

# 1 Summary Of XC Series PLC

---

XC series PLC include diverse CPU units and expansions with powerful functions. This chapter will mainly tell the main specifications, the whole products range, each part's description and name template composing this four items.

1-1 . Products Specifications

1-2 . Model Composing and Model List

1-3 . Each Part's Description



## 1-1 . Products Specifications

### 1-1-1 . CPU Units

#### 1 Diverse Models

XC series PLC's CPU units has many subsidiary products line, the combination can be make freely.

- | I/O Points: 10、14、16、24、32、48、60 points
- | Output Type: Transistor、Relay、R/T mixed type
- | Input Type: PNP、NPN
- | Power Supply Type: AC220V、DC24V
- | Subsidiary <sup>1</sup> XC1、XC2、XC3、XC5、XCM

| Series | Type                | Description   |
|--------|---------------------|---|
| XC1    | Economic Type       | Include 10I/O、16I/O、24I/O、32I/O<br>Suitable for common simple applications which has less I/O requirement, Do not support free communication, expansion, BD cards.  |
| XC2    | Basic Type          | Include 14I/O、16I/O、24I/O、32I/O、48I/O、60I/O<br>Equipped XC series PLC's basic functions, the CPU unit can't work with expansions, but can work with BD card. Equipped with high speed operation ability.                            |
| XC3    | Standard Type       | Include 14I/O、24I/O、32I/O、48I/O、60I/O<br>XC series standard models, equipped with full functions, fulfill the user's diverse requirements   |
| XC5    | Strength Type       | Include 24I/O、32I/O、48I/O、60I/O<br>Besides XC3 series functions, XC5 series PLC added following functions:<br>24I/O、32I/O models have 4CH pulse output;<br>48I/O、60I/O support CAN-bus, users can realize CAN bus network functions |
| XCM    | Motion Control Type | Include 24I/O、32I/O<br>Besides XC series basic functions, XCM models support powerful pulse output functions and rich motion control instruction. The models are designed especially for motion control.                            |

- | Special Type XC3-19AR-E (Combine analogue I/O with digital I/O in one body )

2

1 : For each subsidiary series's model list and functions, please refer to Appendix 4;

2 : XC3-19AR is not included in this manual. For the using method, please refer to 《XC3-19AR-E manual》.

XC series PLC have abundant basic functions and diverse special functions. Each subsidiary series faces to different application field.

#### **Abundant Basic Functions**

- | High Speed Operation  
Basic operation instruction 0.2 ~ 0.5us, the scan time is 10,000 steps per 5ms, the program space reaches to 160K.
- | Abundant expansions  
The CPU units usually support 7 different expansions and 1 BD card.
- | Multiple Communication Ports  
The CPU units have 1 ~ 4 communication ports, support RS232、RS485、CAN bus; can work with many peripheral devices like inverters, instruments, printers etc.
- | Rich soft device space  
The five subsidiary series of XC series PLC are equipped with different internal resource to apply different requirements.  
The resource space reaches: 1024 points flow S、8768 points middle relayM、544 points input relay、544 points output relay、640 points Timer T、640 points counter C、9024 points data register D、2048 points FD、36864 points expansion register ED。
- | 2 types of program form  
XC series PLC support 2 types of program form, i.e instruction list and ladder chart. The two types can switch to each other;
- | Abundant instructions  
Abundant instructions, besides the basic order control, data transfer and compare, arithmetic, data loop and shift, the PLC also support pulse output, high speed counter, interruption, PID etc.
- | Real time clock  
XC series PLC are equipped with real time clock, for time control;
- | Compact size, convenient to install  
XC series PLC has compact size, convenient to install. User can choose DIN or screw installation style.

