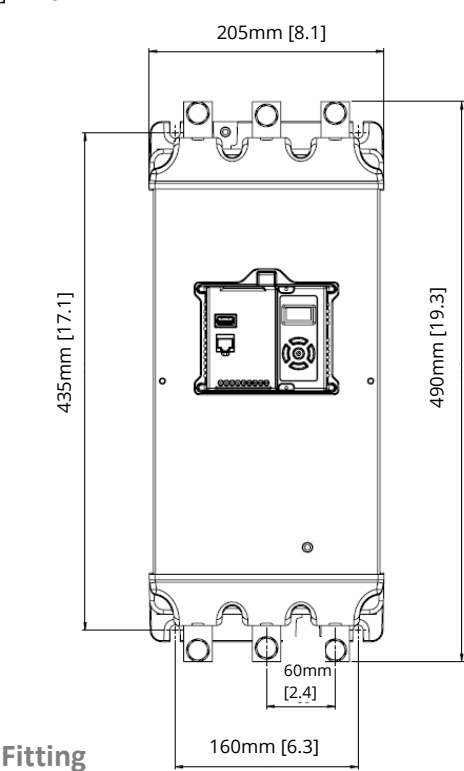


Installation (continued)

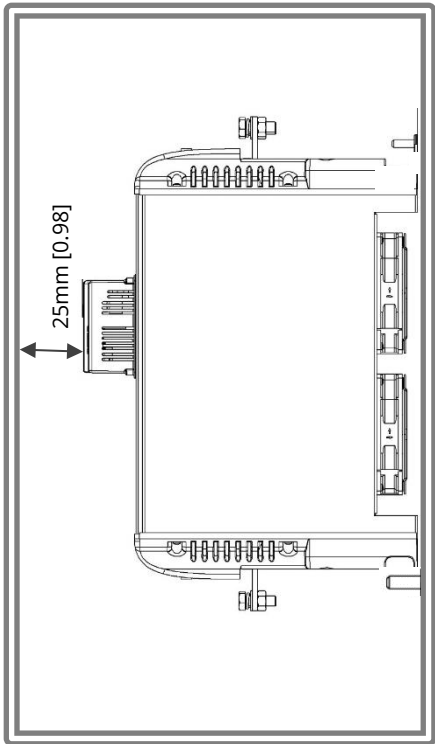
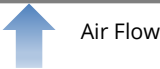
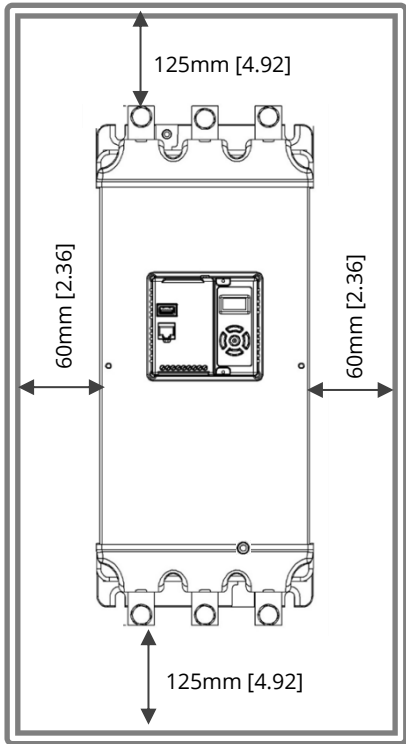
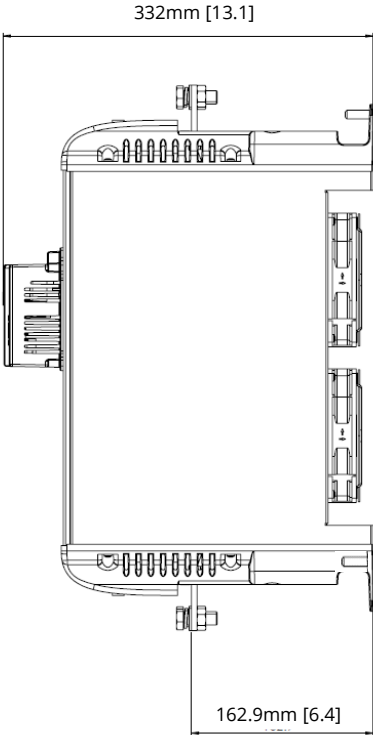
Dimensions VMX-AGY-301 to VMX-AGY-305

Weight 15kg [33.10lb]

[] = inch



Fitting



Electrical Installation

Warnings

Isolation



Caution: VMX-agility™ uses semiconductor devices in the main circuit and is not designed to provide isolation. For this reason, isolation means must be installed in the supply circuit in accordance with the appropriate wiring and safety regulations.

Electrical Control Supply Requirements



All electrical connections are made to power input and output terminals, control terminals and an earth stud.

Fuse Protection



The Mains Supply and the Control Supply each require protection. Although all units have electronic overload protection for the Soft Starter, the installer should always fit fuses, for motor protection, between the unit and the Mains Supply, not between the unit and the motor. Semiconductor fuses can be supplied as an option for short-circuit protection of the semiconductors. These fuses must be fitted externally to the VMX-agility™ chassis to comply with certain standards. It is the responsibility of the installer and system designer/specifier to ensure that the required standards or regulations are not affected by so doing.

Safety



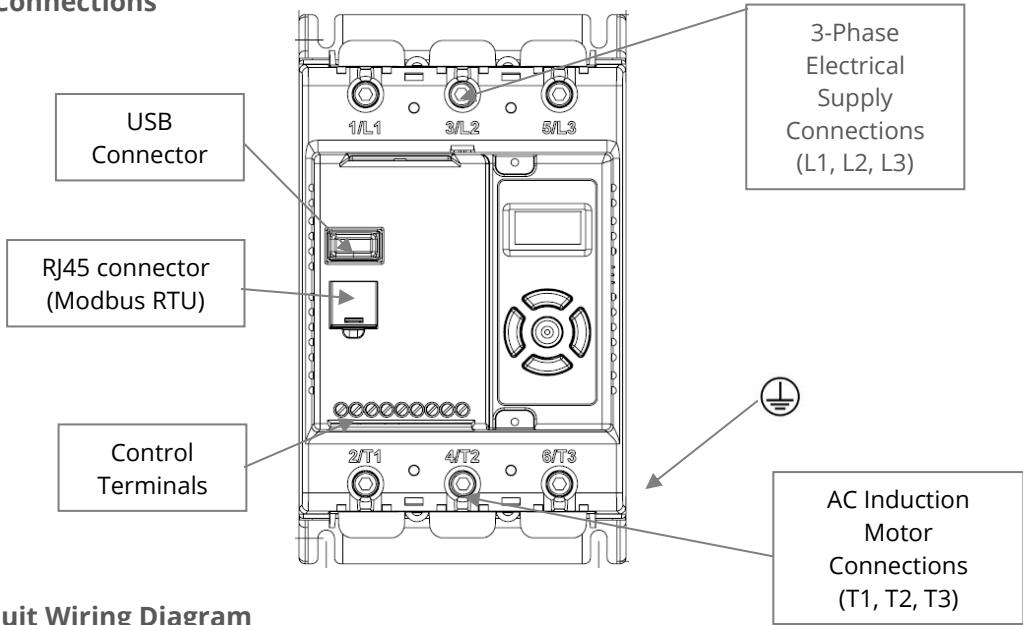
VMX-agility™ soft starters contain hazardous voltages when connected to the electrical power supply. Only qualified personnel who are trained and authorized should carry out installation, operation, and maintenance of this equipment. Refer to and carefully follow all of the 'Warnings' section at the beginning of this user manual, as well as other warnings and notes throughout the manual.

