

Technical data

ACS 2000 medium voltage drives

The ACS 2000 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 ACS 2000 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 ACS 2000 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 ACS 2000 direct-to-line configuration combines the cost savings of a transformerless 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.

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 (transformerless) 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

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Trademarks

- DriveWindow® is a registered trademark of ABB
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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

ACS 2000 medium voltage drives

4kV, direct to line

Non-regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
	P_N		I_N	P_{hd}		I_{hd}					
kV	HP	kW	A	HP	kW	A		kVA			
4160 V Direct to Line **											
4.0	300	224	40	220	164	29	ACS 2040-1L-AN1-a-0C	280	1	5500	2495
4.0	350	261	47	257	192	34	ACS 2040-1L-AN1-a-0D	326	1	5500	2495
4.0	400	298	54	293	218	40	ACS 2040-1L-AN1-a-0E	373	1	5500	2495
4.0	450	336	61	330	246	45	ACS 2040-1L-AN1-a-0F	420	1	5500	2495
4.0	500	373	67	367	274	49	ACS 2040-1L-AN1-a-0H	466	1	5500	2495
4.0	600	447	81	440	328	59	ACS 2040-1L-AN1-a-0L	560	1	5500	2495
4.0	700	522	94	513	383	69	ACS 2040-1L-AN1-a-0Q	653	1	5500	2495
4.0	800	597	108	587	438	79	ACS 2040-1L-AN1-a-0R	746	1	5500	2495
4.0	900	671	121	660	492	85	ACS 2040-1L-AN1-a-0T	839	1	5500	2495
4.0	1000	746	135	733	547	90	ACS 2040-1L-AN1-a-0V	933	1	5500	2495
4.0	1250	933	168	916	684	123	ACS 2040-2L-AN1-a-0Z	1166	2	6200	2810
4.0	1500	1119	202	1100	820	148	ACS 2040-2L-AN1-a-1C	1399	2	6200	2810
4.0	1750	1306	236	1283	958	173	ACS 2040-2L-AN1-a-1F	1632	2	6200	2810
4.0	2000	1492	269	1647	1094	197	ACS 2040-2L-AN1-a-1H	1865	2	6200	2810

Notes on data

- * 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.

I_N : Continuous current rating allowing 110% I_N at 40°C for 1 minute every 10 minutes.

Heavy-duty use

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

I_{hd} : Continuous current rating of particular sub-frame allowing 150% I_{hd} at 40°C for 1 minute every 10 minutes.

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

Dimensions (h x l x d)

Frame 1 Dimensions:

inches: 89.9 x 76.4 x 46.6
mm: 2285 x 1940 x 1185

Frame 2 Dimensions:

inches: 89.9 x 114.8 x 46.6
mm: 2285 x 2915 x 1185

ACS 2000 medium voltage drives

4kV, direct to line

Regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
	P_N	I_N		P_{hd}	I_{hd}						
kV	HP	kW	A	HP	kW	A		kVA			
4160 V Direct to Line **											
4.0	300	224	40	220	164	29	ACS 2040-1T-AN1-a-0C	280	1	5500	2495
4.0	350	261	47	257	192	34	ACS 2040-1T-AN1-a-0D	326	1	5500	2495
4.0	400	298	54	293	218	40	ACS 2040-1T-AN1-a-0E	373	1	5500	2495
4.0	450	336	61	330	246	45	ACS 2040-1T-AN1-a-0F	420	1	5500	2495
4.0	500	373	67	367	274	49	ACS 2040-1T-AN1-a-0H	466	1	5500	2495
4.0	600	447	81	440	328	59	ACS 2040-1T-AN1-a-0L	560	1	5500	2495
4.0	700	522	94	513	383	69	ACS 2040-1T-AN1-a-0Q	653	1	5500	2495
4.0	800	597	108	587	438	79	ACS 2040-1T-AN1-a-0R	746	1	5500	2495
4.0	900	671	121	660	492	85	ACS 2040-1T-AN1-a-0T	839	1	5500	2495
4.0	1000	746	135	733	547	90	ACS 2040-1T-AN1-a-0V	933	1	5500	2495
4.0	1250	933	168	916	684	123	ACS 2040-2T-AN1-a-0Z	1166	2	6200	2810
4.0	1500	1119	202	1100	820	148	ACS 2040-2T-AN1-a-1C	1399	2	6200	2810
4.0	1750	1306	236	1283	958	173	ACS 2040-2T-AN1-a-1F	1632	2	6200	2810
4.0	2000	1492	269	1647	1094	197	ACS 2040-2T-AN1-a-1H	1865	2	6200	2810

Notes on data

* 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.

I_N : Continuous current rating allowing 110% I_N at 40°C for 1 minute every 10 minutes.

Heavy-duty use

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

I_{hd} : Continuous current rating of particular sub-frame allowing 150% I_{hd} at 40°C for 1 minute every 10 minutes.

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

Dimensions (h x l x d)

Frame 1 Dimensions:

inches: 89.9 x 76.4 x 46.6

mm: 2285 x 1940 x 1185

Frame 2 Dimensions:

inches: 89.9 x 114.8 x 46.6

mm: 2285 x 2915 x 1185

ACS 2000 medium voltage drives

6kV, direct to line

Non-regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
kV	P _N		I _N	P _{hd}		I _{hd}		kVA			
	HP	kW	A	HP	kW	A					
6,000 V **											
6.0	335	250	30	245	183	22	ACS 2060-1L-AN1-a-0D	344	1	4400	2000
6.0	422	315	38	310	231	28	ACS 2060-1L-AN1-a-0E	434	1	4400	2000
6.0	476	355	43	349	260	31	ACS 2060-1L-AN1-a-0G	488	1	4400	2000
6.0	536	400	48	393	293	35	ACS 2060-1L-AN1-a-0J	550	1	4400	2000
6.0	603	450	54	442	330	40	ACS 2060-1L-AN1-a-0L	619	1	4400	2000
6.0	670	500	60	492	367	44	ACS 2060-1L-AN1-a-0N	688	1	4400	2000
6.0	751	560	67	551	411	49	ACS 2060-1L-AN1-a-0Q	770	1	4400	2000
6.0	845	630	76	619	462	56	ACS 2060-1L-AN1-a-0S	866	1	4400	2000
6.0	952	710	85	698	521	63	ACS 2060-1L-AN1-a-0U	976	1	4400	2000
6.0	979	730	87	714	533	64	ACS 2060-1L-AN1-a-0V	1,000	1	4400	2000
6.0	1072	800	96	787	587	71	ACS 2060-2L-AN1-a-0W	1,100	2	9460	4300
6.0	1206	900	108	885	660	79	ACS 2060-2L-AN1-a-0Y	1,238	2	9460	4300
6.0	1340	1,000	120	983	733	88	ACS 2060-2L-AN1-a-1A	1,375	2	9460	4300
6.0	1501	1,120	135	1101	821	99	ACS 2060-2L-AN1-a-1C	1,540	2	9460	4300
6.0	1689	1,260	152	1239	924	111	ACS 2060-2L-AN1-a-1E	1,733	2	9460	4300
6.0	1903	1,420	171	1395	1,041	125	ACS 2060-2L-AN1-a-1G	1,953	2	9460	4300
6,600 V **											
6.6	335	250	27	245	183	20	ACS 2066-1L-AN1-a-0D	344	1	4400	2000
6.6	422	315	34	310	231	25	ACS 2066-1L-AN1-a-0E	434	1	4400	2000
6.6	476	355	39	349	260	28	ACS 2066-1L-AN1-a-0G	488	1	4400	2000
6.6	536	400	44	393	293	32	ACS 2066-1L-AN1-a-0J	550	1	4400	2000
6.6	603	450	49	442	330	36	ACS 2066-1L-AN1-a-0L	619	1	4400	2000
6.6	670	500	55	492	367	40	ACS 2066-1L-AN1-a-0N	688	1	4400	2000
6.6	751	560	61	551	411	45	ACS 2066-1L-AN1-a-0Q	770	1	4400	2000
6.6	845	630	69	619	462	51	ACS 2066-1L-AN1-a-0S	866	1	4400	2000
6.6	952	710	78	698	521	57	ACS 2066-1L-AN1-a-0U	976	1	4400	2000
6.6	1072	800	87	787	587	64	ACS 2066-1L-AN1-a-0W	1,100	1	4400	2000
6.6	1206	900	98	885	660	72	ACS 2066-2L-AN1-a-0Y	1,238	2	9460	4300
6.6	1340	1,000	109	983	733	80	ACS 2066-2L-AN1-a-1A	1,375	2	9460	4300
6.6	1501	1,120	122	1101	821	90	ACS 2066-2L-AN1-a-1C	1,540	2	9460	4300
6.6	1689	1,260	138	1239	924	101	ACS 2066-2L-AN1-a-1E	1,733	2	9460	4300
6.6	1903	1,420	155	1395	1,041	114	ACS 2066-2L-AN1-a-1G	1,953	2	9460	4300
6.6	2011	1,500	164	1475	1,100	120	ACS 2066-2L-AN1-a-1H	2,063	2	9460	4300

ACS 2000 medium voltage drives

6kV, direct to line

Non-regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
kV	P _N	I _N		P _{hd}	I _{hd}			kVA			
HP	kW	A	HP	kW	A						
6,900 V **											
6.9	335	250	27	245	183	20	ACS 2069-1L-AN1-a-0D	344	1	4400	2000
6.9	422	315	34	310	231	25	ACS 2069-1L-AN1-a-0E	434	1	4400	2000
6.9	476	355	39	349	260	28	ACS 2069-1L-AN1-a-0G	488	1	4400	2000
6.9	536	400	44	393	293	32	ACS 2069-1L-AN1-a-0J	550	1	4400	2000
6.9	603	450	49	442	330	36	ACS 2069-1L-AN1-a-0L	619	1	4400	2000
6.9	670	500	55	492	367	40	ACS 2069-1L-AN1-a-0N	688	1	4400	2000
6.9	751	560	61	551	411	45	ACS 2069-1L-AN1-a-0Q	770	1	4400	2000
6.9	845	630	69	619	462	51	ACS 2069-1L-AN1-a-0S	866	1	4400	2000
6.9	952	710	78	698	521	57	ACS 2069-1L-AN1-a-0U	976	1	4400	2000
6.9	1072	800	87	787	587	64	ACS 2069-1L-AN1-a-0W	1,100	1	4400	2000
6.9	1206	900	98	885	660	72	ACS 2069-2L-AN1-a-0Y	1,238	2	9460	4300
6.9	1340	1,000	109	983	733	80	ACS 2069-2L-AN1-a-1A	1,375	2	9460	4300
6.9	1501	1,120	122	1101	821	90	ACS 2069-2L-AN1-a-1C	1,540	2	9460	4300
6.9	1689	1,260	138	1239	924	101	ACS 2069-2L-AN1-a-1E	1,733	2	9460	4300
6.9	1903	1,420	155	1395	1,041	114	ACS 2069-2L-AN1-a-1G	1,953	2	9460	4300
6.9	2011	1,500	164	1475	1,100	120	ACS 2069-2L-AN1-a-1H	2,063	2	9460	4300

Notes on data

* 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.

I_N: Continuous current rating allowing 110% I_N at 40°C for 1 minute every 10 minutes.

Heavy-duty use

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

I_{hd}: Continuous current rating of particular sub-frame allowing 150% I_{hd} at 40°C for 1 minute every 10 minutes.

** 6.0 / 6.6 kV, +10% to -10%; 6.9 kV, +5% to -10%

Dimensions

Frame 1 Dimensions (h x l x d):

inches: 90 x 86.6 x 44.9

mm: 2490 x 2200 x 1140

Frame 2 Dimensions (h x l x d):

inches: 90 x 149.6 x 44.9

mm: 2490 x 3800 x 1140

ACS 2000 medium voltage drives

6kV, direct to line

Regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
	P_N	I_N		P_{hd}	I_{hd}						
kV	HP	kW	A	HP	kW	A		kVA			
6,000 V **											
6.0	335	250	30	245	183	22	ACS 2060-1T-AN1-a-0D	344	1	4400	2000
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6.0	979	730	87	714	533	64	ACS 2060-1T-AN1-a-0V	1,000	1	4400	2000
6.0	1072	800	96	787	587	71	ACS 2060-2T-AN1-a-0W	1,100	2	9460	4300
6.0	1206	900	108	885	660	79	ACS 2060-2T-AN1-a-0Y	1,238	2	9460	4300
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6.0	1501	1,120	135	1101	821	99	ACS 2060-2T-AN1-a-1C	1,540	2	9460	4300
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ACS 2000 medium voltage drives

6kV, direct to line

Regenerative induction motor drives, air cooled

Motor data							Converter	Converter data		Approx. Weight	
Voltage	Light overload *			Heavy duty *			Type code	Power	Frame	lbs	kg
	P_N		I_N	P_{hd}		I_{hd}					
kV	HP	kW	A	HP	kW	A		kVA			
6,900 V **											
6.9	335	250	27	245	183	20	ACS 2069-1T-AN1-a-0D	344	1	4400	2000
6.9	422	315	34	310	231	25	ACS 2069-1T-AN1-a-0E	434	1	4400	2000
6.9	476	355	39	349	260	28	ACS 2069-1T-AN1-a-0G	488	1	4400	2000
6.9	536	400	44	393	293	32	ACS 2069-1T-AN1-a-0J	550	1	4400	2000
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6.9	751	560	61	551	411	45	ACS 2069-1T-AN1-a-0Q	770	1	4400	2000
6.9	845	630	69	619	462	51	ACS 2069-1T-AN1-a-0S	866	1	4400	2000
6.9	952	710	78	698	521	57	ACS 2069-1T-AN1-a-0U	976	1	4400	2000
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6.9	1903	1,420	155	1395	1,041	114	ACS 2069-2T-AN1-a-1G	1,953	2	9460	4300
6.9	2011	1,500	164	1475	1,100	120	ACS 2069-2T-AN1-a-1H	2,063	2	9460	4300

Notes on data

* 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.

