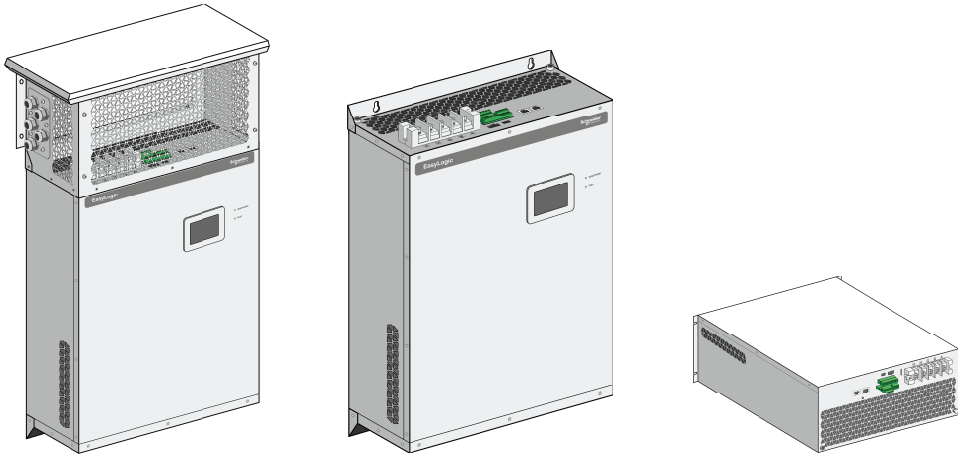
EasyLogic™ APF

Active Harmonic Filter

Installation Manual

EZAPF3160899EN_02
01/2024



www.se.com

Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this document are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owner.

Schneider Electric does not grant any right or license for commercial use of the document or its content, except for a non-exclusive and personal license to consult it on an "as is" basis.

Schneider Electric reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this document, as well as any non-intended use or misuse of the content thereof.

Table of Contents

Foreword

Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a **Danger** or **Warning** safety message indicates that an electrical hazard exists which will result in death or serious injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personnel protective equipment (PPE) and follow safe electrical work practices. Refer to your local regulations.
- This equipment must only be installed in area accessible to electrically skilled personnel and electrically instructed personnel with the proper authorization and serviced by qualified electrical personnel.
- This equipment must only be installed in area without combustible materials.
- Turn off all power to auxiliary contacts and short CT secondary's before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Ensure all disconnect switches are disconnected before servicing equipment. More than one may be present.
- After removing power, wait 15 minutes to allow capacitors to discharge before opening or removing covers.
- Replace all devices and covers before turning on power to this equipment.
- Carefully inspect the interior for tools left behind before replacing covers.
- Verify the rating of the neutral conductor for each unit in the system is greater than the neutral current limit setting.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords at first use to help prevent unauthorized access to device settings and information.
- Disable unused ports/services and default accounts, where possible, to minimize pathways for malicious attacks.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cyber security best practices (for example, least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.
- Restrict unit access to authorized personnel only.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Introduction

Active Harmonic Filter

Active Harmonic Filters are static power electronic products that employ digital logic and Insulated Gate Bipolar Transistor (IGBT) semiconductors to synthesize a current waveform that is injected into the electrical network to cancel harmonic currents caused by nonlinear loads. Active Harmonic Filter employ current transformers to measure the load current to determine the content of harmonic current present. By injecting the synthesized current, network harmonic currents are greatly mitigated, thus reducing the heating effects of harmonic current and reducing voltage distortion.

Active Harmonic Filter also have the ability to correct for poor displacement power factor (DPF) and for mains current balancing. DPF correction can be provided for either leading (capacitive) or lagging (inductive) loads that cause poor DPF. Mains current balancing is achieved by measuring the negative and zero sequence current present and injecting the inverse of those currents to balance the current for the upstream network.

Schneider Electric Active Harmonic Filter, EasyLogic™ APF enclosures are available in an IP20 rack-mounted, IP20 and IP31 wall-mounted.EasyLogic™ APF can be powered by three phase conductors to provide corrective current for Line-to-Line connected loads or by three phase conductors and neutral to provide correction for Line-to-Line and Line-to-Neutral connected loads. The amount of neutral current for up to three times the phase current correction. The neutral wiring must be sized appropriately based on the selected neutral current correction.

The module can be used as an expansion unit. For example, to be installed in other types of cabinets such as Motor Control Center (MCC). After expansion, the whole system is automatically assigned a host unit. The expanded system shall be equipped with an Human Machine Interface (HMI), which allows to view and change the parameter settings of the whole system or any other unit in the parallel system. The expansion unit only needs to connect cables such as power cables and parallel cables.

Product Appearance

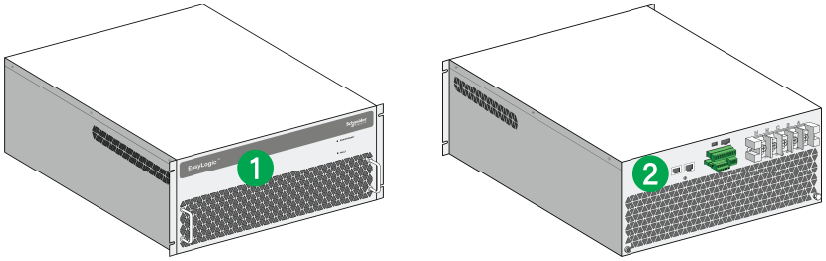
EasyLogic™ APF modules are divided into wall-mounted and rack-mounted modules, with capacities of 50 A, 100 A and 15 0A. The module protection grade is IP20, and the wall-mounted module can be equipped with IP31 anti-drip kit.

The wall-mounted module is controlled by the standard 4.3-Inch HMI during single machine operation and needs to be equipped with 7-Inch HMI for multi module parallel machine operation. The rack-mounted module single or parallel operation must be equipped with 7-Inch HMI.

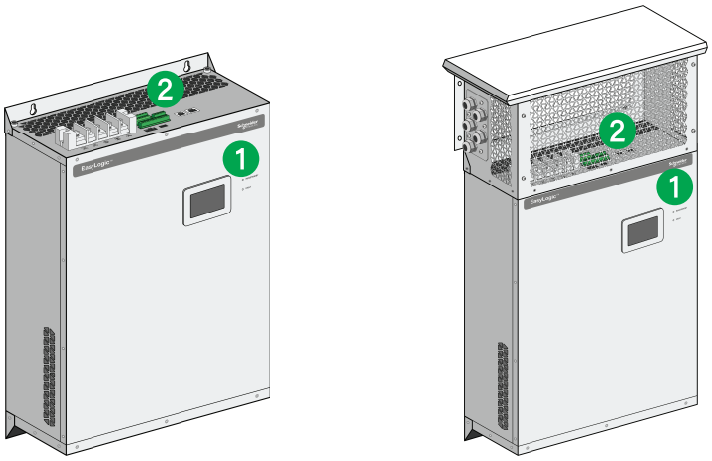
Product Appearance

Product appearance for 50 A, 100 A,, and 150 A standard modules is similar to each other.

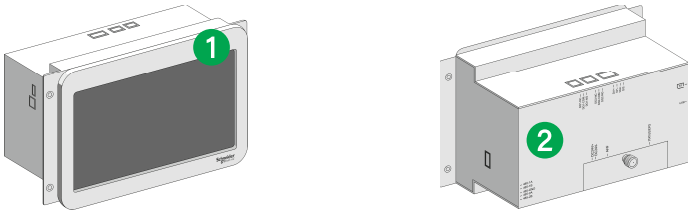
Take 100 A standard module as example, product appearance of rack-mounted module is as follows:



The appearance of the IP20 wall-mounted module and the IP31 anti-drip kit on the top is as follows (the below picture is for illustration only, the real IP31 anti-drip kit may be similar but different):



The appearance of HMI is as follows:



Product Appearance and Function Introduction:

1. Represents the product appearance information area. It can display the product status or enable human-machine interaction.
2. Indicates the product wiring operation area. It can be connected to the power supply or signal cable of the product.

Technical Specifications

Electrical Characteristics

Electrical Characteristics	
Standard RMS output current ratings	208 V: Wall-mounted: 50 A, 100 A Rack-mounted: 100 A 400 V: Wall-mounted: 50 A, 100 A, 150 A Rack-mounted: 50 A, 100 A, 150 A 480 V: Wall-mounted: 50 A, 100 A, 150 A Rack-mounted: 100 A, 150 A
Nominal voltage	208 Vac: -15%/+25% 400 Vac: -40%/+15% 480 Vac: -20%/+10%
Nominal frequency	50/60 Hz, ±3 Hz auto sensing
Connection type	208 Vac: 3 ph/3 wire or 3 ph/4 wire 400 Vac: 3 ph/3 wire or 3 ph/4 wire 480 Vac: 3 ph/3 wire
Earthing systems	TT, TN-C, TN-S, TN-C-S
Network voltage distortion	THDv ≤ 15%, working; THDv > 15%, shutdown
Voltage notch limits	Notch depth: 10%, Notch area (AN): 13,667 Vµs @ 400 V as per IEEE 519-2014, Annex C

Functional Characteristics

Functional Characteristics	
Power electronics	208 Vac: 3 ph only or 3 ph + Neutral 400 Vac: 3 ph only or 3 ph + Neutral 480 Vac: 3 ph only
Compensation type	3 ph only or 3 ph + Neutral
Filtering performance	THDi < 5% in closed loop control (with load harmonic ≥ 50% unit rating) Total harmonic cancellation > 92%
Response time	Control response time < 100 us Harmonic correction time ≤ 2 cycles Reactive correction time ≤ 10 ms
Efficiency	208 V: ≥ 95%, 400 V and 480 V: ≥ 97%
Other performance	Power factor correction (cos φ)：Leading (capacitive) or lagging (inductive) Mains load balancing：Negative and zero sequence simultaneously
CT position	Source sense (closed loop) Load sense (open Loop). Harmonic mode 2 is not supported
Quantity of CT	2 or 3 CTs for 3-phase loads 3 CTs are required for 4-wire with neutral connected loads
Current Transformer	Primary: ~30000 A Secondary: 5 A VA loading: ≥ 5 VA Class 0.5 accuracy
Protection	Thermal, over/under voltage, overcurrent, phase loss, internal short circuit, inverter bridge abnormal operation, corresponding alarm
Paralleling Characteristics	Up to 8 modules in parallel per set of CT; Any type module combination possible Manual setting of ID address of parallel module (DSW on module) Support parallel current sharing output Support redundant output in case of parallel module failure
Module indicator	The front panel of the module has 2 status indicators Green indicator: Light on, normal operating Flash, in standby mode Red indicator: Light on, in fault mode
Parallel communication port	RS485, RS422, CAN, EPO

HMI and Service Provisions

HMI and Service Provisions	
Adapting HMI	HMI is a resistive color touch LCD screen 4.3-Inch HMI is built into the wall-mounted module 7-Inch HMI is used the rack-mounted or wall-mounted modules are connected in parallel
DI/DO port	The 7-Inch HMI is equipped with: • 2 x input ports, voltage range: 7V ≤ Vdc ≤ 36 V • 2 x output ports, adaptability: I≤ 8A, Vdc≤ 28V
STATUS/EPO port	The 7-Inch HMI is equipped with: • Recommended level range: 5 Vdc...6 Vdc • Output capacity: I ≤ 20mA
Remote communication port	the 7-Inch HMI is equrpped with 485 port Communications protocol： Modbus RTU

Environmental Characteristics

Environmental Characteristics	
Storage ambient temperature	-40 ℃...+70 ℃
Operating ambient temperature	-10 °C...+40 °C (full performance, continuous operation) 40 < Tamb ≤ 45: 50 A IP20, no derate, 50 A IP31, 10% derating 100 A IP20, no derate, 100 A IP31, 10% derating 150 A IP20 and IP31, 10% derating 45 < Tamb ≤ 50: 50 A IP20, 10% derating, 50 A IP31, 20% derating 100 A IP20, 20% derating, 100 A IP31, 40% derating 150 A IP20 30% derating, 150 A IP31, 40% derating
Relative humidity	0...90%, noncondensing
Applicable altitude	≤ 1500 m; (full performance, continuous operation) Derate 1% per 100 m above Absolute max altitude: 3700 m

Design Creteria

Design Creteria	
Design reference	EN 61000-6-2 (IEC 61000-6-2), EN 61000-6-4 (IEC 61000-6-4), EN 62477-1 (IEC 62477-1), IEEE Std 519-2014, ISO 9001
EMC and LVD compliance	EN 61000-6-4 Class A (Emissions) EN 61000-6-2 (Immunity) EN 62477-1
Product certification	CE, RoHS, REACH

Mechanical Properties

Mechanical Properties	
Cable entry	IP20 Wall-mounted: top connect IP31 Wall-mounted: left side entry for power cables, right side entry for other cables IP20 Rack module: rear connect
Cooling configuration	Forced ventilation. Air flow: 50 A: 540 m^3/h 100 A and 150 A: 1195 m^3/h
Noise	≤ 65 dBA (environment noise 40 dBA, one meter away from the equipment)

Dimensions, Weight, and Typical Heat Load

This section provides information on the dimensions and weight of Schneider Electric EasyLogic™ APF rack-mounted module, wall-mounted module, HMI, and other accessories.

NOTICE

THERE IS A POSSIBILITY THAT THE DEVICE CANNOT BE INSTALLED

When installing the equipment, both the external dimensions and the installation dimensions must be referred to.

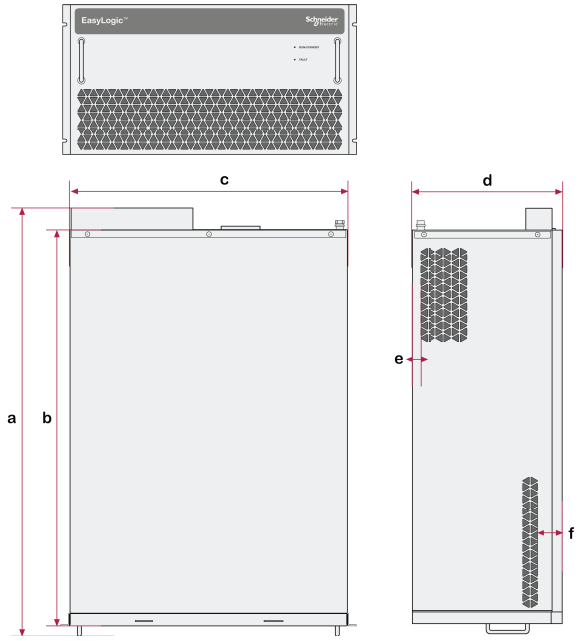
Failure to follow these instructions can result in equipment damage.

For installation dimensions of APF module, HMI and other installation kits, see Installation Environment Requirements, page 24 and Installation Space Requirements, page 24 section.

External Dimensions and Weight of Module

External Dimensions and Weight of IP20 Rack-Mounted Module

The external dimensions of the module include the accessories of the power terminal cover. For the power terminal cover, see Installation of Power Terminal Protective Cover, page 39 section.



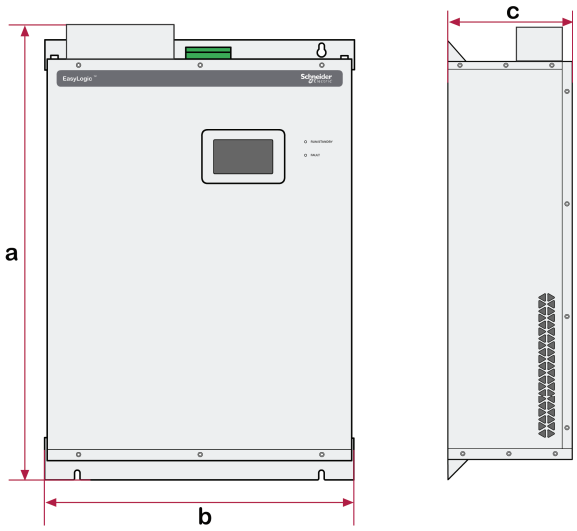
IP20 208 V Rack-Mounted Module		
Module capacity		100 A
External dimensions (mm)	a	733
	b	660
	c	500
	d	200
	e	n/a
	f	31
Weight (kg)		41
Typical heat load (W)		1801
Air flow (m^3/h)		1195
Dimensional tolerance grade: ISO 2768-m/GB 1804-m		

IP20 400 V Rack-Mounted Module				
Module capacity		150 A	100 A	50 A
External dimensions (mm)	a	788	733	603
	b	715	660	535
	c	500	500	500
	d	269	200	280
	e	15	n/a	n/a
	f	46	31	37
Weight (kg)		55	41	28
Typical heat load (W)		3120	2080	1040
Air flow (m^3/h)		1195	1195	540
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

IP20 480 V Rack-Mounted Module			
Module capacity		150 A	100 A
External dimensions (mm)	a	788	733
	b	715	660
	c	500	500
	d	269	200
	e	15	n/a
	f	46	31
Weight (kg)		55	41
Typical heat load (W)		3741	2494
Air flow (m^3/h)		1195	1195
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			

External Dimensions and Weight of IP20 Wall-Mounted Module

The external dimensions of the module include the accessories of the power terminal cover. For the power terminal cover, see Installation of Power Terminal Protective Cover, page 39 section.



