SIFANG

CSC-280 Series
Multifunction Protection IED
Product Guide

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Note: the company keeps the right to perfect the instruction. If equipment do not agree with the instruction at anywhere, please contact our company in time. We will provide you with corresponding service.

This document has been carefully checked. If the user nevertheless detects any errors, he is asked to notify us as soon as possible.

The data contained in this manual is intended solely for the IED description and is not to be deemed to be a statement of guaranteed properties. In the interests of our customers, we constantly seek to ensure that our products are developed to the latest technological standards as a result it is possible that there may be some differences between the hardware/software product and this information product.

Manufacturer:
Beijing Sifang Automation Co., Ltd.

Tel: +86 10 62962554, +86 10 62961515 ext. 8998
Fax: +86 10 82783625
Email: sf_sales@sf-auto.com
Website: http://www.sf-auto.com
Add: No.9, Shangdi 4th Street, Haidian District, Beijing, P.R.C.100085

Overview

CSC-280 series are compact, reliable multifunction protection IED (Intelligent Electronic Device), which are able to be applied for protection, control and measurement for following applications:

- Applicable in subtransmission network and distribution network, with solidly earthed (grounded), low-resistance earthed, isolated or compensated neutral point
- Protection of feeders, capacitors, distribution transformers, bus coupler, motor, etc.
- Used as backup protection IED for lines, transformers, reactors and motor
- Providing control and monitoring functions of the circuit breakers, isolator
- Supporting all functionalities required for automation system

The wide application flexibility and integration of the protection, monitoring and control functions in one device makes the IED an excellent solution for both new installations and retrofitting of the existing stations.

Features

- Extensive multifunction IED including protection, control and monitoring functions
- Three pole tripping required in sub-transmission and distribution network
- A complete protection functions library
- Bus VT secondary circuit connection/disconnection
- Independent CB open/close circuit
  - Opening and closing lockout circuit
  - Opening and closing circuit supervision
  - CB status indication
- CB operating status supervision
- Self-supervision
- Complete and massive reports recording, trip reports, alarm reports, startup reports and operation reports. Any kinds of reports can be stored no less than 40 items, and be memorized in case of power disconnection
- Up to two electric Ethernet ports can be selected to communicate with substation automation system
- Up to two electric RS-485 port is able to communicate with substation automation system by protocol
- Support IEC61850, IEC60870-5-103, DNP 3.0 and MODBUS.
- Time synchronization via network(SNTP), pulse and IRIG-B mode
- Versatile human-machine interface
- Multifunctional software tool for setting, monitoring, fault recording analysis, configuration, etc.

Products

Model	Protection IED	Application
CSC-281-EC	Multifunction protection IED	For MV feeder, capacitor, and auxiliary transformer;
CSC-282-EC	Transformer protection IED	For 2 winding transformer;
CSC-283-EC	Motor protection IED	For motor;
CSC-284-EC	Line differential protection IED	For feeder in transmission or distribution
CSC-285-EC	Voltage protection IED	For load shedding, grid disconnection and VT;

Protection functions

Function	ANSI Code	CSC-281	CSC-282	CSC-283	CSC-284	CSC-285
Line differential protection	87L				■	
Transformer differential protection	87T		■			
Restricted earth fault protection	87REF		□			
Directional overcurrent protection	67	■			■	
Overcurrent protection	50,51	□	□		□	
Directional earth fault protection	67N	■		■	■	
Earth fault protection	50N,51N	□	□		□	
Directional sensitive earth fault protection	67Ns	□			□	
sensitive earth fault protection	50Ns,51Ns	□			□	
Negative-sequence overcurrent protection	46			■		
Undercurrent protection	37			■		
Manual/Automatic switch-onto-fault protection	50SOTF	■			■	
Thermal overload protection	49	■	■	■	■	
Overvoltage protection	27	□		■	□	■
Under voltage protection	59	□		■	□	■
Displacement voltage protection	59N	□		■	□	■
Negative sequence overvoltage protection	47			■		
Auto-reclosing		■			■	
Synchro-check & voltage check	25	□			□	
Overfrequecy protection	81O	□		□	□	
Underfrequecy protection	81U	□		□	□	
Frequency change of rate protection				□		
Long start protection	48			■		
Motor stall protection				■		

Function

TE time protection protection				■		
Reverse phase sequence protection	47			■		
Circuit breaker protection	50BF	■			■	
Load shedding by underfrequency	LS-81U					■
Grid disconnection by overfrequency	GD-81O					■
VT secondary circuit supervision	97FF	■		■	■	■
CT secondary circuit supervision						

Control functions

Description
Circuit breaker, isolator and other switching devices control
Opening and closing lockout circuit
Tripping and closing circuit supervision

Monitoring functions

Description
Status of circuit breaker, isolator and other switching device monitoring
Circuit breaker operating status supervision
Auxiliary contacts of circuit breaker supervision
Self-supervision
Disturbance recorder, max. 5s in 1 recording, up to 32 recordings
Circuit breaker spring status supervision

Station communication

Description
Front communication port
RJ45 Ethernet port

Rear communication port
0-2 isolated electrical RS485 communication ports
1 Ethernet electrical/optical communication ports
1 Time synchronization port
Communication protocols
Ethernet communication: IEC 61850, DNP 3.0; Serial communication: IEC 60870-5-103, MODBUS;

Remote communication for protection

Description
Optical communication ports for protection
2 LC optical communication ports for line differential protection or pilot wire differential protection via CSC-186D communication convertor Note: for CSC-284-EC only.

Hardware

Human-machine Interface (HMI)

The human-machine interface is simple and easy to understand – the whole front plate is divided into zones, each of them with a well-defined functionality:

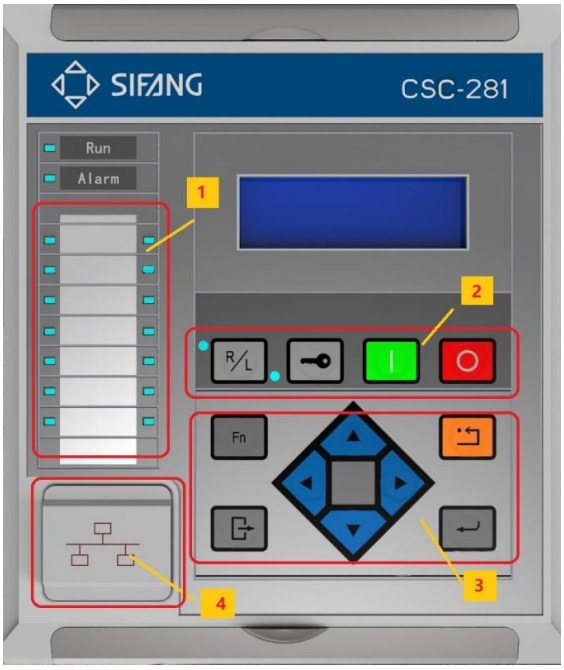


Figure 1 The front plate of IED

1 14 configurable LEDs

2 Function keys

3 Navigation keys

4 Ethernet port

Rear view

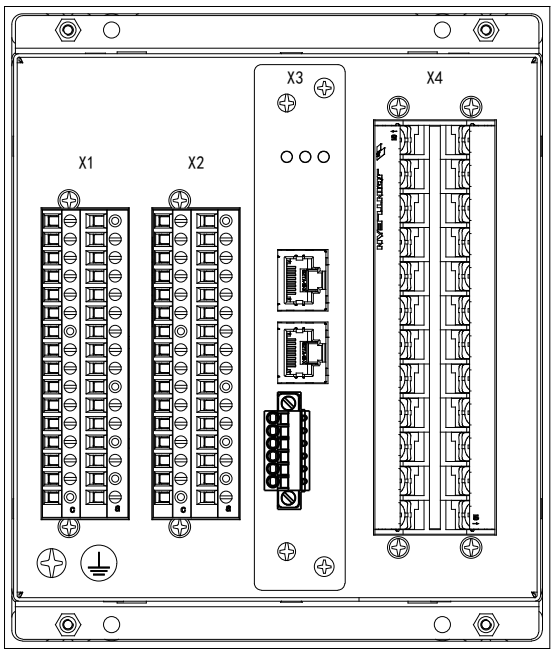


Figure 2 The rear view of IED

Transformer Input Module (TIM)