Electrical Supplies

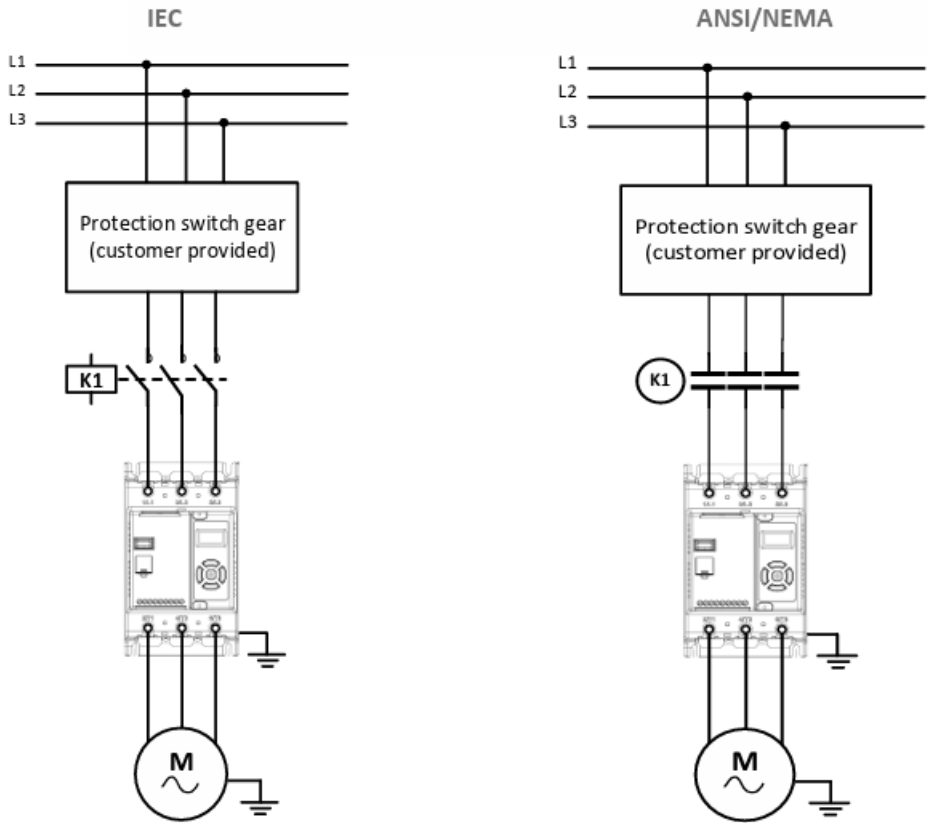
The unit requires a balanced 3-phase Mains Supply to provide the power for the controlled motor. Additionally, a 24Vdc supply, or VMX-AGY-021 is required for the internal control circuitry. The unit will not operate unless the control supply voltage is within the specified limits.

Electrical Installation (continued)

Electrical Connections



Mains Circuit Wiring Diagram

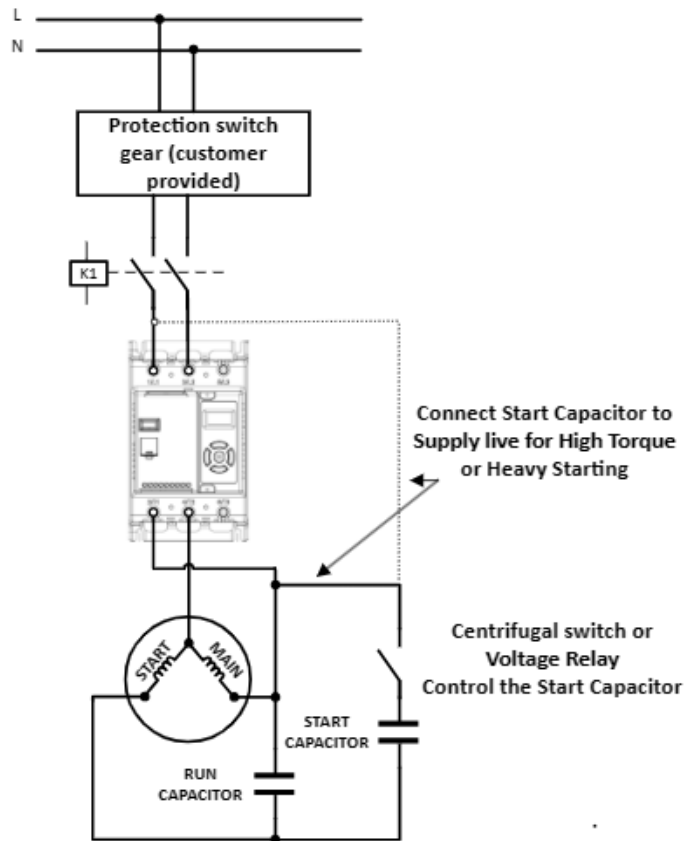


Electrical Installation (continued)

Single Phase Operation

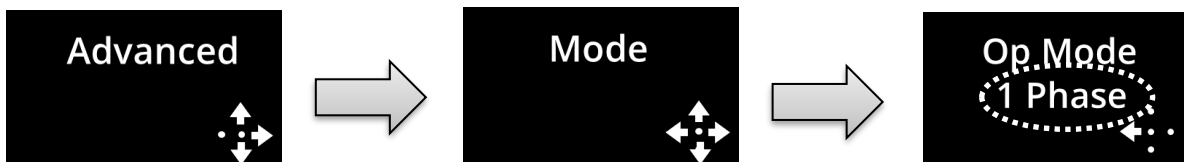
VMX-agility™ soft starts may be operated with a single-phase supply and motor. The base rating of the unit is unchanged.

