RS PRO - VMX-Synergy Plus

Quick Start Guide

200-600VAC, 17-850 Amps

- Removable 3.5” Colour Touch Screen rated IP66/N4X
- 45 Smart Application Profiles - Easy set up in 1 minute
- Auto Pedestal to control spinning motors
- Built in iERS - intelligent Energy Recovery System
- Life Time Event Logging Diagnostics
- Metering for Power, Voltage and Current
- Internally Bypassed

M-RS-025-EN-V01.01 March 2025

RS PRO VMX Synergy Plus

Quick Start Guide

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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-starter. The following symbols may appear in this guide or on the soft-starter 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.

Tension dangereuse

Indique la présence d'une tension dangereuse qui peut entaîner des blessures ou la mort.

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.

Avertissement / Mise en garde

Indique un danger potentiel. Toutes les instructions suivant ce symbole doivent être observées, afin d'éviter les dommages de l'équipement et les blessures ou la mort.

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.

Mise à la terre (Masse)

Indique une borne dont l'usage prévu est d'être connecter à conducteur externe pour assurer la protection contre les chocs électriques en cas de défauts.

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.

Mises en garde

Les exemples et les schémas de ce manuel ne sont donnés qu'à titre illustratif. Les informations présentées dans ce manuel peuvent être modifiées sans avis préalable.En aucun cas nous n'assumons la responsabilité ou l'obligation pour les dommages directs, indirects ou consécutifs qui résultent de l'utilisation ou application de cet équipement.

Short Circuit

RS PRO soft-starters are not short circuit proof. After severe overload or short circuit, the operation of the soft-starter should be fully tested by an authorised service agent.

Court-circuit

Les démarreurs progressifs RS PRO ne sont pas à l'épreuve des courts-circuits. Après une forte surcharge ou un court-circuit, le fonctionnement du démarreur progressif doit être intégralement vérifié par un agent de maintenance agréé.

Safety

• RS PRO soft-starters 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.

• *Les démarreurs progressifs RS PRO contiennent des tensions dangereuses, lorsqu'ils sont connectés à la tension secteur. Les activités d'installation, d'utilisation et d'entretien de cet équipement doivent être effectuées par un personnel qualifié, dûment formé et habilité.*

• Installation of the soft-starter must be made in accordance with existing local and national electrical codes and regulations and have a minimum protection rating.

• *Le démarreur progressif doit être installer conformément au code local et nationale d'électricité et à la réglementation en vigueur, et il doit avoir un indice de protection minimal.*

• It is the responsibility of the installer to provide suitable grounding and branch circuit protection in accordance with local electrical safety codes.

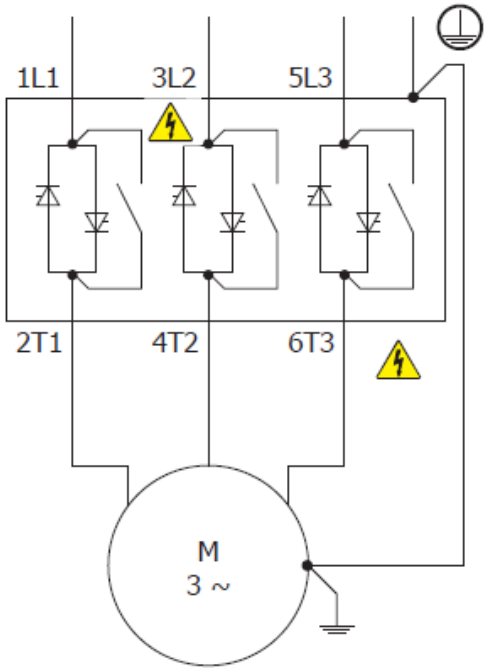
• *Il appartient à l'installeur d'assurer la mise à la terre et la protection du circuit de branchement, conformément au code de sécurité électrique local.*

• This soft-starter contains no serviceable or re-usable parts.

• *Ce démarreur progressif ne contient pas de pièces réparables ou réutilisables*

• The STOP function of the soft-starter does not isolate dangerous voltages from the output of the soft-starter. An approved electrical isolation device must be used to disconnect the soft-starter from the incoming supply before accessing electrical connections.

• *La fonction STOP du démarreur progressif n'isole pas les tension dangereuses en sortie du démarreur progressif. Avant d'accéder aux raccordement électriques, il faut utiliser un dispositif d'isolation électrique approuvé pour déconnecter le démarreur progressif de la tension d'entrée.*



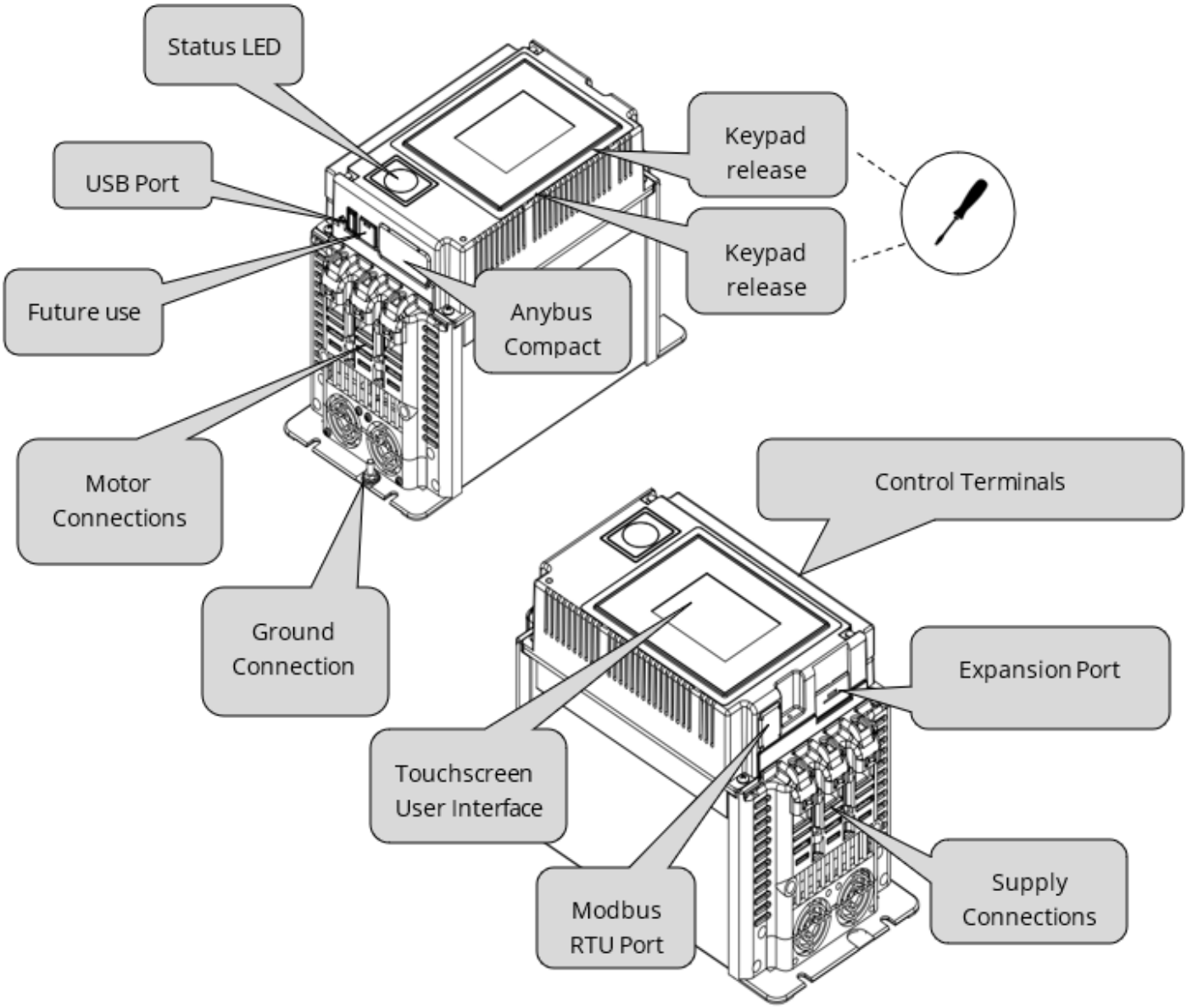
Model number description

It is essential to check the RS PRO VMX-Synergy Plus and the AC motor nameplate and ensure the soft-starter is properly sized for your AC motor.

