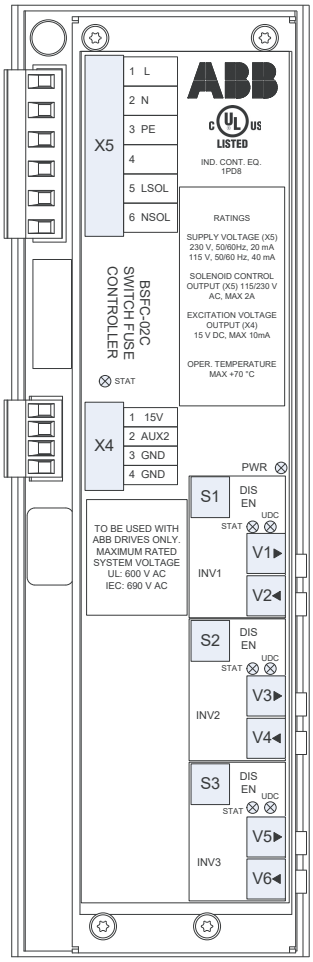
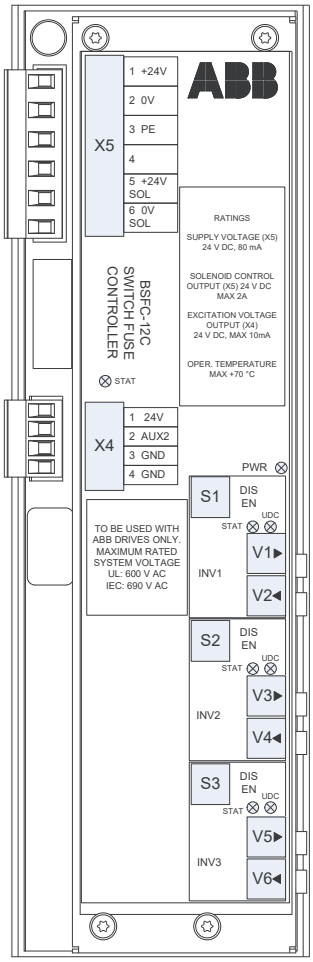
Layout

BSFC-02C



BSFC-12C



X4	Switch status monitoring (Q10 and Q11).
X5	Power supply input for the charging controller and operating voltage output for DC switch-disconnector locking solenoid.
V1…V6	Fiber optic links to inverters 1, 2 and 3.
S1…S3	Enable switches for charging circuit monitoring (inverters 1, 2 and 3). **Note:** The charging controller does not allow the closing of the DC switch-disconnector unless monitoring is enabled for at least one inverter module.
STAT 1…3	Inverter charging status LEDs (3 pcs).
U_{DC} 1…3	Inverter “ready for start” LEDs (3 pcs).
PWR	Charging controller power on LED.