I_N : Continuous current rating allowing 110% I_N at 40°C for 1 minute every 10 minutes.

Heavy-duty use

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

I_{hd} : Continuous current rating of particular sub-frame allowing 150% I_{hd} at 40°C for 1 minute every 10 minutes.

** 6.0 / 6.6 kV, +10% to -10%; 6.9 kV, +5% to -10%

Dimensions

Frame 1 Dimensions (h x l x d):

inches: 90 x 86.6 x 44.9

mm: 2490 x 2200 x 1140

Frame 2 Dimensions (h x l x d):

inches: 90 x 149.6 x 44.9

mm: 2490 x 3800 x 1140

ACS 2000 drive options

Name	Description	Installed Option Code	4kV	6kV
Input / Output Options				
Standard I/O	Programmable: digital - 10 inputs, 4 outputs analog - 2 inputs, 2 outputs Fixed: digital - 4 inputs, 2 outputs	standard	standard	standard
Expansion I/O	Digital: 14 inputs, 6 outputs; Analog: 2 outputs	+CE01	optional	optional
Motor temperature supervision	5 PT100 inputs	+TSM05	optional	optional
Motor temperature supervision	8 PT100 inputs	+TSM08	optional	optional
Spare terminals	30 position terminal block as spares for customer use	+SPT30	optional	optional
Door Mounted Controls				
Standard door mount controls	Supply ON and Supply Off Push buttons with indicator Ground switch indicator, alarm/fault indicator	standard	standard	standard
Run pilot light	Run indicating light (red) providing indication drive is outputting voltage to motor	+FDPL05	optional	N/A
Speed pot	0-10V speed potentiometer	+FDSP01	optional	N/A
Local/remote	Selector switch for switching between local and remote control	+FDSS01	optional	N/A
FWD/REV	Selector switch for direction control	+FDSS02	optional	N/A
Encoder Interface				
Pulse Encoder	Pulse encoder interface (NTAC-02)	+ENC00	optional	optional
Field Bus Adapter				
EtherNet Module	N Series communication module	+FAME0	optional	optional
Modbus Module	N Series communication module	+FAMM0	optional	optional
Profibus Module	N Series communication module	+FAMP0	optional	optional
Ethernet IP	Anybus communication module	+FAMAE	optional	N/A
DeviceNet	Anybus communication module	+FAMAD	optional	N/A
ControlNet	Anybus communication module	+FAMAC	optional	N/A
Auxilliary Supply				
400 V Aux Power	3 phase - 400 VAC +/- 10%	+AUX40	optional	standard
480V Aux Power	3 phase - 480 VAC +/- 10%	+AUX48	standard	optional
600V Aux Power	3 phase - 600 VAC +/- 10%	+AUX60	optional	N/A
Busbar				
Copper blank		+BUSCUBL	standard	N/A
Copper tin-plated		+BUSCUTN	optional	optional
Aluminum nickle plated		+BUSALNI	N/A	standard
Single Phase Control Supply				
Internally supplied control power	1-phase control power derived from 3-phase auxiliary power	+SPC00	standard	contact factory
Externally supplied UPS	110V to 240VAC +/-10%, 90-220VDC	+SPC01	optional	standard
Control Power Ride Through				
Internal battery backup	5 second ride through	+CPR01	N/A	optional
Internal battery backup	10 minute ride through	+CPR02	optional	N/A
Space Heater / Cooling Fans				
Drive Space Heater	Heating cable throughout the drive - 120V	+SHT01	optional	optional
Drive Space Heater	Heating cable throughout the drive - 230V	+SHT02	optional	optional
Redundant Cooling Fan	Additional fan used as backup for drive cooling	note 1	optional	optional

ACS 2000 drive options

Name	Description	Installed Option Code	4kV	6kV
Cabinet Paint				
Cabinet Finish	Front Only	+CPFOF	N/A	note 3
Cabinet Finish	Whole cabinet	+CPFWC	note 2	optional
Cabinet Finish	Special color	+COLSPECIAL	optional	optional
Enclosure				
Degree of Protection	IP 42, NEMA 1 Gasketed	+EPC42	optional	optional
MV Switchgear Package (note 4)				
MV Switchgear, Line Side	Integral Input Contactor with visible blade switch disconnect	+MVL4	optional	contact factory
Auxiliary supply transformer	4160V/480V Control Power Transformer	+LVAT4	optional	contact factory
Motor protection relay	multilin 369	+LVM36	optional	contact factory
Motor protection relay	multilin 469	+LVM46	optional	contact factory
Current transformers	Current transformers for line side monitoring	+MVCL1	optional	contact factory
Current transformers	Current transformers for motor side monitoring	+MVCM1	optional	contact factory
Potential transformers	Potential transformers for line side monitoring	+MVPL4	optional	contact factory
Potential transformers	Potential transformers for motor side monitoring	+MVPM4	optional	contact factory

Note 1) Identifier for redundant fan option changes position 14 of the type code of base converter. See below for details.

Note 2) Standard color for 4kv units is ANSI 61 Gray; full cabinet painted

Note 3) Standard color for 6kv units is RAL 7035 Light Grey

Note 4) Options installed in separate cabinet(s); add 28" to drive width; add 1500 lbs to drive weight.

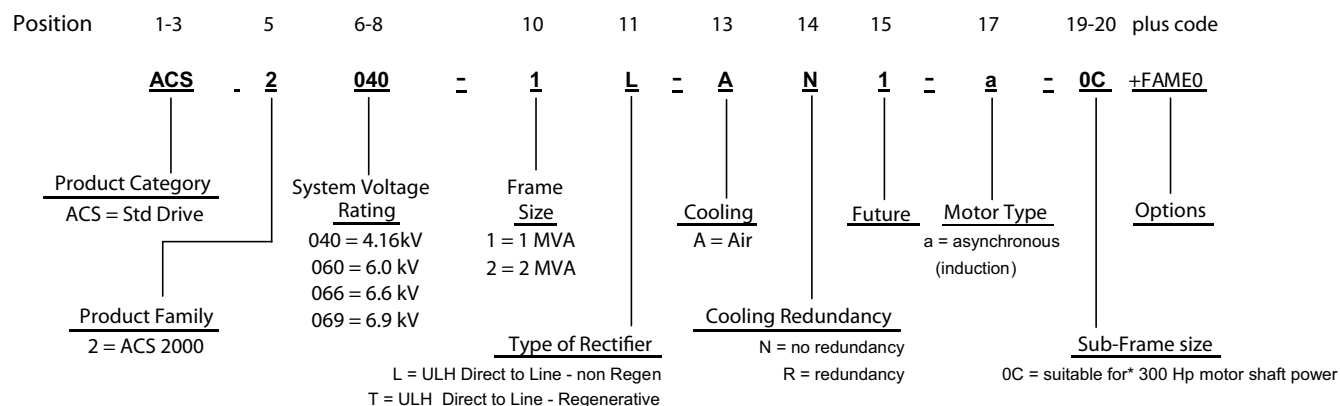
Type code information

To select the appropriate type code, select the basic drive product from the selection guide. To add options, simply add a + at the end of the type code followed by the option code shown for that option.

