

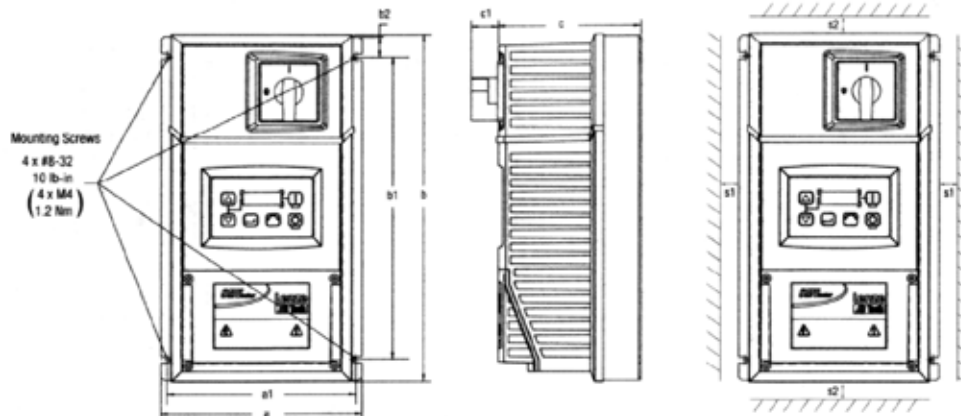
Installation Instructions for Variable Frequency Drive Used on Morse Variable Speed Drum Rotators shown below

Variable Frequency Drive (VFD)		Used with Morse Rotator Model #	Inverter Duty AC Motor	
Part #	Description		Part #	Description
4726-P	VFD, 1PH 1HP, W/ DISCN	1-5154VS-1-115	4732-P	MOTOR, 1/2HP, 3PH, INV DUTY
4726-P	VFD, 1PH 1HP, W/ DISCN	1-5154VS-1-230	4732-P	MOTOR, 1/2HP, 3PH, INV DUTY
4780-P	VFD, 3PH 240V, 1HP W/ DISCN	1-5154VS-3-230	4732-P	MOTOR, 1/2HP, 3PH, INV DUTY
4782-P	VFD, 3PH 480V, 1HP W/ DISCN	1-5154VS-3-460	4732-P	MOTOR, 1/2HP, 3PH, INV DUTY
4726-P	VFD, 1PH 1HP, W/ DISCN	2-5154VS-1-115	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4726-P	VFD, 1PH 1HP, W/ DISCN	2-5154VS-1-230	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4780-P	VFD, 3PH 240V, 1HP W/ DISCN	2-5154VS-3-230	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4782-P	VFD, 3PH 480V, 1HP W/ DISCN	2-5154VS-3-460	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4726-P	VFD, 1PH 1HP, W/ DISCN	1-300VS-1-115	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4726-P	VFD, 1PH 1HP, W/ DISCN	1-300VS-1-230	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4780-P	VFD, 3PH 240V, 1HP W/ DISCN	1-300VS-3-230	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4782-P	VFD, 3PH 480V, 1HP W/ DISCN	1-300VS-3-460	4733-P	MOTOR, 1HP, 3PH, INV DUTY
4729-P	VFD, 1PH 1.5HP W/ DISCN	2-300VS-1-115	4734-P	MOTOR, 1-1/2HP, 3PH, INV DUTY
4729-P	VFD, 1PH 1.5HP W/ DISCN	2-300VS-1-230	4734-P	MOTOR, 1-1/2HP, 3PH, INV DUTY
4781-P	VFD, 3PH 240V, 1.5HP W/ DISCN	2-300VS-3-230	4734-P	MOTOR, 1-1/2HP, 3PH, INV DUTY
4783-P	VFD, 3PH 480V, 1.5HP W/ DISCN	2-300VS-3-460	4734-P	MOTOR, 1-1/2HP, 3PH, INV DUTY