RS PRO Stock Number (I_e)	Frame Size	Rated kW Rating @ 400VAC	Main Supply Voltage	Control Supply U_s
206-123 (17A)	1	7.5kW	200-600VAC	24VDC or 110VAC to 230VAC
206-124 (22A)	1	11kW	200-600VAC	24VDC or 110VAC to 230VAC
206-125 (29A)	1	15kW	200-600VAC	24VDC or 110VAC to 230VAC
206-127 (35A)	1	18.5kW	200-600VAC	24VDC or 110VAC to 230VAC
206-128 (41A)	1	22kW	200-600VAC	24VDC or 110VAC to 230VAC
206-130 (55A)	1	30kW	200-600VAC	24VDC or 110VAC to 230VAC
206-131 (66A)	1	37kW	200-600VAC	24VDC or 110VAC to 230VAC
206-133 (80A)	1	45kW	200-600VAC	24VDC or 110VAC to 230VAC
206-134 (100A)	1	55kW	200-600VAC	24VDC or 110VAC to 230VAC
206-136 (132A)	2	75kW	200-600VAC	24VDC or 110VAC to 230VAC
206-137 (160A)	2	90kW	200-600VAC	24VDC or 110VAC to 230VAC
206-139 (195A)	2	110kW	200-600VAC	24VDC or 110VAC to 230VAC
206-140 (242A)	3A	132kW	200-600VAC	24VDC or 110VAC to 230VAC
206-142 (302A)	3A	160kW	200-600VAC	24VDC or 110VAC to 230VAC
206-143 (361A)	3A	200kW	200-600VAC	24VDC or 110VAC to 230VAC
206-145 (430A)	3B	250kW	200-600VAC	110VAC
206-146 (430A)	3B	250kW	200-600VAC	230VAC
206-147 (500A)	3B	280kW	200-600VAC	110VAC
206-149 (500A)	3B	280kW	200-600VAC	230VAC
206-151 (625A)	4	355kW	200-600VAC	110VAC
206-152 (625A)	4	355kW	200-600VAC	230VAC
206-153 (722A)	4	400kW	200-600VAC	110VAC
206-155 (722A)	4	400kW	200-600VAC	230VAC
206-156 (850A)	4	500kW	200-600VAC	110VAC
206-158 (850A)	4	500kW	200-600VAC	230VAC

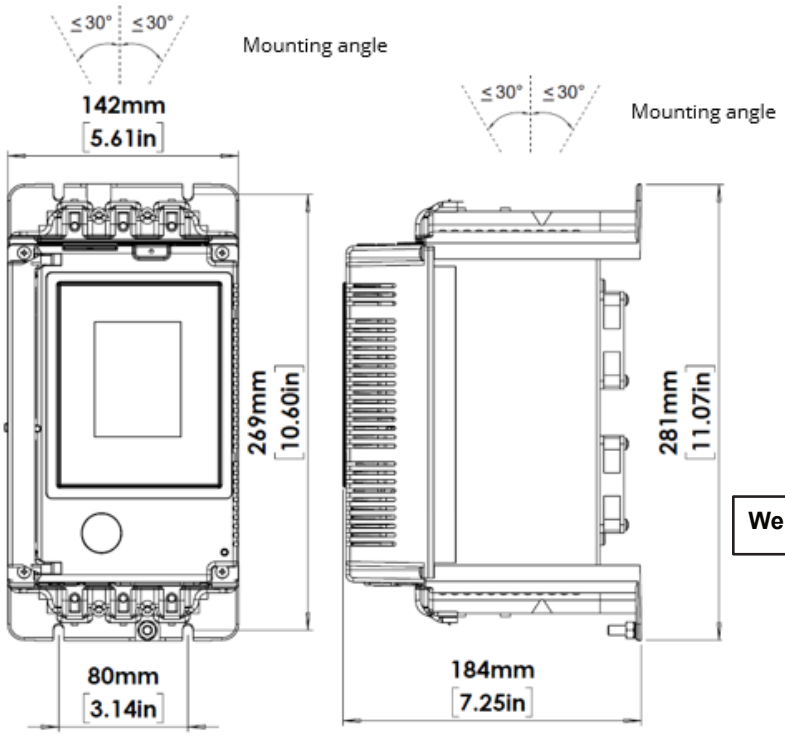
Table 1

Key Features



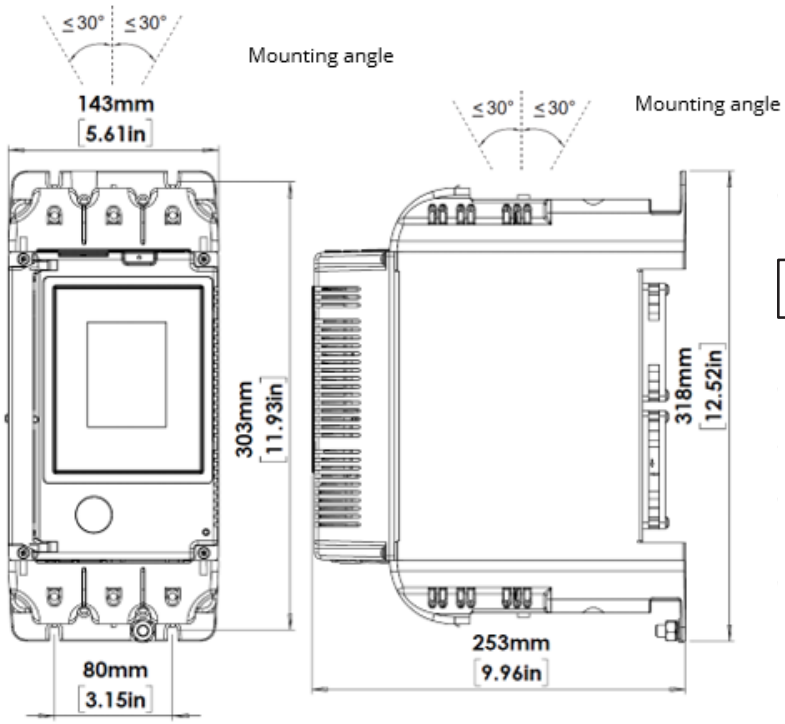
Weights and dimensions

206-123 (17A) to 206-134 (100A) (Frame Size 1)



Weight = 4.2Kg (9.26lbs)

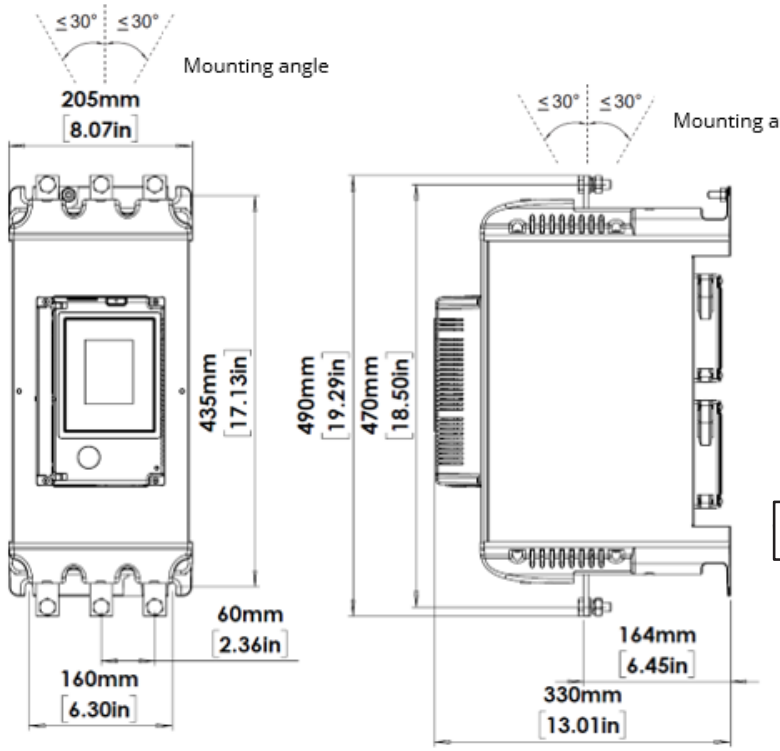
206-136 (132A) to 206-139 (195A) (Frame Size 2)



Weight = 7Kg (15.44lbs)

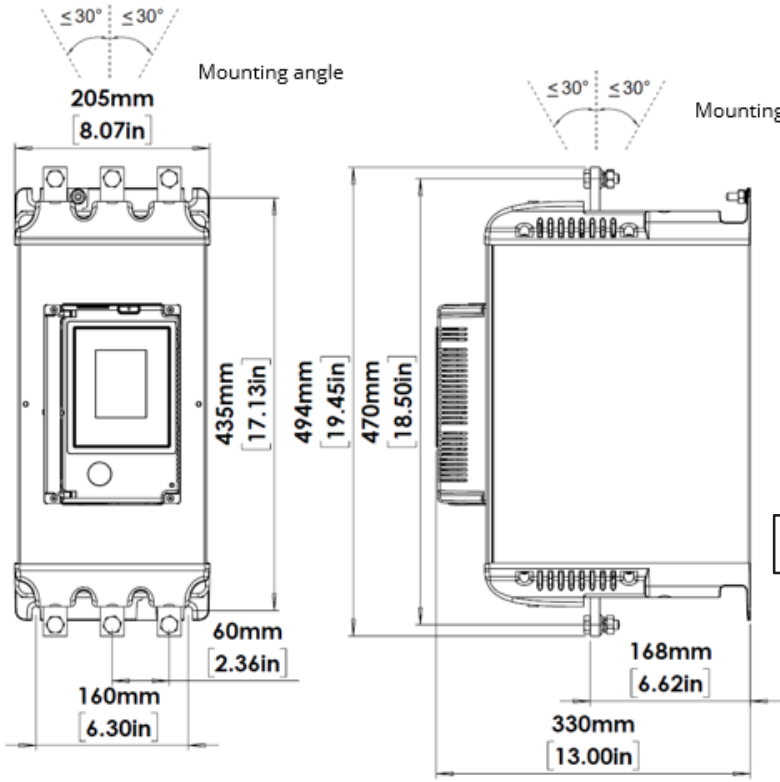
Weights and Dimensions

206-140 (242A) to 206-143 (361A) (Frame Size 3A)



Weight = 17Kg (37.5lbs)

