USER MANUAL
XIMA P SERIES

VERSION : 1.1

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Introduction

Thank you for choosing Xima VFDs . Please read the contents of this manual carefully not only to make a quick and safe installation but also to make use of our company's warranty services. In spite of the specialized terminology and concepts used in this manual, it is useful for those who have minimum information about installing power VFD devices.

Xima VFDs are designed and optimized based on the hardware and software requirements of manufacturers. Xima, also, has special attention to some important parameters including reasonable price, ease of installation, and cost-effective after-sales services.

Dear consumer! Getting help from you, we hope to improve the quality of our products day by day. Feel free to make any suggestions and criticisms; we appreciate that.

Our company's after-sales service center is always ready to answer your questions, and our experts will help you make a faster and easier installation and resolve your possible problems. For more information, visit our website:
www.Datis.in

VFD label information

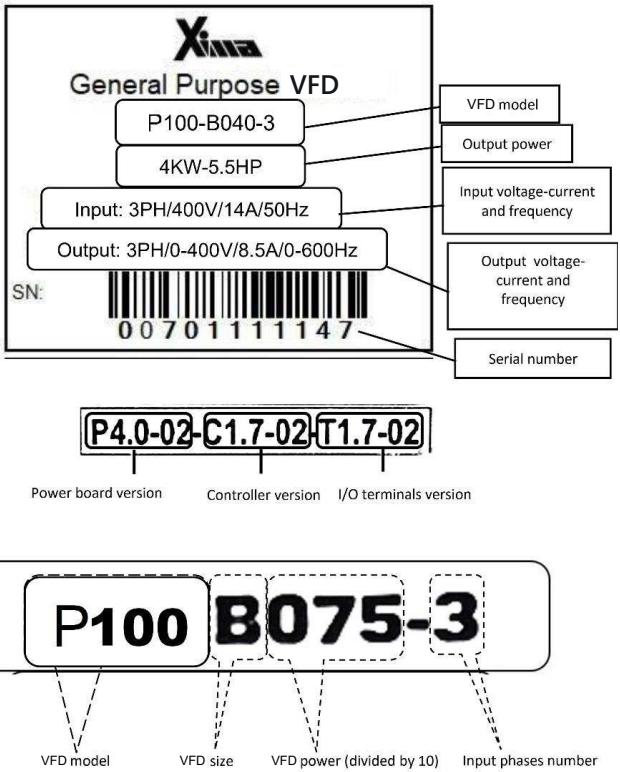


Figure 1 VFD label information

Table 1 Power Electrical Specifications

Model	size	Motor power	Voltage/phase	Nominal current	Input current	fuse	Brake resistance Power/resistance
XIMAP100XYYY-Ph	A-B-C	Kw/Hp	PH/V	A	A	A	OHM/ Watt
XIMAP100A004-1	A	0.4/0.5	1/220	2	5	8	30~50/40
XIMAP100A008-1	A	0.75/1	1/220	4	10	16	30~100/75
XIMAP100A011-1	A	1.1/1.5	1/220	5	13	25	30~80/150
XIMAP100B015-1	B	1.5/2	1/220	7	18	32	30~60/200
XIMAP100B022-1	B	2.2/3	1/220	9	24	40	30~40/250
XIMAP100B030-1	B	3/4	1/220	12	32	50	30~60/350
XIMAP100B008-3	B	0.75/1	3/380	2	3.5	8	50~220/150
XIMAP100B015-3	B	1.5/2	3/380	4	6.5	16	50~220/150
XIMAP100B022-3	B	2.2/3	3/380	5	8	16	50~180/250
XIMAP100B030-3	B	3/ 4	3/380	7	10	16	50~120/300
XIMAP100B040-3	B	4/5.5	3/380	8.5	14	25	50~100/400
XIMAP100B055-3	B	5.5/7.5	3/380	12	18	32	50~80/600
XIMAP200C075-3	C	7.5/10	3/380	18	24	40	50~120/800
XIMAP200C110-3	C	11/15	3/380	24	36	50	50~160/1200
XIMAP200C150-3	C	15/21	3/380	32	50	80	20~30/1500
XIMAP200D185-3	D	18.5/25	3/380	40	45	100	10~20/2000
XIMAP200D220-3	D	22/30	3/380	47	54	125	10~20/2300
XIMAP200D300-3	D	30/40	3/380	63	72	150	10~20/3100

Table 2 Physical specifications (0.4 Kw – 30 Kw)

Model	W (mm)	H (mm)	D (mm)	W1 (mm)	H1 (mm)	t (mm)	Weight (gr)	IP
XIMA-A	95	155	139.5	84.0	144.0	11.5	1600<	20
XIMA-B	103	206	160	91.5	194.5	11.5	2200<	20
XIMA-C	128	293	178.0	117.5	282.5	11.5	3600<	20
XIMA-D	205	448	198	159	434	34	10800<	20