#### **Strength Special Functions**

- | High Speed Pulse Counter can reach 80KHz  
The CPU units of XC2/XC3/XC5 are equipped with 3 channels, 2 phases high speed counter and high speed counter comparator; can realize single phase, pulse+direction, AB phase count, the frequency can reach 80KHz.
- | Powerful communication&network ability  
With multiple communication port and diverse communication protocol like Modbus protocol、free communication protocol etc, it's easy to build the different network; In

Modbus network, PLC can be master or slave; XC5 series can build CAN bus; via T-BOX module can build Ether net; via G-BOX can work with GPRS network;

- | High Speed Pulse Output can reach 400Hz  
XC series PLC <sup>1</sup> are generally equipped 2 pulse output terminals, can output 400KHz pulse; the special model <sup>2</sup> has 4 channels pulse output functions
- | Interruption Function  
XC series PLC have interruption function, including external interruption, time interruption and high speed counter interruption; they can meet different requirements.
- | Switch I/O points freely  
XC series PLC has special switch I/O points function, that is developed in case of terminals broken, there is no need to change the program;
- | C language function block  
Write the function block with C language, the program is more secured. Meantime, with the abundant operation functions, the PLC can realize more functions, which saves great internal space, improve the program efficiency;
- | PID function on CPU units  
The CPU units of XC series PLC <sup>1</sup> has PID control and auto tune function.
- | Sequential Function Block (BLOCK)  
In sequential function Block, users can realize the sequential action of instructions. This function is suitable to apply on pulse output, communication, motion control, inverter's read/write etc. This function simplify the program editing greatly.
- | 24 segments high speed counter interruption  
There are 24 segments 32 bits initial value in high speed counter of XC series PLC <sup>1</sup>. Each segment can generate interruption with perfect real time ability, realize electric cam function;
- | PWM pulse width modulation  
XC series PLC <sup>1</sup> have PWM pulse width modulation function, this function can apply to DC motor control;
- | Frequency testing  
XC series PLC <sup>1</sup> can realize frequency testing
- | Precise Time  
XC series PLC <sup>1</sup> can realize precise time, the precise timer is a 32 bits timer of 1ms
- | Motion Control  
XCM series PLC <sup>1</sup> are motion control models, can realize circular interpolation, position control etc.

---

1 : Here XC series PLC refer to the PLC which can realize the mentioned functions. That's to say, not all XC series PLC can realize the mentioned function. For details, please refer to Appendix 4.

2 : here the special model refers to XC5-32T-E

---

|          |                        |
|----------|------------------------|
| <b>3</b> | <b>Easy to Program</b> |
|----------|------------------------|

When program the PLC via XCPPro, users can feel it Humanism and easy to get familiar.

- | Switch ladder and instruction list freely
- | Offer soft device comment, ladder comment, instruction hint functions etc.
- | Offer many types of program interface for special instructions, convenient to write the instructions.
- | Perfect monitor mode: ladder monitor, free monitor, soft devices monitor
- | Many windows in one interface, convenient to manage.

1 : For the detailed XCP Pro software application, please refer to 《XC series PLC user manual 【software】》.

|                           |
|---------------------------|
| <b>1-1-2 . Expansions</b> |
|---------------------------|

|          |                          |
|----------|--------------------------|
| <b>1</b> | <b>Expansion Modules</b> |
|----------|--------------------------|

To fulfill the field control requirements better, XC series PLC can work with expansions, each CPU units can link 7 expansions.

- | Diverse Types  
Digital I/O expansions, analogue I/O modules, temperature control modules and function mixed modules etc.
- | Compact Size
- | DC24V power supply (32I/O modules are AC220V power supply).
- | Analogue、 temperature modules all include PID tune function.

| Digital I/O<br>Modules   | Analogue I/O<br>Modules   | Temperature<br>Control Modules   | Function Mixed<br>Modules   |
|--|---|--|---|
| Power Supply: DC24V<br>AC220V<br>Input points: 8-32<br>Output points: 8-32<br>Output Type: Relay<br>Transistor | Power Supply: DC24V<br>Type: DA、 AD<br>AD/DA<br>DA channel Nr. : 2、 4<br>AD channel Nr.: 4、 8 | Power Supply: DC24V<br>Temperature: PT100<br>thermocouple<br>Temp. Channel Nr.: 6<br>PID Control: Included | Power Supply: DC24V<br>AD: 3CH<br>Temperature: 4CH PT100<br>DA: 2CH |

|          |                |
|----------|----------------|
| <b>2</b> | <b>BD Card</b> |
|----------|----------------|

Besides the expansion modules, XC series PLC can also expand by the BD cards. The BD cards are small PCB cards which can insert into PLC from the BD port (on CPU unit), so this kind of expansion doesn't take extra space.

