

TECHNICAL CATALOG

Medium voltage AC drives

ABB industrial drives ACS2000, 300 to 3000 HP, 4kV



The flexibility you require. The reliability you expect.

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ACS2000 medium voltage drive



The ACS2000 is designed for high reliability, easy installation and fast commissioning, reducing the total cost of ownership.

With the integration of an Active Front End (AFE) combined with multilevel control, the ACS2000 is an Ultra Low Harmonic (ULH) design that minimizes line side harmonics without the use of expensive, specialized transformers with the added benefit of a smaller overall package.

With its compact packaging, the ACS2000 can be retrofitted to control standard induction motors via a direct connection to the line supply (direct-to-line). Alternatively, a simple two winding input isolation transformer can be applied to allow for connection to various line side supply voltages.

The ACS2000 direct-to-line configuration combines the cost savings of a transformer-less variable speed drive system with the benefits of Voltage Source Inverters (VSIs), including excellent availability and reliability, high and constant power factor and superior dynamic control performance.

The heritage of ABB's VSI topology, along with a patented HV-IGBT-based multi-level control, provides a proven track record for reliable and motor friendly medium voltage AC drive performance. When your processes run more

Key product features

- Suitable for use with or without an input isolation transformer
- Meets IEEE 519 and IEC 61000-2-4
- Direct-to-line configuration (transformer-less) allows 3 in and 3 out power cabling for quick and easy installation
- Multi-level switching topology and built-in dV/dt filtering enables use with new or existing induction motors
- Regenerative option and ability to maintain near unity power factor across the entire speed range provides additional energy savings
- Modular construction provides high reliability and low maintenance costs
- Configurable disconnect option package for a flexible, self contained switchgear solution

Features and benefits

| Features | Advantages | Benefits |
|--|--|---|
| Operation without transformer (direct-to-line) | | |
| | No transformer required | Reduces capital expenditure, light weight, compact |
| | Easy retrofit to fixed-speed motors | Minimizes investment |
| | Easy and fast commissioning | Reduces overall cost of project |
| | Compact and light drive system | Lowers transportation costs; less space required in electrical room |
| Active Front End (AFE) | | |
| | Ultra low harmonic (ULH) footprint | Harmonic emissions compliant with all relevant standards |
| | Allows operation with an input isolation transformer or for direct connection to the line supply | Flexibility of installation |
| Energy savings | | |
| | Maintains near unity power factor across the entire speed range | Reduces energy loss in distribution system, avoiding utility penalties and the need for larger cables |
| | Regenerative braking option | Minimizes energy consumption |
| Multilevel topology | | |
| | Patented multilevel topology | Low parts count boosts drive availability |
| | Provides near sinusoidal current and voltage waveforms | Compatible with standard new or existing motors |
| Voltage Source Inverter (VSI) topology | | |
| | Excellent availability, reliability and efficiency | Higher uptime of plant or process |
| | High and constant power factor | Eliminates utility penalties |
| | Superior dynamic control performance | Safe ride through during supply voltage dips and better process control |
| Direct Torque Control (DTC) | | |
| | Precise and reliable process control with superior performance | Higher productivity |
| Compact size | | |
| | Requires less space in electrical room | Frees up valuable floorspace |
| | | |

4kV Technical data

Direct-to-line, low harmonic drives

| Motor data * Converter data | | | | Converter length and weight (approx. values) | | | | | |
|-----------------------------|----------------|-----------------|-----------------|--|-------|---------------------|------------------|------------------|------------------|
| | | | | | | Direct-to- | | For opera | |
| Normal | l data | Heavy | data | Type code | Power | Length ¹ | Weight | Length | Weight |
| P _N | I _N | P _{hd} | I _{hd} | | kVA | in | lbs | in | lbs |
| hp (kW) | Α | hp (kW) | A | | _ | (mm) | (kg) | (mm) | (kg) |
| 4,000 - | 4,160 V | ** | | | | | | | |
| 300 (224) | 40 | 220 (164) | 30 | ACS2000-040-A01A-x1-010 | 280 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 350 (261) | 47 | 257 (191) | 35 | ACS2000-040-A01B-x1-010 | 326 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 400 (298) | 54 | 293 (219) | 39 | ACS2000-040-A01C-x1-010 | 373 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 450 (336) | 61 | 330 (246) | 44 | ACS2000-040-A01D-x1-010 | 420 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 500 (373) | 67 | 367 (274) | 49 | ACS2000-040-A01E-x1-010 | 466 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 600 (448) | 81 | 440 (328) | 59 | ACS2000-040-A01F-x1-010 | 560 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 700 (522) | 94 | 513 (383) | 69 | ACS2000-040-A01G-x1-010 | 653 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 800 (597) | 108 | 587 (438) | 79 | ACS2000-040-A01H-x1-010 | 746 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 900 (671) | 121 | 660 (492) | 89 | ACS2000-040-A01J-x1-010 | 839 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 1000 (746) | 135 | 733 (547) | 99 | ACS2000-040-A01K-x1-010 | 933 | 77.5 (1,968) | 4,570 (2,073) | 77.5 (1,968) | 4,570 (2,073) |
| 1250 (933) | 168 | 916 (684) | 123 | ACS2000-040-A02A-x1-010 | 1,166 | 114.8 (2,916) | 6,750 (3,672) | 114.8 (2,916) | 6,750 (3,672) |
| 1500 (1119) | 202 | 1100 (821) | 148 | ACS2000-040-A02B-x1-010 | 1,399 | 114.8 (2,916) | 6,750 (3,672) | 114.8 (2,916) | 6,750 (3,672) |
| 1750 (1306) | 236 | 1283 (957) | 173 | ACS2000-040-A02C-x1-010 | 1,632 | 114.8 (2,916) | 6,750 (3,672) | 114.8 (2,916) | 6,750 (3,672) |
| 2000 (1492) | 269 | 1467 (1094) | 197 | ACS2000-040-A02D-x1-010 | 1,865 | 114.8 (2,916) | 6,750 (3,672) | 114.8 (2,916) | 6,750 (3,672) |
| 2250 (1679) | 303 | 1650 (1231) | 222 | ACS2000-040-A03A-x1-010 | 2,099 | 137.2 (3,486) | 9,000 (4,082) | 137.2 (3,486) | 9,000 (4,082) |
| 2500 (1865) | 337 | 1833 (1368) | 247 | ACS2000-040-A03B-x1-010 | 2,332 | 137.2 (3,486) | 9,000 (4,082) | 137.2 (3,486) | 9,000 (4,082) |
| 2750 (2052) | 370 | 2,017 (1504) | 272 | ACS2000-040-A03C-x1-010 | 2,565 | 137.2 (3,486) | 9,000 (4,082) | 137.2 (3,486) | 9,000 (4,082) |
| 3000 (2238) | 404 | 2200 (1641) | 296 | ACS2000-040-A03D-x1-010 | 2,798 | 137.2 (3,486) | 9,000 (4,082) | 137.2 (3,486) | 9,000 (4,082) |

Notes:

 * Indicative information referring to typical 4-pole motor, under nominal supply voltage conditions.

