

VEICHI

Manual

AC70 Series Frequency Inverter

VEICHI

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Standard diagram

● Standard diagram

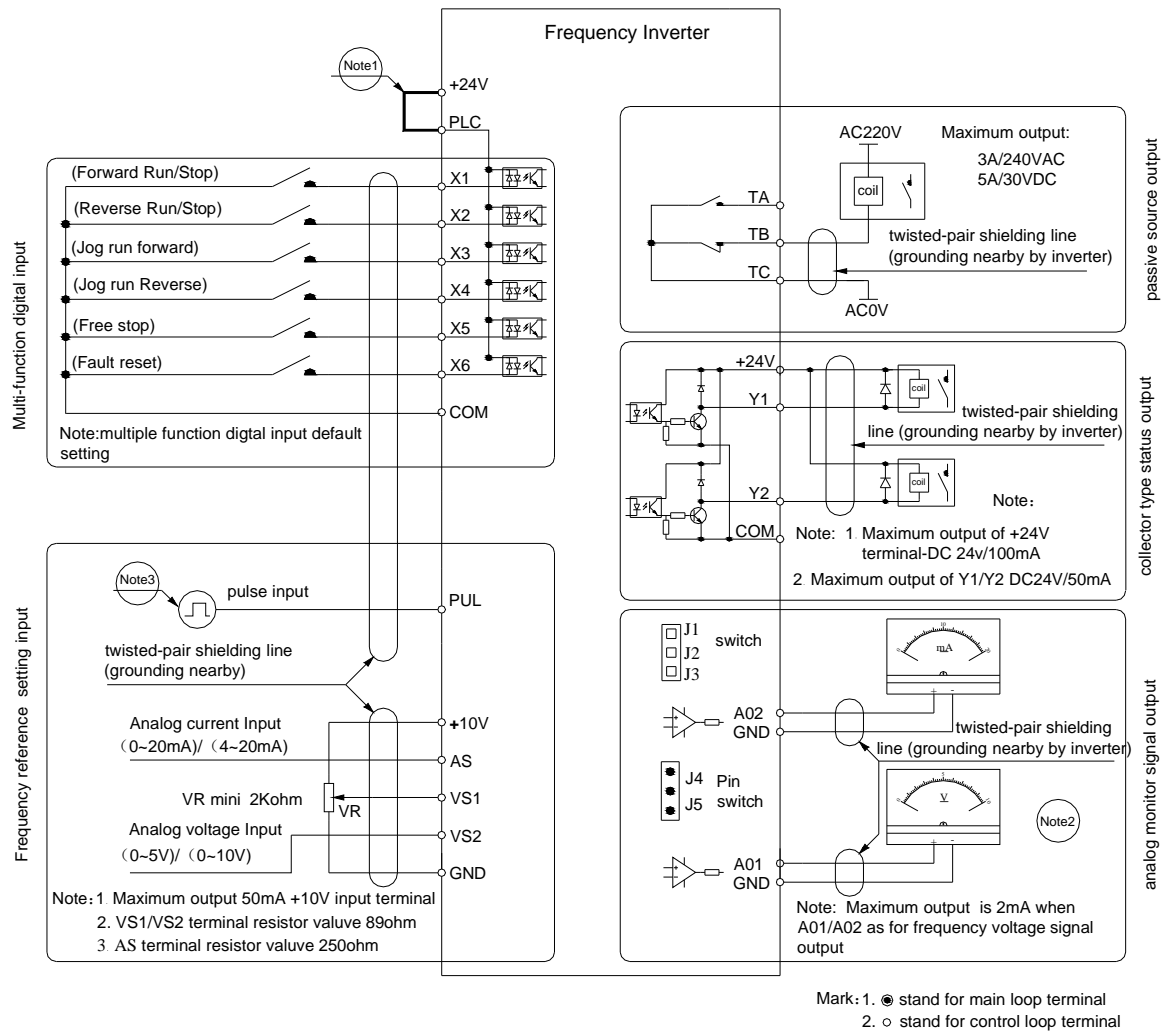


Chart 3-18:AC70 series inverter standard diagram

- Note: 1.NPN or PNP transistor signal can be selected as input of multi-function input terminal (X1~X6) . Inverter built-in power supply (+24V terminal) or external power supply (PLC terminal) can be chosen as bias voltage. Factory setting '+24V' short connect with 'PLC'.
2. Analog monitor output is special output of meters such as frequency meter, current meter, voltage meter and etc. It can not be used for control operations such as feedback control.
3. As there are multi pulse styles, please refer to the line connect mode description details.