Installation

3.1.4 NEMA 4X (IP65) Models with Disconnect Switch



Type	a in (mm)	a1 in (mm)	b in (mm)	b1 in (mm)	b2 in (mm)	c in (mm)	c1 in (mm)	s1 in (mm)	s2 in (mm)	m lb (kg)
AA1 ESV371N01SM ; ESV371N02YM ; ESV371N02SL ; ESV371N04TM ; ESV371N04TL ; ESV371N06TM ; ESV751N01SM ; ESV751N02YM ; ESV751N02SL ; ESV751N04TM ; ESV751N04TL ; ESV751N06TM ;	6.28 (160)	5.90 (150)	10.99 (279)	9.54 (242)	0.66 (17)	4.47 (114)	.86 (22)	2.00 (51)	2.00 (51)	4.7 (2.13)
AA2 ESV112N01SM ; ESV112N02YM ; ESV112N02SL ; ESV112N04TM ; ESV112N04TL ; ESV152N02YM ; ESV152N02SL ; ESV152N04TM ; ESV152N04TL ; ESV152N06TM ; ESV222N04TM ; ESV222N04TL ; ESV222N06TM ; ESV302N04TL ;	6.28 (160)	5.90 (150)	10.99 (279)	9.54 (242)	0.66 (17)	6.31 (160)	.86 (22)	2.00 (51)	2.00 (51)	7.9 (3.58)
AD1 ESV222N02SL ; ESV222N02YM ;	7.12 (181)	6.74 (171)	10.99 (279)	9.54 (242)	0.66 (17)	6.77 (172)	.86 (22)	2.00 (51)	2.00 (51)	9.0 (4.08)
AB1 ESV552N02TM- ; ESV752N02TM- ESV752N04TM- ; ESV752N06TM- ESV752N04TL-	8.04 (204)	7.56 (192)	13.00 (330)	11.04 (280)	0.92 (23)	8.00 (203)	.86 (22)	4.00 (102)	4.00 (102)	13.9 (6.32)
AC1 ESV402N02TM ; ESV402N04TM ; ESV552N04TM ; ESV402N06TM ; ESV552N06TM ; ESV402N04TL ; ESV552N04TL-	8.96 (228)	8.48 (215)	13.00 (330)	11.04 (280)	0.92 (23)	8.04 (204)	.86 (22)	4.00 (102)	4.00 (102)	14.7 (6.66)
AE1 ESV113N04TM- ; ESV153N04TM- ESV113N06TM- ; ESV153N06TM-	9.42 (240)	8.94 (228)	14.50 (368)	12.54 (319)	0.92 (24)	9.45 (241)	0.73 (19)	4.00 (102)	4.00 (102)	23.0 (10.4)
AF1 ESV113N02TM- ; ESV153N02TM- ESV113N04TL- ; ESV153N04TL- ESV183N04TL- ; ESV223N04TL- ESV183N04TM- ; ESV223N04TM- ESV183N06TM- ; ESV223N06TM-	9.42 (240)	8.94 (228)	18.5 (470)	16.54 (420)	0.92 (24)	9.45 (241)	0.73 (19)	4.00 (102)	4.00 (102)	28.5 (12.9)

_ = Last digit of part number: C = N4X Indoor (convection cooled) ~ = Last digit of part number: D = N4X Indoor (fan cooled)

Conduit Hole Dimensions		Type	N in (mm)	P in (mm)	Q in (mm)	S in (mm)	S1 in (mm)
		AA1	3.14 (80)	2.33 (59)	1.50 (38)	.88 (22)	n/a
		AA2	3.14 (80)	4.18 (106)	1.50 (38)	.88 (22)	n/a
		AD1	3.56 (90)	4.63 (118)	1.50 (38)	.88 (22)	n/a
		AB1	4.02 (102)	5.00 (127)	1.85 (47)	1.06 (27)	n/a
		AC1	4.48 (114)	5.00 (127)	1.85 (47)	1.06 (27)	n/a
		AE1	4.71 (120)	5.70 (145)	2.00 (51)	1.375 (35)	1.125 (28)
		AF1	4.71 (120)	5.70 (145)	2.00 (51)	1.375 (35)	1.125 (28)

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3.2 Electrical Installation

Installation After a Long Period of Storage



STOP!

Severe damage to the drive can result if it is operated after a long period of storage or inactivity without reforming the DC bus capacitors.

If input power has not been applied to the drive for a period of time exceeding three years (due to storage, etc), the electrolytic DC bus capacitors within the drive can change internally, resulting in excessive leakage current. This can result in premature failure of the capacitors if the drive is operated after such a long period of inactivity or storage.

In order to reform the capacitors and prepare the drive for operation after a long period of inactivity, apply input power to the drive for 8 hours prior to actually operating the motor.

3.2.1 Power Connections



STOP!

If the kVA rating of the AC supply transformer is greater than 10 times the input kVA rating of the drive(s), an isolation transformer or 2-3% input line reactor must be added to the line side of the drive(s).



DANGER! Hazard of electrical shock!

Circuit potentials up to 600 VAC are possible. Capacitors retain charge after power is removed. Disconnect power and wait at least three minutes before servicing the drive.