The ratings apply at $40\,^{\circ}\text{C}$. At higher temperatures (up to $50\,^{\circ}\text{C}$) the derating is 1.5% / $1\,^{\circ}\text{C}$. **Light-overload use (normal duty)**

 P_N : Typical motor power in light-overload use.

 $_{\rm N}$: Continuous current rating of particular sub-frame allowing 110% IN at 40°C for 1 minute every 10 minutes.

Heavy-duty use

P_{hd}: Typical motor power in heavy-duty use.

h_d. Continuous current rating of particular sub-frame allowing 150% lhd at 40°C for 1 minute every 10 minutes.

** 4.16 kV, +10% to -10%

Dimensions (h x l x d) includes standard fan

Frame 1 Dimensions: inches: 90.0 x 77.5 x 46.8 mm: 2285 x 1968 x 1190

Frame 2 Dimensions: inches: 98.0 x 114.8 x 46.8 mm: 2489 x 2916 x 1190

Frame 3 Dimensions: inches: 98.0 x 137.2 x 46.8 mm: 2489 x 3486 x 1190

 $^{\mbox{\tiny 1)}}$ With fused disconnect/contactor option, add 28 in (698mm) to length

4kV Technical data

Direct-to-line, regenerative drives

| Motor data * Converte | | | Converter data | onverter data Converter length and weight | | | | | |
|-----------------------|----------------|-----------------|-----------------|---|-------|---------------------|---------|-------------------------|-------------------------|
| | | | | | | Direct-to- | line | For opera external t | tion with ransformer |
| Norma | l duty | Heavy | duty | Type code | Power | Length ¹ | Weight | Length | Weight |
| P _N | I _N | P _{hd} | I _{hd} | | kVA | in | lbs | in | lbs |
| hp | Α | hp | Α | | _ | (mm) | (kg) | (mm) | (kg) |
| (kW) | | (kW) | | | | | | | |
| 4,000 - | 4,160 V | ** | | | | | | | |
| 300 | 40 | 220 | 30 | ACS2000-040-A01A-x1-010 | 280 | 77.5 | 4,570 | 77.5 | 4,570 |
| (224) | | (164) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 350 | 47 | 257 | 35 | ACS2000-040-A01B-x1-010 | 326 | 77.5 | 4,570 | 77.5 | 4,570 |
| (261) | | (191) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 400 | 54 | 293 | 39 | ACS2000-040-A01C-x1-010 | 373 | 77.5 | 4,570 | 77.5 | 4,570 |
| (298) | | (219) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 450 | 61 | 330 | 44 | ACS2000-040-A01D-x1-010 | 420 | 77.5 | 4,570 | 77.5 | 4,570 |
| (336) | | (246) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 500 | 67 | 367 | 49 | ACS2000-040-A01E-x1-010 | 466 | 77.5 | 4,570 | 77.5 | 4,570 |
| (373) | | (274) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 600 | 81 | 440 | 59 | ACS2000-040-A01F-x1-010 | 560 | 77.5 | 4,570 | 77.5 | 4,570 |
| (448) | | (328) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 700 | 94 | 513 | 69 | ACS2000-040-A01G-x1-010 | 653 | 77.5 | 4,570 | 77.5 | 4,570 |
| (522) | | (383) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 800 | 108 | 587 | 79 | ACS2000-040-A01H-x1-010 | 746 | 77.5 | 4,570 | 77.5 | 4,570 |
| (597) | | (438) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 900 | 121 | 660 | 89 | ACS2000-040-A01J-x1-010 | 839 | 77.5 | 4,570 | 77.5 | 4,570 |
| (671) | | (492) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 1000 | 135 | 733 | 99 | ACS2000-040-A01K-x1-010 | 933 | 77.5 | 4,570 | 77.5 | 4,570 |
| (746) | | (547) | | | | (1,968) | (2,073) | (1,968) | (2,073) |
| 1250 | 168 | 916 | 123 | ACS2000-040-A02A-x1-010 | 1,166 | 114.8 | 6,750 | 114.8 | 6,750 |
| (933) | | (684) | | | | (2,916) | (3,672) | (2,916) | (3,672) |
| 1500 | 202 | 1100 | 148 | ACS2000-040-A02B-x1-010 | 1,399 | 114.8 | 6,750 | 114.8 | 6,750 |
| (1119) | | (821) | | | | (2,916) | (3,672) | (2,916) | (3,672) |
| 1750 | 236 | 1283 | 173 | ACS2000-040-A02C-x1-010 | 1,632 | 114.8 | 6,750 | 114.8 | 6,750 |
| (1306) | | (957) | | | | (2,916) | (3,672) | (2,916) | (3,672) |
| 2000 | 269 | 1467 | 197 | ACS2000-040-A02D-x1-010 | 1,865 | 114.8 | 6,750 | 114.8 | 6,750 |
| (1492) | 202 | (1094) | 222 | ACC2000 040 4024 24 040 | 2.000 | (2,916) | (3,672) | (2,916) | (3,672) |
| 2250 | 303 | 1650 | 222 | ACS2000-040-A03A-x1-010 | 2,099 | 137.2 | 9,000 | 137.2 | 9,000 |
| (1679) | 227 | (1231) | 247 | ACC2000 040 A02B at 010 | 2 222 | (3,486) | (4,082) | (3,486) | (4,082) |
| 2500 (1865) | 337 | 1833 (1368) | 241 | ACS2000-040-A03B-x1-010 | ۷,332 | 137.2 | 9,000 | 137.2 | 9,000 |
| 2750 | 370 | | 272 | ACE2000 040 A02C ::1 010 | 2 565 | (3,486) | (4,082) | (3,486) | (4,082) |
| (2052) | 310 | 2,017 (1504) | 212 | ACS2000-040-A03C-x1-010 | 2,565 | 137.2 (3,486) | 9,000 | 137.2 | 9,000 |
| 3000 | 404 | 2200 | 296 | ACE2000 040 A02D ::1 010 | 2.700 | | (4,082) | (3,486) | (4,082) |
| | 404 | (1641) | 296 | ACS2000-040-A03D-x1-010 | 2,198 | 137.2 | 9,000 | 137.2 | 9,000 |
| (2238) | | (1041) | | | | (3,486) | (4,082) | (3,486) | (4,082) |

Notes:

* Indicative information referring to typical 4-pole motor, under nominal supply voltage conditions.

The ratings apply at 40°C. At higher temperatures (up to 50°C) the derating is 1.5% / 1°C. Light-overload use (normal duty)

 P_N : Typical motor power in light-overload use.

 $\rm I_{N}$: Continuous current rating of particular sub-frame allowing 110% IN at 40°C for 1 minute every 10 minutes.

Heavy-duty use

P_{hd}: Typical motor power in heavy-duty use.

h_d. Continuous current rating of particular sub-frame allowing 150% lhd at 40°C for 1 minute every 10 minutes.