If item is standard to given drive, option code should not be added to part number. For additional details and available options refer to those pages in this price book. For items not listed, contact the factory for engineered product quotes.

Example

ACS-2040-1L-AN1-a-0C with optional Ethernet adapter would be: ACS-2040-1L-AN1-a-0C+FAME0



See Selection Guide for additional ratings

ACS 2000 4kV options

Other scope of supply

Description	Order Code	4kV
Extended Warranty		
24/30 Months Parts Only Warranty	ACS2000_Ext_Warranty 1)	optional
36/42 Months Parts Only Warranty	ACS2000_Ext_Warranty 1)	optional
48/54 Months Parts Only Warranty	ACS2000_Ext_Warranty 1)	optional
60/66 Months Parts Only Warranty	ACS2000_Ext_Warranty 1)	optional
24/30 Months Parts & Labor Warranty	ACS2000_Ext_Warranty 1)	optional
36/42 Months Parts & Labor Warranty	ACS2000_Ext_Warranty 1)	optional
48/54 Months Parts & Labor Warranty	ACS2000_Ext_Warranty 1)	optional
60/66 Months Parts & Labor Warranty	ACS2000_Ext_Warranty 1)	optional
Accessories / Field installed options		
DriveWindow Card kit (DriveWindow CD included)	3AUA0000040000 EN RUSB	optional
DriveWindow Install CD - Hardware is not included	3AFE64547968	optional

Services

Description	Order Code	4kV
Witness Test		
One day Witness Test	ACS2000_Witness 1)	optional
Commissioning		
2 days on site commissioning	ACS2000_StartUp 1)	optional
2 days on site commissioning + 1 day training	ACS2000_StartUp 1)	optional
3 days on site commissioning	ACS2000_StartUp 1)	optional
3 days on site commissioning + 1 day training	ACS2000_StartUp 1)	optional
Training		
2 Day Training On Site - 8 student max	USG775-C	optional
3 day Training at ABB Facility - 8 student max	G775-A	optional
Spare parts		
Basic spare part kit 300-400 hp	ACS2040-BPK0400 2) 3)	optional
Basic spare part kit 450-700 hp	ACS2040-BPK0700 2) 3)	optional
Basic spare part kit 800-1000 hp	ACS2040-BPK1000 2) 3)	optional
Phase module kit 300-1000hp	ACS2040-PMK1000 2) 3)	optional
Circuit board kit 300-1000hp	ACS2040-CBK1000 3)	optional
Technical support		
Silver - 10 hrs of 24/7 tech support	ACS2040_Tech_Silver	optional
Gold - 15 hrs of 24/7 tech support + 1 day of preventative maintenance at site by ABB service personnel	ACS2040_Tech_Gold	optional
Platinum - Unlimited 24/7 tech support + drive monitor connectivity+20 hr block of onsite support + 10% discount on parts. 3yr min contract	ACS2040_Tech_Platinum	optional

- Note 1) Please add description to order code on purchase order
 Note 2) The basic spare part kit and phase module kit form the recommended spare part package
 Note 3) Discount applies only when purchased with drive at time of sale.

Technical specifications

Power Section	
Topology	5 level Voltage Source Inverter
Rectifier Type	HV IGBT
Regenerative Mode	Optional
Input Voltage Rating	4160V +/- 10%, 6000V +/- 10%, 6600V +/- 10%, 6900V +5% /- 10%
Voltage Sag	-30% (with derating)
Input Voltage unbalance	<2%
Input Frequency	50/60Hz, +/- 5%
Max Available Short Circuit Current	50kA
Supply minimum short circuit capacity	20 times installed peak power
Input Protection	Fuses
Basic Impulse Level	60kV
Input Surge Protection	MOV Surge Arresters
Input impedance	LCL filter topology
Typical Line Harmonics	Compliant with IEEE 519, EN 61000 -2-4, GB/T 14549-93
Input Power Factor	Controlled to > 1.0
Busbar	4kV - Copper blank, Optional Copper with tin plating 6kV - Aluminum nickel plated
Precharge Circuit	Via auxiliary power supply. Coordination with MV switchgear required.
DC Link Capacitors	Foil/thin film type
Output Switching Device	HV IGBT
Motor Type	Induction
Maximum motor cable length	≤ 1000ft (300m); up to 3300ft (1000m) consult factory
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: 12 kVA
Control Voltage	24VDC; power derived from 3 phase 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, 12 bit resolution; scalable to 4-20mA
HMI	CDP 312 keypad - four line, 16 character start, stop, local/remote, reset
Door Mounted Controls	Standard - Supply On, Supply Off, Ground Switch De-Energized, Fault/Alarm 4kV options - Run Light, Speed Potentiometer, Local/Remote Switch
Control power ride through	5 cycle ride through standard; extended ride thru via optional battery powered UPS

Technical specifications

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	≤ 1000ft (300m); up to 3300ft (1000m) consult factory
Output Frequency Range	0...75 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	Frame 1 : 5000 cubic ft/min (8500 cubic m/h) Frame 2 : 10000 cubic ft/min (17000 cubic m/h)
Heat losses	< 3% of minimal output power
Ambient operating temperature range	5 to 40 C, 50C available with derating
Transportation and Storage	-25C to +55C
Operational Altitude	< 2000 m above sea level Higher with derating
Relative Humidity	< 95%, non condensing
Area Classification of Motor	Non Hazardous
Cabinet/Enclosure	
Protection Class	IP21(Nema 1) with gaskets and filters
Color	4kV - ANSI 61 Gray - whole cabinet 6kV- RAL 7035 - front only
Cabinet Material	4kV - Corrosion protected, coated steel enclosure, 12 gauge 6kV - Corrosion protected, coated steel enclosure, 14 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	4kV - cUL, NEMA, ANSI, IEEE, IEC, EN, CE 6kV - IEC, EN, CE
Audible Noise	< 85dba

Technical specifications

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 +SPC01 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	Frame 1 - 6 kVA Frame 2 - 12 kVA

