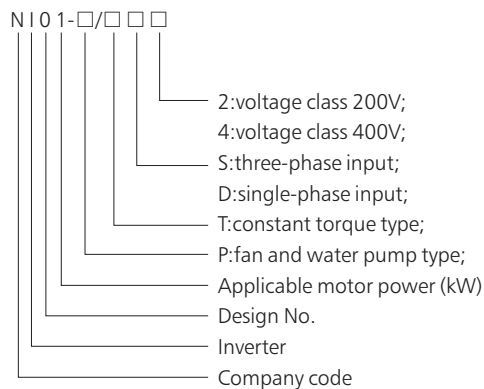| CE	(symbol) 005
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NIO1 Inverter

1. General

NIO1 inverter is a multifunctional frequency inverter developed by our company. With the application of space vector PWM (SVPWM) and dead zone compensation techique, the inverter has functions including automatic start while electrified, restart after power off instantly, re-synchronism after stalling test, automatic speed drop compensation, operation at arbitrary line, control at constant voltage, trial recovery from failure, operation at multiple speeds, and energy-saving operation, etc. Equipped with RS232 and 485 communication interfaces, it could satisfy users' various demands completely. It's designed and tested in accordance with international standards; It is in confirmity with, IEC/EN 61800-2 and IEC/EN 61800-3 standards.

It could be widely applied to electric drive and automatic control fields, including metallurgy, petroleum, mechanism, food processing, spinning, chemical industry, metalwork, paper making, printing, packing, fan, and water pump, etc.

2. Product characteristic

2.1 Type Designation

N I 0 1 - □ / □ □ □

2:voltage class 200V;
4:voltage class 400V;
S:three-phase input;
D:single-phase input;
T:constant torque type;
P:fan and water pump type;
Applicable motor power (kW)
Design No.
Inverter
Company code

2.2 Advanced control technology: Space voltage vector control, three-phase modulation (PM) mechanism, symmetrical seven-section PWM wave output, with the minimal harmonic and high efficiency;

010   110
011   100
001   101
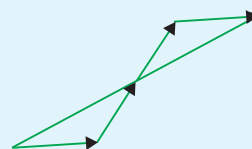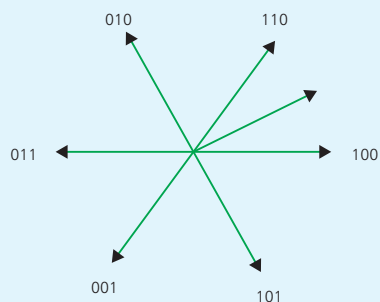
Space voltage vector

2.3 Abundant running functions

2.3.1 Prograde, reverse, prograde reverse prograde/ self-maintaining mode, straight line/ S-shaped curve acceleration and deceleration, which could satisfy different diversion control and different starting methods.

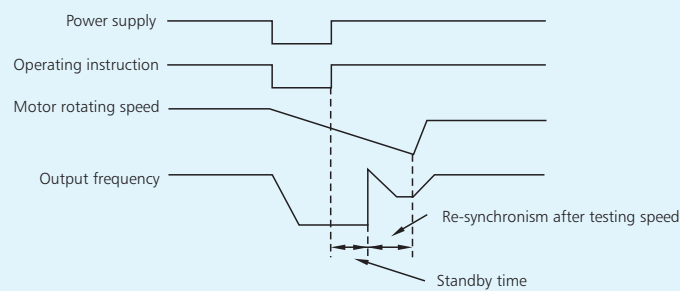Straight line mode

S-shaped mode
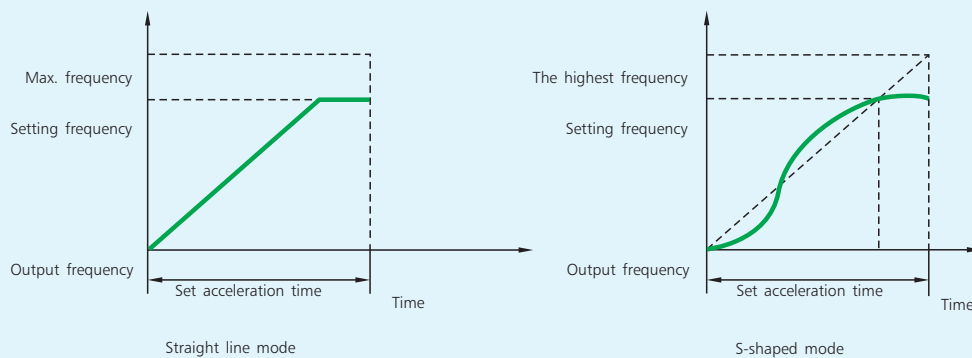
2.3.2 16 kinds of different diversion combination are designed for internal four-section programming circular operation and non-circular operation, which makes a simple PLC control. External terminal combination input could reach eight-section speed, and satisfy users' different demands of control for on small-scale machinery, manufacturing installation, and automatically controlled production line.