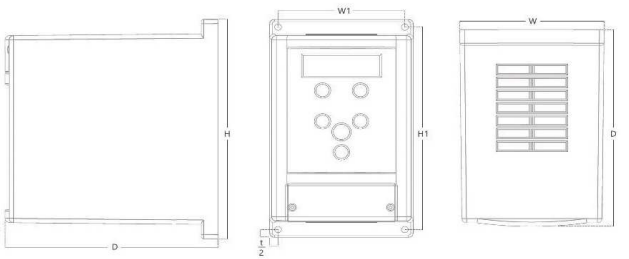


Figure 2 Physical specifications (0.4 Kw – 30 Kw)

Table 3 Technical specifications (0.4 – 30 Kw)

General Technical Features	
Display	4 Seven Segments, 4 LEDs
Keypad	6 (8) Keys
Frequency resolution	0.001 Hz (0.1Hz display)
PWM Frequency	2.0 – 10.0 KHz
PWM resolution	<11bit
ADC resolution	12bit / 4Msps
DSP	32bit Motor control
Control sampling Frequency	1000Hz
Input Frequency	47 – 63 Hz
Input Voltage	200-260(1PH) / 330-460(3PH)
Output Voltage	0 – Input Voltage
Efficiency (PF=1, Vout=Vin)	>97.5%
Phase Short circuit protection	To phase, Ground, +Bus, -Bus
Brake	Dynamic Brake
Voltage limit threshold (if enabled)	380V(1PH) / 700V(3PH)
Brake ON Voltage	370V(1PH) / 690 V (3PH)
Brake OFF Voltage	365V(1PH) / 680 V (3PH)
Over Voltage fault	400V(1PH) / 720 V (3PH)
Current limit threshold	Adjustable
Over Current threshold	2 x Drive rated Current
Analog Voltage Input impedance	14.3Kohm
Analog Current Input impedance	150ohm
Digital Input impedance	9.5Kohm
12V output Voltage	12 – 14V
12V supply output impedance	5ohm (PTC protected)
Torque Control Response	<200ms
Start Torque	150% Rated Output Torque/ 0.5 Hz
Torque Control Precision	± 0.5% Rated Output Torque

Safety Tips

○ General Tips

Observance of safety tips not only will eliminate possible dangers during installation and use, but also will result in a longer lifetime and more continuous performance for the device. Non-compliance with these tips causes potential life-threatening or financial risks.
Note that the installation of this device requires expertise and specialization, and non-specialist personnel is never allowed to install and set up the device, and corresponding personal injury and material damage is the responsibility of the consumer.

○ Input / Output Voltage

The electrical input and output voltage in the power system is high (380 V) and dangerous for humans. When installing these systems, be sure that the power is disconnected and run all steps in the "Electrical Installation" section of this user manual.

○ Mechanical and Safety System

A VFD is essentially a part of a moving mechanical system that can be dangerous for people. Proper design of the mechanical system and other items are all important for providing a safe environment. Using safety buttons to cut off the power of the machine in emergency conditions or installing mechanical brakes for motors is required in some cases.

○ Fire

The speed control system is a part which is capable of igniting and should therefore be placed inside an appropriate panel with appropriate fire standards. **Any fire damage caused by the device is the responsibility of the consumer**, and only damages regarding the speed control system, which originates from the device itself, will be covered by the warranty service, and even if the fire of the device (even due to technical problems of the device itself) results in fire and damage to a system other than the device, it will not be the responsibility of the company.

○ Fuses and Protective Circuits

The use of fuses and protective circuits in the device input is mandatory, and not applying such parts will invalidate the warranty and increase the risk of personal injuries and material damages. Refer to Table *1* for the right choice of the protective circuit.

○ Overload range

In normal conditions, the motor current must be less than the rated current of the VFD, and if the current is more than 110% of the rated current, the device enters the overload phase, and a fault will occur after a period. The duration after which the fault will occur depends on the amplitude of the current passing through the VFD . When an overload fault occurs, the system will require a restart before it can operate again.

If overload occurs when the motor is working normally, with a current less than or equal to the rated current, the duration of the fault will be shorter than the case in which the overload occurs at the beginning of the motor startup. In the following table, the duration of the overload fault in different conditions is presented.
If the current exceeds 200% of the rated current, the device will demonstrate an over-current fault right away.

Table 4 Durations in which the device tolerates the overload period

Overload output current to input current	Duration of overload fault from cold installation (seconds)	Duration of overload fault from rated load (seconds)
115%	190	80
120%	140	50
130%	100	30
150%	60	15
170%	40	10

Note:
If the average motor power is larger than the rated power of the device for a long time, it will demonstrate a low-power fault, which means that the device needs to be replaced with an VFD with larger rated power should be replaced. Note that all parameters, including faults, average and maximum temperature, current, voltage, etc., are stored in the memory of the device and will be evaluated for warranty validity**.**

Device Installation

○ Installation Location

One of the most important factors in the failure of the motor speed control system is the non-observance of the relevant principles at the installation location, which in some cases could result in warranty voidance.