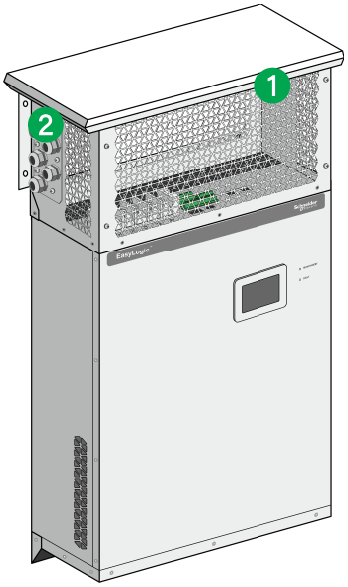
IP20 208 V Wall-Mounted Module			
Module capacity		100 A	50 A
External dimensions (mm)	a	750	750
	b	507	507
	c	205	205
Weight (kg)		41	41
Typical heat load (W)		1801	901
Air flow (m^3/h)		1195	1195
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			

IP20 400 V Wall-Mounted Module				
Module capacity		150 A	100 A	50 A
External dimensions (mm)	a	805	750	620
	b	507	507	507
	c	275	205	185
Weight (kg)		55	41	28
Typical heat load (W)		3120	2080	1040
Air flow (m^3/h)		1195	1195	540
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

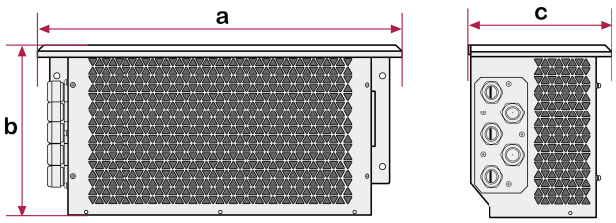
IP20 480 V Wall-Mounted Module				
Module capacity		150 A	100 A	50 A
External dimensions (mm)	a	805	750	750
	b	507	507	507
	c	275	205	205
Weight (kg)		55	41	41
Typical heat load (W)		3741	2494	1247
Air flow (m^3/h)		1195	1195	1195
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

External Dimensions and Weight of IP31 Anti-Drip Kit

The wall-mounted module can be added with an IP31 anti-drip kit at the top. External dimensions and weight of the kit are as follows:



1. Ventilation window for anti-drip kit
2. Outlet of anti-drip kit (one on each side)



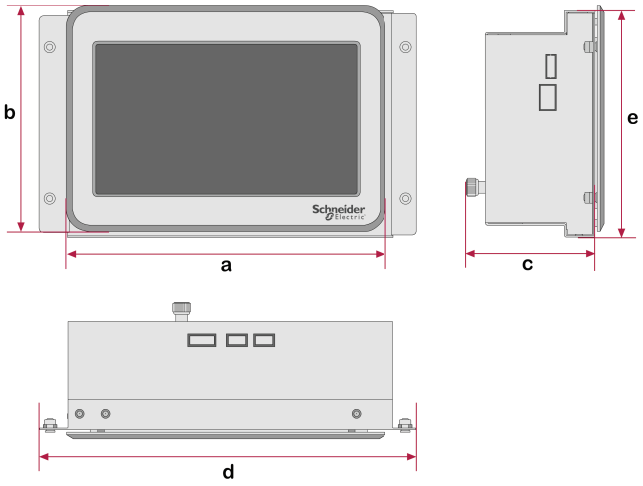
IP31 208 V Anti-Drip Kit			
Module capacity		100 A	50 A
External dimensions (mm)	a	600	600
	b	280	280
	c	230	230
Weight (kg)		3.3	3.3
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			

IP31 400 V Anti-Drip Kit				
Module capacity		150 A	100 A	50 A
External dimensions (mm)	a	600	600	600
	b	280	280	280
	c	300	230	210
Weight (kg)		3.9	3.3	3.1
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

IP31 480 V Anti-Drip Kit				
Module capacity		150 A	100 A	50 A
External dimensions (mm)	a	600	600	600
	b	280	280	280
	c	300	230	230
Weight (kg)		3.9	3.3	3.3
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

External Dimensions and Weight of HMI

The external dimensions and weight of the HMI are as follows:



7-Inch HMI		
External dimensions (mm)	a	192
	b	135
	c	77.7
	d	234
	e	135
Weight (kg)		≈2
Dimensional tolerance grade: ISO 2768-m/GB 1804-m		

Receiving, Handling, and Storing

Receiving

Inspect the active filter for any damage as soon as it is received. Transfer of the equipment to a carrier at any manufacturing plant or other shipping point constitutes delivery to the purchaser. Title and all risk of loss or damage in transit shall pass to the purchaser at that time, regardless of freight payment.

Inspection

- Check that all packages and/or crates have been delivered and that the equipment has not been damaged in transit.
- In the event of damaged or missing items, contact the carrier immediately. Check with them for time limits for filing claims and any documentation required such as a Bill of Lading number, etc.
- Goods, whether sent freight pre-paid or not, are shipped at the consignee's risk.
- Damaged or missing items are the responsibility of the carrier and must be reported.
- Check that the information shown on the equipment nameplates corresponds with the order specifications.
- The packaging material should be replaced to protect the unit until installation has begun.

Handling

⚠WARNING

HAZARD OF PERSONNEL INJURY

- Use proper lifting equipment such as an overhead crane to handle the active filter.
- Do not lay the equipment on its front.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Ensure that the proper equipment such as an overhead crane is available at the installation site to handle the active filter. This equipment will help avoid injury to personnel and damage to the active filter. Verify the lifting capacity of the equipment being used to handle the active filter in accordance with the shipping weight of each shipping section.

Storing

If the active filter is not to be installed when unpacked, it should be stored indoors in a clean, dry and protected place, no condensation, no conductive particles permitted. The storage temperature must be between -40 °C and 70 °C with a maximum relative humidity of 95%. It is preferable to store the unit in its original shipping container to protect the unit from potential damage.

Unpack and Check

The EasyLogic™ APF adopts plastic packaging, which can isolate moisture from the environment and meet the requirements of transportation and storage. Please check whether the package is intact before removing the package. After the package is removed, please check whether the equipment model is correct, whether the appearance is normal and intact, and whether the accessories are complete.

The rack-mounted module is packaged with the following accessories:

SN	Name	Specification Description	Unit	QTY	Remark	Check
1	Module	50 A or 100 A or 150 A	PCS	1		
2	Combined terminal block	6 pin cable terminal-cap (with lock bolt)	PCS	1	installed on the module	
3	Combined terminal block	Pluggable 4 pin terminal block	PCS	1	installed on the module	
4	Combined terminal block	Pluggable 10 pin terminal block	PCS	1	installed on the module	
5	Insulated Round Terminals	Insulated Round Terminal (E2508-Blue-2.5 mm)	PCS	9		
6	Power terminal shield	Power terminal cover	PCS	1	installed on the module	
7	Screw for power terminal shield	Cross recessed pan head combination screw M4 x 8 ROHS	PCS	1	installed on the module	
8	Screw	Cross recessed hexagon head combination screw M5*12	PCS	4		
9	M8 fixing hole screws	PE grounding bolt and left M8 fixing bolt (M8 x 16)	PCS	2	installed on the module	
10	422 communica-tion line	Length 2400 mm, grey	PCS	1		
11	Protective film	Front and rear sealing cover	PCS	2	installed on the module	
12	Packing list	A4	PCS	1		
13	Installation Checklist	A4	PCS	1		
14	Testing Report	A4	PCS	1		

The IP20 wall-mounted module is packaged with the following accessories:

SN	Name	Specification Description	Unit	QTY	Remark	Check
1	Module	50 A or 100 A or 150 A	PCS	1		
2	Combined terminal block	6 pin cable terminal-cap (with lock bolt)	PCS	1	installed on the module	
3	Combined terminal block	Pluggable 4 pin terminal block	PCS	1	installed on the module	
4	Combined terminal block	Pluggable 10 pin terminal block	PCS	1	installed on the module	
5	Insulated Round Terminals	Insulated Round Terminal (E2508-Blue-2.5 mm)	PCS	9		
6	Power terminal shield	Power terminal cover	PCS	1		
7	Screw for power terminal shield	Cross recessed pan head combination screw M4 x 8 ROHS	PCS	1		
8	Expansion bolt	M8x80 expansion bolts for module installation	PCS	4		
9	M8 fixing hole screws	PE grounding bolt and left M8 fixing bolt (M8 x 16)	PCS	2	installed on the module	
10	422 communica-tion line	Length 2400 mm, grey	PCS	1		
11	Prevent foreign objects from falling into the film	Front and rear sealing cover	PCS	2	installed on the module	
12	Packing list	A4	PCS	1		
13	Installation Checklist	A4	PCS	1		
14	Checklist Testing Report	A4	PCS	1		

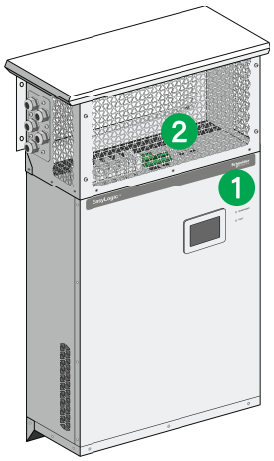
The IP31 wall-mounted module is packaged with the following accessories:

SN	Name	Specification Description	Unit	QTY	Remark	Check
1	Module	50 A or 100 A or 150 A	PCS	1		
2	Combined terminal block	6 pin cable terminal-cap (with lock bolt)	PCS	1	installed on the module	
3	Combined terminal block	Pluggable 4 pin terminal block	PCS	1	installed on the module	
4	Combined terminal block	Pluggable 10 pin terminal block	PCS	1	installed on the module	
5	Insulated Round Terminals	Insulated Round Terminal (E2508-Blue-2.5 mm)	PCS	9		
6	Anti-drip kit	IP31 Protection Kit	PCS	1	installed on the module	
7	Kit and Body Connection Screws	M4 x 10 Phillips pan head combination screw	PCS	5 or 7	150 A uses 7 pcs 50 A and 100 A use 5 pcs	
8	Expansion bolt	M8 x 80 expansion bolts for module installation	PCS	4		
9	M8 fixing hole screws	PE and left M8 fixing bolt (M8 x 16)	PCS	2	installed on the module	
10	Kit and Wall-Mounted Screws	Screw—M8 x 80 expansion screw	PCS	4		
11	422 communica-tion line	Length 2400 mm, grey	PCS	1		
12	Prevent foreign objects from falling into the film	Front and rear sealing cover	PCS	2	installed on the module	
13	Installation Checklist	A4	PCS	1		
14	Packing List	A4	PCS	1		
15	Testing Report	A4	PCS	1		

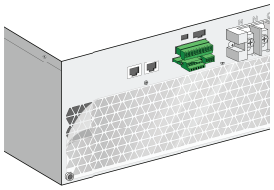
The 7-Inch HMI is packaged with the following accessories:

SN	Name	Specification Description	Unit	QTY	Remark	Check
1	Control screen	7-Inch	PCS	1		
2	Connecting cable	Connecting cable-10 pin L = 3000 mm	PCS	1		
3	Terminals of 485	485 connector with 5 pin	PCS	1	Installed on the HMI	
4	Terminals of DO	DO connector with 3 pin	PCS	2	Installed on the HMI	
5	Terminals of DI	DI connector with 4 pin	PCS	1	Installed on the HMI	
6	Nut	M4	PCS	8		
7	STATUS/EPO cable	Length + 610 + 870 + 1060 mm	PCS	1		
8	Resistor	Communication Matching Resistor	PCS	2		
9	CT transfer terminal	15 pin (TRTB6–15 PIN Connector)	PCS	1		
10	Packing list	A4	PCS	1		

To avoid deformation and falling, please use force to move the module onto the module body. The IP31 anti drip kit is only connected by a few screws and cannot withstand the weight of the module.



To avoid foreign matters falling into the equipment during installation, the front air inlet and rear air outlet of the rack-mounted module and the upper air inlet and lower air outlet of the wall-mounted module are covered with removable protective films, as shown in the figure below:



⚠WARNING

RISK OF FOREIGN MATTERS FALLING INTO THE EQUIPMENT

It is forbidden to remove the protective film on the air inlet and outlet before installing modules and connecting cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation

This chapter provides the information required to properly install the EasyLogic™ APF and associated equipment for proper operation and performance. Frequently, commissioning difficulties are the result of incorrect wiring. Every precaution must be taken to assure that the wiring is done as instructed. Read and understand all instructions in this manual prior to installation.

Correct installation of the active filter is essential for proper operation of all components. Study the associated instruction books and all drawings carefully.

The location chosen for installation should provide working clearances complying with the appropriate section of the National Electrical Code, or applicable local standards.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personnel protective equipment (PPE) and follow safe electrical work practices. Refer to your local regulations.
- This equipment must only be installed in area accessible to electrically skilled personnel and electrically instructed personnel with the proper authorization and serviced by qualified electrical personnel.
- This equipment must only be installed in area without combustible materials.
- Turn off all power to auxiliary contacts and short CT secondaries before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Ensure all disconnect switches are disconnected before servicing equipment. More than one may be present.
- After removing power, wait 15 minutes to allow capacitors to discharge before opening or removing covers.
- Replace all devices and covers before turning on power to this equipment.
- Carefully inspect the interior for tools left behind before replacing covers.
- Verify the rating of the neutral conductor for each unit in the system is greater than the neutral current limit setting.

Failure to follow these instructions will result in death or serious injury.

Foundation Preparation

NOTICE

RISK OF EQUIPMENT DAMAGE

Adhere to DC choke, SCR based rectifier, and capacitor placement requirements.

Failure to follow these instructions can result in equipment damage.

If these recommendations are not followed, the target harmonic level may not be met and equipment damage can occur.

The installation site of EasyLogic™ APF must be able to support the weight of the equipment without sinking.

The rack-mounted module allows horizontal installation, while the wall-mounted module allows vertical installation. Inclined mounting is not supported on both modules.

⚠WARNING

RISK OF FALL INJURY

- Nonprofessional personnel are strictly prohibited from installing the equipment.
- The equipment is heavy, so PPE must be used when installing the equipment.
- Proper handling equipment and load-bearing supports must be used in accordance with the installation instructions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation Environment Requirements

For optimum performance in harmonic mitigation mode, adhere to the following recommendations:

- All harmonic generating loads must have a minimum 3% line reactor or 3% DC choke installed.
- Notch depth: 10%, Notch area (AN): 13,667 Vμs @ 400 V as per IEEE 519-2014, Annex C.
- No capacitors downstream of the Main CTs.

EasyLogic™ APF is only for indoor use. When installed inside the cabinet, ventilation shall be maintained for proper cooling. Pollution degree 2, that is, it does not contain conductive dust, a large amount of dust, corrosive gas or other harmful gases. In general, conductive pollution may occur or dry non-conductive pollution can be expected to become conductive due to condensation.

NOTICE

RISK OF EQUIPMENT DAMAGE

Ensure that the installation location satisfies environmental requirements.

Failure to follow these instructions can result in equipment damage.

Installation Space Requirements

The cooling mode of the module is air cooling. The rack-mounted module adopts front air inlet and rear air outlet, and the wall-mounted module adopts lower air inlet and upper air outlet.

NOTICE

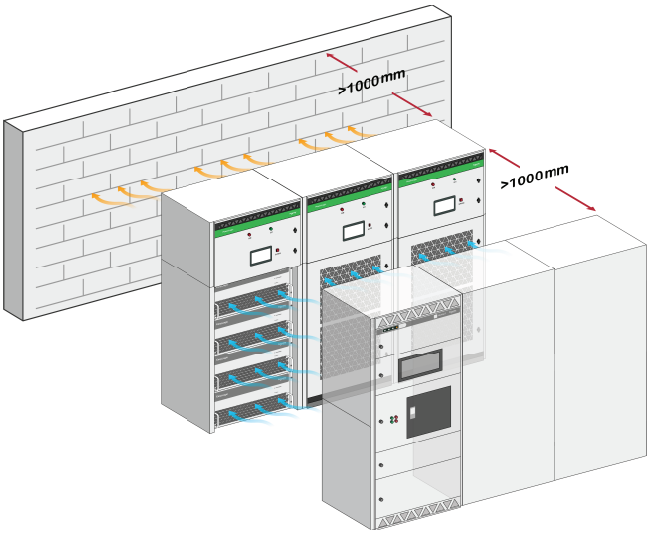
THE COOLING PERFORMANCE OFEASYLOGIC™ APF MAY DECREASE

Be sure to install the equipment according to the space requirements.

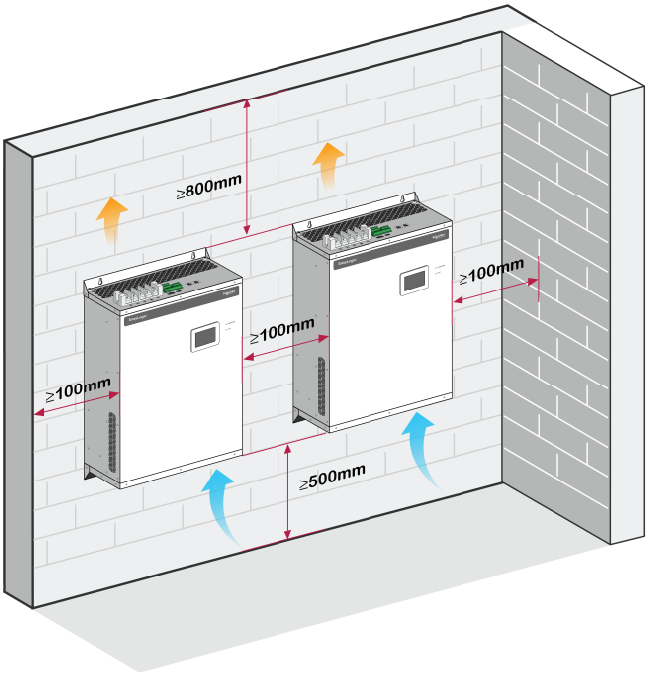
Failure to follow these instructions can result in equipment damage.

