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ПРИВОДЫ ПЕРЕМЕННОГО ТОКА НИЗКОВОЛЬТНЫЕ Техническое описание на преобразователи ACS/ACC 677



For dimensional drawings, refer to *ACS/ACC 607/617/627/677 Dimensional Drawings* (EN code 64488422).

For optional equipment, refer to the accompanying manuals.

Delivery Check

Check that there are no signs of damage. Before attempting installation and operation, check the information on the frequency converter nameplate to verify that the unit is of the correct model.

Each ACx 600 is fitted with a nameplate for identification purposes. The nameplate data includes a type code and a serial number, which allow individual recognition of each unit. The type code contains information on the properties and configuration of the unit. The first digit of the serial number refers to the manufacturing plant. The next four digits refer to the unit's manufacturing year and week, respectively. The remaining digits complete the serial number so that there are no two units with the same serial number.

Inquiries

Any inquiries about the product should be addressed to the local ABB representative, quoting the type code and the serial number of the unit. If the local ABB representative cannot be contacted, inquiries should be addressed to ABB Industry, Helsinki, Finland.

ACx 6x7 Type Code

The meaning of the main selections of ACx 6x7 type code characters is explained in the table below. Not all selections are available for all types. More information on selections is in *ACS 600 SingleDrive Ordering Information* guide (code: 58977985, available on request).

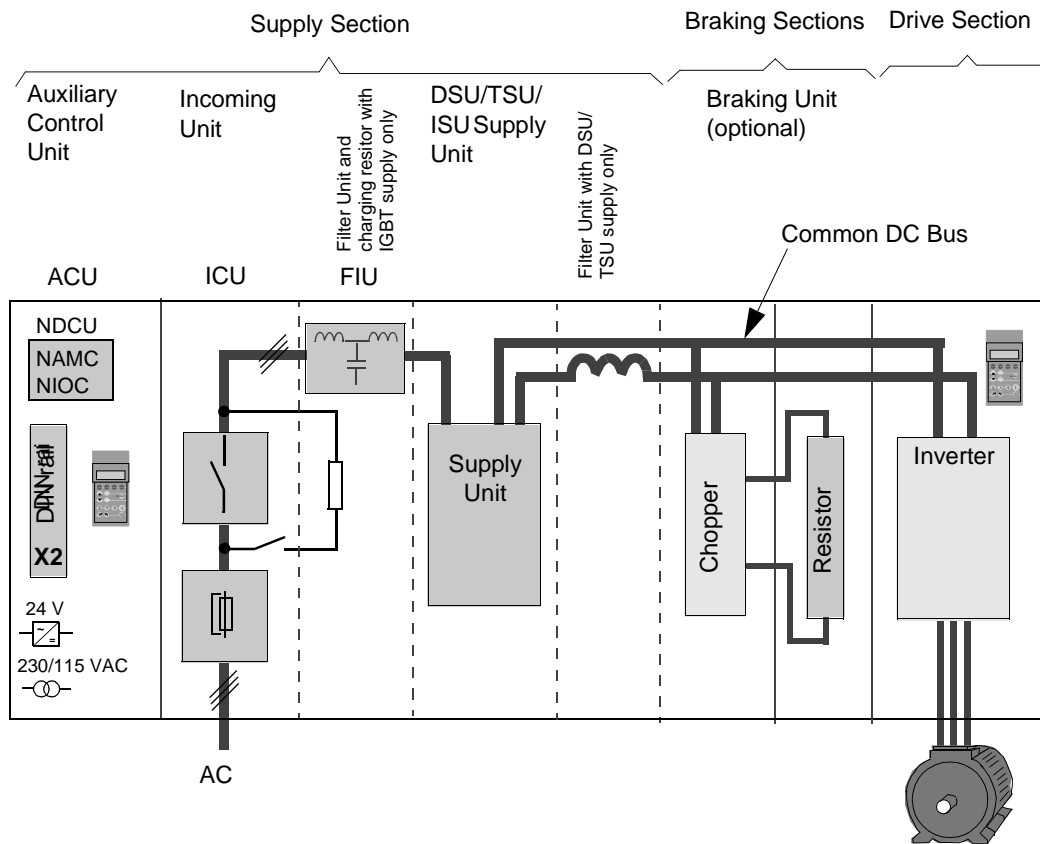
Character no.	Meaning	Refer to
Example: ACS627090062BD0C150200A00100B2100A1A2AX		
1	Product Category A = AC Drive	
2...3	Product Type CS = Standard, CC = Crane Drive	
4	Product Family 6 = ACS 600	
5	Input Bridge 0 = 6-pulse diode rectifier, 1 = IGBT converter, 2 = 12-pulse diode rectifier, 7 = regenerative 4Q thyristor bridge	
6	Construction 7 = cabinet	
7..10	Power Rating (kVA)	<i>Appendix A: Ratings</i>
11	Voltage Rating 3 = 380/400/415 V a.c. 5 = 380/400/415/440/460/480/500 V a.c. 6 = 525/550/575/600/660/690 V a.c.	
12	Supply Frequency 2 = 50 Hz, 3 = 60 Hz	

Character no.	Meaning	Refer to
13	<p>Cabling</p> <p>B = supply and motor cables bottom entry/exit T = supply and motor cables top* entry/exit 1 = supply cables top* entry and motor cables bottom exit 2 = supply cables bottom entry and motor cables top* exit 3 = supply and motor cables bottom entry/exit with common motor output section 4 = supply cables top entry and motor cables bottom exit with common motor output section</p> <p>* extra output section required</p>	
14, 15	I/O Options and Fieldbus Adapter	
16	<p>Application Software</p> <p>x = Languages and Application Macro Options</p>	<i>Appendix A: Application Programs</i>
17	<p>Control Panel</p> <p>0 = none, 1 = Control Panel included</p>	
18	<p>Degree of Protection</p> <p>1 = IP 21, 2 = IP 22, 4 = IP 42, 5 = IP 54, 6 = IP 54R</p>	<i>Appendix A: Enclosures</i>
19	Coated Boards	
20	Emergency Stop	
21	<p>Motor Temperature Protections</p> <p>0 = none, 1 = Pt 100 relay, 2 = thermistor relay</p>	
22	Quantity of Temperature Protections	
23	<p>Cabinet Options</p> <p>0 = none, A = cabinet heater</p>	
24	Auxiliary Motor Fan Supply	
25	Quantity of Auxiliary Motor Fan Supply	
26	<p>EMC</p> <p>1 = EMC cubicle, 2 = EMC cubicle + RFI filters</p>	<i>Appendix A: CE marking</i>
27	<p>du/dt Filter</p> <p>0 = none, 1 = du/dt filters, 2 = common mode filters, 3 = du/dt filters + light common mode filters, 4 = du/dt filters + common mode filters, 5 = light common mode filters</p>	
28	<p>Braking Chopper and Resistors</p> <p>0 = none, 1 = braking chopper, 2 = braking chopper + resistors</p>	
29	<p>Earth Fault Monitoring</p> <p>0 = none, A = selected (unearthed supply network), B = selected (earthed supply network)</p>	
30	<p>Control Voltage for Relays and Fans</p> <p>1 = auxiliary control voltage 230 VAC 2 = auxiliary control voltage 115 VAC 3 = connection for external control 230 VAC supply (UPS) 4 = connection for external control 115 VAC supply (UPS)</p>	
31	<p>Incoming Unit Options</p> <p>0 = switch fuse or load switch 1 = switch fuse or load switch + earthing (grounding) switch 2 = contactor with switch fuse or breaker 3 = contactor with switch fuse or breaker + earthing (grounding) switch</p>	