The analogue input module is used to galvanically separate and transform the secondary currents and voltages generated by the instrument transformers.

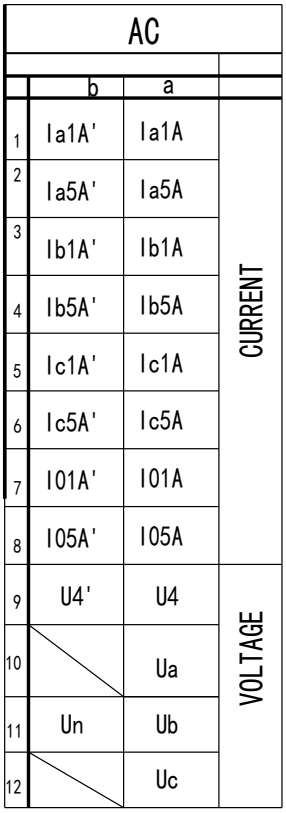


Figure 3 Terminal diagram of transformer input module

Communication module (COM)

The module provides synchronization and communication ports as following.

- 2 isolated electrical/optical fiber Ethernet ports
- 1 RS485 serial communication port
- 1 time synchronization port

The IED is able to meet the demands of different substation automation system and RTU at the same time.

The pulse, IRIG-B or SNTP time synchronization mode can be applied.

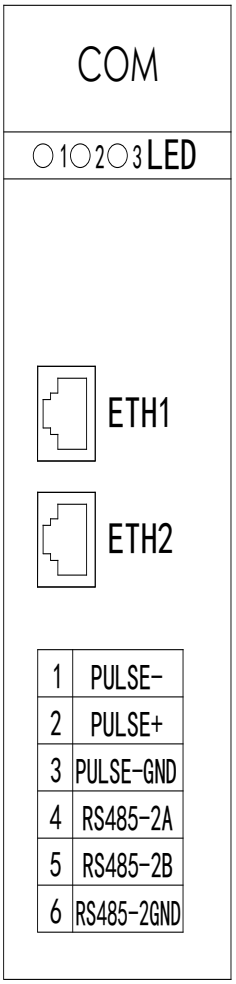


Figure 4 Terminal diagram of communication module

Hardware

Binary input & output module (BIO)

This module provides tripping outputs with tripping circuit supervision and signaling outputs for protection functions and binary inputs as following.

- 1 heavy duty output relays, with tripping circuit supervision
- 4 NO general output relays for tripping, control or signaling
- 1 NO/NC general output relay
- 8 binary inputs
- 1 analog input (optional)
- 2 analog outputs (optional)

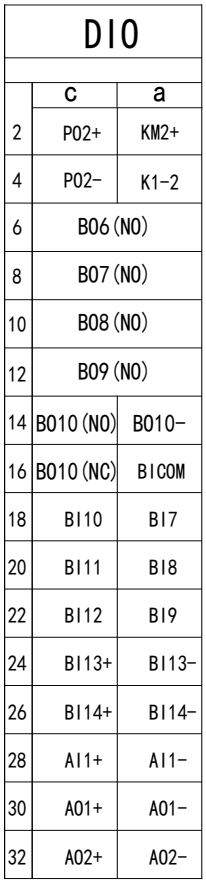


Figure 5 Terminal diagram of binary output & input module

Note: The BI14 will be occupied when TCS function is used.

Power Supply Module (PSM)

The power supply module does not provides auxiliary power only, but also outputs, binary inputs and RS485 series communication port, listed as following.

- 1 heavy duty output relays, with tripping circuit supervision
- 4 NO general output relays
- 1 NC internal failure alarm relay
- 6 binary inputs
- 1 RS485 serial communication port

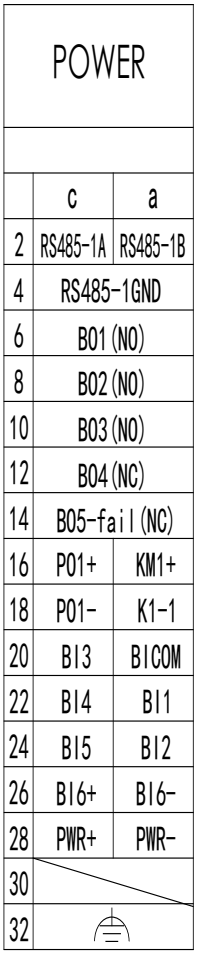


Figure 6 Terminal diagram of power supply module

Note: The BI6 will be occupied when TCS function is used.