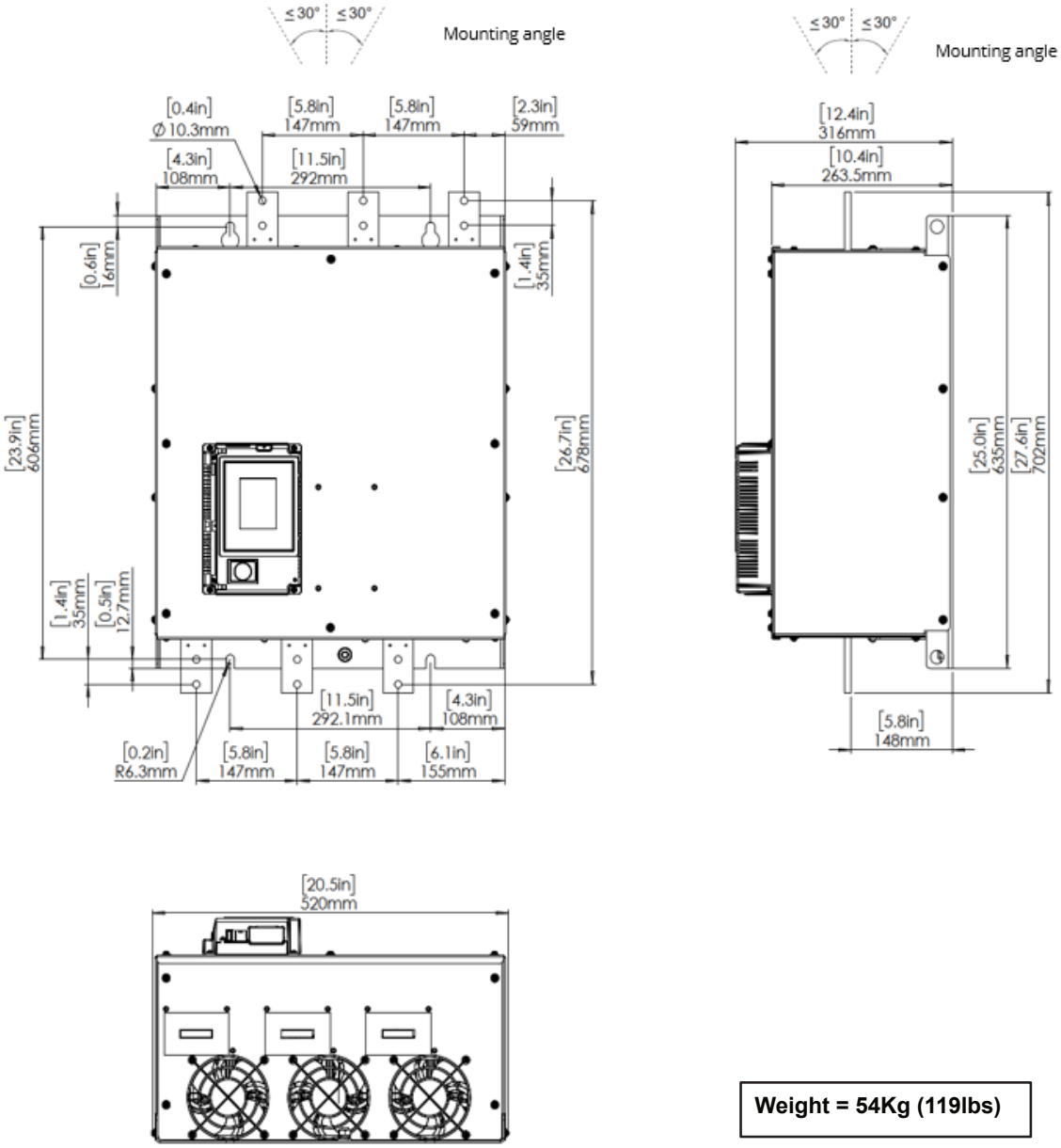
206-145 (430A) to 206-149 (500A) (Frame Size 3B)



Weight = 22Kg (48.5lbs)

Weights and Dimensions

206-151 (625A) to 206-158 (850A) (Frame Size 4)



Weight = 54Kg (119lbs)

Enclosure ventilation

Enclosure Ventilation

When installing an RS PRO VMX-Synergy Plus into an enclosure, ventilation must be provided if the heat output of the unit is greater than the cabinet will dissipate. 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 supplier's data.

Heat dissipated can be approximated with the formulas:

Starting

$$\text{Watts (RS PRO VMX-Synergy Plus)} = \frac{\text{Start current (A) x Start time (s) x Number of starts per hour}}{1200}$$

iERS Disabled

Watts (RS PRO VMX-Synergy Plus) = (RS PRO VMX-Synergy Plus current rating) x 0.6

iERS Enabled

The maximum power dissipation occurs when iERS is turned on

Watts (RS PRO VMX-Synergy Plus) = (RS PRO VMX-Synergy Plus current rating) x 1.5

Volume of Air

$$Q = \frac{4 \times W_{total}}{T_{max}\text{-}T_{amb}}$$

Where

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

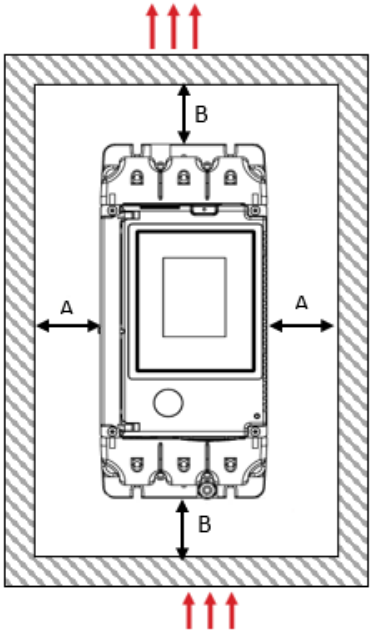
$\mathbf{W_{total}}$ = Heat produced by the RS PRO VMX-Synergy Plus unit and all other heat sources within the enclosure (Watts)

$\mathbf{T_{max}}$ = Maximum permissible temperature within the enclosure (50°C for a fully rated RS PRO VMX-Synergy Plus)

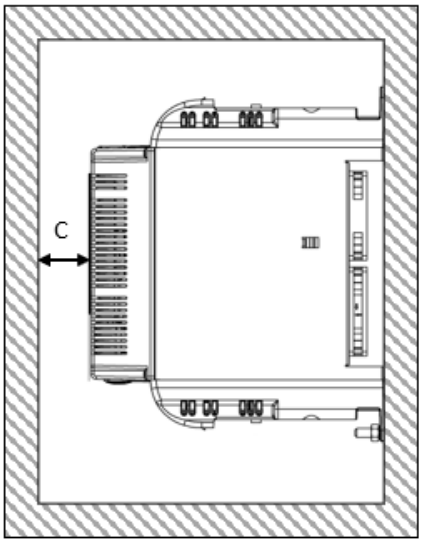
$\mathbf{T_{amb}}$ = Temperature of the air entering the enclosure (°C)

If you prefer to work in CFM, substitute °F for °C. Q is now in CFM

Enclosure ventilation



Air Flow



Model	A		B		C	
	mm	inch	mm	inch	mm	inch
206-123 (17A) to 206-134 (100A)	25	0.98	75	2.95	25	0.98
206-136 (132A) to 206-139 (195A)	40	1.57	100	3.93	25	0.98
206-140 (242A) to 206-149 (500A)	60	2.36	125	4.92	25	0.98
206-151 (625A) to 206-158 (850A)	100	3.94	250	9.84	25	0.98

Table 2

Temperature and altitude

206-123 (17A) to 206-149 (500A)
-20°C (-4°F) to 50°C (122°F). Above 50°C (122°F) de-rate linearly by 4% of RS PRO VMX-Synergy Plus I_e per °C to a maximum of 60°C (140°F).

206-151 (625A) to 206-158 (850A)
-20°C (-4°F) to 40°C (122°F). Above 40°C (104°F) de-rate linearly by 2% of RS PRO VMX-Synergy Plus I_e per °C to a maximum of 60°C (140°F)

Altitude above sea level 1000m (3281ft). Above 1000m (3281ft) de-rate by 1% of RS PRO VMX-Synergy Plus Ie per 100m (328ft) to a maximum altitude of 2000m (6562ft). Please note for higher temperatures and altitudes contact your supplier.

Conductor sizes and torques

Terminal		Models RS PRO VMX-Synergy Plus …	Conductor Size		Torque	
			Metric	Imperial	Nm	lb-in
Main Terminals **Cu STR 75°C only**	**Terminal**	206-123 (17A) to 206-134 (100A)	2.5 - 70mm²	12- 2/0AWG	9	80
		206-136 (132A) to 206-139 (195A)	4 - 185mm²	12 – 350MCM	14	124
	M10 bolt	206-140 (242A) to 206-143 (361A)	2 x 95mm²	2 x 4/0AWG	28	248
		206-145 (430A) to 206-149 (500A)	2 x 150mm²	2 x 350MCM		
	2 x M10 bolt	206-151 (625A) to 206-158 (850A)	3 x 240 mm²	3 x 400MCM		
Main Terminals **Copper busbar** [2]	**2 x M10 bolt**	206-151 (625A) to 206-158 (850A)	60mm x10mm	2.0in x 0.5in		
Control terminals		All models	0.2–1.5mm²	24-16AWG	0.7	6.0
⏚ **Protective Earth** [1] **Cu only**	**M6 stud**	206-123 (17A) to 206-128 (41A)	≥ 6mm²	≥ 10AWG	8	71
		206-130 (55A) to 206-133 (80A)	≥ 10mm²	≥ 8AWG		
		206-134 (100A)	≥ 16mm²	≥ 6AWG		
	M8 stud	206-136 (132A) to 206-137 (160A)	≥ 16mm²	≥ 6AWG	12	106
		206-139 (195A)	≥ 25mm²	≥ 4AWG		
		206-140 (242A)	≥ 35mm²	≥ 3AWG		
		206-142 (302A)	≥ 35mm²	≥ 2AWG		
		206-143 (361A)	≥ 50mm²	≥ 1AWG		
		206-145 (430A) to 206-149 (500A)	≥ 70mm²	≥ 1/0AWG		
		206-151 (625A) to 206-158 (850A)	≥ 85mm²	≥ 3/0AWG		