The installation space requirements for rack-mounted and wall-mounted modules of EasyLogic™ APF are as follows:

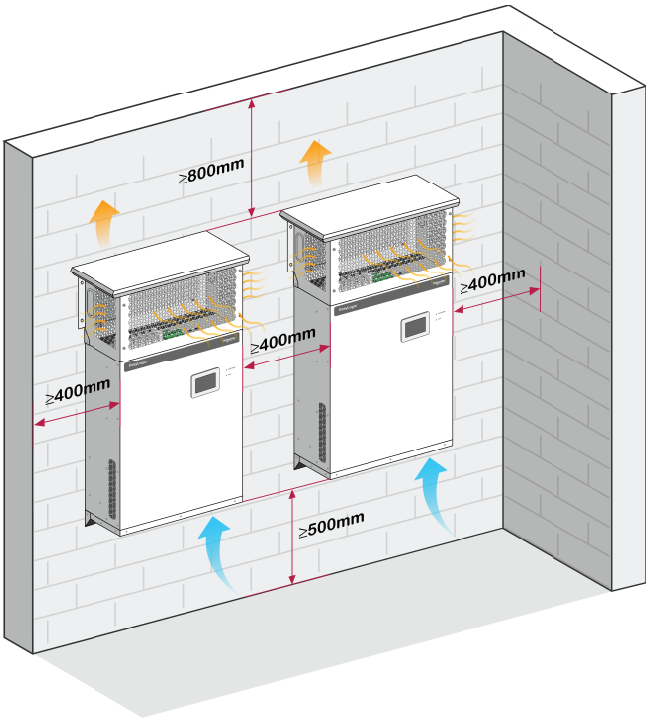
IP20 Rack-Mounted in Cabinet



IP20 Wall-Mounted



Wall-Mounted with IP31 Anti-Drip Kit



Installation Steps

The following is a summary of the installation steps:

1. Ensure that the line voltage is compatible with the rated voltage of EasyLogic™ APF.
2. Ensure that the installation supporting objects or structures for EasyLogic™ APF are in place.
3. Ensure that the installation environment meets the requirements.
4. Please refer to the dimension drawing of the EasyLogic™ APF to be installed.
5. Install the equipment at the desired location.
6. Connect the power cable and PE cable, but do not power on the EasyLogic™ APF.
7. Connect the CT terminal of the module and connect the CT cable to the terminal of the CT adapter plate.
8. Establish parallel communication and control connections (if applicable).
9. Connect external HMI and module (if applicable).
10. Connect the communication between the HMI and the upper computer, and the wiring with dry contact accessories (if applicable).
11. Remove the protective film to prevent foreign matters from falling in.
12. Check the installation and complete spot check of the installation checklist.

The installation and debugging of EasyLogic™ APF module must be carried out by professionals recognized by Schneider Electric. Due to the complexity of the installation process, in order to avoid incorrect installation, the installation of the module must be checked according to steps of the installation checklist.

⚠WARNING

RISK OF INCORRECT INSTALLATION OF EASYLOGIC™ APF

Be sure to check the installation process using the installation checklist to avoid omissions or incorrect installation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The installation checklist is attached to the product. Please refer to it during installation.

The following is an example of installation checklist:

Receipt and Unpacking Inspection	Accepted/ Unaccepted
Check product packing box label information (correct order, product information)	
Check the appearance of the package (normal without damage)	
Unpack and inspect the products appearance normal without damage. Two pieces of protective films that are used to prevent foreign objects from falling into products are properly adhered to it without loss or damage	
Check product nameplate label information (correct product information)	
Check that the product is shipped with the packaging attachment (complete with the attachment, detailed attachment is described in Unpack and Check, page 19 section)	
Install Environment Check	**Accepted/ Unaccepted**
Check ambient temperature (operating ambient temperature requirements: -10 °C...+40 °C; derating if it is between 40 °C and 50 °C.	
Check the installation site altitude (requires ≤1500m; derating if it is between 1500 m and 3700 m	
Check installation site pollution degree (requirements: pollution degree 2, without conductive dust, large amounts of dust, corrosive gas and other harmful gases)	
Check the installation space (to meet the installation or cooling space requirements of Installation Guide Installation Environment Requirements, page 24,Installation Space Requirements, page 24 sections.	

Installation Process Check for Single Wall-Mounted Models (if applicable)	Accepted/ Unaccepted
Check the required mounting dimensions for the body securing screws or bolts (correct mounting hole position, correct bolt specification, and meet the requirements of Installation Guide Installation of Wall-Mounted Module, page 34, Installation of IP31 Anti-Drip Kit, page 36, Installation of Power Terminal Protective Cover, page 39 sections)	
Check the installation torque of the body securing screw/bolt (the correct torque meets the torque requirements for the securing screw/bolt in Installation of Wall-Mounted Module, page 34 section of the installation manual)	
Check the protective film against foreign material falling (both are intact and free of fall or damage)	
Check the cable specifications for the single wall-mounted module power and PE cables (correct cable specification, required in Module Ports and Cable Selection, page 43 section of the installation manual)	
Check the terminal installation and torque of the single wall-mounted module power and PE cables (correct cable connection location, correct terminal torque to meet the requirements of Module Ports and Cable Selection, page 43 section of the installation manual)	
Check CT specifications (meet CT Specification and CT Cable Requirements, page 49 section requirements)	
Check the cable specifications for single-module CT cables (correct cable specifications to meet the requirements of Selection and Connection of Current Transformer (CT), page 48 section of the installation manual)	
Check that the CT patch panel is properly shorted and grounded	
Check the terminal installation and torque of the single-module CT cable (correct cable connection location, correct terminal torque, to meet the requirements of Module Ports and Cable Selection, page 43 section of the installation manual)	
Check the cable specifications of the single-module EPO signal cable (correct cable specification, as required in Module Ports and Cable Selection, page 43and Wall-Mounted Single Module External EPO Switch, page 57 sections)	
Check the terminal mounting and torque of the single-module EPO signal line (correct cable connection location, correct terminal torque, to meet the requirements inModule Ports and Cable Selection, page 43 and Wall-Mounted Single Module External EPO Switch, page 57 sections)	
Double check all cables for correct connection logic	
Check that the short grounding of the CT patch panel has been removed	
Check the relative line insulation resistance of the product	
Check that the protective film has been removed (both films are removed without residue)	
Check the mounting torque of the anti-drop cap fixing screw/bolt, if applicable. The torque is correct to meet the torque requirements for the fixed screw/bolt in Installation of IP31 Anti-Drip Kit, page 36 section of the installation manual)	
On-site and appearance inspection (no damage to the appearance of the product, no residual foreign objects, impurities in the site)	

Multi-module parallel installation process checking (If applicable, can be multi-rack module in parallel or multi-wall module in parallel)	Accepted/ Unaccepted
Check the required mounting dimensions for each module's body securing screws or bolts (correct mounting hole position, correct bolt specification, and meet the requirements of Installation Guide Installation of Rack-mounted module, page 30 or Installation of Wall-Mounted Module, page 34, Installation of IP31 Anti-Drip Kit, page 36, Installation of Power Terminal Protective Cover, page 39 sections)	
Check the mounting torque of each module body fixing screw/bolt (the correct torque meets the torque requirements for fixing screws or bolts in sections Installation of Rack-mounted module, page 30 or Installation of Wall-Mounted Module, page 34 and Installation of IP31 Anti-Drip Kit, page 36of the installation manual)	
Inspect each module for foreign material falling into the protective film (both films of each module are intact and not falling or damaged)	
Check the cable specifications for each module power and PE cable (correct cable specification to meet the requirements of Installation Guide Module Ports and Cable Selection, page 43 and Wiring Diagram of Parallel Port, page 58 sections)	
Check the terminal installation and torque of each module power and PE cable (correct cable connection location, correct terminal torque to meet the requirements of Installation Manual , page 43 and Wiring Diagram of Parallel Port, page 58 sections)	
Check CT specifications (meet CT Specification and CT Cable Requirements, page 49 section requirements)	
Check the specifications of the parallel CT cable (correct cable specification to meet the requirements of Installation Guide CT Specification and CT Cable Requirements, page 49 and Wiring Diagram of Parallel Port, page 58 sections)	
Check that the CT patch panel is properly shorted and grounded	
Check the terminal installation and torque of the parallel CT cable (correct cable connection location, correct terminal torque, to meet the requirements of Installation Manuals Module Ports and Cable Selection, page 43 and Wiring Diagram of Parallel Port, page 58 sections)	
Check the cable specifications for the parallel signal line (correct cable specification, as required in Module Ports and Cable Selection, page 43 section)	
Check the terminal connection and torque of the parallel signal line (the correct cable connection location, the correct terminal torque, to meet the requirements of Module Ports and Cable Selection, page 43 and Wiring Diagram of Parallel Port, page 58 section)	
Check the address settings for the parallel module (to meet the requirements of Parallel Address Code Configuration, page 63 section)	
Check the specifications of the HMI Screen cable (correct cable specification to meet the requirements of the installation manual for HMI.485, DO/DI, STATUS/EPO ports, see Description of Port Wiring Selection, page 48 section)	
Check the terminal connections and torques for the HMI screen cables (correct cable connection location, correct terminal torques, and meet the requirements of the installation manual for HMI.485 ports, DO/DI ports, STATUS/EPO ports, see Description of Port Wiring Selection, page 48, Connection of Upper Computer Communication, page 57, Connection of 7-Inch HMI Dry Contact, page 64, Connection of EPO Button and Status Indicator With 7-Inch HMI, page 64 sections)	
Check the connection of the 12Ω termination resistance (meets the requirements of Use of 120Ω Terminating Resistor During Parallel Operation, page 63 section)	
Double check all cables for correct connection logic	
Check that the short grounding of the CT patch panel has been removed	
Check the relative line insulation resistance of the product	
Check that the protective film for each module has been removed (both of the modules have been removed without residue)	
On-site and appearance inspection (no damage to the systems appearance, no residual foreign objects, impurities in the site)	

Installation of Module

This section will introduce the installation and fixing process of EasyLogic™ APF in detail.

Please strictly follow the requirements of this manual for installation.

⚠WARNING

RISK OF FALL INJURY

- Non professional personnel are strictly prohibited from installing the equipment.
- The equipment is heavy, so PPE must be used when installing the equipment.
- Proper handling equipment and load-bearing supports must be used in accordance with the installation instructions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

To prevent foreign matters from falling into the module, do not remove the protective film on the air inlet and outlet during installation.

⚠WARNING

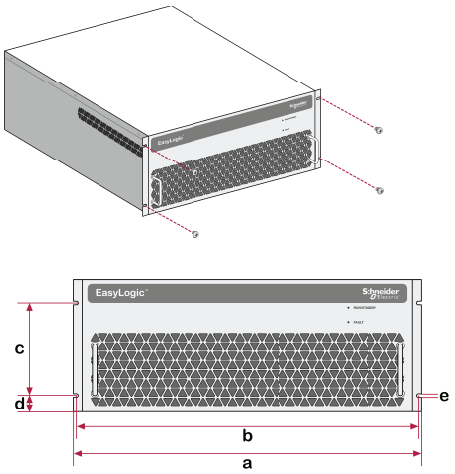
RISK OF FOREIGN MATTERS FALLING INTO THE EQUIPMENT

It is forbidden to remove the protective film on the air inlet and outlet before installing modules and connecting cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation of Rack-mounted module

The rack-mounted module is used for installation in the cabinet, and the mounting bracket of the module need to be locked to the cabinet, as shown in the following figure:

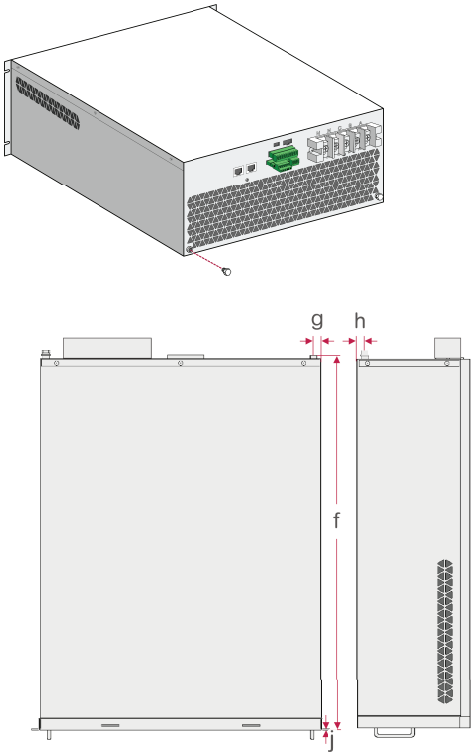


IP20 208 V Rack-Mounted Module		
Module capacity		100 A
Installation dimension of mounting bracket set screw (mm)	a	530
	b	518
	c	140
	d	25
	e	6
Specifications of mounting bracket set screw		Cross recessed hexagon head combination screw M5 x 12 (4 pcs in total)
Torque of mounting bracket set screw		2.7~3.3 (Nm)
Dimensional tolerance grade: ISO 2768-m/GB 1804-m		
Schneider Electric provides the above mounting screws with the product		

IP20 400 V Rack-Mounted Module				
Module capacity		150 A	100 A	50 A
Installation dimension of mounting bracket set screw (mm)	a	530	530	530
	b	518	518	518
	c	219	140	140
	d	25	25	25
	e	6	6	6
Specifications of mounting bracket set screw		Cross recessed hexagon head combination screw M5 x 12 (4 pcs in total)		
Torque of mounting bracket set screw		2.7~3.3 (Nm)		
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				
Schneider Electric provides the above mounting screws with the product				

IP20 480 V Rack-Mounted Module			
Module capacity		150 A	100 A
Installation dimension of mounting bracket set screw (mm)	a	530	530
	b	518	518
	c	219	140
	d	25	25
	e	6	6
Specifications of mounting bracket set screw		Cross recessed hexagon head combination screw M5 x 12 (4 pcs in total)	
Torque of mounting bracket set screw		2.7~3.3 (Nm)	
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			
Schneider Electric provides the above mounting screws with the product			

At the same time, in order to install the module on the cabinet more firmly, a fixed connection point that can be connected with M8 bolts is also provided at the back of the rack-mounted module, as shown in the figure below:



IP20 208 V Rack-Mounted Module		
Module capacity		100 A
Installation dimension of body set screw (mm)	f	665.5
	g	12.7
	h	13.5
	j	1.5
Specifications of body set screw	Hexagon combination screw M8 × 16 (1 pc in total)	
Torque of body set screw	10.8~13.2 (Nm)	
Dimensional tolerance grade: ISO 2768-m/GB 1804-m		
Schneider Electric provides the above mounting screws with the product		

IP20 400 V Rack-Mounted Module				
Module capacity		150 A	100 A	50 A
Installation dimension of body set screw (mm)	f	720.5	665.5	540.5
	g	12.7	12.7	12.7
	h	13.5	13.5	13.5
	j	1.5	1.5	1.5
Specifications of body set screw		Hexagon combination screw M8 × 16 (1 pc in total)		
Torque of body set screw		10.8~13.2 (Nm)		
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				
Schneider Electric provides the above mounting screws with the product				

IP20 480 V Rack-Mounted Module			
Module capacity		150 A	100 A
Installation dimension of body set screw (mm)	f	720.5	665.5
	g	12.7	12.7
	h	13.5	13.5
	j	1.5	1.5
Specifications of body set screw		Hexagon combination screw M 8× 16 (1 pc in total)	
Torque of body set screw		10.8~13.2 (Nm)	
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			
Schneider Electric provides the above mounting screws with the product			

⚠WARNING

RISK OF FALL INJURY

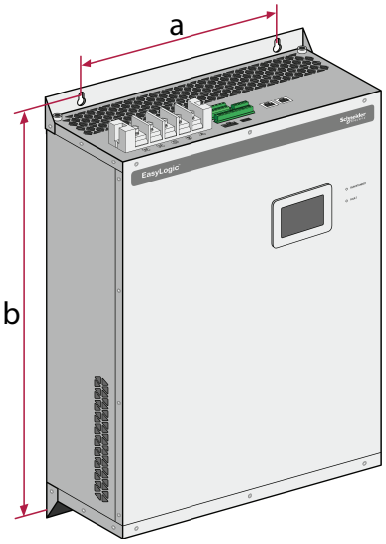
The set screws of rack-mounted modules cannot be used for load bearing.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

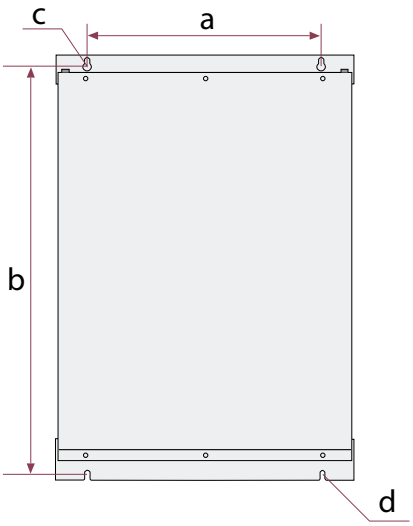
When designing cabinets for rack-mounted module, customers need to design a suitable cabinet load-bearing structure according to external dimensions of the module, the size and position of the mounting bracket or the body set screw.