Layout and dimension

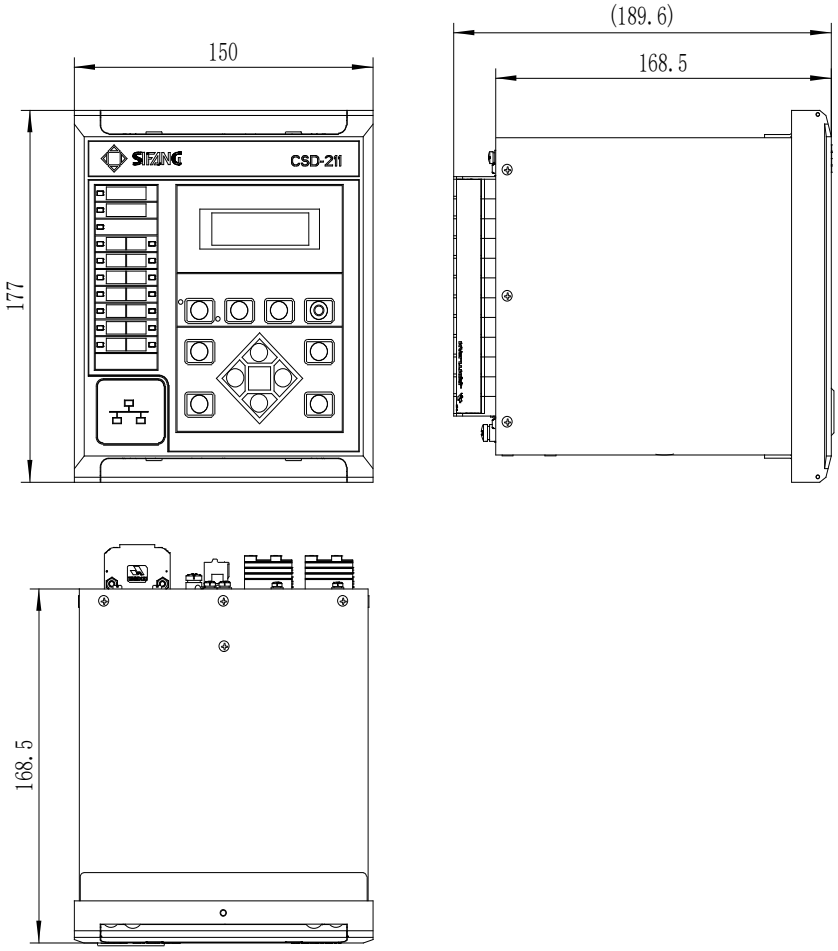


Figure 7 Case of CSC280 series protection IED

Hardware

Typical hardware scheme	CSC-28x-EC-A	CSC-28x-EC-B	CSC-28x-EC-C
AC current inputs	3	3	3
AC normal/sensitive current input	1	1	1
AC voltage inputs	4	4	
Analog inputs	1	1	
Analog outputs	2	2	
Binary inputs	14	6	6
Power outputs with TCS	2	1	1
General outputs (NO)	8	4	4
General outputs (NO/NC)	1		
Device failure alarm (NC)	1	1	1
RS-485 ports	2	2	1
Ethernet ports	2	2	
Time synchronization port	1	1	
Configurable LEDs	14	14	14
Open/Close button	1/1	1/1	1/1

AC current measurement

Item	Data
Rated current Ir	1A and 5A
Operating range of protection CT	(0 ~ 100) I_r
Measuring range of protection CT	(0.05 ~ 40) I_r
Reading Accuracy for protection CT	±1%I at I> I_r ±0.5%I_r at I≤I_r
Thermal overload capacity of protection CT IEC60255-27	4 I_r Continuously; 30 I_r for 10s 100 I_r for 1s
Power consumption (per phase)	≤0.15VA at In=1A; ≤0.3VA at In=5A
Dynamic thermal overload capacity	250 I_r for 1.5 cycle

AC voltage measurement

Item	Data
Rated voltage $V_{r.ph-ph}$ IEC60255-1	100V ~ 120V, settable;
Measuring range V_{ph-e}	0.1V ~ 180V
Reading accuracy V_{ph-e}	±1% at >10%$V_{r.ph-e}$. 0.03V at ≤10% $V_{r.ph-e}$
Power consumption IEC60255-27 DL/T478-2013	≤ 0.05VA/Phase, at $V_{r.\ ph-ph}$ = 110V
Thermal overload capacity V_{ph-e} IEC60255-27 DL/T478-2013	180V, continuously; 400V for 60s.

Other measurement

Item	Data
Rated frequency	50Hz / 60Hz, settable
Measuring range of frequency	±10% Fn
Reading accuracy of frequency	±0.02Hz
Reading accuracy of angle	±1°, at rated AC voltage and AC current
Reading accuracy of power and reactive power	1%, at rated voltage and current

Binary inputs

Item	Data
Rated voltage $V_{r.aux}$ IEC60255-1	110V/125V/220V/250V DC, settable; Or 24V/48V DC settable;
Max. permissible voltage IEC60255-1	300V, at rated 110V/ 125V/ 220V/ 250V DC; 62V, at rated 24V/ 48V;
Operating Threshold IEC60255-1	≥70% $V_{r.aux}$, guarantee operating ≤55% $V_{r.aux}$, guarantee not to operating
Pickup time	Approx. 1ms, intrinsic
Dropout time	Approx. 2ms, intrinsic
Power consumption IEC60255-1	≤0.1 W/input, at $V_{r.aux}$=110V DC ≤0.5 W/input, at $V_{r.aux}$=220V DC

Output relay

Item	Data
Rated contact voltage IEC60255-1	24V, 48V, 110V, 220V DC 100V, 220V AC
Maximum contact voltage IEC60255-1	250V AC/DC
Current carrying capacity IEC60255-1	General relay: 5A continuous, 10A, 1s on,15s off 30A, 200ms on,15s off Power output relay: 10A continuous, 30A, 200ms on,15s off
Making capacity IEC60255-1	General relay: 1100W(DC) at L/R>40ms 1000VA(AC) Power output relay: 1250W (DC) 2000VA(AC)

Specification

Breaking capacity IEC60255-1	General relay: 0.2A, at $V_{r.aux}$=220V, L/R≤40ms; 0.4A, at $V_{r.aux}$=110V, L/R≤40ms; 1000VA, at $V_{r.AC}$; Power output relay: 0.25A, at $V_{r.aux}$=220V, L/R≤40ms; 0.45A, at $V_{r.aux}$=110V, L/R≤40ms; 1200VA, at $V_{r.AC}$;
Pick up time IEC60255-1	General relay: ≤5ms Power output relay: ≤5ms
Drop off time IEC60255-1	≤10ms

Auxiliary power

Item	Data
Rated voltage $V_{r.aux}$ IEC60255-1	100V to 250V DC/AC 24/48V DC
Input voltage range IEC60255-1	±%20 $V_{r.aux}$
Static power consumption IEC60255-1	≤ 18W
Maximum load power consumption IEC60255-1	≤ 20W

Ethernet communication

Item	Data
Max. ports number	3
Electrical Ethernet port type	RJ45
Maximum transmission distance of Ethernet cable	100M
Optical Ethernet port type	LC
Fiber optic cable type	Multi-mode
Optic wavelength	1310 nm
Optic received sensitivity	-34 dBm
Emitter electric level	>-11 dBm;
Maximum transmission distance of optical fiber	2kM
Transmission rate for IEC61850	100Mbit/s
Transmission rate for DNP 3.0	100Mbit/s

Serial communication

Item	Data
Number	2
Port type	Extract twisted pair
Maximum transmission distance	1.0km
Voltage withstand test	500V earthing AC voltage
Transmission rate for IEC60870-5-103	Default setting 9600 bps; Minimum: 1200bps; maximum: 19200bps

Time synchronization

Item	Data
Synchronization mode	SNTP IRIG-B time sync Minute or second Pulse
IRIG-B signal format	IRIG-B000
IRIG-B Port type	Twisted-pair connection or optical fibers
IRIG-B signal voltage level	Differential signal input

Inter-substation communication

Item	Data
Ports number	2
Fiber optic cable type	Single-mode
Optic wavelength	1310 nm, when the transmission distance <60 km 1550 nm, when the transmission distance >60 km
Optic received sensitivity	-34 dBm

Emitter electric level	>-11 dBm, at length <40 kM >-4 dBm, at length 40~60 kM
Fiber optic connector type	LC
Data transmission rate	64 kbit/s, G703 2,048 kbit/s, G703-E1
Max. transmission distance	60 kM