Electrical Connection



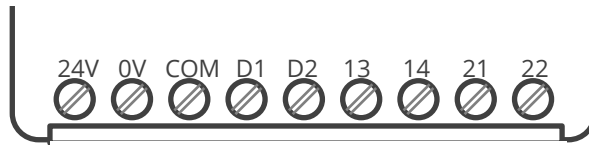
For additional information please see document TSD-010 Soft Starting and Single Phase Motor Control on our website.

For single phase operation the mode of the soft start must be set correctly in the Advanced menu:



Electrical Installation (continued)

Control Terminal Connections



Control Terminal Functions

Terminal	Description	Default	Function Selectable	Note
24Vdc	Control Supply +Us	-	No	#1
0V	Control Supply -Us	-	No	
COM	Digital Inputs Common	-	No	
D1	Digital Input 1	-	No	#2
D2	Digital Input 2	-	Yes	#2
13/14	Main Contactor Control (Run Relay)	-	Yes	#3
21/22	Fault Relay	-	Yes	#3

#1 24Vdc Specification: See General Specification (page 18) for VA rating, residual ripple < 100mV, spikes/switching peaks < 240mV, Turn On/Off response no overshoot of Vout, Overvoltage voltage protection output voltage must be clamped <30Vdc

#2 The voltage applied to the digital inputs D1 and D2 must not exceed 24Vdc

#3 250Vac, 2A, Cosφ =0.5

Digital Input 2 (D2) Selectable Functions

Different functions may be assigned to Digital Input 2 in the I/O menu. Available assignments are:

- D1 Prog - Reset
- D1 Prog - Hold Start Ramp
- D1 Prog - Enable
- D1 Prog - Fire Mode



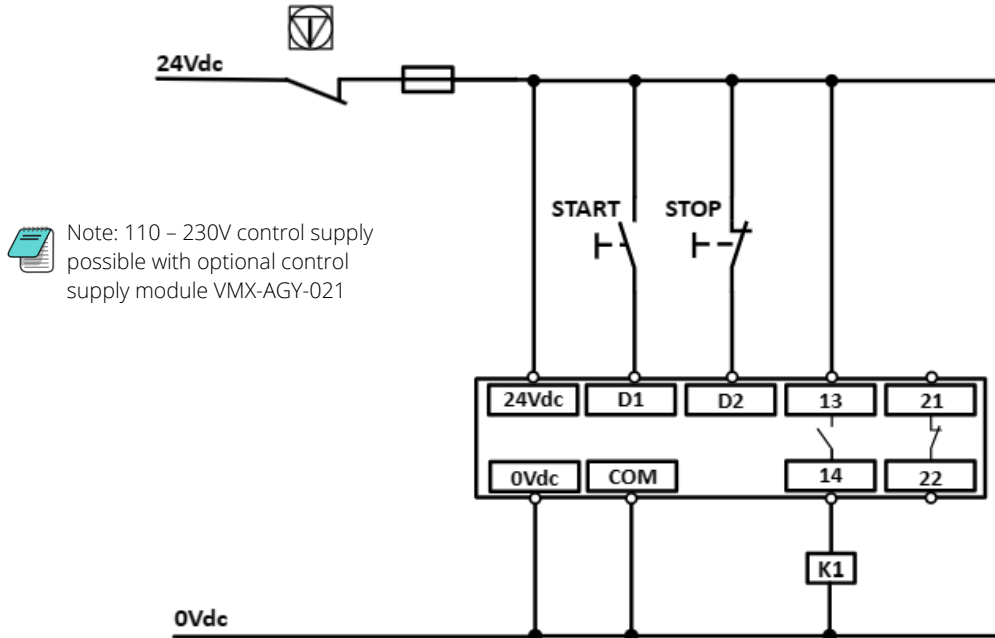
In Fire Mode all trips are disabled.

Digital Outputs 13, 14, 21, 22 Selectable Functions

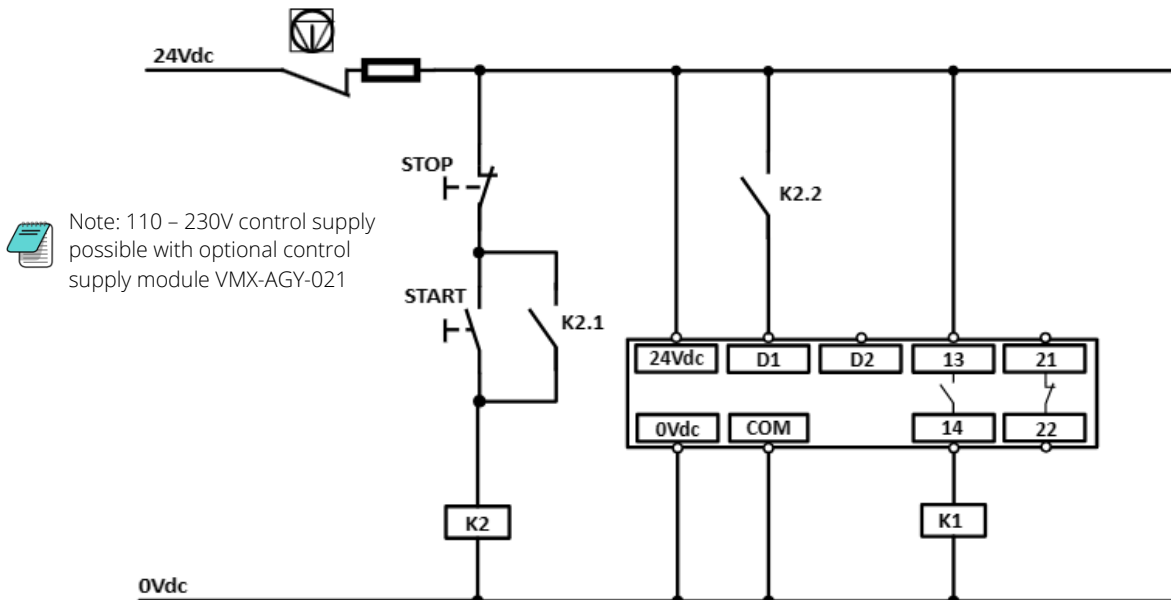
The outputs may be mapped to Run, Auto Reset Pending, Auto Reset Exceeded, Breaker, PH/SCR, End of Start and Fault.