Installation of Wall-Mounted Module

The wall-mounted module is used for wall-mounted installation or single-wall-mounted installation in a cabinet. The backplane of the module needs to be fixed to the wall or cabinet, as shown in the figure below:



The installation dimension of its backplane is shown in the figure below:



IP20 208 V Wall-Mounted Module			
Module capacity		100 A	50 A
Installation dimension of wall-mounted module set screw (mm)	a	400	400
	b	699	699
	c	2-Ø10	2-Ø10
	d	10	10
Specifications of wall-mounted module set screw		Expansion bolt M8 × 80 (4 pcs in total)	
Torque of wall-mounted module set screw		10.8~13.2 (Nm)	
Dimensional tolerance grade: ISO 2768-m/GB 1804-m			
Schneider Electric provides the above mounting screws with the product			

IP20 400 V Wall-Mounted Module				
Module capacity		150 A	100 A	50 A
Installation dimension of wall-mounted module set screw (mm)	a	400	400	400
	b	754	699	574
	c	2-Ø10	2-Ø10	2-Ø10
	d	10	10	10
Specifications of wall-mounted module set screw		Expansion bolt M8 × 80 (4 pcs in total)		
Torque of wall-mounted module set screw		10.8~13.2 (Nm)		
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				
Schneider Electric provides the above mounting screws with the product				

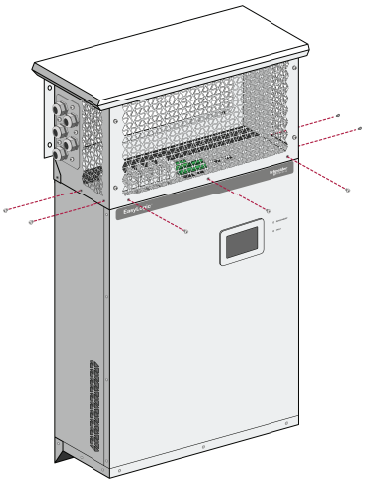
IP20 480 V Wall-Mounted Module				
Module capacity		150 A	100 A	50 A
Installation dimension of wall-mounted module set screw (mm)	a	400	400	400
	b	754	699	699
	c	2-Ø10	2-Ø10	2-Ø10
	d	10	10	10
Specifications of wall-mounted module set screw		Expansion bolt M8 × 80 (4 pcs in total)		
Torque of wall-mounted module set screw		10.8~13.2 (Nm)		
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				
Schneider Electric provides the above mounting screws with the product				

Installation of IP31 Anti-Drip Kit

When the wall-mounted module is installed on the wall with IP31 anti-drip requirements, the below steps shall be followed to assure a successful installation.

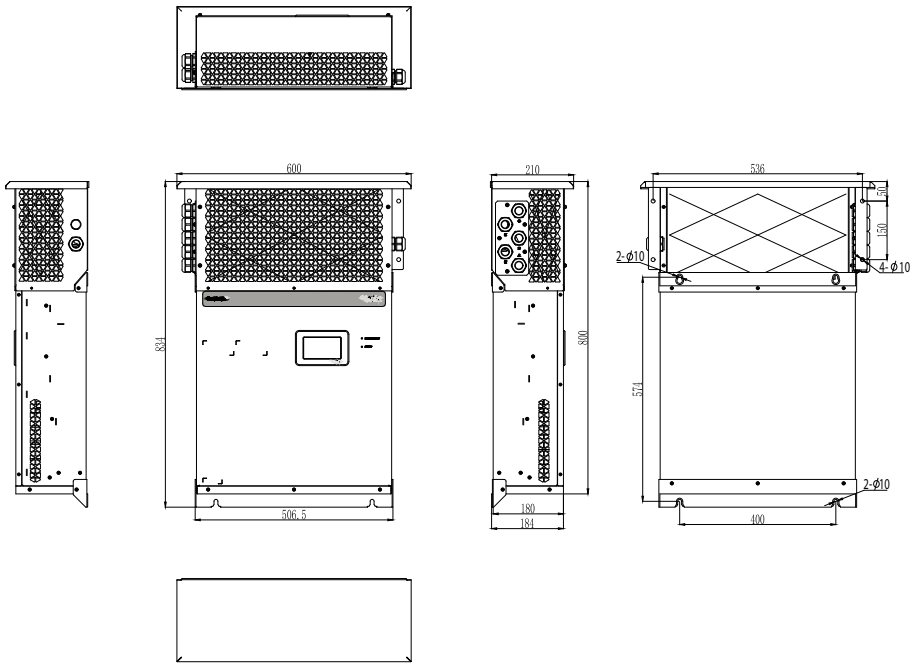
1. Remove the IP31 anti-drip kit from the EasyLogic™ APF and keep the flat head M4x10 screws properly to avoid any missing (Qty of M4 x 10: 150 A: 7 pieces; 100 A/50 A: 5 pieces).
2. Mount the EasyLogic™ APF to the wall by 4 pieces of M8 x 80 expansion bolts.
3. Assemble the IP31 anti-drip kit back to the EasyLogic™ APF by the original flat head M4 x 10 screws (Qty of M4 x 10: 150 A: 7 pieces; 100 A/50 A: 5 pieces)
4. Mount the IP31 anti-drip kit to the wall by 4 pieces of M8 x 80 expansion bolts.
5. Remove the front metal plate from the IP31 anti-drip kit by removing 3 pieces of flat head M4 x 10 screws and 4 pieces of pan head M4 x 12 screws, and keep those screws properly to avoid any missing.
6. Cables connections for the communication cables and PE cable according to the wiring diagram and route those cables out of the IP31 anti-drip kit via the cable gland on the right side of the IP31 anti-drip kit.
7. Cables connections for the power terminals and route those cables out of the IP31 anti-drip kit via the cable glands on the left side of the IP31 anti-drip kit. Pay attention to the corresponding phase A/B/C/N from power terminals to cable glands. Avoid any slack of cables to be approaching the vents of the EasyLogic™ APF, which may block the desired ventilation.
8. Compare with the wiring diagrams to make sure all the necessary connection is completed and no mistakes for the connections. If there are any doubts, contact the Schneider Electric technical person immediately.
9. Place all cables in order and to avoid any crossing of cables.
10. Check carefully to avoid any tools left within the IP31 anti-drip set.
11. Assemble the front metal plate back to the IP31 anti-drip set back with 3 pieces of flat head M4 x 10 screws and 4 pieces of pan head M4 x 12 screws.

Illustration of IP31 anti-drip set to be fasten to the EasyLogic™ APF:



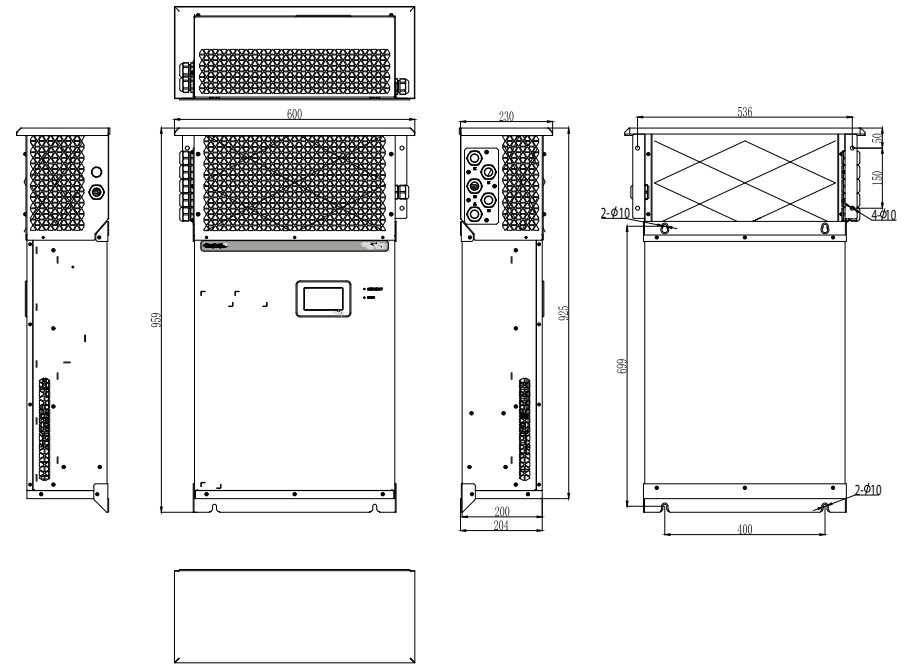
Module Capacity	150 A	100 A	50 A
Specifications of kit set screw	Cross pan head combination screw M4 x 10 (7 pieces in total)	Cross pan head combination screw M4 x 10 (5 pieces in total)	
Torque of kit set screw	1.44~1.76 (Nm)		
Schneider Electritic provides the above mounting screws with the product			

Installation dimension drawing of 50 A wall-mounted module after anti-drip kit is installed:



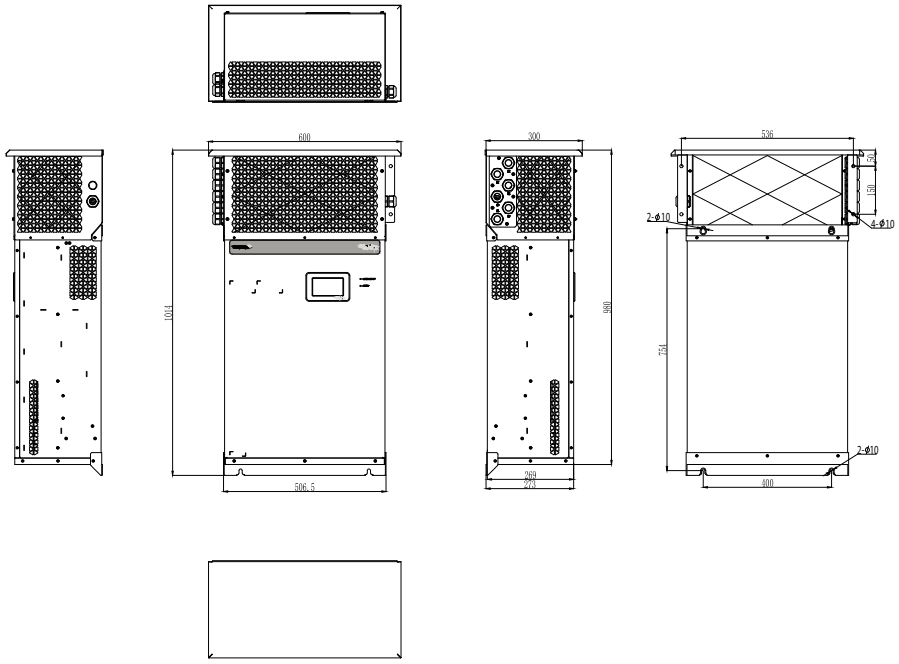
Dimensional tolerance grade: ISO 2768-m/GB 1804-m

Installation dimension drawing of 100 A wall-mounted module after anti-drip kit is installed:



Dimensional tolerance grade: ISO 2768-m/GB 1804-m

Installation dimension drawing of 150 A wall-mounted module after anti-drip kit is installed:



Dimensional tolerance grade: ISO 2768-m/GB 1804-m

The bolt installation torque of the anti-drip kit is as follows:

Module Capacity	150 A	100 A	50 A
Specifications of kit set screw on wall-mounted module	Expansion bolt M8 × 80 (4 pieces in total)		
Torque of kit set screw on wall-mounted module	10.8~13.2 (Nm)		

During on-site installation, it is recommended to fix the anti-drip kit to the module first, then connect cables to terminals, and finally install the whole equipment on the wall.

⚠WARNING

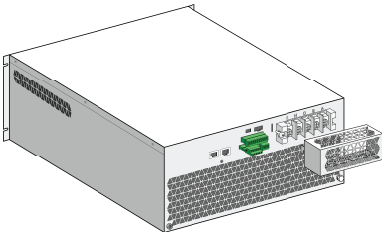
RISK OF OVERHEATING OPERATION

Before fixing the anti-drip cover to the wall, be sure to remove the protective film of the air inlet and outlet.

Failure to follow the above instructions may cause overheating fault alarm and even damage to the equipment.

Installation of Power Terminal Protective Cover

Schneider Electric APF rack-mounted and wall-mounted modules are equipped with power terminal protective covers along with the product, and the installation method is shown in the figure below:

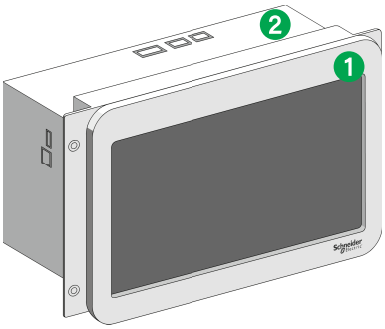


Module capacity	150 A	100 A	50 A
Specifications of set screw of terminal protective cover	Cross recessed pan head combination screw M4 × 8 (1 piece in total)		
Torque of set screw of terminal protective cover	1.44~1.76 (Nm)		

Installation of HMI

Wall-mounted single module, with 4.3-Inch HMI, does not require a 7-Inch HMI. Rack-mounted modules are single or parallel, the wall-mounted modules are connected in parallel, a 7-Inch HMI is required as the overall control system.

HMI is divided into two parts, as shown in the following figure:



1. HMI outer frame (for installation in surface of the cabinet)
2. HMI body (for installation in the cabinet)

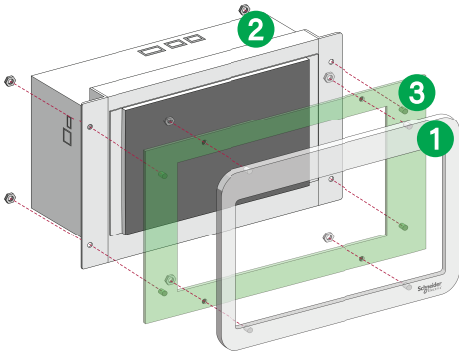
NOTICE

RISK OF DAMAGE TO HMI

- The HMI body is an open structure before installation to avoid touching internal electronic components.
- Be sure to install with care to avoid damage to internal components.

Failure to follow these instructions can result in equipment damage.

The HMI shall be installed according to the following steps:



1. HMI Frame
2. HMI Controller
3. Cabinet Board

The installation steps are as follows:

1. Install the outer frame of HMI from the outside of the cabinet to the panel of the cabinet.
2. Install the HMI controller from the cabinet to the cabinet board of the cabinet.

NOTICE

RISK OF FAILURE TO INSTALL

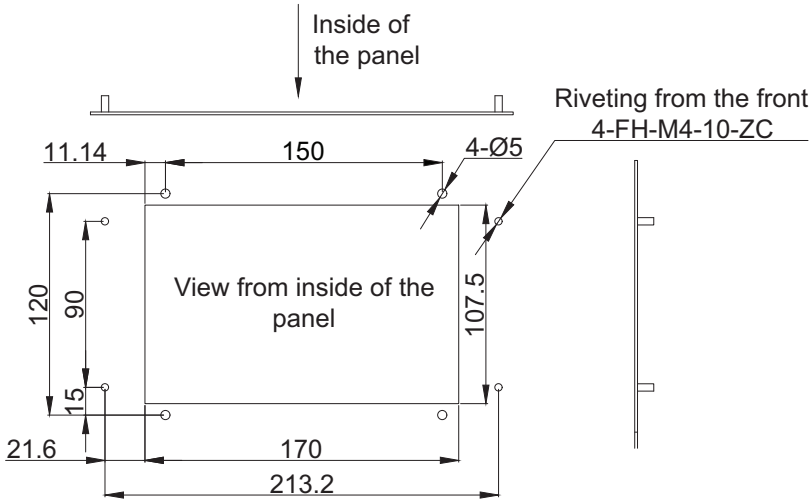
Be sure to install the HMI in the order of the steps indicated.

Failure to follow these instructions can result in equipment damage.

Model	Size of mounting studs on the outer frame of HMI	Size of mounting holes on the body of HMI	Specification of HMI fixing nut	Torque of HMI fixing nut
7-Inch	M4 × 8	Ø5	Hexagon flange nylon locknut M4 (8 pieces in total)	1.44~1.76 (Nm)
Dimensional tolerance grade: ISO 2768-m/GB 1804-m				

In order to install the HMI correctly, mounting window must be made on the cabinet panel ③ to be installed in advance, and installation holes and riveting studs must be configured. The recommended cabinet mounting window size for 7-Inch HMI is shown in the figure below:

Cabinet mounting window drawings of 7-Inch HMI cabinet:



Dimensional tolerance grade: ISO 2768-m/GB 1804-m

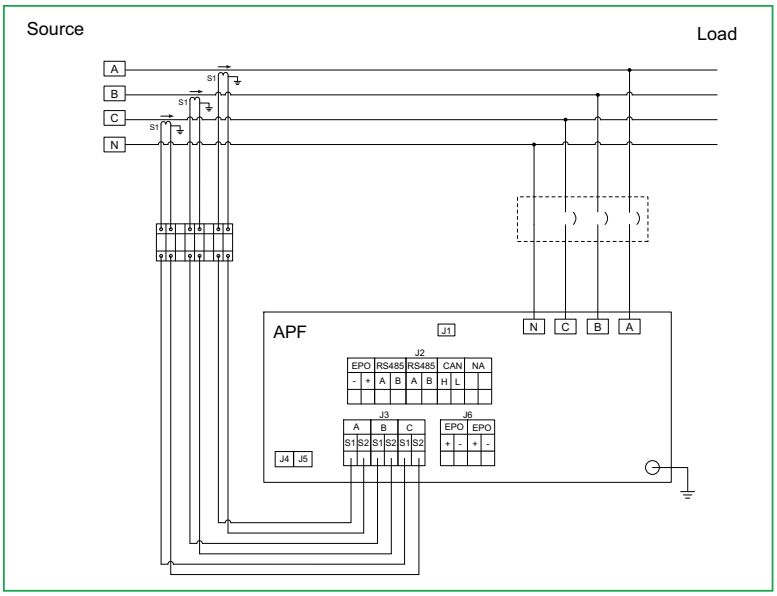
Since there is a need to insert cable terminals or memory cards around the 7-Inch HMI , it is recommended to reserve more than 80mm of installation space around the HMI.

