

**YASKAWA**

# MV1000 NEMA 3R

Medium Voltage AC Drive



# Extending the Range

Tested to withstand extreme outdoor conditions, from the heat and dust of the arid desert to the bitter cold of the tundra (-45°C to +50°C), the MV1000 NEMA 3R is available in an extended range of 500 to 6,000 HP models.



## End User Benefits

1. Integrated cooling / Pre-commissioned system. No air balancing required.
2. No risk execution, streamline your supply chain (single source responsibility).
3. Scalable deployment of product to site.
4. Preventative maintenance monitoring.
5. Remote monitoring and diagnostics, takes the guesswork out.
6. Reliability greater than 200,000 hrs MTBF.
7. Fast start-up.
8. Pre-engineered solution (electrical, mechanical).
9. No special shipping permit required.
10. No building permit required (state/provincial level).

## Installation Friendly

- Exceeds IEEE 519 requirements.
- 17-level motor waveform suitable for standard motors.

## High Performance

- Control platform based on hugely successful A1000 low voltage product
- Open Loop Vector (OLV) or Closed Loop Vector (CLV) for control of the most difficult loads

## User Friendly

- Operation, adjustment, maintenance and management are simple and intuitive
- Utilizes the same tools as Yaskawa's 1000 series low voltage drives and a parallel parameter set





## TESTED **TOUGH**

Yaskawa builds upon its proven track record for quality, performance and reliability of medium voltage drives with the MV1000 NEMA 3R, our outdoor-rated version of the MV1000.

**Reduce  
Capex and  
Opex  
Fastest  
System  
Delivery**



# Optimal Packaging Design

Meets the Demands of Field Conditions

## Input Switchgear

- Non-load break switch
- E-Rated current limiting fuses
- Vacuum contactor for load interruption
- All UL / CSA rated components
- Viewing window

## Heat Exchangers

- Fully sealed
- Air to air heat transfer
- High efficiency
- Easy to maintain



500HP to 2,000 HP

## Transformer Section

- 36-pulse patented design
- Galvanic isolation
- Double insulated windings
- Winding temperature monitoring and protection
- 5% taps
- Surge protected primary

## Control Section

- Easy access to most control devices
- Control wiring interface
- Main processor
- Digital input/outputs
- Isolated analog inputs/outputs
- Fan control/monitoring boards
- Contacts and circuit boards for fans, etc.
- Control voltage power supplies

## Power Cell Section

- Six cells, two per phase
- Fuse protection on each cell
- Control and monitoring via single fiber optic cable per cell
- IGBT temperature monitors
- Easy cell replacement in 15 minutes

## Space for Options

- Sync. transfer reactor
- Sine wave filter
- Output transformer



### Thermal Management System (2,500HP and Above)

- Control the internal temperature of the enclosure
- Eco-Friendly, no refrigerant required
- Dew point monitoring and internal heaters to avoid condensation
- Wide range of operation (-45°C to +50°C)
- User friendly, PLC based controls
- Local and remote control
- Single interface for VFD controls and thermal management
- Alarm and fault logging
- Trend and history data logging
- Cellular connectivity option
- Remote user log-in capability with access control



## 2,500HP to 6,000 HP

### Input Switchgear

- Load break switch
- High capacity circuit breaker
- Integral protection relay
- Surge protection
- Local and/or remote control

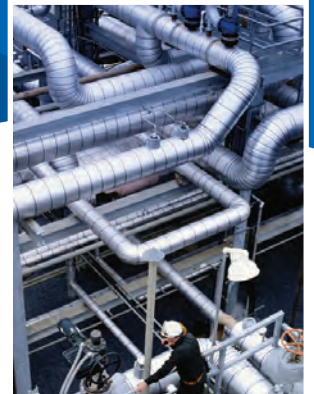
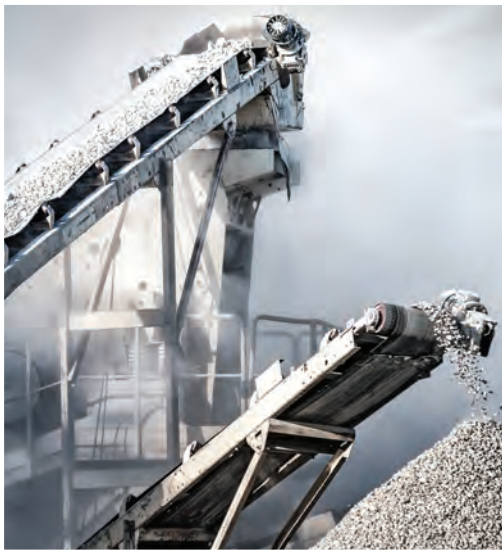
### Transformer

- 36-pulse patented design
- Galvanic isolation
- Double insulated windings
- Temperature monitor/protection
- 5% taps