Electrical Installation (continued)

3-Wire Control Circuit Wiring Diagram

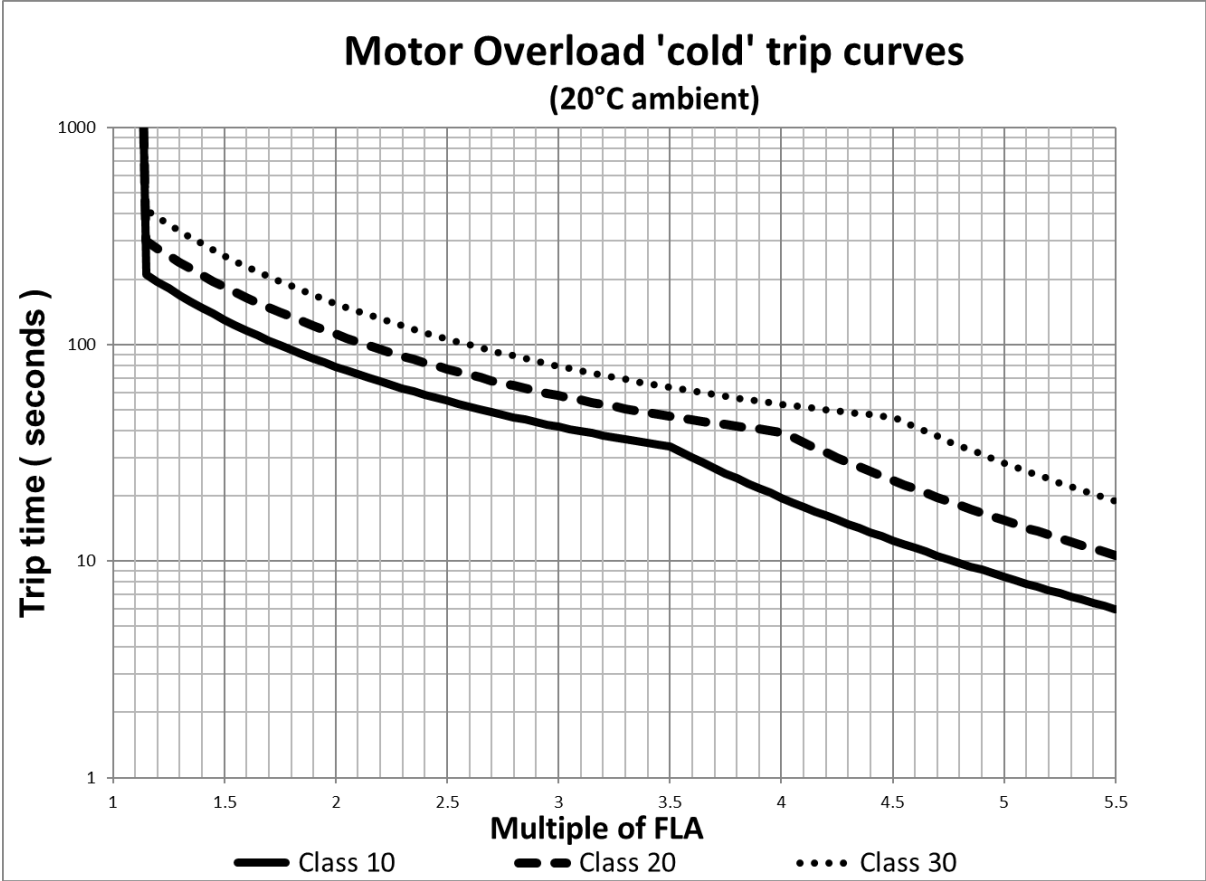


2-Wire Control Wiring Diagram



Motor Overload

VMX-agility™ provides full motor overload protection, configurable through the user interface. Overload trip settings are determined by the Motor Current setting and the Trip Class setting. Trip Class choices are Class 10, Class 20, and Class 30. The VMX-agility™ soft starters are protected using full I²T motor overload with memory.



When the overload has tripped, there is a forced cooling time to allow the overload to recover before the next start. The 'warm' trip times are 50% of the 'cold' trip time.

Configuration and Parameters

Display and Controls



- ① Status messages.
- ② Instantaneous motor current.
- ③ Control scheme: Local, Control terminal, Modbus RTU.
- ④ Keypad guidance wizard: Displays which keys are valid for specific menu items.
- ⑤ Motor overload level; 0 to 100%.
- ⑥ Control keypad.
- ⑦ Status LED (incorporated into centre button) Green/Red.

Keypad Guidance Examples



All keys active



Left & Right keys active



Right, Down & Centre keys active

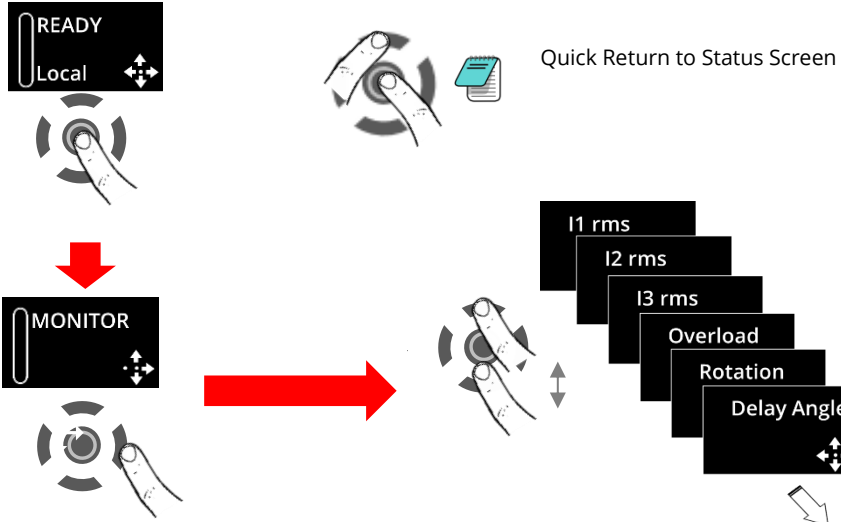
Note: A flashing centre button indicates that a menu item may be selected or saved.

Configuration and Parameters (continued)