Technical specifications

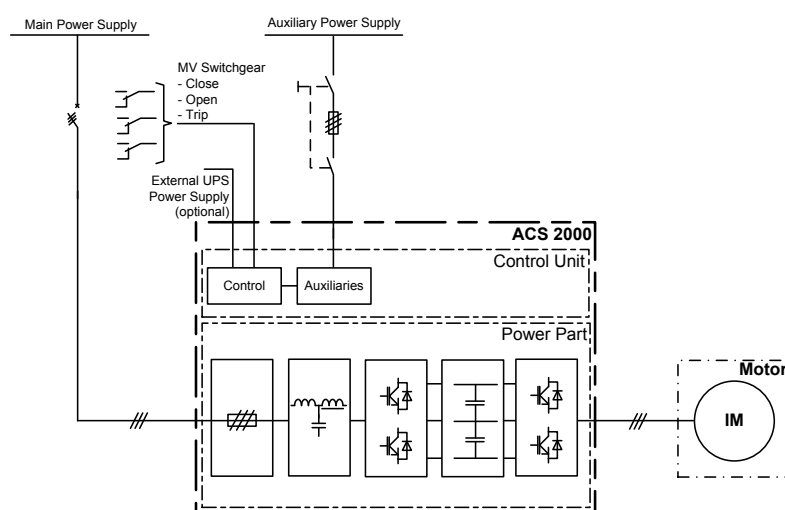
Customer supplied MV switchgear (standard)

The ACS 2000 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 Switchgear needs to be equipped with the following features:

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

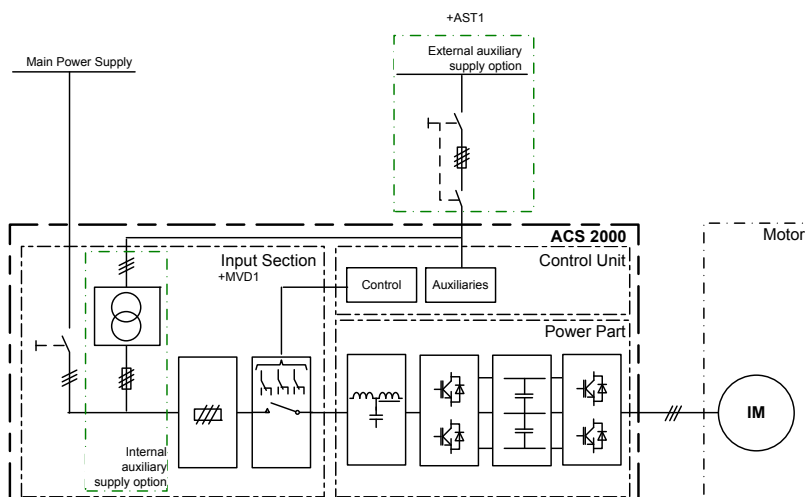
See publication MV Switchgear - document number 2UEB000095 for technical specifications



Integral MV switchgear package (optional)

ABB can also offer a configurable disconnect option package for a flexible, self contained switchgear solution where no control coordination is required upstream. It provides a visible blade

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



Technical specifications

Environment

Operation

Ambient temperature	+ 0...+ 40 °C (32...104 °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 °C (+122 °F). Example: If the ambient temperature is 50 °C the derating is calculated as $100\% - 1.5\% / ^\circ\text{C} \cdot 10\text{ }^\circ\text{C} = 85\%$. Hence, the maximum output power is 85% of the rated value.
Sound pressure level	Fan: < 85 dB (A) Operation conditions are according to IEC 60721-3-3 'Stationary use at weather-protected locations' (otherwise indicated).

Standards

The ACS 2000 complies with following 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 power, purely inductive

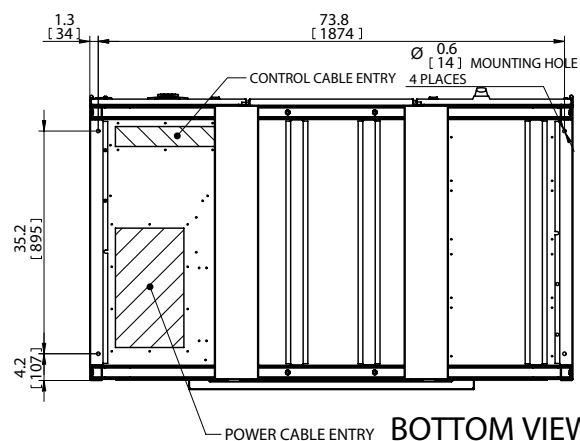
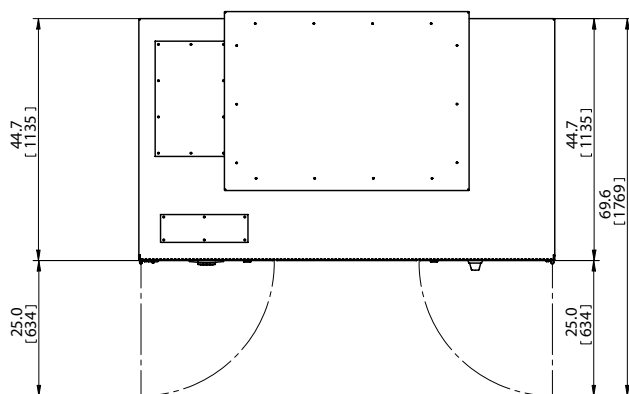
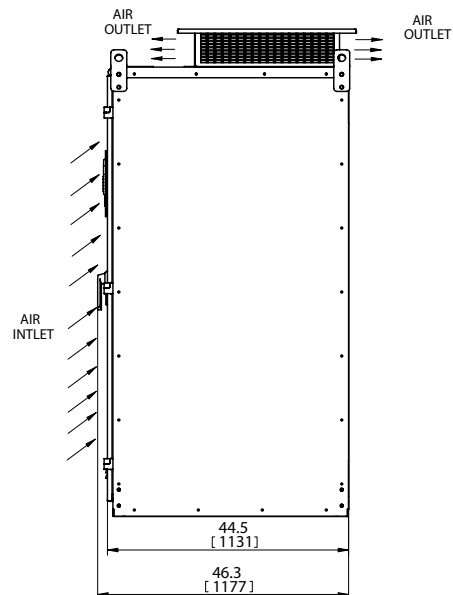
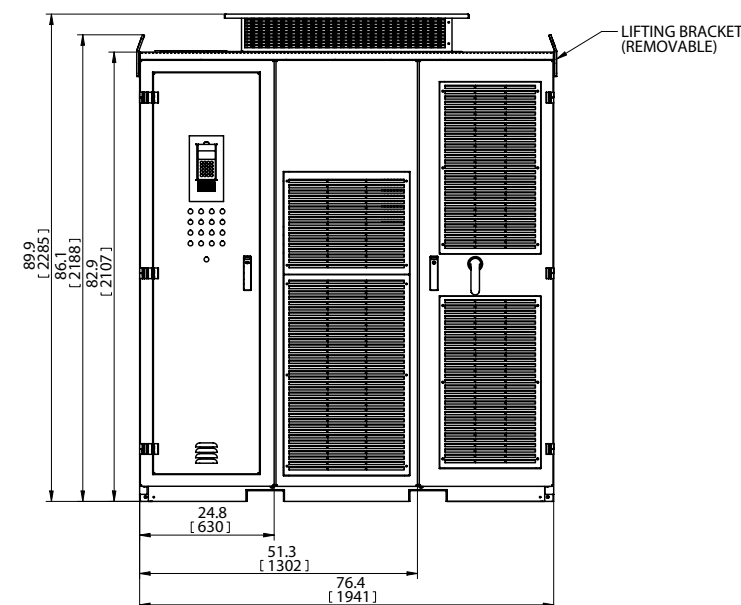
Specifications

Power Cabling	2UEB000093
Motor	2UEB000091
MV Switchgear	2UEB000095

ACS 2000 dimensions

4kv, direct to line (regenerative and non-regenerative)

Frame 1



NOTE: TOP CABLE ENTRY IS IN THE SAME LOCATION AS THE BOTTOM.