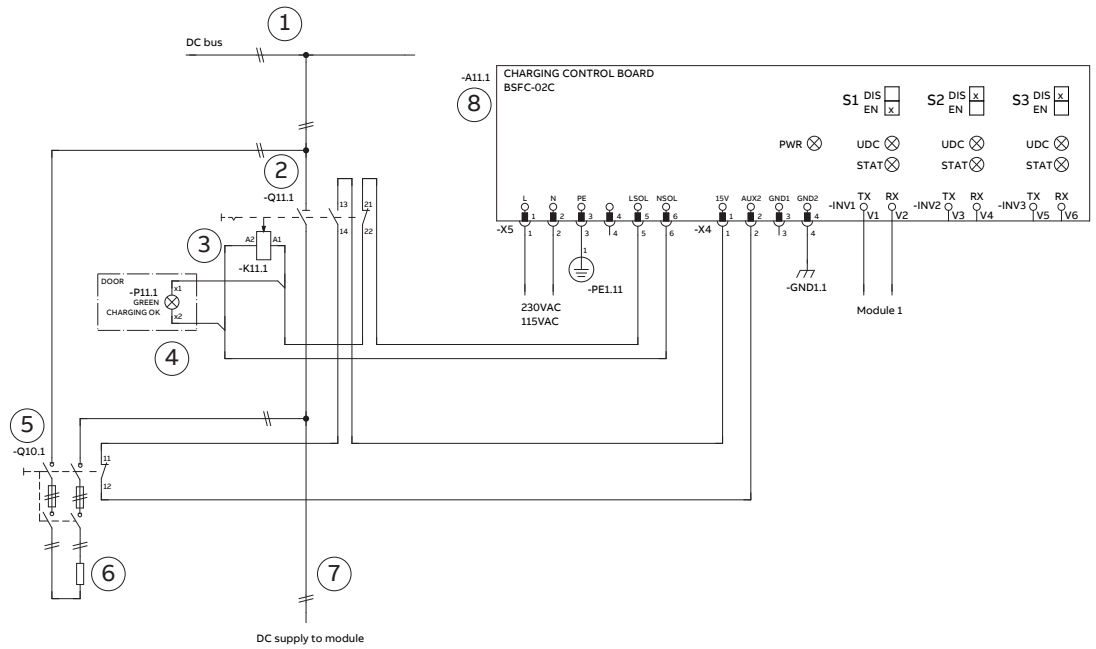
Connectors

BSFC-02C

Connector		Description
X4		Switch status monitoring (inverter DC switch-disconnector (Q11), and inverter charging switch (Q10)).
1	+15 V	Supply voltage for switch status monitoring circuit (Q10 and Q11). Max. 10 mA
2	AUX2	Digital input monitoring the switch status (Q10 and Q11).
3	GND	Ground for control electronics
4	GND	Ground for control electronics
X5		Power supply input & DC switch-disconnector [Q11] locking solenoid control output
1	L	External 230/115 V AC input
2	N	Neutral
3	PE	Protective Earth
4	NC	Not connected
5	LSOL	230/115 V AC control voltage for DC switch-disconnector [Q11] locking solenoid
6	NSOL	Neutral for switch Q11 locking solenoid
V1	INV1 EN	Optical transmitter (start enable to Inverter 1)
V2	$U_{DC}1$	Optical receiver (U_{DC} > 80% acknowledgement from Inverter 1)
V3	INV2 EN	Optical transmitter (start enable to Inverter 2)
V4	$U_{DC}2$	Optical receiver (U_{DC} > 80% acknowledgement from Inverter 2)
V5	INV3 EN	Optical transmitter (start enable to Inverter 3)
V6	$U_{DC}3$	Optical receiver (U_{DC} > 80% acknowledgement from Inverter 3)

Connections of the DC supply circuit

BSFC-02C, air-cooled modules



1	Drive DC bus
2	DC switch-disconnector
3	Solenoid that locks the manual operation mechanism
4	Indicator lamp on the cabinet door
5	Charging switch fuse
6	Charging resistors
7	BSFC-02C charging controller
8	Module DC input connection

Inverter power switch-on sequence

The terms and designations used in the table below refer to the diagrams in section Connections of the DC supply circuit.

1. User turns charging switch [Q10] to position 1 (ON).
   - Charging of the inverter capacitors starts through the charging resistors [R10]:
     - Auxiliary contact 1-2 of charging switch [Q10] opens.
     - The charging controller prevents the starting of inverters and the closing of DC switch-disconnector [Q11].
     - The charging controller monitors inverter **INV UDC** and **PWR**$_{DC}$ signals through fiber-optic link(s) **INV1**…**INV3**.
     - **INV STAT** and **PWR** LEDs are on.
   - When the charging is complete (inverter DC voltage over 80% of nominal):
     - The charging controller receives a U_{DC} signal from the inverter(s).
     - The charging controller connects operating voltage to the solenoid of DC switch-disconnector [Q11]. The solenoid releases the locking mechanism, allowing operation of the handle.
     - **INV UDC** and **PWR** LEDs are on.
     - The **Charging OK** light [P11] on the cabinet door is on, indicating that the operation of the DC switch-disconnector [Q11] is allowed.
2. User turns DC switch-disconnector [Q11] to position 1 (ON).
   - Main contacts 1-2…7-8 of DC switch-disconnector [Q11] connect inverter(s) to DC power supply.
   - Auxiliary contact 13-14 of DC switch-disconnector [Q11] closes.
   - Auxiliary contact 21-22 of DC switch-disconnector [Q11] opens, de-energizing the solenoid. The **Charging OK** light [P11] on the cabinet door goes off.
   - **INV UDC** and **PWR** LEDs are on.
3. User turns charging switch [Q10] to position 0 (OFF).
   - The charging controller receives a “main switch ON, charging switch OFF” signal through terminal AUX2.
   - The charging controller sends an enable signal to inverter through the fiber-optic link.
   - **INV UDC** and **PWR** LEDs are on.