Product safety test

Item	Data
Over voltage category IEC60255-27	Category III
Pollution degree IEC60255-27	Degree 2
Insulation IEC60255-27	Basic insulation
Degree of protection (IP) IEC60255-27 IEC60529	Front plate: IP54 Side plate:IP52 Rear plate: IP30
Power frequency high voltage withstand test IEC60255-5 EN60255-5 ANSIC37.90 GB/T15145-2001 DL/T478-2013	2KV, 50Hz, at rated voltage > 63V, Tested on: ◆ Auxiliary power supply port; ◆ Enclosure port; ◆ Input and output ports; ◆ Functional earth port; 500V, 50Hz, at rated voltage ≤63V, Tested on: ◆ Communication port;
Impulse voltage IEC60255-5 IEC60255-27 EN60255-5 ANSIC37.90 GB/T15145-2001 DL/T478-2013	5kV, at rated voltage>60V, Tested on: ◆ Auxiliary power supply port; ◆ Enclosure port; ◆ Input and output ports; ◆ Functional earth port; 1kV, at rated voltage≤60V, tested on:
	◆ Communication port;
Insulation resistance IEC60255-5 IEC60255-27 EN60255-5 ANSIC37.90 GB/T15145-2001 DL/T478-2013	≥100MΩ,500V, ⎓
Protective bonding resistance IEC60255-27	≤0.1Ω
Fire withstand/flammability IEC60255-27	Class V2

EMC test

Item	Data
Electrostatic discharge immunity test IEC60255-26:2013 IEC61000-4-2	Criteria A; Level IV; ±6kV contact discharge; ±8kV air gap discharge;
Radiated, radio-frequency electromagnetic field immunity test IEC60255-26:2013 IEC61000-4-3	Criteria A; Class IV; 10 V/m(r.m.s.), 80%,AM (1 kHz) Frequency sweep: 80 MHz – 1 GHz; 1.4 GHz – 2.7 GHz spot frequencies (MHz): 80; 160; 380; 450; 900; 1850; 2150.
Electrical fast transient/burst immunity test IEC60255-26:2013, IEC61000-4-4 ANSI/IEEE C37.90.1	Class A 4KV peak voltage; Tested on: ◆ Auxiliary power supply port; ◆ Enclosure port; ◆ Input and output ports; ◆ Functional earth port; 2KV peak voltage; Tested on: ◆ Communication port;
Surge (impact) immunity test	Class A，Level IV 4.0kV, Line-to-earth;

Specification

IEC60255-26:2013, IEC61000-4-5	2.0kV, Line-to-line; Tested on: ◆ Auxiliary power supply port; ◆ Enclosure port; ◆ Input and output ports; ◆ Functional earth port; 4.0kV, Line-to-earth; Tested on: ◆ Communication ports;
Test for Immunity to conducted disturbances, induced by radio-frequency fields IEC60255-26:2013 IEC61000-4-6	10 V/m(r.m.s.), 80%,AM (1 kHz) Frequency sweep: 150kHz–80MHz Spot frequencies: 27MHz and 68MHz; Tested on: ◆ Auxiliary power supply port; ◆ Input and output ports; ◆ Functional earth port; ◆ Communication ports;
Power frequency magnetic field immunity test IEC60255-26：2013 IEC61000-4-8	Class V 30A / m Continuous; 300A/m, from 1s to 3s; Test on: ◆ Enclosure ports;
Power frequency immunity test IEC60255-26:2013; IEC61000-4-16	Zone A 300V, CM; 150V, DM; Test on: ◆ Binary input ports;
Slow damped oscillatory wave immunity test (1MHz) IEC60255-26：2013 IEC61000-4-18 ANSI/IEEEC37.90.1	Class III 2.5 kV CM ; 1 kV DM; Tested on: ◆ Auxiliary power supply port; ◆ Input and output ports; 1 kV CM ; 0 kV DM; Tested on: ◆ Communication ports
Fast damped oscillatory wave immunity test IEC61000-4-18	Level 4 4 kV, at 3MHz, 10MHz, 30MHz.

	Tested on: ◆ Auxiliary power supply port; ◆ Input and output ports;
Pulse magnetic field immunity IEC61000-4-9	Class V 1000A/m
Damped oscillation magnetic field immunity test IEC61000-4-10	Class V 100A/m
Conducted emission IEC60255-26:2013 CISPR22	Class A; 0.15MHz to 0.50MHz; 0.50MHz to 30MHz; Tested on: ◆ Auxiliary power supply port;
Radiated emission IEC60255-26：2013 CISPR11	Class A; 30MHz to 230MHz; 230MHz to 1GHz;
DC voltage dips IEC60255-26:2013 IEC 61000-4-11 IEC 61000-4-29	20 ms at 0% residual voltage; 200 ms at 40% residual voltage; 500 ms at 70% residual voltage;
AC voltage dips IEC60255-26:2013 IEC 61000-4-11 IEC 61000-4-29	At 60Hz: 1.0 cycle at 0% residual voltage; 12 cycle at 40% residual voltage,; 30 cycle at 70% residual voltage; At 50Hz: 1.0 cycle at 0% residual voltage; 10 cycle at 40% residual voltage,; 25 cycle at 70% residual voltage;
DC voltage interruptions IEC60255-26：2013 IEC 61000-4-11 IEC 61000-4-29	5 s, at 0% residual voltage;

AC voltage interruptions IEC60255-26：2013 IEC 61000-4-11 IEC 61000-4-29	At 60Hz: 300 cycle at 0% residual voltage; At 50Hz: 250 cycle at 0% residual voltage;
A.C. component in d.c. (ripple) IEC60255-26:2013 IEC 61000-4-17	15%, at 100Hz, twice rated frequency; 15%, at 120Hz, twice rated frequency;
Gradual shutdown/ start-up (for d.c. power supply) IEC60255-26:2013	60 s shut down ramp 5 min power off 60 s start-up ramp
DC voltage reverse polarity	1 min

Contact performance test of general relay

Item	Data
Mechanical endurance, Unloaded IEC60255-1	Unloaded, 10,000 times (switching frequency is 3Hz); Making, ≥1000; Breaking, ≥1000
Current carrying capacity IEC60255-1	5A continuous, 30A, 200ms on,15s off
Making capacity IEC60255-1	1000W(DC) at $V_{r.aux}$, L/R>40ms 1000VA(AC)
Breaking capacity IEC60255-1	30W, at $V_{r.aux}$, L/R≤40ms; 1000VA, at $V_{r.AC}$;
Contact circuit resistance IEC60255-1	30mΩ
Contact insulation test (AC dielectric strength) IEC60255-1	AC1000V,1min
Maximum temperature that operation allows IEC60255-1	70℃

Contact performance test of power output relay

Item	Data
Mechanical endurance, Unloaded IEC60255-1	Unloaded, 10,000 times (switching frequency is 3Hz); Making, ≥1000; Breaking, ≥1000
Current carrying capacity IEC60255-1	10A continuous, 30A, 200ms on,15s off
Making capacity IEC60255-1	1250W(DC) at $V_{r.aux}$, L/R>40ms 2000VA(AC)
Breaking capacity IEC60255-1	0.25A, at $V_{r.aux}$=220V, L/R≤40ms; 0.45A, at $V_{r.aux}$=110V, L/R≤40ms; 1200VA, at $V_{r.AC}$;
Contact circuit resistance IEC60255-1	30mΩ
Contact insulation test (AC dielectric strength) IEC60255-1	AC1000V,1min
Maximum temperature that operation allows IEC60255-1	70℃

Mechanical test

Item	Data
Sinusoidal vibration response test IEC60255-21-1 EN60255-21-1	Class 1 10-60 Hz: ± 0.035 mm amplitude 60-150 Hz: 0,5g acceleration Frequency sweep: 1 octave/min 1 sweep cycle in each axis Relay energized
Sinusoidal vibration endurance test IEC60255-21-1 EN60255-21-1	Class 1 10 Hz to 150 Hz: 1 g 20 sweep cycle in each axis Relay non-energized
Shock response test IEC60255-21-2	Class 1 Acceleration 5g, duration 11

