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
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

MADE in the USA
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

**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

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

**Space for Options**
- Sync. transfer reactor
- Sine wave filter
- Output transformer

500HP to 2,000 HP
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

Cement
- Conveyors
- Fans
- Rotary Kilns
- Pumps
- Crushers

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

Chemical & Petrochemical
- Pumps
- Compressors
- Extruders
- Fans
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 ±0.01% of the max output frequency (-10°C to +40°C)
  - Analog input: within ±0.5% of the max output frequency (-10°C ± 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**:
  - 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: ± 2 to 3%, OLV: ± 0.5%, (25°C ± 10°C), CLV: ± 0.02% (25°C ± 10°C)
  - Speed Response: OLV: 10 Hz, CLV: 50 Hz
- **Accel/Decel Time**: 0.0 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)

Protection Function
- **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 VPC > 1035 VDC
- **Undervoltage Protection**: Power Cell VPC < 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
- **Ground Fault Protection**: Electronic circuit protection

Operating Environment
- **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)
- **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

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.

<table>
<thead>
<tr>
<th>Output Current</th>
<th>2.4 kV Units</th>
<th>4.16 kV Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Current (HP)</td>
<td>No.</td>
</tr>
<tr>
<td>102</td>
<td>102A (450)</td>
<td>064</td>
</tr>
<tr>
<td>135</td>
<td>135A (600)</td>
<td>102</td>
</tr>
<tr>
<td>220</td>
<td>220A (1000)</td>
<td>125</td>
</tr>
<tr>
<td>330</td>
<td>330A (1500)</td>
<td>190</td>
</tr>
<tr>
<td>315</td>
<td></td>
<td>315A (2500)</td>
</tr>
<tr>
<td>375</td>
<td></td>
<td>375A (3000)</td>
</tr>
<tr>
<td>440</td>
<td></td>
<td>440A (3500)</td>
</tr>
<tr>
<td>505</td>
<td></td>
<td>505A (4000)</td>
</tr>
<tr>
<td>575</td>
<td></td>
<td>575A (4500)</td>
</tr>
<tr>
<td>625</td>
<td></td>
<td>625A (5000)</td>
</tr>
<tr>
<td>700</td>
<td></td>
<td>700A (5500)</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td>800A (6000)</td>
</tr>
</tbody>
</table>

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