- The device must be installed inside a standard metal control panel and this panel must have suitable ventilation.
- By implementing unsuitable closure of the control panel or lack of ventilation, not only there is the possibility of an excessive temperature fault, but also the lifetime of the device is significantly reduced.
- The panel should be in a covered area**.**
- There must be at least a10 centimeters gap from the bottom, top, and sides between the device and the panel, and also there must be a pathway for fresh air inlet and hot air outlet (From the bottom of the panel upwards).

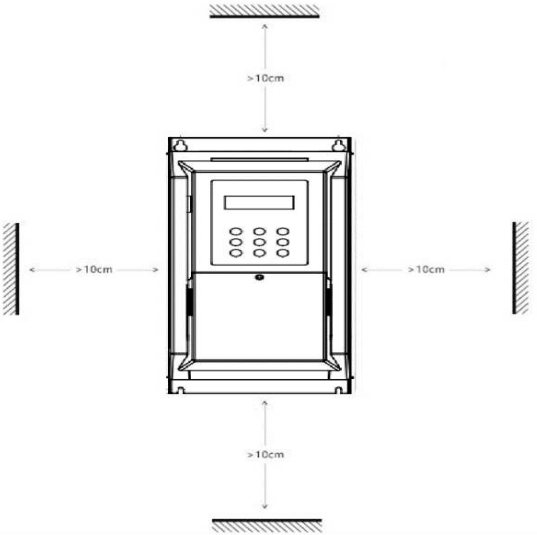


Figure 3 Allowable gap for the physical installation

- The use of an air filter in the air inlet of the control panel, especially in unclean and dusty areas is mandatory, and the excessive dust inside the device will invalidate the warranty.

- Any direct and dense humidity (such as dew) can cause a lot of damage to the device and this device will not be subject to the warranty of replacement and repair**.**

The use of heaters inside the panel, especially in the winter, and humid environments, and places where there is a potential for dew on surfaces, is mandatory, and in long term, it will result in considerable savings on the maintenance and repair cost of electronic devices**.**

- The installation location temperature should be within the range of -10 to +50 ° C and for the temperature range of 40 to 50 ° C, the rated power should be reduced by 2% per centigrade degree increase in temperature. Temperatures outside this range will significantly decrease the lifetime of the device and will invalidate its warranty**.**

The lifetime of the device's power capacitors will be halved for every 10 centigrade degrees being warmer. So, devices that operate in hot environments or under heavy-load conditions, will be required their power capacitors to be replaced in shorter time intervals.

- The installation location should not be subjected to severe and consistent vibrations. If it is necessary to install the device in such places, consult with our company's experts before installation**.**

- Direct sunlight will dramatically decrease the lifetime of the device's box and keyboard, and will also invalidate the warranty**.**

- If the altitude of the installation location is more than 1000 meters (above mean sea level), a 2% reduction in the power capacity of the device should be considered for every 100 meters above the 1000 meters above mean sea level, otherwise there is the possibility of the device heating in its rated load. In this case, it is required to install a device with larger power.

Note: Higher altitudes (above mean sea level) as well as warmer environments, reduces the lifetime of the power capacitors; because the air concentration decreases and the heat exchange of the capacitors with the environment decreases in both situations.

○ Characteristics of Device Installation Location

The table below shows the required characteristics of the installation location for the stable and reliable operation of the device**.**

Note that non-observance of the following conditions will cause the device to function incorrectly, and possible consequences are beyond the responsibility of the company.

Table 5 The physical installation characteristics

Installation Location	Inside the control panel with suitable ventilation and filter, and in a covered area	
Temperature	- 10 ~50 C	Above 40 ° C, for every 1 Celsius degree increase, consider a 2% reduction in the output power
Relative noncondensing humidity	h< 85%	If dew is possible to form, be sure to use a heater inside the panel.
Vibration	a < 0.5g	X, Y, Z Three axes
UV resistant	No	No exposure to sunlight
IP	20	No safety against water; No dust protection
Altitude (above mean sea level)	A < 2600m	For every 100 meters above 1000 meters, consider about 2% decrease in the rated power

○ Motor

Before installing the device, remove the motor from the mechanical system, if possible. This is especially important where turning the motor in the reverse direction causes damages to the system**.**

Connect the motor case to the ground. Otherwise, in the case of a connection of the motor case to the coil, there is a possibility of extreme electrical injury and even death**.**

If the metal is used in the entire system and the body of the motor is connected to the system, you can connect any point of the system to the ground**.**

The motor power should never be larger than the rated power of the VFD. Otherwise, the device performance is not optimal and the warranty is invalidated.

○ Mechanical Installation

To install the device inside the desired control panel, and according to the conditions described in the installation location section, firstly mark the drilling spot in alignment by the stencil (which is available with the device) and drill this spot using a 3mm drill. Then, close the screws of the top of the device (6 screws of diameter 4mm are available with the device) and close the screws of the bottom of the device (do not completely close), and then tighten (completely close) the four screws as is necessary. Note that you should also use the washers with the screws**.**

To speed up the installation and to make it easy, it is better to be done by two people.