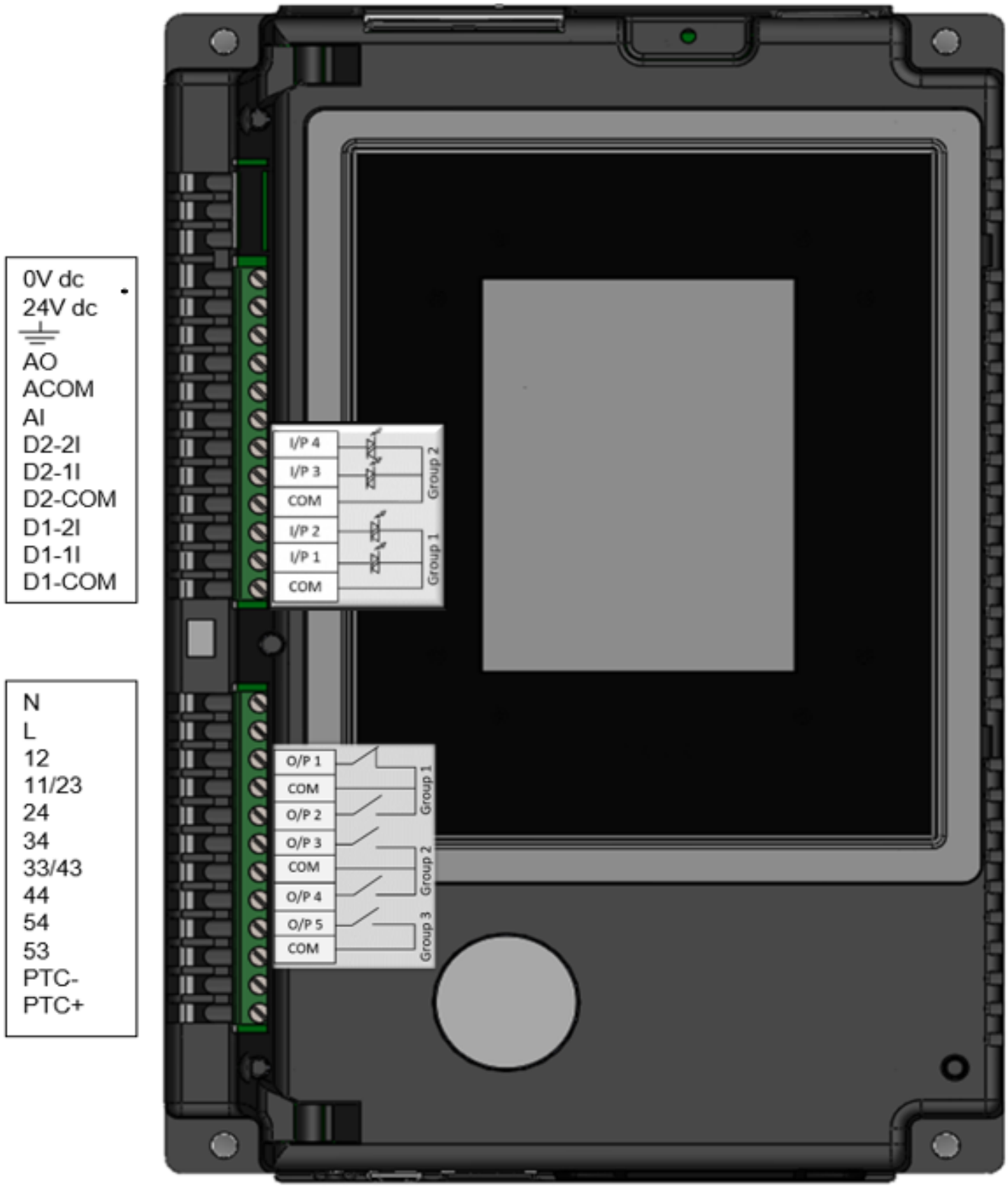
[1] Protective Earth wire size based on bonding conductor requirements of UL508 Table 7.4 and UL508A Table 15.1, with suitable equivalent metric conductor sizes as per IEC 60947-1 Table 7a.

[2] Maximum busbar sizes based on IEC 60947-1 Table 11.

[3] The actual conductor used must comply with local wiring regulations.

Table 3

Terminal designations



0VDC, 24VDC input terminals on 206-123 (17A) to 206-143 (361A) models only

Terminal descriptions

Terminal Name	Description	Programmable	Default	Rating	Notes
0VDC	Control Supply			See **Table 1**, Us	#3
24VDC					
⏚	Signal Ground				
AO	Analog Output	Yes	0-10v	0-10V or 4-20mA	
ACOM	Analog Common				
AI	Analog Input	Yes	0-10v	0-10V or 4-20mA	
D2-2I	Digital Input 4 - Group 2	Yes	None	See **Table 5**, Uc	#2
D2-1I	Digital Input 3 - Group 2	Yes	Reset	See **Table 5**, Uc	#2
D2-COM	Digital Input - Group 2 Common				#2
D1-2I	Digital Input 2 - Group 1	Yes	None	See **Table 5**, Uc	#1
D1-1I	Digital Input 1 - Group 1	Yes	Start / Stop	See **Table 5**, Uc	#1
D1-COM	Digital Input - Group 1 Common				#1
N	Control supply			See **Table 5**, Us	#3
L					
12	Digital Output 1 - Group 1 relay N/C	Yes	Fault	230VAC 1A AC15	
11 / 23	Digital Output - Group 1 Common				
24	Digital Output 2 - Group 1 relay N/O	Yes	Fault	230VAC 1A AC15	
34	Digital Output 3 - Group 2 relay N/O	Yes	Running	230VAC 1A AC15	
33 / 43	Digital Output - Group 2 Common				
44	Digital Output 4 - Group 2 relay N/O	Yes	End of Start	230VAC 1A AC15	
54	Digital Output 5 - Group 3 relay N/O	Yes	Running	230VAC 3A AC15	
53	Digital Output 5 - Group 3 Common				
PTC-	3 x PTC in series (130°C)		Off		
PTC+					

⚠ Notes

#1	The programmed digital input setting on D1-COM, D1-1I, D1-2I must correspond to the voltage applied to these terminals to avoid risk of damage to the equipment. Afin d'éviter d'endommager l'équipement, le réglage de l'entrée numérique programmé sur D1-COM, D1-1I, D1-2I doit correspondre à la tension appliquée à ces bornes.
#2	The programmed digital input setting on D2-COM, D2-1I, D2-2I must correspond to the voltage applied to these terminals to avoid risk of damage to the equipment. Afin d'éviter d'endommager l'équipement, le réglage de l'entrée numérique programmé sur D2-COM, D2-1I, D2-2I doit correspondre à la tension appliquée à ces bornes.
#3	The control supply can be 110 to 230Vac applied to the N, L terminals or 24Vdc applied to the 0Vdc, 24V input terminals. The correct voltage as specified must only be applied to one of these supply inputs to avoid risk of damage to the equipment. L'alimentation contrôle peut être 110 a 230Vca, appliquke aux bornes N et L, ou 24Vcc, appliquke aux bornes d'entrke de 0Vcc, 24V. Afin d'kviter d'endommager l'kquipement, la tension approprike selon les indications ne doit être appliquée qu'à une entrée d'alimentation.
#4	Refer to RS PRO VMX-Synergy Plus User Manual for factory default settings. Référer au la Manuel de Programmation pour des paramètres par défaut d'usine

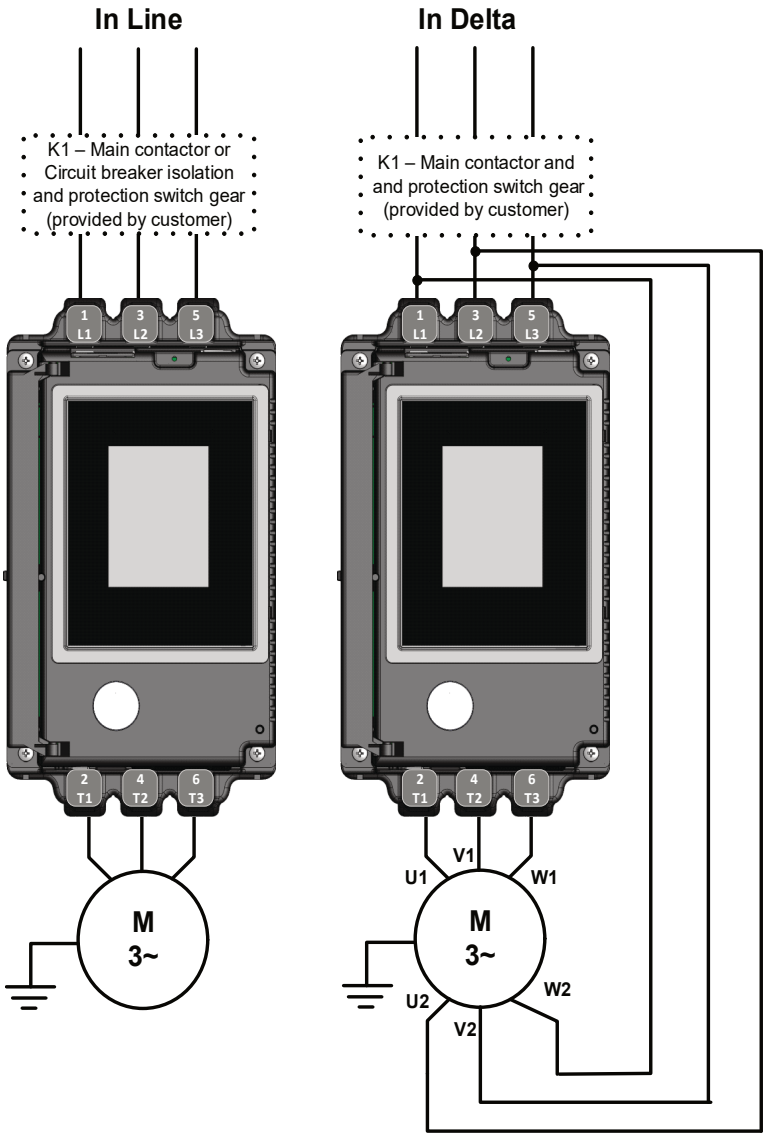
Table 4

Control supply and control circuit (Us and Uc)

Model No (s)	Power consumption	U_s (+10% -15%)	U_c (+10% -15%)	Notes
206-123 (17A) to 206-143 (361A)	60VA	110-230VAC or 24VDC (#1)	⚠ 110VAC or 230VAC or 24VDC 230VAC factory default. 230VAC défaut d'usine.	⚠ The system can have either a 110/230VAC mains or 24VDC input NOT both. Le système peut avoir soit une alimentation principale de 110/230VAC ou de 24VDC mais en aucun cas les deux imultanement.
206-145 (430A) to 206-156 (850A)	120VA	110VAC		
206-145 (430A) to 206-157 (850A)	180VA	230VAC		
Notes				
#1	206-123 (17A) to 203-143 (361A) 24VAC 60W Residual ripple 100mV Spikes/switching peaks 240mV Turn On/Off no overshoot of V_{out} Overvoltage protection output voltage must be clamped to <30VDC			

Table 5

Wiring connection



Terminal	Forward	Reverse
2 / T1	U1	U1
4 / T2	V1	W1
6 / T3	W1	V1
1 / L1	W2	V2
3 / L2	U2	U2
5 / L3	V2	W2

In-Delta important information

When Delta wiring is configured, the Firing Mode **MUST** be set to In-Delta in the advanced menu.