Specification

EN 60255-21-2	ms. 3 shocks in each direction (6 shocks in each axis) Relay energized
Shock withstand test IEC60255-21-2 EN 60255-21-2	Class 1 Acceleration 15g, duration 11 ms. 3 shocks in each direction (6 shocks in each axis) Relay non-energized
Bump test IEC60255-21-2 EN 60255-21-2	Class 1 Acceleration 10g, duration 16 ms 1000 bumps in each direction (2000 bumps in each axis) Relay non-energized
Seismic test IEC60255-21-3	Class 1 1-8 Hz: ± 3.5 mm amplitude (horizontal axis) 1-8 Hz: ± 1.5 mm amplitude (vertical axis) 8-35 Hz: 1g acceleration (horizontal axis) 8-35 Hz: 0,5g acceleration (vertical axis) Frequency sweep 1 octave/min 1 sweep cycle in each axis Relay energized

Environmental test

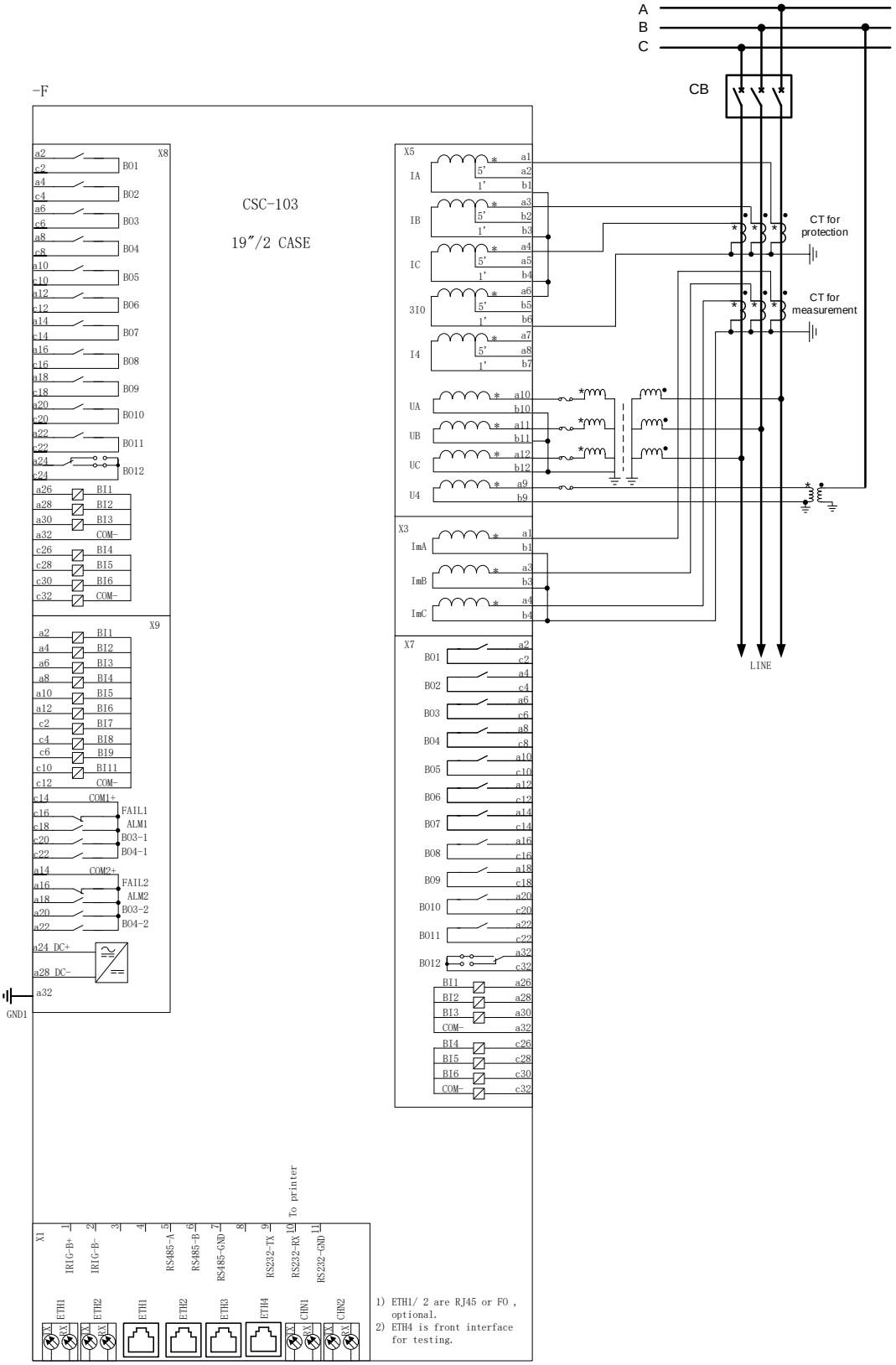
Item	Data
Cold test - Operation IEC60255-27 IEC60068-2-1	-40°C, 96 hours, rated load
Cold test – Storage IEC60255-27 IEC60068-2-1	-40°C, 96 hours
Dry heat test – Operation IEC60255-27 IEC60068-2-2	+75°C, 96 hours, rated load
Dry heat test – Storage IEC60255-27 IEC60068-2-2	+75°C, 96 hours
Change of temperature IEC60255-27 IEC60068-2-14	Test Nb, figure 2, 5 cycles -40°C / +70°C
Damp heat static test IEC60255-27 IEC60068-2-78	+40°C, 95% r.h. 56 days, rated load
Damp heat cyclic test IEC60255-27 IEC60068-2-30	+55°C, 97% r.h. 6 cycles, rated load

CE Certification

Item	Data
EMC	EN61000-6-2 and EN61000-6-4(EMC steering committee 2004/108/EC)
LVD	EN60255-27(LVD2006/95EC)