Character no.	Meaning	Refer to
32	Prevention of Unexpected Start 0 = none, 1 = selected	
33	24 VDC Power Supply 0 = power supply from inverter for NAMC/NIOC 1 = external power supply for NAMC/NIOC	
34	Manual Language	
35	Supply Conductor Type 1 = cable, 2 = busbar	
36	DC Busbar Material A = aluminium, B = tin plated copper	
37	Output for Motor Heaters 0 = none, 2 = 2 pieces, 4 = 4 pieces	
38	Type Code Revision	
39	Special	

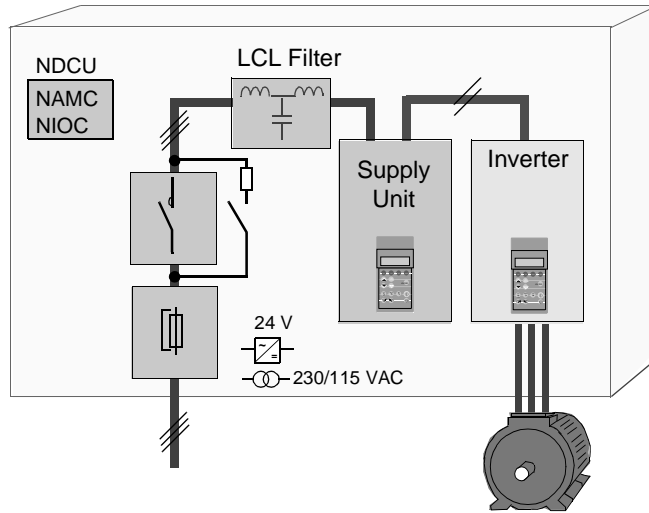
Main Components of the ACx 6x7

The main components of the drive (the ACS/ACC 607/627/677 and 617 frame sizes R11i and up) are shown below. The Supply Unit is equipped with either a Diode, a Thyristor or an IGBT input bridge. Braking Unit is an optional device. The control panels are optional. For a more detailed description of the Supply Unit refer to the Supply Sections User's Manuals. This chapter describes the Drive Section in more detail.



**ACx 617 Frame Sizes
R6i to R9i**

The main components of ACS/ACC 617 frame sizes R6i to R9i are shown below. The control panels are optional.



Technical Data

Ratings

The ratings for the ACx 607/617/627/677 with 50 Hz and 60 Hz supplies are given below. ACx = ACS/ACC.

Frequency Converter Type	Drive Frame Size	Normal Use			Duty Cycle 1/5min		Duty Cycle 10/60s	
		I_{2N}	S_N	P_N	I_{2hd} 4/5min	I_{2hd} 1/5min	I_{2hd} 50/60s	I_{2hd} 10/60s
		[A]	[kVA]	[kW]	[A]	[A]	[A]	[A]
Supply voltage range 380, 400 or 415 V								
ACx 617-0120-3	R7i	178	120	90	147	221	147	294
ACx 617/677-0185-3	R8i	259	185	132	194	291	178	356
ACx 617/677-0225-3	R8i	312	225	160	234	351	216	432
ACx 617/677-0265-3	R8i	379	265	200	284	426	260	520
ACx 617/677-0335-3	R9i	474	335	250	356	533	316	632
ACx 617/677-0405-3	R9i	576	405	315	432	648	395	790
ACx 617/677-0500-3	R10i	720	500	400	540	810	494	988
ACx 617/677-0630-3	R11i	907	630	500	680	1020	600	1200
ACx 607/617/627/677-0760/0765-3	R11i	1094	760/765	630	821	1231	751	1502
ACx 607/617/627/677-0930/0935-3	R12i	1336	930/935	710	1002	1503	901	1802
ACx 607/617/627/677-1120/1125-3	R12i	1624	1120/1125	900	1218	1827	1126	2252
ACx 607/627/677-1440-3	2xR11i	2079	1440	1120	1559	2339	1501	3002
ACx 607/627/677-1770-3	2xR12i	2558	1770	1400	1919	2878	1801	3602
ACx 607/627/677-2140-3	2xR12i	3085	2140	1750	2314	3471	2252	4504
ACx 627-2340-3	4xR11i	3374	2340	1900	2531	3796	2402	4804
ACx 627-2820-3	4xR11i	4070	2820	2300	3053	4579	3002	6004
Supply voltage range 380, 400, 415, 440, 460, 480 or 500 V								
ACx 617-0100-5	R6i	112	100	75	84	126	84	168
ACx 617-0140-5	R7i	164	140	110	135	203	135	270
ACx 617/677-0215-5	R8i	246	215	160	185	277	164	328
ACx 617/677-0255-5	R8i	295	255	200	221	332	200	400
ACx 617/677-0325-5	R8i	368	325	250	276	414	240	480
ACx 617/677-0395-5	R9i	448	395	315	336	504	300	600
ACx 617/677-0495-5	R9i	565	495	400	424	636	365	730
ACx 617/677-0610-5	R10i	700	610	500	525	788	456	912
ACx 617/677-0770-5	R11i	887	770	630	665	998	570	1140
ACx 607/617/627/677-0930/0935-5	R11i	1073	930/935	710	805	1208	694	1388
ACx 607/617/627/677-1090/1095-5	R12i	1263	1090/1095	900	947	1421	855	1710
ACx 607/617/627/677-1380/1385-5	R12i	1593	1380/1385	1120	1195	1793	1040	2080
ACx 607/627/677-1760-5	2xR11i	2039	1760	1400	1529	2294	1387	2774
ACx 607/627/677-2160-5	2xR12i	2501	2160	1800	1876	2814	1710	3420
ACx 607/627/677-2620-5	2xR12i	3026	2620	2200	2270	3405	2081	4162
ACx 627-2850-5	4xR11i	3300	2850	2400	2475	3713	2280	4560
ACx 627-3450-5	4xR11i	3992	3450	2900	2994	4491	2774	5548