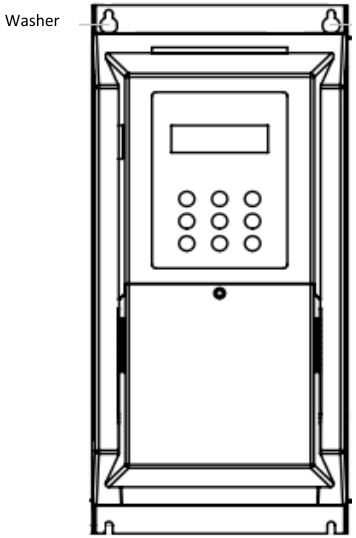


Figure 4 Installation in alignment with the horizontal surface

Electrical Installation

- General schematic of Xima

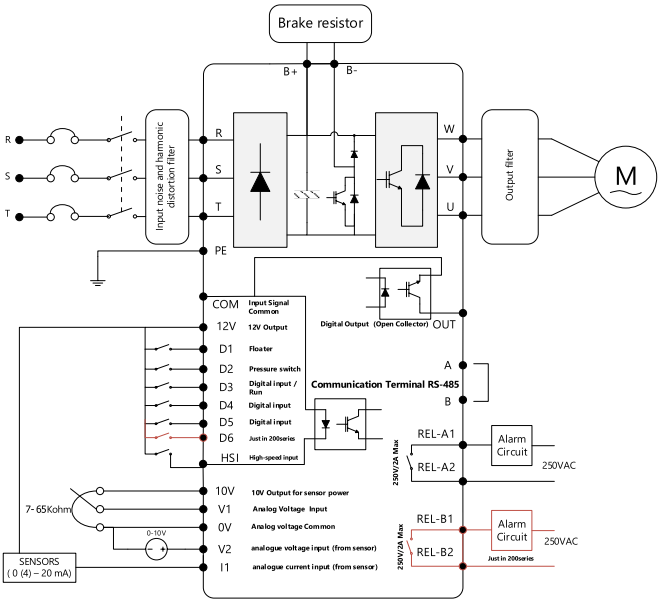


Figure 5 Xima General schematic

○ Power Terminals

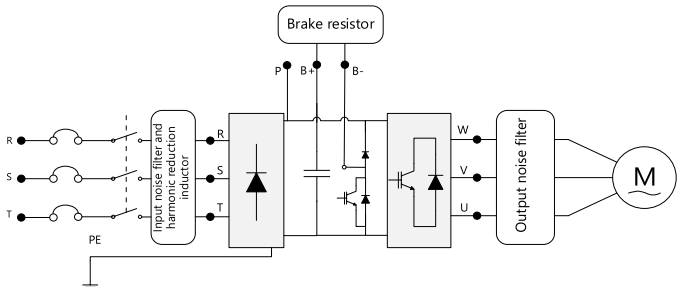


Figure 6 Input and output power terminals

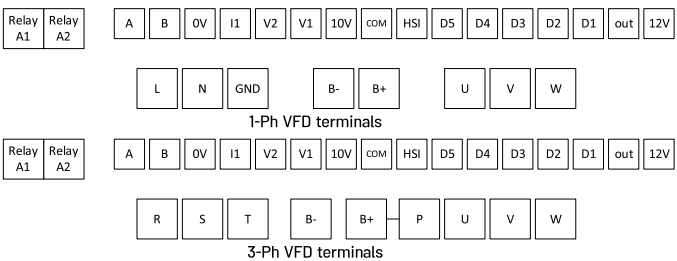
	1-ph (220V)	3-Ph(380V)
Input power	L , N	**R , S , T**
Output power	W , V , U	**W , V , U**

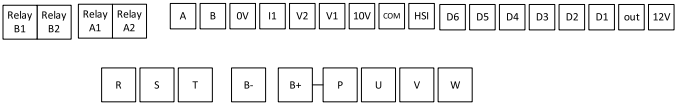
Table 6 Input / Output wire specifications

XIMAP100XYYY-Ph	kW/V	Input wire / output wire (mm^2)
XIMAP100A004-1	**0.4/220v**	1 / 1.5
XIMAP100A008-1	**0.75/220v**	1 / 1.5
XIMAP100A011-1	**1.1/220v**	1 / 1.5
XIMAP100B015-1	**1.5/220v**	1.5 / 2.5
XIMAP100B022-1	**2.2/220v**	2.5 / 4
XIMAP100B030-1	**3.0/220v**	4/ 6
XIMAP100B008-3	**0.75/380v**	1 / 1.5
XIMAP100B015-3	**1.5/380v**	1 / 1.5
XIMAP100B022-3	**2.2/380v**	1 / 1.5
XIMAP100B030-3	**3/380v**	1.5 / 2.5
XIMAP100B040-3	**4/380v**	2.5 / 2.5
XIMAP100B055-3	**5.5/380v**	2.5(4)/ 4
XIMAP100C075-3	**7.5/380v**	4 / 6
XIMAP200C110-3	**11/380v**	6/10
XIMAP200C150-3	**15/380v**	10/10
XIMAP200D185-3	**18.5/380v**	10/10
XIMAP200D220-3	**22/380v**	10/16
XIMAP200D300-3	**30/380v**	16/25