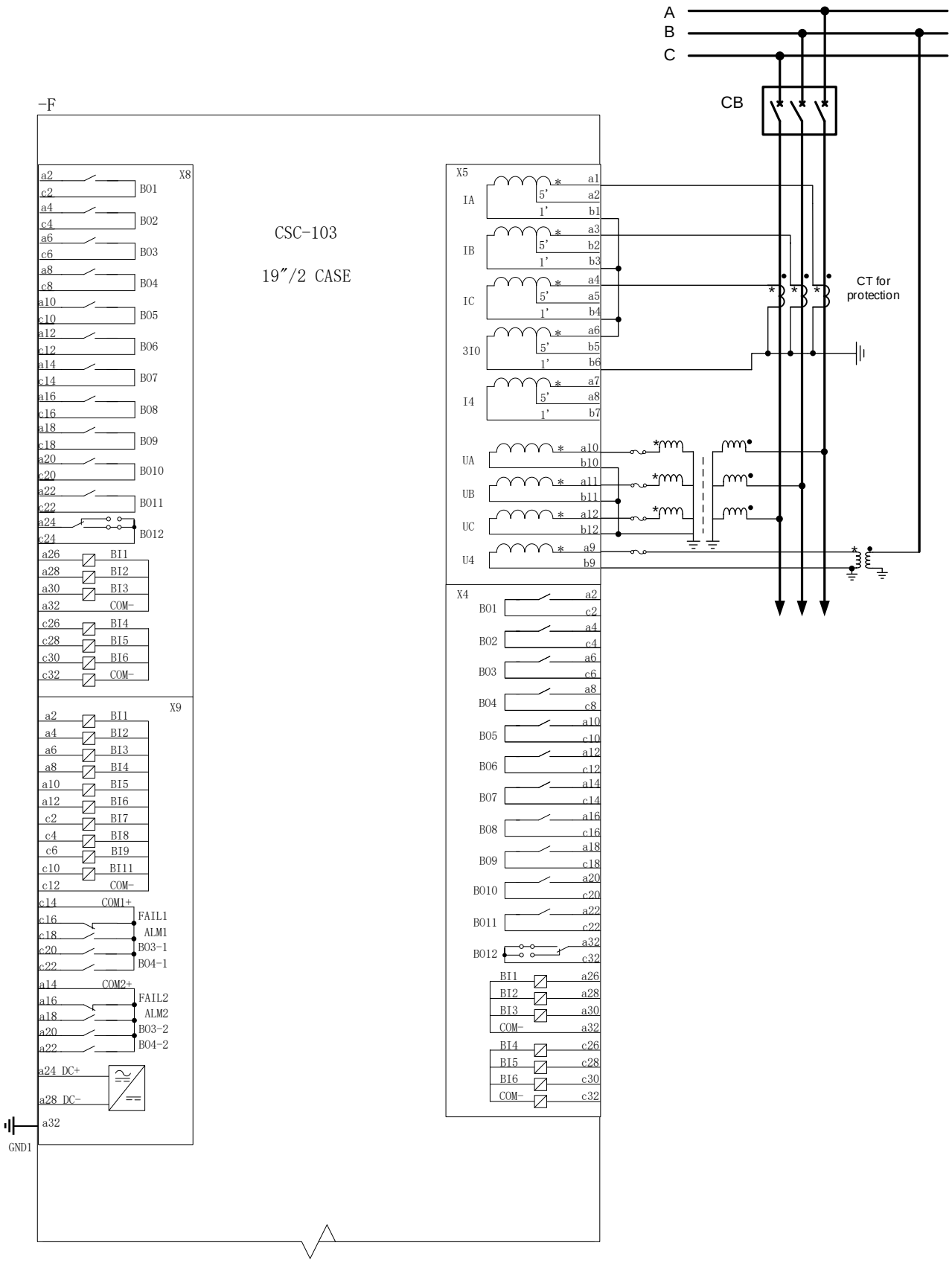
Connection

Typical configure 1

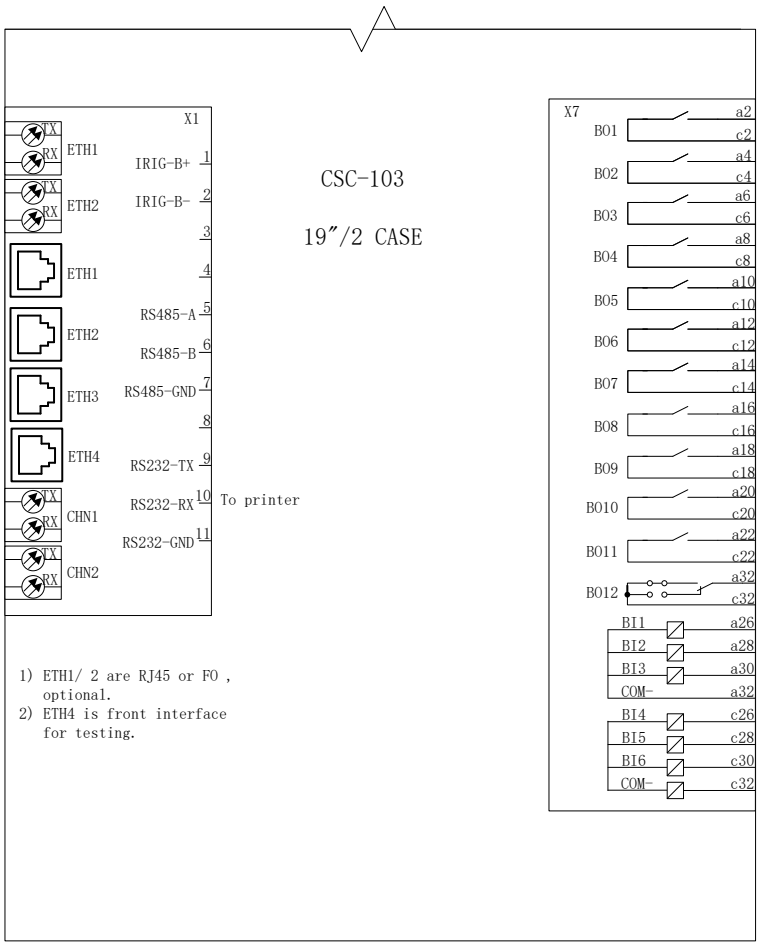


Connection

Typical configure 2

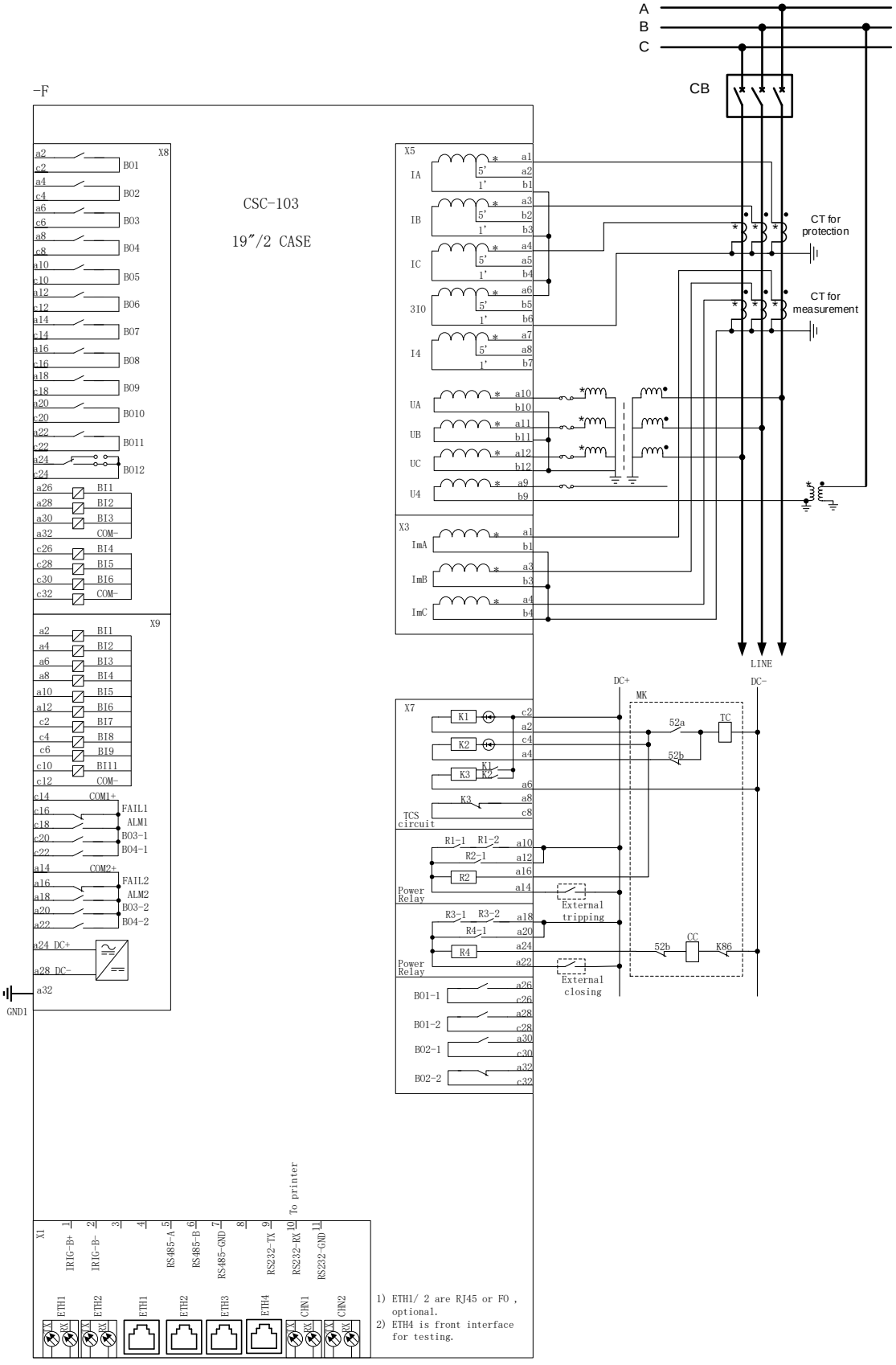


Connection


X1
TX
RX
ETH1
ETH2
ETH1
ETH2
ETH3
ETH4
TX
RX
CHN1
TX
RX
CHN2
IRIG-B+ 1
IRIG-B- 2
3
4
RS485-A 5
RS485-B 6
RS485-GND 7
8
RS232-TX 9
RS232-RX 10
RS232-GND 11
To printer
CSC-103
19″/2 CASE
X7
B01 a2 c2
B02 a4 c4
B03 a6 c6
B04 a8 c8
B05 a10 c10
B06 a12 c12
B07 a14 c14
B08 a16 c16
B09 a18 c18
B010 a20 c20
B011 a22 c22
B012 a32 c32
BI1 a26
BI2 a28
BI3 a30
COM- a32
BI4 c26
BI5 c28
BI6 c30
COM- c32
1) ETH1/ 2 are RJ45 or FO , optional.
2) ETH4 is front interface for testing.