### Power Cells

- Six cells, two per phase
- Fast fuse protection on each cell
- Control and monitoring via single fiber optic cable per cell
- IGBT temperature monitors
- Easy cell replacement

# Industries Served



## Oil / Gas

- Midstream Compressors & Pumps
- Oil Field Water Injection Pumps
- High Efficiency Fracking Pumps
- Electrical Submersible Pumps
- SSP/ HSP pumps
- Gas Injection

## Mining

- Slurry Pumps
- Ventilation Fans
- Conveyors
- Crushers
- Dryer Fans

## Cement

- Conveyors
- Fans
- Rotary Kilns
- Pumps
- Crushers

## Chemical & Petrochemical

- Pumps
- Compressors
- Extruders
- Fans

CIMR-MV2 U D 6 D A 125 O D A I B

**Product Type**  
Drive

**Product Series**  
MV1000 Series

**Region Code**  
U : U.S.A.

**Input Voltage**  
A : 2.3 kV  
D : 4.16 kV  
F : 6.6 kV  
J : 13.8 kV  
K : 12.4 kV  
L : 13.2 kV  
W : 480 V

**Input Frequency**  
5 : 50 Hz  
6 : 60 Hz

**Output Voltage Class**  
A : 2 kV Class  
D : 4 kV Class  
F : 6 kV Class

**Custom Specification**  
A : Standard A  
B : Standard B

Note: Other input voltages available up to 15 kV. Please consult Yaskawa.

Note: All input voltages are not necessarily compatible with all output voltage classes.

**Input Switchgear**  
A : None  
B : with input switchgear

**Control Voltage Class**  
I : Internal PT

**Environmental Spec.**  
A : Standard

**Enclosure Type**  
OD : Outdoor Rated

**Output Current**

2.4 kV Units		4.16 kV Units	
No.	Current (HP)	No.	Current (HP)
102	102A (450)	064	64A (500)
135	135A (600)	102	102A (800)
220	220A (1000)	125	125A (1000)
330	330A (1500)	190	190A (1500)
440	440A (2000)	250	250A (2000)
		315	315A (2500)
		375	375A (3000)
		440	440A (3500)
		505	505A (4000)
		575	575A (4500)
		625	625A (5000)
		700	700A (5500)
		800	800A (6000)

## Common Specifications

Item		Specifications
Control Characteristics	Control Methods	V/f Control (V/f), Open Loop Vector Control (OLV), Closed Loop Vector Control (CLV)
	Frequency Control Range	0.01 to 120 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital input: within $\pm 0.01\%$ of the max output frequency (-10°C to +40°C) Analog input: within $\pm 0.5\%$ of the max output frequency (-10°C $\pm$ 40°C)
	Frequency Setting Resolution	Digital inputs: 0.01 Hz Analog inputs: 1/2048 of the maximum output frequency setting (11 bit plus sign)
	Output Frequency Resolution	0.001 Hz
	Frequency Setting Methods	-10 to +10 V, 0 to +10 V, 4 to 20 mA
	Starting Torque	V/f: 130% at 3 Hz, OLV: 130% at 0.3 Hz, CLV: 130% at 0 r/min
	Speed Control Range	V/f: 1:20, OLV: 1:100, CLV: 1:1000
	Speed Control Accuracy	V/f: $\pm 2$ to 3%, OLV: $\pm 0.5\%$ , (25°C $\pm$ 10°C), CLV: $\pm 0.02\%$ (25°C $\pm$ 10°C)
	Speed Response	OLV: 10 Hz, CLV: 50 Hz
Protection Function	Accel/Decel Time	0.0 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
	Motor Protection	Electronic thermal overload relay
	Momentary Overcurrent Protection	Drive stops when output current exceeds 132%
	Overload Protection	Drive stops after 60 s at 110% of rated output current
	Overvoltage Protection	Power Cell VPN > 1035 VDC
	Undervoltage Protection	Power Cell VPN < 300 VDC
	Momentary Power Loss Ride-Thru	Resumes operation if power loss is less than 2 s (standard) (UPS Required)
	Overheat Protection	Power Cell = Thermistor, Transformer = PT100 and Thermal Switch
Operating Environment	Ground Fault Protection	Electronic circuit protection
	Ambient Temperature	-45°C to +50°C (de-rating may apply above 40°C)
	Humidity	95% RH or less (no condensation)
	Storage Temperature	-20°C to +60°C (short-term temperature during transportation)
Comm. Options	Altitude	Up to 2000 m without derating, up to 4000 m with output current and voltage derating
	Communications Protocols (Optional)	EtherNet/IP, DeviceNet, Modbus TCP/IP, Modbus RTU, PROFIBUS DP, and PROFINET





Yaskawa is the leading global manufacturer of low and medium voltage variable frequency drives, servo systems, machine controllers and industrial robots. Our standard products, as well as tailor-made solutions, are well known and have a high reputation for outstanding quality and reliability.