Integral controller ZG / ZP / XP Series

Industrial automation trusted partner

Product lineup

Humanized design and perfect integration of PLC and HMI

ZG series `Integrated XD series PLC and TG series HMI`

ZGM

7 inches 16.77 million colors display, XDM series PLC, 16 inputs 14 outputs, 4-axis 100KHz, pulse output, Linear/circular interpolation, high-speed counting, RS232, RS485, USB-A, USB-B port, standard clock

ZG3

4.3 inches to 7 inches 16.77 million colors display, XD3 series PLC, 16 inputs 14 outputs, 10 inputs 10 outputs, 2-axis 100KHz pulse output, High speed counting, RS232, RS485, USB-A, USB-B port, standard clock

ZG1

4.3 inches 16.77 million colors display, XD1 series PLC, 10 inputs 10 outputs, I/O sequential control, RS232, RS485, USB-A, USB-B port, standard clock

ZP series `Integrated XD series PLC and OP series operate panel`

ZP3

3.7 inches yellow green LCD display, XD3 series PLC, 10 inputs 8 outputs, 2-axis 100KHz pulse output, high speed counting

XP series `Integrated XC series PLC and OP series operate panel`

XP3

3.7 inches yellow green LCD display, XC3 series PLC, 10 inputs 8 outputs, I/O sequential control, 2-axis 100KHz pulse output, high speed counting, RS232, RS485, 26 buttons, standard clock

XP2

3.7 inches yellow green LCD display, XC2 series PLC, 10 inputs 8 outputs, I/O sequential control, 2-axis 100KHz pulse output, high speed counting, RS232, RS485, 26 buttons, standard clock

XP1

3.7 inches yellow green LCD display, XC1 series PLC, 10 inputs 8 outputs, I/O sequential control, RS232, RS485, 26 buttons, standard clock

Function and features

1 More compact structure design saves more installation space

For the realization of the same function

Past One PLC and one HMI

Now One integral controller

Save

Save the installation space of a PLC

Past PLC+HMI   Integral controller

2 The functions of PLC and HMI are combined in one, bring new experience

- It integrates logic control, analog input and output and HMI functions in one unit
- Support high-speed counting, high-speed pulse and external interrupt `except XP1&ZG1`
- Support plane interpolation and follow-up motion control `only ZGM series support`
- Support most functions of HMI
- HMI screen editing is simple and intuitive with rich functions

ZG3-30   XD3-32   TG765

## 3 Vivid picture expressiveness `ZG series`

- 3D gallery brings new visual enjoyment
- New animation editing method, more vivid performance
- Process control data acquisition function, and the trend chart display is more vivid
- Various forms of character and language

4 Panel design close to user needs

- The text integrated controller has 26 function keys, the functions can be set freely, and the keys are sensitive and accurate.
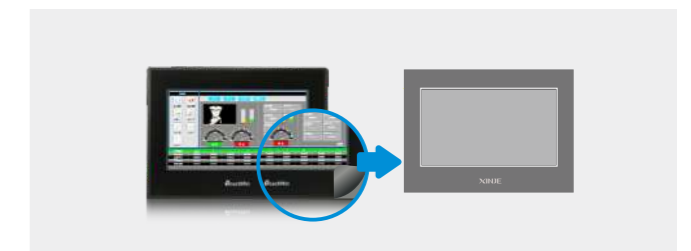
- The mask of all integrated controllers can be customized according to the needs of users, and can be replaced at will.

Function and features

5 Extended alarm function for easy maintenance

- The alarm list, alarm window, call window and other flexible monitoring settings help the maintenance personnel find the abnormal causes in time, shorten the downtime and quickly restore the system.
- The historical event display allows the user to view historical alarm events.
- Cooperate with the historical event export in the function key to realize the export of historical alarm events.

Buzzer alarm

Cooperate with the alarm list and alarm window, when an alarm occurs, you can select the silent mode, ring once and ring continuously according to the important level of the alarm to make the alarm more accurate and timely.

6 Rich interfaces and more perfect functions

- **Based on USB-B port, the program download is fast and time-saving**

  USB-B interface complies with USB2.0 standard, using the commercially available USB cable, it can carry out high-speed data transmission and greatly shorten the download time.