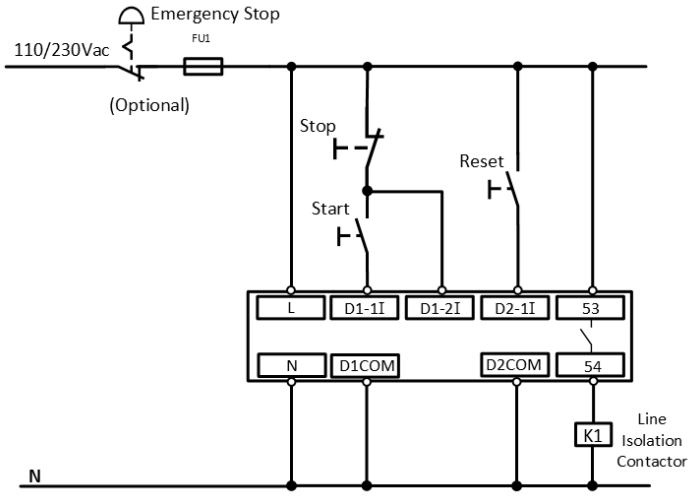
If reverse rotation is required it is important to keep the incoming phase rotation as L1, L2, L3 and connect the motor windings as shown in the table above.

The contactor K1 can also be connected inside the delta circuit.
When K1 is connected in the delta K1 current rating = I_e (motor) / √3

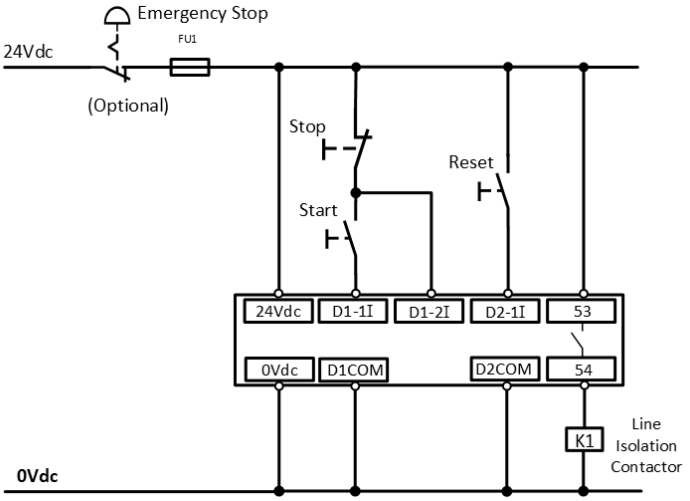
⚠ For suitable short circuit protection devices (SCPD's) see Short Circuit Protection in the Technical Information/standards section of this guide. Pour un dispositif de protection approprié contre le court-circuit, voir la protection contre le court-circuit dans la section « Informations techniques/ normes » du présent guide.	⚠ For wire size and torque requirements see Technical Information/standards section of this guide. Pour les dimensions de câble et les besoins en couple, voir la section « Informations techniques/ normes » du présent guide.	⚠ In Delta for this configuration applying the equation. RS PRO VMX-Synergy Plus I_e = I_e (motor) / √3 Allows lower current rating RS PRO VMX-Synergy Plus than the motor.	⚠ En Delta Pour cette configuration, appliquer l'équation.suivante: RS PRO VMX-Synergy Plus I_e = I_e (moteur)/ √3 Cela permet le courant nominal inférieur de RS PRO VMX-Synergy Plus par rapport au moteur.	⚠ Power factor correction capacitors must NOT be positioned between the soft-starter and the motor or there is a risk of damaging thyristors due to current peaks. Condensateurs de correction de facteur de puissance NE doivent pas être placés entre le moteur at le démarreur progressif ou il y a un risqué d'endommager les thyristors en raison des pics de courant.

Wiring connection

3 Wire Control Diagram
110/230VAC control supply (U_s) and digital input (U_c) programming



3 Wire Control Diagram
24VDC control supply (U_s) and digital input (U_c) programming
(only applicable to 206-123 (17A) to 203-143 (361A))



CAUTION

#1

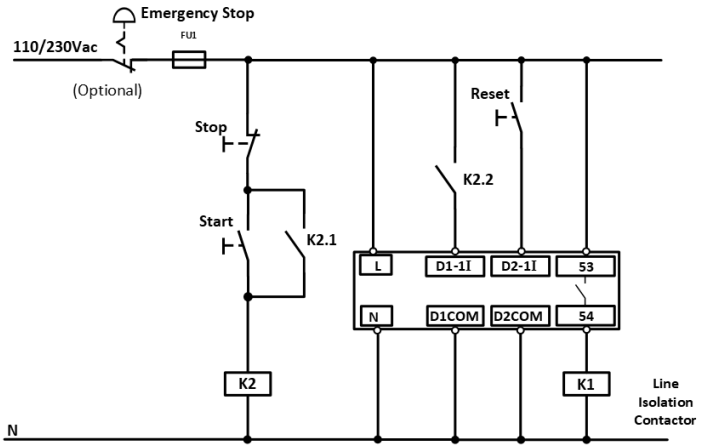
Refer to **TABLE 5** page 13 for input control voltages.

These recommended wiring diagrams are specifically where the control supply voltage (U_s) is identical to the control circuit voltage (U_c) and not to be supplied separately. Other wiring configurations must also be in accordance with existing local and national codes and regulations.

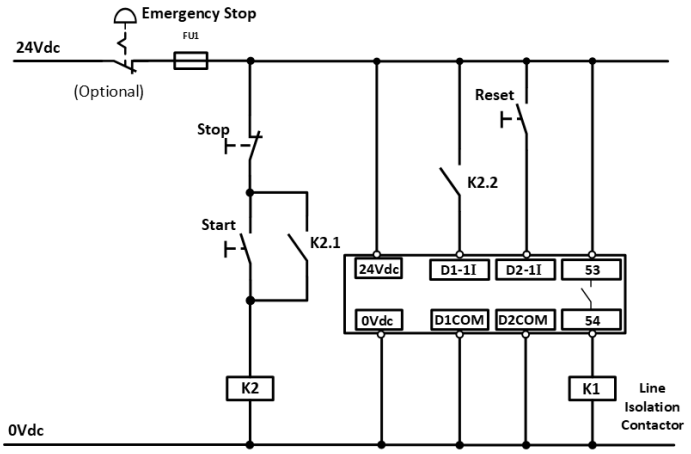
RÉFÉRER au TABLEU 5 à la page 13 pour des tensions de contrôle d'entrée.

Ces schémas de câblage sont recommandées spécifiquement lorsque la tension d'alimentation de commande (U_s) est identique à la tension du circuit de commande (U_c). U_s et Uc ne doivent pas être alimentés séparément. Toutes les configurations de câblage doivent également être en conformité avec les codes et les règlements locaux et nationaux en vigueur.

User Programmable Control Diagram
110/230VAC control supply (U_s) and digital input (U_c) programming