NOTICE
RISK OF FAILURE TO INSTALL Be sure to design the installation space of the cabinet according to the reserved space size indicated. **Failure to follow the above instructions will result in failure to install and use.**

Module Electrical Connection

System Connection

The EasyLogic™ APF module needs to wire and install three-phase power cables, N cables, PE cables and external CT cables. If the system uses three-phase three-wire system, N cables in the following figure is not connected, and the L2 phase CT cable may not need to be connected.



⚠⚠DANGER

DANGER OF ELECTRIC SHOCK, EXPLOSION, OR FLASH BURN

- Be sure to wire correctly according to the port symbols indicated.
- CT terminals must be connected according to the instructions, and mis-connection is strictly prohibited.

Failure to follow these instructions will result in death or serious injury.

Line Voltage
Refer to electrical characteristic specifications of EasyLogic™ APF module to ensure that line voltage is compatible with voltage range of the EasyLogic™ APF.

Over-Current Protection Device Selection
EasyLogic™ APF module shall be equipped with circuit breaker or fuse over current protection device. For 4-pole protection, it is necessary to consider that the neutral current correction value is 300% of the module rating.

Module capacity	150 A	100 A	50 A
Pre-circuit breaker or fuse for each EasyLogic™ APF module recommended rated current	1.25~1.5 x in		
Precautions for using RCD	1.EasyLogic™ APF will generate a large leakage current during operation, which may lead to RCD action. If RCD (Residual Current Device) must be used, the following precautions must be observed: • EasyLogic™ APF will generate a large leakage current at the moment of power on, so appropriate response delay should be considered when selecting RCD. • Do not use RCDs that are sensitive to high frequency current. • If RCD needs to be configured for multi-module parallel operation, it is recommended to configure RCD separately for each module. 2.RCD recommended specification: Type B, 500 mA or higher.		

⚠WARNING

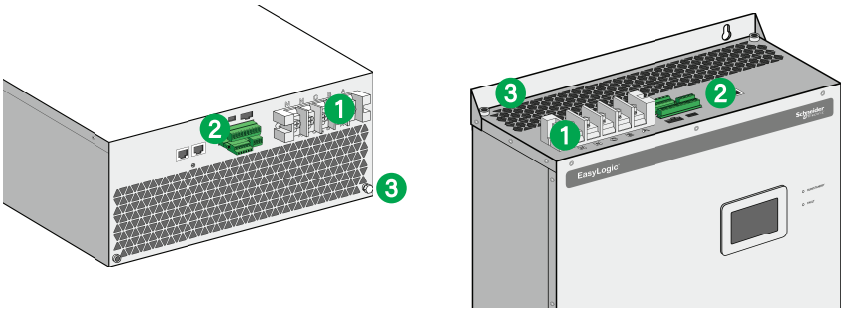
THE EQUIPMENT CAN GENERATE DC LEAKAGE CURRENT INTO THE PE LINE

Use a Type B Residual Current Device (RCD/GFCI) or a Residual Current Monitor (RCM) that has approval for use with frequency inverters and is sensitive to all types of current.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Module Ports and Cable Selection

The wiring operation area of Schneider Electric EasyLogic™ APF module includes wiring terminals such as power terminals, CT terminals, signal terminals, and PE terminals. Rack-mounted and wall-mounted modules of the same capacity have identical terminals.



1. Power supply A, B, C, N-phase cable terminals
2. Parallel connection cable terminal
3. PE cable terminal

⚠⚠DANGER

DANGER OF ELECTRIC SHOCK, EXPLOSION, OR FLASH BURN

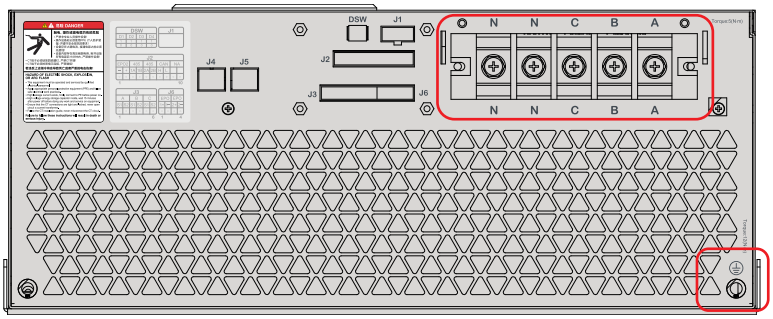
- The equipment must be properly grounded before powering on.
- Grounding must be done using the grounding points provided.
- The connecting cable must be of the correct specification.
- The cable terminals must be installed with the correct torque.
- Wrong phase sequence installation of power terminals is strictly prohibited.

Failure to follow these instructions will result in death or serious injury.

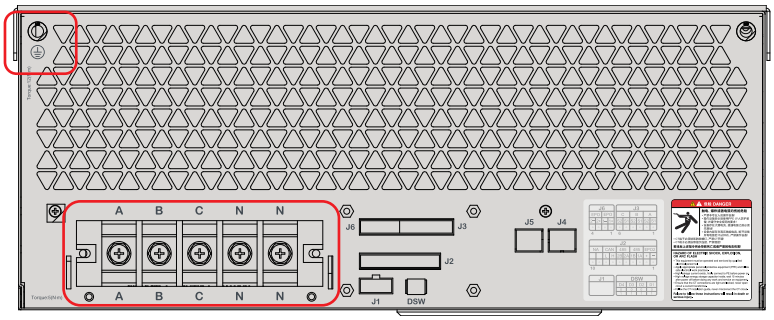
Power Port and Wiring

The power ports and wiring connections are identical for both rack-mounted and wall-mounted modules of Schneider Electric EasyLogic™ APF.

The power wiring board of the rack-mounted module is shown in the figure below:



The power wiring board of the wall-mounted module is shown in the figure below:



All power cables must comply with all national and local electrical code. The outside diameter of the power and PE cables cannot exceed maximum outside diameter in the below table. Installation of parallel power cabling is not supported.

Careful consideration must be given when sizing the neutral conductor, due to the majority of third harmonic which can lead to the current tripling in the neutral in relation to the phases.

When used as a harmonic current compensation device, the active filter produces currents at frequencies that are multiples of the AC line fundamental frequency. Power cables as well as input disconnect devices should be rated at 125% of the active filter rated current. This helps avoid excessive heating from any skin effect resistance increase at these higher frequencies.

NOTE: Check national and local codes and regulations to ensure compliance

208 V Power and Ground Cable		
EasyLogic™ APF	**100 A**	**50 A**
Voltage	208 Vac, -15%/+25%	208 Vac, -15%/+25%
Power Terminals	6 pin, A/B/C/N/N/N	5 pin, A/B/C/N/N
Power and Ground Connection Type	M8	M8
A/B/C/N Maximum outside diameter	13.6 mm	13.6 mm
A/B/C Recommended Cable (Copper)	50 mm^2 (12 Nm)	35 mm^2 (12 Nm)
N Recommended Cable (Copper)	3 x 50mm^2 (12 Nm)	2 x 50 mm^2 (12 Nm)
PE Recommended Cable (Copper)	25 mm^2 (10.8~13.2 Nm)	16 mm^2 (10.8~13.2 Nm)

400 V Power and Ground Cable			
EasyLogic™ APF	**150 A**	**100 A**	**50 A**
Voltage	400 Vac, -40%/+15%	400 Vac, -40%/+15%	400 Vac, -40%/+15%
Power Terminals	6 pin, A/B/C/N/N/N	5 pin, A/B/C/N/N	5 pin, A/B/C/N/N
Power and Ground Connection Type	M8	M8	M6 (M8 for PE)
A/B/C/N Maximum outside diameter	13.6 mm	13.6 mm	11.6 mm
A/B/C Recommended Cable (Copper)	50 mm^2(12 Nm)	35 mm^2 (12 Nm)	25 mm^2 (12 Nm)
N Recommended Cable (Copper)	3 x 50 mm^2 (12 Nm)	2 x 50 mm^2 (12 Nm)	2*35mm^2 (12 Nm)
PE Recommended Cable (Copper)	25 mm^2 (10.8~13.2 Nm)	16 mm^2 (10.8~13.2 Nm)	16 mm^2 (10.8~13.2 Nm)

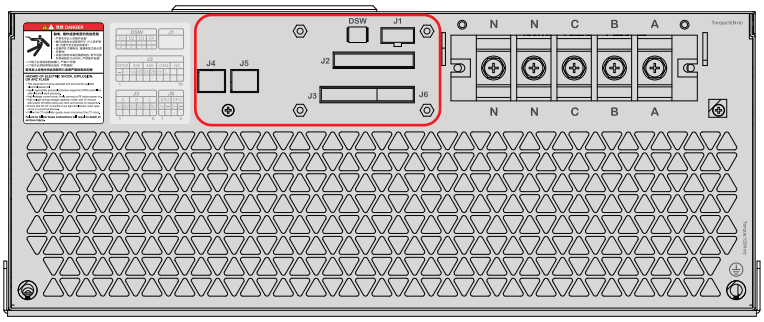
480 V Power and Ground Cable			
EasyLogic™ APF	**150 A**	**100 A**	**50 A**
Voltage	480 Vac, -20%/+10%	480 Vac, -20%/+10%	480 Vac, -20%/+10%
Power Terminals	3 pin, A/B/C	3 pin, A/B/C	3 pin, A/B/C
Power and Ground Connection Type	M8	M8	M8 (M8 for PE)
A/B/C/N Maximum outside diameter	13.6 mm	13.6 mm	13.6 mm
Cable (Copper)	50 mm^2(12 Nm)	35 mm^2 (12 Nm)	25 mm^2 (12 Nm)
PE Recommended Cable (Copper)	25 mm^2 (10.8~13.2 Nm)	16 mm^2 (10.8~13.2 Nm)	16 mm^2 (10.8~13.2 Nm)

- Power terminal A: Phase A input terminal, yellow cable is recommended.
- Power terminal B: Phase B input terminal, green cable is recommended.
- Power terminal C: Phase C input terminal, red cable is recommended.
- Power terminal N: neutral line access point (the three-phase four-wire system needs to be connected to N cable, and the three-phase three-wire system does not need to be connected .

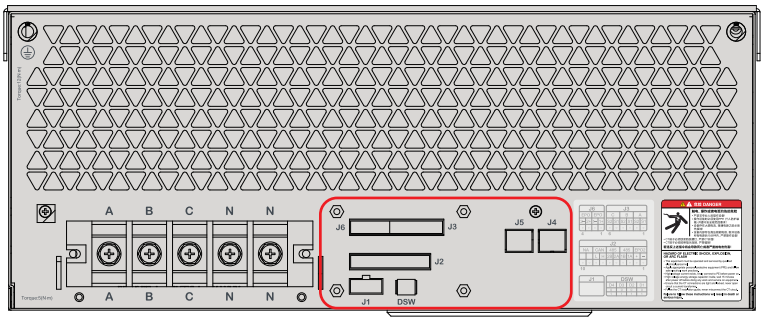
Signal Port and Wiring

Signal ports and wiring connections are identical for both rack-mounted and wall-mounted modules of Schneider Electric EasyLogic™ APF.

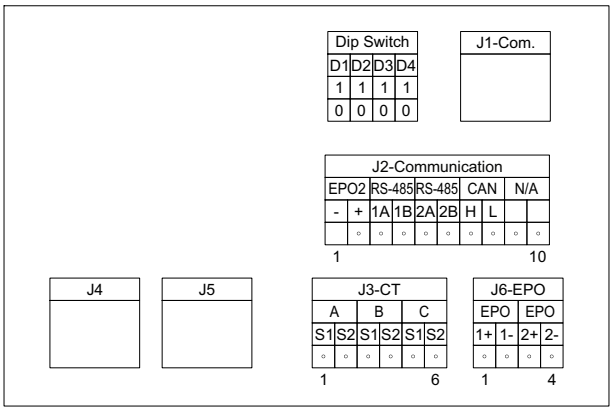
The screenshot of wiring board of rack-mounted module is as follows：



The screenshot of wiring board of wall-mounted module is as follows:



Wiring port indication diagram of rack-mounted and wall-mounted modules:



Functions of each port are described as follows:

- J1 port: it is used to interconnect with HMI, see HMI Port Description, page 47 section or connect with the 120 Ω terminating resistor accessories during parallel operation. See Use of 120Ω Terminating Resistor During Parallel Operation, page 63 section; (the connector, cable and terminating resistor accessories are supplied by Schneider Electric)
- Dip switch (DSW): it is used to specify the communication address of the module during parallel operation. See Parallel Address Code Configuration, page 63 section .

- J2 port: 10 pin plug-in terminal without locking screw is used as the connector. It is used for RS485 communication and CAN communication between modules during parallel operation. Wall-mounted single module external EPO switch. See Wall-Mounted Single Module External EPO Switch, page 57 section ; (the connector accessories are supplied by Schneider Electric)
- J3 port: 6 pin plug-in terminal with locking screw is used as the connector. It is used for connection with CT signal connection. See Selection and Connection of Current Transformer (CT), page 48 section; (the connector accessories are supplied by Schneider Electric)
- J4/J5 port: RJ45 terminal is used as the connector. It is used for the interconnection of RS422 communication lines during parallel operation. See Multi-Module Parallel Connection, page 57 section ; (the connector and cable accessories are supplied by Schneider Electric)
- J6 port: 4 pin plug-in terminal with locking screw is used as the connector. It is used for connection with EPO signal interconnection between modules during parallel operation. See Multi-Module Parallel Connection, page 57 section; (the connector accessories are supplied by Schneider Electric).

The recommended specifications of connecting cables to each port are as follows:

Module Capacity		150 A	100 A	50 A
J1 port	HMI cable specifications	The cable accessories are supplied by Schneider Electric with HMI (including terminals, length 3m)		
J2 port	EPO cable specifications	UL1015 20AWG	UL1015 20AWG	UL1015 20AWG
	RS485 cable specifications	UL1015 20AWG	UL1015 20AWG	UL1015 20AWG
	CAN cable specifications	UL2464 18AWG	UL2464 18AWG	UL2464 18AWG
J3 port	CT cable specifications	See Selection and Connection of Current Transformer (CT), page 48 section		
J4/J5 port	RS422 cable specifications	The cable accessories are supplied by Schneider Electric with module (CAT5e S/FTP 24AWG) (cable length: 1.5m)		
J6 port	EPO cable specifications	UL1015 20AWG	UL1015 20AWG	UL1015 20AWG
Remarks		Except for cable accessories provided by Schneider Electric, other cable accessories or optional accessories mentioned above are not provided in EasyLogic™ APF products.		

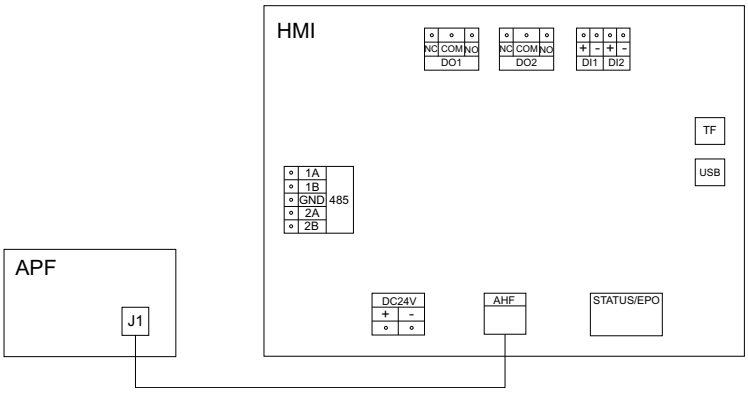
The connector torque requirements are as follows:

Port	Tightening torque (Nm)
Binding screws of pin holes of J2 connector	0.5~0.6
Binding screws of pin holes of J3 connector	0.5~0.6
J3 connector locking screw	0.5~0.6

Wiring Description of 7-Inch HMI

Wall-mounted single module, with 4.3-Inch HMI, does not require a 7-Inch HMI. Rack-mounted modules are single or parallel, the wall-mounted modules are connected in parallel, a 7-Inch HMI is required as the overall control system.

The electrical connection diagram of 7-Inch HMI and module is as follows:

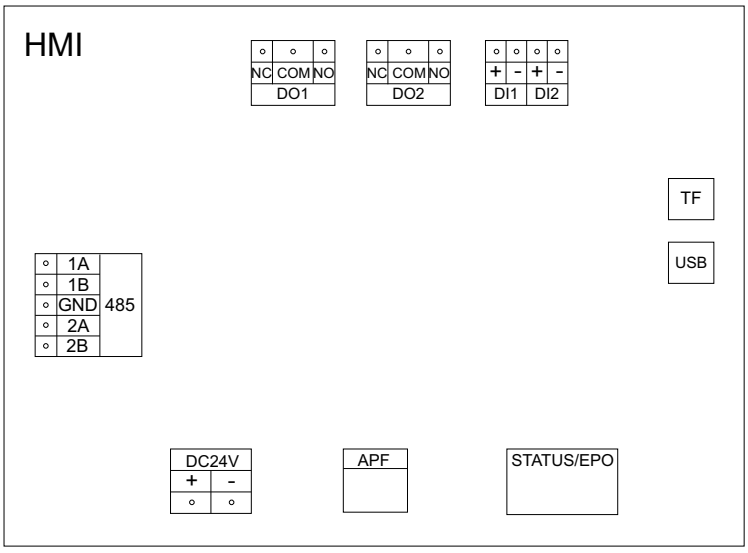


NOTE: The port position shown in the figure is only a logic diagram. It is slightly different from the port position on the actual product. Please pay attention to identifying the port label during installation.