- **Fast import export the data, based on USB-A port**

  The back of ZG series controller is equipped with a USB-A interface for HMI data backup, which is especially suitable for on-site data collection and storage, data import and export and two-way transmission. Through the storage format of CSV file, the maintenance and verification of engineering data are more efficient, flexible formula data are produced, the unified management of variety information is realized, and the control business is simplified.
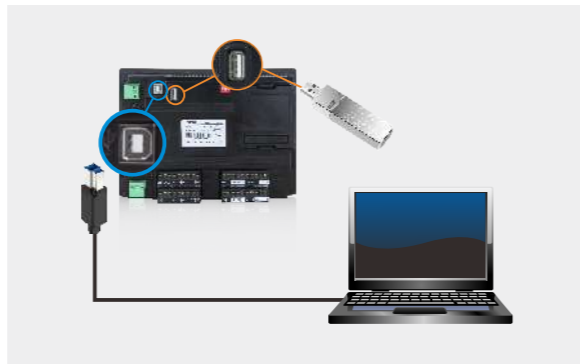
- **Multifunctional programming port**

  The HMI and PLC of ZP/XP series integrated controller use the same programming cable. Users do not need to replace repeatedly, only one cable is needed.

  Only need one cable

  Download HMI

  Download PLC

  ZP3 Series
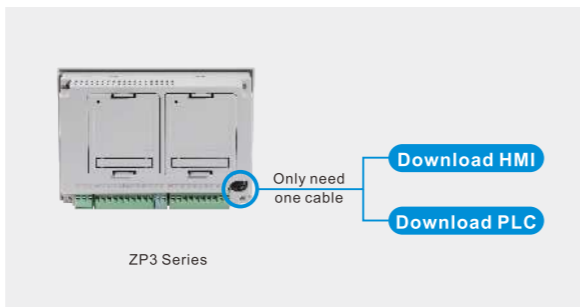
- **Dual communication ports for quick connection of various equipment**

  Download port: for HMI and PLC program uploading and downloading (ZG series needs to upload/download HMI program through USB-B port).

  Communication port: support PLC to communicate with external equipment in RS232 or RS485 mode.

7 High speed processing capability

| XP2, XP3 series | The chip of XC series PLC is adopted, which is compatible with all high-speed processing functions of XC series PLC |
| ZG3 series | The chip of XD3 series PLC is adopted, which is compatible with all high-speed processing functions of XD3 series PLC |
| ZGM-30 | XDM series PLC chip is adopted, it has richer motion control functions. Support 4 axes 100KHz pulse output, multi-channel 2-axis interpolation, 4-channel single/AB phase high speed counting, follow-up command up to 4 channels |

• Positioning control

① When using pulse output, an integrated controller with transistor output is required, such as XP2-18RT-B

② XP2, XP3 and ZG3 series all have 2 channels pulse output

③ ZGM series have 4 channels pulse output

*Note: when using the high-speed pulse output function, PLC can output 100kHz pulse at most. If it is necessary to increase the pulse output frequency on the basis of 100kHz, about 500 ohm resistance can be connected between output and 24V power supply. At this time, the output frequency can reach 200kHz at most.

• High speed counting input

By selecting different counters, single-phase counting (the maximum frequency can reach 80kHz), pulse + direction mode counting (only supported by XP series, the maximum frequency can reach 80kHz) and AB phase mode counting (double frequency and quadruple frequency are optional, and the maximum frequency can reach 50KHz).

Counting input

Sensor　　Rotary encoder

Single phase counting 3~5 channels　　AB phase counting 2~4 channels
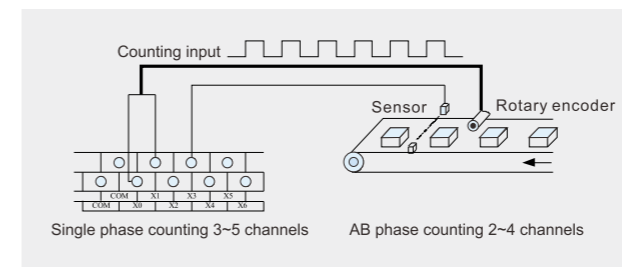
*Note: see ZG/XP-18/ZP3-18 series manual for the detailed configuration of high-speed counting of each model.