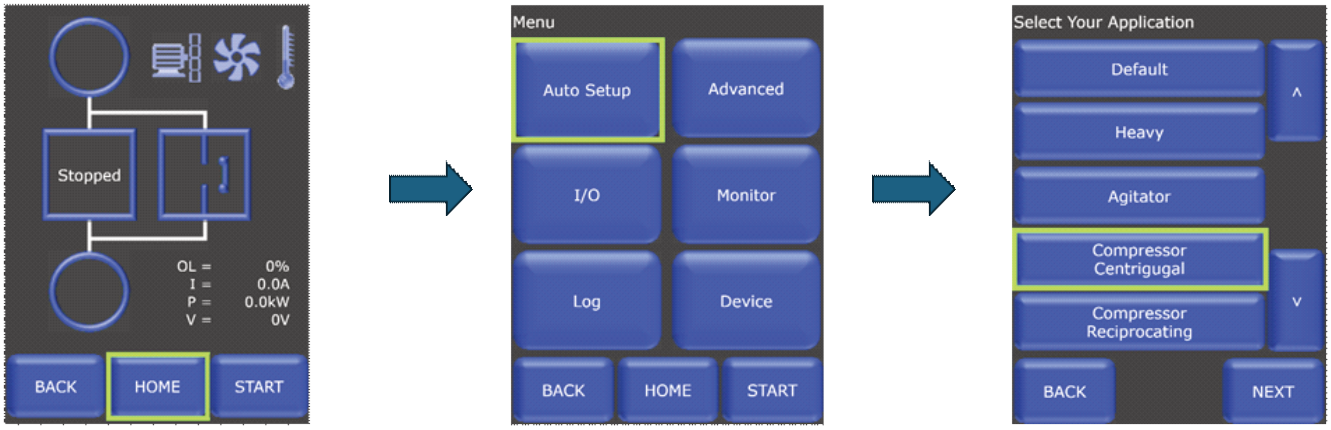


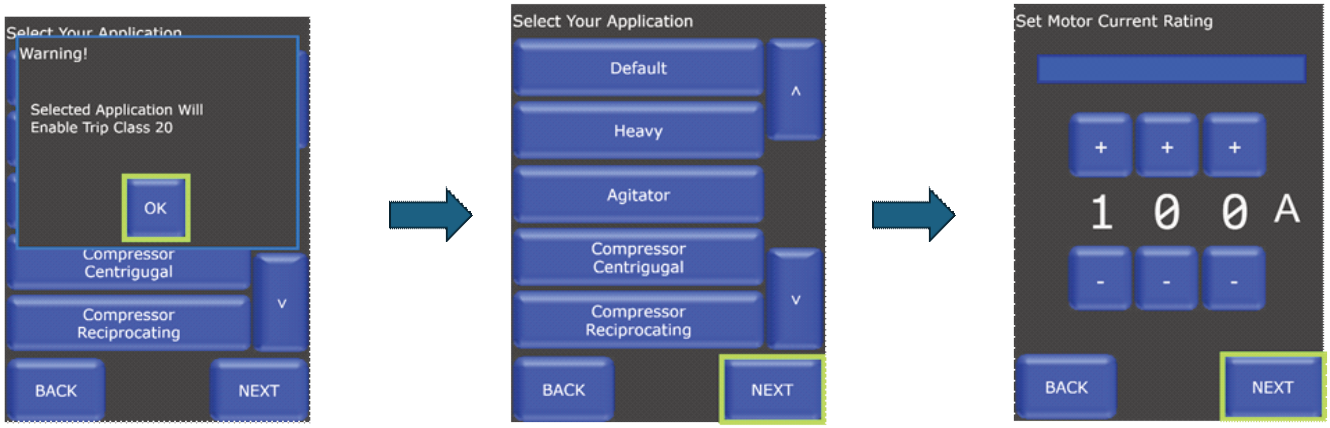
User Programmable Control Diagram
24VDC control supply (U_s) and digital input (U_c) programming
(only applicable to 206-123 (17A) to 203-143 (361A))

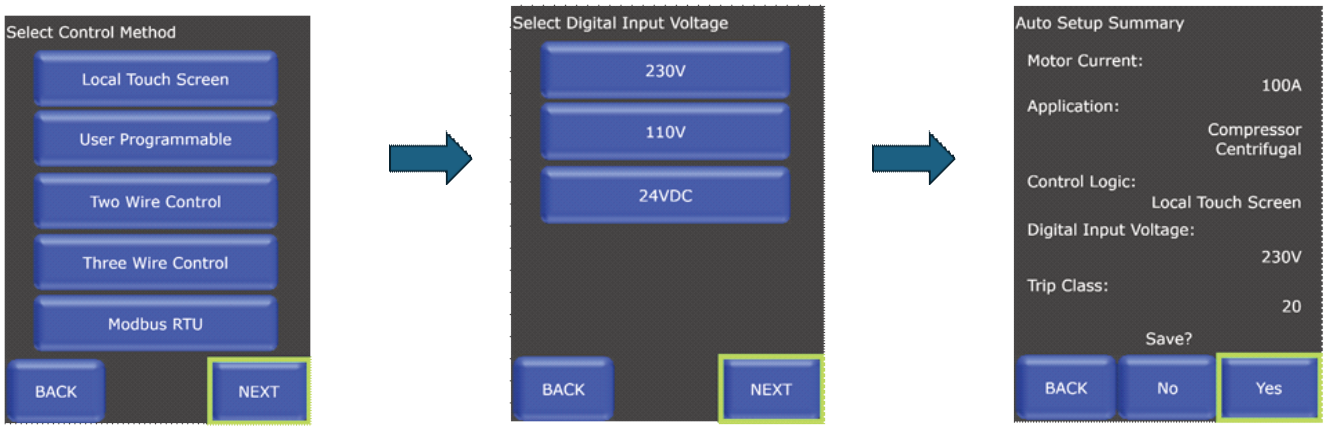


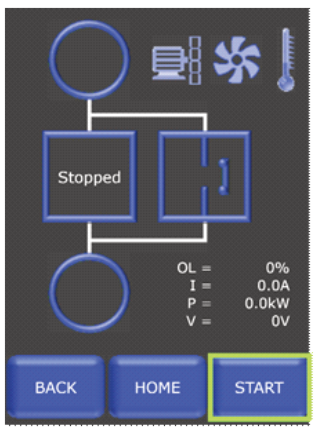
User programmable inputs are fully programmable	1) Optional high reset. If this reset is required ensure "User Programmable" is selected in the control method menu found in the Digital Inputs menu. If you would prefer the reset to work by removing and reapplying the Start Signal on D1 - 1I then select "Two wire control" in the control method menu.
D1 – 1I = High Start / Low Stop	
D1 – 2I = None	
D2 – 1I = High Reset	

Programming









Rating table

Type RS PRO VMX-Synergy Plus.. (I_e)	I_e A [3]	kW [1]			FLA A [3]	HP [2]					U_s
		230V	400V	500V		200V	208V	220-240V	440-480V	550-600V	
206-123 (17A)	**17**	4	7.5	7.5	**17**	3	5	5	10	15	24VDC, 110VAC to 230VAC
206-124 (22A)	**22**	5.5	11	11	**22**	5	5	5	15	20	
206-125 (29A)	**29**	7.5	15	15	**27**	7.5	7.5	7.5	20	25	
206-127 (35A)	**35**	7.5	18.5	22	**34**	10	10	10	25	30	
206-128 (41A)	**41**	11	22	22	**41**	10	10	10	30	40	
206-130 (55A)	**55**	15	30	37	**52**	15	15	15	40	50	
206-131 (66A)	**66**	18.5	37	45	**65**	20	20	20	50	60	
206-133 (80A)	**80**	22	45	55	**77**	20	25	25	60	75	
206-134 (100A)	**100**	30	55	55	**99**	30	30	30	75	100	
206-136 (132A)	**132**	37	75	90	**125**	40	40	40	100	125	
206-137 (160A)	**160**	45	90	110	**156**	50	50	60	125	150	
206-139 (195A)	**195**	55	110	132	**192**	60	60	75	150	200	
206-140 (242A)	**242**	75	132	160	**242**	75	75	75	200	250	
206-142 (302A)	**302**	90	160	200	**302**	100	100	100	250	300	
206-143 (361A)	**361**	110	200	250	**361**	125	125	150	300	350	
206-145 (430A)	**430**	132	250	250	**414**	150	150	150	350	450	110VAC
206-147 (500A)	**500**	150	280	355	**480**	150	150	150	400	500	
206-151 (625A)	**625**	200	355	425	**625**	200	200	250	500	600	
206-153 (722A)	**722**	220	400	530	**722**	250	250	300	600	700	
206-156 (850A)	**850**	280	500	630	**850**	300	300	350	700	800	
206-146 (430A)	**430**	132	250	250	**414**	150	150	150	350	450	230VAC
206-149 (500A)	**500**	150	280	355	**480**	150	150	150	400	500	
206-152 (625A)	**625**	200	355	425	**625**	200	200	250	500	600	
206-155 (722A)	**722**	220	400	530	**722**	250	250	300	600	700	
206-156 (850A)	**850**	280	500	630	**850**	300	300	350	700	800	

Notes:

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

[2] Rated operational powers in HP corresponding to FLA current rating according to UL508 and Table 430.250 of the National Electrical Code.

[3] **For 206-123 (17A) to 206-149 (500A)**:
The I_e and FLA rating applies for a maximum surrounding air temperature of 50°C. Above 50°C de-rate linearly by 4% of Ie or FLA per °C to a maximum of 60°C.

For 206-151 (625A) to 206-156 (850A):
The I_e and FLA rating applies for a maximum surrounding air temperature of 40°C. Above 40°C de-rate linearly by 2% of Ie or FLA per °C to a maximum of 60°C.

Sizing guide

In-Line Connection

Use tables to determine the size of the RS PRO VMX-Synergy Plus required for the motor selected.