● Auxiliary terminal output capacity

Terminal	Function definition	Max output
+10V	10V auxiliary power supply output, constitutes loop with GND.	50mA
A01/A02	Analog monitor output, constitutes loop with GND.	As frequency,voltage signal, max output 2mA
+24V	24V auxiliary power supply output, constitutes loop with COM.	100mA

Y1/Y2	Collector open circuit output, can set the action-object by program.	DC24V/50mA
TA/TB/TC	Passive connector output, can set the action-object by program.	3A/240VAC 5A/30VDC

Table 3-4:AC70 series inverter auxiliary terminals output capacity

● Switch terminals connection function specification

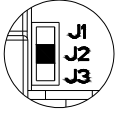
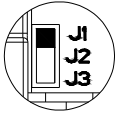
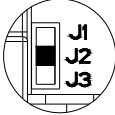
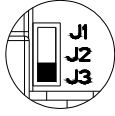
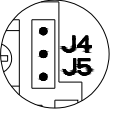
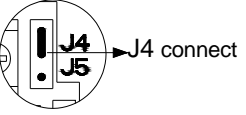
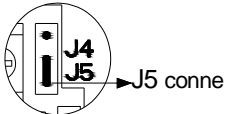

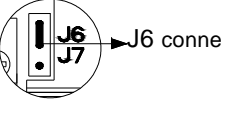
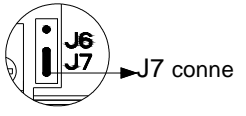
Switch terminal	Optional position	Picture example	Function specification
 (K2)	J1		(AO2) 0.0~50kHz open collect pole pulse frequency output
	J2		(AO2) 0~20mA current output or 4~20mA current output
	J3		(AO2) 0~10V voltage output
 (K1)	J4		(AO1) 0~10V voltage output
	J5		(AO1) 0~20mA current output or 4~20mA current output
 (K3)	J6		RS485 communication initial port connect matching resistor 120 Ω
	J7		Matching resistor disconnect

