

ABB INDUSTRIAL DRIVES

BAMU-12C auxiliary measurement unit

Hardware manual



BAMU-12C auxiliary measurement unit

Hardware manual

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3. Installation



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1

Introduction to the manual

Contents of this chapter

This chapter gives basic information on the manual.

Safety instructions

Follow all safety instructions delivered with the drive before you install, commission, or use the drive. For single drives, the safety instructions are given at the beginning of the hardware manual. For the safety instructions of air-cooled units, see *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). For the safety instructions of liquid-cooled units, see *Safety instructions for ACS880 liquid-cooled multidrive cabinets and modules* (3AXD50000048633 [English]).



WARNING!

Note that BAMU-12C auxiliary measurement unit is used for measuring main circuit voltage. Main voltage can be present even if auxiliary circuit voltages are switched off.

Target audience

This manual is intended for people who install, start-up or operate drives or multidrive modules with BAMU-12C auxiliary measurement unit. The reader is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

Terms and abbreviations

Term	Description
BAMU	Auxiliary measurement unit
BCU	Type of control unit
DC/DC converter	Charges or discharges an external energy storage (such as a battery or capacitor bank) from or into the DC bus
IGBT	Insulated gate bipolar transistor

Related documents

■ Cabinet-installed multidrive manuals

Manual	Code
General manuals	
<i>ACS880 multidrive cabinets and modules safety instructions</i>	3AUA0000102301
<i>ACS880 liquid-cooled multidrive cabinets and modules safety instructions</i>	3AXD50000048633
<i>ACS880 multidrive cabinets and modules electrical planning instructions</i>	3AUA0000102324
<i>ACS880 liquid-cooled multidrive cabinets and modules electrical planning instructions</i>	3AXD50000048634
<i>ACS880 multidrive cabinets mechanical installation instructions</i>	3AUA0000101764
<i>ACS880 liquid-cooled multidrive cabinets mechanical installation instructions</i>	3AXD50000048635
<i>CIO-01 I/O module for distributed I/O bus control user's manual</i>	3AXD50000126880
Supply unit manuals	
<i>ACS880-207 IGBT supply units hardware manual</i>	3AUA0000130644
<i>ACS880-207LC IGBT supply units hardware manual</i>	3AXD50000174782
<i>ACS880 IGBT supply control program firmware manual</i>	3AUA0000131562
<i>ACS880-307 +A003 diode supply units hardware manual</i>	3AUA0000102453
<i>ACS880-307 +A018 diode supply units hardware manual</i>	3AXD50000011408
<i>ACS880 diode supply control program firmware manual</i>	3AUA0000103295
<i>ACS880-907 regenerative rectifier units hardware manual</i>	3AXD50000020546
<i>ACS880 regenerative rectifier control program firmware manual</i>	3AXD50000020827
Inverter unit manuals	
<i>ACS880-107 inverter units hardware manual</i>	3AUA0000102519
<i>ACS880-107LC inverter units hardware manual</i>	3AXD50000196111
<i>ACS880 primary control program firmware manual</i>	3AUA0000085967
<i>ACS880 primary control program quick start-up guide</i>	3AUA0000098062
Manuals for application programs (Crane, Winder, etc.)	
Brake unit and DC/DC converter unit manuals	
<i>ACS880-607 1-phase brake units hardware manual</i>	3AUA0000102559
<i>ACS880-607LC 1-phase brake units hardware manual</i>	3AXD50000481491

Manual	Code
<i>ACS880-607 3-phase brake units hardware manual</i>	3AXD50000022034
<i>ACS880 (3-phase) brake control program firmware manual</i>	3AXD50000020967
<i>ACS880-1607 DC/DC converter units hardware manual</i>	3AXD50000023644
<i>ACS880-1607LC DC/DC converter units hardware manual</i>	3AXD50000431342
<i>ACS880 DC/DC converter control program firmware manual</i>	3AXD50000024671
Option manuals	
<i>ACS880-1007LC liquid cooling unit user's manual</i>	3AXD50000129607
<i>ACS-AP-x assistant control panels user's manual</i>	3AUA0000085685
<i>Drive composer start-up and maintenance PC tool user's manual</i>	3AUA0000094606
Manuals for I/O extension modules, fieldbus adapters, safety options etc.	

You can find manuals on the Internet. See www.abb.com/drives/documents. For manuals not available in the document library, contact your local ABB representative.