- | Analogue and temperature type: XC-2AD2PT-BD
- | Communication: XC-COM-BD

1: User should install and configure before using the BD cards. For details, please refer to: 《XC series BD cards user manual》.

|   |
|---|
| <b>1-2 . Model Composing and Model List</b> |
|---|

|   |
|---|
| <b>1-2-1 . Name Principle and Model list of CPU units</b> |
|---|

|          |                                    |
|----------|------------------------------------|
| <b>1</b> | <b>Name Principle of CPU units</b> |
|----------|------------------------------------|

Name principle of XC series PLC CPU units:



- |                        |   |
|------------------------|---|
| 1 : Series Name        | XC1、XC2、XC3、XC5、XCM   |
| 2 : Input/Output Point | 10、14、16、24、32、48、60  |
| 3 : If Input is NPN    | R : Relay output<br>T : Transistor output<br>RT :Relay/Transistor mix output (Y0、Y1 are Transistor)     |
| If Input is PNP        | PR : Relay output<br>PT : Transistor output<br>PRT : Relay/Transistor mix output (Y0、Y1 are Transistor) |
| 4 : Power Supply       | E : AC Power Supply ( 220V )<br>C : DC Power Supply ( 24V )   |

1 : Generally, clock and RS485 are standard configuration on communication port. But some models are not included. Please refer to Appendix 4.

## 2 CPU Units List

### I XC1 Series Model List

| Model           |                   |                 |                   |            | Input points<br>(DC24V) | Output points<br>(R , T) |
|-----------------|-------------------|-----------------|-------------------|------------|-------------------------|--------------------------|
| AC Power Supply |                   | DC Power Supply |                   |            |                         |                          |
| Relay output    | Transistor output | Relay output    | Transistor output |            |                         |                          |
| N<br>P<br>N     | XC1-10R-E         | XC1-10T-E       | XC1-10R-C         | XC1-10T-C  | 5                       | 5                        |
|                 | XC1-16R-E         | XC1-16T-E       | XC1-16R-C         | XC1-16T-C  | 8                       | 8                        |
|                 | XC1-24R-E         | XC1-24T-E       | XC1-24R-C         | XC1-24T-C  | 12                      | 12                       |
|                 | XC1-32R-E         | XC1-32T-E       | XC1-32R-C         | XC1-32T-C  | 16                      | 16                       |
| P<br>N<br>P     | XC1-10PR-E        | XC1-10PT-E      | XC1-10PR-C        | XC1-10PT-C | 5                       | 5                        |
|                 | XC1-16PR-E        | XC1-16PT-E      | XC1-16PR-C        | XC1-16PT-C | 8                       | 8                        |
|                 | XC1-24PR-E        | XC1-24PT-E      | XC1-24PR-C        | XC1-24PT-C | 12                      | 12                       |
|                 | XC1-32PR-E        | XC1-32PT-E      | XC1-32PR-C        | XC1-32PT-C | 16                      | 16                       |