-0765-3, -0935-3, 1125-3, 0935-5, 1095-5 and 1385-5 are ACx 617 types

Continues on the next page

Frequency Converter Type	Drive Frame Size	Normal Use			Duty Cycle 1/5min		Duty Cycle 10/60s	
		I_{2N}	S_N	P_N	I_{2hd} 4/5min	I_{2hd} 1/5min	I_{2hd} 50/60s	I_{2hd} 10/60s
		[A]	[kVA]	[kW]	[A]	[A]	[A]	[A]
Supply voltage range 525, 550, 575, 600, 660 or 690 V								
ACx 617-0120-6	R7i	105	120	90	88	132	88	176
ACx 617/677-0205-6	R8i	176	205	160	132	198	127	254
ACx 617/677-0255-6	R8i	210	255	200	158	236	150	300
ACx 617/677-0315-6	R8i	264	315	250	198	297	179	358
ACx 617/677-0375-6	R9i	310	375	315	233	349	225	450
ACx 617/677-0485-6	R9i	410	485	400	308	461	265	530
ACx 617/677-0600-6	R10i	502	600	500	377	565	340	680
ACx 617/677-0750-6	R11i	630	750	630	473	709	428	856
ACx 607/617/627/677-0900-6	R11i	755	900	710	566	849	504	1008
ACx 607/617/627/677-1040/1045-6	R12i	874	1040/1045	800	656	983	641	1282
ACx 607/617/627/677-1380/1385-6	R12i	1156	1380/1385	1120	867	1301	755	1510
ACx 607/627/677-1710-6	2xR11i	1435	1710	1400	1076	1614	1007	2014
ACx 607/627/677-2120-6	2xR12i	1777	2120	1800	1333	1999	1283	2566
ACx 607/627/677-2540-6	2xR12i	2129	2540	2000	1597	2395	1511	3022
ACx 607/627/677-2800-6	4xR11i	2344	2800	2300	1758	2637	1710	3420
ACx 607/627/677-3350-6	4xR11i	2809	3350	2800	2107	3160	2014	4028

-1045-6 and -1385-6 are ACx 617 types

Normal Use

I_{2N} Rated rms output current (= maximum continuous output current)
 S_N Rated apparent output power
 P_N Typical motor power. The power ratings in kW apply to most IEC 34 motors.

Duty Cycle

I_{2hd} Rated rms output current

The current ratings are the same regardless of the supply voltage within one voltage range. The rated current of the ACx 600 must be higher than or equal to the rated motor current to achieve the rated motor power given in the table.

Note 1: The load capacity (current and power) decreases if the installation site altitude exceeds 1000 metres, or if the ambient temperature exceeds 40 °C (units with degree of protection IP 21/22/42/54).

Note 2: Usually du/dt filters are needed at the output of 525 V to 690 V units with random wound motors. No du/dt filters are usually required with form wound motors.

Note 3: For the ACx 677, the P_N ratings are 90 percent of the values given in the table.

Output Current Temperature Derating

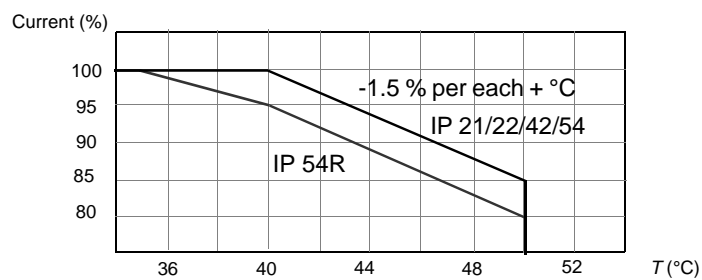
The output current is calculated by multiplying the current given in the rating table by the derating factor.

Temperature derating factor for degree of protection IP 21/22/42/54:

- *General rule:* Above +40 °C, the rated output current is decreased 1.5 % for every additional 1 °C (up to +50 °C).
- *Example 1:* If the ambient temperature is 50 °C the derating factor is

$$100 \% - 1.5 \frac{\%}{^{\circ}\text{C}} \cdot 10 ^{\circ}\text{C} = 85 \% \text{ or } 0.85. \text{ The output current is then}$$

$$0.85 \cdot I_{2N} \text{ or } I_{2hd}.$$



Derating Diagram: the effect of ambient temperature on the ACx 6x7 continuous load capacity.

Input Power Connection

Voltage (U_1):

380/400/415 VAC 3-phase $\pm 10\%$ for 400 VAC units

380/400/415/440/460/480/500 VAC 3-phase $\pm 10\%$ for 500 VAC units

525/550/575/600/660/690 VAC 3-phase $\pm 10\%$ for 690 VAC units

Short Circuit Capability IEC 439-1: The rated short time withstand current of ACx 6x7 is given below

Frame Size	$I_{cw} / 1\text{ s}$ kA	I_{pk} kA
ACS/ACC 627/677: B3	37	78
ACS/ACC 607/627/677: B4, B5	50	105
ACS/ACC 607/627/677: B4, B5 without optional earthing switch	65	143
ACS/ACC 617: R8i, R9i	38	78
ACS/ACC 617: R11i, R12i	50	105

Frequency: 48 to 63 Hz, maximum rate of change 17 %/s

Input Voltage Unbalance: $\pm 3\%$ (EN 60204-1)

Power Factor:

Diode and Thyristor Supply Units

($\cos \varphi_1$): 0.97 (fundamental at nominal load)

($\cos \varphi$): 0.93...0.95 (total)

IGBT Supply Units

$\cos \varphi_1 = 1.00$ (fundamental at nominal load)

$\lambda = I_1 / I_{rms} \cdot \cos \varphi_1 > 0.98$ (total), where

λ is power factor,

I_1 is fundamental input current rms value,

I_{rms} is total input current rms value.

Motor Connection

Voltage (U_2): 0 to U_1 , 3-phase symmetrical

Frequency: DTC mode: 0 to $3.2 \cdot f_{FWP}$. Maximum frequency 300 Hz.

$$f_{FWP} = \frac{U_{Nmains}}{U_{Nmotor}} \cdot f_{Nmotor}$$

f_{FWP} : Frequency at field weakening point; U_{Nmains} : Mains (input power) voltage;
 U_{Nmotor} : Rated motor voltage; f_{Nmotor} : Rated motor frequency

Scalar Control mode (not for ACP 600): 0 to 300 Hz

With du/dt Filter (DTC and Scalar Control modes): 0 to 120 Hz

Frequency Resolution: 0.01 Hz

Continuous Current: $1.0 \cdot I_{2N}$ (normal use)

Short Term Overload Capacity: according to rating tables on pages A-1 and A-2.

Field Weakening Point: 8 to 300 Hz

Switching Frequency: 2 kHz (average), 3 kHz (ACS/ACC 617).

Maximum Recommended Motor Cable Length: For cables longer than 500 metres / 1640 ft (cumulative length in case of parallel connected motors), an ABB representative must be consulted. With pulse encoder speed measurement, the maximum cable length is 300 m. With du/dt filters, refer to *du/dt Installation Guide* (EN code: 58933368). For additional EMC requirements on cable length, refer to section *CE Marking* below.

Motor Bearings: Insulated bearing at the non-driven end is recommended.