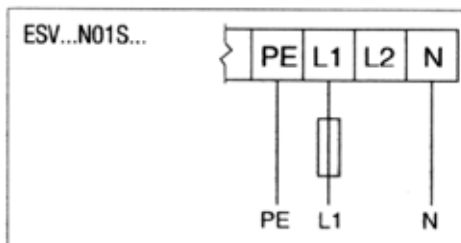


STOP!

- Verify mains voltage before connecting to drive.
- Do not connect mains power to the output terminals (U,V,W)! Severe damage to the drive will result.
- Do not cycle mains power more than once every two minutes. Damage to the drive may result.

Mains and Motor Terminations		
Type	Torque	Strip Length
<5HP	12 lb-in (1.3 Nm)	0.25 in (6mm)
ESV552xx2T, ESV752xx2T, ESV113xx4/6, ESV153xx4/6, ESV183xx6, ESV223xx6	16 lb-in (1.8 Nm)	0.25 in (6mm)
ESV552xx4Txx, ESV752xx4Txx, ESV552xx6Txx, ESV752xx6Txx	12 lb-in (1.3Nm)	0.25 in (6mm)
ESV113xx2xxx, ESV153xx2xxx, ESV183xx4xxx, ESV223xx4xxx	24 lb-in (2.7 Nm)	0.25 in (6mm)
Torque: N4X/IP65 Door Screws		
N4X/IP65	6-7 lb-in (0.67-0.79 Nm)	0.25 in (6mm)

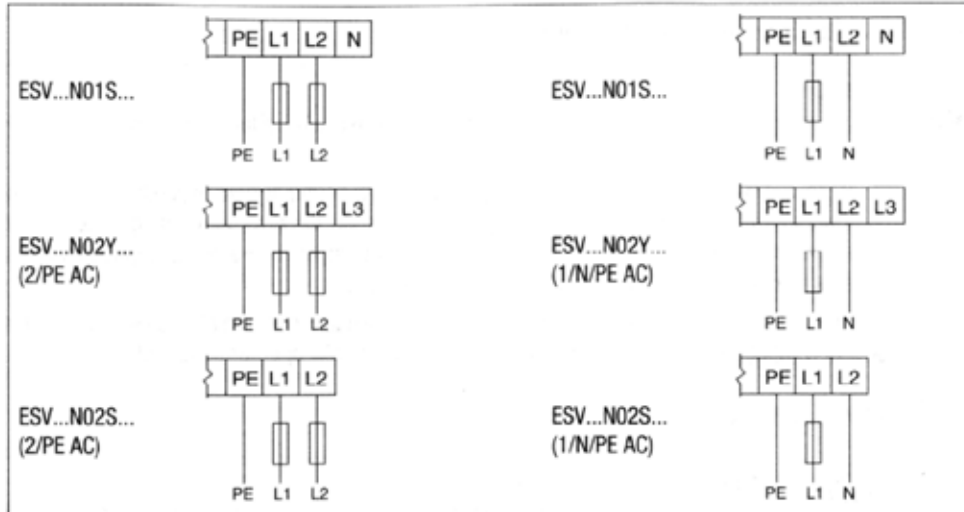
3.2.1.1 Mains Connection to 120VAC Single-Phase Supply



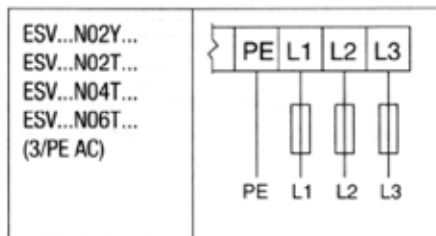


Installation

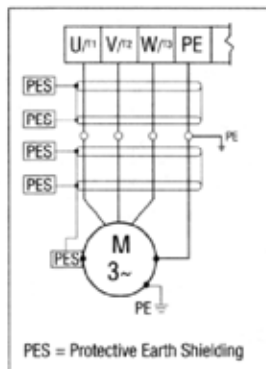
3.2.1.2 Mains Connection to 240VAC Single-Phase Supply



3.2.1.3 Mains Connection to Three-Phase Supply



3.2.1.4 Motor Connection



WARNING!

If the cable connection between the drive and the motor has an in-line contactor or circuit breaker then the drive must be stopped prior to opening/closing the contacts. Failure to do so may result in Overcurrent trips and/or damage to the inverter.



WARNING!

Leakage current may exceed 3.5 mA AC. The minimum size of the protective earth (PE) conductor shall comply with local safety regulations for high leakage current equipment.