■ Multidrive module manuals

Manual	Code
General manuals	
<i>ACS880 multidrive cabinets and modules safety instructions</i>	3AUA0000102301
<i>ACS880 liquid-cooled multidrive cabinets and modules safety instructions</i>	3AXD50000048633
<i>ACS880 multidrive cabinets and modules electrical planning instructions</i>	3AUA0000102324
<i>ACS880 liquid-cooled multidrive cabinets and modules electrical planning instructions</i>	3AXD50000048634
<i>Drive modules cabinet design and construction instructions</i>	3AUA0000107668
<i>BCU-02/12/22 control units hardware manual</i>	3AUA0000113605
<i>CIO-01 I/O module for distributed I/O bus control user's manual</i>	3AXD50000126880
Supply module manuals	
<i>ACS880-204 IGBT supply modules hardware manual</i>	3AUA0000131525
<i>ACS880-204LC IGBT supply modules hardware manual</i>	3AXD50000284436
<i>ACS880 IGBT supply control program firmware manual</i>	3AUA0000131562
<i>ACS880-304...+A003 diode supply modules hardware manual</i>	3AUA0000102452
<i>ACS880-304...+A018 diode supply modules hardware manual</i>	3AXD50000010104
<i>ACS880-304LC...+A019 diode supply modules hardware manual</i>	3AXD50000045157
<i>ACS880 diode supply control program firmware manual</i>	3AUA0000103295
<i>ACS880-904 regenerative rectifier modules hardware manual</i>	3AXD50000020457
<i>ACS880 regenerative rectifier control program firmware manual</i>	3AXD50000020827
Inverter module manuals and guides	
<i>ACS880-104 inverter modules hardware manual</i>	3AUA0000104271
<i>ACS880-104LC inverter modules hardware manual</i>	3AXD50000045610
<i>ACS880 primary control program firmware manual</i>	3AUA0000085967
<i>ACS880 primary control program quick start-up guide</i>	3AUA0000098062
Brake module and DC/DC converter module manuals	
<i>ACS880-604 1-phase brake chopper modules hardware manual</i>	3AUA0000106244
<i>ACS880-604LC 1-phase brake chopper modules hardware manual</i>	3AXD50000184378

10 Introduction to the manual

Manual	Code
<i>ACS880-604 3-phase brake modules hardware manual</i>	3AXD50000022033
<i>ACS880 (3-phase) brake control program firmware manual</i>	3AXD50000020967
<i>ACS880-1604 DC/DC converter modules hardware manual</i>	3AXD50000023642
<i>ACS880-1604LC DC/DC converter modules hardware manual</i>	3AXD50000371631
<i>ACS880 DC/DC converter control program firmware manual</i>	3AXD50000024671
Module package hardware manuals	
<i>ACS880-04 single drive module packages (560 to 2200 kW) hardware manual</i>	3AUA0000138495
<i>ACS880-14 and -34 single drive module packages hardware manual</i>	3AXD50000022021
Option manuals	
<i>ACS880-1007LC liquid cooling unit user's manual</i>	3AXD50000129607
<i>ACX-AP-x assistant control panels user's manual</i>	3AUA0000085685
<i>BAMU-12C auxiliary measurement unit hardware manual</i>	3AXD50000117840
<i>Drive composer start-up and maintenance PC tool user's manual</i>	3AUA0000094606
<i>Drive application programming (IEC 61131-3) manual</i>	3AUA0000127808
<i>Installation frames for ACS880 multidrive modules hardware manual</i>	3AXD50000010531
Manuals and quick guides for I/O extension modules, fieldbus adapters, safety functions modules, etc.	

See www.abb.com/drives/documents for all manuals on the Internet.

You can find all documentation related to the multidrive modules on the Internet at <https://sites-apps.abb.com/sites/lvacdrivesengineering/support/content>.

2

Hardware description

Contents of this chapter

The chapter describes the hardware of BAMU-12C auxiliary measurement unit.

Hardware description

BAMU-12C auxiliary measurement unit is a measurement unit for precise voltage and current measurements. The unit has:

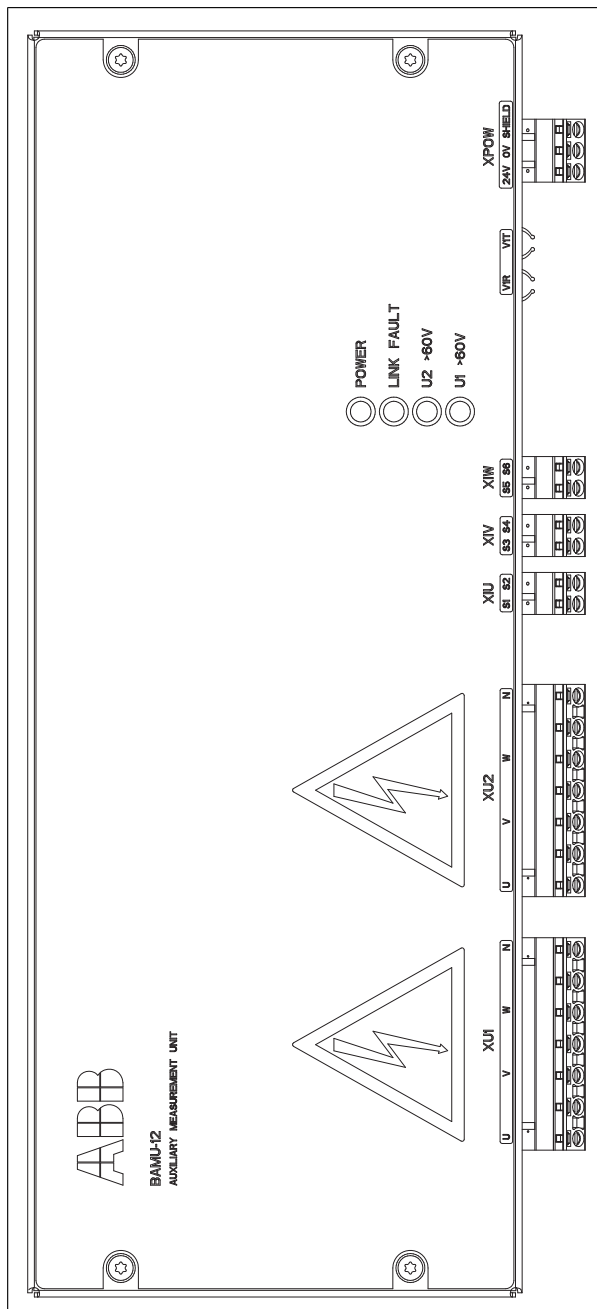
- two 3-phase voltage inputs
- three current inputs
- indication LEDs
- 24 V DC supply voltage
- optical link for communication with the overriding drive control unit.

