

## Shuttle Car Traction, Pump and Conveyor Systems

### VFD-3 System

VFD-3 is a standard inverter capable of functioning as a traction, pump or conveyor drive when paired with the VCU (Vehicle Control Unit). It is designed as a drop-in replacement for the VF1-75 drive. Specific drive functionality is determined by parameter setup on the VCU, allowing full function flexibility. Control Command uses SamCANII command messaging and hardware I/O control. System includes a 24V power supply for accessories, a soft charge with EMI filter, upgraded CAN foot switch and CAN conveyor switch.

#### Features

- All drives are identical and interchangeable (spares can be used in any position: pump, motor 1, motor 2, conveyor)
- CAN communications
- Simplified installation with high power pre-wired in the back of the XP enclosure, and low voltage kept in the front. A hinged back assembly holds the heavy wire connections and the inverter is slid into it.
- Power and control are separated for better signal isolation and noise immunity.
- Control voltages are consolidated to a single 24V DC supply.
- Control and communications are simplified by daisy chain connections

- across the front.
- Lower drive profile allows for more enclosure space.
- Soft-charge module is incorporated within the EMC filter assembly for easy access.
- Auto tune is based on nameplate information.
- DC injection braking.
- Dynamic braking capability with programable I/O to disable regeneration.
- Drive addressing expanded to 13 devices using easily accessible selector switch located on the front of each module.



### VF1-75 AC/AC VFD System

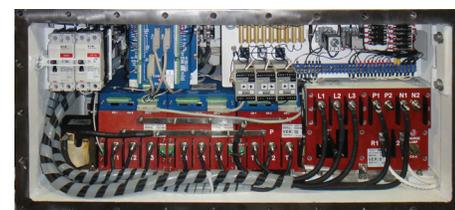
AC/AC VFD system for shuttle cars using AC motors and powered via AC trailing cable from a power center. Two options are available:

- The 440V system with input voltages of 440-480V
- The 550V system with input voltages of 500-660V

#### Features

- Tram and Conveyor Drive is a regenerative drive with flux vector torque control that provides differential traction control for superb cornering. Tram motors are load sharing with electrical braking in addition to the on board mechanical braking.
- Multiple control options: standard analog foot switch, radio remote control, operator station.
- Dual Function pre-charge / pump controller:
  - Soft charge for 550V DC power Bus / DC Bus by-pass contactor

- Pump motor soft start inverter 25kW @ 460V AC programmable pump motor current limit setting
- Variable speed / reversible conveyor control
- Rectifier Brake Module is a SCR rectifier with soft charge:
  - Absorbs high voltage surges on DC voltage supplies due to regenerative braking of AC drive
  - Compact, single enclosure houses all components, including internal isolated power supply



### JR1000 AC VFD System

Designed for large or small shuttle cars, these drives are able to serve multiple functions.

#### Features

- Voltage ranges of 850V to 1260V, 3PH, 50/60 Hz available.
- Multiple voltage outputs
- Maximum output frequency of 150Hz
- Adaptive under-voltage and over-voltage control
- Smart rectifier modules provide energy-saving regenerative braking down to stall which can be held indefinitely without inverter or motor overheating.
- Air contact-cooled or liquid cooled base plate systems
- Closed loop flux vector and open loop flux vector modes for unsurpassed accuracy to allow low speed holding when descending, especially when proximity detection system requested.

- Analog reference input and/ or CAN-bus Communications is available.
- Radio controlled option is available.
- Cutter motor feedback to optimize tram speed.
- Full motor protection (overload, short circuit, lock rotor, Motor RTD, online, jam, phase loss, ground fault)
- Our AC drive has up to 2X starting torque compared to a DC motor.
- Infinitely variable speed tramping



### JD400 Digital Drive System

Microprocessor controlled DC motor drive with advanced diagnostics and programmable features.

#### Features

- Three drive system available for shuttle cars (left tramping, right tramping, and conveyor control).
- Regenerative braking capability and solid state reversing included in compact module.