Four-section circular operation
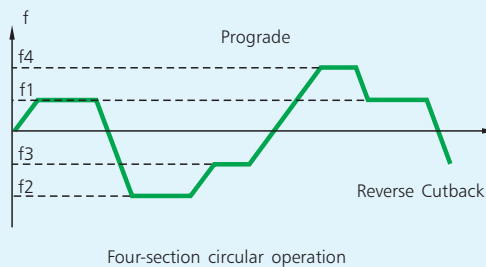
2.3.3 Built-in PI function could be utilized, and the simplest closed loop control system could be made with externally added analog quantity sensors. With internal and external set values, external voltage feedback and current feedback could satisfy various closed loop control functions completely.
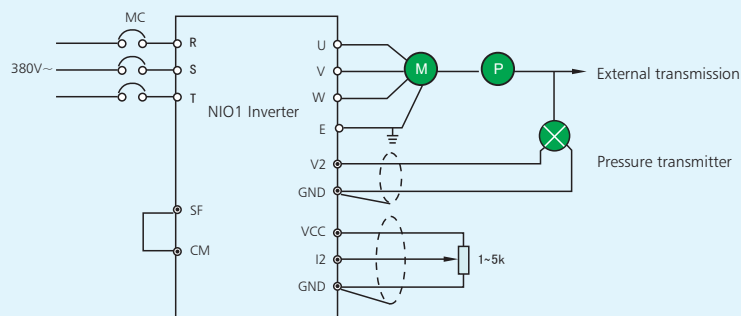
2.3.4 Speed drop compensation function could make output frequency of inverters change with load changes, so that constant speed of motor which users required could be achieved. Inching function makes users realize inching motions including positions at workstations, and transportation, etc conveniently.

2.3.5 Automatic start with recovered power, re-start at an instant, re-synchronism after seailing test, tripping-free function, trial recovery from failure, and constant voltage output, etc could make users' equipment operate more stably, reliably and automatically, and bring more convenience for them.

2.3.6 Operation at arbitrary straight line and torque compensation at low speed could satisfy different load starting and operations.
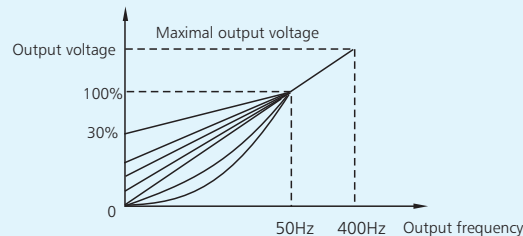
2.3.7 Automatic energy-saving operation function could save funds for users to the greatest extent.

2.3.8 Communication function could realize telecontrolh more conveniently.

2.3.9 Complete breaking function: D.C. Breaking will make the load "stop quickly".
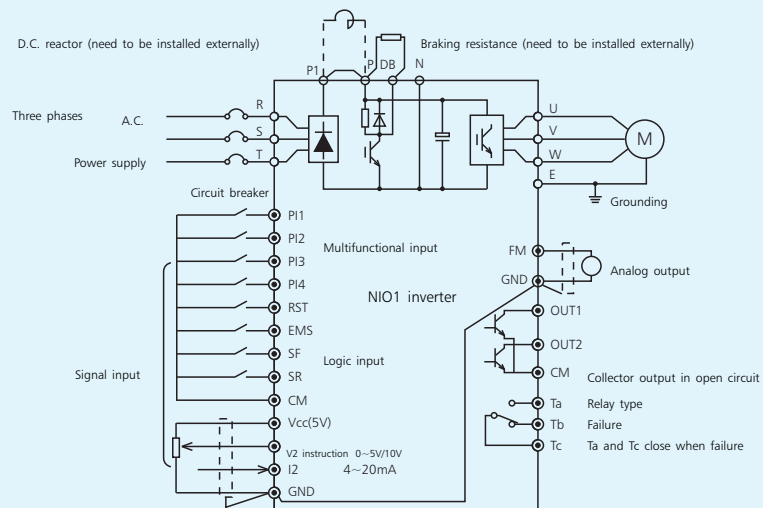
2.4 Convenient input and output terminals: Various feedback and analog input could be programmed and input. They could make emergency stop, recovery from failure, failure output, alarms for speed arrival and overload, and output of frequency meters;

		Function	Signal requirement	Instruction
Switch volume input	SF	Forward/ stop	Photoelectric isolation, effective while in short circuit with CM terminal.	Applicable to control prograde externally.
	SR	Reverse/ stop		Applicable to control reverse externally
	RST	Reset		Applicable to external reset
	EMS	Emergency stop		Applicable to external emergency stop
	PI1～PI4	Programmable input terminal		Applicable to inching, multiple-section speed and other control functions
	CM	Common terminal		Applicable to short circuit with switch volume output
Analog volume input	+5Vdc	CPU panel + 5V power supply		The maximal output current: 10mA
	V2	Voltage-type input	0～5V，0～10V	Analog feedback input and settings, external frequency setting
	I2	Current-type input	4mA～20mA	
	GND	Analog ground	+5V ground on CPU panel	
Switch volume	OUT1.2	Collector output in open circuit	The maximal allowable output: DC24V/50mA	Applicable to output signals of operating frequency arrival, speed arrival test extent, and overload times arrival
	CM，	Public termina		
	Ta，Tb，Tc	Alarm output in the method of relay	Contact capacity: 250VAC: ＜0.3A	When there is any failure, converter and other manually set signals could be controlled with the converter
Analog volume output	FM	Output which could be connected with voltmeter (with GND)	The maximal allowable output: 0～10V/1mA	It's able to monitor frequency, current and voltage output in a long distance with pointer-type cymometer or voltmeter.

2.5 Complete protective functions: Over voltage, under voltage, over current, overload (Characteristic of electrical thermal relay), instant power-off, radiator overheat and shorted to earth.