Inverter power switch-off sequence



⚠WARNING Do not open the DC switch-disconnector [Q11] while the inverters are loaded.

The terms and designations used in the table below refer to the diagrams in section Connections of the DC supply circuit.

1. User stops the inverters.
2. User turns DC switch-disconnector [Q11] handle to position 0 (OFF).
   - DC switch-disconnector [Q11] disconnects inverter(s) from the DC power supply.
   - Contact 13-14 of DC switch-disconnector [Q11] switches off the AUX2 signal to the charging controller. The charging controller switches INV1 EN signal off, which disables inverter start.
   - Auxiliary contact 21-22 closes, energizing the solenoid of DC switch-disconnector [Q11]. The solenoid releases the locking mechanism of the DC switch-disconnector. Operation of the handle is possible as long as inverter DC voltage remains high.
   - **INV UDC** and **PWR** LEDs are on. The **Charging OK** light [P11] on the cabinet door is on.
   - The inverter DC voltage decreases to zero gradually. When below 80% of nominal:
     - Inverters switch off UDC signals from the charging controller.
     - The charging controller switches off the operating voltage to solenoid of DC switch-disconnector [Q11]. Locking mechanism activates, which prevents turning the handle into position 1 (ON).
     - **INV UDC** and **PWR** LEDs are on.

Locking solenoid control

The DC switch-disconnector [Q11] has a locking solenoid, which prevents the operation of the handle when the solenoid is de-energized. You can only close the DC switch-disconnector [Q11] when:

- DC voltage of all inverter modules monitored by the charging controller unit exceeds 80% of the nominal value. (The charging controller receives U_{DC} signals from inverters and energizes the solenoid).
- DC switch-disconnector [Q11] handle is in position 0 (OFF).