### I XC2 Series Model List

| Model           |            |            |                 |                   |            |             | Input points<br>(DC24V) | Output points<br>(R , T) |
|-----------------|------------|------------|-----------------|-------------------|------------|-------------|-------------------------|--------------------------|
| AC Power Supply |            |            | DC Power Supply |                   |            |             |                         |                          |
| Relay output    |            |            | Relay output    | Transistor output | R/T Type   |             |                         |                          |
| N<br>P<br>N     | XC2-14R-E  | XC2-14T-E  | XC2-14RT-E      | XC2-14R-C         | XC2-14T-C  | XC2-14RT-C  | 8                       | 6                        |
|                 | XC2-16R-E  | XC2-16T-E  | XC2-16RT-E      | XC2-16R-C         | XC2-16T-C  | XC2-16RT-C  | 8                       | 8                        |
|                 | XC2-24R-E  | XC2-24T-E  | XC2-24RT-E      | XC2-24R-C         | XC2-24T-C  | XC2-24RT-C  | 14                      | 10                       |
|                 | XC2-32R-E  | XC2-32T-E  | XC2-32RT-E      | XC2-32R-C         | XC2-32T-C  | XC2-32RT-C  | 18                      | 14                       |
|                 | XC2-48R-E  | XC2-48T-E  | XC2-48RT-E      | XC2-48R-C         | XC2-48T-C  | XC2-48RT-C  | 28                      | 20                       |
|                 | XC2-60R-E  | XC2-60T-E  | XC2-60RT-E      | XC2-60R-C         | XC2-60T-C  | XC2-60RT-C  | 36                      | 24                       |
| P<br>N<br>P     | XC2-14PR-E | XC2-14PT-E | XC2-14PRT-E     | XC2-14PR-C        | XC2-14PT-C | XC2-14PRT-C | 8                       | 6                        |
|                 | XC2-16PR-E | XC2-16PT-E | XC2-16PRT-E     | XC2-16PR-C        | XC2-16PT-C | XC2-16PRT-C | 8                       | 8                        |
|                 | XC2-24PR-E | XC2-24PT-E | XC2-24PRT-E     | XC2-24PR-C        | XC2-24PT-C | XC2-24PRT-C | 14                      | 10                       |
|                 | XC2-32PR-E | XC2-32PT-E | XC2-32PRT-E     | XC2-32PR-C        | XC2-32PT-C | XC2-32PRT-C | 18                      | 14                       |
|                 | XC2-48PR-E | XC2-48PT-E | XC2-48PRT-E     | XC2-48PR-C        | XC2-48PT-C | XC2-48PRT-C | 28                      | 20                       |

|  |            |            |             |            |            |             |    |    |
|--|------------|------------|-------------|------------|------------|-------------|----|----|
|  | XC2-60PR-E | XC2-60PT-E | XC2-60PRT-E | XC2-60PR-C | XC2-60PT-C | XC2-60PRT-C | 36 | 24 |
|--|------------|------------|-------------|------------|------------|-------------|----|----|

**| XC3 Series Model List**

| Model           |            |            |                 |              |                   |             | Input points<br>(DC24V) | Output points<br>(R , T) |
|-----------------|------------|------------|-----------------|--------------|-------------------|-------------|-------------------------|--------------------------|
| AC Power Supply |            |            | DC Power Supply |              |                   |             |                         |                          |
| Relay output    |            |            |                 | Relay output | Transistor output | R/T Type    |                         |                          |
| N<br>P<br>N     | XC3-14R-E  | XC3-14T-E  | XC3-14RT-E      | XC3-14R-C    | XC3-14T-C         | XC3-14RT-C  | 8                       | 6                        |
|                 | XC3-24R-E  | XC3-24T-E  | XC3-24RT-E      | XC3-24R-C    | XC3-24T-C         | XC3-24RT-C  | 14                      | 10                       |
|                 | XC3-32R-E  | XC3-32T-E  | XC3-32RT-E      | XC3-32R-C    | XC3-32T-C         | XC3-32RT-C  | 18                      | 14                       |
|                 | XC3-48R-E  | XC3-48T-E  | XC3-48RT-E      | XC3-48R-C    | XC3-48T-C         | XC3-48RT-C  | 28                      | 20                       |
|                 | XC3-60R-E  | XC3-60T-E  | XC3-60RT-E      | XC3-60R-C    | XC3-60T-C         | XC3-60RT-C  | 36                      | 24                       |
| P<br>N<br>P     | XC3-14PR-E | XC3-14PT-E | XC3-14PRT-E     | XC3-14PR-C   | XC3-14PT-C        | XC3-14PRT-C | 8                       | 6                        |
|                 | XC3-24PR-E | XC3-24PT-E | XC3-24PRT-E     | XC3-24PR-C   | XC3-24PT-C        | XC3-24PRT-C | 14                      | 10                       |
|                 | XC3-32PR-E | XC3-32PT-E | XC3-32PRT-E     | XC3-32PR-C   | XC3-32PT-C        | XC3-32PRT-C | 18                      | 14                       |
|                 | XC3-48PR-E | XC3-48PT-E | XC3-48PRT-E     | XC3-48PR-C   | XC3-48PT-C        | XC3-48PRT-C | 28                      | 20                       |
|                 | XC3-60PR-E | XC3-60PT-E | XC3-60PRT-E     | XC3-60PR-C   | XC3-60PT-C        | XC3-60PRT-C | 36                      | 24                       |