Operation - **Local Motor Start**

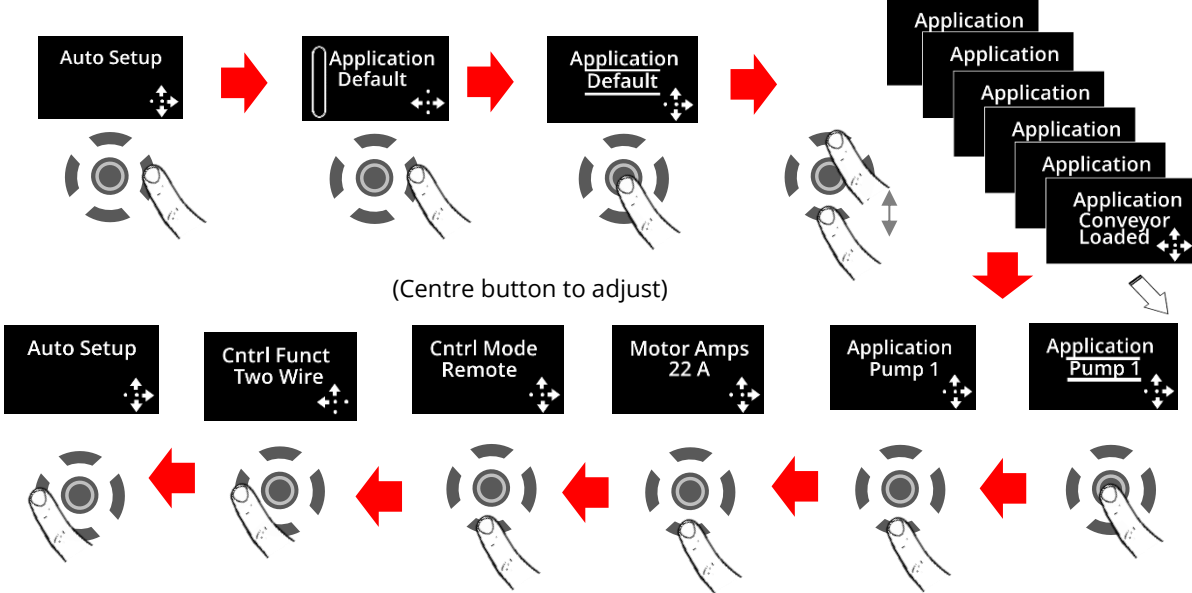


Example Navigation Method



Quick Return to Status Screen

Auto Application Setup



(Centre button to adjust)

Configuration and Parameters (continued)

Auto Application Setup Parameter Settings

Unit	Initial Volts	Start Time	Stop Time	Trip Class	Current Limit	Current Limit Time
Unit	%	s	s	-	x FLC	s
Default	20%	10	0	10	3.5	30
Heavy	40%	10	0	20	4	40
Agitator	30%	10	0	10	3.5	25
Compressor 1	40%	15	0	20	3.5	25
Compressor 2	35%	7	0	10	3.5	25
Conveyor Loaded	10%	10	7	20	5.5	30
Conveyor Unloaded	10%	10	7	10	3.5	30
Crusher	40%	10	0	30	3.5	60
Fan High Inertia	40%	10	0	30	3.5	60
Fan Low Inertia	30%	15	0	10	3.5	30
Grinder	40%	10	0	20	3.5	40
Mill	40%	10	0	20	3.5	40
Mixer	10%	10	0	20	4	25
Moulding M/C	10%	10	0	10	4.5	25
Press Flywheel	40%	10	0	20	3.5	40
Pump 1	10%	10	60	10	3.5	25
Pump 2	10%	10	60	20	3.5	25
PumpJack	40%	10	0	20	3.5	40
SawBand	10%	10	0	10	3.5	25
SawCircular	40%	10	0	20	3.5	40
Screen Vibrating	40%	10	0	20	4.5	40
Shredder	40%	10	0	30	3.5	60
Woodchipper	40%	10	0	30	3.5	60

Compressor 1 = Centrifugal, Reciprocating, Rotary Screw

Compressor 2 = Rotary Vane, Scroll

Pump 1 = Submersible: Centrifugal, Rotodynamic

Pump 2 = Positive Displacement: Reciprocating, Rotary

Technical Information/Specification

General Specification				
Product Standard		EN 60947-4-2: 2012		
Rated operational voltages		U_e	200Vac to 600Vac (See Key to part numbers)	
Rated operational current		I_e	See Rating Table	
Rating index		See Rating Table		
Rated frequencies		50 - 60Hz ± 5Hz		
Rated duty		Uninterrupted.		
Form designation		Form 1, Internally Bypassed		
Method of operation		Symmetrically controlled starter		
Method of control		Semi-automatic		
Method of connecting		Thyristors connected between motor windings and supply		
Number of poles		3 main poles, 2 main poles controlled by semiconductor switching element		
Rated insulation voltage		U_i	Main circuit	See Key to part numbers
			Control supply circuit	230Vac r.m.s ¹⁾
Rated impulse withstand voltage		U_{imp}	Main circuit	6 kV ⁶⁾
			Supply and Control circuit	IP20
IP code		Main circuit	IP00 (IP20 with finger guards) ⁵⁾	
		Supply and Control circuit	IP20	
Overvoltage Category/Pollution degree		III / 3		
Rated conditional short-circuit current and type of co-ordination with associated short circuit protective device (SCPD)		Type 1 co-ordination		
		See Short Circuit Protection Tables for rated conditional short-circuit current and required current rating and characteristics of the associated SCPD		

Technical Information/Specification

General Specification (continued)			
As Standard	Control Supply <small>(2)</small>	Supply input	0, 24V
		Kind of current, rated frequency	dc
		Rated voltage U_s	24Vdc
		Maximum power consumption	12VA (VMX-AGY-101 to VMX-AGY-113) 48VA (VMX-AGY-201 to VMX-AGY-305)
	Control circuit <small>(2)</small>	Programmable opto-isolated inputs	D1, D2
		Common input, marking	COM
		Kind of current, rated frequency	dc
		Rated voltage U_c	24Vdc
With Optional power supply module <small>(1)</small>	Control Supply	Supply input	L, N
		Kind of current, rated frequency	ac, 50 - 60Hz \pm 5Hz
		Rated voltage U_s	110V to 230Vac
		Rated input current	210mA max (cont.) 1A Peak
	Control circuit	Programmable opto-isolated inputs	D1, D2
		Common input	COM
		Kind of current, rated frequency	ac, 50 - 60Hz \pm 5Hz
		Rated voltage U_c	110V to 230Vac
Auxiliary Circuit <small>(3)</small>	Form A - Single gap make -contact (normally open)		13, 14
	Form B - Single gap break-contact (normally closed)		21, 22
	Utilisation category, voltage rating, current rating		Resistive load, 250Vac, 2A. Cos ϕ =0.5, 250Vac, 2A ⁴⁾

Protect with UL248 listed fuse rated Max 4A

Continued over

Technical Information/Specification

General Specification (continued)		
Electronic overload relay with manual reset and thermal memory	Trip Class	10 (factory default), 20 or 30 (selectable)
	Current setting	See Electronic Overload Relay Current Settings
	Rated frequency	50 to 60Hz ± 5Hz
	Time-current characteristics	See Fig.1 for trip curves (Trip time $T_p \pm 20\%$)
<p>¹⁾ With optional VMX-AGY-021 power supply module. ²⁾ Must be supplied by class 2, limited voltage current or protected by a 4A UL 248 listed fuse. ³⁾ Compliant with Annex S of IEC 60947-1:2007 at 24Vdc ⁴⁾ Not applicable for UL. ⁵⁾ For models VMX-AGY-101 to VMX-AGY-209 the main circuit IP20 rating only applies when the finger guards as supplied are correctly fitted. ⁶⁾ Transient surge suppression shall be installed on the line side of this equipment and shall be rated 600_V (phase to phase), suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 6 kV.</p> <p>NOTE: The safety functions were not evaluated by UL. Listing is accomplished according to requirements of Standard UL 508 and CSA14-13, general use applications. The current limiting function and phase loss protection is limited to the ramping period only.</p>		