Cable Types: The tables below give the copper and aluminium cable types for different load currents (I_{Lmax}). A correction factor of $K = 0.70$ has been used (max. 9 cables laid on a cable ladder side by side, three ladders on top of each other, ambient temperature 30 °C (86 °F), EN 60204-1 and IEC 364-5-523)

COPPER CABLES WITH A CONCENTRIC COPPER SCREEN		
I_{Lmax} [A]	Cable Type	Diameter [mm]
255	3x185 + 95	50
274	2 x (3x70 + 35)	2 x 32
301	3x240 + 120	55
334	2 x (3x95 + 50)	2 x 38
386	2 x (3x120 + 70)	2 x 41
446	2 x (3x150 + 70)	2 x 44
510	2 x (3x185 + 95)	2 x 50
579	3 x (3x120 + 70)	3 x 41
602	2 x (3x240 + 120)	2 x 55
669	3 x (3x150 + 70)	3 x 44
765	3 x (3x185 + 95)	3 x 50
772	4 x (3x120 + 70)	4 x 41
892	4 x (3x150 + 70)	4 x 44
903	3 x (3x240 + 120)	3 x 55
1020	4 x (3x185+ 95)	4 x 50

ALUMINIUM CABLES WITH A CONCENTRIC COPPER SCREEN		
I_{Lmax} [A]	Cable Type	Diameter [mm]
260	2 x (3x95Al + 29Cu)	2 x 38
302	2 x (3x120Al + 41Cu)	2 x 41
348	2 x (3x150Al + 41Cu)	2 x 44
398	2 x (3x185Al + 57Cu)	2 x 49
470	2 x (3x240Al + 72Cu)	2 x 54
522	3 x (3x150Al + 41Cu)	3 x 44
597	3 x (3x185Al + 57Cu)	3 x 49
696	4 x (3x150Al + 41Cu)	4 x 44
705	3 x (3x240Al + 72Cu)	3 x 54
796	4 x (3x185Al + 57Cu)	4 x 49
940	4 x (3x240Al + 72Cu)	4 x 54
995	5 x (3x185Al + 57Cu)	5 x 49
1175	5 x (3x240Al + 72Cu)	5 x 54

Efficiency and Cooling Method

Efficiency: Approximately 98 % at nominal power level. For units equipped with IGBT supply unit approximately 96 %.

Cooling Method: Internal fan, flow direction from the bottom to the top

Ambient Conditions

Environmental limits of the ACx 6x7 frequency converters are given below. The frequency converters are to be used in a heated, indoor, controlled environment.

ACS/ACC/ACP 600	Operation installed for stationary use	Storage in the protective package	Transportation in the protective package
Installation Site Altitude	Nominal output power at 0 to 1000 m (3300 ft) above sea level ¹⁾	-	-
Air Temperature	0 to +40 °C (32 to 104 °F) ²⁾ (IP 21/22/42/54) 0 to +35 °C (32 to 95 °F) ²⁾ (IP 54R)	-40 to +70 °C (-40 to +158 °F)	-40 to +70 °C (-40 to +158 °F)
Relative Humidity	5 to 95%	Max. 95%	Max. 95%
	No condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.		
Contamination Levels (IEC 721-3-3)	No conductive dust allowed.		
	Boards without coating: Chemical gases: Class 3C1 Solid particles: Class 3S2 Boards with coating: Chemical gases: Class 3C2 Solid particles: Class 3S2	Boards without coating: Chemical gases: Class 1C2 Solid particles: Class 1S3 Boards with coating: Chemical gases: Class 1C2 Solid particles: Class 1S3	Boards without coating: Chemical gases: Class 2C2 Solid particles: Class 2S2 Boards with coating: Chemical gases: Class 2C2 Solid particles: Class 2S2
Atmospheric Pressure	70 to 106 kPa 0.7 to 1.05 atmospheres	70 to 106 kPa 0.7 to 1.05 atmospheres	60 to 106 kPa 0.6 to 1.05 atmospheres
Vibration (IEC 68-2-6)	Max. 0.3 mm (0.01 in.) (2 to 9 Hz), max. 1 m/s ² (3.3 ft./s ²) (9 to 200 Hz) sinusoidal	Max. 1.5 mm (0.06 in.) (2 to 9 Hz), max. 5 m/s ² (16.4 ft./s ²) (9 to 200 Hz) sinusoidal	Max. 3.5 mm (0.14 in.) (2 to 9 Hz), max. 15 m/s ² (49 ft./s ²) (9 to 200 Hz) sinusoidal
Shock (IEC 68-2-29)	Not allowed	Max. 100 m/s ² (330 ft./s ²), 11 ms	Max. 100 m/s ² (330 ft./s ²), 11 ms
Free Fall	Not allowed	250 mm (10 in.) for weight under 100 kg (220 lbs.) 100 mm (4 in.) for weight over 100 kg (220 lbs.)	250 mm (10 in.) for weight under 100 kg (220 lbs.) 100 mm (4 in.) for weight over 100 kg (220 lbs.)

¹⁾ At sites over 1000 m (3300 ft.) above sea level, the maximum output current is derated as follows. If the installation site is higher than 2000 m (6600 ft.) above sea level, please contact your local ABB distributor or office for further information.

$$I_{max} = I_{N40C} \cdot (100 \% - 1 \% \cdot (h - 1000 \text{ m}) / (100 \text{ m}) + 1.5 \% \cdot (40 \text{ °C} - T_{amb}))$$

where

h altitude above sea level

*I*_{N40C} ACS 600 nominal current at 40 °C

*T*_{amb} maximum ambient temperature.

Note: *I*_{max} < *I*_{N40C} and *T*_{amb} < 40 °C. At 2000...4000 m optional “varistors” are needed.

²⁾ See subsection *Output Current Temperature Derating*.

Technical Data

AC Fuses (ACx 607/627/677) The a.c. fuses (Bussmann) used in the supply section of the ACx 607/627/677 are listed below.

12-pulse and 6-pulse Diode Supply ACx 6x7 Type	Fuse					Thyristor Supply ACx 6x7 Type	Fuse				
	U_N V	I_N A	Pre-arcing Integral A^2s	Type	Size		U_N V	I_N A	Pre-arcing Integral A^2s	Type	Size
ACx 627-0760-3 ACx 627-0930-5 ACx 627-1090-5	660	900	100000	170M6207	3SHT	ACx 677-0185-3 ACx 677-0215-5 ACx 677-0255-5	660	450	15500	170M5371	2SHT
ACx 607-0900-6 ACx 627-1380-6 ACx 627-1710-6	660	900	100000	170M6207	3SHT	ACx 677-0225-3 ACx 677-0265-3 ACx 677-0325-5	660	700	44500	170M6206	3SHT
ACx 627-0900-6 ACx 627-1040-6	690	800	69500	170M6812	DIN3	ACx 677-0335-3 ACx 677-0405-3 ACx 677-0395-5 ACx 677-0495-5	660	900	100000	170M6207	3SHT
						ACx 677-0205-6 ACx 677-0255-6	1250	315	130000	170M5403	2SHT
						ACx 677-0315-6 ACx 677-0375-6	1250	400	23000	170M5404	2SHT
						ACx 677-0485-6	1250	630	83500	170M6205	3SHT
						ACx 677-0900-6	660	900	100000	170M6207	3SHT

Branch Fuses (ACx 607/627/677) The branch fuses (Bussmann) used in the supply section of the ACx 607/627/677 are listed below.