3. Technical Data

	Voltage, frequency	200V class: Single (three) phase 200V/ 230V±15%, 50Hz/60Hz±5%;
		400V class: Three-phase 380V/440V±15%, 50Hz/60Hz±5%;
Output	Rated output voltage	200V class: Three-phase 200V/230V (optional constant voltage control);
		400V class: Three-phase 380V/440V (optional constant voltage control), non-symmetrical degree of voltages at three phases is less than 3%.
	Output frequency range	1Hz～400Hz, the maximal frequency could be set arbitrarily from 25Hz to 400Hz;
		1Hz～60Hz for constant torque type above 30kW, fan and water pump type, and the maximal frequency could be set arbitrarily from 25Hz to 60Hz
Control function	Control function	Full digital wire voltage sine wave PWM control, with 10 kinds of modulation frequency optional.
	Starting frequency	It could be set arbitrarily from 1Hz to 25Hz.
	Output frequency resolution	0.01Hz
	Frequency setting resolution	Digital setting input: 0.01Hz, analog setting input: 1% of the maximal frequency
	Frequency precision	Digital setting input: ±0.01% (-10℃～+50℃) Analog setting: ±0.5% (-25℃～+10℃)

	Voltage,	200V class: Single (three) phase 200V/ 230V±15%, 50Hz/60Hz±5%;
	frequency	400V class: Three-phase 380V/440V±15%, 50Hz/60Hz±5%;
Control function	Voltage frequency ratio	Basic frequency could be set arbitrarily from 25Hz to 400Hz (25Hz~60Hz for fan and water pump type), constant torque/ reduced torque (fan, water pump type)
	Torque compensation	Constant torque compensation mode, reduced torque compensation mode, The range is: 0~30%
	D.C. Braking	Starting frequency (0.5Hz~10Hz), voltage (0~15%), time (0.2s~10s) could be set arbitrarily.
	Overload current	150% rated current for constant torque type, 1min; 120% rated current for fan and water pump type, 1min, with a reverse time limit characteristic.
Operating function	Operating method	Forward, reverse, forward - reverse-prograde/ self-maintaining mode are optional (Remote operating occasion)
	Stopping method	Deceleration stopping/ free stopping, optional
	Frequency setting	Operating panel, input ▼▲, potentiometer on the panel, external analog signal DC4mA~20mA, DC0~10V, DC0~5V
	Acceleration and deceleration time and mode	0.1s~3000s (deceleration and acceleration could be set separately), No. 1/No. 2 deceleration and acceleration time are optional. Straight line/ S-shaped acceleration/ deceleration mode are optional.
	Multiple-section speed program operation	Speed 8 (switch externally) or speed 4 program (16 kinds of operating methods) could be set maximally.
	Inching operation	Frequency could be set arbitrarily (from 0 to the maximal frequency). Acceleration and deceleration time are set separately (from 0.1s to 900s), and straight line/ S-shaped acceleration and deceleration are selected separately.
	The maximal and minimal frequency	The maximal frequency (from the minimal frequency to the maximal one); the minimal frequency (from zero to maximal one)
	Other functions	Automatic starting with power on, re-synchronism after stalling test, re-start after an instant stop, automatic energy-saving operation, trial recovery from failure (from once to eight times), operation on arbitrary straight line, free unit time display, speed drop compensation, failure record (four times in the past), built-in PLC counter and PI adjuster
Input & output signal	Operating panel	Five-digit seven-section LED (red) display, set with six keys.
	Serial input	4 programmable input, foeward, reverse, emergency stop, and reset from failure
	Abnormal input	Relay input with failure
	Collecting electrode output in open circuit	Operating/ speed arrival/ overload alarm signals are optional.
	Pointer-type instrument output	DC0~10V (the maximal output current is 1mA, and the resolution is 0.4%) output frequency/ current/ voltage are optional
	Communication interface	RS232 and RS485 are optional.
Protection	Prevention	Over current limit (could be set arbitrarily from 50% to 200%), over voltage limit
	"Trip" (seal inverter)	Over voltage, over current, overload (Characteristic of electrical thermal relay), instant power-off, insufficient voltage, emergency stop, radiator overheat, and electric leak protection (only protect converter)
Protective grade		Wall-hanging type, protective grade: IP20
Enviro-nment	Setting place	Indoor, below altitude 1000m, without sunshine illumination
	Ambient temperature	-10℃~+40℃
	Ambient humidity	Below 90% (relatively) (without water condensation)
	Vibration	Below 0.5G
	Surrounding air	Without corrosive and evaporable air, steam, dust, oil fog, etc.

4. Application of NIO1 Inverters

4.1 Application of fans

Flow rate of traditional fans is designed in accordance with the maximal demand on air delivery, applying baffle, and damper, starting and stopping motor to control. Closed loop control cannot be formed to make required air delivery reach the ideal state, so a lot of electric energy is wasted and most motors are started by Y-△, which makes it unable to be started smoothly, and cause huge starting current and strong mechanical shock, and make electric grids unstable and the life of transmission system be reduced, etc.

NIO1 inverter is equipped with PI adjuster inside, and it's unnecessary to connect PID adjusters externally. It could be directly input PI feedback terminals with physical quantity test This could completely take the place of mechanical units, like the original flow baffle, etc, to form closed loop for automatic control. Over 25% power consumption can be saved. It's applicable to factories and enterprises with fan control, including cement works, fan plants, etc.