**| XC5 Series Model List**

| Model           |            |            |                 |              |                   |             | Input points<br>(DC24V) | Output points<br>(R , T) |
|-----------------|------------|------------|-----------------|--------------|-------------------|-------------|-------------------------|--------------------------|
| AC Power Supply |            |            | DC Power Supply |              |                   |             |                         |                          |
| Relay output    |            |            |                 | Relay output | Transistor output | R/T Type    |                         |                          |
| N<br>P<br>N     | -          | XC5-24T-E  | -               | -            | XC5-24T-C         | -           | 14                      | 10                       |
|                 | -          | XC5-32T-E  | -               | -            | XC5-32T-C         | -           | 18                      | 14                       |
|                 | XC5-48R-E  | XC5-48T-E  | XC5-48RT-E      | XC5-48R-C    | XC5-48T-C         | XC5-48RT-C  | 28                      | 20                       |
|                 | XC5-60R-E  | XC5-60T-E  | XC5-60RT-E      | XC5-60R-C    | XC5-60T-C         | XC5-60RT-C  | 36                      | 24                       |
| P<br>N<br>P     | -          | XC5-24PT-E | -               | -            | XC5-24PT-C        | -           | 14                      | 10                       |
|                 | -          | XC5-32PT-E | -               | -            | XC5-32PT-C        | -           | 18                      | 14                       |
|                 | XC5-48PR-E | XC5-48PT-E | XC5-48PRT-E     | XC5-48PR-C   | XC5-48PT-C        | XC5-48PRT-C | 28                      | 20                       |
|                 | XC5-60PR-E | XC5-60PT-E | XC5-60PRT-E     | XC5-60PR-C   | XC5-60PT-C        | XC5-60PRT-C | 36                      | 24                       |

**| XCM Series Model List**

| Model           |                 | Input points | Output points |
|-----------------|-----------------|--------------|---------------|
| AC Power Supply | DC Power Supply |              |               |

| Relay output |   |            |   | Relay output | Transistor output | R/T Type | (DC24V) | (R , T) |
|--------------|---|------------|---|--------------|-------------------|----------|---------|---------|
| N<br>P<br>N  | - | XCM-24T-E  | - | -            | XCM-24T-C         | -        | 14      | 10      |
|              | - | XCM-32T-E  | - | -            | XCM-32T-C         | -        | 18      | 14      |
|              | - | XCM-48T-E  | - | -            | XCM-48T-C         | -        | 28      | 20      |
| P<br>N<br>P  | - | XCM-24PT-E | - | -            | XCM-24PT-C        | -        | 14      | 10      |
|              | - | XCM-32PT-E | - | -            | XCM-32PT-C        | -        | 18      | 14      |
|              | - | XCM-48PT-E | - | -            | XCM-48PT-C        | -        | 28      | 20      |

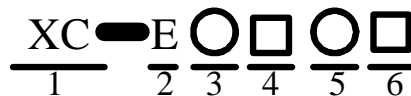
1 : XC1 can also have special 20 I/O model