** 4.16 kV, +10% to -10%

Dimensions (h x l x d) includes standard fan

Frame 1 Dimensions: inches: 90.0 x 77.5 x 46.8 mm: 2285 x 1968 x 1190

Frame 2 Dimensions: inches: 98.0 x 114.8 x 46.8 mm: 2489 x 2916 x 1190

Frame 3 Dimensions: inches: 98.0 x 137.2 x 46.8 mm: 2489 x 3486 x 1190

 $^{\mbox{\tiny 1)}}$ With fused disconnect/contactor option, add 28 in (698mm) to length

Drive options

| Option description | Plus code | Plus code | Selection description | Frame |
|----------------------------------|-----------|-----------|--|-------|
| | (prefix) | (suffix) | | size |
| Motor side | | | | |
| Motor space heater control and | MHP | 0006 | 6A, 110-240V | ALL |
| protection | | | (Consult ABB for current ratings) | |
| Speed encoder interface | SEN | 0001 | Manufacturers selection | ALL |
| Line side | | | | |
| Line side disconnect / contactor | ICO | 0002 | Fused disconnect and line side vacuum contactor | ALL |
| Line side current transformer | CTL | 0001 | Differential CT's for line side monitoring | ALL |
| Cabinets | | | | |
| Cabinet color | COL | 0101 | ANSI 61 (light grey) | ALL |
| | | 0003 | Customer specific | ALL |
| Enclosure protection class | EPC | 0112 | IP21/NEMA 1 | ALL |
| | | 0042 | IP42 | ALL |
| Corrosion protected busbars | СРВ | 0000 | Copper/blank | ALL |
| | | 0020 | Copper/corrosion protected | ALL |
| Cooling circuit | | | | |
| Main fan redundancy 1) | RMC | 0002 | Yes | ALL |
| Auxiliary supply | | | | |
| Auxiliary Supply Configuration | ASC | 0010 | Internally supplied from MV main supply (4160: 480V CPT) | ALL |
| Control Supply Configuration | CSC | 0010 | From auxiliary supply | ALL |
| | | 0001 | Single supply (customer supplied UPS) | ALL |
| Control power ride-through | CPR | 0001 | 100ms control ride-through | ALL |
| | | 0004 | 15min control ride-through (battery based UPS) | ALL |
| Space heater for converter | SHT | 0001 | Single phase supply (120V) | ALL |
| | | 0002 | Single phase supply (240V) | ALL |

¹⁾ For air cooled drives, if one fan fails this fan will be substituted by the redundant fan. For water cooled drives, if one pump fails this pump will be substituted by the redundant pump.
²⁾ Requires option ICO0002.

Supervisory control system

| Fieldbus adapter modules | FAB | 8000 | Modbus RTU | ALL |
|--|-----|------|---------------------------|-----|
| | | 0009 | Profibus | ALL |
| | | 0005 | Modbus/TCP | ALL |
| | | 0012 | Anybus ControlNet Module | ALL |
| | | 0013 | Anybus DeviceNet Module | ALL |
| | | 0014 | Anybus Ethernet IP Module | ALL |
| Control I/O extension | CEO | 0001 | Extension 1 | ALL |
| Enhanced customer interface | CIT | 0030 | 30 spare terminals | ALL |
| Controls on front door: Run pilot light - red lamp | LRU | 0001 | Yes | ALL |
| Controls on front door: Door-mounted speed pot | PSP | 0001 | Yes | ALL |
| Controls on front door: Local/remote switch | SLR | 0001 | Yes | ALL |

Drive options

| Option description | Plus code | Plus code | Selection description | Frame |
|--|-----------|-----------|-----------------------------------|-------|
| | (prefix) | (suffix) | | size |
| Controls on front door: Forward/Reverse switch | SFR | 0001 | Yes | ALL |
| Control and Protection | | | | |
| Motor temperature supervision | TSM | 0005 | Motor supervision, 5 PT100 inputs | ALL |
| | | 8000 | Motor supervision, 8 PT100 inputs | ALL |
| Motor protection relay | LVM | 0001 | Multilin 369 | ALL |
| Software | | | | |
| Software Diagnostic tool 1) | DRW | 0001 | Yes | ALL |
| (DriveWindow + RUSB card) | | | | |
| Additional scope and services | ' | | | |
| Packing | | | | |
| Packing | PAK | 0000 | DOM - domestic land packing | ALL |
| | | 0001 | EXP - export sea freight packing | ALL |
| Testing | | | | |
| Factory acceptance test | FAT | 0011 | Standard factory acceptance test | ALL |
| | | | (including visual inspection) | |
| Visual inspection | VIS | 0011 | Visual inspection by customer | ALL |

¹⁾ To order DriveWindows as a separate scope of supply, utilize part number 2UEA001557

^{*} Indicates recommended option

Project spares

Value proposition

The right part, at the right place, at the right time.

Service offerings

Spare Parts

- Replaceable component and assemblies identical to and interchangeable with the item it is intended to replace.
- ABB provides genuine spare parts accompanied with the relevant documentation.
- Available throughout the entire life-cycle of the product family.
- To be ordered via ABB Business OnLine

Spare parts packages

- Assist the selection of spare parts.
- Three different pre-defined packages:
- Minimum
- Standard
- Extended
- Are sold as part of the project or as a customized kit after drive installation

Life-cycle kits

- Designed to address lifecycle issues of specific drives
- Preventive maintenance service includes replacement of aging components.
- Instead of replacing components 1:1 certain hardware can be upgraded as part of maintenance
- Profound knowledge of drives required (HW generation etc.)

Single parts

Project spares

Spare kits

PM kits

HW upgrades

What are Project Spares?

Project spares are predefined spare part packages that are sold with the drive project. They are designed to assist in the selection of spare parts during the sales phase of new drives. Three different service levels exist.

Minimum Spare Part Package The minimum package is recommended in the case of redundant drives, where a failure of one drive does not have any impact on production. This package also covers the requirements for "commissioning spares" or maintenance spares.

Standard Spare Part Package

The standard spare part package is recommended for non-critical applications, where a failure of the drive system does not necessarily cause an immediate production stop. This package also covers the requirement for "two-year spares".

Extended Spare Part Package

The extended package is recommended for "critical, non-redundant" drive systems, where a failure of the drive causes a complete production stop. This package also covers the requirements for "five-year spares".

Drive Services

Spare part packages

| Component Type | Minimum spare | Standard spare | extended spare |
|-----------------------------------|---------------|----------------|----------------|
| | part package | part package | part package |
| Power Supply (Mini) | 1 | 1 | 1 |
| Power Supply (QUINT) | 1 | 1 | 1 |
| Power Supply (IPS 24V) | 1 | 1 | 1 |
| LV Fuse | 6 | 6 | 6 |
| MV Fuse Kit | 1 | 1 | 1 |
| Filter Mat | 1 | 1 | 1 |
| Phase Module | 1 | 1 | 1 |
| Main Control Board | | 1 | 1 |
| Interface Board | | 1 | 1 |
| I/O Board | | 1 | 1 |
| Power Supply Buffer | | 1 | 1 |
| Fan | | 1 | 1 |
| Crowbar Module | | | 1 |
| Current Transducer | | | 1 |
| 3 Phase Voltage Measurement Board | | | 1 |
| Power Supply (IPS single 27V) | | | 1 |
| Voltage Divider | | | 1 |
| Over Voltage Detection | | | 1 |
| Control Panel, CDP-312R | | | 1 |
| Pressure Switch | | | 1 |
| Temperature Sensor | | | 1 |
| HV Relay | | | 1 |
| Charging Transformer | | | 1 |
| EMC Filter Capacitor | | | 1 |
| EMC Filter Choke | | | 1 |