4.2 Application of water pumps

Traditional water supply system with water pumps controls flow with valves, which often causes problems that water pressure of storage tanks is not sufficient or pipe pressure is too huge at high and low peak of water consumption periods. With the application of NIO1 inverters, water pipe pressure can be collected with its internal PI adjusters and pressure sensors to form closed loop control water supply system with constant pressure, so that a water supply system without pressure is formed, bad conditions at high and low peak of water consumption are improved, and water supply quality is advanced. Water supply under constant pressure is necessary especially for modern living residence. Traditionally, water towers are applied to store water and supply water, while the application of water supply under constant pressure could eliminate expenses on high water towers and cleaning expenses of water towers. System with multiple pumps and small capacity is normally applied to supply water under constant pressure.

Over 30% power consumption can be saved by applying N1O1 converters to control water supply. It's applicable to places with water supply systems and pumps, including residence, oil refining, and fire protection, etc.

4.3 Replacement of the original D.C. speed requlation system

D.C. speed requlation system is applied in most of the fields in our country. For example, it's better to apply D.C. speeding requation system in traditional spinning machines. However, comparing with A.C. motors, D.C. motors have disadvantages themselves, such as large volume, relatively heavy weight, and high price. And there is a lot of maintenance work for wear and tear of electric brushes; great losses are caused from stopping production every time. The above problems could be solved by applying NIO1 inverters, and it's with good speed governing performance, runs smoothly and easy to operate, unnecessary to be maintained basically. If the original spinning machines without speed requation system are changed into NIO1 inverters, product quality and output can be greatly improved.

4.4 A.C. motor system without speed adjustment is applied in the field in the past. Its also an important problem at present that product quality

problems are caused by applying the system without adjustment on speed. For example, Fertilizer grains are thrown by centrifugal force of motors in chemical plants. But fertilizer grains are uneven and easy to agglomerate because of the fluctuation of electric grids. Fertilizer grains become very even with the application of NIO1 inverter; and the quality is advanced. Fertilizer is returned with planers and grinders, etc, the efficiency and precision, etc could be improved by applying NIO1 inverter.

4.5 Estimation on power saving
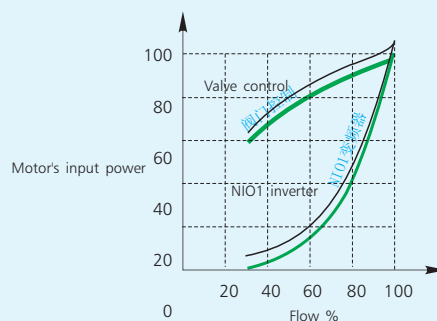
Comparison of Actual Power Consumption of 75kW Motors with Two Flow Control Methods

Flow (%)	Motor's output power (kW)	NIO1 inverter control (kW)		Valve control (kW)	
		Power consumption	Loss	Power consumption	Loss
100	75	81	6	80	5
90	50.6	56	5.4	77	21.2
80	31	35	4	74	43
70	18.8	22	3.2	69	50.2
60	12	15	3	64	52
50	8.4	11	2.6	59	50.6
40	5	7	2	53.4	48.4
30	2.2	4	1.8	50	47.8

4.6 An example for estimation of electric charge saved every month

A 75kW/380V/50Hz fan controls flow by adjusting opening degree of baffle, with only 70% daily flow averagely. How much electric charge can be saved every month after changing it into a N101 converter? Inverter by 24 hours a day and 30 days of operation every month, when the baffle is completely opened, electric charge is counted by 0.5yuan per degree:

Electric charge is: $0.5 \times 69 \times 24 \times 30 = 24840$ (yuan)

After applying a N101 converter, electric charge is: $0.5 \times 22 \times 24 \times 30 = 7920$ (yuan)

Electric charge saved every month: $24840 - 7920 = 16920$ (yuan)

Suppose 75kW converter as 40000yuan, it could be reclaimed in $40000 \div 16920 = 2.4$ (month), that is over two months, and electric charge could be saved by 16920yuan every month after that.

5. Specification, overall dimension and weight

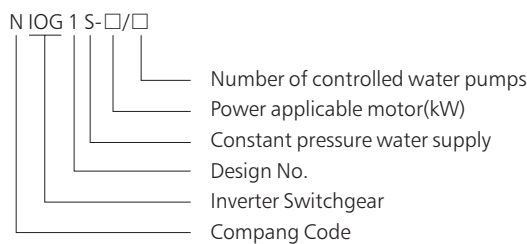| Specifi-cation	Constant torque	For fan & water pump	Applicable motor (kW)	Rated current (A)	Overall dimension (mm) (W×L×H)	Weight (kg)
200 series	NIO1-0.75/TD(S)2		0.75	4.5	133×162×149	1.5
	NIO1-1.5/TD(S)2		1.5	7.5		
	NIO1-2.2/TD(S)2		2.2	11	148×245×169	2.7
	NIO1-3.7/TD(S)2		3.7	17	186×310×178	5.5
	NIO1-5.5/TD(S)2		5.5	24		
400 series	NIO1-0.75/TS4		0.75	2.5	133×162×149	1.5
	NIO1-1.5/TS4	NIO1-1.5/PS4	1.5	4		
	NIO1-2.2/TS4	NIO1-2.2/PS4	2.2	5.5		
	NIO1-3.7/TS4	NIO1-3.7/PS4	3.7	10	148×245×169	2.7
		NIO1-5.5/PS4	5.5	13		
	NIO1-5.5/TS4		5.5	13	186×310×178	5.5
	NIO1-7.5/TS4	NIO1-7.5/PS4	7.5	17		
	NIO1-11/TS4	NIO1-11/PS4	11	24	250×395×240	13
	NIO1-15/TS4	NIO1-15/PS4	15	33		
		NIO1-18.5/PS4	18.5	39		
	NIO1-18.5/TS4		18.5	39	280×487×250	18
	NI01-22/TS4	NI01-22/PS4	22	44		
		NI01-30/PS4	30	60		