Compatibility

The measuring unit is compatible with BCU-02, -12 and -22 control units. The control unit must also be equipped with a control program that can communicate with the measuring unit, for example the IGBT supply control program. For the compatibility with other control programs, see their firmware manuals.

Layout drawing

The following figure shows the layout of the measurement unit.



Connector	Description
XU1	Voltage measurement connector. For pin descriptions, see section Voltage measurement connections (XU1, XU2) (page 18) .
XU2	Voltage measurement connector. For pin descriptions, see section Voltage measurement connections (XU1, XU2) (page 18) .
XIU	Current measurement connector. For pin descriptions, see section Current measurement connections (XIU, XIV, XIW) (page 19) .
XIV	Current measurement connector. For pin descriptions, see section Current measurement connections (XIU, XIV, XIW) (page 19) .
XIW	Current measurement connector. For pin descriptions, see section Current measurement connections (XIU, XIV, XIW) (page 19) .
V1R	Fiber optic connector
V1T	Fiber optic connector
XPOW	Power supply connector. For pin descriptions, see section Power supply connection (XPOW) (page 19) .

LEDs

LED	Color	Description
POWER	Green	Power on
LINK FAULT	Red	Fiber optic link fault
U2 > 60 V	Yellow	Input U2 voltage exceeds 60 V
U1 > 60 V	Yellow	Input U1 voltage exceeds 60 V

Settings

See the firmware manual of the appropriate control program for the firmware settings, eg, selection between phase or main voltage measurement, etc.

There are no hardware settings on the measurement unit.

3

Installation

Contents of this chapter

The chapter instructs in installing BAMU-12C auxiliary measurement unit.

Checking the delivery

Check that there are no signs of damage. Check that the package contains:

- measurement unit
- this manual.

Placing

Install the module inside a cabinet/cubicle in indoor environment. Leave enough space for cabling. Make sure that the temperature will not be not excessive.

Do not install the measurement unit in the immediate vicinity of electromagnetic disturbance sources, such as relays, contactors, brake choppers, power and motor cabling. The minimum recommended distance from such components is 200 mm (7.9 in). We recommend to install metallic screening between the measurement unit and the source of disturbance. This can reduce the required distance.

Mount the control unit so that air can pass freely through the ventilation holes in the housing. Avoid mounting directly above heat-generating equipment.

**WARNING!**

Protect the unit against accidental contact. There are connectors that are connected to drive main circuit potential.