| Input Power Factor Busbar AkV - Copper blank, Optional Copwith tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors DC Link Capacitors Output Switching Device Motor Type Induction Maximum motor cable length Motor current THD Control Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Digital Inputs Oight (30 WaC, 20-150VDC, 8-25mA Digital Outputs (qty 4 fixed and 4 programmable) Gamp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) O-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 5 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Power Section | |
|--|-------------------------------------|--|
| Regenerative Mode | Topology | 5 level Voltage Source Inverter |
| Input Voltage Rating Voltage Sag -30% (with derating) Input Voltage unbalance Input Frequency Max Available Short Circuit Current Supply minimum short circuit capacity Input Protection Basic Impulse Level Input Frequence MOV Surge Arresters - DTL, AFE; consult factory for other configurations Input impedance Input impedance ICL filter topology DTL Typical Line Harmonics Compliant with IEEE 519, EN 6100 -2-4, 6BJT 14549-93 Input Power Factor Controlled to 1.0 - DTL, AFE Busbar 4kV - Copper blank, Optional Cop with tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors DC Link Capacitors Foil/thin film type Unduston Maximum motor cable length Motor Current THD Switching Device Motor current THD Switching Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Minimum Supply recommended Digital Inputs Quity 4 fixed and 10 programmable, 20-240VC, 20-150VDC, 8-25mA Digital Outputs Quity 2 fixed and 4 programmable, Control Voltage Quity 2 fixed and 4 programmable, Control Voltage Analog Inputs Quity 2 fixed and 4 programmable, Quity 3 fixed and 4 programmable, Quity 4 fixed and 10 programmable, Quity 4 fixed and 4 programmable, Quity 4 fixed and 4 p | Rectifier Type | HV IGBT |
| Notage Sag -30% (with derating) Input Voltage unbalance <2% | Regenerative Mode | Optional |
| Input Voltage unbalance Input Frequency So/60Hz, +/- 5% Max Available Short Circuit Current SokA Supply minimum short circuit capacity Input Protection Basic Impulse Level GokV Input Surge Protection Input impedance Input impedance Input Power Factor Busbar AkV - Copper blank, Optional Copwith tin plating Precharge Circuit Wia auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. Pot Link Capacitors Motor Current THD Control Auxiliary Power Consumption (minimum supply recommended finame supply auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 24VDC; power derived from 3 pha auxiliary power optional 120V e 230V 1 phase control power Digital Inputs Qipt 4 fixed and 10 programmable) o-10V or 0-20mA, 10 bit resolution Analog Outputs HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Input Voltage Rating | 4160V +/- 10% |
| Input Frequency Max Available Short Circuit Current SokA Supply minimum short circuit capacity Input Protection Basic Impulse Level Input Surge Protection MoV Surge Arresters - DTL, AFE; consult factory for other configurations Input impedance I.CL filter topology DTL Typical Line Harmonics Compliant with IEEE 519, EN 6100 -2-4, GB/T 14549-93 Input Power Factor Busbar AkV - Copper blank, Optional Cop with tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Output Switching Device HV IGBT Motor Type Induction Maximum motor cable length Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Quy A fixed and 10 programmable, 20-240VAC, 20-150VDC, 8-25mA Digital Outputs Quy 2 fixed and 4 programmable, 20-240VAC, 20-150VDC, 8-25mA Digital Outputs Quy 2 fixed and 4 programmable, 0-10V or 0-20mA, 10 bit resolution for seet Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Voltage Sag | -30% (with derating) |
| Max Available Short Circuit Current Supply minimum short circuit capacity Input Protection Input surge Protection Input impedance Input impedance Input Power Factor Busbar Input Power Factor Busbar Controlled to 1.0 - DTL, AFE Coordinations Incurrent THD Control Auxiliary Supply Voltage Auxiliary Supply Voltage Digital Inputs Digital Inputs Digital Inputs Digital Outputs Digital Outputs Analog Outputs Door Mounted Controls Analog Outputs Door Mounted Controls Door Mounted Controls Auxiliary Supply Off, Supply Off, Supply Off, Supply Off, Farener Stapply Inputs Programs Digital Farener Stapply Input Power Factor Supply Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Input Voltage unbalance | <2% |
| Supply minimum short circuit capacity Input Protection Basic Impulse Level Input Surge Protection Input Surge Protection Input impedance Input impedance Input Fower Factor Busbar Precharge Circuit Compliant with IEEE 519, EN 6100 -2-4, GB/T 14549-93 Input Power Factor Busbar Precharge Circuit Cortinited integrated disconnect option not chosen. DC Link Capacitors Output Switching Device Maximum motor cable length Motor current THD Control Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Supply Voltage Digital Inputs Digital Inputs Digital Outputs Digital Outputs Digital Outputs Door Mounted Controls Analog Outputs Door Mounted Controls Door Mounted Controls Standard - Supply Of, Supply Off, Ground Switch De-Energized, Fau | Input Frequency | 50/60Hz, +/- 5% |
| capacity Input Protection Basic Impulse Level Input Surge Protection MOV Surge Arresters - DTL, AFE; consult factory for other configurations Input impedance ICL filter topology DTL Typical Line Harmonics Compliant with IEEE 519, EN 6100-2-4, GB/T 14549-93 Input Power Factor Controlled to 1.0 - DTL, AFE Busbar AkV - Copper blank, Optional Copwith tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device HV IGBT Motor Type Induction Maximum motor cable length Auxiliary Bower Consumption (minimum supply recommended Control Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Quy Affixed and 10 programmable) Auxiliary power or optional 120V cannow and a programmable) Control Voltage Quy 2 fixed and 2 programmable) Gamp@ 24VDC or 120VAC Analog Inputs Quy 2 fixed and 2 programmable) O-10V or O-20mA, 10 bit resolution; scalable to 4-20mA, bit resolution. Bit and the protect of the | Max Available Short Circuit Current | 50kA |
| Basic Impulse Level Input Surge Protection MOV Surge Arresters - DTL, AFE; consult factory for other configurations Input impedance LCL filter topology DTL Typical Line Harmonics Input Power Factor Busbar Precharge Circuit Compliant with IEEE 519, EN 6100 -2-4, GB/T 14549-93 Input Power Factor Controlled to 1.0 - DTL, AFE 4kV - Copper blank, Optional Copwith tin platting Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device HV IGBT Induction Maximum motor cable length Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Quay 4 fixed and 10 programmable 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs Quay 2 fixed and 4 programmable) Gamp@ 24VDC or 120VAC Analog Inputs Quay 2 fixed and 4 programmable) Gamp@ 24VDC or 120VAC Analog Outputs Analog Outputs Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | 20 times installed peak power |
| Input Surge Protection MOV Surge Arresters - DTL, AFE; consult factory for other configurations Input impedance LCL filter topology DTL Typical Line Harmonics Compliant with IEEE 519, EN 6100-2-4, GB/T 14549-93 Input Power Factor Busbar Precharge Circuit Controlled to 1.0 - DTL, AFE 4kV - Copper blank, Optional Copwith in plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device HV IGBT Motor Type Induction Maximum motor cable length Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Supply Voltage 400 VAC, 480 VAC, 600 VAC, +/-10 50/60Hz, external supply Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 2: 11 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Digital Inputs (qty 2 fixed and 10 programmable) 20-240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 4 programmable) 0-10V or 0-20mA, 10 bit resolution; scalable to 4-20mA bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Input Protection | Fuses - DTL |
| consult factory for other configurations Input impedance LCL filter topology DTL Typical Line Harmonics Compliant with IEEE 519, EN 6100 -2-4, GB/T 14549-93 Input Power Factor Busbar Precharge Circuit Controlled to 1.0 - DTL, AFE Busbar 4kV - Copper blank, Optional Copwith tin platting Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Output Switching Device HV IGBT Motor Type Induction Maximum motor cable length Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Control Voltage Digital Inputs City 2 fixed and 10 programmable 20-240VAC, 20-150VDC, 8-25mA Digital Outputs City 2 fixed and 4 programmable 0-10V or 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Basic Impulse Level | 60kV |
| Typical Line Harmonics Compliant with IEEE 519, EN 6100-2-4, GB/T 14549-93 Input Power Factor Busbar AkV - Copper blank, Optional Copwith in plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device Maximum motor cable length Motor Type Induction Maximum motor cable length Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Digital Inputs Digital Outputs (qty 4 fixed and 10 programmable) 2-240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution standard - Supply Off, Ground Switch De-Energized, Fau | Input Surge Protection | consult factory for other |
| Input Power Factor Busbar AkV - Copper blank, Optional Copwith tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors DC Link Capacitors DC Link Capacitors Foil/thin film type Output Switching Device Motor Type Induction Maximum motor cable length Motor current THD Control Auxiliary Supply Voltage Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Digital Inputs Quy Acy Fixed and 10 programmable 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs Quy 2 fixed and 2 programmable) Gamp@ 24VDC or 120VAC Analog Inputs Quy 2 fixed and 2 programmable) O-10V or 0-20mA, 10 bit resolution Frase tart, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Input impedance | LCL filter topology DTL |
| Busbar 4kV - Copper blank, Optional Copwith tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Output Switching Device Motor Type Induction Maximum motor cable length Motor current THD Control Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Digital Inputs Outputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Typical Line Harmonics | Compliant with IEEE 519, EN 61000 -2-4, GB/T 14549-93 |
| with tin plating Precharge Circuit Via auxiliary power supply. Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device Maximum motor cable length Motor Type Induction Maximum motor cable length Via auxiliary Power Consumption (minimum supply recommended frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Digital Inputs Outputs Output Switching Device Work, 480 VAC, 600 VAC, +/-10 50/60Hz, external supply Auxiliary Power Consumption (minimum supply recommended frame 1: 6 kVA Frame 3: 16 kVA Control Voltage Digital Inputs Outputs Out | Input Power Factor | Controlled to 1.0 - DTL, AFE |
| Coordination with MV switchgear required if integrated disconnect option not chosen. DC Link Capacitors Foil/thin film type Output Switching Device HV IGBT Motor Type Induction Maximum motor cable length < 1000ft (300m); Contact factory longer cable lengths Motor current THD < 5% for typical motors Control Auxiliary Supply Voltage 400 VAC, 480 VAC, 600 VAC, +/-10 50/60Hz, external supply Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V c 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20-240VAC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) -0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) -0-20mA, 1 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Busbar | 4kV - Copper blank, Optional Copper with tin plating |
| Output Switching Device Motor Type Induction Maximum motor cable length Motor current THD Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Digital Outputs Analog Inputs Analog Outputs Motor Current Motor current THD Auxiliary Power Consumption (minimum supply recommended Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Outputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution; scalable to 4-20mA bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Precharge Circuit | Coordination with MV switchgear required if integrated disconnect |
| Motor Type Maximum motor cable length Motor current THD Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Control Voltage Digital Inputs Digital Outputs Digital Outputs Analog Inputs Analog Outputs Motor current THD Auxiliary Power Consumption (minimum supply recommended) Auxiliary Power Consumption (minimum supply recommended) Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage Auxiliary power or optional 120V or 230V 1 phase control power (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA Bit resolution; scalable to 4-20mA CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | DC Link Capacitors | Foil/thin film type |
| Maximum motor cable length (1000ft (300m); Contact factory longer cable lengths Motor current THD (5% for typical motors Control Auxiliary Supply Voltage (400 VAC, 480 VAC, 600 VAC, +/-10 50/60Hz, external supply Auxiliary Power Consumption (minimum supply recommended (Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage (24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA Bit resolution; scalable to 4-20mA CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Output Switching Device | HV IGBT |
| Ionger cable lengths Motor current THD < 5% for typical motors Control Auxiliary Supply Voltage | Motor Type | Induction |
| Control Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Maximum motor cable length | < 1000ft (300m); Contact factory for longer cable lengths |
| Auxiliary Supply Voltage Auxiliary Power Consumption (minimum supply recommended Maxiliary Power Consumption (minimum supply recommended Auxiliary Power Consumption (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Motor current THD | < 5% for typical motors |
| Auxiliary Power Consumption (minimum supply recommended May DTL: Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 6amp@ 24VDC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Control | |
| (minimum supply recommended Frame 1: 6 kVA Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA Dit resolution; scalable to 4-20mA Sit resolution; sc | Auxiliary Supply Voltage | 400 VAC, 480 VAC, 600 VAC, +/-10%, 50/60Hz, external supply |
| Frame 2: 11 kVA Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V of 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution Analog Outputs (pty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | 4kV DTL: |
| Frame 3: 16 kVA Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V of 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA, 10 bit resolution; scalable to 4 | (minimum supply recommended | |
| Control Voltage 24VDC; power derived from 3 pha auxiliary power or optional 120V of 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | |
| auxiliary power or optional 120V or 230V 1 phase control power Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | |
| Digital Inputs (qty 4 fixed and 10 programmable) 20 -240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Control Voltage | |
| Digital Inputs (qty 4 fixed and 10 programmable 20 - 240VAC, 20-150VDC, 8-25mA Digital Outputs (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolutio bit resolutio; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | - · · · · · · · · · · · · · · · · · · · |
| Digital Outputs 20 -240VAC, 20-150VDC, 8-25mA (qty 2 fixed and 4 programmable) 6amp@ 24VDC or 120VAC Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Digital Inputs | · |
| Analog Inputs (qty 2 fixed and 2 programmable) 0-10V or 0-20mA, 10 bit resolutio Analog Outputs (qty 2 programmable) - 0-20mA, 3 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | 20 -240VAC, 20-150VDC, 8-25mA |
| O-10V or 0-20mA, 10 bit resolution Analog Outputs (qty 2 programmable) - 0-20mA, 10 bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | 6amp@ 24VDC or 120VAC |
| bit resolution; scalable to 4-20mA HMI CDP 312 keypad - four line, 16 character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | | (qty 2 fixed and 2 programmable) - 0-10V or 0-20mA, 10 bit resolution |
| character start, stop, local/remot reset Door Mounted Controls Standard - Supply On, Supply Off, Ground Switch De-Energized, Fau | Analog Outputs | (qty 2 programmable) - 0-20mA, 12 bit resolution; scalable to 4-20mA |
| Ground Switch De-Energized, Fau | нмі | character start, stop, local/remote, |
| Alarm 4kV options - Run Light, Speed Potentiometer, Local/Remote Sw | Door Mounted Controls | |
| Control power ride through 5 cycle ride through standard; | Control power ride through | 5 cycle ride through standard; extended ride through via optional |