Notes:

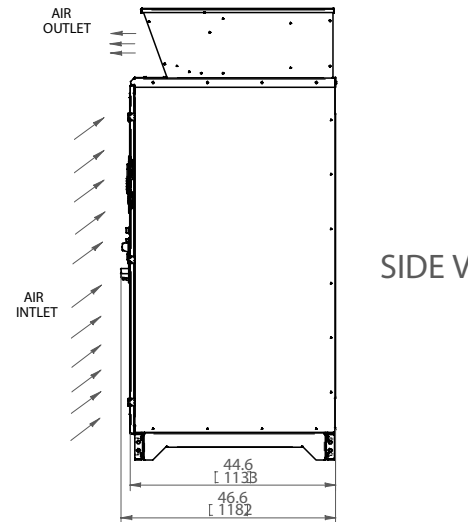
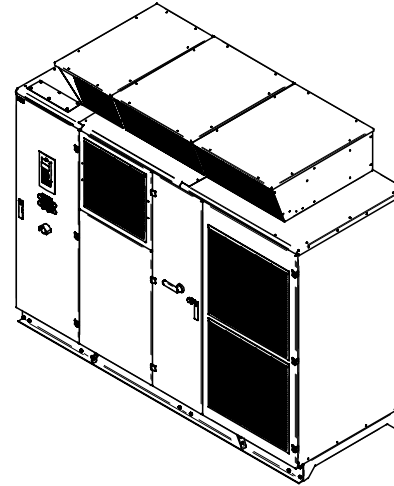
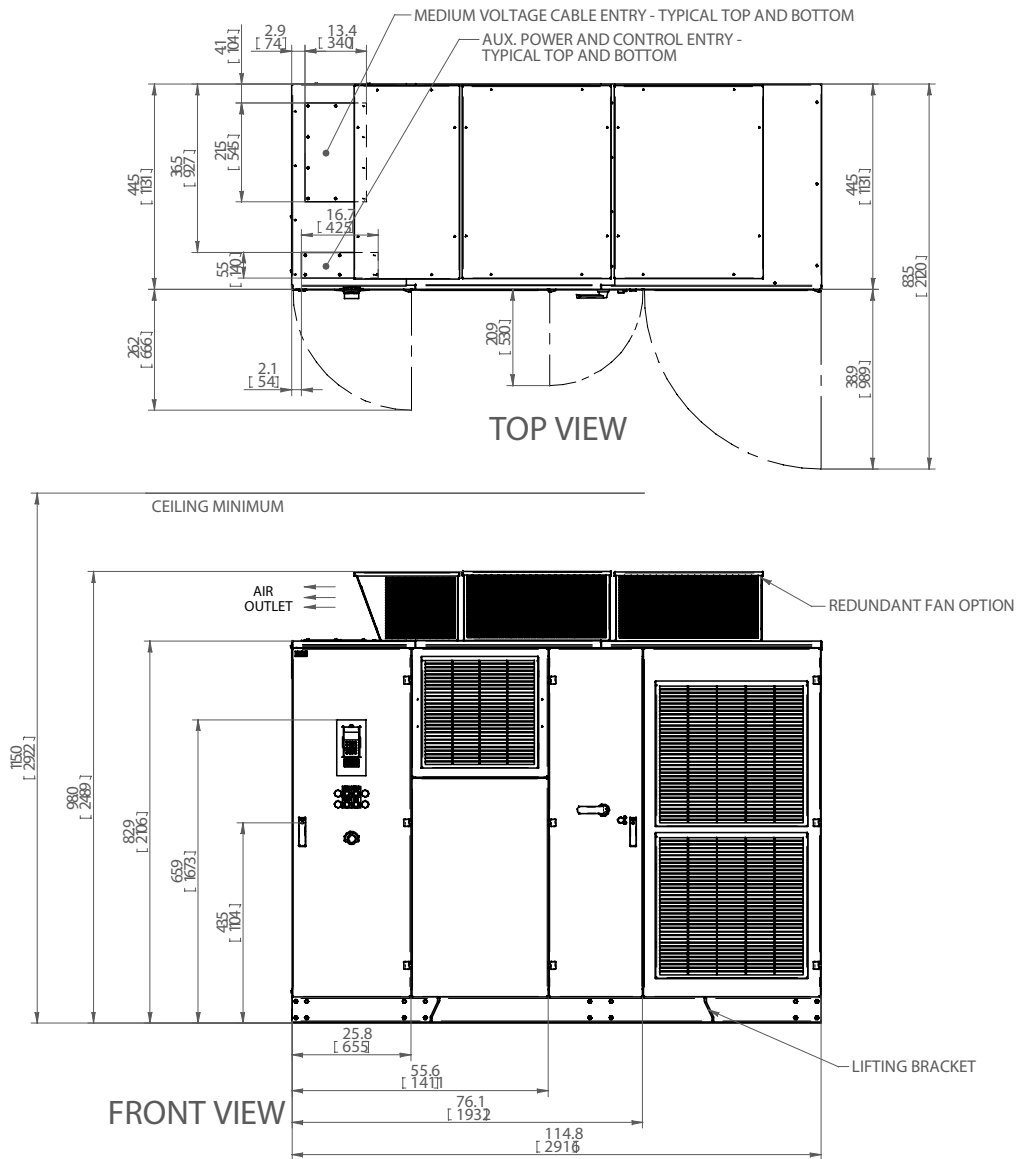
Degree of Protection:	NEMA 1 / IP21
Color:	ANSI 61 Gray
Clearance at back:	0 in
For maintenance to remove phase module and NP frame	
Clearance at front:	48 in [1220 mm]
Clearance at side:	0 in
Clearance top:	28" [710mm]; 21" [534mm] with non-redundant fan
Approx. Weight:	5200 lbs [2360 kg]

Drawings are for reference only, not for engineering purposes.