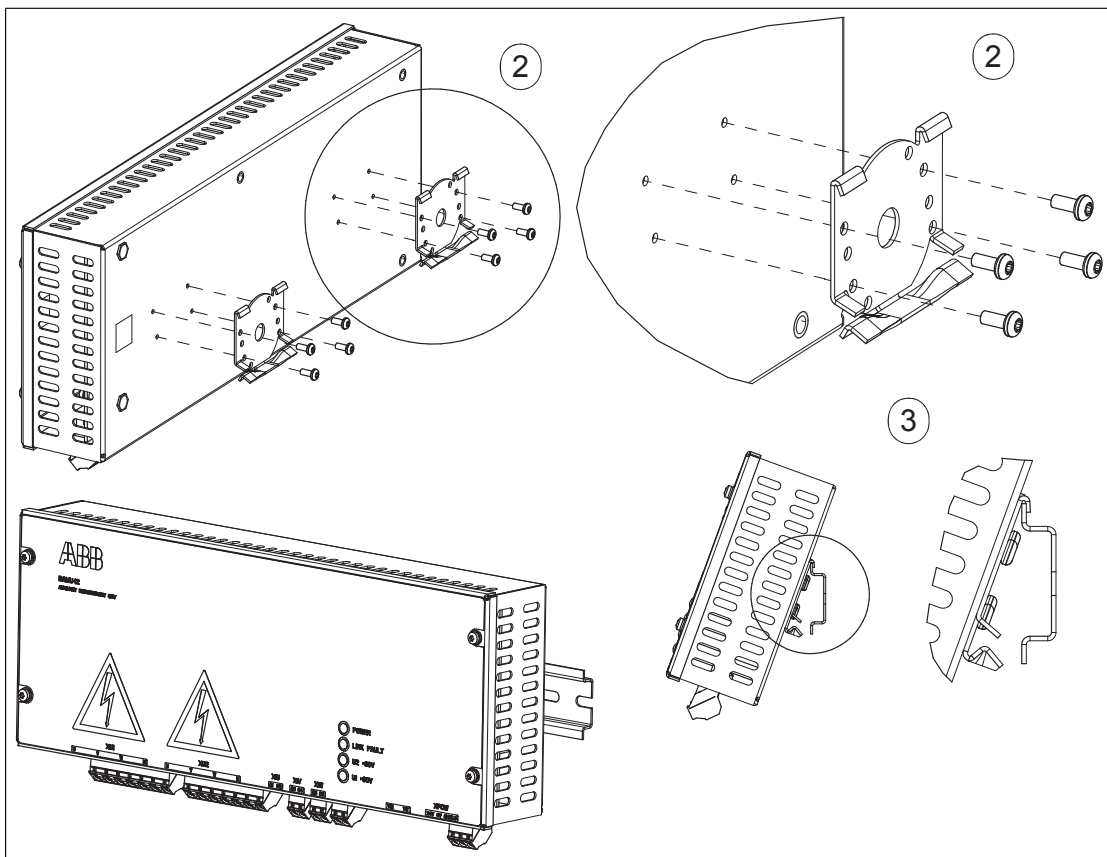


WARNING!

No condensation is allowed. There are connectors that are connected to drive main circuit potential.

Mechanical installation

1. Install a standard 35 × 7.5/15 mm DIN rail to the cabinet into which the unit is to be installed.
2. Fasten the two latches to the back of the measurement unit with four screws.
3. Click the measurement unit to the rail as shown below.
4. Make sure that the installation rail is grounded properly, either via the assembly plate, or with a separate grounding wire. The unit is grounded through the rail.



Electrical installation

■ Connection diagram

Default use of the connectors is shown below. For further details on wiring, see the delivery-specific circuit diagrams.

XPOW External power input		
1	24V	24 V DC
2	0V	
3	SHIELD	
V30 Fiber optic connections		
V1T	V1T	Fiber optic connector, transmitter. Connected to the control unit of the drive.
V1R	V1R	Fiber optic connector, receiver. Connected to the control unit of the drive.
XIU Current measurement ¹⁾		
1	S1	U-phase current input
2	S2	U-phase current output
XIV Current measurement ¹⁾		
3	S3	V-phase current input
4	S4	V-phase current output
XIW Current measurement ¹⁾		
5	S5	W-phase current input
6	S6	W-phase current output
XU1 Voltage measurement ²⁾		
1	U1	U-phase voltage 1
2	-	Not connected
3	V1	V-phase voltage 1
4	-	Not connected
5	W1	W-phase voltage 1
6	-	Not connected
7	N1	Neutral 1
XU2 Voltage measurement ²⁾		
1	U2	U-phase voltage 2
2	-	Not connected
3	V2	V-phase voltage 2
4	-	Not connected
5	W2	W-phase voltage 2
6	-	Not connected
7	N2	Neutral 2

¹⁾ Measuring range: ± 2.5 A. Input impedance: < 0.2 ohm

²⁾ Measuring range: ± 2.0 kV peak (phase-to-phase), 1250 V rms (phase-to-phase). Maximum voltage connected to terminals is 600/690 V (DVC C). Input impedance against virtual ground: 1.76 Mohm.

■ Voltage measurement connections (XU1, XU2)

Pin descriptions of connector XU1 are given in the table below.

Pin	Name	Description
1	U1	U-phase 1
2	-	Not connected
3	V1	V-phase 1
4	-	Not connected
5	W1	W-phase 1
6	-	Not connected
7	N1	Neutral 1

Pin descriptions of connector XU2 are given in the table below.

Pin	Name	Description
1	U2	U-phase 2
2	-	Not connected
3	V2	V-phase 2
4	-	Not connected
5	W2	W-phase 2
6	-	Not connected
7	N2	Neutral 2

Use cable rated for the measured voltage. Recommended conductor cross section is 1...2.5 mm².

Tightening torque: 0.5...0.6 N·m.



■ Current measurement connections (XIU, XIV, XIW)

Pin descriptions of connector XIU are given in the table below.

Pin	Name	Direction	Description
1	IN	In	U-phase current input
2	OUT	Out	U-phase current output

Pin descriptions of connector XIV are given in the table below.