Table 3-5:AC70 series inverter switch terminal connection function specification

Main circuit wiring

● Main circuit wiring

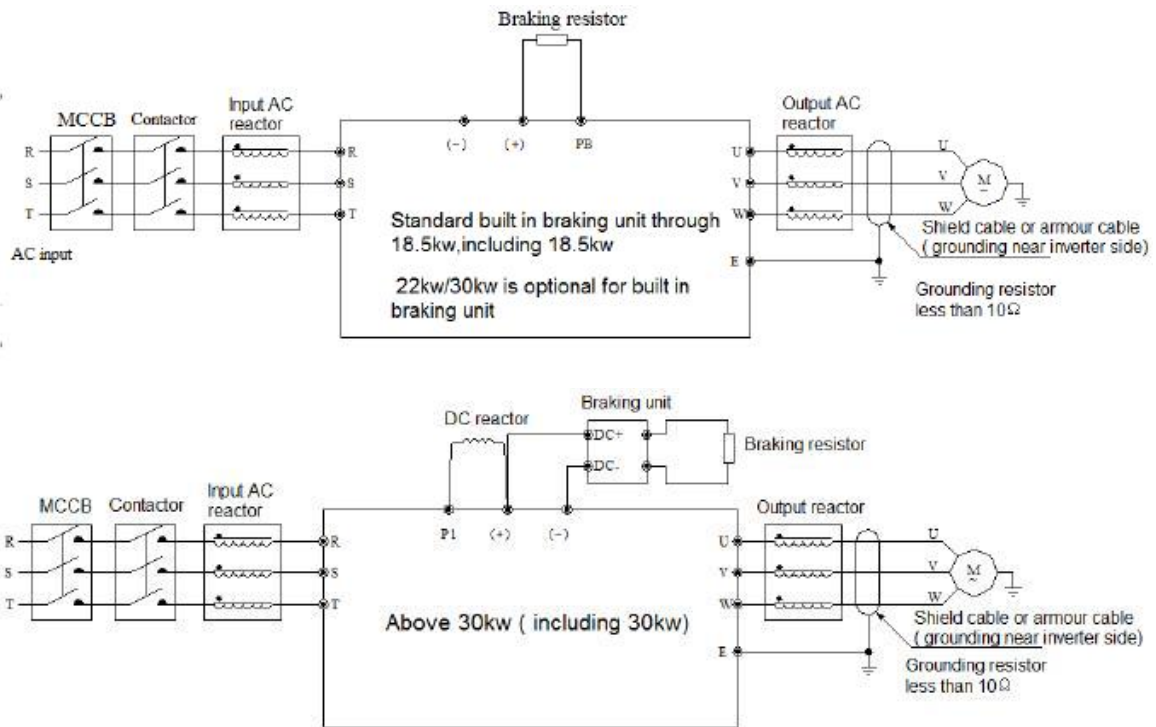


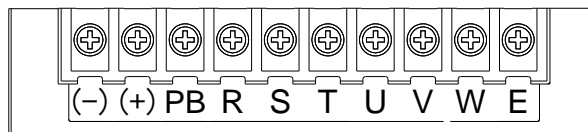
Chart 3-19: AC70 frequency inverter main circuit wiring

Note: 1, Fuse, dc reactor, braking unit, braking resistor, input actor, input filter, output reactor, output filter are optional parts, please refer to "peripheral equipment".
2, P1 terminal and (+) short connect. If need add dc reactor, please take away the short connect part between P1 and (+).

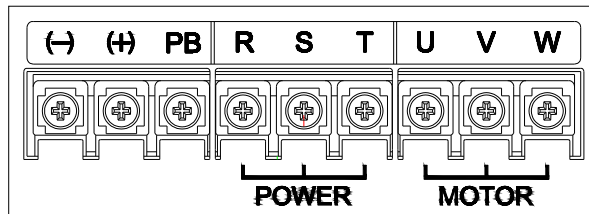
Main circuit terminals

● Main circuit terminals array and definition

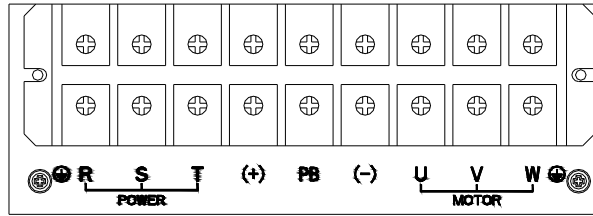
Arrangement sequence of main circuit terminal with 18.5kW or less power (15 ~ 18.5KW for steel cover machine)



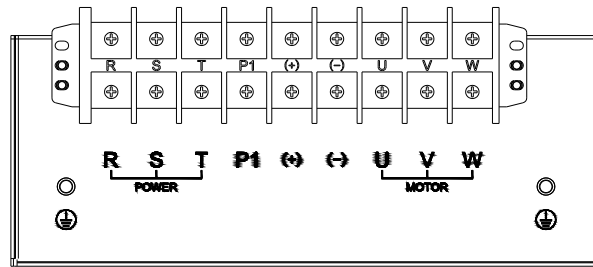
Arrangement sequence of main circuit terminal with 15-22KW (15~22KW for plastic cover machine)



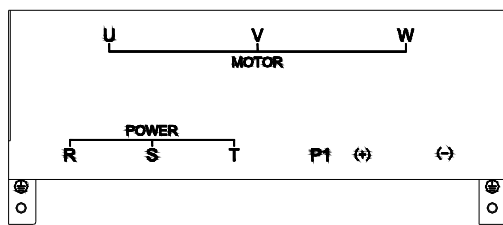
Arrangement sequence of main circuit terminal with 22~30KW (standard machine without PB terminal) (22KW for steel cover machine)



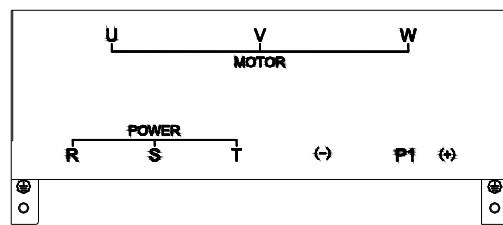
Arrangement sequence of main circuit terminal with 37~110kW



Arrangement sequence of main circuit terminal with 132kW:



Arrangement sequence of main circuit terminal with 160~560kW



Terminal	Name	
(-)	DC power terminal	DC power output, (-) means DC bus cathode, (+) means DC bus anode, used for external braking unit.
(+)		
(+)	Braking resistance terminal	Used for external braking resistance to realize quick stop.
PB		
P1	DC reactor terminal	Used for external DC reactor.
(+)		
R	Inverter input terminal	Used to connect 3-phase AC power supply.
S		
T		
U	Inverter output terminal	Used to connect the motor.
V		
W		
⊕	Earth	Earth terminal, earth resistance<10 OHM
E		