I_e A	kW			FLA A	HP					Trip Class 10	Trip Class 20	Trip Class 30
	230V	400V	500V		200V	208V	220-240V	440-480V	550-600V	I_e: AC-53a: 3.5-17: 90-S RS PRO VMX-Synergy Plus.. [1)]	I_e: AC-53a: 4-19: 90-S RS PRO VMX-Synergy Plus.. [1)]	I_e: AC-53a: 4-29: 90-S RS PRO VMX-Synergy Plus..[1)]
17	4	7.5	7.5	**17**	3	5	5	10	15	**206-123 (17A)**	**206-124 (22A)**	**206-125 (29A)**
22	5.5	11	11	**22**	5	5	5	15	20	**206-124 (22A)**	**206-125 (29A)**	**206-127 (35A)**
29	7.5	15	15	**27**	7.5	7.5	7.5	20	25	**206-125 (29A)**	**206-127 (35A)**	**206-128 (41A)**
35	7.5	18.5	22	**34**	10	10	10	25	30	**206-127 (35A)**	**206-128 (41A)**	**206-130 (55A)**
41	11	22	22	**41**	10	10	10	30	40	**206-128 (41A)**	**206-130 (55A)**	**206-131 (66A)**
55	15	30	37	**52**	15	15	15	40	50	**206-130 (55A)**	**206-131 (66A)**	**206-133 (80A)**
66	18.5	37	45	**65**	20	20	20	50	60	**206-131 (66A)**	**206-133 (80A)**	**206-134 (100A)**
80	22	45	55	**77**	20	25	25	60	75	**206-133 (80A)**	**206-134 (100A)**	**206-136 (132A)**
100	30	55	55	**99**	30	30	30	75	100	**206-134 (100A)**	**206-136 (132A)**	**206-137 (160A)**
132	37	75	90	**125**	40	40	40	100	125	**206-136 (132A)**	**206-137 (160A)**	**206-139 (195A)**
160	45	90	110	**156**	50	50	60	125	150	**206-137 (160A)**	**206-139 (195A)**	**206-140 (242A)**
195	55	110	132	**192**	60	60	60	150	200	**206-139 (195A)**	**206-140 (242A)**	**206-142 (302A)**
242	75	132	160	**242**	75	75	75	200	250	**206-140 (242A)**	**206-142 (302A)**	**206-143 (361A)**
302	90	160	200	**302**	100	100	100	250	300	**206-142 (302A)**	**206-143 (361A)**	**206-145 (430A)** **206-146 (430A)**
361	110	200	250	**361**	125	125	150	300	350	**206-143 (361A)**	**206-145 (430A)** **206-146 (430A)**	**206-147 (500A)** **206-149 (500A)**
430	132	250	250	**414**	150	150	150	350	450	**206-145 (430A)** **206-146 (430A)**	**206-147 (500A)** **206-149 (500A)**	**206-151 (625A)** **206-152 (625A)**
500	150	280	355	**480**	150	150	150	400	500	**206-147 (500A)** **206-149 (500A)**	**206-151 (625A)** **206-152 (625A)**	**206-153 (722A)** **206-155 (722A)**
625	200	355	425	**625**	200	200	250	500	600	**206-151 (625A)** **206-152 (625A)**	**206-153 (722A)** **206-155 (722A)**	**206-156 (850A)** **206-158 (850A)**
722	220	400	530	**722**	250	250	300	600	700	**206-153 (722A)** **206-155 (722A)**	**206-156 (850A)** **206-158 (850A)**	-
850	280	500	630	**850**	300	300	350	700	800	**206-156 (850A)** **206-158 (850A)**	-	-

Note:

[1)] Duty cycle rating 90-S where S=5 for models 206-123 (17A) to 206-139 (195A) and S=3 for models 206-140 (242A) to 206-158 (850A).

Sizing guide

In-Delta Connection

Use tables to determine the size of the RS PRO VMX-Synergy Plus required for the motor selected.

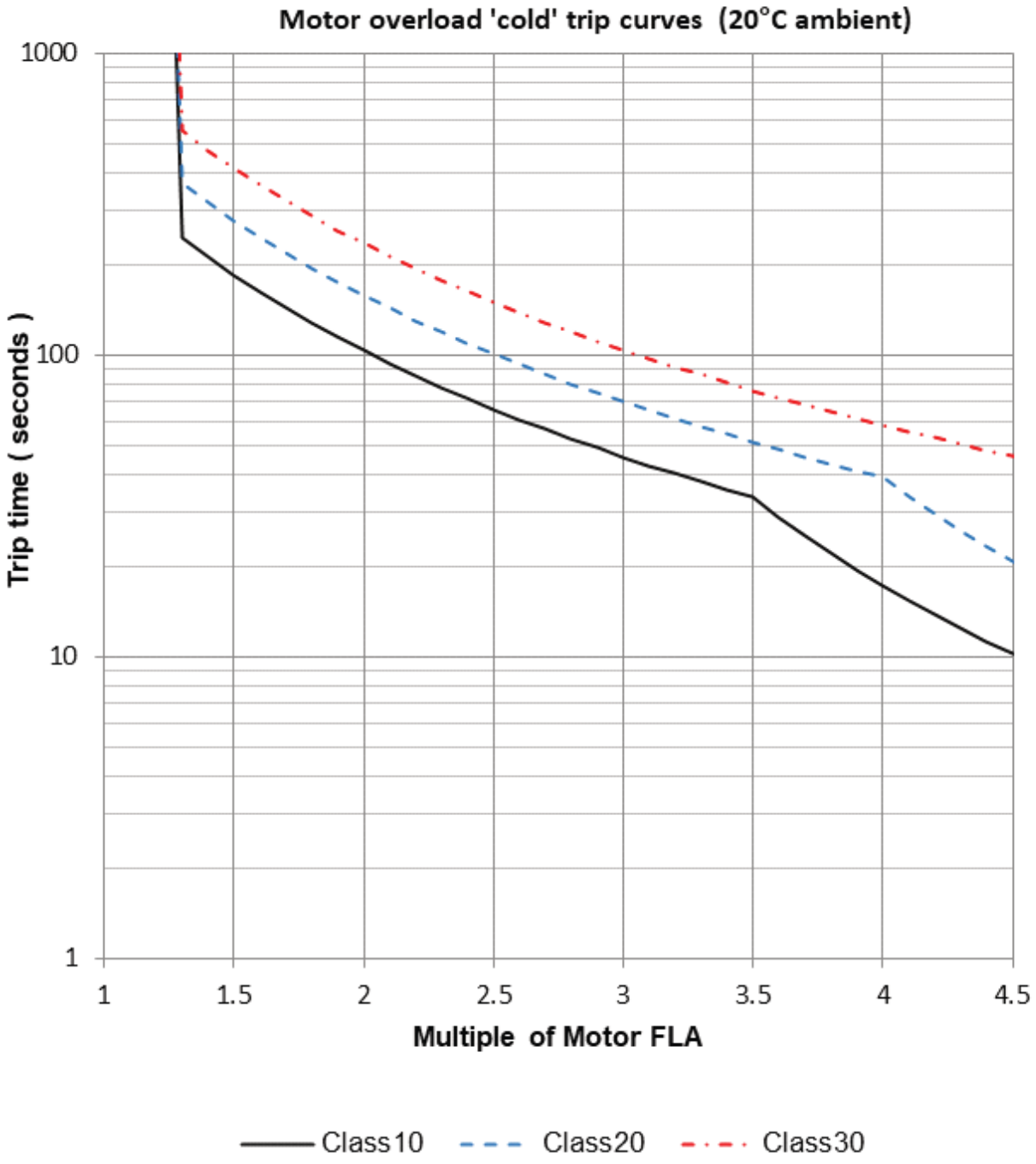
I_e A	kW			FLA A	HP					Trip Class 10	Trip Class 20	Trip Class 30
	230V	400V	500V		200V	208V	220-240V	440-480V	550-600V	I_e: AC-53a: 3.5-17: 90-S RS PRO VMX-Synergy Plus.. [1]	I_e: AC-53a: 4-19: 90-S RS PRO VMX-Synergy Plus..[1]	I_e: AC-53a: 4-29: 90-S RS PRO VMX-Synergy Plus..[1]
29	7.5	15	18.5	**29**	7.5	7.5	10	20	25	**206-123 (17A)**	**206-124 (22A)**	**206-125 (29A)**
38	11	18.5	22	**38**	10	10	10	25	30	**206-124 (22A)**	**206-125 (29A)**	**206-127 (35A)**
50	11	22	30	**50**	10	15	15	30	40	**206-125 (29A)**	**206-127 (35A)**	**206-128 (41A)**
61	18.5	30	37	**61**	15	15	20	40	50	**206-127 (35A)**	**206-128 (41A)**	**206-130 (55A)**
71	18.5	37	45	**71**	20	20	25	50	60	**206-128 (41A)**	**206-130 (55A)**	**206-131 (66A)**
95	22	45	55	**95**	25	30	30	60	75	**206-130 (55A)**	**206-131 (66A)**	**206-133 (80A)**
114	30	55	75	**114**	30	30	40	75	100	**206-131 (66A)**	**206-133 (80A)**	**206-134 (100A)**
139	37	75	90	**139**	40	40	50	100	125	**206-133 (80A)**	**206-134 (100A)**	**206-136 (132A)**
173	55	90	110	**173**	50	50	60	125	150	**206-134 (100A)**	**206-136 (132A)**	**206-137 (160A)**
229	55	110	160	**229**	60	75	75	150	200	**206-136 (132A)**	**206-137 (160A)**	**206-139 (195A)**
277	75	150	185	**277**	75	75	100	200	250	**206-137 (160A)**	**206-139 (195A)**	**206-140 (242A)**
332	90	185	220	**332**	100	100	125	150	300	**206-139 (195A)**	**206-140 (242A)**	**206-142 (302A)**
419	132	220	300	**419**	150	150	150	350	450	**206-140 (242A)**	**206-142 (302A)**	**206-143 (361A)**
523	160	300	375	**523**	150	150	200	450	500	**206-142 (302A)**	**206-143 (361A)**	**206-145 (430A)** **206-146 (430A)**
625	200	355	425	**625**	200	200	250	500	600	**206-143 (361A)**	**206-145 (430A)** **206-146 (430A)**	**206-147 (500A)** **206-149 (500A)**
745	220	425	530	**745**	250	250	250	500	700	**206-145 (430A)** **206-146 (430A)**	**206-147 (500A)** **206-149 (500A)**	**206-151 (625A)** **206-152 (625A)**
866	280	500	630	**866**	250	300	300	600	800	**206-147 (500A)** **206-149 (500A)**	**206-151 (625A)** **206-152 (625A)**	**206-153 (722A)** **206-155 (722A)**
1083	335	630	800	**1083**	350	400	450	900	1000	**206-151 (625A)** **206-152 (625A)**	**206-153 (722A)** **206-155 (722A)**	**206-156 (850A)** **206-158 (850A)**
1251	400	710	900	**1251**	450	450	500	1000	1250	**206-153 (722A)** **206-155 (722A)**	**206-156 (850A)** **206-158 (850A)**	-
1472	475	850	1000	**1472**	500	500	600	1100	1500	**206-156 (850A)** **206-158 (850A)**	-	-

Note:

[1] Maximum motor line current indicated. For In-Delta connections, all six motor wires must be available for connection, and it is critical to exactly follow the In-Delta wiring diagram in the RS PRO VMX-Synergy Plus Quick Start Guide. The soft-starter will only sense the Phase Current, which is about 57.7% of the motor line current.

