
ABB WIND TURBINE CONVERTERS

ACS800-67LC wind turbine converters

Hardware manual



Terms and abbreviations

Term/Abbreviation	Explanation
AGDR	Gate driver control board (interface to IGBTs)
AINT	Main Circuit Interface Board
AMC	Application and Motor Controller Board. Part of the NDCU Drive Control Unit
APBU	Optical branching unit for fiber links that use the PPCS protocol. The unit is used for connecting parallel-connected inverter modules to the RDCU/NDCU.
APOW	Power Supply Board
Auxiliary control cubicle (ACU)	The cubicle with auxiliary devices such as auxiliary voltage circuit breakers, control electronics, measurement boards, etc.
DC (brake) chopper	Conducts the surplus energy from the intermediate circuit of the converter to the DC (brake) resistor when necessary. The chopper operates when the DC link voltage exceeds certain maximum limit. The voltage rise is typically caused by deceleration (braking) of a high inertia generator. DC chopper type ABRU is used in ACS800-67LC.
DC (brake) resistor	Dissipates the converter surplus braking energy conducted by the DC chopper to heat. Essential part of the chopper circuit. See DC (brake) chopper .
Converter	Converts electric power from one form to another.
Cubicle	One section of a cabinet-installed wind turbine converter. A cubicle is typically behind a door of its own.
Crowbar	Conducts the surplus energy from the rotor circuit of the converter to the resistor when necessary. The crowbar operates when the DC link voltage or rotor circuit current exceeds certain maximum limit. The voltage rise is typically caused by grid failures like voltage dips (sags). Crowbar type ACBU is used in ACS800-67LC.
DC link	DC circuit between grid-side converter and rotor-side converter
DC link capacitors	Energy storage which stabilizes the intermediate circuit DC voltage.
DDCS	Distributed Drives Communication System. Communication protocol used with fiber optic link.
DTC	Direct Torque Control
EMC	Electromagnetic Compatibility
Frame (size)	Refers to power modules that share a similar mechanical construction, for example: <ul style="list-style-type: none"> • converter or converter/inverter modules of frame R8i • frame 2×R8i + 1×R8i includes two size R8i inverter modules and one size R8i supply module. To determine the frame size of a component, refer to the rating tables in chapter Technical data .
Grid-side converter	A converter that is connected to the power supply network (grid) and is capable of transferring energy from the converter DC link to the grid and vice versa. The grid-side converter is also called ISU.
IGBT	Insulated gate bipolar transistor
IGBT supply module	Bidirectional IGBT bridge and related components enclosed inside a metal frame or enclosure. Intended for cabinet installation. Used as the supply module in regenerative and low-harmonic converters.
IGBT supply unit (ISU)	Grid-side converter unit. Consists of the converter module and the related accessories (such as fuses, switches, control unit, etc.). See IGBT supply module .