Table 3-6:AC70 series inverter main circuit terminals array and definition

● 3-phase 380V machine main circuit wiring

Model	Main circuit terminals screw specifications	Suggested fixed moment (N·m)	Suggested Copper-core cable specification mm ² (AWG)
AC70-T3-R75G/1R5P	M4	1.2~1.5	1.5mm ² (14)
AC70-T3-1R5G/2R2P	M4	1.2~1.5	2.5mm ² (12)
AC70-T3-2R2G/004P	M4	1.2~1.5	2.5mm ² (12)
AC70-T3-004G/5R5P	M4	1.2~1.5	4mm ² (10)
AC70-T3-5R5G/7R5P	M4	1.2~1.5	6mm ² (9)
AC70-T3-7R5G/011P	M5	2~2.5	6mm ² (9)
AC70-T3-011G/015P	M5	2~2.5	10mm ² (7)
AC70-T3-015G/018P	M6	4~6	10mm ² (7)
AC70-T3-018G/022P	M6	4~6	16mm ² (5)
AC70-T3-022G/030P	M8	8~10	16mm ² (5)
AC70-T3-030G/037P	M8	8~10	25mm ² (3)
AC70-T3-037G/045P	M8	8~10	25mm ² (3)
AC70-T3-045G/055P	M8	8~10	35mm ² (2)
AC70-T3-055G/075P	M10	11~13	35mm ² (2)
AC70-T3-075G/093P	M10	11~13	50mm ² (1)
AC70-T3-093G/110P	M10	11~13	50mm ² (1/0)
AC70-T3-110G/132P	M10	11~13	70mm ² (2/0)
AC70-T3-132G/160P	M10	11~13	95mm ² (3/0)
AC70-T3-160G/185P	M12	14~16	95mm ² (4/0)
AC70-T3-185G/200P	M12	14~16	120mm ²
AC70-T3-200G/220P	M12	14~16	150mm ²
AC70-T3-220G/250P	M12	14~16	150mm ²
AC70-T3-250G/280P	M12	14~16	185mm ²
AC70-T3-280G/315P	M12	14~16	185mm ²
AC70-T3-315G/355P	M16	20~23	240mm ²
AC70-T3-355G/400P	M16	20~23	240mm ²
AC70-T3-400G/450P	M16	20~23	300mm ²
AC70-T3-450G/500P	M16	20~23	400mm ²
AC70-T3-500G/560P	M16	20~23	400mm ²
AC70-T3-560G/630P	M16	20~23	500mm ²

Note: Here we suggest to use copper joins as mains electric connectors of machine over 185KW. Pls refer the cut section area above.

Table 3-7: Suggested cable diameter and fixed moment 3-phase 380V machine main circuit

● Single-phase 220V machine main circuit wiring

Model	Main circuit terminals screw specifications	Suggested fixed moment (N·m)	Suggested Copper-core cable specification mm ² (AWG)
AC70-S2-R40G	M4	1.2~1.5	1.5mm ² (14)
AC70-S2-R75G	M4	1.2~1.5	2.5mm ² (12)
AC70-S2-1R5G	M4	1.2~1.5	2.5mm ² (12)
AC70-S2-2R2G	M4	1.2~1.5	4mm ² (10)

Table 3-8: Suggested cable diameter and fixed moment single-phase 220V machine main circuit