Pin	Name	Direction	Description
3	IN	In	V-phase current input
4	OUT	Out	V-phase current output

Pin descriptions of connector XIW are given in the table below.

Pin	Name	Direction	Description
5	IN	In	W-phase current input
6	OUT	Out	W-phase current output

Use cable that withstands the measured current and is rated for the voltage in the measured circuit. Recommended conductor cross section is 1...2.5 mm².

Tightening torque: 0.5...0.6 N·m.

Note: In current measurements, make sure that the current transformers are wired in the correct direction (see wiring example on page 20).

■ Power supply connection (XPOW)

Pin descriptions of power supply connector are given in the table below.

Pin	Name	Direction	Description
1	+24V	In	+24 V DC supply voltage
2	0V	In	DC neutral
3	GND_S	In	Ground

Recommended conductor cross section is 1...2.5 mm².

Tightening torque: 0.5...0.6 N·m.

■ Communication link connection (V30)

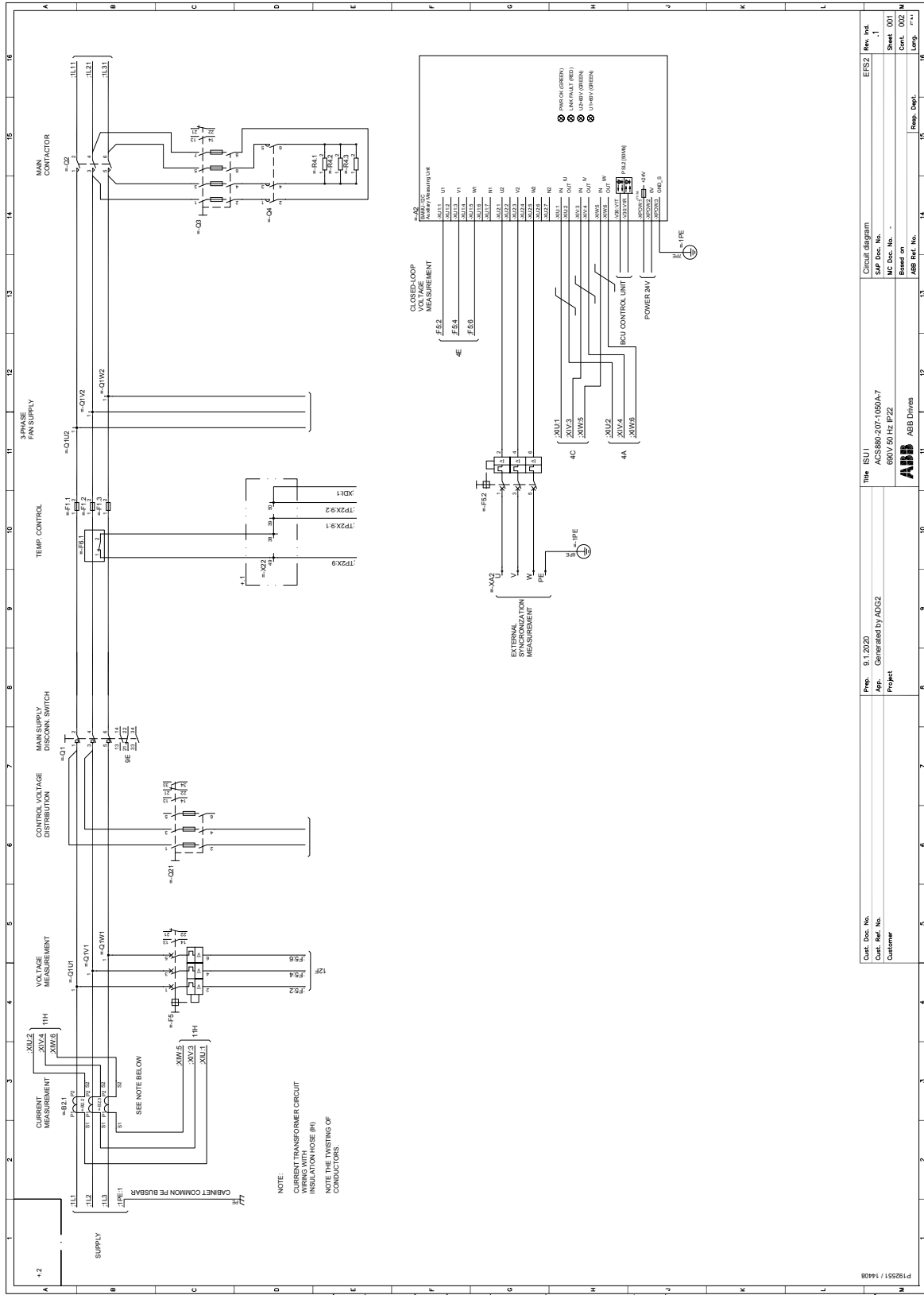
Transmitter V1T, receiver V1R

Optical communication link: Avago Versatile Link series optical transmitters & receivers, DC-50 MBd (50 Mbd/s)