Specification	Constant torque	For fan & water pump	Applicable motor (kW)	Rated current (A)	Overall dimension (mm) (W×L×H)	Weight (kg)
400 series	NIO1-30/TS4		30	60	280×597×250	22.5
	NIO1-37/TS4	NIO1-37/PS4	37	75		
	NIO1-45/TS4	NIO1-45/PS4	45	90	385×677×250	38
	NIO1-55/TS4	NIO1-55/PS4	55	110		
	NIO1-75/TS4	NIO1-75/PS4	75	150	455×812×260	46.5
		NIO1-90/PS4	90	175		
	NIO1-90/TS4		90	175	530×345×890	100
	NIO1-110/TS4	NIO1-110/PS4	110	210		
	NIO1-132/TS4	NIO1-132/PS4	132	255		
		NIO1-160/PS4	160	310		
	NIO1-160/TS4		160	310	695×345×1140 cabinet: 1700×820×465	130 180
	NIO1-185/TS4	NIO1-185/PS4	185	350		
	NIO1-200/TS4	NIO1-200/PS4	200	380		
	NIO1-220/TS4	NIO1-220/PS4	220	420	820×460×1334 cabinet: 1700×820×465	280 330
	NIO1-245/TS4	NIO1-245/PS4	245	470		
	NIO1-280/TS4	NIO1-280/PS4	280	530		
		NIO1-315/PS4	315	600		
	NIO1-315/TS4		315	600	cabinet: 1700×820×465	350
	NIO1-355/TS4	NIO1-355/PS4	355	660		
	NIO1-400/TS4	NIO1-400/PS4	400	750		

NIOG1S Energy-saving Inverter Switchgear for Constant Pressure Water Supply

1. General

The product is designed and produced on the basis of water consumption in practical working conditions of high-rise buildings and dwelling houses in communities. The product controls the rotate speed of the water using built-in PID adjuster of the transducer by collecting water consumption (pressure). This forms closed loop control to make automatic adjusting and to supply water at constant pressure. Quality of water supply can be improved by constant pressure water supply unit. The problem of uneven hydraulic pressure can be resolved. Water supply of original water tower can be completely called off. Unmanned automatic control system of non-tower water supply can come true.

2. Type Designation

N IOG 1 S-□/□

- Number of controlled water pumps
- Power applicable motor(kW)
- Constant pressure water supply
- Design No.
- Inverter Switchgear
- Compang Code

3. Technical characteristic

3.1 Open loop fixed speed output control, closed loop PID control;

3.2 With high efficiency and highly energy-saving, operating cost will be reduced obviously;

3.3 Soft startup is realized and the life of electric motor is prolonged;

3.4 Manual and automatic double path control;

3.5 Multi motors provide switched and circled control between major motor sand spare motors;

3.6 Having many protective functions of over-voltage, under-voltage, over-current, over-loading, over-heating, short-circuit to earth, motor stalling and etc;

3.7 RS232/485 communication interface is equipped.

4. Technical

4.1 Power supply：three-phase alternating current 400V±10%, 50Hz;

4.2 Precision of pressure setting: 0.01MPa;

4.3 Pump delivery：(10～1000)m³/h;

4.4 Pump lift: 12.5m～225m;

4.5 Number of controlled water pump: 2sets～6sets，stabilized pressure pump 1set;

4.6 Efficiency of energy-saving: 30%～50%.

5. Main Functions

5.1 Digital PI adjustment, high precision of constant pressure, little fluctuation of hydraulic pressure;

5.2 Multi water supply modes: Up to 7 pumps can be controlled in the mode of frequency inverter pump and 4 pumps can be controlled in the mode of circulating pump;

5.3 Timing inversion control can make working hours of each pump balanced and prevent pumps from rusting;

5.4 Soft circulating startup, adopting self compensation switching technique makes little system electric and mechanical block. Life of electric control element and water pump can be prolonged for this;

5.5 Manual adjusting function allows users to check operation of water pumps set by set. It's very convenient for adjustment;

5.6 Multi input and inspection protection like over pressure, under pressure of pipe works and lack of water of the pool can ensure the safety of the water supply system.