● Suggested main circuit components specification

Model	Contactor specification	Breaker specification	DC reactor	Input filter	Output filter
AC70-T3-R75G/1R5P	10A	10A	-----	NFI-005	NFO-010
AC70-T3-1R5G/2R2P	10A	10A	-----	NFI-005	NFO-010
AC70-T3-2R2G/004P	16A	15A	-----	NFI-010	NFO-010
AC70-T3-004G/5R5P	16A	20A	-----	NFI-010	NFO-010
AC70-T3-5R5G/7R5P	25A	20A	-----	NFI-020	NFO-020
AC70-T3-7R5G/011P	25A	30A	-----	NFI-020	NFO-020
AC70-T3-011G/015P	32A	40A	-----	NFI-036	NFO-036
AC70-T3-015G/018P	40A	50A	-----	NFI-036	NFO-036
AC70-T3-018G/022P	50A	60A	-----	NFI-050	NFO-050
AC70-T3-022G/030P	50A	75A	DCL-50	NFI-050	NFO-050
AC70-T3-030G/037P	63A	100A	DCL-80	NFI-080	NFO-080
AC70-T3-037G/045P	80A	125A	DCL-100	NFI-100	NFO-100
AC70-T3-045G/055P	100A	150A	DCL-110	NFI-100	NFO-100
AC70-T3-055G/075P	125A	175A	DCL-125	NFI-150	NFO-150
AC70-T3-075G/093P	160A	200A	DCL-150	NFI-150	NFO-150
AC70-T3-093G/110P	220A	250A	DCL-200	NFI-200	NFO-300
AC70-T3-110G/132P	220A	300A	DCL-200	NFI-200	NFO-300
AC70-T3-132G/160P	250A	400A	DCL-300	NFI-300	NFO-300
AC70-T3-160G/185P	300A	500A	DCL-300	NFI-300	NFO-300
AC70-T3-185G/200P	400A	600A	DCL-400	NFI-400	NFO-400
AC70-T3-200G/220P	400A	700A	DCL-400	NFI-400	NFO-400
AC70-T3-220G/250P	630A	800A	DCL-500	NFI-600	NFO-600
AC70-T3-250G/280P	630A	1000A	DCL-600	NFI-600	NFO-600
AC70-T3-280G/315P	630A	1200A	DCL-600	NFI-600	NFO-600
AC70-T3-315G/355P	630A	1200A	DCL-800	-----	-----
AC70-T3-355G/400P	800A	1400A	DCL-800	-----	-----
AC70-T3-400G/450P	1000A	1600A	DCL-1000	-----	-----
AC70-T3-450G/500P	1000A	2000A	DCL-1000	-----	-----

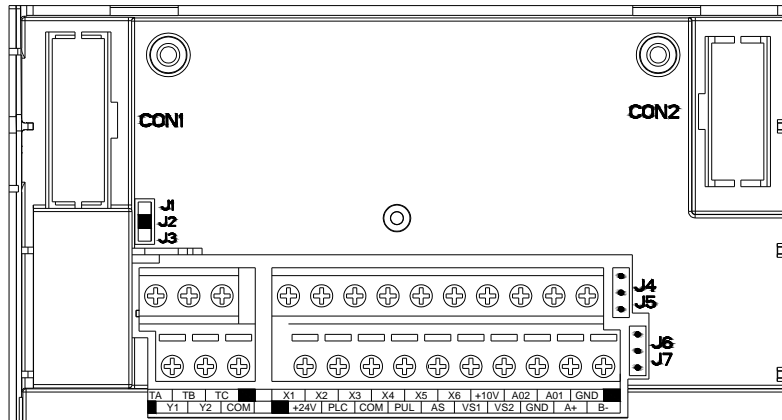
AC70-T3-500G/560P	1000A	2000A	DCL-1200	-----	-----
AC70-T3-560G/630P	-----	2000A	DCL-1200	-----	-----

Note: For DC reactor, input filter, output filter and other components specification details and circuit mode, please refer chapter 7 “peripheral equipments and options”

Table 3-9: Suggested mains fittings for 3-phase 380V machine

Control loop terminals

- Control loop terminals array



Sort	Terminal	Name	Function definition
Passive connection output	TA	Normally-open contact	Can set the action-object by programme. Max contact capacity:3A/240VAC 5A/30VDC
	TB	Normally-closed contact	
	TC	Common contact	
State output	Y1	Collector open output 1	Can set the action-object by programme. Max contact capacity:DC30V/50mA
	Y2	Collector open output 2	
Auxiliary power supply	+24V	Auxiliary power output +	Max output: 24VDC/100mA.
	COM	Auxiliary power output -	
Multi-function contact input	X1	Multi-function contact input 1	Build-in photoelectric converter can set the action-object by program. Input condition: Max DC30V/8mA. Note:Factory setting is common-collector characteristic input. If need common-emitter characteristic input, please remove the short connector between“+24V” and “PLC”, then use the short connector to connect “PLC” and “COM”.
	X2	Multi-function contact input 2	
	X3	Multi-function contact input 3	
	X4	Multi-function contact input 4	
	X5	Multi-function contact input 5	
	X6	Multi-function contact input 6	
	PLC	Multi-function contact input common terminal	
Pulse input	PUL	Pulse input	Pulse range:0.0~50.00kHz. Factory setting is collector open output (R80,R82 transfer to R81,R83 can be active input)