Important points	
1	Note that it is not necessary to connect the null to the N input for three-phase models.
2	Connect the ground wire to the PE terminal. In the three-phase model, use a wire with a maximum cross-section of 1.5 mm2 to connect the ground to the device.
3	Connect the brake resistor to the B+ and B- terminals with a 1.5 mm2 cable (The direction of the connection is not important). You can also use a thicker wire in the single-phase models.

Warnings	
1	Avoid connecting the null wire directly to the ground terminal.
2	Do not use any cable shoes. Using a cable shoe will increase the possibility of loosening the terminal screws.
3	Strip wires to a maximum length of 8 mm from the tip, such that the wires in the adjacent terminals couldn't be shorted to each other.
4	Avoid excessive tightening the terminal screws as the cost of replacing damaged terminals is not covered by the warranty.
5	Do not use a miniature or thermal switch on the output of the device.
6	Connect the ground input, if possible, in order to prevent the output noise and the possibility of electric shock.
7	It is not mandatory to use the harmonic reduction inductor and the input/output noise filter. (Except special cases)
Non-observance of the above points would cause damage to the device and invalidation of the warranty coverage.	





3-Ph VFD terminals, 200 series

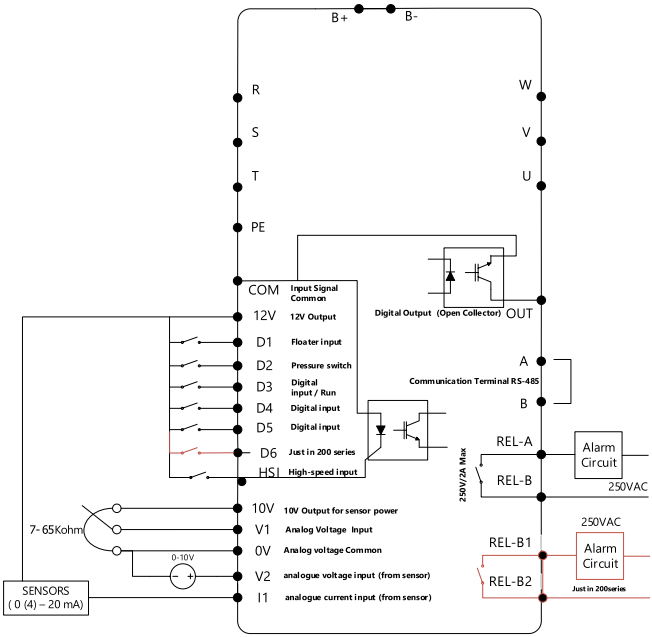
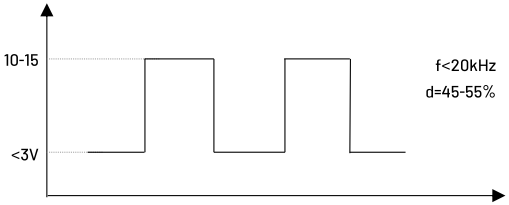


Figure 7 Input and output control terminals

Table 7 Control terminals specifications

Absolute maximum rating	Function	Terminal
200mA	12V terminal is a power supply suitable for activating digital inputs. This voltage is between 12V and the ground, which is available by the COM terminal. This voltage may fluctuate between 12 and 14 volts.	12V
50mA	Out terminal is a digital open collector output. In order to make a 12volts pulse using this terminal, a 470Ω to 1KΩ resistor is recommended to be used to pull up this terminal via the 12V terminal. In P200 VFDs, there is an OP+ and an OP - terminal which are the positive and negative sides of the digital output.	OUT (OP+/- in P200)
30V/5mA	The first digital input. This terminal is connected to the floater if available.	D1
30V/5mA	The second digital input. This terminal is connected to the pressure switch if available.	D2
30V/5mA	The third digital input. If parameter E33 is set on 1, activating this input will start the VFD instead of the run key on the keypad.	D3
30V/5mA	The fourth digital input.	D4
30V/5mA	The fifth digital input.	D5
	The sixth digital input. This terminal is only available in P200 VFDs.	D6
	Digital terminals are activated when connected to the 12V terminal. It is worthy of note that if an external voltage supply is used, the voltage level for activating the digital input must be in range of 9 to 30 volts. Also, the ground of the external voltage supply must be connected to the COM terminal.	
24V/10mA	High-speed digital input.	HSI
	This input could be used either as another digital input or as a square wave signal receiver. The square wave should have a 10 to 15-volt amplitude as the high level and a voltage lower than 3 volts as the low level. The maximum frequency of the HSI signal is 20KHz.	