• Motion control

Support multi-channel 2-axis interpolation (exclusive function of ZGM)

Modbus RS-485

Pulse out

4 axes

2 groups
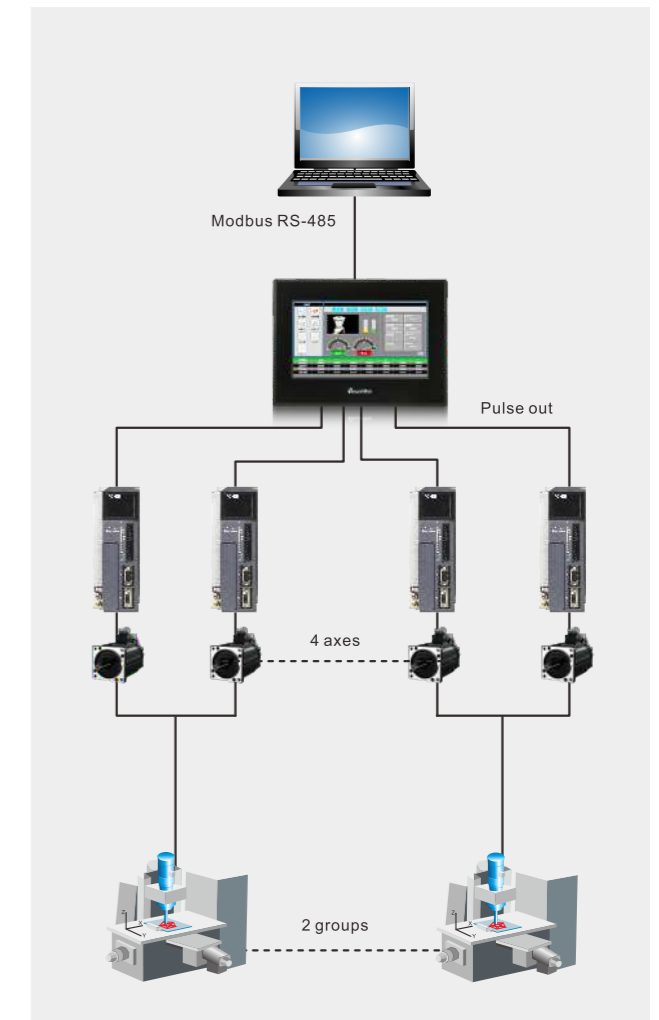
Function and features

8 Rich analog acquisition function

ZG, ZP and XP series integral controllers can realize analog input and output, temperature control and other functions by connecting BD board. ZP series can expand two BD boards, other models can only expand one BD board.

The expansion BD board is divided into Z series and XP series. Z series is suitable for ZG and ZP series integral controllers, and XP series is suitable for XP series integral controllers (XP1 cannot support BD board).

ZP3 series
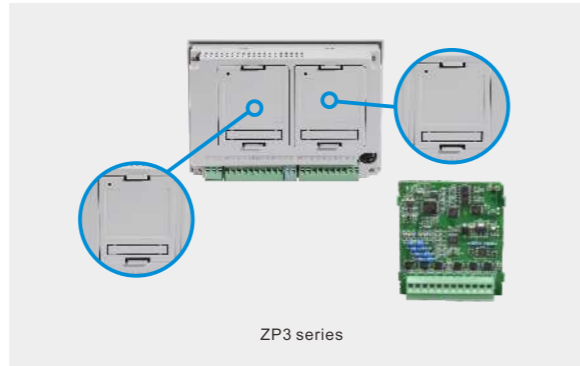
• Z series expansion BD board