■ Connection to BCU control unit

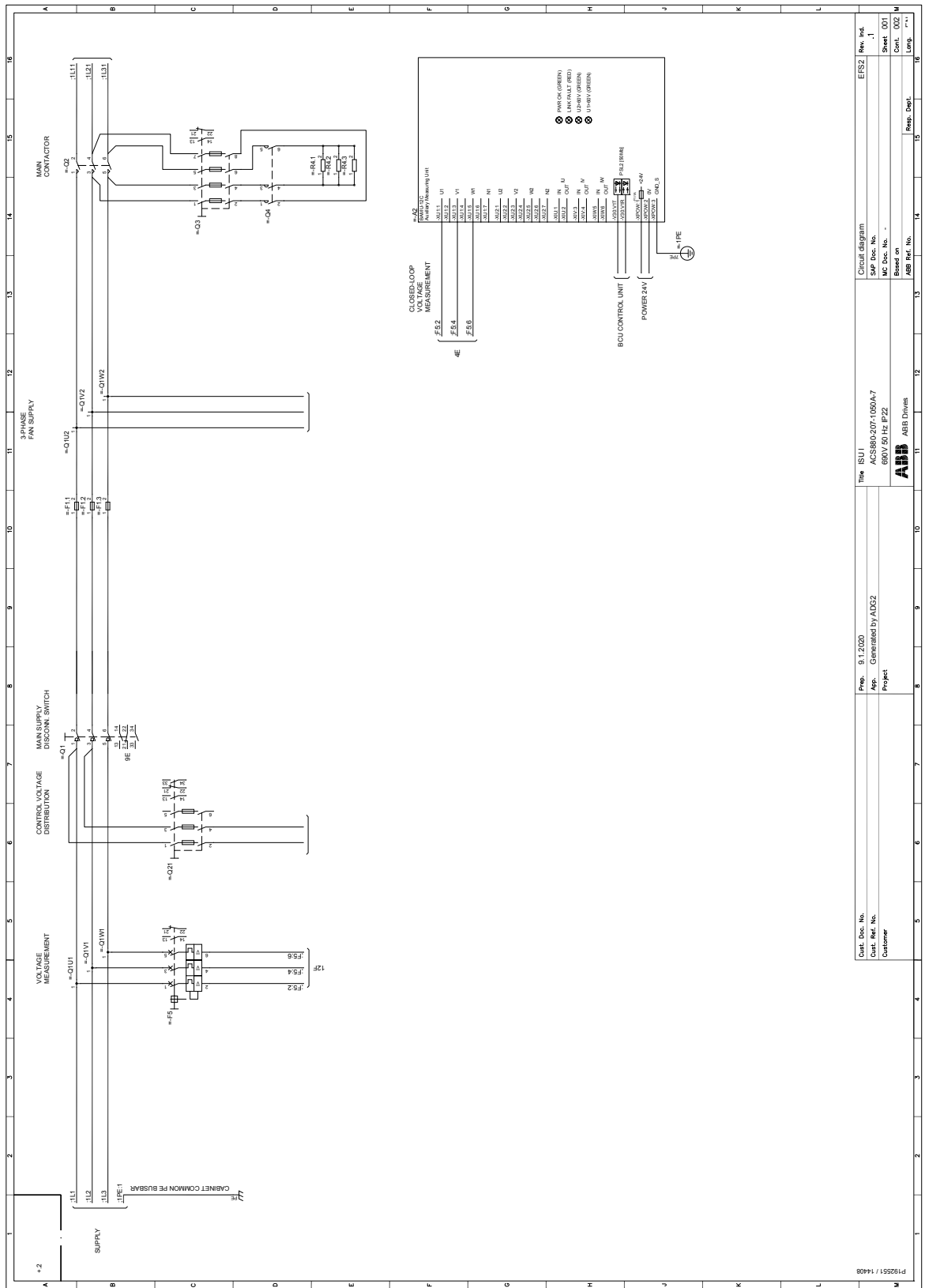
Connect BAMU-12C auxiliary measurement unit to the first unused channel of the BCU control unit with fiber optic cables. For parameter settings, see *ACS880 IGBT supply control program firmware manual* (3AUA0000131562 [English]).