ACS 2000 dimensions

4kv, direct to line (regenerative and non-regenerative)

Frame 2



Notes:

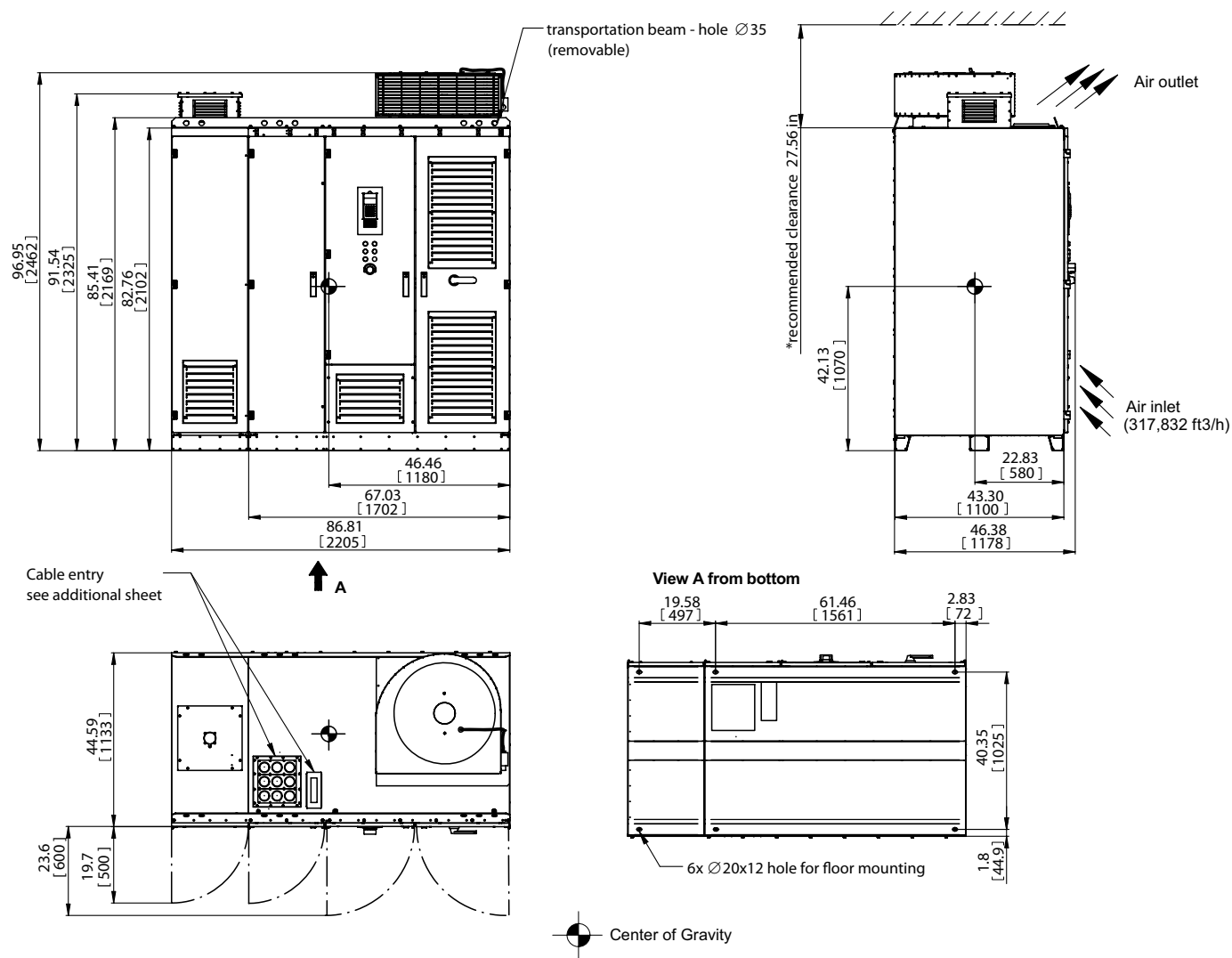
- Degree of Protection: NEMA 1 / IP21
- Color: ANSI 61 Gray
- Clearance at back: 0 in
- For maintenance to remove phase module and NP frame
 - Clearance at front: 48 in [1220 mm]
 - Clearance at side: 0 in
 - Clearance top: 28 in [710mm]; 13" [330mm] including fan
- Approx. Weight: 6200 lbs [2810kg]

Drawings are for reference only, not for engineering purposes.

ACS 2000 dimensions

6kv, direct to line (regenerative and non-regenerative)

Frame 1



Notes:

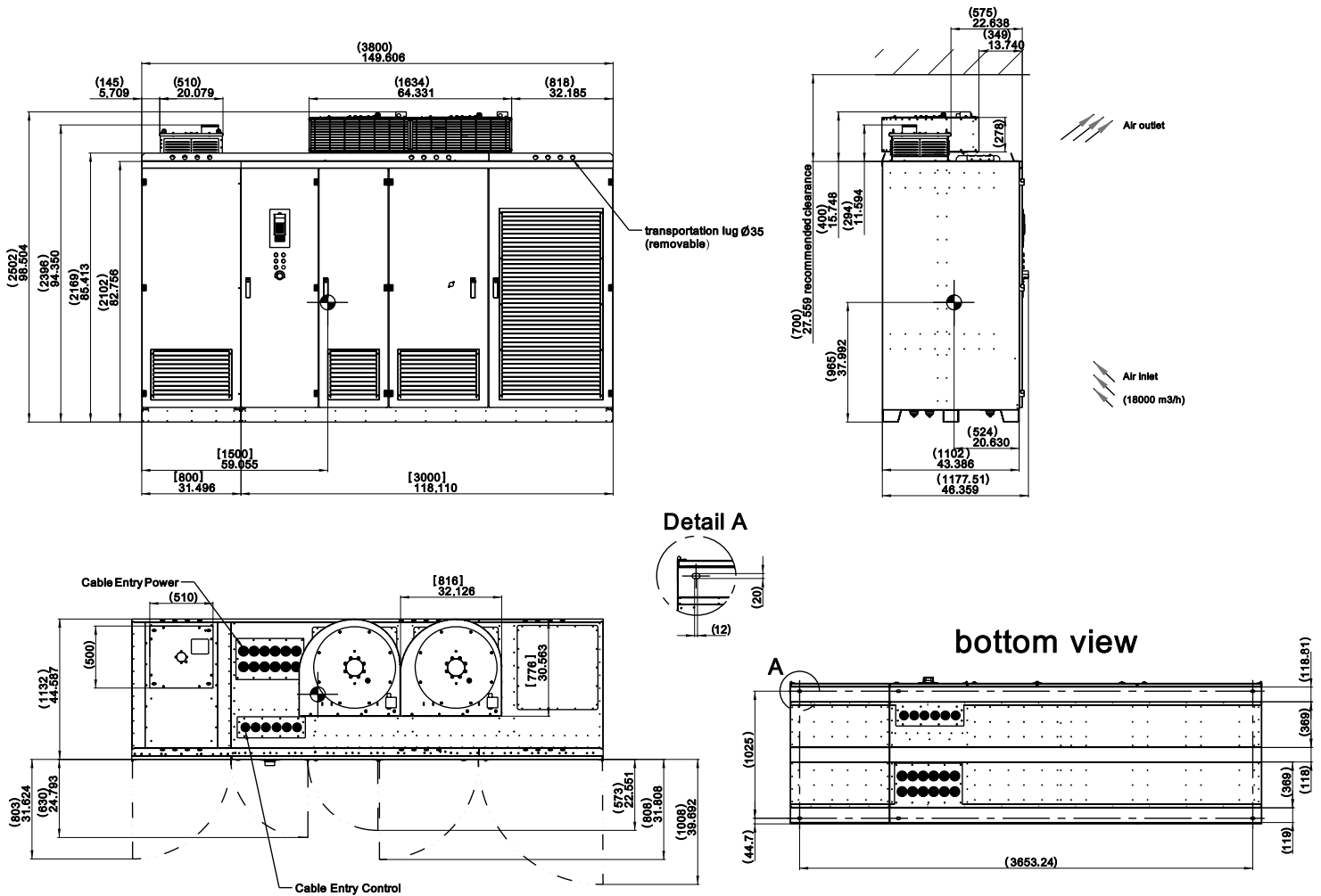
Degree of Protection: IP 21 / IP42
 Color: RAL 7035 (doors)
 Clearance at back: 0 in
 For maintenance to remove phase module and NP frame
 Clearance at front: 43.3 in [1100 mm]
 Clearance at side: 0 in
 *Clearance top: only valid for non redundant fan box
 Approx. Weight: 4850 lbs [2200 kg]