Analog output	A01	Analog output 1	Can set the action and object by program. Physical type of output signal: 0~10VDC. 0~20mA , 4~20mA. It can be selected by parameter [F-62] and J4,J5 (see table 3-5)
	A02	Analog output 2	Can set the action-object by program. Physical type of output signal: 0~10VDC. 0~20mA , 4~20mA, It can be selected by parameter [F-62] and J1 J2 J3 (see table 3-5)
Analog input	AS	Current analog input	As inverter control signal or feedback signal, can set the act range and response speed by program. VS1/VS2 resistance:100KΩ; AS resistance: 250Ω.
	VS1	Voltage analog input 1	
	VS2	Voltage analog input 2	
Signal auxiliary power supply	+10V	Signal auxiliary power supply terminal	Max output 10VDC/50mA
	GND	Signal auxiliary power supply terminal	Common auxiliary power of analog output, analog input signal.
Communication terminal	A+	Communication terminal A+	RS485 communication port
	B-	Communication terminal B-	

Table 3-10:AC70 series inverter control loop terminals array and definition

● Control loop terminal wiring specification

Terminal	Bolt specification (mm)	Fixed moment (N·m)	Cable specification (mm ²)	Cable type
A+ B-	M2.5	0.4~0.6	0.75	Twisted-pair shielded cable
+10V GND A01 A02 VS1 VS2 AS	M2.5	0.4~0.6	0.75	Twisted-pair shielded cable
+24V COM Y1 Y2 TA TB TC PLC PUL X1 X2 X3 X4 X5 X6	M2.5	0.4~0.6	0.75	Shielded cable

Table 3-11:Control loop terminal wiring specification

Braking unit (braking resistance) connection

- Brake resistance wiring of machine with 18.5KW or less power (15KW-18.5KW for steel cover machine)

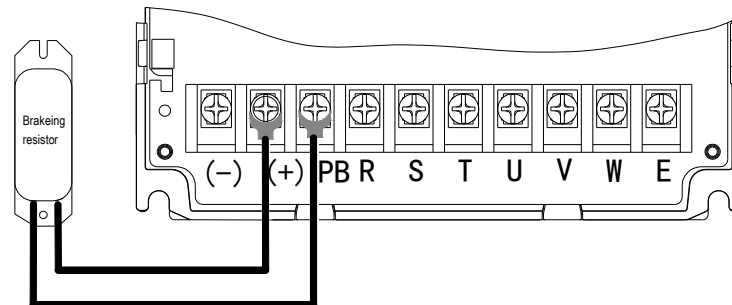


Fig 3-20: AC70 Series Frequency Inverter Brake resistance wiring of machine with 18.5KW or less power

- Brake resistance wiring of machine with 15-22KW (for plastic cover machine)

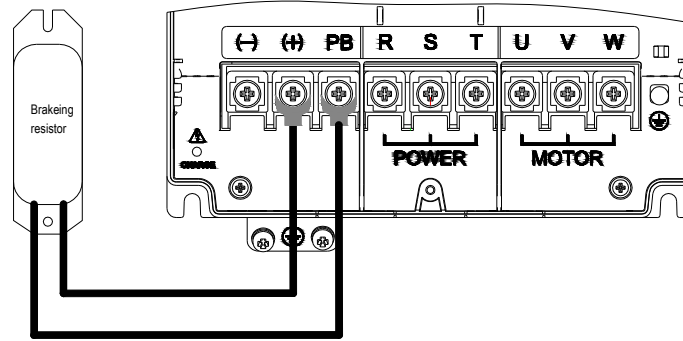


Fig 3-21: AC70 Series Frequency Inverter Brake resistance wiring of machine with 15-22KW (for plastic cover machine)

- Brake resistance wiring of machine with 22KW and 30KW(built-in brake is optional) (22KW for steel cover machine)

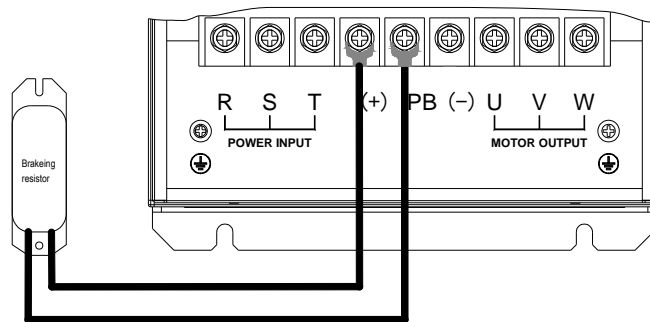


Fig 3-22: AC70 Series Frequency Inverter Brake resistance wiring of machine with 22KW and 30KW(built-in brake is optional) (22KW for steel cover machine)