- Dual mode operation:
  - Current control for torque sharing for shuttle cars
- CAN-bus communication

Three drive system for shuttle cars





## Specifications - Traction and Pump Drives\*

		VFD-3 (Part # A801244)	VF1-75 (Part # A800374)	VF1-75 (Part # A800376)	JR1000 (Part # A801001) VF1001 Tram Drive	JD400 (Part # A800815)
Electrical Specifications		Multi-purpose Inverter for Traction, Pump or Conveyor	Tram Drive	Pump Drive	Dual Inverter 110kW / 1140V (Tram / Pump OR Tram / Conveyor)	Tram Drive
Rated Power @ Rated Volts	Input	72kW @ 550V DC (Rectified)	72kW @ 550V DC (Rectified)	98kW @ 550V DC (Rectified)	113kW @ 1140V AC	68kVA @ 480V
	Output	75kVA @ 440V AC	75kVA @ 440V AC	39kVA @ 460V AC	110kW	50kW @ 500V
Frequency Range	Input	DC	DC	DC	47 - 63 Hz, AC	50 - 60 Hz
	Output	0 - 125 Hz	0 - 125 Hz	0 - 125 Hz	0 - 150 Hz	DC
Voltage Range	Input	500V - 750V DC	500 - 750V DC	500 - 750V DC	855 - 1254V AC rms	3PH 480V AC
	Output	0 - 525V AC	0 - 525V AC	0 - 525V AC	0 -095% of input	0 - 500V DC
Amps @ Rated Power	Input	110A	110A	150A	83AAC rms	82A @ 68kVA
	Output	110A (250A peak)	100A (250A peak)	50A (125A peak)	85AAC rms	100A @ 50kW (400 peak)
Dimensions		VFD-3 Inverter	VF1-75 Tram Drive	VF1-75 Pump Drive	VF1001	JD400
Height		208mm (8.2")	210mm (8.25")	210mm (8.25")	202mm (8")	219mm (8.6")
Width		198mm (7.8")	203mm (8")	203mm (8")	372mm (14.6")	214mm (8.4")
Depth		336mm (13.2")	356mm (14")	356mm (14")	483mm (19")	386mm (15.2")
Weight		12.7 kg (28 lbs)	14.5 kg (32 lbs)	14.5 kg (32 lbs)	55 kg (121 lbs)	22 kg (48 lbs)

\*Consult with your sales representative for additional voltages.



Environmental	VFD-3 Inverter	VF1-75 System	JR1000 System	JD400
Ambient Operating Temperature	-20°C (no frost) to +50°C (-4°F to 122°F)	-10°C (no frost) to +50°C (14°F to 122°F)	-20°C to +50°C (-4°F to 122°F)	-10°C (no frost) to +50°C (14°F to 122°F)
Storage Temperature	-40°C to +65°C (-40°F to 149°F)	-40°C to +60°C (-40°F to 140°F)	-40°C to +65°C (-40°F to 149°F)	-40°C to +60°C (-40°F to 140°F)
Relative Humidity	100% non-condensing	<90% no condensation	<90% no condensation	<90% no condensation
Altitude	1000 meters (3300 feet) - de-rate above 3000 meters			

Specifications - Rectifiers*	VF1-75 System (A800497)		VF1002 (A801002)	
	Rectifier / Brake Module 660V AC 1060V DC Brake Setting		Regenerative Rectifier for JR1000 System 220kW / 1140V	
Electrical Specifications	Input	Output	Input	Output
Rated Power @ Rated Volts	190kVA @ 660V	139kW @ 900V	223kW @ 1140V AC /1500V DC	220kW
Frequency Range	47 - 63 Hz	DC	47 - 63 Hz	DC
Voltage Range	500 - 660V	700 - 1060V	855-1254V AC rms	135% of input
Amps @ Rated Power	168A	154A	136AAC rms	150A DC

## Saminco Cool-Torque Motors

Saminco Cool-Torque Motors are available:

- AC or DC input
- 120V DC to 500V DC
- 230V AC to 1000V AC
- Air-cooled or Liquid-cooled
- Internal encoders give Closed Loop Control down to zero speed
- Low current draw of motor (Low AMPS) will extend life of motor
- Torque and speed-sharing between motors with greater starting torque.



## Control Modules with CAN Communications

Vehicle Control Unit (VCU) Interface Module for the VFD-3 system.



Master Control Module for VF1-75, JR1000 and the JD400



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