2 : XCM-48 is in developing

## 1-2-2 . Expansion's name principle and module list

|   |                  |
|---|------------------|
| 1 | I/O<br>Expansion |
|---|------------------|

The I/O expansions' name principle:



- |                   |   |
|-------------------|---|
| 1 : Series name   | XC  |
| 2 : For Expansion | E   |
| 3 : Input points  | 8、 16、 32                                   |
| 4 : For Input     | NPN Type: X<br>PNP Type: PX                 |
| 5 : Output points | 8、 16、 32                                   |
| 6 : For output    | YR : relay output<br>YT : transistor output |

I/O expansions list:

| Model |        |              |                   | I/O<br>Points | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-------|--------|--------------|-------------------|---------------|----------------------------|----------------------------|
|       | Input  | Output       |                   |               |                            |                            |
|       |        | relay output | transistor output |               |                            |                            |
| N     | XC-E8X | -            | -                 | 8             | 8                          | -                          |
| P     | -      | XC-E8YR      | XC-E8YT           | 8             | -                          | 8                          |

|   |          |              |              |    |    |    |
|---|----------|--------------|--------------|----|----|----|
| N | -        | XC-E8X8YR    | XC-E8X8YT    | 16 | 8  | 8  |
|   | XC-E16X  | -            | -            | 16 | 16 | -  |
|   | -        | XC-E16YR     | XC-E16YT     | 16 | -  | 16 |
|   | -        | XC-E16X16YR  | XC-E16X16YT  | 32 | 16 | 16 |
|   | XC-E32X  | -            | -            | 32 | 32 | -  |
|   | -        | XC-E32YR     | -            | 32 | -  | 32 |
| P | XC-E8PX  | -            | -            | 8  | 8  | -  |
|   | -        | XC-E8YR      | XC-E8YT      | 8  | -  | 8  |
|   | -        | XC-E8PX8YR   | XC-E8PX8YT   | 16 | 8  | 8  |
| N | XC-E16PX | -            | -            | 16 | 16 | -  |
| P | -        | XC-E16YR     | XC-E16YT     | 16 | -  | 16 |
|   | -        | XC-E16PX16YR | XC-E16PX16YT | 32 | 16 | 16 |
|   | XC-E32PX | -            | -            | 32 | 32 | -  |
|   | -        | XC-E32YR     | -            | 32 | -  | 32 |

|          |   |
|----------|---|
| <b>2</b> | <b>Analogue &amp; Temperature<br/>Expansion</b> |
|----------|---|

Analogue, Temperature model name Principle:

**XC - E 4AD 4DA 6PT 6TCA - P**

|                     |  |
|---------------------|--|
| For Expansion       | E  |
| Analogue Input      | 4AD : 4CH analogue input<br>8AD : 8CH analogue input   |
| Analogue Output     | 2DA : 2CH analogue output<br>4DA : 4CH analogue output |
| PT100 Temperature   | 6PT : 6CH PT100  |
| K type thermocouple | 6TCA : 6CH thermocouple input (V3.1 or above)          |
| P, I, D tune        | P : with PID tune                                      |

Blank : without PID tune

I Analogue、 temperature modules list:

| Model                  |               | Description   |
|------------------------|---------------|---|
| Analogue<br>Input      | XC-E8AD       | 8CH analogue input  |
|                        | XC-E4AD       | 4CH analogue input  |
|                        | XC-E4AD2DA    | 4CH analogue input, 2CH analogue output                             |
| Analogue<br>Output     | XC-E2DA       | 2CH analogue output   |
|                        | XC-E4DA       | 4CH analogue output   |
| Temperature<br>Testing | XC-E6PT-P     | 6CH PT100 testing with PID tune                                     |
|                        | XC-E6TCA-P    | 6CH K type thermocouple testing, each channel's PID tune separately |
|                        | XC-E3AD4PT2DA | 3CH analogue input, 4CH PT100 testing, 2CH analogue output          |
|                        | XC-E2AD2PT2DA | 2CH analogue input, 2CH PT100 testing, 2CH analogue output          |

|   |         |
|---|---------|
| 3 | BD Card |
|---|---------|

The BD card name principle:

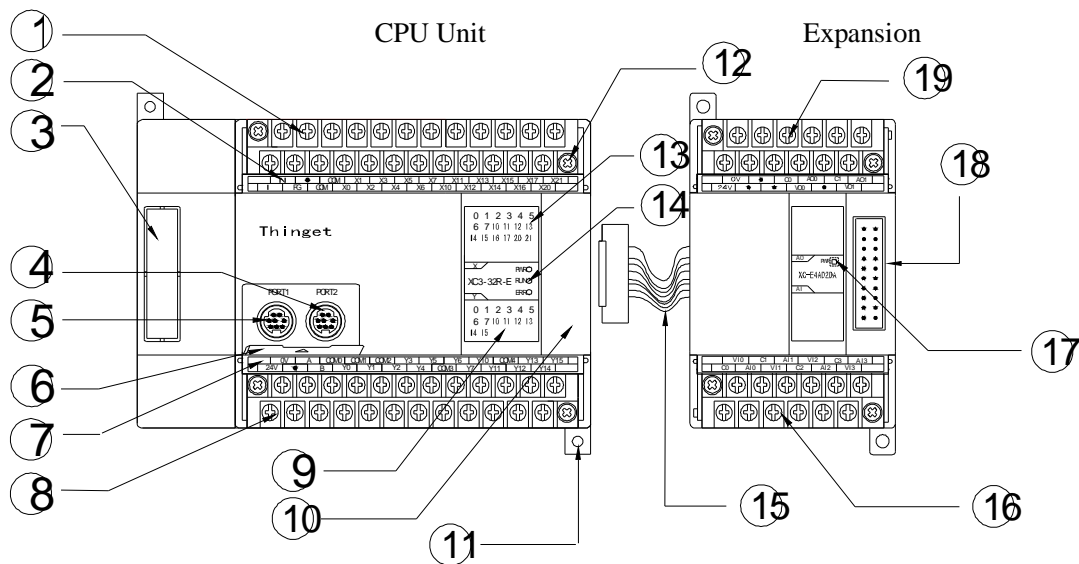
**XC - 4AD 6PT 6TC - P - BD**

|                     |                                     |
|---------------------|-------------------------------------|
| Analogue Input      | 4AD : 4CH analogue input            |
|                     | 8AD : 8CH analogue input            |
| PT100 Temperature   | 6PT : 6CH PT100 temperature Testing |
| K Type thermocouple | 6TC : 6CH thermocouple testing      |
| P、 I、 D Tune        | P : with PID tune                   |
|                     | Blank : without PID tune            |
| For BD card         | BD                                  |

I BD card list

| Model         |              | Description                                       |
|---------------|--------------|---|
| Temperature   | XC-2AD2PT-BD | 2CH analogue input, 2CH PT100 temperature testing |
| Communication | XC-COM-BD    | RS-485/232 communication                          |

### 1-3 . Each Part's Description



Each part's name is listed below:

| Number | Name                           | Number | Name  |
|--------|--------------------------------|--------|---|
| 1      | Input&power supply terminals   | 11     | Installation holes (2)                          |
| 2      | Input terminal label           | 12     | Screws to install/remove the terminals          |
| 3      | Port to install BD card        | 13     | Input LED                                       |
| 4      | COM2                           | 14     | Action LED: PWR (power); RUN (RUN); ERR (Error) |
| 5      | COM1                           | 15     | Expansion cable                                 |
| 6      | Cover plate for COM port       | 16     | Output terminals                                |
| 7      | Output terminal label          | 17     | Action LED: PWR (power);                        |
| 8      | Output& 24V power terminals    | 18     | Port to connect with expansion                  |
| 9      | Output LED                     | 19     | Input&power supply terminals                    |
| 10     | Port to connect with expansion |        |   |