| Performance | |
|--------------------------------|--|
| Control Software | DTC (Direct Torque Control) |
| Zero speed starting torque | 0-speed starting torque 100 % (for max. 10 s) - with encoder 70 % (< 5 % motor speed) - without encoder |
| | 100 % (> 12 % motor speed) |
| Speed accuracy with encoder | 0.01% static, 0.2 to 0.5% dynamic |
| Speed accuracy without encoder | 0.1% static, 0.5 to 1% dynamic |
| Torque Response Time | 5ms at 70% of full speed |
| Maximum Motor Cable Distance | < 1000 ft (300m); for longer distance consult ABB |
| Output Frequency Range | 075 Hz |
| Protection | Overvoltage, Overcurrent, Short Circuit, Overtemperature Motor stall, Overspeed, communication (I/O Watchdog), ground fault main circuit breaker supervision/trip, Auxiliary voltage fault, Emergency off signal supervision |
| Cooling/Ambient | |
| Cooling method | Forced air cooling, Roof-vented fan unit |
| Air flow rate | 4kV DTL Frame 1 : 5000 ft ³ /min (8500 m ³ /h) Frame 2 : 10000 ft ³ /min (17000 m ³ /h) Frame 3 : 15000 ft ³ /min (25485 m ³ /h) |
| Ambient operating temperature | 5 to 40 C, |
| range | 50C available with derating |
| Transportation and Storage | -25C to +55C |
| Operational Altitude | < 2000 m above sea level, for higher altitudes please consult factory Higher with derating |
| Relative Humidity | 5 to 85%, non-condensing |
| Cabinet/Enclosure | |
| Protection Class | IP 21, IP 42, NEMA 1 Gasketed |
| Color | ANSI 61 Gray - whole cabinet |
| Cabinet Material | Corrosion protected, coated steel enclosure, 12 gauge |
| Main power cable entry | Top or bottom entry/exit |
| Control cable entry | Top or bottom entry/exit |
| Safety | Mechanical interlocking of doors for MV Sections |
| Design Standards | cUL, NEMA, ANSI, IEEE, IEC, EN, CE |
| Audible Noise | < 85dbA, consult user manual for test description |