■ Wiring example – Voltage and current measurements in use



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Customer	Project	Rep. Dept.	Rep. Dept.	Long. 11

■ Wiring example – Voltage measurement in weak network



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<p>Prep. 9.1.2020 App. Generated by AIG2 Project</p>											<p>The ISU1 ACS880-307-1000-A7 690V 50 Hz IP22 ABB Drives</p>		<p>Circuit diagram EFS2 Rev. 1 Sheet 001</p>		
<p>Cust. Doc. No. Customer</p>											<p>MC Doc. No. Based on</p>		<p>Resp. Dept. Cont. 002</p>		



■ Wiring example – DC/DC converter

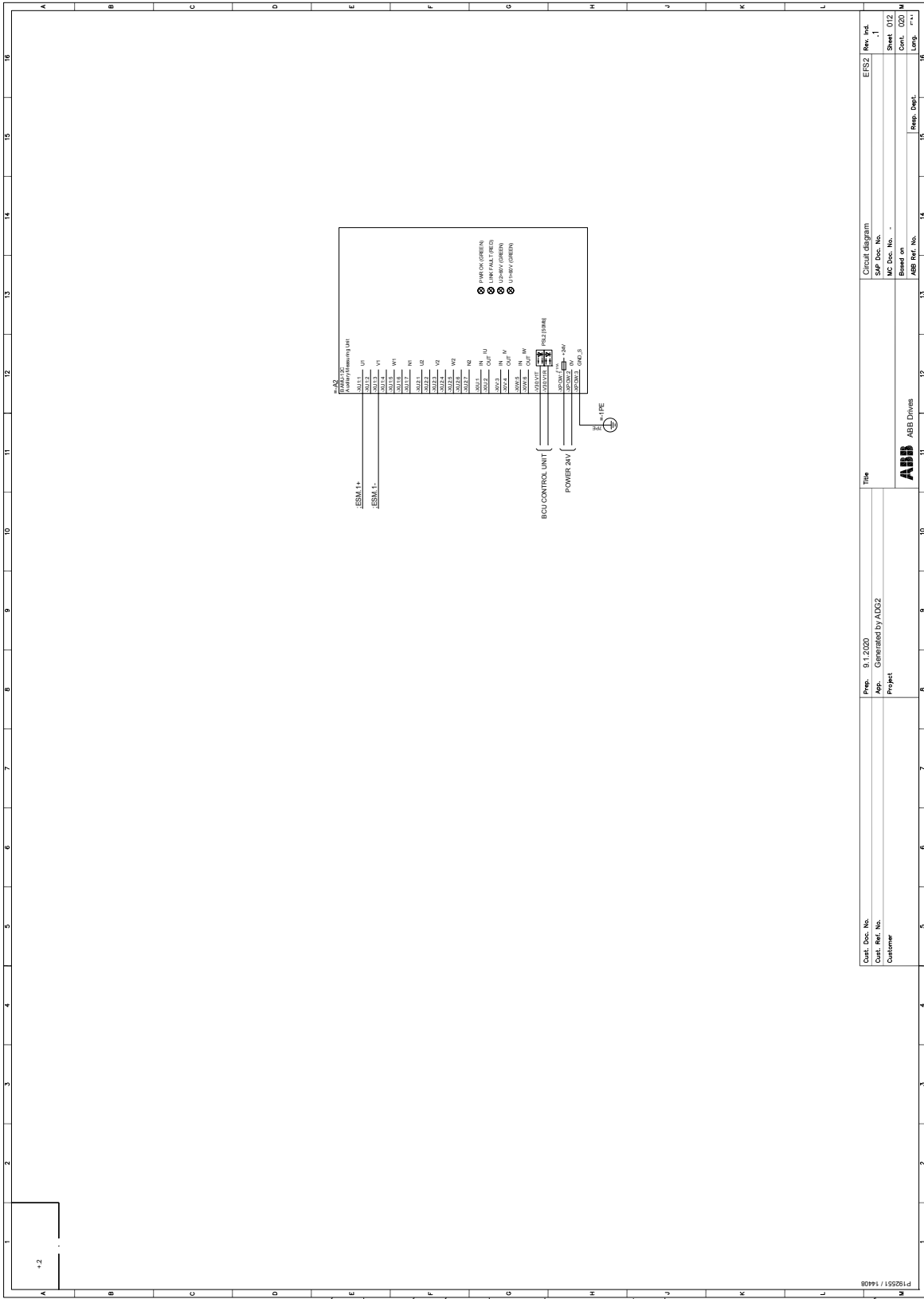


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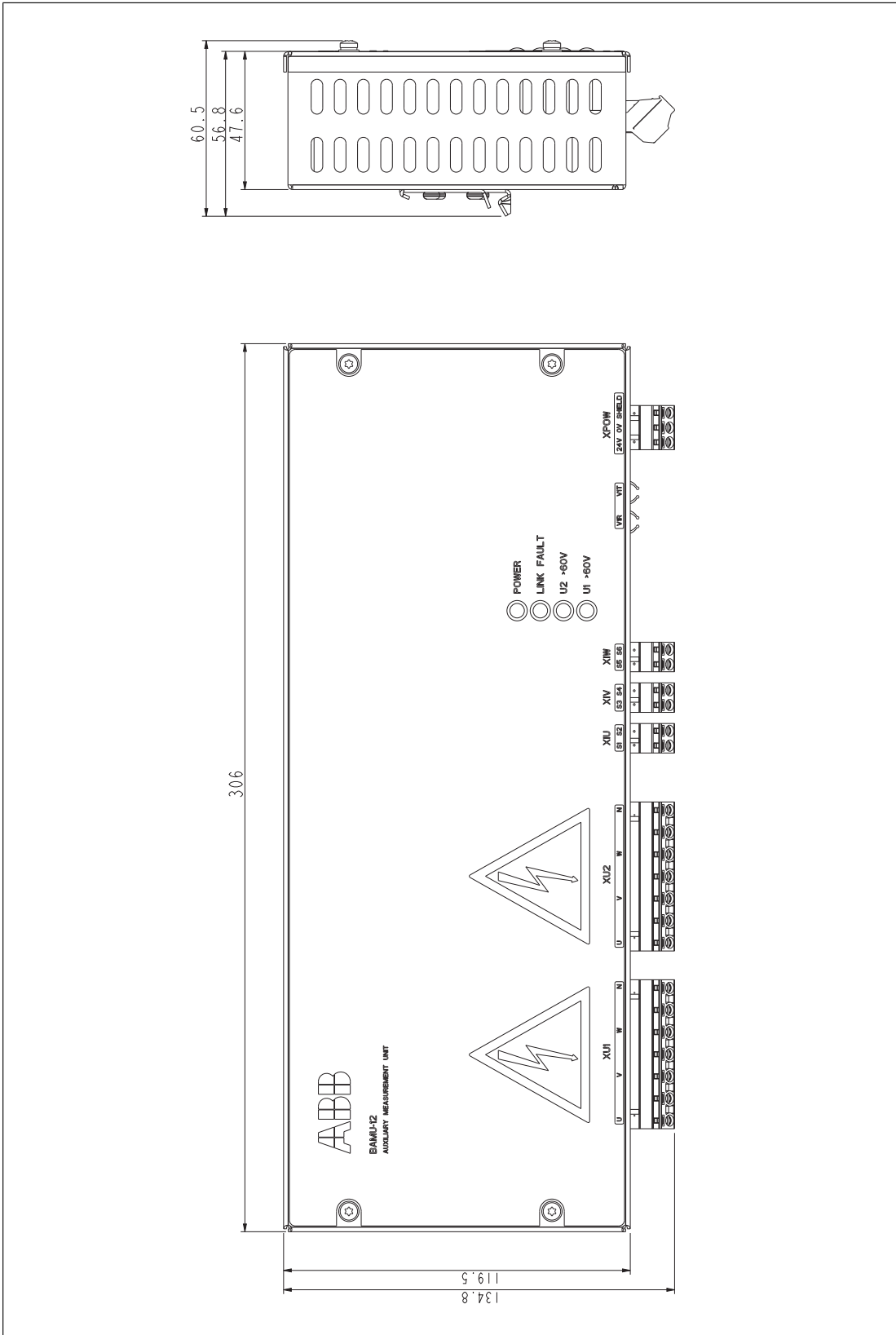
A large, bold, black number '4' is centered within a light blue square with rounded corners. The square is positioned in the upper right quadrant of the page.

Technical data

Contents of this chapter

The chapter contains the technical data of BAMU-12C auxiliary measurement unit.

Dimension drawing



Dimensions in mm

1 mm = 0.0394 in

Specifications

Input voltage	24 V DC \pm 10%
Power consumption (24DVC supply)	150 mA
Overvoltage category	OVC III
Pollution degree	PD2
AC/DC voltage limits	1250 Vrms/DC, 2.0 kV peak
Allowed assembly position	Horizontal
Distances to other components	690 V AC basic insulation (8 mm [0.31 in]) from control electronics

Ambient conditions