Model	Description
Z-8X-BD	8 channels digital input (NPN)
Z-8YT-BD	8 channels transistor output
Z-4X4YT-BD	4 channels digital input (NPN), 4 channels transistor output
Z-4AD2DA-A-BD	4 channels current input 0~20mA, 4~20mA optional
	2 channels current output 0~20mA, 4~20mA optional
	12-bit high precision analog input (0~4095)
	10-bit high precision analog output (0~1023)
	Conversion speed 1ms/channel
	Comprehensive accuracy: ±0.8% of the full scale
Z-3AD3PT-BD	3 channels voltage input 0~10V, 0~5V optional
	3 channels PT100 (2-wire) temperature sensor input
	Temperature range -100~500ºC, accuracy 0.1ºC
	12-bit high precision analog input (0~4095)
	Conversion speed 1ms/channel
Z-4TC-BD	4 channels thermocouple temperature sensor input, support multiple thermocouple types
	Temperature range -200~1340ºC (take type K as an example, others please refer to the manual), accuracy 0.1ºC
Z-4PT3-BD	4 channels PT100 (3-wire) temperature sensor input
	Temperature range -100~500ºC, accuracy 0.1ºC
Z-1WT-BD	1 channel weighing sensor input, 20-bit high precision, analog input range DC0~10mV (sensor 2mV/V)
Z-2WT-BD	2 channel weighing sensor input, 20-bit high precision, analog input range DC0~10mV (sensor 2mV/V)
Z-NES-BD	1 RS232 and 1 RS485 communication port, the two ports cannot be used at the same time

• XP series expansion BD board

Model	Description
XP-2AD2PT-BD	2 channels voltage input 0~10V, 0~5V optional
	2 channels PT100 (2-wire) temperature sensor input (temperature range -100~350ºC, accuracy 0.1ºC)
	14-bit high precision analog input (0~16383)
	Conversion speed 15ms/4 channels
XP-2AD2PT1DA-BD	2 channels voltage input 0~10V, 0~5V optional
	2 channels PT100 (2-wire) temperature sensor input (temperature range -100~350ºC, accuracy 0.1ºC)
	1 channel current output 0~20mA, 4~20mA optional
	14-bit high precision analog input (0~16383)
	10-bit high precision analog output (0~1023)
	Conversion speed 15ms/4 channels
XP-4AD-BD	4 channels voltage input 0~10V, 0~5V optional
	14-bit high precision analog input (0~16383)
	Conversion speed 15ms/4 channels
XP-4PT-BD	4 channels PT100 (2-wire) temperature sensor input
	Temperature range -100~500ºC, accuracy 0.1ºC

Specification and models

ZG series

Integrated XD series PLC and TG series HMI in one unit, equipped with RS232, RS485, USB-B, USB-A port for downloading, communicating and data backup. 4~7 inches display, 16.77 million colors LCD, touch screen.

① I/O 20~30 points
② 2~4 axes 100KHz high speed pulse output (ZG1 cannot support)
③ 3~4 channels high speed counting input (ZG1 cannot support)
④ RS232, RS485, USB-B, USB-A
⑤ 16.77 million colors display
⑥ 128MB screen capacity
⑦ Command processing speed 0.05us
⑧ ZGM supports linear, arc interpolation and other motion control functions

Performance specification

Item	Model	ZG1 series	ZG3 series						ZGM series
		ZG1-20T-4	ZG3-20R-4	ZG3-20T-4	ZG3-30R-7	ZG3-30T-7	ZG3-30RT-7	ZGM-30T4-7
Function	HMI	Same to TG series							
	PLC	Same to XD1 series	Same to XD3 series						Same to XDM series
Interface	Download/COM1	RS232 (upload/download PLC program, PLC port1)							
	COM2	AB terminals, RS485 (PLC port2)							
	USB-A	Support import export HMI data through flash disk							
	USB-B	For HMI program download and debug, can realize high speed download, transmission rate up to 480Mbps							
Screen features	Type	16.77 million true colors LCD							
	Screen size	4.3''	4.3''		7''			7''
	Service life	Above 50000 hours, ambient temperature 25ºC, 24-hour operation							
	Display area	480*272	480*272		800*480			800*480
	Contrast	Adjustable							
	Language	Chinese, English, Japanese, German, etc.							
	Character	Any font and size							
	Touch mode	4-wire resistive mode touch							
	Memory	Screen: 128MB							
PLC specification	Program execution mode	Cyclic scanning mode							
	Programming method	Instruction, ladder chart, C language							
	Processing speed	0.05 us							
	User program capacity※1	256KB	256KB						512KB
	Digital input	10 points	10 points		16 points			16 points
	Digital output	10 points	10 points		14 points			14 points
	Output type	Transistor	Relay	Transistor	Relay	Transistor	Mixed transistor and relay	Transistor
	Soft component capacity	Same to XD1	Same to XD3						Same to XDM
	High speed pulse channel	/	/	2 channels	/	2 channels	2 channels	4 channels
	Motion control function	/	Not support						Support
	High speed counting input	/	3 channels						4 channels
			Single phase max 80KHz, AB phase max 50KHz						
	External interrupt	/	10 channels						10 channels
	Frequency measurement	/	3 channels						4 channels
	Password protection	6-bit ASCII code							
	Self diagnosis function	Power on self-test, monitoring timer, syntax check							
	Expansion BD board	1							
	Clock	Standard configuration							