[2] Duty cycle rating 90-S where S=5 for models 206-123 (17A) to 206-139 (195A) and S=3 for models 206-140 (242A) to 206-158 (850A).

Overload trip curves



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

Technical information and standards

Product standard		EN 60947-4-2:2012		
Rated operational voltages	**U_e**	200VAC to 600VAC		
Rated operational currents	**I_e**	See Rating Table		
Rating index		See Sizing Guide		
Rated frequency/frequencies		50 - 60Hz ± 5Hz		
Rated duty		Uninterrupted		
Form designation		Form 1, Internally Bypassed		
Rated insulation voltage	**U_i**	600V		
Rated impulse withstand voltage	**U_{imp}**	Main circuit	6kV	
IP code		Main circuit	IP00 (IP 20 optional on 206-123 (17A) to 206-139 (195A))	
		Supply and Control circuit	IP20	
Pollution degree		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		
Rated control circuit voltage (programmable)	**U_c**	24VDC, 110VAC or 230VAC	50 - 60Hz ±5Hz	Protect with UL listed fuse rated max 4A
Rated control supply voltage	**U_s**	See Rating Table, 2 Amp supply (cont.)		
Relay specification	**11/23, 12, 24 and 33/43, 34, 44**	AC-15, 230VAC, 1A DC-13 30VDC, 0.7A		
	53, 54	AC-15, 250VAC, 3A DC-13 24VDC, 2A		
Electronic Overload relay with manual reset	**Trip Class**	10, 20 or 30 (See Sizing Guide for associated I_e rating)		
	Current setting	10% I_e to I_e		
	Rated frequency	50 to 60Hz ± 5Hz		
	Time-current characteristics	See Fig.1 for trip curves (Trip time T_p ± 20%)		
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		

The safety functions were not evaluated by UL.

Transient surge suppression shall be installed on the line side of this equipment and shall be rated 600VAC (phase to phase), suitable for over-voltage category III, and shall provide protection for a rated impulse withstand voltage peak of 6 kV" – or equivalent.

The control circuits are to be supplied by class 2, limited voltage current or protected by a 4A UL 248 listed fuse.

Control and auxiliary circuits have an over-voltage withstand capacity of 2.5kV.

[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.

Short circuit protection

Size 1

Type designation (eg. RS PRO VMX-Synergy Plus-...)			206-123 (17A)	206-124 (22A)	206-125 (29A)	206-127 (35A)	206-128 (41A)	206-130 (55A)	206-131 (66A)	206-133 (80A)	206-134 (100A)
Rated operational currents	I_e	A	17	22	29	35	41	55	66	80	100
Rated conditional short circuit current	I_q	kA	10	10	10	10	10	10	10	10	10
Class J time-delay fuse [1)]	Maximum rating Z_1	A	25	30	40	45	60	70	90	100	125
UL Listed inverse-time delay circuit breaker [1)]	Maximum rating Z_2	A	25	30	40	45	60	70	90	100	125
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	100	100	160	160	200	200	200	315	315

Size 2 + 3A/3B

Type designation (eg. RS PRO VMX-Synergy Plus-...)			206-136 (132A)	206-137 (160A)	206-139 (195A)	206-140 (242A)	206-142 (302A)	206-143 (361A)	206-145 206-146 (430A)	206-147 206-149 (500A)
Rated operational currents	I_e	A	132	160	195	242	302	361	430	500
Rated conditional short circuit current	I_q	kA	10	10	10	18	18	18	30	30
Class J time-delay fuse [1)]	Maximum rating Z_1	A	175	200	250	350	400	450	600	600
UL Listed inverse-time delay circuit breaker [1)]	Maximum rating Z_2	A	175	200	250	400	500	600	700	800
Semiconductor fuse (class aR) [2)]	Type		Mersen 6,9 URD 30 _ Bussmann 170M40_ Bussmann 170M41_ Bussmann 170M42_ SIBA 20 61___				Mersen 6,9 URD 33__ Bussmann 170M60_ Bussmann 170M61_ Bussmann 170M62__ SIBA 20 63___		Mersen 6,9 URD 33__ SIBA 20 63___	
	Fuse rating	A	400	550	550	900	900	900	1000	1000

Size 4

Type designation (eg. RS PRO VMX-Synergy Plus-...)			206-151 206-152 (625A)	206-153 206-155 (722A)	206-156 206-158 (850A)
Rated operational currents	I_e	A	625	722	850
Rated conditional short circuit current	I_q	kA	42	42	42
Class J time-delay fuse [1)]	Maximum rating Z_1	A	800	1000	1200
UL Listed inverse-time delay circuit breaker [1)]	Maximum rating Z_2	A	1000	1200	1200
Semiconductor fuse (class aR) [2)]	Type		Mersen PC36UD69V**CP11 SIBA 20 688 32		
	Fuse rating	A	1800	1800	1800

Note: for Mersen fuses ** is 18 for 1800A fuse and 20 for 2000A fuse.

Notes:

[1)]. Suitable for use on a circuit capable of delivering not more than ___I_q___ rms Symmetrical Amperes, 600 Volts Maximum, when protected by Class J or Class L time delay fuses as indicated 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 RS PRO VMX-Synergy Plus unit. These semiconductor fuses are recommended to provide this increased protection.

Electric current, Danger to life!
Only skilled or instructed persons may carry out the operations.

Lebensgefahr durch Strom!
Nur Elektrofachkräfte und elektrotechnisch unterwiesene Personen dürfen die im Folgenden beschriebenen Arbeiten ausführen.

Tension électrique dangereuse!
Seules les personnes qualifiées et averties doivent exécuter les travaux ci-après.

¡Corriente eléctrica! ¡Peligro de muerte!
El trabajo a continuación descrito debe ser realizado por personas cualificadas y advertidas.

Tensione elettrica: Pericolo di morte!
Solo persone abilitate e qualificate possono eseguire le operazioni di seguito riportate.

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。

Электрический ток! Опасно для жизни!
Только специалисты или проинструктированные лица могут выполнять следующие операции.

Levensgevaar door elektrische stroom!
Uitsluitelijk deskundigen in elektriciteit en elektrotechnisch geinstrueerde personen is het toegestaan, de navolgend beschrevene werkzaamheden uit te voeren.

Livsfare på grund af elektrisk strøm!
Kun uddannede el-installatører og personer der e instruerede i elektrotekniske arbejdsopgaver, må udføre de nedenfor anførte arbejder.

Προσοχή, κίνδυνος ηλεκτροπληξίας!
Οι εργασίες που αναφέρονται στη συνέχεια θα πρέπει να εκτελούνται μόνο από ηλεκτρολόγους και ηλεκτροτεχνίτες.

Perigo de vida devido a corrente eléctrica!
Apenas electricistas e pessoas com formação electrotécnica podem executar os trabalhos que a seguir se descrevem.

Livsfara genom elektrisk ström!
Endast utbildade elektriker och personer som undervisats i elektroteknik får utföra de arbeten som beskrivs nedan.

Hengenvaarallinen jännite!
Vain pätevät sähköasentajat ja opastusta saaneet henkilöt saavat suorittaa seuraavat työt.

Nebezpečí úrazu elektrickým proudem!
Níže uvedené práce smějí provádět pouze osoby s elektrotechnickým vzděláním.

Eluohtlik! Elektrilöögioht!
Järgnevalt kirjeldatud töid tohib teostada ainult, elektriala spetsialist või elektrotehnilise, Järgnevalt kirjeldatud töid tohib teostada ainult, instrueerimise läbinud personal.

Életveszély az elektromos áram révén!
Csak elektromos szakemberek és elektrotechnikában képzett személyek végezhetik el a következőkben leírt munkákat.

ElektriskŌ strŌva apdraud dzŅvŅbu!
TŌlŌk aprakstŅtos darbus drŅkst veikt tikai elektrospeciŌlisti un darbam ar elektrotehniskŌm iekŌrtŌm instruńtŌs personas!

Porażenie prądem elektrycznym stanowi zagrożenie dla życia!
Opisane poniżej prace mogą przeprowadzać tylko wykwalifikowani elektrycy oraz osoby odpowiednio poinstruowane w zakresie elektrotechniki.

Livsfara genom elektrisk ström!
Endast utbildade elektriker och personer som undervisats i elektroteknik får utföra de arbeten som beskrivs nedan.

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TŌlŌk aprakstŅtos darbus drŅkst veikt tikai elektrospeciŌlisti un darbam ar elektrotehniskŌm iekŌrtŌm instruńtŌs personas!

Pavojus gyvybei dĮl elektros srovĮs!
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.

Življenjska nevarnost zaradi električnega toka!
Spodaj opisana dela smejo izvajati samo elektrostrokovnjaki in elektrotehnično poučene osebe

Nebezpečenstvo ohrozenia života elektrickým prúdom!
Práce, ktoré sú nižšie opísané, smú vykonávať iba elektroodborníci a osoby s elektrotechnickým vzdelaním.

Опасност за живота от електрически ток!
Операциите, описани в следващите раздели, могат да се извършват само от специалисти-електротехници и инструктиран електротехнически персонал.

Atenţie! Pericol electric!
Toate lucrările descrise trebuie efectuate numai de personal de specialitate calificat şi de persoane cu cunoştiinţe profunde în electrotehnică.

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Pavojus gyvybei dĮl elektros srovĮs!
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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 Article33 Declaration on website. User 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 packing materials.

RS PRO aim to ensure that any battery used within their products is readily removable and replaceable by the end user. Instructions are available on the RS PRO website.

RS PRO reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

This product is for professional use only and requires a level of training, it should not be supplied to consumers and is therefore outside the scope of the PSTI act.

Notes

Notes

RS PRO VMX-Synergy Plus

Quick Start Guide

www.RS-online.com

M-RS-025-V01.01