Auxiliary power supply

The drive requires auxiliary power for cooling fans and control hardware. The total auxiliary power can be fed to the drive by a 3-phase power supply. As an option the control hardware can be supplied separately by a 1-phase supply that is backed up by a UPS.

If only a 3-phase supply provides the auxiliary power, the values for the auxiliary supply and the external UPS must be added to obtain the total power to be supplied.

Single phase control supply

When external control power is desired, option code +CSC0001 must be selected, which shall have the following specs:

| 1-phase auxiliary control voltage | 120 VAC +/- 10% |
|-------------------------------------|-----------------------|
| 1-phase auxiliary supply frequency | 50 / 60 Hz |
| 1-phase auxiliary power consumption | Approximately 0.5 kVA |

Default Configuration

| Auxiliary supply voltage (3 phase) | 400 VAC, 480 VAC, 600 VAC +/- 10% |
|------------------------------------|-----------------------------------|
| Auxiliary supply frequency | 50 / 60 Hz |
| Auxiliary power consumption | 4kV DTL |
| | Frame 1 - 6 kVA |
| | Frame 2 - 11 kVA |
| | Frame 3 - 16 kVA |

Customer supplied MV MCB (breaker or vacuum contactor) (standard)

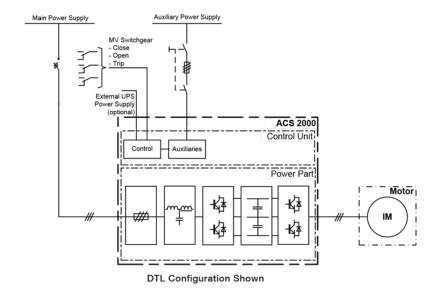
The ACS2000 needs to have direct and exclusive control over the MV Switchgear. The close, open and / or trip command must be wired directly from the frequency converter to the MV Switchgear. It is not permitted to wire the trip command

through any PLC or DCS system if it is not certified to meet SIL 3 level requirements.

The MV MCB (breaker or vacuum contactor) needs to be equipped with the following features:

 1 normally open and 1 normally closed contact to provide status feedback to the drive

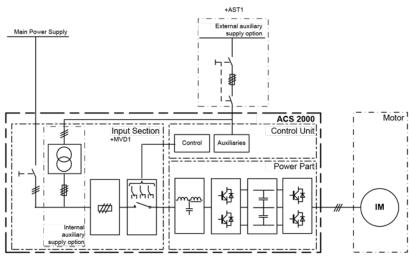
See publication MV Switchgear - document number 2UEB000095 for technical specifications



Integral MV fused disconnect / vacuum contactor package (optional)

ABB can also offer a fused disconnect / contactor option for a flexible, self contained solution where no control coordination is required upstream. It provides a visible blade switch

disconnect and integral input contactor with options such as motor protection relay, auxiliary power transformer and other customer controls.



DTL Configuration Shown

Environment

| Operation | | | |
|------------------------------------|---|--|--|
| Ambient temperature | + 0+ 40 °C (32104 °F) | | |
| | Above +40 °C (+104 °F) the rated | | |
| | output power decreases by 1.5 % for | | |
| | each additional 1 °C up to the | | |
| | maximum permitted temperature of $+50 ^{\circ}\text{C} (+122 ^{\circ}\text{F})$. | | |
| | Example: If the ambient temperature | | |
| | is 50 °C the derating is calculated as $100\% - 1.5 \%/^{\circ}C \cdot 10 ^{\circ}C = 85\%$. | | |
| | Hence, the maximum output current | | |
| | is 85% of the rated value. | | |
| Sound pressure level | Fan: < 85 dB (A), consult user manual | | |
| | for test description | | |
| | Operation conditions are according | | |
| | to IEC 60721-3-3 'Stationary use at | | |
| | weather-protected locations' | | |
| | (otherwise indicated). | | |
| Standards | | | |
| The ACS 2000 complies with follow | ing codes and standards: | | |
| Drive standards | IEC 60146 | | |
| | IEC 61800 | | |
| | IEC 60721 | | |
| Safety standards | UL 347A | | |
| Line and motor interface | ANSI C84.1 | | |
| | NEMA MG1 | | |
| Network harmonics standards * | IEEE 519 | | |
| | IEC 61000 | | |
| | GB/T 14549-93 | | |
| * minimum SCC > 20 times installed | d power, purely inductive | | |
| Specifications | | | |
| Power Cable | 2UEB000093 (4kV) | | |
| Induction Motor | 2UEB000250 (4kV) | | |
| MV Switchgear | 2UEB000095 (4kV) | | |

Typical application load torque profiles

MV Drive Selection

The drive selection and pricing tables are based on two (2) types of service duty ratings.1

1) Normal Duty

Used for Variable Torque (VT) applications only.