HMI Port Description

In addition to the interconnection with the module, the 7-Inch HMI can also realize functions such as communicate with other upper computers or use external dry contact equipment for remote switch on/off control.

The schematic diagram of connection ports of 7-Inch HMI is as follows:



NOTE: The port position shown in the figure is only a logic diagram. It is slightly different from the port position on the actual product. Please pay attention to identifying the port label during installation.

Functions of each port are described as follows:

- EasyLogic™ APF port: used to connect to EasyLogic™ APF module.
- DC24V port: capable of outputting 24 Vdc power (the port is not open for use).
- 485 port: used to communicate with the remote upper computer. See Connection of Upper Computer Communication, page 57 section.
- DO1/DO2 port: used for remote status indication. See Connection of 7-Inch HMI Dry Contact, page 64 section .

- DI1/DI2 port: used for remote switch on/off control. See Connection of 7-Inch HMI Dry Contact, page 64 section.
- TF card port: not needed.
- SD card port: used for interface upgrade of HMI.
- USB port: used to upgrade the communication program of HMI and download the recorded data.
- STATUS/EPO port: used to indicate the status of the parallel system and connect the EPO emergency switch. See Connection of EPO Button and Status Indicator With 7-Inch HMI, page 64 section.

Description of Port Wiring Selection

The recommended cable specifications for HMI ports are as follows:

HMI Port	Applicable Cable or Equipment
APF port	Module HMI interconnection cable (length: 3 m), provided by Schneider Electric
DC24V port	UL1015 16~28AWG (the port does not open for use)
485 port	UL1015 16~28AWG
DO1 port	UL1015 16~28AWG
DO2 port	UL1015 16~28AWG
DI port	UL1015 16~28AWG
TF card port	TF memory card, not needed
SD card port	SD memory card (2G~8G)
USB port	USB memory card (2G~8G)
STATUS/EPO port	STATUS/EPO cable (length 1.5m), provided by Schneider Electric
Remarks	Except for cable accessories provided by Schneider Electric, accessories or optional accessories of other cables and equipment mentioned above are not provided in APF products

The connector torque requirements are as follows:

Port	Tightening Torque
485 port	0.23 Nm (2 lbf-in)
DO1 port	0.23 Nm (2 lbf-in)
DO2 port	0.23 Nm (2 lbf-in)
DI port	0.23 Nm (2 lbf-in)

Selection and Connection of Current Transformer (CT)

As an external component of Schneider Electric APF, current transformer CT plays a key role in the normal operation of APF, so the selection of external current transformer is very important.

NOTICE
USE CT OF CORRECT SPECIFICATION Use CT that meets the technical requirements of APF. **Failure to follow these instructions can result in equipment damage.**

Schneider Electric APF is not attached with external CT components.

CT Specification and CT Cable Requirements

CT wiring must be routed directly from the conduit entry-plate to the terminal block of the CT board.

CT must be selected for:

- Up to 30,000 primary rating
- 5 A secondary
- 50/60 Hz
- Accuracy above Grade 0.2 (closed type) or Grade 0.5 (open type).
- The CT primary current rating must exceed the maximum load current where they are installed.
- The maximum burden (in VA) on the CT is formed by the CT wiring and total active filter burden. This is equal to 1.0 VA for CTs with a 5 A secondary rating.
- The maximum wire size of the CT secondary is 2.5 mm^2 / 12 AWG. Consult the CT manufacturer for secondary wiring recommendations. See “Maximum Wire Length” tables.

CT secondary wiring must be either twisted and/or shielded pairs.

Do not connect the active filter CT to any other loads. Use a separate current transformer if additional uses are required.

Any splicing to the CT leads needs to be done with crimp style connectors or soldered.

S2 of each CT installed must be grounded as close to the CT as possible

The CTs installed either on the source side or load side (Harmonic mode 2 is not supported) of the active filter.

5 A Secondary Maximum Wire Length

Maximum Wire Length From Active Filter to CT in Meters		
CTS burden capacity with 5 A secondary rating	1.5 mm^2	2.5 mm^2
5 VA	15	24
15 VA	51	84
25 VA	87	143
30 VA	105	173
35 VA	124	203
45 VA	160	263

5A Secondary Maximum Wire Length

Maximum Wire Length From Active Filter to CT in Feet		
CTS burden capacity with 5 A secondary rating	14 AWG	12 AWG
5 VA	65	103
15 VA	228	361
25 VA	390	619
30 VA	472	748
35 VA	553	877
45 VA	715	1135

NOTICE

USE AND CONFIGURE CT OF CORRECT SPECIFICATION

- Use CT that meets the technical requirements.
- The same transformation ratio parameters as the CT must be configured and adopted in the HMI.

Failure to follow these instructions can result in equipment damage.

Before startup, check whether the external CT transformation ratio value set by the system is consistent with the actual CT transformation ratio value.

CT installation

Schneider Electric APF supports three-phase three-wire and three-phase four-wire applications.

Three phase three-wire system requires at least two CTs, which are installed on phase A and phase C respectively (or all three-phases are installed). Three-phase four-wire system requires three CTs, which are respectively connected to three-phase circuits of A, B and C. CT can be installed on the load side which are called open-loop installation (Harmonic mode 2 is not supported) , or on the source side, which are called closed-loop installation.

⚠⚠DANGER

HAZARD OF ELECTRICAL SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personnel protective equipment (PPE) and follow safe electrical work practices. Refer to your local regulations.
- Never open circuit a current transformer (CT).
- Turn off power to unit including auxiliary contacts and short CTs.
- Always use grounded external CTs for current inputs.

Failure to follow these instructions will result in death or serious injury.

CT Terminal and Wiring

CT terminals on Schneider Electric EasyLogic™ APF share a 6 pin J3 connector with locking screw. The description of terminals is as follows:

J3-CT					
A		B		C	
S1	S2	S1	S2	S1	S2
○	○	○	○	○	○
1					6

J3 connector locking screw 0.5~0.6 Nm.

Do not connect the CT secondary side cable to any other non-EasyLogic™ APF load. Any splicing of CT leads shall be completed by using crimp connectors or by welding. S2 of each installed CT shall be grounded as close to the CT as possible.

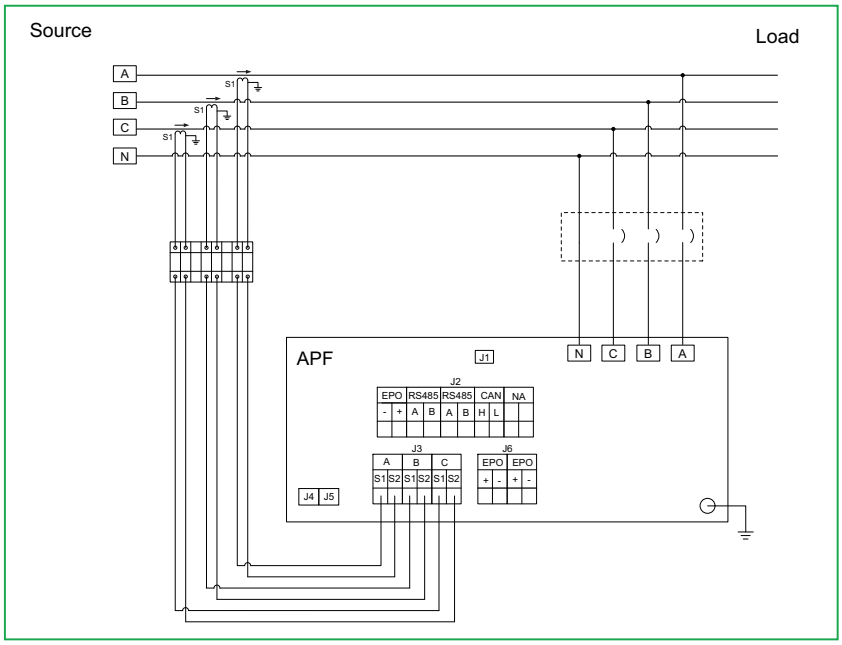
NOTICE

DEGRADED EASYLOGIC™ APF PERFORMANCE

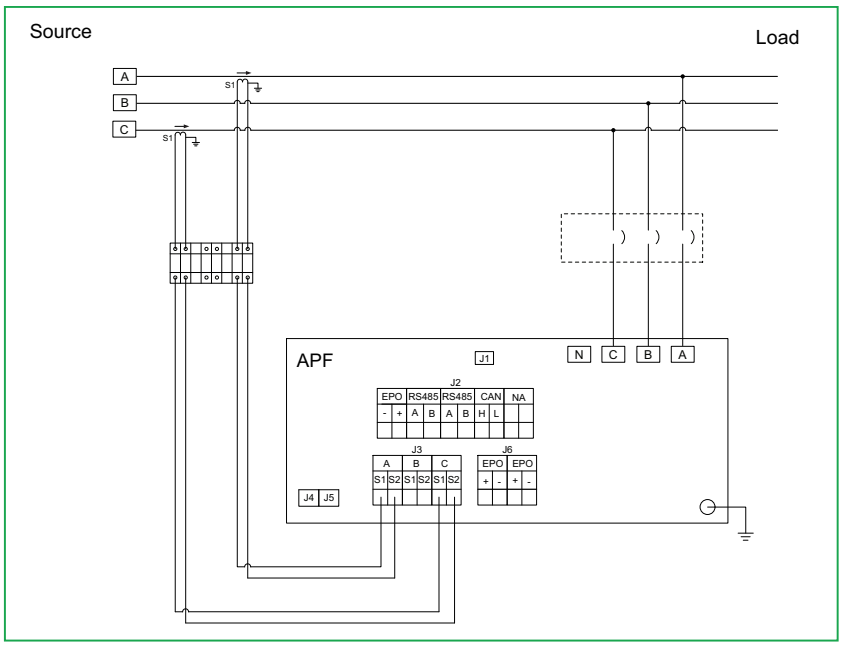
CT cables must be laid separately from power cable.

Failure to follow these instructions can result in equipment damage.

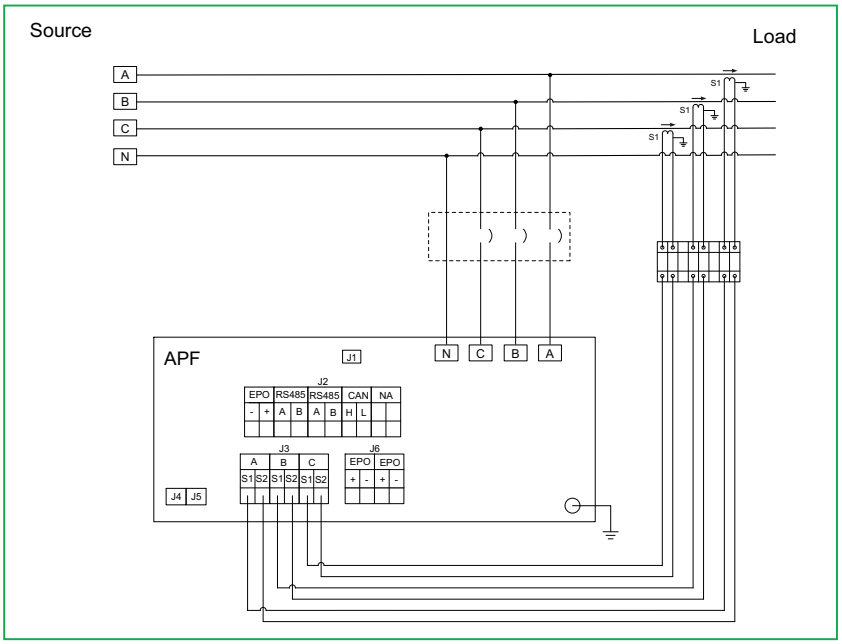
Source Side CT Position Single Module With Neutral Connected



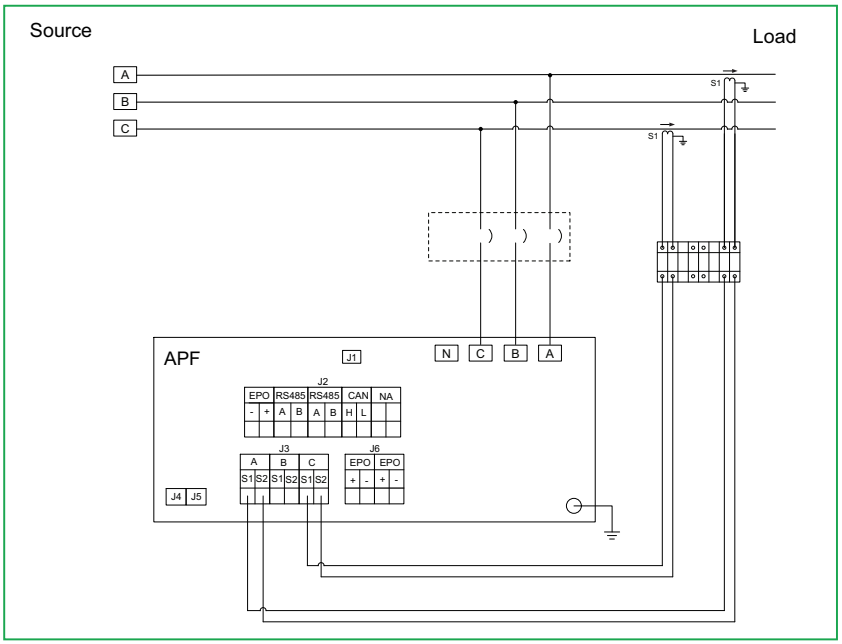
Source Side CT Position Single Module Without Neutral Connected



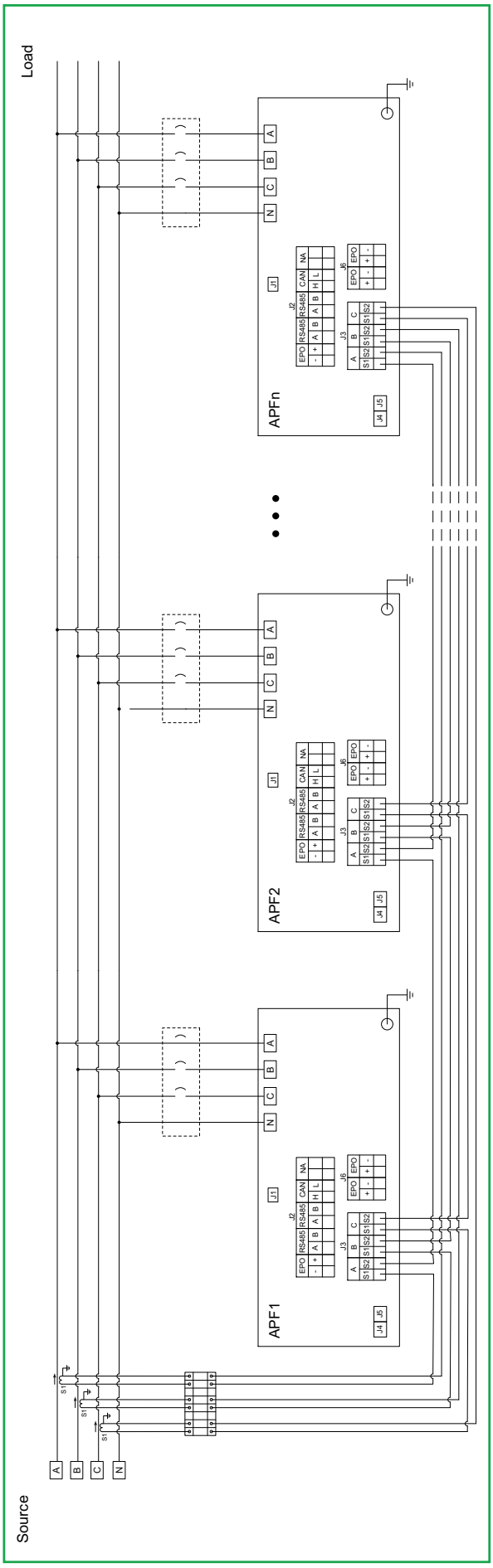
Load Side CT Position Single Module With Neutral Connected



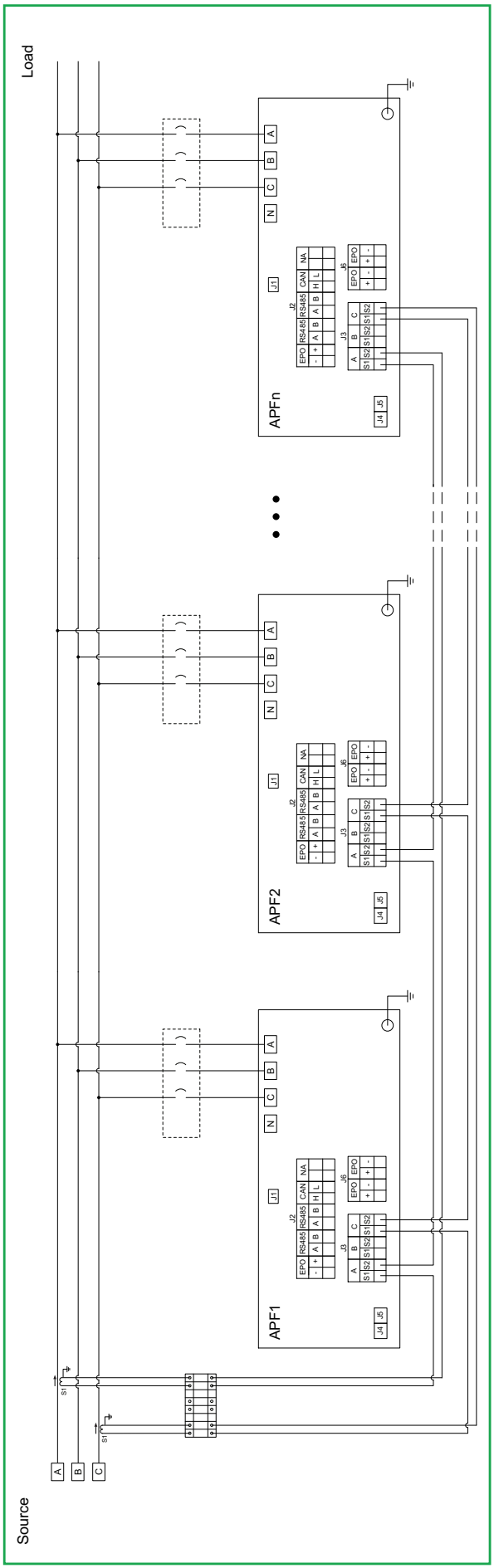
Load Side CT position Single Module Without Neutral Connected