Absolute maximum rating	Function	Terminal
	 HSI Pulse Format	
200mA	The ground terminal for the 12V power supply.	COM
8mA	The regulated 10-volt power supply. The suitable input impedance of sensors power via this terminal is 2KΩ to 10KΩ.	10V
30V	The first analog voltage input. The voltage applied to this input must be within the range of 0 to 10 volts.	V1
30V	The second analog voltage input. The voltage applied to this input must be within the range of 0 to 10 volts. This terminal is specifically used for connecting voltage pressure sensors if available.	V2
40mA/6V	The analog current input. The injected current to this terminal must be between 4 and 20 milliamperes. This terminal is specifically used for connecting pressure transducers if available.	I1
100mA	The ground terminal for the 10V power supply.	0V
+/-5V	The negative terminal of the RS485 connection for booster pump applications.	B-
+/-5V	The positive terminal of the RS485 connection for booster pump applications.	A+
250V/1A	The first relay terminals.	RELAY 1

Absolute maximum rating	Function	Terminal
250V/1A	The second relay terminals.	RELAY 2

Settings

Pressing the Enter key on the keypad opens the menu. The first thing written on the display is the word PASS. By entering 22 as the password the parameters of the VFD will be available. The process of setting the parameters is illustrated in Figure 8.

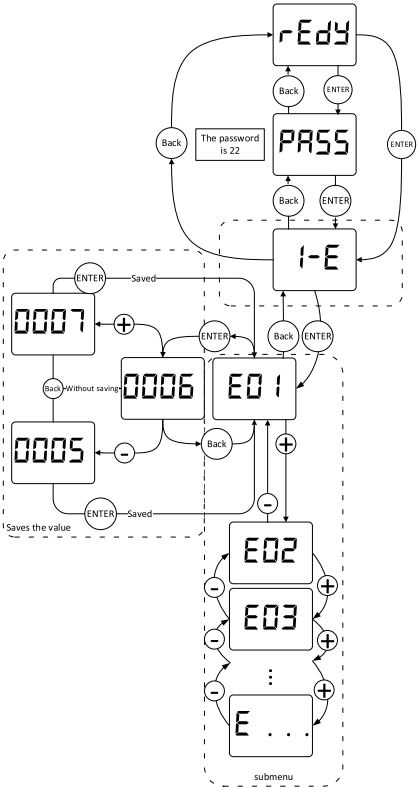


Figure 8 Parameter settings

Parameters

Parameter	Name	Setting range	Default	Mode
E01	Pressure up limit	0-25 bar	6bar	R/W
	The maximum value available for users to set for pressure setpoint.			
E02	Pressure hysteresis	0.2-1 bar	0.3 bar	R/W
	In steady-state operation, the setpoint pressure oscillates by an amplitude of E02 and a period set by E25. This will prevent idle operation when there is no water consumption.			
E03	Acceleration time	1-50 s	2.5 s	R/W
	The minimum acceleration time.			
E04	Deceleration time	1-50 s	2.5 s	R/W
	The minimum deceleration time.			
E05	"No water" Error Percentage	50-90 %	75 %	R/W
	If the pump works at maximum frequency for E06 seconds, and the pressure does not reach E05 percent of the pressure setpoint, the no water protection will stop the pump, and a dry fault will be reported. This parameter will be effective if parameter E 18 is set to 1, 5, or 6.			
E06	"No water" Error Time	10-120 s	30 s	R/W
	The period during which if the pump works at its maximum frequency, and the pressure does not reach E05 percent of the pressure setpoint, a dry fault will be reported. This parameter will be effective if parameter E 18 is set to 1, 5, or 6.			
E07	"No water" Error Retry Time	10-120 min	10 min	R/W
	The dry fault will reset after the period set to this parameter. This process repeats until the no water situation is resolved.			

Parameter	Name	Setting range	Default	Mode
E08	Idle Time	10-120 s	10 s	R/W
	If the pump is not required to run for 24 hours, it will run at the maximum frequency for E08 seconds to prevent pump jams due to rust and scale.			
E09	Motor Rated Current	0.2 A – According to VFD model	According to VFD model	R/W
	The rated current written on the nameplate of the motor.			
E10	Motor Default Direction	0-1	0	
	If the motor runs in the wrong direction, this parameter should be set to 1.			
E11	Sensor Range	2-25bar	11bar	
	The maximum pressure the pressure sensor measures.			
E12	Sensor Type	0-4	0	R/W
	Pressure voltage sensor [0-10V]		0	
	Pressure transducer [4mA-20mA]		1	
	Pressure voltage sensor [0.5V-4.5V]		2	
	If D2 (the second digital input) is activated, the pump will stop running. This mode is used when the pressure is controlled using a pressure switch.		3	
	If D2 (the second digital input) is activated, the pump will start running. This mode is used when the pressure is controlled using a pressure switch.		4	
E13	PWM Frequency	2-10 kHz	4 kHz	R/W
	Switching frequency.			
E14	Stop Frequency	10-45 Hz	25 Hz	R/W
	The frequency under which running the pump does not affect the water flow. In order to prevent excessive energy consumption and increasing the life span of the pumps, any pump working under the frequency set to this parameter will be stopped.			