※1: User program capacity refers to the max program capacity in secret download mode.

Specification and models

ZP series

Integrated XD series PLC and OP series operate panel in one unit, equipped with RS232, RS485 port for downloading and communicating. 3.7 inches monochrome display, 26 buttons can set the function freely.

① I/O 18 points
② 2-axis 100KHz high speed pulse output
③ 3 channels high speed counting input
④ RS232, RS485
⑤ 64KB screen capacity
⑥ 26 functional buttons
⑦ Command processing speed 0.05us

Performance specification

Item	Model	ZP3 series
		ZP3-18T
Function	HMI	Same to OP331 series
	PLC	Same to XD3 series
Interface	Download/COM1	RS232 (upload/download PLC program, download OP program)
	COM2	AB terminals, RS485 (PLC port2)
	USB-A	/
	USB-B	/
Screen features	Type	Yellow green LCD
	Screen size	3.7 inches
	Service life	Above 20000 hours, ambient temperature 25ºC, 24-hour operation
	Display area	192*64
	Contrast	Potentiometer adjustable
	Language	Chinese, English
	Character font	Dot matrix font, vector font
	Touch mode	Cannot touch
	Memory	Screen: 64KB Data: 4KB
	Character size	Chinese: 16*16, 32*32; English: 8*16, 16*32
	Button	26 buttons
PLC specification	Program execution mode	Cyclic scanning mode
	Programming method	Command, ladder chart, C language
	Processing speed	0.05 us
	User program capacity※1	256 KB
	Digital input	10 points
	Digital output	8 points
	Output type	Transistor
	Soft component capacity	Same to XD3
	High speed pulse channel	2 channels
	Motion control function	/
	High speed counting input	3 channels, single phase up to 80KHz, AB phase up to 50KHz
	External interrupt	8 channels
	Frequency measurement	3 channels
	Password protection	6-bit ASCII code
	Self diagnosis function	Power on self-test, monitoring timer, syntax check
	Expansion BD board	2
	Clock	Standard configuration

※1：User program capacity refers to the max program capacity in secret download mode.

XP series

Integrated XC series PLC and OP series operate panel in one unit, equipped with RS232, RS485 port for downloading and communicating. 3.7 inches monochrome display, 26 buttons can set the function freely.

① I/O 18 points
② 2-axis 100KHz high speed pulse output
③ High speed counting input
④ RS232, RS485
⑤ 64KB screen capacity
⑥ 26 functional buttons
⑦ Command processing speed 0.5us