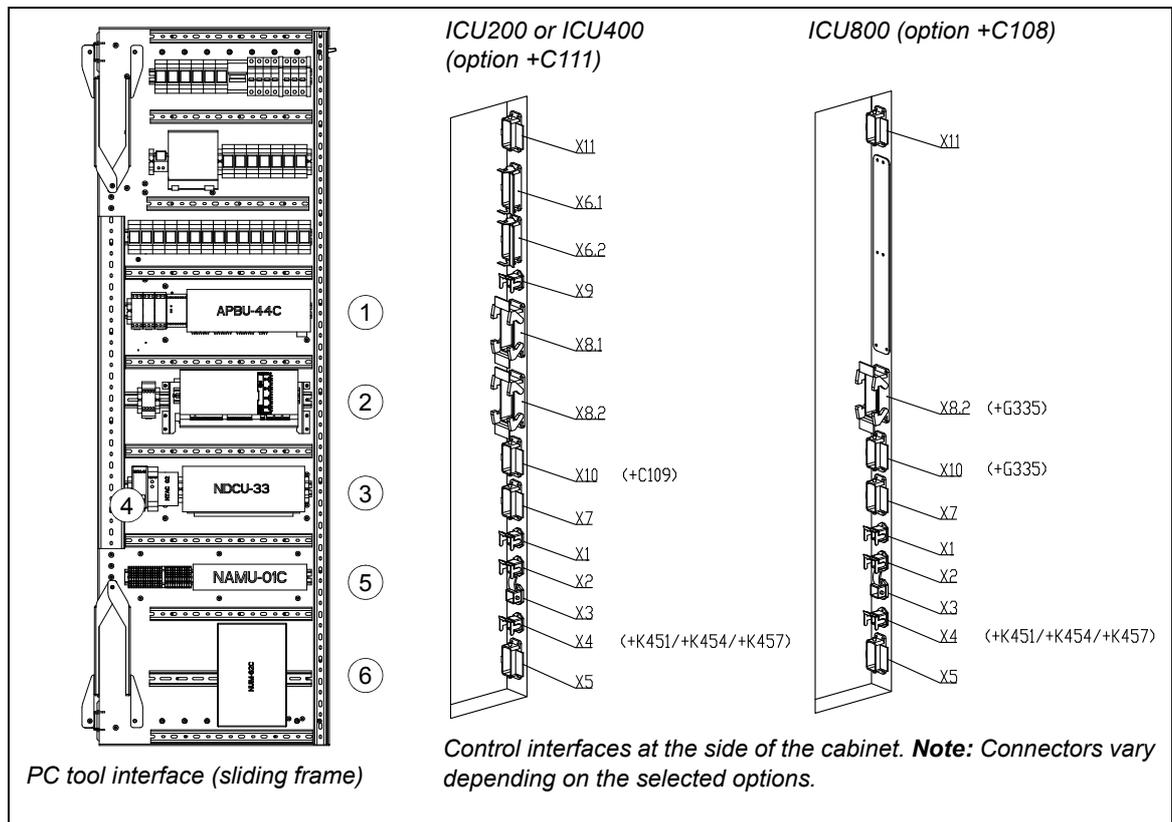
Term/Abbreviation	Explanation
Incoming cubicle (ICU)	Cubicle with input power terminals, main switching and disconnecting devices, etc. See Cubicle .
Inverter	Converts direct current and voltage to alternating current and voltage.
Inverter module	Inverter bridge, related components and converter DC link capacitors enclosed inside a metal frame or enclosure. Intended for cabinet installation.
Inverter module cubicle	Cubicle which includes inverter module(s). See Inverter module , Cubicle .
Inverter unit (INU)	Rotor-side converter unit. Consists of the converter module and the related accessories (such as fuses, switches, control unit, etc.) See Inverter module .
Intermediate circuit	See DC link .
LCU	Liquid cooling unit
LCL	Grid-side filter that suppresses voltage distortion and current harmonics. Essential part of the grid-side converter.
Main circuit breaker (MCB)	Electrically-controlled main switching and protecting device. Also used as the main disconnecter.
NAMU	Auxiliary Measuring Unit. Performs voltage measurement for IGBT supply unit RMIO board.
NCAN	CANopen® Adapter Module
NDCU	Drive Control Unit. Consists of a AMC board and NIOC board built into a metal housing. NDCU unit controls the rotor-side converter.
NDNA	DeviceNet™ Adapter Module
NETA	Ethernet Adapter Module
NIBA	Interbus-S® Adapter Module
NIOC	Input/Output Board. Part of the NDCU Drive Control unit
NPBA	PROFIBUS DP® Adapter Module
NTAC	Pulse Encoder Interface Module
NUIM	Voltage and Current Measurement Unit. Performs voltage and current measurement for AMC board.
PPCS	Power Plate Communication System. Communication protocol used with optic fiber link which controls the power stage of the converter modules.
RAIO	Analog I/O Extension Module
RDCO	DDCS Communication Option with optic fiber channels
RDCU	Drive Control Unit which contains an RMIO (Motor Control and I/O) board. An RDCU unit controls the grid-side converter.
RFI	Radio Frequency Interference
RMIO	Motor Control and I/O Board. Part of the RDCU Drive Control Unit
Rotor-side converter	A converter that is connected to the generator rotor and controls its operation. The rotor-side converter is also called the inverter unit or INU.
UPS	Uninterruptible power supply

■ Control interfaces

Control interfaces of the converter are described below.