Electronic Overload Relay Current Settings															
Frame Size	Size 1							Size 2					Size 3		
Type Designation	VMX-AGY-101	VMX-AGY-103	VMX-AGY-105	VMX-AGY-107	VMX-AGY-109	VMX-AGY-111	VMX-AGY-113	VMX-AGY-201	VMX-AGY-203	VMX-AGY-205	VMX-AGY-207	VMX-AGY-209	VMX-AGY-301	VMX-AGY-303	VMX-AGY-305
Min A	7	7	7	7	7	7	7	20	20	20	20	20	36	36	36
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Max A	17	22	29	35	41	55	66	80	106	132	160	195	242	302	361

Technical Information/Specification

Electromagnetic Compatibility		
EMC Emission levels	EN 55011	Class A ¹⁾
EMC Immunity levels	IEC 61000-4-2	8kV/air discharge or 4kV/contact discharge
	IEC 61000-4-3	10 V/m
	IEC 61000-4-4	2kV/5kHz (main and power ports)
		1kV/5kHz (signal ports)
	IEC 61000-4-5	2kV line-to-ground 1kV line-to-line
IEC 61000-4-6	10V	
¹⁾ NOTICE: This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances, in which case the user may be required to take adequate mitigation measures		

Fan Option	
VMX-agility™ model	Maximum duty cycle F-S with optional fan fitted
VMX-AGY-101 to VMX-AGY-203	90-40 (40 cycles per hour)
VMX-AGY-205	90-30 (30 cycles per hour)
VMX-AGY-207	90-20 (20 cycles per hour)
VMX-AGY-209	90-10 (10 cycles per hour)

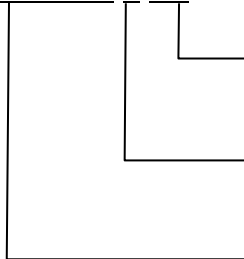


VMX-AGY-301 – 305 have permanently fitted fans

Key to Part Numbers

VMX-agility™ series models are assigned part numbers as per the following key.

VMX-AGY-101-4-XX



Option

Non-critical customer options (may be blank)

Main Supply voltage

4 – 200Vac to 480Vac, U_i 480Vac

6 – 200Vac to 600Vac, U_i 600Vac

VMX-agility™ model rating designation

See Rating Table

Technical Information/Specification

Environmental Specifications							
Model (VMX-AGY-)	101	103	105	107	109	111	113
Frame Size	1						
Heat Output (W)	9	12	14	16	20	25	30
Weight kg [lb]	1.97 [4.20]						
Model (VMX-AGY-)	201	203	205	207	209		
Frame Size	2						
Heat Output (W)	37	49	61	74	90		
Weight kg [lb]	VMX-AGY-201-VMX-AGY-209 6.00 [13.23]						
Model (VMX-AGY-)	301	303	305				
Frame Size	3						
Heat Output (W)	111	139	166				
Weight kg [lb]	15.00 [33.10]						
Ambient Operating Temperature	-20°C [-4°F] to 40°C [104°F]; above 40°C derate linearly by 2% of VMX-agility™ I _e per °C to a maximum of 60°C (140°F)						
Transportation and Storage Temperature	-20°C to 70°C [-4°F to 158°F] continuous						
Humidity	max 85% non-condensing, not exceeding 50% @ 40°C [104°F]						
Maximum Altitude	1,000m [3281ft]; above 1000m derate by 1% of VMX-agility™ I _e per 100m (328ft) to a maximum altitude of 2,000m (6562ft)						
Environmental Rating	Main Circuit: IP00 (IP20 with optional finger guards for VMX-AGY-101 to VMX-AGY-209 Only). Control Circuit: IP20; No corrosive gases permitted						

Wire Sizes and Torques						
Terminal		Models VMX....	Wire/Busbar Size ²⁾		Torque	
			Metric	Imperial	Nm	lb-in
Main Terminals Cu STR 75°C only	Terminal	AGY-101 to AGY-113	2.5 - 70mm ²	12- 2/0AWG	9	80
		AGY-201 to AGY-209	4 - 185mm ²	12 - 350MCM	14	124
	M10 bolt	AGY-301 to AGY-305	2 x 95mm ²	2 x 4/0AWG	28	248
Control Terminals		All models	0.2-1.5mm ²	24-16AWG	0.5	4.5
Protective Earth Cu only ¹⁾	M6 screw	AGY-101	≥ 4mm ²	≥ 12AWG	8	71
		AGY-103 to AGY-111	≥ 6mm ²	≥ 10AWG		
		AGY-113 to AGY-203	≥ 10mm ²	≥ 8AWG		
	M8 screw	AGY-205 to AGY-209	≥ 16mm ²	≥ 6AWG	12	106
	M8 stud	AGY-301	≥ 25mm ²	≥ 4AWG		
AGY-303 to AGY-305		≥ 35mm ²	≥ 3AWG			

¹⁾ Protective Earth wire size based on bonding conductor requirements of UL508 Table 6.4 and UL508A Table 15.1.

²⁾ The actual conductor used must comply with local wiring regulations.

Short Circuit Protection

VMX-agility™ Size 1

Type designation (VMX-AGY...)			101	103	105	107	109	111	113-4	113-6
Rated operational current	I_e	A	17	22	29	35	41	55	66	66
Rated conditional short circuit current at 200 - 600Vac	I_q	kA	5	5	5	5	5	5	5	10
Class J time-delay fuse #1	Maximum rating Z_1	A	30	40	50	60	70	100	125	125
UL Listed inverse-time delay circuit breaker #1	Maximum rating Z_2	A	60	60	60	60	60	150	150	150
Semiconductor fuse (class aR) #2	Type		Mersen 6,9 URD 30 _ Bussmann 170M30_ Bussmann 170M31_ Bussmann 170M32_ SIBA 20 61__				Mersen 6,9 URD 31 _ Bussmann 170M40_ Bussmann 170M41_ Bussmann 170M42_ SIBA 20 61__			
	Fuse rating	A	160A	160A	200A	200A	250A	250A	250A	250A

VMX-agility™ Size 2 and 3

Type designation (VMX-AGY...)			201	203	205	207	209	301	303	305
Rated operational current	I_e	A	80	106	132	160	195	242	302	361
Rated conditional short circuit current at 200 - 600Vac	I_q	kA	10	10	10	10	10	18	18	18
Class J time-delay fuse #1	Maximum rating Z_1	A	150	200	250	300	400	450	600	600
UL Listed inverse-time delay circuit breaker #1	Maximum rating Z_2	A	250	300	350	450	500	700	800	800
Semiconductor fuse (class aR) #2	Type		Mersen 6,9 URD 31_ Bussmann 170M40_ Bussmann 170M41_ Bussmann 170M42_ SIBA 20 61__				Mersen 6,9 URD 33_ Bussmann 170M60_ Bussmann 170M61_ Bussmann 170M62_ SIBA 20 63__			
	Fuse rating	A	400A	400A	550A	550A	550A	800A	900A	1000A

1. Suitable For Use on A Circuit Capable of Delivering Not More Than I_q rms Symmetrical Amperes, 600 Volts ac Maximum, When Protected by Class J time delay Fuses with a Maximum Rating of Z_1 or by a Circuit Breaker with a Maximum Rating of Z_2 .