6.Specification and overall dimensions(mm)

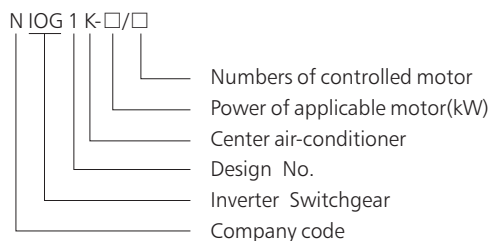| Type	Applicable motor of water pump(kW)	Rated current (A)	Overall dimension W×D×H(mm)
NIOG1S-7.5/2	7.5	17	600×400×1600
NIOG1S-11/2	11	24	600×400×1600
NIOG1S-15/2	15	33	600×400×1600
NIOG1S-18.5/2	18.5	39	700×400×1600
NIOG1S-22/2	22	44	700×500×1700
NIOG1S-30/2	30	60	800×500×1700
NIOG1S-37/2	37	75	800×500×1900
NIOG1S-45/2	45	90	800×500×2000
NIOG1S-55/2	55	110	800×500×2000
NIOG1S-75/2	75	150	800×600×2200

Note: Dimensions of cabinet body can be determined according to requirements of the drawings provided by the client.

NIOG1K Energy-saving Inverter Switchgear Cabinet of Center Air-conditioning

1. General

The product is designed and manufactured according to design power of center air condition and practical service conditions. Closed loop control is built by adopting timing function of the transducer and PI function. Setting temperature of inlet and outlet water according to permitted requirements of air condition system. Output power changes by the change of ambient temperature. Therefore energy will be saved.

2. Type Designation

N IOG 1 K-□/□

- Numbers of controlled motor
- Power of applicable motor(kW)
- Center air-conditioner
- Design No.
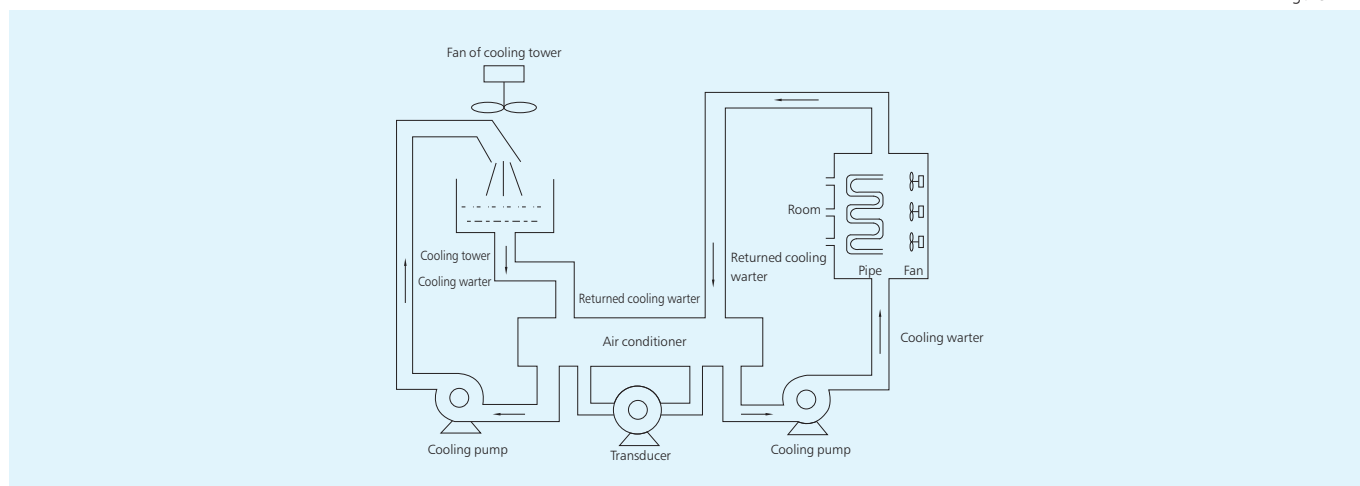- Inverter Switchgear
- Company code

3. Technical characteristic

3.1 Effect of energy-saving is obvious: electric motor may save 30％～70％ of the energy. Investment will be recouped in 6-12months；

3.2 Prolong life of the equipment: Soft startup of the motor makes no block to electric network and equipment. Libration, noises and abrasion will be reduced;

3.3 Convenient operation: No adjustment will be made to the transducer in normal running and follow-up control will be made in the whole course;

3.4 High security: Double channels design of industry frequency running and frequency conversion running ensures the air condition system safe and reliable;

3.5 High protection: with self protection to abnormal state like over current, over voltage, short circuit, lack of phase and over loading.

4. Principle of control

Closed loop control is formed using timing and PI function of inverter. When required temperature in the room is very different from the ambient temperature, output frequency of the interver increased but the maximum frequency is as same as frequency of industry power; On the contrary, if the temperature in the room is not very different from that of the ambient, output frequency of the transducer reduces. Now the input voltage of the transducer does not change but the input current reduces, that is, power consumption is reduced. Please refer to Figure 1, Sketch map of center air condition system:

Figure 1

Fan of cooling tower

Room

Cooling tower
Cooling warter

Returned cooling warter

Returned cooling warter

Pipe   Fan

Air conditioner

Cooling warter

Cooling pump   Transducer   Cooling pump

4.1 Control of cooled water circulation system

The temperature of chilled water is stable for it is discharged from cooling machine, so only temperature of backwater may reflect temperature in the room. Therefore the following control can be made by frequency control system of cooling pump simply according to temperature of backwater. High backwater temperature indicates high room temperature, so circulation speed of the cooling pump shall be increased; And low backwater temperature indicates low room temperature, so circulation temperature of cooling pump shall be receded to save energy.