Drawings are for reference only, not for engineering purposes.

ACS 2000 dimensions

6kv, direct to line (regenerative and non-regenerative)

Frame 2



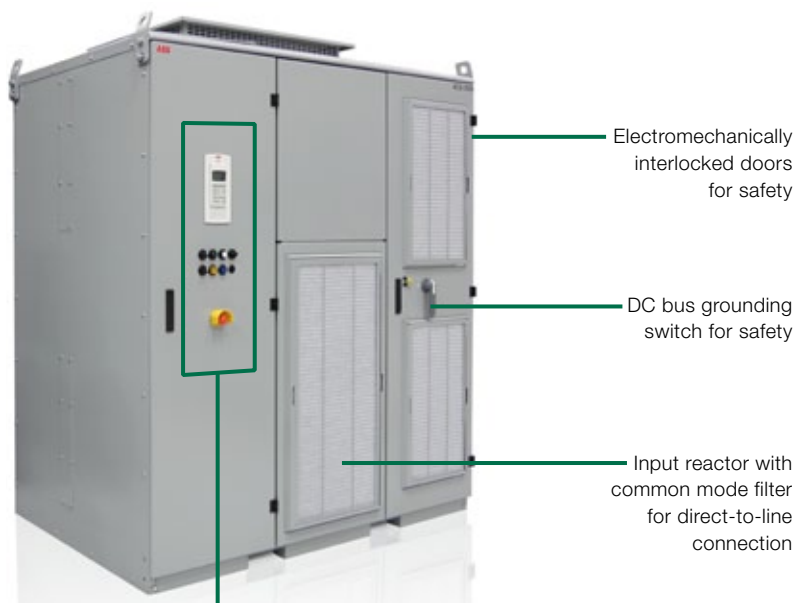
Notes:

Degree of Protection: IP 21 / IP42
 Color: RAL 7035 (doors)
 Clearance at back: 0 in
 For maintenance to remove phase module and NP frame
 Clearance at front: 63 in [1600 mm]
 Clearance at side: 0 in
 Clearance top: only valid for non redundant fan box
 Approx. Weight: 10,580 lbs [4800 kg]

ACS 2000

Simple, reliable motor control

ACS 2000, 4kV
Frame 1
up to 1000 hp



Electromechanically interlocked doors for safety

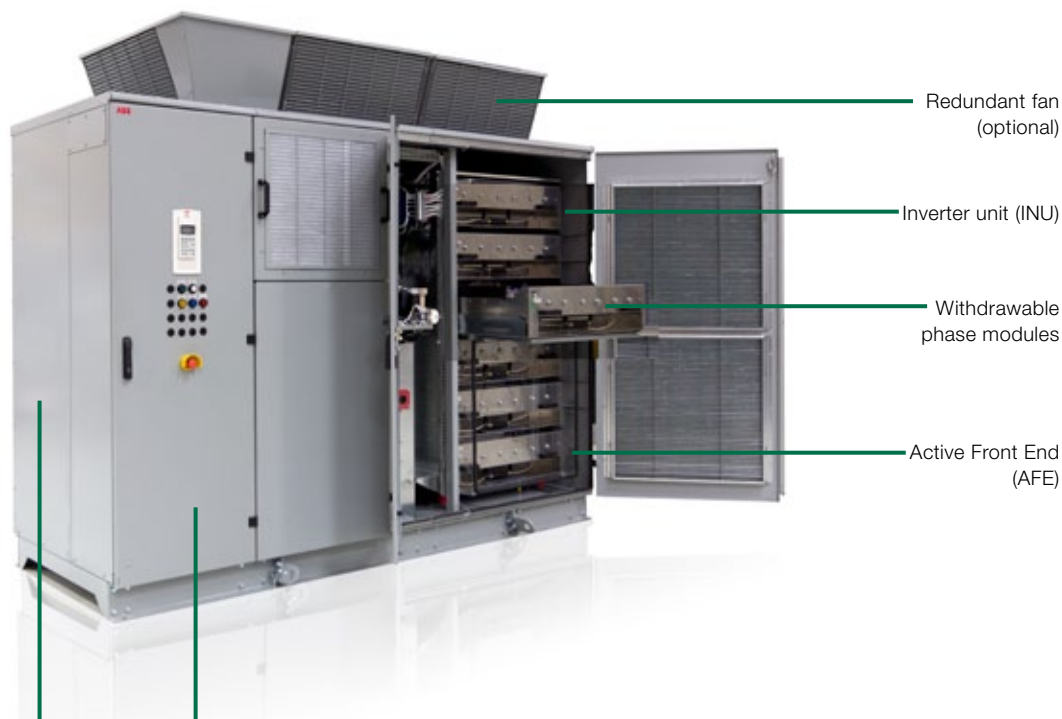
DC bus grounding switch for safety

Input reactor with common mode filter for direct-to-line connection

User-friendly drive control panel for local operation

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

ACS 2000, 4kV
Frame 2
up to 2000 hp



Redundant fan (optional)

Inverter unit (INU)

Withdrawable phase modules

Active Front End (AFE)

Cable connection section allows top and bottom entry

Control section

Notes

Contact us

ABB Inc.

Medium Voltage Drives

16250 W. Glendale Drive

New Berlin, WI 53151

Tel: 800-752-0696

Fax: 262-785-3322

E-Mail: mv.drives.sales@us.abb.com

www.abb.us/drives