2. Correctly selected semiconductor fuses can provide additional protection against damage to the VMX-agility™ unit. These semiconductor fuses are recommended to provide this increased protection.

Short Circuit Protection for 65kA Fault Current

VMX-agility™ Size 1

Type designation (VMX-AGY...)			101	103	105	107	109	111	113
Rated operational current	I_e	A	17	22	29	35	41	55	66
Rated conditional short circuit current at 200 – 480V _{ac} .	I_q	kA	65	65	65	65	65	65	65
Class J time-delay fuse #1	Maximum rating Z_1	A	30	40	50	60	70	80	80
UL Listed inverse-time delay circuit breaker #1	Maximum rating Z_2	A	60	60	60	60	60	100	100

VMX-agility™ Size 2 and 3

Type designation (VMX-AGY...)			201	203	205	207	209	301	303	305
Rated operational current	I_e	A	80	106	132	160	195	242	302	361
Rated conditional short circuit current at 200 – 480V _{ac} .	I_q	kA	65	65	65	65	65	65	65	65
Class J time-delay fuse #1	Maximum rating Z_1	A	150	200	250	250	250	400	400	400
UL Listed inverse-time delay circuit breaker #1	Maximum rating Z_2	A	250	250	250	250	250	450	450	450

1. Suitable For Use on A Circuit Capable of Delivering Not More Than I_q rms Symmetrical Amperes, 480 Volts ac Maximum, When Protected by Class J time delay Fuses with a Maximum Rating of Z_1 or by a Circuit Breaker with a Maximum Rating of Z_2 .

Technical Information/Specification

Rating Table – Vertically Mounted												
I _e A ³⁾	kW ¹⁾			FLA A ³⁾	Hp ²⁾					Trip Class 10 I _e : AC-53a: 3.5-17: F-S ⁵⁾ VMX..	Trip Class 20 I _e : AC-53a: 4-19: F-S ⁵⁾ VMX..	Trip Class 30 I _e : AC-53a: 4-29: F-S ⁵⁾ VMX..
	230V	400V	500V ⁴⁾		200V	208V	220- 240V	440- 480V	550- 600V ⁴⁾			
17	4	7.5	7.5	17	3	5	5	10	15	-	-	AGY-101
17	4	7.5	7.5	17	3	5	5	10	15	-	AGY-101	AGY-103
17	4	7.5	7.5	17	3	5	5	10	15	AGY-101	AGY-103	AGY-105
22	5.5	11	11	22	5	5	7.5	15	20	AGY-103	AGY-105	AGY-107
29	7.5	15	15	27	7.5	7.5	7.5	20	25	AGY-105	AGY-107	AGY-109
35	7.5	18.5	22	34	10	10	10	25	30	AGY-107	AGY-109	AGY-111
41	11	22	22	41	10	10	10	30	40	AGY-109	AGY-111	AGY-113
55	15	30	37	52	15	15	15	40	50	AGY-111	AGY-113	AGY-201
66	18.5	37	45	65	20	20	20	50	60	AGY-113	AGY-201	AGY-203
80	22	45	55	77	20	25	25	60	75	AGY-201	AGY-203	AGY-205
106	30	55	75	100	30	30	30	75	100	AGY-203	AGY-205	AGY-207
132	37	75	90	125	40	40	40	100	125	AGY-205	AGY-207	AGY-209
160	45	90	110	156	50	50	60	125	150	AGY-207	AGY-209	AGY-301
195	55	110	132	192	60	60	60	150	200	AGY-209	AGY-301	AGY-303
242	75	132	160	242	75	75	75	200	250	AGY-301	AGY-303	AGY-305
302	90	160	200	302	100	100	100	250	300	AGY-303	AGY-305	-
361	110	200	250	361	125	125	150	300	350	AGY-305	-	-

¹⁾ Rated operational powers in kW as per IEC 60072-1 (primary series) corresponding to IEC current rating.

²⁾ Rated operational powers in hp as per UL508 corresponding to FLA current rating.

³⁾ The I_e and FLA rating applies for a maximum surrounding air temperature of 40°C. Above 40°C derate linearly by 2% of I_e or FLA per °C to a maximum of 60°C.

⁴⁾ kW and Hp ratings applicable for VMX-AGY-101-6 to VMX-AGY-305-6 models only.

⁵⁾ For VMX-AGY-101 to VMX-AGY-209, duty cycle F-S = 90-5, however more cycles per hour are possible with optional fan fitted as indicated in Fan option table. For VMX-AGY-301 to VMX-AGY-305, duty cycle F-S = 90-3 for more cycles consult Motortronics UK or supplier.

Technical Information/Specification

Rating Table – Horizontally Mounted												
I _e A ³⁾	kW ¹⁾			FLA A ³⁾	Hp ²⁾					Trip Class 10 I _e : AC-53a: 3.5-17: 90-5 VMX..	Trip Class 20 I _e : AC-53a: 4-19: 90-5 VMX..	Trip Class 30 I _e : AC-53a: 4-29: 90-5 VMX..
	230V	400V	500V		200V	208V	220- 240V	440- 480V	550- 600V			
17	4	7.5	7.5	17	3	5	5	10	15	-	AGY-101	AGY-103
17	4	7.5	7.5	17	3	5	5	10	15	AGY-101	AGY-103	AGY-105
17	4	7.5	7.5	17	3	5	5	10	15	AGY-103	AGY-105	AGY-107
22	5.5	11	11	22	5	5	7.5	15	20	AGY-105	AGY-107	AGY-109
29	7.5	15	15	27	7.5	7.5	7.5	20	25	AGY-107	AGY-109	AGY-111
35	7.5	18.5	22	34	10	10	10	25	30	AGY-109	AGY-111	AGY-113
41	11	22	22	41	10	10	10	30	40	AGY-111	AGY-113	-
55	15	30	37	52	15	15	15	40	50	AGY-113	-	-

¹⁾ Rated operational powers in kW as per IEC 60072-1 (primary series) corresponding to IEC current rating.