Parameter	Name	Setting range	Default	Mode
E 15	Maximum Frequency	40-65 Hz	50 Hz	R/W
	The maximum frequency applied to the pump.			
E 16	Sensor Offset	0-100 %	0	R/W
	In order to eliminate the offset of the sensor, parameter E 16 should be set to 1, and the enter key is needed to be pressed for 5 seconds. This process will set the feedback pressure corresponding to the feedback signal at the moment of eliminating the offset to zero.			
E 17	Auto Reset Count	0-30	10	R/W
	This parameter determines the number of times faults will be reset automatically. If the number of times faults have been reset reaches E 17, the remaining fault is required to be reset manually by pressing the reset key for 3 seconds. This parameter does not affect the number of times the dry fault will be reset.			
E 18	"No Water" Error Type	0-6	5	R/W
	This parameter determines the method by which VFD detects the no water situation.			
	Disabled			0
	Detect via feedback pressure (Refer to E05, E06, and E07)			1
	Detect via consumed power (Refer to E21 and E22)			2
	Detect via floater (D1 or the first digital input) If D1 is activated, the VFD will face the float fault.			3
	Detect via floater (D1 or the first digital input) If D1 is deactivated, the VFD will face the float fault.			4
	Detect via floater (D1 or the first digital input) and feedback pressure (Refer to E05, E06, and E07) If D1 is activated, the VFD will face the float fault.			5
	Detect via floater (D1 or the first digital input) and feedback pressure (Refer to E05, E06, and E07) If D1 is deactivated, the VFD will face the float fault.			6

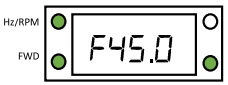
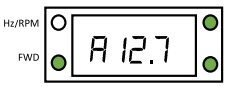
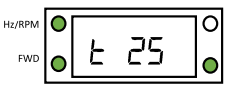
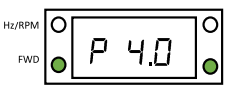
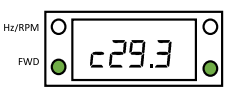
Parameter	Name	Setting range	Default	Mode
E19	Output Relay Mode	0-1	1	R/W
	The output relay will be closed while there is a fault.		0	
	The output relay will be closed while the pump is running.		1	
	The output relay controls a contactor connecting a second pump directly to the power line. The output relay will be closed if the first pump had been running for the duration set in parameter E34, and the pressure did not reach the setpoint value. This mode is useful when a second pump is required for full-load operation.		2	
E20	Backup-Restore	0-3	0	R/W
	Deactivated		0	
	To reset all of the parameters to the factory settings, this parameter should be set to 1, and the enter key on the keypad is required to be pressed for 5 seconds.		1	
	To restore edited parameters, this parameter should be set to 2, and the enter key on the keypad should be pressed for 5 seconds.		2	
	In order to create a backup from the current VFD settings , this parameter should be set to 3, and the enter key on the keypad should be pressed for 5 seconds. These settings can be restored using parameter E20.		3	
E21	Power Dry	0.5 - According to VFD model	According to VFD model	R/W
	The power consumed by the pump while working with no water. This parameter is effective only if E18 is set to 2.			
E22	Auto Power Dry	0-1	0	R/W
	To measure the power consumed in the no water situation, this parameter should be set to 1, and the enter key on the keypad			

Parameter	Name	Setting range	Default	Mode
	must be pressed for 5 seconds while the inlet valve is closed, and there is no water running through the pump.			
E23	P	1-50	4	R/W
	The proportional gain of the PI controller.			
E24	I	1-50	13	R/W
	The integral gain of the PI controller.			
E25	Oscillation Time	1-50 s	5 s	R/W
	The period of oscillation for preventing the idle operation when there is no water consumption. (Refer to E02)			
E26	Fan Mode	0-1	0	R/W
	Fan runs while the pump is running.		0	
	Fan starts running when the temperature of switches goes above 55°C and stops when the temperature falls below 50°C.		1	
	Fan runs continuously.		2	
E27	VFD Address	1-E28	1	R/W
	When connecting VFDs through RS485 for booster pump applications, this parameter indicates the address of each VFD. In a network of VFDs, the VFD with the lowest address will play the role of the master, and the other VFDs will be t he slaves. It is worthy of note that if the connection or the master VFD fails, the network will operate with the new master which is the VFD with the smallest VFD address.			
E28	Number of connected Devices	0-16	1	R/W
	For setting a network in booster pump applications, this parameter determines the number of VFDs in the network.			
E29	Efficient Frequency Setpoint	40-100 %	80 %	R/W
	In booster pump applications, the frequency of operation at which the next pump will start running is set by this parameter. This parameter is based on a percentage of E 15.			