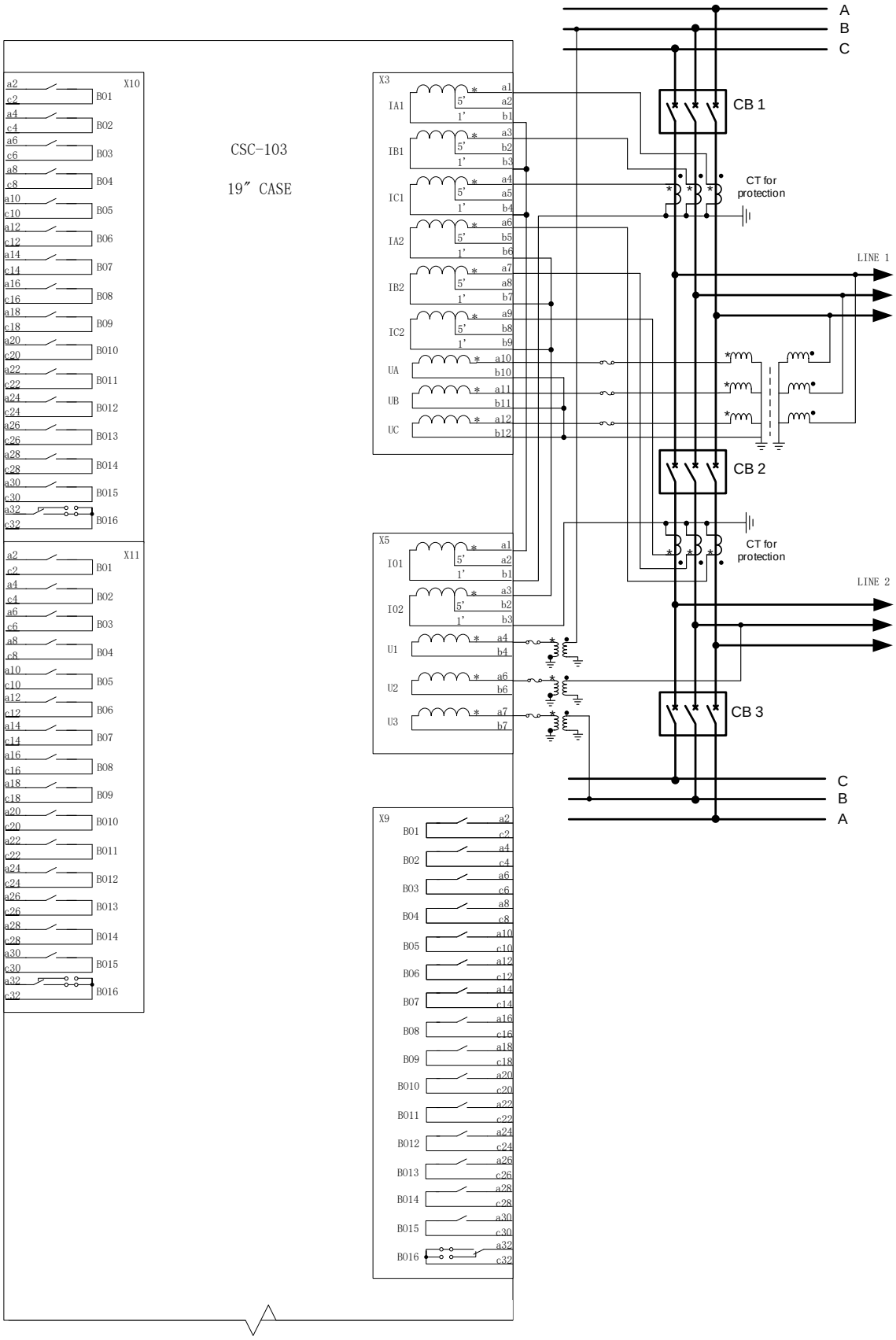
Connection

Typical configure 3

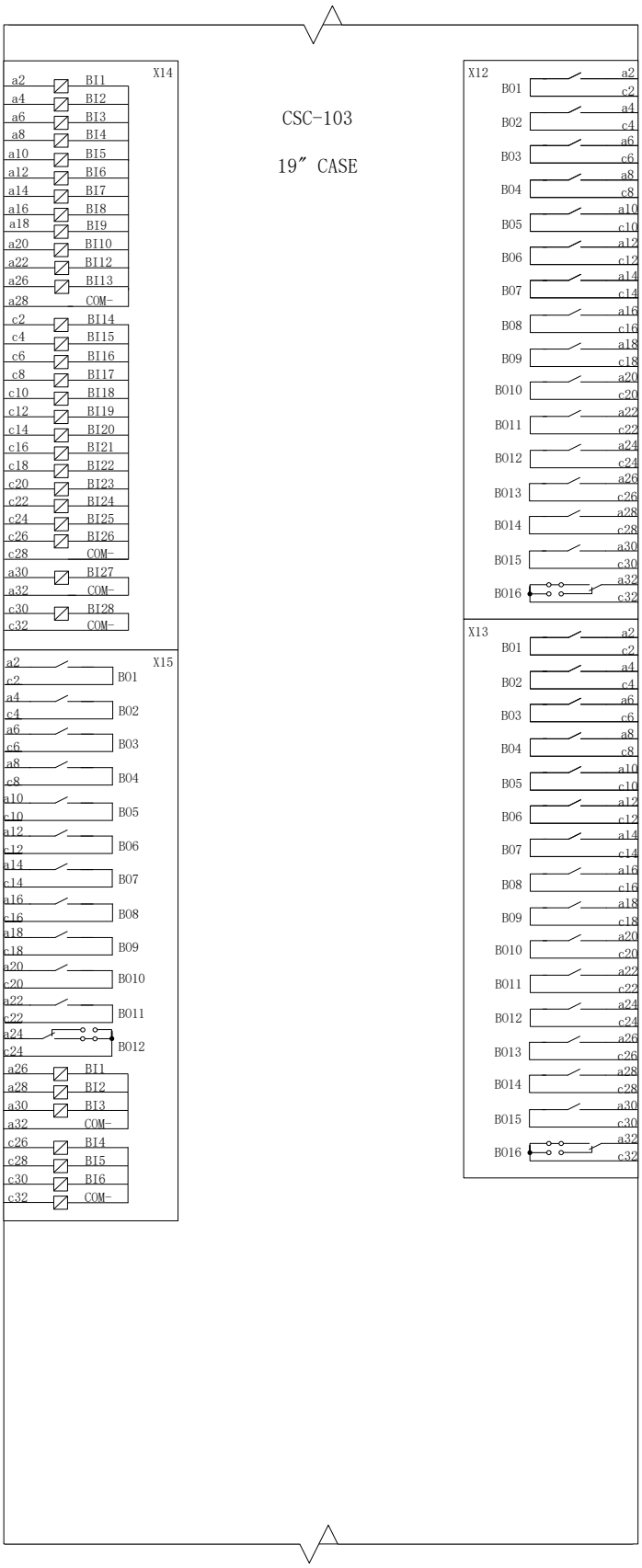


Connection

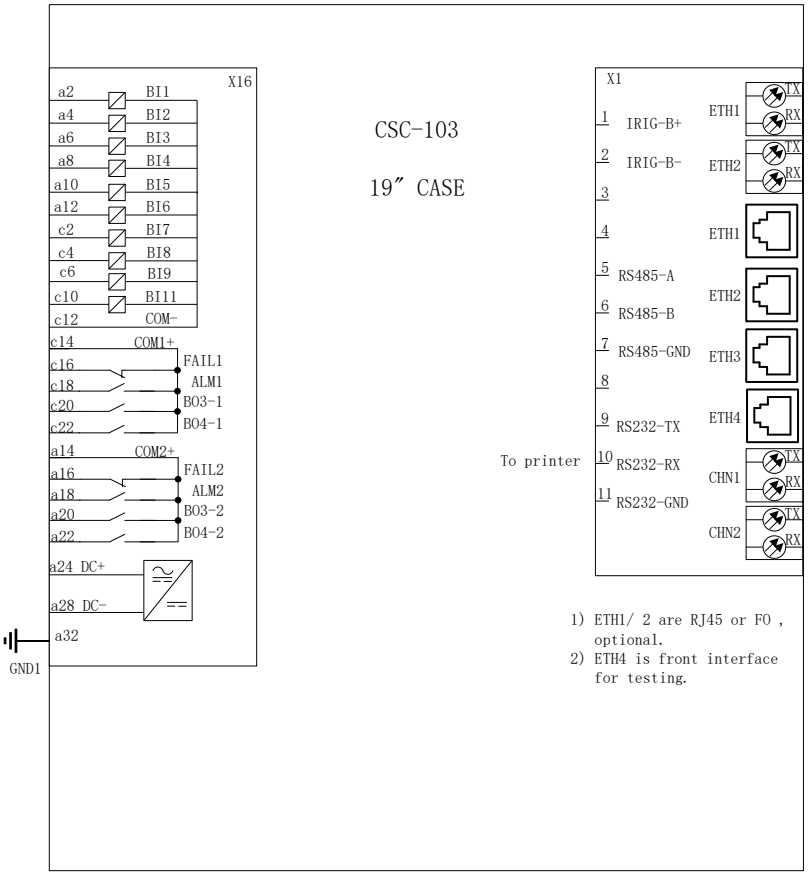
Typical configure 4



Connection


CSC-103
19″ CASE
X14
a2 BI1
a4 BI2
a6 BI3
a8 BI4
a10 BI5
a12 BI6
a14 BI7
a16 BI8
a18 BI9
a20 BI10
a22 BI12
a26 BI13
a28 COM-
c2 BI14
c4 BI15
c6 BI16
c8 BI17
c10 BI18
c12 BI19
c14 BI20
c16 BI21
c18 BI22
c20 BI23
c22 BI24
c24 BI25
c26 BI26
c28 COM-
a30 BI27
a32 COM-
c30 BI28
c32 COM-
X15
a2 c2 B01
a4 c4 B02
a6 c6 B03
a8 c8 B04
a10 c10 B05
a12 c12 B06
a14 c14 B07
a16 c16 B08
a18 c18 B09
a20 c20 B010
a22 c22 B011
a24 c24 B012
a26 BI1
a28 BI2
a30 BI3
a32 COM-
c26 BI4
c28 BI5
c30 BI6
c32 COM-
X12
B01 a2 c2
B02 a4 c4
B03 a6 c6
B04 a8 c8
B05 a10 c10
B06 a12 c12
B07 a14 c14