Drives with this rating are designed for 100% continuous operation, with 110% overload for one (1) minute, once every 10 minutes.

P) Heavy Duty

Used for Constant Torque (CT) or Variable Torque (VT) applications.

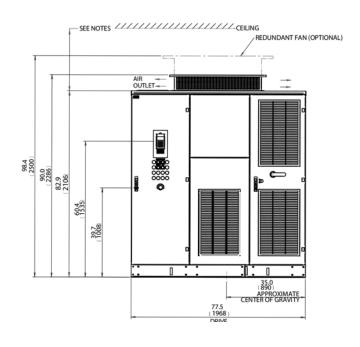
Drives with this rating are designed for 100% continuous operation, with 150% overload for one (1) minute, once every 10 minutes.

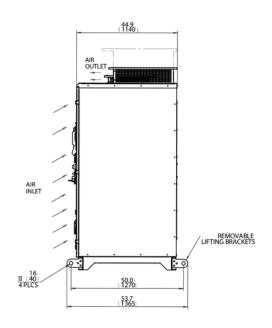
3) Non-standard Duty - Contact ABB

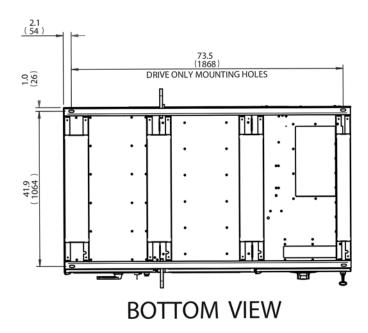
| Application | Description | Torque profile | Load torque | | | Duty |
|-------------|---|-------------------|-------------|--------------|--------------|-----------------|
| | | | Breakaway | Acceleration | Peak running | |
| Agitator | Liquid | СТ | 100 | 100 | 100 | Heavy |
| | Slurry | CT | 150 | 100 | 100 | Heavy |
| Blower | Centrifugal, damper closed | VT | 30 | 50 | 40 | Normal |
| | Centrifugal, damper open | VT | 40 | 110 | 100 | Normal |
| | Positive displacement, rotary, bypassed | VT | 40 | 40 | 100 | Normal |
| Compressor | Axial-vane, loaded | VT | 40 | 100 | 100 | Normal |
| | Centrifugal | VT | 40 | 100 | 100 | Normal |
| | Reciprocating, start unloaded | СТ | 100 | 50 | 100 | Heavy |
| | Screw, start unloaded | СТ | 100 | 50 | 100 | Heavy |
| Conveyor | Belt loaded | СТ | 150 | 130 | 100 | Heavy |
| | Drag | CT | 175 | 150 | 100 | Contact Factory |
| | Screw | CT | 200 | 100 | 100 | Contact Factory |
| Edger | Start unloaded | VT | 40 | 30 | 200 | Contact Factory |
| Fan | Centrifugal, ambient, damper closed | | 25 | 60 | 50 | Normal |
| | Centrifugal, ambient, damper open | VT | 25 | 110 | 100 | Normal |
| | Centrifugal, hot gas, damper close | VT | 25 | 60 | 100 | Normal |
| | Centrifugal, hot gas, damper open | VT | 25 | 200 | 175 | Contact Factory |
| | Propeller, axial flow | VT | 40 | 110 | 100 | Normal |
| Kiln | Rotary, loaded | СТ | 250 | 125 | 125 | Contact Factory |
| Mill | Cold rolling | СТ | 150 | 110 | 200 | Contact Factory |
| | Hot Rolling | СТ | 40 | 30 | 200 | Contact Factory |
| | Wire rod | СТ | 90 | 50 | 200 | Contact Factory |
| Mixer | Chemical | СТ | 175 | 75 | 100 | Contact Factory |
| | Liquid | СТ | 100 | 100 | 100 | Heavy |
| | Slurry | CT | 150 | 125 | 100 | Heavy |
| | Solids | СТ | 175 | 125 | 150 | Contact Factory |
| Pump | Centrifugal, discharge open | VT | 40 | 100 | 100 | Normal |
| | Centrifugal, discharge closed | VT | 40 | 75 | 75 | Normal |
| | Oil field flywheel | СТ | 150 | 200 | 200 | Contact Factory |
| | Propeller | VT | 40 | 100 | 100 | Normal |
| | Reciprocating, positive displacement | СТ | 175 | 30 | 175 | Contact Factory |
| | Screw, started dry | VT | 75 | 30 | 100 | Normal |
| | Screw, primed, discharge open | СТ | 150 | 100 | 100 | Heavy |
| | Slurry, discharge open | СТ | 150 | 100 | 100 | Heavy |
| | Turbine, centrifugal, deep well | VT | 50 | 100 | 100 | Normal |
| | Vane type, positive displacement | СТ | 150 | 150 | 175 | Contact Factory |
| Separators | Air, fan type | VT | 40 | 100 | 100 | Normal |

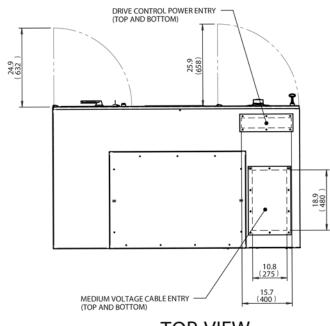
1 Some applications may require a non-standard duty rating due to requirements such as high starting torque or "ultra heavy" overload. Contact factory for assistance to quote an optimized solution.

4kV, direct to line (regenerative and non-regenerative) Frame 1



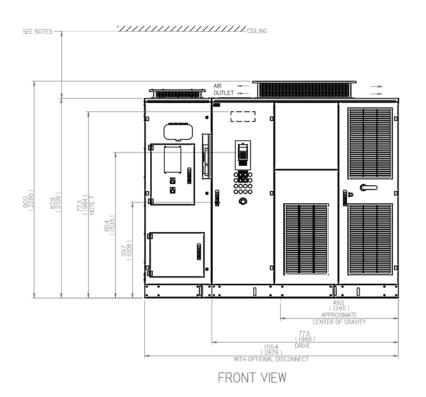


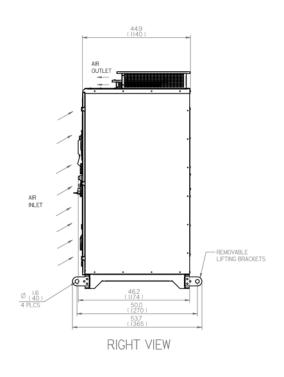


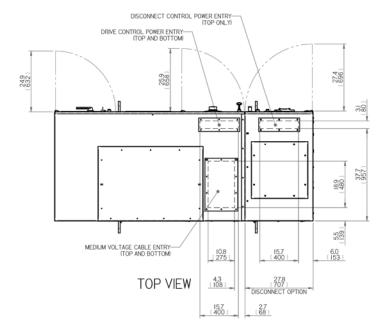


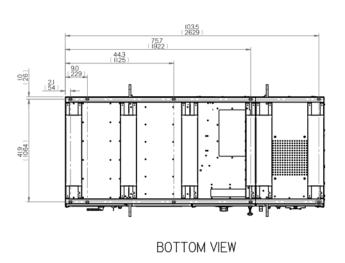
TOP VIEW

4kV, direct to line (regenerative and nonregenerative) Frame 1 with fused disconnect/vacuum contactor option