ACx 6x7 Type	Fuse					ACx 6x7 Type	Fuse				
	U_N V	I_N A	Pre-arcing Integral A^2s	Type	Size		U_N V	I_N A	Pre-arcing Integral A^2s	Type	Size
400 V and 500 V Supply						690 V Supply					
ACx 677-0500-3 ACx 677-0630-3 ACx 677-0610-5 ACx 677-0770-5 ACx 627-0930-3 ACx 627-1120-3 ACx 627-1380-5 ACx 627-1760-5	660	900	1000000	170M6163	3/110	ACx 677-0600-6 ACx 677-0750-6 ACx 607-0900-6 ACx 627-1380-6 ACx 627-1710-6 ACx 677-0600-6 ACx 677-0750-6 ACx 677-0900-6	1250	630	83500	170M6144	3/110
ACx 607-0760-3 ACx 607-0930-3 ACx 607-1120-3 ACx 627-1440-3 ACx 627-1770-3 ACx 627-2140-3 ACx 607-0930-5 ACx 607-1090-5 ACx 607-1380-5 ACx 627-2160-5 ACx 627-2620-5 ACx 627-2850-5	660	1500	460000	170M6168	3/110	ACx 607-1040-6 ACx 607-1380-6 ACx 627-2120-6 ACx 627-2540-6 ACx 627-2800-6	1250	1100	575000	170M6149	3/110
ACx 607-1440-3 ACx 607-1770-3 ACx 627-2340-3 ACx 627-2820-3 ACx 607-1760-5 ACx 607-2160-5 ACx 627-3450-5 ACx 677-0760-3 ... ACx 677-1170-3 ACx 677-0930-5 ... ACx 677-2160-5	660	1500	460000	170M6168	3/110	ACx 607-1710-6 ACx 607-2120-6 ACx 607-2540-6 ACx 627-3350-6 ACx 677-1040-6 ... ACx 677-2540-6	1250	1100	575000	170M6149	3/110
ACx 607-2140-3 ACx 607-2620-5 ACx 677-2140-3 ACx 677-2620-5	1100	1400	1250000	170M6151	3/110	ACx 607-2800-6 ACx 607-3350-6 ACx 677-2800-6 ACx 677-3350-6	1100	1400	1250000	170M6151	3/110

Drive Section DC Fuses The Bussmann fuses used in the inverters of the ACx 6x7 are listed below. U_N and I_N are nominal voltage and current of the fuse.

415 V and 500 V Drive Sections						690 V Drive Sections					
Drive Section Frame Size	U_N [V]	I_N [A]	Pre-arcing Integral A^2s	Type	Size	Drive Section Frame Size	U_N [V]	I_N [A]	Pre-arcing Integral A^2s	Type	Size
2xR11i 4xR11i 2xR12i	660	1000	140000	170M6814	3	2xR11i 4xR11i 2xR12i	1250	630	83500	170M6205	3SHT

Braking Section DC Fuses The d.c. fuses (Bussmann) for the braking sections are listed below.

ACx 6x7 Type	Dynamic Braking Section	Fuse				
		U_N (V)	I_N (A)	Pre-arcing Integral (A^2s)	Type	Size
400 V Range						
ACx 6x7-0760-3...-2820-3	ACA 622-0320-3...-1920-3	1000-1250	630	115000	170M 5146	2/110
500 V Range						
ACx 6x7-0930-5...-3450-5	ACA 622-0400-5...-2400-5	1000-1250	630	115000	170M 5146	2/110
690 V Range						
ACx 6x7-0900-6...-3350-6	ACA 622-0400-6...-2400-6	1000-1250	630	115000	170M 5146	2/110

PDM code 00025310-A

**Thyristor Supply
Section**

The connection holes for cable lugs and bus ducts are presented below.

Type	Holes for cable lugs per phase	Number of cable entries at bottom (diameter 60 mm)	Bottom plate opening dimensions (mm)	Number of cable entries at top (diameter 60 mm)	Holes for bus duct connection
U_N = 400V (380V...415V)					
ACx 677-0185-3	2x14	3	310x240	3	-
ACx 677-0225-3	4x14	6	502x280	6	-
ACx 677-0265-3					
ACx 677-0335-3					
ACx 677-0405-3					
ACx 677-0500-3	4x(13x18)	12	502x280	12	4x(13x24)
ACx 677-0630-3					
ACx 677-0760-3	8x(13x18)	12	502x280	12	4x(13x24)
ACx 677-0930-3					
ACx 677-1120-3					
ACx 677-1440-3	12x(13x18)	18	502x280	18	4x(13x24)
ACx 677-1770-3					
ACx 677-2140-3	12x(13x18)	18	502x280	18	4x(13x24)
U_N = 500V (380V...500V)					
ACx 677-0215-5	2x14	3	310x240	3	-
ACx 677-0255-5					
ACx 677-0325-5	4x14	6	502x280	6	-
ACx 677-0395-5					
ACx 677-0495-5					
ACx 677-0610-5	4x(13x18)	12	502x280	12	4x(13x24)
ACx 677-0770-5					
ACx 677-0930-5	8x(13x18)	12	502x280	12	4x(13x24)
ACx 677-1040-5					
ACx 677-1380-5					
ACx 677-1760-5	12x(13x18)	18	502x280	18	4x(13x24)
ACx 677-2160-5					
ACx 677-2620-5	12x(13x18)	18	502x280	18	4x(13x24)
U_N = 690V (525V...690V)					
ACx 677-0205-6	2x14	3	310x240	3	-
ACx 677-0255-6					
ACx 677-0315-6	4x14	6	502x280	6	-
ACx 677-0375-6					
ACx 677-0485-6					
ACx 677-0600-6	4x(13x18)	12	502x280	12	4x(13x24)
ACx 677-0750-6					
ACx 677-0900-6	4x(13x18)	12	502x280	12	4x(13x24)
ACx 677-1040-6	8x(13x18)	12	502x280	12	4x(13x24)
ACx 677-1380-6					
ACx 677-1710-6	12x(13x18)	18	502x280	18	4x(13x24)
ACx 677-2120-6					
ACx 677-2540-6					
ACx 677-2800-6	12x(13x18)	18	502x280	18	4x(13x24)
ACx 677-3350-6					

Drive Sections The connection holes for motor cable lugs (terminals U2, V2 and W2) are presented below.

Type	Frame size	Holes for cable lugs per phase 1)	Number of cable entries at bottom (diameter 60 mm)	Bottom plate opening dimensions (mm)	Number of cable entries at top (diameter 60 mm)
380V, 400V, 415V					
ACx 6x7-0760-3	R11i	6x(13x18)	9	270x911	9
ACx 6x7-0930-3	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1120-3	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1440-3	2xR11i	2x6x(13x18)	2x9	270x711	9
ACx 6x7-1770-3	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2140-3	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2340-3	4xR11i	4x6x(13x18)	4x9	270x711	18
ACx 6x7-2820-3	4xR11i	4x6x(13x18)	4x9	270x711	18
440V, 460V, 500V					
ACx 6x7-0930-5	R11i	6x(13x18)	9	270x911	9
ACx 6x7-1090-5	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1380-5	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1760-5	2xR11i	2x6x(13x18)	2x9	270x711	9
ACx 6x7-2160-5	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2620-5	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2850-5	4xR11i	4x6x(13x18)	4x9	270x711	18
ACx 6x7-3450-5	4xR11i	4x6x(13x18)	4x9	270x711	18
575V, 660V, 690V					
ACx 6x7-0900-6	R11i	6x(13x18)	9	270x911	6
ACx 6x7-1040-6	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1380-6	R12i	8x(13x18)	12	195x501	12
ACx 6x7-1710-6	2xR11i	2x6x(13x18)	2x9	270x711	9
ACx 6x7-2120-6	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2540-6	2xR12i	2x8x(13x18)	2x12	270x711	18
ACx 6x7-2800-6	4xR11i	4x6x(13x18)	4x9	270x711	18
ACx 6x7-3350-6	4xR11i	4x6x(13x18)	4x9	270x711	18

1) The number of holes when common output cubicle is used for common motor cable connection or top exit is as follows:

Frame size	Number of holes per phase
R11i, R12i	8
2xR11i, 2xR12i	10
4xR11i	2x8

**External Control
Connection Diagrams**

External control connections of ACS 6x7 equipped with Standard Application Program (Factory Macro) are shown below. External control connections are different with other application macros and programs (see *Firmware Manual*). For external control connections of Supply Section, see *Supply Sections User's Manual* (DSU, TSU or ISU).