B08 a16 c16
B09 a18 c18
B010 a20 c20
B011 a22 c22
B012 a24 c24
B013 a26 c26
B014 a28 c28
B015 a30 c30
B016 a32 c32
X13
B01 a2 c2
B02 a4 c4
B03 a6 c6
B04 a8 c8
B05 a10 c10
B06 a12 c12
B07 a14 c14
B08 a16 c16
B09 a18 c18
B010 a20 c20
B011 a22 c22
B012 a24 c24
B013 a26 c26
B014 a28 c28
B015 a30 c30
B016 a32 c32

Connection


X16
a2 BI1
a4 BI2
a6 BI3
a8 BI4
a10 BI5
a12 BI6
c2 BI7
c4 BI8
c6 BI9
c10 BI11
c12 COM-
c14 COM1+
c16 FAIL1
c18 ALM1
c20 BO3-1
c22 BO4-1
a14 COM2+
a16 FAIL2
a18 ALM2
a20 BO3-2
a22 BO4-2
a24 DC+
a28 DC-
a32
GND1
CSC-103
19″ CASE
X1
1 IRIG-B+
2 IRIG-B-
3
4
5 RS485-A
6 RS485-B
7 RS485-GND
8
9 RS232-TX
10 RS232-RX
11 RS232-GND
ETH1
ETH2
ETH1
ETH2
ETH3
ETH4
CHN1
CHN2
TX
RX
To printer
1) ETH1/ 2 are RJ45 or FO , optional.
2) ETH4 is front interface for testing.