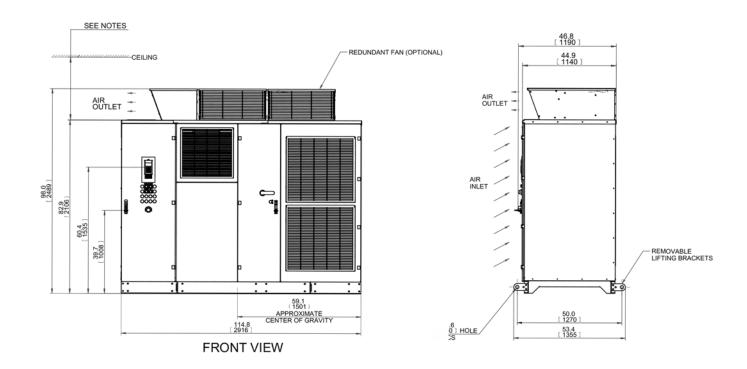


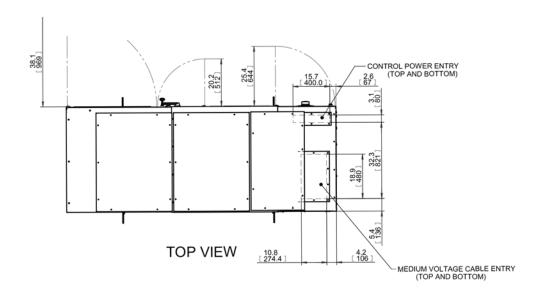




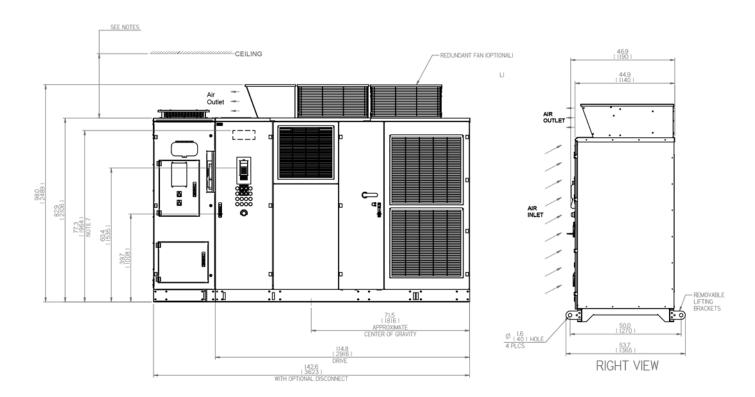


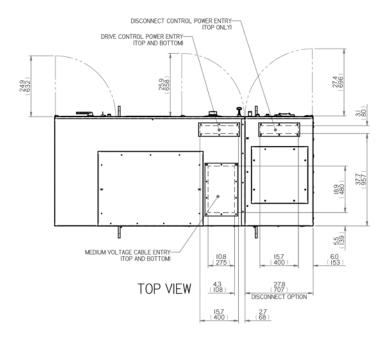
4kV, direct to line (regenerative and non-regenerative) Frame 2





4kV, direct to line (regenerative and nonregenerative) Frame 2 with fused disconnect/vacuum contactor option

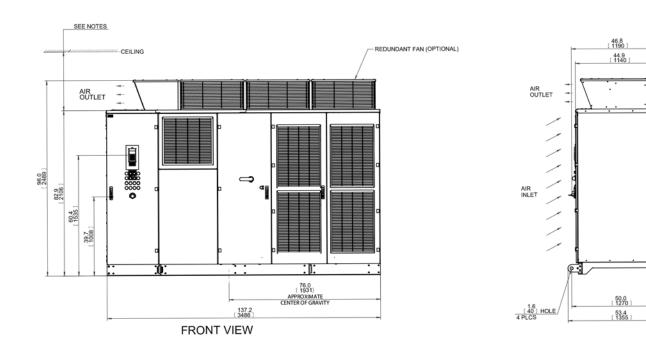


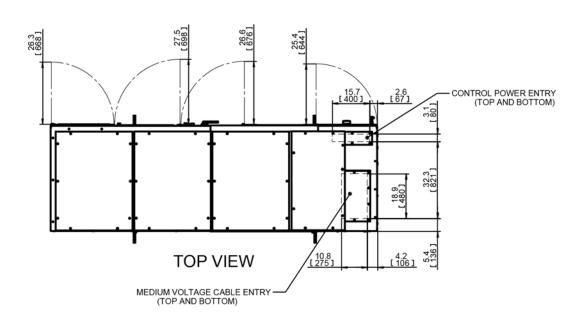


REMOVABLE LIFTING BRACKETS

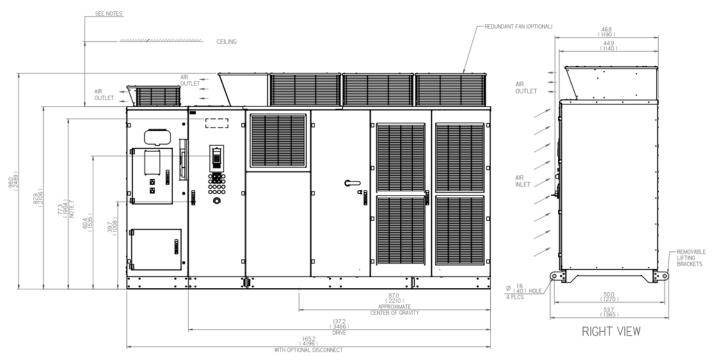
Dimensional Drawings

4kV, direct to line (regenerative and non-regenerative) Frame 3

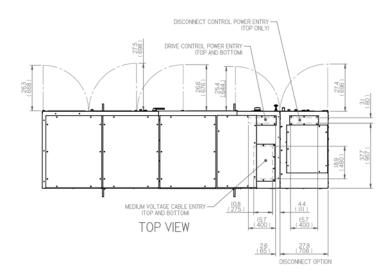




4kV, direct to line (regenerative and nonregenerative) Frame 3 with fused disconnect/vacuum contactor option



FRONT VIEW



A scalable product line with a range of power to meet any general purpose application

ACS2000, 4kV Frame 1 up to 1000 hp



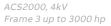
- · Keypad with multi-language display
- Main supply on/off pushbuttons
- Emergency off pushbutton

ACS2000, 4kV Frame 1 with fused disconnect and vacuum contactor option



A scalable product line with a range of power to meet any general purpose application









For more information, please contact your local ABB representative or visit

www.abb.com/drives

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