STOP!

In the case of a Spinning Motor:

To bring free-wheeling loads such as fans to a rest before starting the drive, use the DC injection braking function. Starting a drive into a freewheeling motor creates a direct short-circuit and may result in damage to the drive.

Confirm motor suitability for use with DC injection braking.

Consult parameter P110 for starting / restarting into spinning motors.

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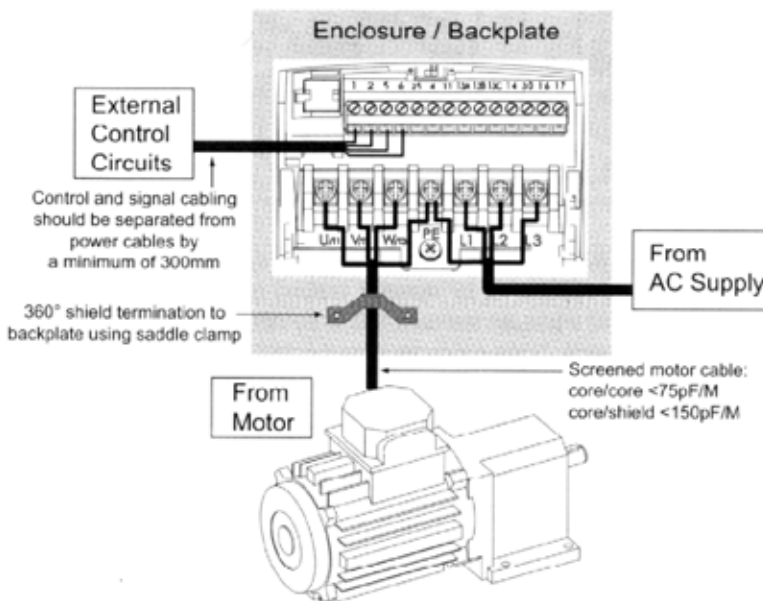
3.2.1.5 Installation Recommendations for EMC Compliance

For compliance with EN 61800-3 or other EMC standards, motor cables, line cables and control or communications cables must be shielded with each shield/screen clamped to the drive chassis. This clamp is typically located at the conduit mounting plate.

The EMC requirements apply to the final installation in its entirety, not to the individual components used. Because every installation is different, the recommended installation should follow these guidelines as a minimum. Additional equipment (such as ferrite core absorbers on power conductors) or alternative practices may be required to meet conformance in some installations.

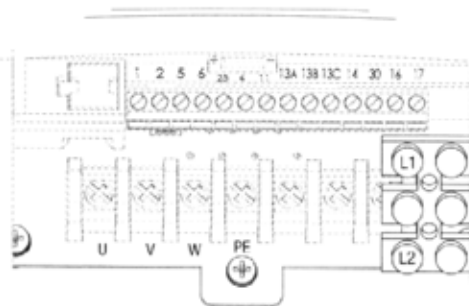
Motor cable should be low capacitance (core/core <75pF/m, core/shield <150pF/m). Filtered drives can meet the class A limits of EN 55011 and EN 61800-3 Category 2 with this type of motor cable up to 10 meters.

NOTE: Refer to Appendix A for recommended cable lengths. Any external line filter should have its chassis connected to the drive chassis by mounting hardware or with the shortest possible wire or braid.

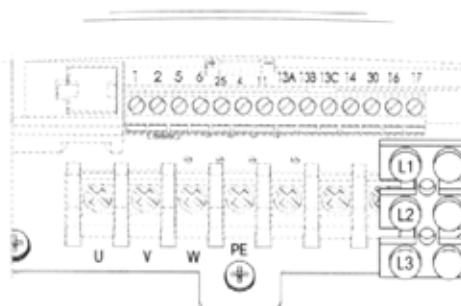


3.2.1.6 NEMA 4X (IP65) Input Terminal Block

For NEMA 4X (IP65) models with integrated EMC filter and/or integrated line disconnect, the input terminal block is located on the right-hand side of the SMV inverter in the NEMA 4X (IP65) enclosure. The single and three phase models are illustrated herein. Refer to paragraph 3.2.3 Control Terminals for pin out information.



Single Phase (2/PE)
With Filter and/or integrated line disconnect



Three Phase (3/PE)
With Filter and/or integrated line disconnect



WARNING

Power remains present for up to 3 minutes on power input terminals (L1, L2 and L3) and output terminals (U, V and W) even when the disconnect switch is in the OFF position. Remove input power ahead of the drive and wait 3 minutes before removing the terminal cover.



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