- Brake resistance wiring of machine with 37KW or above

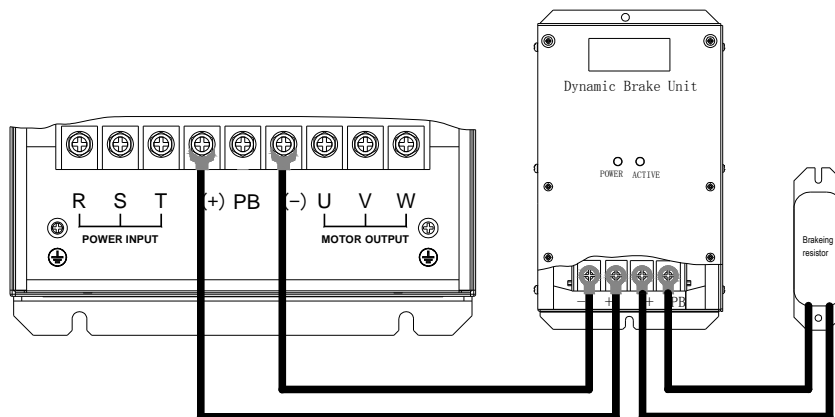


Fig 3-23: AC70 Series Frequency Inverter Brake resistance wiring of machine with 37KW or above

- Suggested braking resistance specification parameters

Braking resistance value and power in the chart are decided according to common inertia load and intermittent braking mode. While used in large inertia occasion or long time frequent brake occasion, please adjust resistance value and power according to the inverter specification and the rated parameter of braking unit. If any problem, please consult customer service department of Veichi Electric Com., Ltd.

Three-phase 380V			
Motor power(kW)	Resistance value(Ω)	Resistance power(W)	Braking torque (%)
0.75 kW	750 Ω	150W	100%
1.5 kW	400 Ω	300W	100%
2.2 kW	250 Ω	400W	100%
4.0 kW	150 Ω	500W	100%
5.5 Kw	100 Ω	600W	100%
7.5 kW	75 Ω	780W	100%
11 kW	50 Ω	1,200W	100%
15 kW	40 Ω	1,500W	100%
18.5 kW	32 Ω	2,000W	100%
22 kW	28 Ω	2,200W	100%
30 kW	24 Ω	3,000W	100%
37 kW	20 Ω	3,700W	100%
45 kW	16 Ω	4,500W	100%
55 kW	13 Ω	5,500W	100%
75 kW	9 Ω	7,500W	100%
90 kW	6.8 Ω	9,300W	100%
110 kW	6.2 Ω	11,000W	100%
132 kW	4.7 Ω	13,000W	100%
160 kW	3.9 Ω	15,000W	100%
185 kW	3.3 Ω	17,000W	100%
200 kW	3 Ω	18,500W	100%
220 kW	2.7 Ω	20,000W	100%
250 kW	2.4 Ω	22,500W	100%
280 kW	2 Ω	25,500W	100%
315 kW	1.8 Ω	30,000W	100%
355 kW	1.5 Ω	33,000W	100%
400 kW	1.2 Ω	42,000W	100%
450 kW	1.2 Ω	42,000W	100%
500 kW	1 Ω	42,000W	100%
560 kW	1 Ω	50,000W	100%
Single-phase 220V			
Motor power(kW)	Resistance value(Ω)	Resistance power(W)	Braking moment (%)
0.4 kW	400 Ω	100W	100%
0.75 kW	200 Ω	120W	100%
1.5 kW	100 Ω	300W	100%
2.2 kW	75 Ω	300W	100%

Table 3-12: Suggested braking resistance specification parameters of AC70 series inverter

- Build-in braking unit max braking performance

Braking unit of AC70 series product with low power can be selected according to the suggested braking resistance specification parameters in table 3-11. In large inertia or long time frequent brake occasion, the moment maybe should be increased. The max braking power is showed in the following table, the range of which can not be over in use. Otherwise the equipment maybe destroyed. If any problem, please consult Veichi Electric Com., Ltd customer service department.