Parameter	Name	Setting range	Default	Mode
E30	Rotary Time	15-60 min	30 min	R/W
	In booster pump applications, the order of running pumps varies for every start. The period after which changeover happens between the pumps is determined by this parameter.			
E31	Connection loss time	3-60 S	5 S	R/W
	In booster pump applications, if the connection is lost for the duration determined by parameter E31, the network will operate with the new master.			
E32	Reference Hysteresis	0.0-4.0 bar	0.0	R/W
	When the pump is not running, if the pressure falls below the setpoint pressure by E02+E32, the pump will start running. By reducing this parameter, the amplitude of pressure fluctuations becomes smaller while the number of times the pump turns on and off increases.			
E33	External Run	0-1	0	R/W
	Run and stop command are received from the keypad on the VFD.		0	
	Run and stop command are received from D3 (The third digital input). When D3 is activated, the VFD will be in the run mode.		1	
E34	Second Pump Delay	1-120 S	5	R/W
	This parameter determines the delay for turning on the second pump using the output relay. (Refer to parameter E19.)			

Monitoring

While the VFD is running , the display and the LEDs can be used for monitoring the state of the operation. For changing the displayed variable while operation, the back key on the keypad of the VFD should be pressed.

State of the Display and LED	**Monitored variable**
	The frequency at which the VFD is operating is displayed. The decimal point and HZ/RPM LED turn on.
	The current being injected to the pump is displayed. The decimal point and A/% turn on.
	The power being consumed by the pump is displayed.
	The feedback pressure is displayed.
	The voltage on the dc-link is displayed.
	The temperature of the heatsink of the switches is displayed.
	The setpoint pressure is displayed. This value can change if +/- keys on the keypad are pressed. The maximum setpoint is determined by parameter *E01* in the settings menu.

Booster pump

Through RS485, Xima VFDs can form a network for boo ster pump applications.
To connect Xima VFDs, all the A terminals of the VFDs should be connected to each other, and all the B terminals are required to be connected according to Figure 9 .
In short distances, connecting a resistor to the end of the line, and connecting the com terminals to each other may be arbitrary.

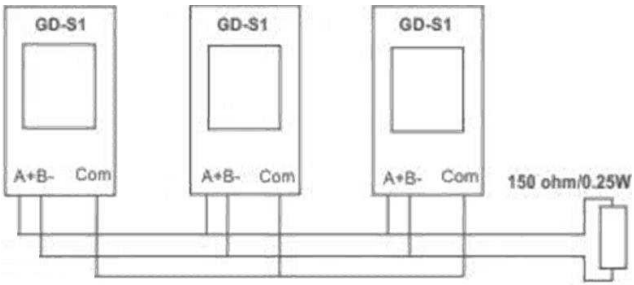


Figure 9 The configuration of serial communication for booster pump application

Communication settings

After setting the connections, parameters relating to booster pump applications are required to be set according to the project. These parameters include E27, E28, E29, E30, and E31.

Faults

During operation, the faults introduced in Table 8 may appear on the display of the VFD. In the following table, the possible faults are described.

Table 8 Faults

Number	Fault	Abbreviation
1	Sensor fault	SEnS
	The sensor is not working properly. Or, parameter E 12 is not set.	
2	No water fault	dry
	There is no water flowing into the pump. Refer to parameter E 18.	
3	Short circuit	SC
	There is a short circuit at the U, V, and W terminals. This fault may indicate a damage of the windings of the motor, wiring, or the VFD itself. In noisy environments, this fault could be because of unsuitable cable placement.	
4	Over current	OC
	The current consumed by the pump is more than the allowable limit.	
5	Over current during acceleration	Oc-A
	The current consumed by the pump is more than the allowable limit during acceleration.	
6	Over current during deceleration	Oc-d
	The current consumed by the pump is more than the allowable limit during deceleration.	
7	Over Voltage	Ou
	The voltage of the dc-link is over the allowable limit.	
8	12V Overload	12oC
	The current taken from the 12V terminal is over the allowable limit.	
9	Transducer error	CUrr
	The current injected by the transducer is below 4mA.	
10	Phase loss	PLoS
	One of the phases of the input power of the VFD is not connected.	

Number	Fault	Abbreviation
11	Output phase loss	OLoS
	One or two of the phases of the output of the VFD are not connected to the motor.	
12	Under Voltage	Uu
	The voltage of the dc-link is below the allowable range.	
13	Overload	OL
	The load of the pump is over the allowable limit.	
14	Over Temperature	OH
	The temperature is over the allowable limit. This error may happen if an out of range voltage is applied to the analog inputs.	
15	Under Temperature	UH
	The temperature is below the allowable limit. This error may happen if an out of range voltage is applied to the analog inputs.	
16	Output Power Error	OP
	The rating power of the VFD is below the required power.	
17	Memory error	EE-
	The memory of the VFD is damaged.	
18	External fault	EFrt
	This fault is triggered externally by another controller.	
19	Connection loss	E485
	In booster pump applications, this fault indicates that the connection is faulty.	