External control wiring is connected to terminals on the NIOC board through a terminal block X2 (IEC standard designation) or an optional terminal block 2TB (ANSI standard designation, for US manufactured units only).

When making the external control connections be sure to carefully compare the terminal configuration found in the drive with diagrams below to be sure that the correct diagram is used.

Terminal Block X2, NIOC Board

External connections to terminal block X2 for ACS 600 Standard Application Program (Factory Macro) are shown below. External control connections are different with other application macros and programs (see *Firmware Manual*).

Terminal Block Size

X21, X22: cables 0.5 to 1.5 mm² (#20 to #16 AWG)

X2, X23, X25, X26, X27: cables 0.5 to 2.5 mm² (#20 to #14 AWG)

Control Cable Lead-through Size:

Ø: 2 x 3x2...11 mm (0.08 to 0.43")

Factory settings of application software selection B (type code):

DI1: Start, DI2: Stop, DI3: Reverse, DI4: Acc/Dec 2, DI5,6: Constant speed 1 to 3 select.

1) Parameter 10.3 must be set to REQUEST.

2) Operation: 0 = Open, 1 = Closed

DI 5	DI 6	Output
0	0	Set speed through AI 1
1	0	Constant Speed 1
0	1	Constant Speed 2
1	1	Constant Speed 3

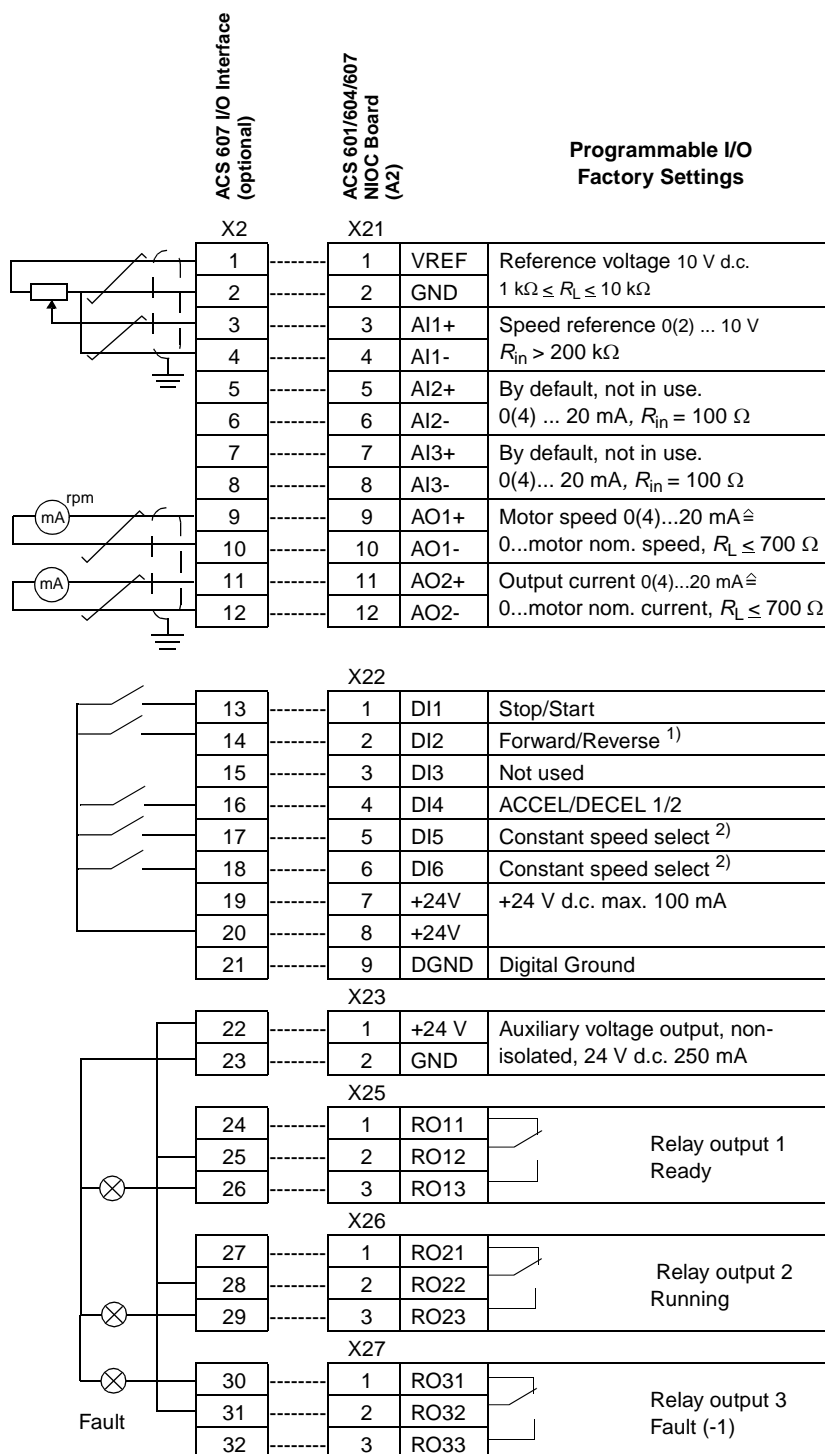
Connector X28 for RS 485 connection*

1	TRANS	Standard Modbus Link
2	GND	
3	B-	
4	A+	
5	GND	
6	+24V	

Connector X29 for RS 485 connection*

1	TRANS	Standard Modbus Link
2	FAULT	
3	B-	
4	A+	
5	GND	
6	+ 24V	

* Connector shield is connected via an RC filter to the frame.



Optional Terminal Block 2TB

External connections to optional terminal block 2TB. This option is available only with ACS 600 Standard Application Program. External control connections with Factory Macro are shown below. Connections are different with other application macros (see *Firmware Manual*).

Terminal Block Size

X21, X22: cables 0.5 to 1.5 mm² (#20 to #16 AWG)
 2TB, X23, X25, X26, X27: cables 0.5 to 2.5 mm² (#20 to #14 AWG)

Control Cable Lead-through Size:

Ø: 2 x 3x2...11 mm (0.08 to 0.43")

Factory settings of application software selection B (type code):

DI1: Start, DI2: Stop, DI3: Reverse, DI4: Acc/Dec 2, DI5,6: Constant speed 1 to 3 select.