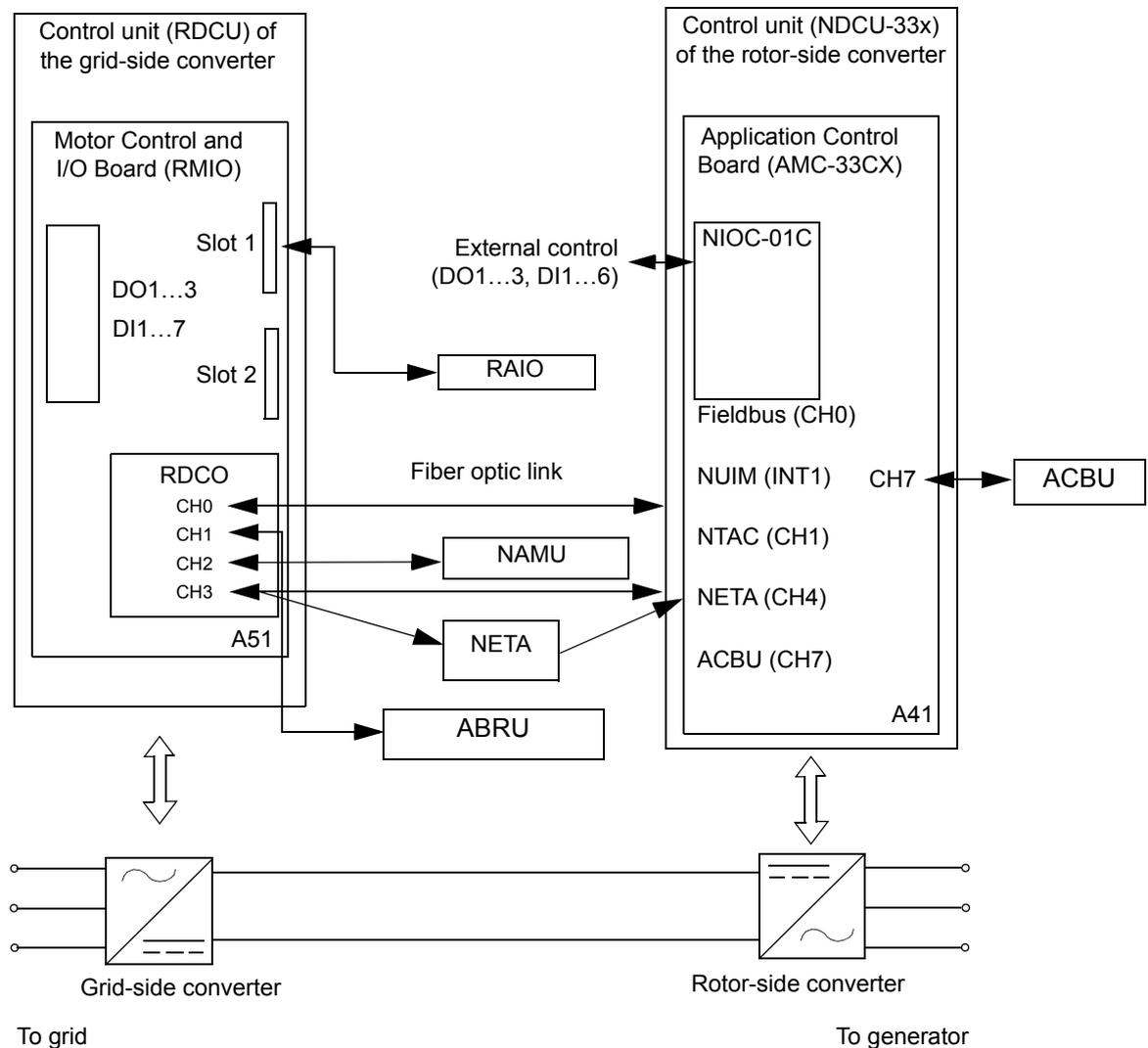
Sliding frame in the auxiliary control cubicle	
No.	Description
1	APBU branching unit
2	RDCU unit. (If parallel connected grid-side converter modules are used, another APBU unit is located behind RMIO board.)
3	NDCU unit
4	NTAC Pulse Encoder Interface module, optional fieldbus modules if ordered
5	NAMU measuring unit
6	NUIM voltage and current measuring unit

Control interfaces at the side of the cabinet	
Terminal	Description
X1	230 V AC supply (non-UPS)
X2	230 V AC supply (UPS)
X3	Ethernet
X4	Fieldbus
X5	Safety circuit and control signals
X6.1	External grid MCB control
X6.2	External stator MCB control
X7	Pulse encoder
X8.1	Grid voltage measurement
X8.2	Stator voltage measurement. Marked with X80 when option +G335 is selected.
X9	Stator current measurement
X10	ICU auxiliaries. Marked with X90 when option +G335 is selected.
X11	Grid MCB trip and on/off status (and Interbus option +K453)



■ PC tool interfaces

The following diagram shows the control interfaces and option modules of the converter.



RDCU and NDCU control units encapsulate the RMIO/AMC boards which are used for controlling the converter. The units are located in the sliding frame of the auxiliary control cubicle. With control units a PC tool can be used for parameter change and check, local control of the converter during the commissioning and remote monitoring of the converter. It is also possible to read fault indications through a relay output and communicate with the unit through a serial communication interface. DriveWindow PC tool is used with the ACS800-67LC.

Control unit of the grid-side converter

The grid-side converter is controlled by its own RDCU control unit. The RDCU is connected to the grid-side converter power modules by a fiber optic link (distributed through an APBU optical branching unit in case of parallel connected power modules). In the grid-side converter module(s) the fiber optic link is connected to the AINT board.

Control unit of the rotor-side converter

The rotor-side converter is controlled by its own NDCU control unit. The NDCU is connected to the rotor-side converter power modules by a fiber optic link, distributed through APBU optical branching unit. In the rotor-side converter modules the fiber optic link is connected to the AINT board.

■ Control unit NDCU-33Cx/RDCU-12C

The connectors of the rotor-side converter control unit NDCU-33Cx (consisting of the NIOC-02C and AM33C boards) and the grid-side converter control unit RDCU-12C (containing the RMIO-12C board) are shown below. For further information on the RDCU control unit, see *RDCU drive control units hardware manual* [3AFE64636324 (English)].

NDCU-33Cx

RDCU-12C