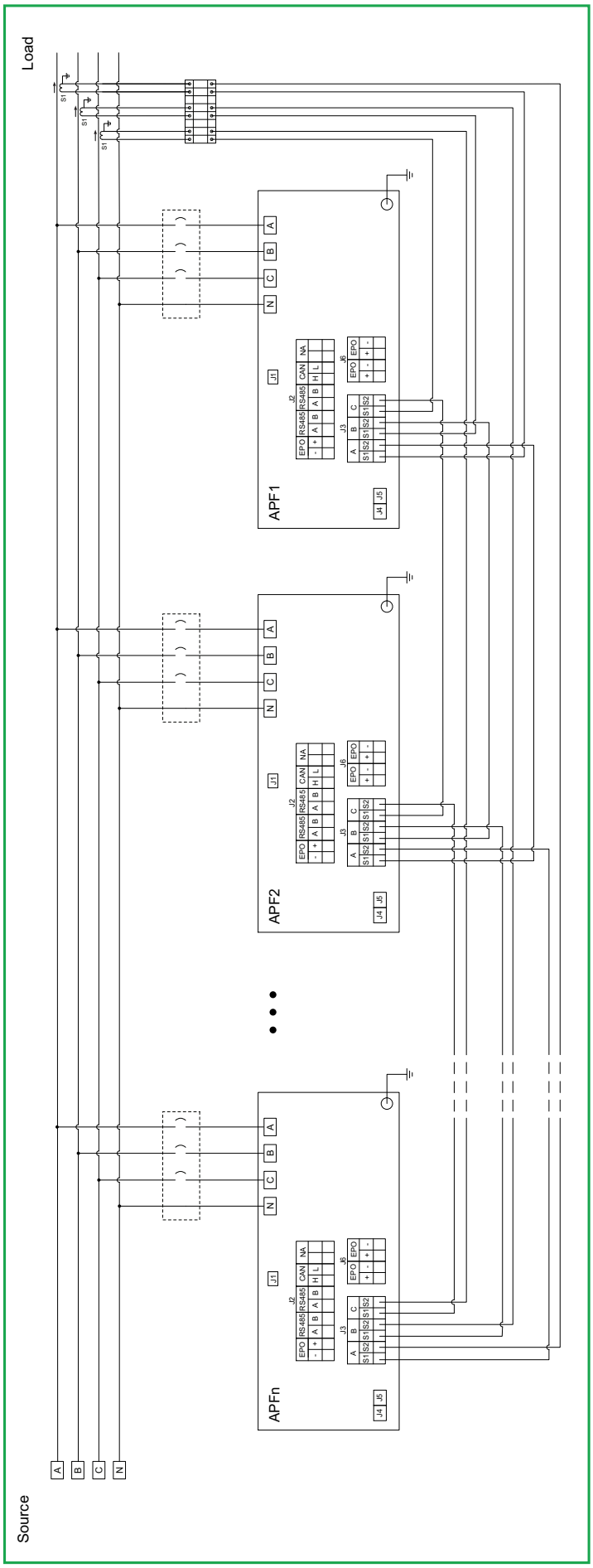
Source Side CT position Multi-Module Parallel With Neutral Connected



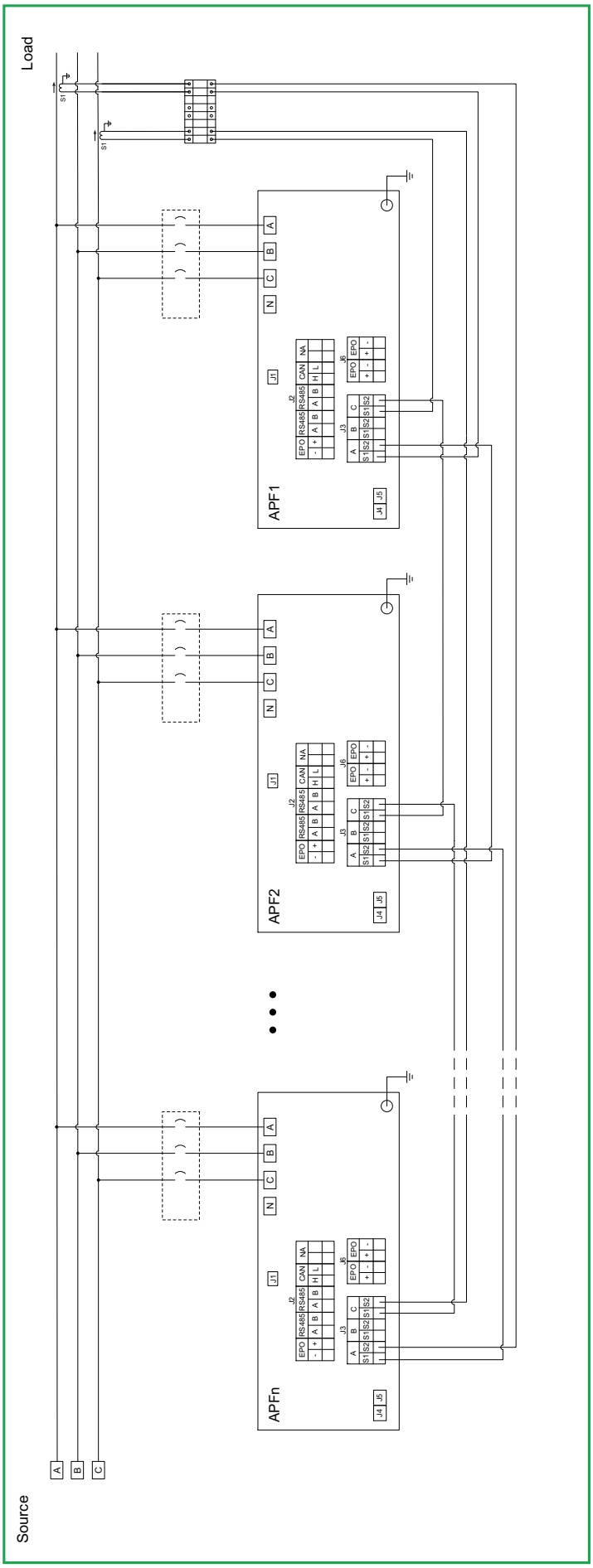
Source Side CT Position Multi-Module Parallel Without Neutral Connected



Load Side CT Position Multi-Module Parallel With Neutral Connected



Load Side CT Position Multi-Module Parallel Without Neutral Connected



Connection of Upper Computer Communication

Schneider Electric APF provides communication between the remote upper computer and the 7-Inch HMI (the 4.3-Inch HMI of the single wall-mounted module does not have this function).

When remote communication is required, use the 485-communication port on the 7-Inch HMI to connect to the upper computer, as shown in the figure below:

○	1A	
○	1B	
○	GND	485
○	2A	
○	2B	

The ports 485-2A and 485-2B are connected to the upper computer, while the ports 485-1A and 485-1B are not open for use yet.

When the HMI is connected to the upper computer for communication, USB to 485 converter is recommended for upper computer. For tightening torque requirements for binding screws of 485 connection terminals on HMI, see Description of Port Wiring Selection, page 48 section

The communication protocol of port 485 is Modbus-RTU. For more information about the communication protocol, please contact Schneider Electric.

Wall-Mounted Single Module External EPO Switch

Wall-mounted single module is equipped with input ports for EPO signals. Just connect the emergency stop button with EPO2+ and EPO2- of J2 terminal in the figure below to realize the emergency stop function.

The driving capability of EPO: 5 Vdc~6 Vdc, output capacity: I ≤ 20 mA.

J2-Communication									
EPO2		RS-485		RS-485		CAN		N/A	
-	+	1A	1B	2A	2B	H	L		
	○	○	○	○	○	○	○	○	○
1									10

⚠⚠DANGER

THERE IS A DANGER OF UNEXPECTED OPERATION OF EQUIPMENT

- Pressing the EPO emergency stop button can only stop harmonic output of the equipment and cannot completely power off the equipment.
- Appropriate sensing devices with rated voltages should always be used to confirm that the power is off.

Failure to follow these instructions will result in death or serious injury.

Multi-Module Parallel Connection

Schneider Electric APF rack-mounted or wall-mounted modules can have up to 8 modules installed in parallel.

Wall-mounted single module, with 4.3 Inch HMI, does not require a 7-Inch HMI. Rack-mounted modules are single or parallel, the wall-mounted modules are connected in parallel, a 7-Inch HMI is required as the overall control system.

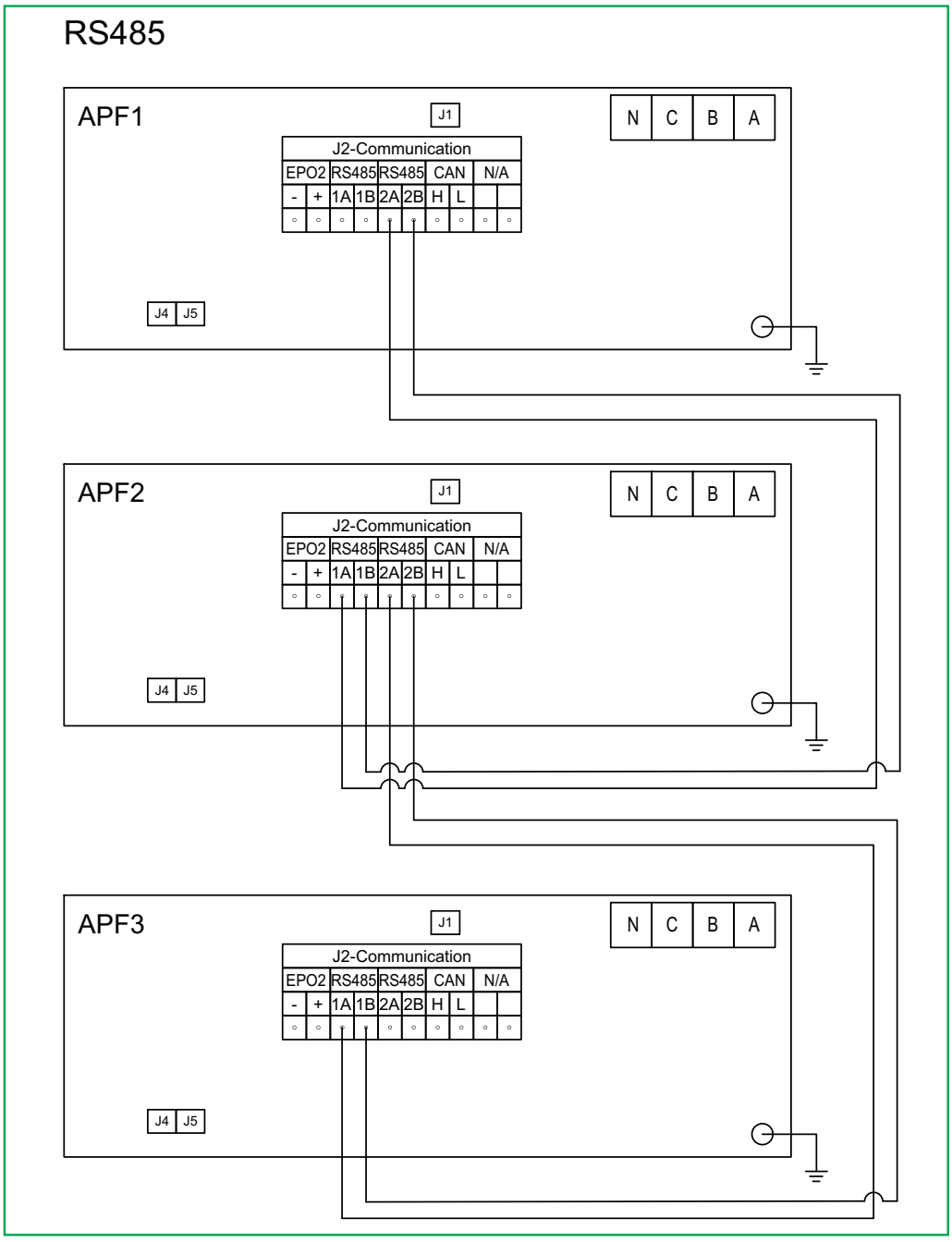
When multiple modules are connected in parallel, RS485 port, CAN port, RS422 and EPO port shall be connected between parallel modules. At the same time, the DSW dial switch on the module must be used to set an independent address for each parallel module, so that the HMI can monitor and identify the corresponding address of each module.

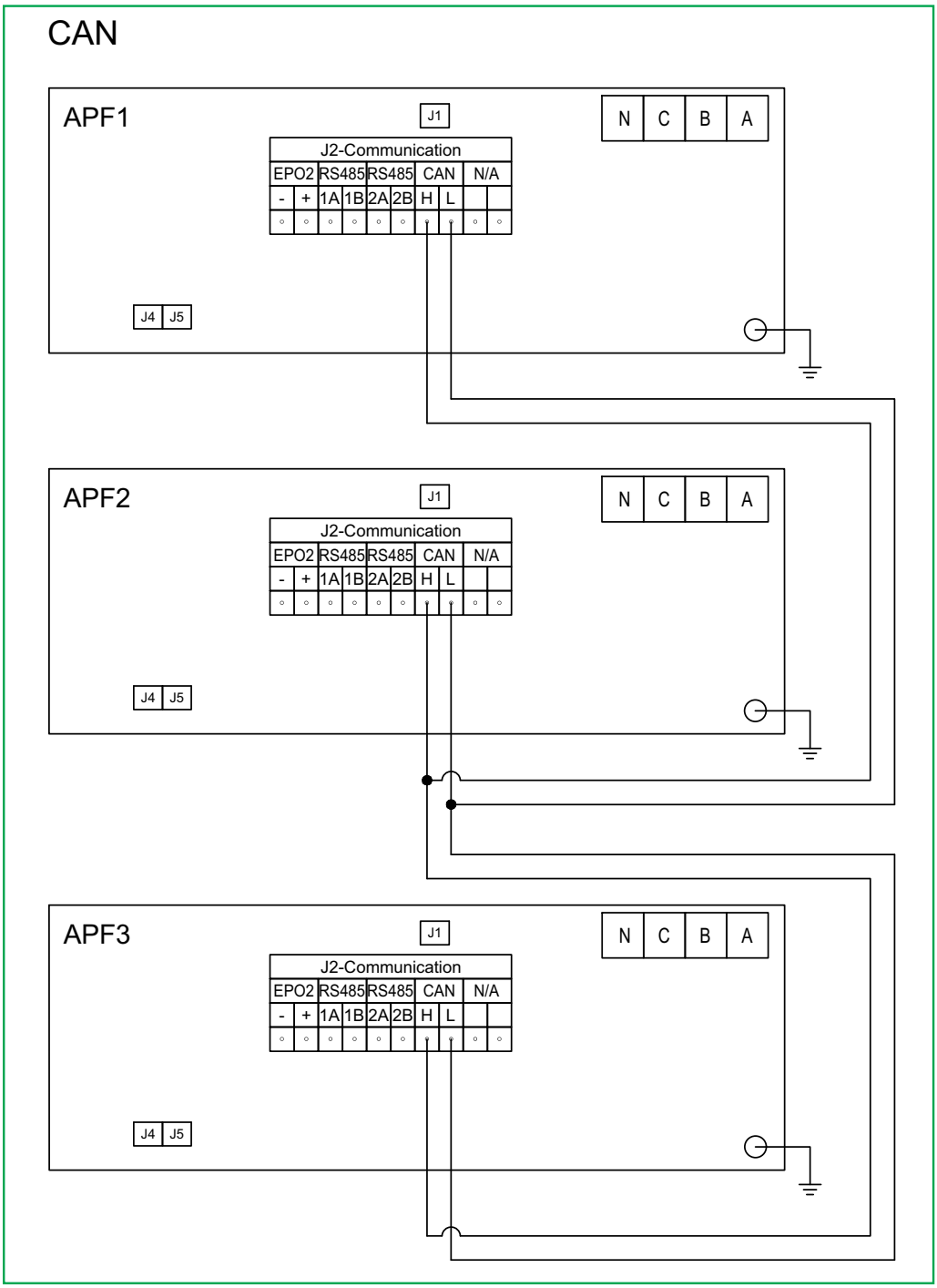
When multiple modules are connected in parallel, the RS485 line and CAN line may have signal distortion. If necessary, a 120 Ω terminating resistor accessory can be connected to the J1 port to improve communication signal quality. The HMI of Schneider Electric APF is attached with a dedicated120 Ω terminating resistor accessory.