As showed in Figure 2, install temperature transmitter at return pipe. The transmitter output signals (equal to temperature) into transducer. The transducer compares feedback temperature to the setting temperature. When the feedback temperature is higher than setting one, output frequency of the transducer increases and the circulation speed of the chilled water increases too to reduce the room temperature rapidly; And if the feedback temperature is lower than the setting one, output frequency of the transducer decreases and the circulation speed decreases too to make the room temperature reduce slowly. Circulate like this to achieve thermostatic temperature control.

4.2 Control of cooling water circulation system

Cooling water mainly makes heat exchange on heat produced by the refrigerating unit. If the quantity of heat produced by the refrigerating unit is large, increase the rotate speed of the cooling pump; And if the heat quantity is less, decrease the rotate speed of the cooling pump. Difference in temperature between chilled water and cooling water is small, usually between $1°C \sim 3°C$, so requirements can be met by inspecting the temperature of backwater of the cooling water to control the rotate speed of the cooling pump. It is showed as Figure 3:
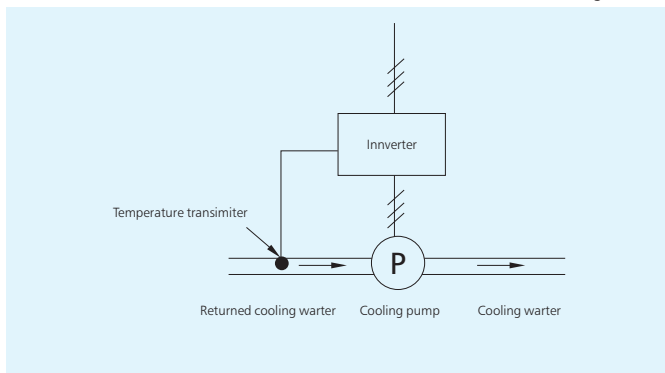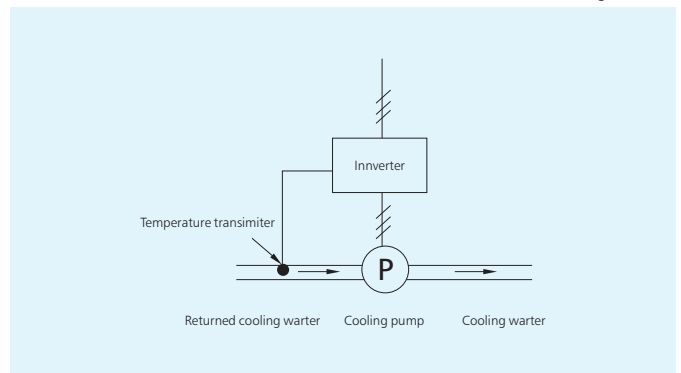
Figure 2

Figure 3

5. Specification, overall dimension and weight

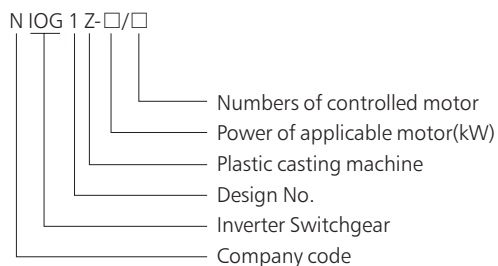| Type	Applicable motor of water pump(kW)	Rated current (A)	Overall dimension W×D×H(mm)
NIOG1K-11/2	11	24	600×400×1600
NIOG1K-15/2	15	33	600×400×1600
NIOG1K-18.5/2	18.5	39	700×400×1600
NIOG1K-22/2	22	44	700×500×1700
NIOG1K-30/2	30	60	800×500×1700
NIOG1K-37/2	37	75	800×500×1900
NIOG1K-45/2	45	90	800×500×2000
NIOG1K-55/2	55	110	800×500×2000
NIOG1K-75/2	75	150	800×600×2200
NIOG1K-90/2	90	175	800×600×2200

Note: Dimensions of cabinet body can be determined according to requirements of the drawings provided by the client.

NIOG1Z Inverter Switchgear for Energy Saving of Casting Machine

1. General

The product is specially designed according the actual operating condition of plastic casting machine. The required pressure and flow of plastic casting machine in the phase of mold matching, locking, plastic jetting and cooling changes. Loading pressure and flow of the proportioning pump is adjusted by the overflow valve installed at the exit of the oil pump when the quantity of plastic casting machine changes and the output power of the motor does not change, thus energy is wasted. By adapting inverter to form closed loop control, rotate speed of the oil pump can be adjusted automatically by inspecting the signal of pressure and flow of the plastic casting machine and the state of idle operation of the motor in heat insulation mode can be changed to achieve the effect of energy saving.