1) Parameter 10.3 must be set to REQUEST.

2) Operation: 0 = Open, 1 = Closed

DI 5	DI 6	Output
0	0	Set speed through AI 1
1	0	Constant Speed 1
0	1	Constant Speed 2
1	1	Constant Speed 3

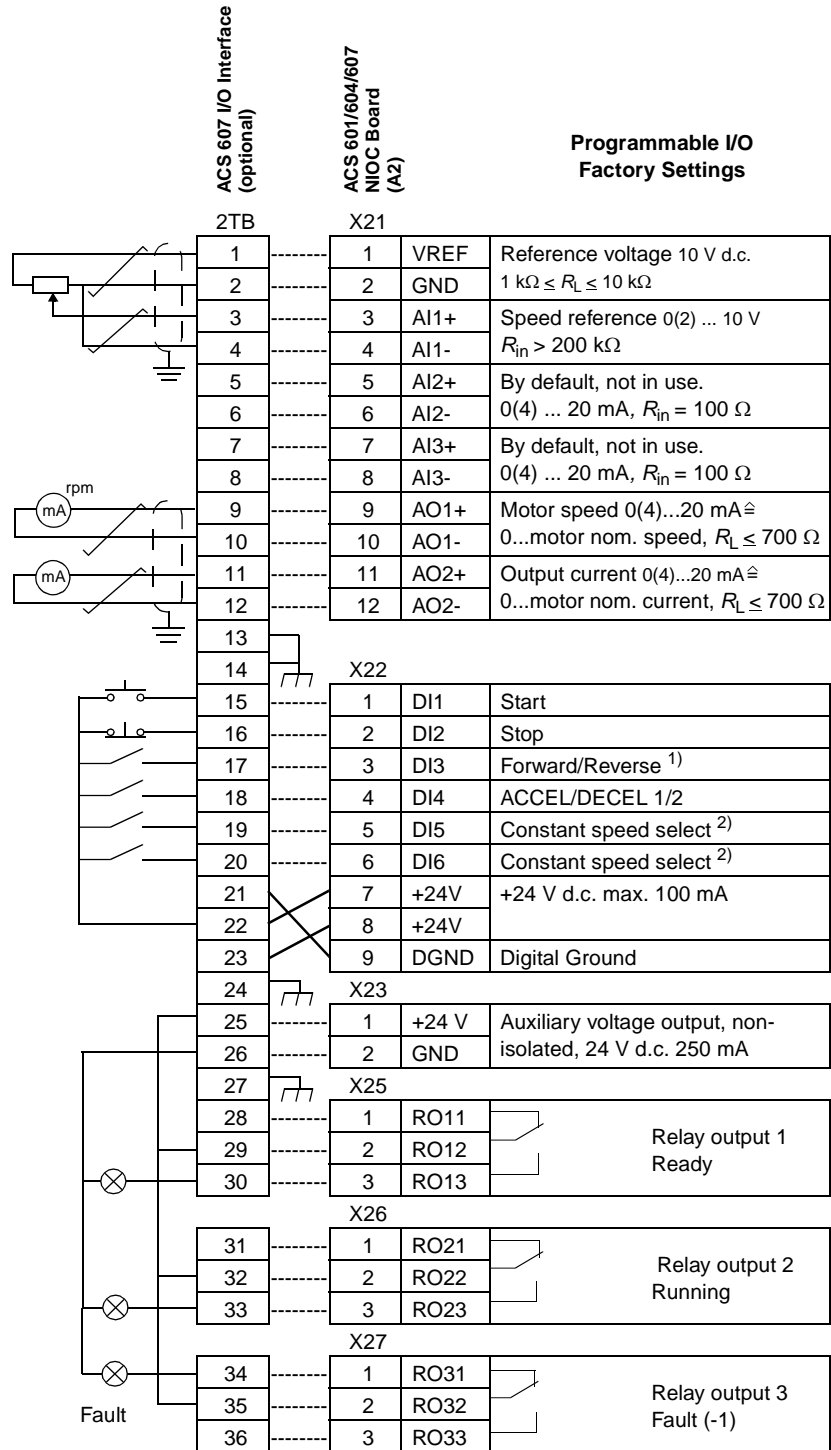
Connector X28 for RS 485 connection*

Pin	Signal	Link Type
1	TRANS	Standard Modbus Link
2	GND	
3	B-	
4	A+	
5	GND	
6	+24V	

Connector X29 for RS 485 connection*

Pin	Signal	Link Type
1	TRANS	Standard Modbus Link
2	FAULT	
3	B-	
4	A+	
5	GND	
6	+24V	

* Connector shield is connected via an RC filter to the frame.



**Drive Section
Hardware**

The frequency converter types contain inverters given below.

Frequency Converter Type	Inverter	Drive Frame Size
Supply voltage 380, 400 or 415V		
ACx 617-0100-3	ACN 634 0100 3	R7i
ACx 617-0120-3	ACN 634 0120 3	R7i
ACx 617/677-0185-3	ACN 634-0185-3	R8i
ACx 617/677-0225-3	ACN 634-0225-3	R8i
ACx 617/677-0265-3	ACN 634-0265-3	R8i
ACx 617/677-0335-3	ACN 634-0335-3	R9i
ACx 617/677-0405-3	ACN 634-0405-3	R9i
ACx 617/677-0500-3	ACN 634-0505-3	R10i
ACx 617/677-0630-3	ACN 634-0635-3	R11i
ACx 607/617/627/677-0760/0765-3	ACN 634-0755-3	R11i
ACx 607/617/627/677-0930/0935-3	ACN 634-0935-3	R12i
ACx 607/617/627/677-1120/1125-3	ACN 634-1125-3	R12i
ACx 607/627/677-1440-3	ACN 634-1445-3	2xR11i
ACx 607/627/677-1770-3	ACN 634-1775-3	2xR12i
ACx 607/627/677-2140-3	ACN 634-2145-3	2xR12i
ACx 627-2340-3	ACN 634-2345-3	4xR11i
ACx 627-2820-3	ACN 634-2825-3	4xR11i
Supply voltage 380, 400, 415, 440, 460, 480 or 500V		
ACx 617-0120-5	ACN 634 0120 5	R7i
ACx 617-0140-5	ACN 634 0140 5	R7i
ACx 617/677-0215-5	ACN 634-0215-5	R8i
ACx 617/677-0255-5	ACN 634-0255-5	R8i
ACx 617/677-0325-5	ACN 634-0325-5	R8i
ACx 617/677-0395-5	ACN 634-0395-5	R9i
ACx 617/677-0495-5	ACN 634-0495-5	R9i
ACx 617/677-0610-5	ACN 634-0615-5	R10i
ACx 617/677-0770-5	ACN 634-0775-5	R11i
ACx 6x7-0930/0935-5	ACN 634-0925-5	R11i
ACx 6x7-1090/1095-5	ACN 634-1095-5	R12i
ACx 6x7-1380/1385-5	ACN 634-1385-5	R12i
ACx 607/627/677-1760-5	ACN 634-1765-5	2xR11i
ACx 607/627/677-2160-5	ACN 634-2165-5	2xR12i
ACx 607/627/677-2620-5	ACN 634-2625-5	2xR12i
ACx 627-2850-5	ACN 634-2855-5	4xR11i
ACx 627-3450-5	ACN 634-3455-5	4xR11i
Supply voltage 525, 550, 575, 600, 660 or 690V		
ACx 617-0100-6	ACN 634 0100 6	R7i
ACx 617-0120-6	ACN 634 0120 6	R7i
ACx 617/677-0205-6	ACN 634-0205-6	R8i
ACx 617/677-0255-6	ACN 634-0255-6	R8i
ACx 617/677-0315-6	ACN 634-0315-6	R8i
ACx 617/677-0375-6	ACN 634-0375-6	R9i
ACx 617/677-0485-6	ACN 634-0485-6	R9i
ACx 617/677-0600-6	ACN 634-0605-6	R10i
ACx 617/677-0750-6	ACN 634-0755-6	R11i
ACx 6x7-0900-6	ACN 634-0905-6	R11i
ACx 607/617/627/677-1040/1045-6	ACN 634-1045-6	R12i
ACx 607/617/627/677-1380/1385-6	ACN 634-1385-6	R12i
ACx 607/627/677-1710-6	ACN 634-1715-6	2xR11i
ACx 607/627/677-2120-6	ACN 634-2125-6	2xR12i
ACx 607/627/677-2540-6	ACN 634-2545-6	2xR12i
ACx 607/627/677-2800-6	ACN 634-2805-6	4xR11i
ACx 607/627/677-3350-6	ACN 634-3355-6	4xR11i