BAMU-12C auxiliary measurement unit measurement unit complies with RoHS directive (2002/95/EC).

Operating temperature without self-heating: 0... +70 °C (32...158 °F)

Storage temperature: -40...+85 °C (-40...185 °F)

Maximum relative humidity: 90% (non-condensing)

Maximum operating altitude: 4000 m (13123 ft)

Voltage measurement specification

Number	Two identical, independent measurements channels. Both channels include three (phase) voltage inputs and neutral input (U1, V1, W1, N1 and U2, V2, W2, N2)
Measurement range	\pm 2.0 kV peak (phase-to-phase). Maximum voltage connected to the voltage measurement terminals is 600/690 V (DVC C).
Typical error	<0.5% at 25 °C (77 °F)
Maximum error	<1.25% over full temperature range

Current measurement specification

Range	\pm 2.5 A peak
Input impedance	<0.5 ohm
Typical error	<0.5% at 25 °C (77 °F)
Maximum error	<1.25% over full temperature range

Related standards

- Safety requirements: EN 50178 Electronic equipment for use in power installations
 - IEC 61800-5-1 Semiconductor power converters for adjustable frequency drive systems
 - UL 508 C Industrial Control Equipment
 - EMC emission: EN/IEC 6100-6-4:2007 Emission standard for industrial environments
 - EMC immunity: EN/IEC 61000-6-2:2005 Immunity for industrial environments
-

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.



www.abb.com/drives



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