²⁾ Rated operational powers in hp as per UL508 corresponding to FLA current rating.

³⁾ The I_e and FLA rating applies for a maximum surrounding air temperature of 40°C. Above 40°C derate linearly by 2% of I_e or FLA per °C to a maximum of 60°C.

Electric current, Danger to life! Only skilled or instructed persons may carry out the operations.	Livsfara genom elektrisk ström! Endast utbildade elektriker och personer som undervisats i elektroteknik får utföra de arbeten som beskrivs nedan.
Lebensgefahr durch Strom! Nur Elektrofachkräfte und elektrotechnisch unterwiesene Personen dürfen die im Folgenden beschriebenen Arbeiten ausführen.	Hengenvaarallinen jännite! Vain pätevät sähköasentajat ja opastusta saaneet henkilöt saavat suorittaa seuraavat työt.
Tension électrique dangereuse! Seules les personnes qualifiées et averties doivent exécuter les travaux ci-après.	Nebezpečí úrazu elektrickým proudem! Níže uvedené práce smějí provádět pouze osoby s elektrotechnickým vzděláním.
¡Corriente eléctrica! ¡Peligro de muerte! El trabajo a continuación descrito debe ser realizado por personas cualificadas y advertidas.	Eluohhtlik! Elektrilöögioht! Järgnevalt kirjeldatud töid tohib teostada ainult elektriala spetsialist või elektrotehnilise instrueerimise läbinud personal.
Tensione elettrica: Pericolo di morte! Solo persone abilitate e qualificate possono eseguire le operazioni di seguito riportate.	Életveszély az elektromos áram révén! Csak elektromos szakemberek és elektrotechnikában képzett személyek végezhetik el a következőkben leírt munkákat.
触电危险! 只允许专业人员和受过专业训练的人员进行下列工作。	Elektriskā strāva apdraud dzīvību! Tālāk aprakstītos darbus drīkst veikt tikai elektrospēcialisti un darbam ar elektrotehniskām iekārtām instruētās personas!
Электрический ток! Опасно для жизни! Только специалисты или проинструктированные лица могут выполнять следующие операции.	Pavojus gyvybei dėl elektros srovės! Tik elektrikai ir elektrotechnikos specialistai gali atlikti žemiau aprašytus darbus.
Levensgevaar door elektrische stroom! Uitsluitelijk deskundigen in elektriciteit en elektrotechnisch geïnstrueerde personen is het toegestaan, de navolgend beschrevene werkzaamheden uit te voeren.	Porażenie prądem elektrycznym stanowi zagrożenie dla życia! Opisane poniżej prace mogą przeprowadzać tylko wykwalifikowani elektrycy oraz osoby odpowiednio poinstruowane w zakresie elektrotechniki.
Livsfare på grund af elektrisk strøm! Kun uddannede el-installatører og personer der er instruerede i elektrotekniske arbejdsopgaver, må udføre de nedenfor anførte arbejder.	Življenska nevarnost zaradi električnega toka! Spodaj opisana dela smejo izvajati samo elektrostrokovnjaki in elektrotehnično poučene osebe.
Προσοχή, κίνδυνος ηλεκτροπληξίας! Οι εργασίες που αναφέρονται στη συνέχεια θα πρέπει να εκτελούνται μόνο από ηλεκτρολόγους και ηλεκτροτεχνίτες.	Nebezpečnostv ohrozenia života elektrickým prúdom! Práce, ktoré sú nižšie opísané, smú vykonávať iba elektroodborníci a osoby s elektrotechnickým vzdelaním.
Perigo de vida devido a corrente eléctrica! Apenas electricistas e pessoas com formação electrotécnica podem executar os trabalhos que a seguir se descrevem.	Опасност за живота от электрически ток! Операциите, описани в следващите раздели, могат да се извършват само от специалисти-електротехници и инструктиран електротехнически персонал.
Livsfara genom elektrisk ström! Endast utbildade elektriker och personer som undervisats i elektroteknik får utföra de arbeten som beskrivs nedan.	Atenție! Pericol electric! Toate lucrările descrie trebuie efectuate numai de personal de specialitate calificat și de persoane cu cunoștințe profunde în electrotehnică.
Hengenvaarallinen jännite! Vain pätevät sähköasentajat ja opastusta saaneet henkilöt saavat suorittaa seuraavat työt.	Življenska nevarnost zaradi električnega toka! Spodaj opisana dela smejo izvajati samo elektrostrokovnjaki in elektrotehnično poučene osebe.
Nebezpečí úrazu elektrickým proudem! Níže uvedené práce smějí provádět pouze osoby s elektrotechnickým vzděláním.	Nebezpečnostv ohrozenia života elektrickým prúdom! Práce, ktoré sú nižšie opísané, smú vykonávať iba elektroodborníci a osoby s elektrotechnickým vzdelaním.
Eluohhtlik! Elektrilöögioht! Järgnevalt kirjeldatud töid tohib teostada ainult elektriala spetsialist või elektrotehnilise instrueerimise läbinud personal.	Опасност за живота от электрически ток! Операциите, описани в следващите раздели, могат да се извършват само от специалисти-електротехници и инструктиран
Életveszély az elektromos áram révén! Csak elektromos szakemberek és elektrotechnikában képzett személyek végezhetik el a következőkben leírt munkákat.	Atenție! Pericol electric! Toate lucrările descrie trebuie efectuate numai de personal de specialitate calificat și de persoane cu cunoștințe profunde în electrotehnică.
Elektriskā strāva apdraud dzīvību! Tālāk aprakstītos darbus drīkst veikt tikai elektrospēcialisti un darbam ar elektrotehniskām iekārtām instruētās personas!	Pavojus gyvybei dėl elektros srovės! Tik elektrikai ir elektrotechnikos specialistai gali atlikti žemiau aprašytus darbus.
Porażenie prądem elektrycznym stanowi zagrożenie dla życia! Opisane poniżej prace mogą przeprowadzać tylko wykwalifikowani elektrycy oraz osoby odpowiednio poinstruowane w zakresie elektrotechniki.	

California Customers: California Proposition 65 Warning

WARNING: this product and associated accessories may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information visit <https://p65warnings.ca.gov>. For further regulatory information, please see Article 33 Declaration on the website. Unit specific SCIP details are also available upon request.

To assist with assessing your Environmental Impact, International Recycling codes are printed/stamped on unit boxes, to cover all enclosed packaging materials. Motortronics UK aim to ensure that any battery used within their products is readily removable and replaceable by the end-user. Instructions on this are available on the Motortronics website.



MOTORTRONICS™

Solid State AC Motor Control

VMX-agility™

Application Driven Compact Soft Starter

www.motortronics-uk.co.uk