Technical Data

ACx 677 Below are cooling air flow requirements, heat losses, dimensions and weights of ACx 677.

Frequency Converter Type	Supply Section		Drive Frame Size	Air Flow [m ³ /h]	Heat Loss [kW]	Width [mm]	Weight [kg]
	Frame Size	6-pulse Supply Type					
Supply voltage 400V Four-quadrant Thyristor Supply							
ACx 677-0185-3	B2	ACA 632-0200-3	R8i	1920	4.6	1430	550
ACx 677-0225-3	B3	ACA 632-0300-3	R8i	2320	5.6	1430	630
ACx 677-0265-3	B3	ACA 632-0300-3	R8i	2320	6.6	1630	630
ACx 677-0335-3	B3	ACA 632-0420-3	R9i	2320	8.4	1630	630
ACx 677-0405-3	B3	ACA 632-0420-3	R9i	2320	10	1630	630
ACx 677-0500-3	B4	ACA 632-0680-3	R10i	5600	12	3630	1950
ACx 677-0630-3	B4	ACA 632-0680-3	R11i	5600	16	3630 (1)	1980
ACx 677-0760-3	B4	ACA 632-1120-3	R11i	5600	20	400+600+400+2x600+1000+30=3630 (1)	1980
ACx 677-0930-3	B4	ACA 632-1120-3	R12i	7150	24	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1120-3	B4	ACA 632-1120-3	R12i	7150	30	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1440-3	B5	ACA 632-1700-3	2xR11i	10700	39	400+600+400+2x600+200+1000+1000+30=4830 (2 (B	3100
ACx 677-1770-3	B5	ACA 632-1700-3	2xR12i	13800	48	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
ACx 677-2140-3	B5	ACA 632-2100-3	2xR12i	13800	55	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
Supply voltage 500V Four-quadrant Thyristor Supply							
ACx 677-0215-5	B2	ACA 632-0250-5	R8i	1920	5.1	1430	550
ACx 677-0255-5	B3	ACA 632-0250-5	R8i	2320	6.0	1430	630
ACx 677-0325-5	B3	ACA 632-0375-5	R8i	2320	7.7	1630	630
ACx 677-0395-5	B3	ACA 632-0525-5	R9i	2320	9.4	1630	630
ACx 677-0495-5	B3	ACA 632-0525-5	R9i	2320	12	1630	630
ACx 677-0610-5	B4	ACA 632-0850-5	R10i	5600	14	3630	1950
ACx 677-0770-5	B4	ACA 632-0850-5	R11i	5600	18	3630 (1)	1980
ACx 677-0930-5	B4	ACA 632-1400-5	R11i	5600	22	400+600+400+2x600+1000+30=3630 (1)	1980
ACx 677-1090-5	B4	ACA 632-1400-5	R12i	7150	26	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1380-5	B4	ACA 632-1400-5	R12i	7150	34	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1760-5	B5	ACA 632-2120-5	2xR11i	10700	43	400+600+400+2x600+200+1000+1000+30=4830 (2 (B	3100
ACx 677-2160-5	B5	ACA 632-2120-5	2xR12i	13800	53	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
ACx 677-2620-5	B5	ACA 632-2600-5	2xR12i	13800	62	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
Supply voltage 690V Four-quadrant Thyristor Supply							
ACx 677-0205-6	B2	ACA 632-0250-6	R8i	1920	4.9	1430	550
ACx 677-0255-6	B3	ACA 632-0250-6	R8i	2320	5.8	1430	630
ACx 677-0315-6	B3	ACA 632-0375-6	R8i	2320	7.5	1630	630
ACx 677-0375-6	B3	ACA 632-0375-6	R9i	2320	9	1630	630
ACx 677-0485-6	B3	ACA 632-0525-6	R9i	2320	12	1630	630
ACx 677-0600-6	B4	ACA 632-0850-6	R10i	5600	14	3630	1950
ACx 677-0750-6	B4	ACA 632-0850-6	R11i	5600	18	3630 (1)	1980
ACx 677-0900-6	B4	ACA 632-0850-6	R11i	5600	19	400+600+400+2x600+1000+30=3630 (1)	1980
ACx 677-1040-6	B4	ACA 632-1400-6	R12i	7150	25	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1380-6	B4	ACA 632-1400-6	R12i	7150	33	400+600+400+2x600+1500+30=4130 (2)	2450
ACx 677-1710-6	B5	ACA 632-2600-6	2xR11	10700	39	400+600+400+2x600+200+1000+1000+30=4830 (2 (B	3100
ACx 677-2120-6	B5	ACA 632-2600-6	2xR12i	13800	49	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
ACx 677-2540-6	B5	ACA 632-2600-6	2xR12i	13800	58	400+600+400+2x600+200+1500+1500+30=5830 (3)	3800
ACx 677-2800-6	B5	ACA 632-3600-6	4xR11i	16900	60	400+600+400+2x600+200+1000+1000+1000+30=6830 (3)	4300
ACx 677-3350-6	B5	ACA 632-3600-6	4xR11i	16900	73	400+600+400+2x600+200+1000+1000+1000+30=6830 (3)	4300

- 1) With cable top exit an additional 400 mm wide cubicle
- 2), B) With cable top exit (and/or common motor connection terminal units (B)) an additional 600 mm wide cubicle
- 3) With cable top exit and/or common motor connection terminal units an additional 800 mm wide cubicle
- 4) With cable top entry an additional 1200 mm wide cubicle
- 5) With EMC filter an additional 600 mm wide cubicle

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