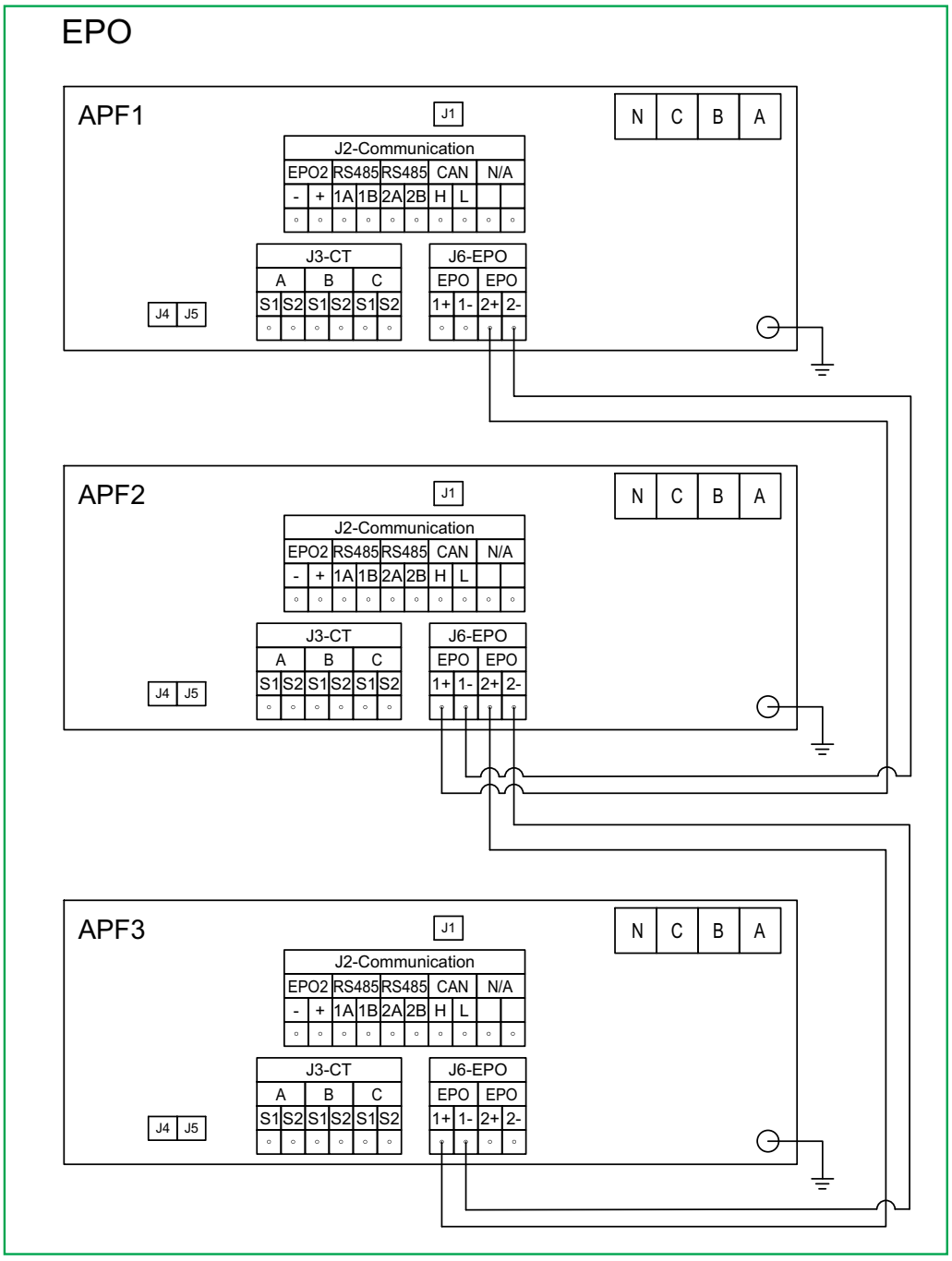
Wiring Diagram of Parallel Port

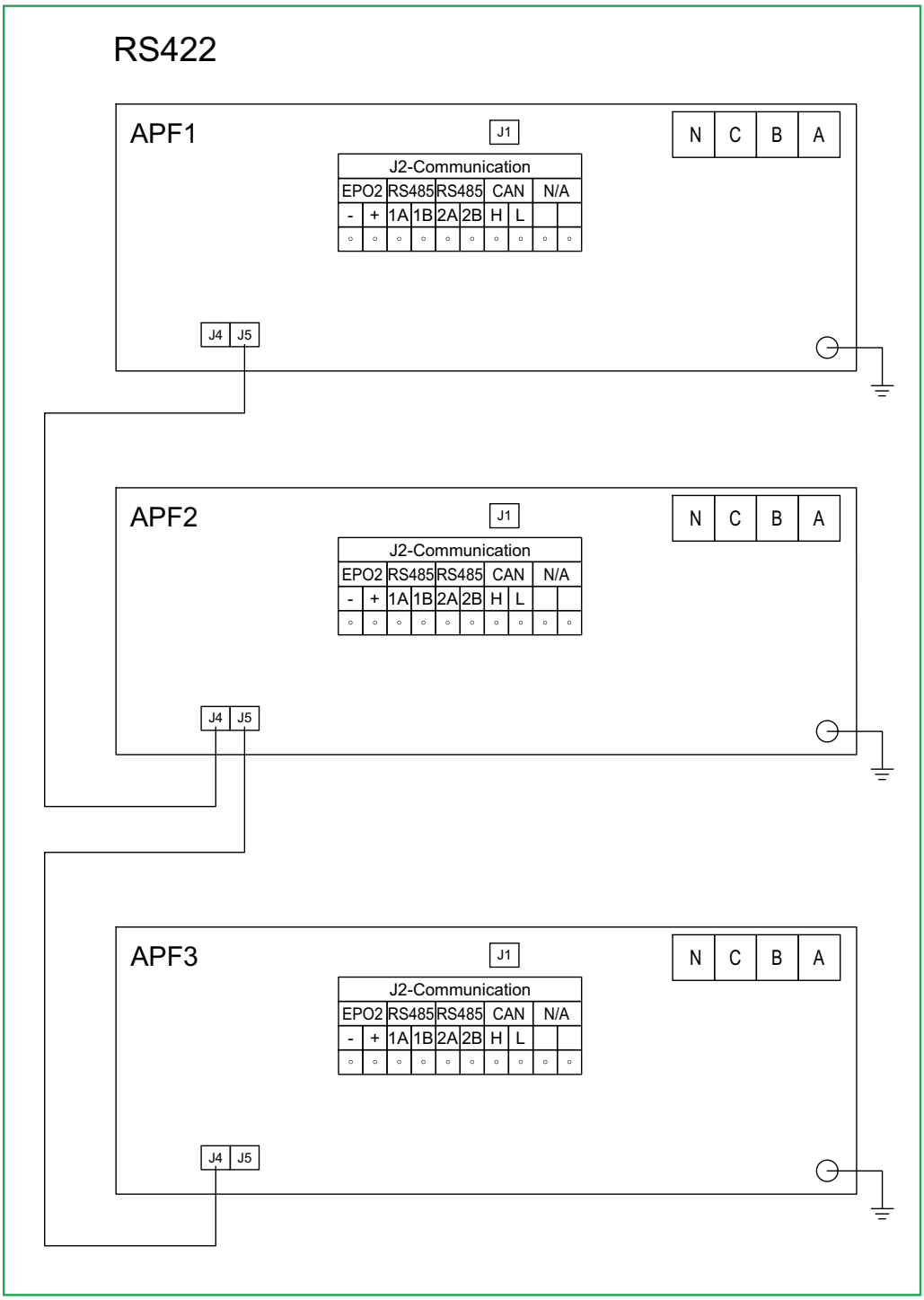
The wiring diagram of each port of the module during parallel operation is as follows:
(The port position shown in the figure is only a logic diagram. It is slightly different from the port position on the actual product. Please pay attention to identifying the port label during installation.)

For tightening torque requirements for binding screws of J2 and J6 connectors when the modules are connected in parallel, see Description of Port Wiring Selection, page 48 section .


RS485
APF1
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5
APF2
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5
APF3
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5


CAN
APF1
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5
N C B A
APF2
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5
N C B A
APF3
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J4 J5
N C B A


EPO
APF1
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J3-CT
A B C
S1 S2 S1 S2 S1 S2
J6-EPO
EPO EPO
1+ 1- 2+ 2-
J4 J5
APF2
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J3-CT
A B C
S1 S2 S1 S2 S1 S2
J6-EPO
EPO EPO
1+ 1- 2+ 2-
J4 J5
APF3
J1
N C B A
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
J3-CT
A B C
S1 S2 S1 S2 S1 S2
J6-EPO
EPO EPO
1+ 1- 2+ 2-
J4 J5


RS422
APF1
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
N C B A
J4 J5
APF2
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
N C B A
J4 J5
APF3
J1
J2-Communication
EPO2 RS485 RS485 CAN N/A
- + 1A 1B 2A 2B H L
N C B A
J4 J5

Parallel Address Code Configuration

The device number of each paralleling module shall be set through the Dip Switch (DSW) during parallel operation. The dial switch is 4 bits, while the effective bits of the dial switch are 1 ~ 3 bits, and the D4 bit must be set to 0 (off bit).

Rack-mounted

Dip Switch			
D1	D2	D3	D4
1	1	1	1
0	0	0	0

Wall-mounted

Dip Switch			
D4	D3	D2	D1
0	0	0	0
1	1	1	1

The relationship between the dial switch and the device number is expressed in binary: 1 represents on and 0 represents off, as shown in the following table:

Module number	D1	D2	D3	D4
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0

NOTICE

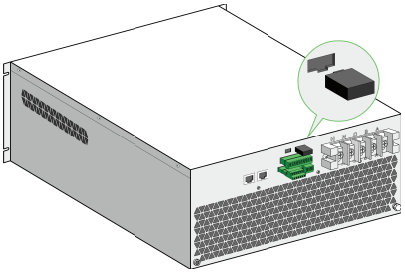
SET THE MODULE ADDRESS CORRECTLY

- Configure the module address according to address table.
- The D4 bit of DSW dial switch must be set to 0 (off) bit

Failure to follow these instructions can result in equipment damage.

Use of 120Ω Terminating Resistor During Parallel Operation

Whether the rack-mounted or wall-mounted EasyLogic™ APF is connected in parallel, if the length of the communication line between the parallel modules at both ends is long (for example, exceeds 10 m for RS485 or CAN network), it may affect the signal quality of the communication network. At this time, it is recommended to insert the attached 120 Ω terminating resistor accessories on the J1 port of the two terminal modules, as shown in the figure below:



Cooperation Mode of Different HMI During Parallel Operation

When the rack-mounted EasyLogic™ APF is connected in parallel, a 7-Inch HMI must be used to distribute and monitor the parameters of each paralleled module.

4.3-Inch HMI configured by each module can only configure the parameters of its own module and monitor itself and cannot control other modules. 7-Inch HMI must be used, whose parallel connection mode is the same as that of rack-mounted modules. Please note that parameters distributed by the 7-Inch HMI in the wall-mounted parallel mode refer to: setting parameters are distributed to the internal control boards of all parallel modules (similar to the parallel operation of rack-mounted modules), rather than to the 4.3-Inch control panel of all wall-mounted modules. At this time, the setting parameters displayed on the 4.3-Inch control panel will be different from those on the 7-Inch control panel.

Connection of 7-Inch HMI Dry Contact

Schneider Electric APF can realize remote switch on/off and state monitoring via the DI dry contact and DO digital output port on the 7-Inch HMI.

Functions of DI/DO port on HMI are described as follows:

Output dry contact DO1:

- When APF is off or in standby mode: NC-COM is in open circuit state, NO-COM short circuit state.
- When APF is on and in output mode: NC-COM is in short circuit state, NO-COM is in open circuit state.

Output dry contact DO2:

- When APF is not faulty: NC-COM is in short circuit state and NO-COM is in open circuit state
- When APF report fault: NC-COM is in open circuit state and NO-COM is in short circuit state

Input dry node:

- DI1+ and DI1- are the shutdown control of the module. When a high power is input, the module can be shut down.
- DI2+ and DI2- are the startup control of the module. When a high power is input, the module can be powered on.
- When the two input dry contact ports are at low level, the user terminal will not perform dry contact on/off operation.

If DI/DO port is used, additional power supply is required. For information about level adaptation capability of DI/DO port, see HMI and Service Provisions, page 11 section .

For tightening torque requirements for binding screws of DI/DO connector terminals on HMI, see Description of Port Wiring Selection, page 48 section .

Connection of EPO Button and Status Indicator With 7-Inch HMI

The STATUS/EPO port on 7-Inch HMI can be used for overall status indication and EPO control of the paralleled system.

⚠⚠DANGER

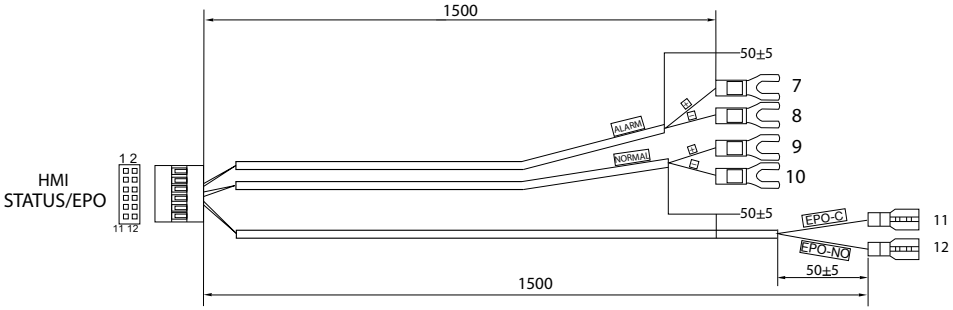
THERE IS A DANGER OF UNEXPECTED OPERATION OF EQUIPMENT

- Pressing the EPO emergency stop button can only stop harmonic output of the equipment and cannot completely power off the equipment.
- Appropriate sensing devices with rated voltages should always be used to confirm that the power is off.

Failure to follow these instructions will result in death or serious injury.

During parallel operation, it is necessary to ensure that J6 EPO terminals between multiple modules have been correctly interconnected, and then connect the EPO emergency stop button and status indicator to the STATUS/EPO port on the HMI.

Wiring of STATUS/EPO port on the HMI is described as (STATUS/EPO cable (length 1.5m), provided by Schneider Electric with 7-Inch HMI) :



For information on driving capability of STATUS/EPO ports, Recommended level range: 5Vdc~6Vdc, Output capacity: I≤20mA.

Final Inspection Upon Installation

After completing each installation step of EasyLogic™ APF, be sure to use the installation checklist to check and confirm that it is installed correctly.

When all installation steps have been completed, and all spot checks of the installation checklist have been completed and recorded, it means that the installation process is complete.

⚠WARNING

RISK OF OVERHEATING OPERATION

After the module installation and wiring are completed, make sure to remove the protective film on the air inlet and outlet.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Pre-Commissioning

This chapter provides information for preparation of the active power filter for commissioning. Before applying power, read and understand this information thoroughly.

Instruments Required For Commissioning

- Voltmeter or multimeter
- Clamp-on ammeter
- Megohmmeter

Pre-Energizing Procedure

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personnel protective equipment (PPE) and follow safe electrical work practices. Refer to your local regulations.
- This equipment must only be installed in area accessible to electrically skilled personnel and electrically instructed personnel with the proper authorization and serviced by qualified electrical personnel.
- This equipment must only be installed in area without combustible materials.
- Turn off all power to auxiliary contacts and short CT secondary's before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Ensure all disconnect switches are disconnected before servicing equipment. More than one may be present.
- After removing power, wait 15 minutes to allow capacitors to discharge before opening or removing covers.
- Replace all devices and covers before turning on power to this equipment.
- Carefully inspect the interior for tools left behind before replacing covers.
- Verify the rating of the neutral conductor for each unit in the system is greater than the neutral current limit setting.

Failure to follow these instructions will result in death or serious injury.

Installation Inspection

Inspect all connections for both power and control wiring. Ensure that the correct termination points have been made for each wire. Ensure that all connections are firmly tightened prior to start-up.

Pre-Commissioning Checklist

Prior to commissioning the active filter system, the following items must be completed:

- Electrical connections have been made in accordance with local codes.

- Main CTs are installed to measure the current of the system to be corrected.
- The secondary wiring of the main CTs have been connected to the CT board of the active filter.
- If it is a parallel active filter system, CT wiring and parallel communications wiring have been installed between the CT boards of each unit.
- Check that the short circuit grounding of the CT adapter board has been removed.
- Check the phase line to ground insulation resistance of the product.
- Check that the protective film against foreign matters has been removed.
- At least 50% of the anticipated load should be available during the commissioning procedure. To fully test the system integration, all loads supported by the active filter system should be available for operation. The total output current required for the system must be at least 10% of the unit's nameplate rating. For example, a 50 A unit will need a minimum of 5A Total Output current.
- If backup generation is connected to the active filter, the system should also be tested with the generator supporting the connected loads.

The Field Service Engineer will need to know the following information to commission the active filter:

- Installation location of the main CTs in relationship to the active filter (load or grid).
- The ratio of the main CTs installed.
- The phase on which each CT is installed.
- Intended mode of operation (Harmonic, Power Factor, Load Balancing).

Operation Instructions For Power On/Off and Debugging

Refer to the User Manual for Operation Instructions for Power on/off and Debugging. The User Manual is available as a download from our website.

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

EZAPF3160899EN_02