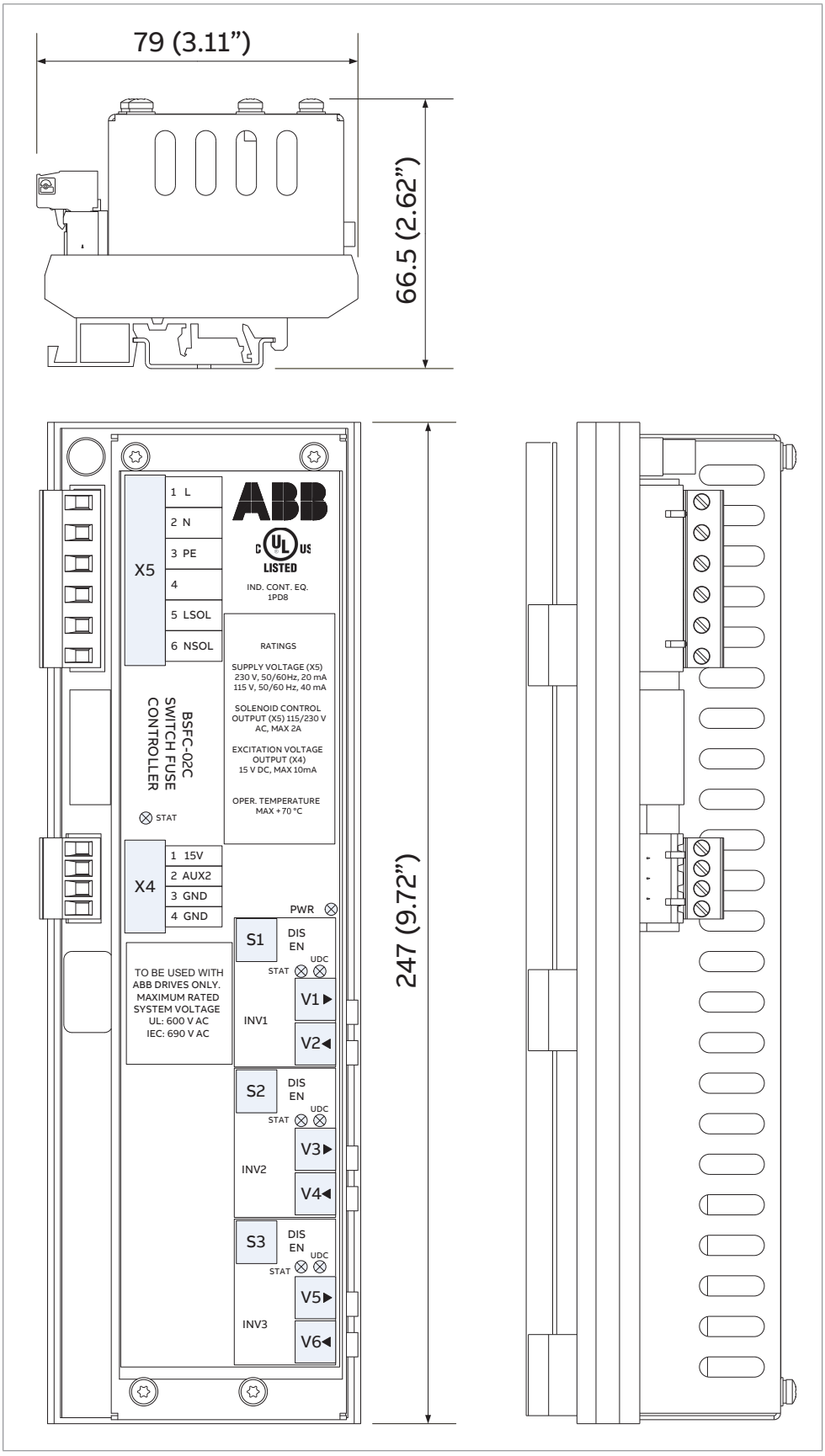
	BSFC-02C	BSFC-12C
Operating temperature	Free air circulation: 0…70 °C (32…158 °F)	
Dimensions (L × W × D)	247 mm × 79 mm × 66.5 mm (9.72 in × 3.11 in × 2.62 in)	
Mounting	35 mm mounting rail EN 50022, vertical or horizontal	
Other features	UL Listed Accessory according to UL 61800-5-1 Edition 1	
	Conformal coating as standard	

Handling fiber-optic cables

NOTICE Obey these instructions. If you ignore them, equipment malfunction and damage to the fiber-optic cables can occur.

- Handle the fiber-optic cables with care.
- When you disconnect the cables, always hold the connector, not the cable itself.
- Do not touch the ends of the optical fibers with bare hands, because the ends are very sensitive to dirt.
- Do not bend the fiber-optic cables too tightly. The minimum permitted bend radius is 35 mm (1.4 in).

BSFC-02C


79 (3.11”)
66.5 (2.62”)
247 (9.72”)
X5
1 L
2 N
3 PE
4
5 LSOL
6 NSOL
LISTED
IND. CONT. EQ.
1PD8
RATINGS
SUPPLY VOLTAGE (X5)
230 V, 50/60Hz, 20 mA
115 V, 50/60 Hz, 40 mA
SOLENOID CONTROL
OUTPUT (X5) 115/230 V
AC, MAX 2A
EXCITATION VOLTAGE
OUTPUT (X4)
15 V DC, MAX 10mA
OPER. TEMPERATURE
MAX +70 °C
BSFC-02C
SWITCH FUSE
CONTROLLER
STAT
X4
1 15V
2 AUX2
3 GND
4 GND
PWR
TO BE USED WITH
ABB DRIVES ONLY.
MAXIMUM RATED
SYSTEM VOLTAGE
UL: 600 V AC
IEC: 690 V AC
S1
DIS
EN
UDC
STAT
V1
INV1
V2
S2
DIS
EN
UDC
STAT
V3
INV2
V4
S3
DIS
EN
UDC
STAT
V5
INV3
V6