2. Type Designation

N IOG 1 Z-□/□

- Numbers of controlled motor
- Power of applicable motor(kW)
- Plastic casting machine
- Design No.
- Inverter Switchgear
- Company code

3. Technical characteristic of product

3.1 a. Effect of energy-saving is obvious: electric motor may save 30％～60％ of the energy. Investment will be recouped in 4～6months;

    b. Life of equipment can be prolonged: the running is stable, vibration of locking and unlocking can be reduced. So block on equipment can be avoided and abrasion on works can be reduce, temperature of oil can be decreased and consumption of cooling water can be reduced;

    c. Optimize electric installation: Soft startup of motor makes no block to electric network and equipment, capacity of power supply is reduced and investment on transformer can be cut down;

    d. Improve operational environment: Noise of the equipment can be reduced to improve the operational environment;

    e. Convenient operation: No adjustment will be made to the transducer in production and follow-up control will be made in the whole course;

    f. flexible conversion: switches can be made between industry frequency and frequency conversion.
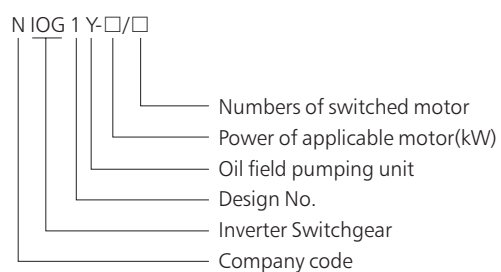
3.2 specification and external dimensions

Type	Applicable motor of water pump(kW)	Rated current (A)	Overall dimension W×D×H(mm)
NIOG1-5.5/1	5.5	13	300×250×600
NIOG1-7.5/1	7.5	17	300×250×600
NIOG1-11/1	11	24	400×350×650
NIOG1-15/1	15	33	400×350×650
NIOG1-18.5/1	18.5	39	450×400×750
NIOG1-22/1	22	44	450×400×750
NIOG1-30/1	30	60	400×350×900
NIOG1-37/1	37	75	400×350×900
NIOG1-45/1	45	90	500×400×1200
NIOG1-55/1	55	110	500×400×1200
NIOG1-75/1	75	150	600×400×1600
NIOG1-90/1	90	175	600×400×1600
NIOG1-110/1	110	210	800×600×1800

NIOG1Y Energy-saving Inverter of Oil Field Pumping Unit

1. General

The product can reduce energy wastage of K. E. exchange of running gear according to periodical change of loading operating condition of beam-pumping unit using inverter control and adopting mode of up rapidness and low slowness to improve the function transfer efficiency of the equipment and device to meet the object of energy saving.

2. Type Designation

N IOG 1 Y-□/□

- Numbers of switched motor
- Power of applicable motor(kW)
- Oil field pumping unit
- Design No.
- Inverter Switchgear
- Company code

3. Characteristics

3.1 energy can be saved more than 30％.
3.2 capacity of low speed over loading can be up to 150％.
3.3 With features of rooter and function of "no trip".
3.3 Whole course follow-up control according to feedback of current.

4. Specification and overall dimensions (mm)

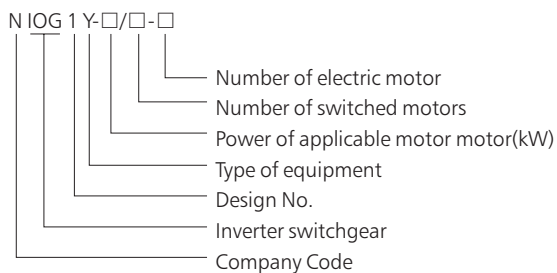| Type	Applicable motor of water pump(kW)	Rated current (A)	Overall dimension W×D×H(mm)
NIOG1Y-11/1	11	24	400×350×650
NIOG1Y-15/1	15	33	400×350×650
NIOG1Y-18.5/1	18.5	39	450×400×750
NIOG1Y-22/1	22	44	450×400×750
NIOG1Y-30/1	30	60	450×400×900
NIOG1Y-37/1	37	75	450×400×900
NIOG1Y-45/1	45	90	500×400×1200
NIOG1Y-55/1	55	110	500×400×1200
NIOG1Y-75/1	75	150	600×400×1600
NIOG1Y-90/1	90	175	600×400×1600

NIOG1□ Industrial Control Inverter Switchgear

1. General

NIOG1□ series industrial control transducer cabinet is designed and manufactured for convenience to the user by adding other control units on the basis of transducer. The product is mainly equipped to occasions with motor timing in enterprises and works like spinning, paper making, metallurgy, mechanism, oil field and coal mine and etc. to save energy, improve the degree of automatization, improve process technique and production efficiency. It is the best choice for achieving the best performance of motor timing in modern enterprises and works.

2. Type Designation

N IOG 1 Y-□/□-□

- Number of electric motor
- Number of switched motors
- Power of applicable motor motor(kW)
- Type of equipment
- Design No.
- Inverter switchgear
- Company Code

3. Characteristics

3.1 Telecontrol can achieve startup, stop and timing of motor easily;

3.2 Function of smooth timing can realize united control of multi machines;

3.3 Speed synchro control, multi sects choice, extended application range of the equipment;

3.4 With function of to-and fro shift to ensure quality of product;

3.5 Inching running is convenient for test-driving and is safe and reliable;

3.6 Operation efficiency is improved, energy is saved and noises are reduced;

3.7 Having simplified the mechanical structure, reduced mechanical abrasion and prolonged the life of the equipment;

3.8 Having simplified the control system and improve the reliability of operation;

3.9 With protective function of over loading, over voltage, under voltage, over current, short circuit, short circuit to earth, over heat, lack of phased and etc.

4. Technical Data

4.1 power supply: three-phase AC 400V±10％, 50Hz;

4.2 capacity: 5.5kW～160kW;

4.3 Range of output frequency: 1Hz～400Hz, set maximum frequency between 25Hz～400Hz at random；Up to and over 30kW is 1Hz～60Hz, set maximum frequency between 25Hz～60Hz at will;

4.4 Note：Dimensions of cabinet body can be determined according to requirements of the client.