Performance specification

Item	Model	XP1 series		XP2 series		XP3 series		
		XP1-18R	XP1-18T	XP2-18R-B	XP2-18RT-B	XP3-18R	XP3-18T	XP3-18RT
Function	HMI	Same to OP330 series						
	PLC	Same to XC1 series		Same to XC2 series		Same to XC3 series		
Interface	Download/COM1	RS232 (upload/download PLC program, download OP program)						
	COM2	AB terminals, RS485 (only can be slave station)		AB terminals, RS485 (PLC port2)				
	USB-A	/						
	USB-B	/						
Screen features	Type	Yellow green LCD						
	Screen size	3.7 inches						
	Service life	Above 20000 hours, ambient temperature 25ºC, 24-hour operation						
	Display area	192*64						
	Contrast	Potentiometer adjustable						
	Language	Chinese, English						
	Character font	Dot matrix font, vector font						
	Touch mode	Cannot touch						
	Memory	Screen: 64KB Data: 4KB						
	Character size	Chinese: 16*16, 32*32; English: 8*16, 16*32						
	Button	26 buttons						
PLC specification	Program execution mode	Cyclic scanning mode						
	Programming method	Command, ladder chart, C language						
	Processing speed	0.5 us						
	User program capacity※1	32KB		96KB		96KB		
	Digital input	10 points						
	Digital output	8 points						
	Output type	Relay	Transistor	Relay	Mixed transistor and relay	Relay	Transistor	Mixed transistor and relay
	Soft component capacity	Same to XC1		Same to XC2		Same to XC3		
	High speed pulse channel	/	/	/	2 channels	/	2 channels	
	Motion control function	/	/	Not support		Not support		
	High speed counting input	/	/	Single phase 4-channel max 10KHz, AB phase 2-channel max 5KHz		Single phase 4-channel max 80KHz, AB phase 2-channel max 50KHz		
	External interrupt	/	/	3 channels		3 channels		
	Frequency measurement	/	/	3 channels		3 channels		
	Password protection	6-bit ASCII code						
	Self diagnosis function	Power on self-test, monitoring timer, syntax check						
	Expansion BD board	/	/	1		1		
	Clock	/	/	Standard configuration		Standard configuration		

※1：User program capacity refers to the max program capacity in secret download mode.

Specification and models

General specification (ZG/ZP/XP)

| Item	Model	Specification		
		XP series	ZP series	ZG series
Electrical features	Input voltage	DC24V (voltage range DC21.6~26.4V)		
	Allowable instantaneous power failure	Less than 20ms		10ms
	Insulation impedance	About 10MΩ, DC500V (signal and ground)		
Environment	Operation temperature	0~50℃		
	Storage temperature	−10~60℃		
	Ambient humidity	20~85% (no condensation)		
	Vibration resistance	10~25Hz (X, Y, Z direction each 30 minutes 2G)		
	Anti-interference	Voltage noise: 1000Vp-p		
	Ambient air	No corrosive gas		

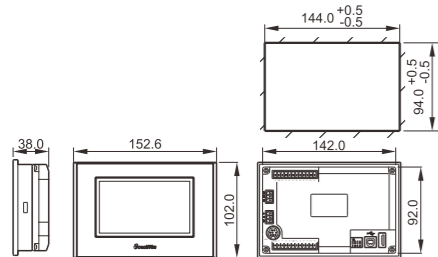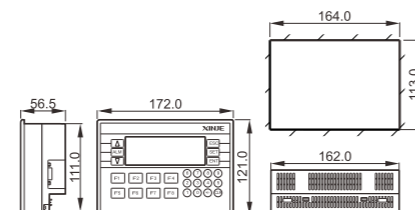# Appearance dimension drawing

(Unit: mm)

ZG3-30R/T/RT-7 / ZGM-30T4-7
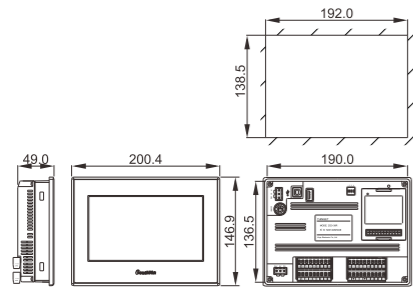
ZG3-20R/T-4
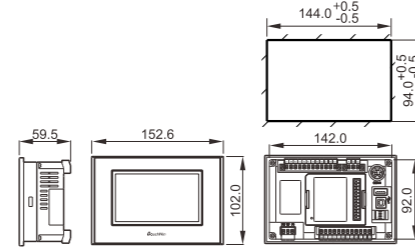
ZG1-20T-4

ZP3-18T

XP1/XP2/XP3-18R/T/RT