Three-phase 380V			
Inverter model	Motor power	Max braking current	Min resistance
AC70-T3-R75G/1R5P	0.75 kW	3.5A	200Ω
AC70-T3-1R5G/2R2P	1.5 kW	3.5A	200Ω
AC70-T3-2R2G/004P	2.2 kW	7A	100Ω
AC70-T3-004G/5R5P	4 kW	10A	75Ω
AC70-T3-5R5G/7R5P	5.5 kW	10A	75Ω
AC70-T3-7R5G/011P	7.5 kW	14A	50Ω
AC70-T3-011G/015P	11 kW	17A	40Ω
AC70-T3-015G/018P	15 kW	23A	30Ω
AC70-T3-018G/022P	18.5 kW	28A	25Ω
AC70-T3-022G/030P	22 kW	30A (optional)	24Ω(optional)
AC70-T3-030G/037P	30 kW	35A (optional)	22Ω(optional)
Single-phase 220V			
Inverter model	Motor power	Max braking current	Min resistance
AC70-S2-R40G	0.4 kW	3.8A	100Ω
AC70-S2-R75G	0.75 kW	3.8A	100Ω
AC70-S2-1R5G	1.5 kW	6.5A	60Ω
AC70-S2-2R2G	2.2 kW	10.5A	40Ω

Table 3-13: AC70 series inverter build-in braking unit max braking power

Multi-function contact input connection

- NPN transistor connection mode

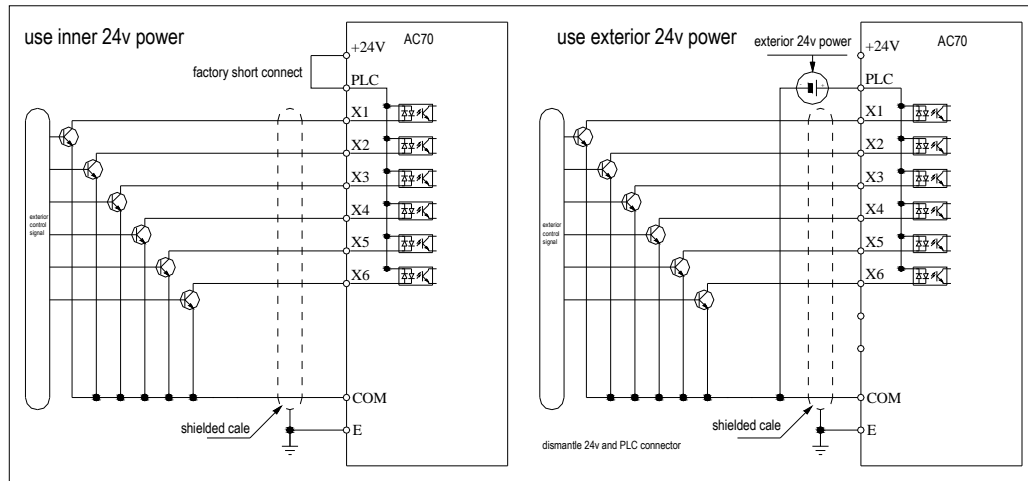


Chart 3-24: NPN transistor digital input signal connection mode

- PNP transistor connection mode

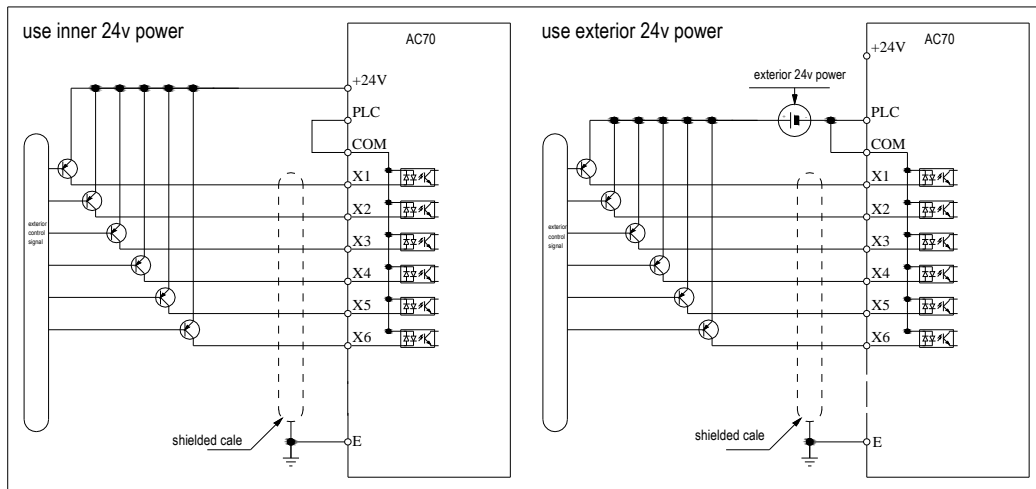


Chart 3-25 PNP transistor digital input signal connection mode

Digital output signal connection

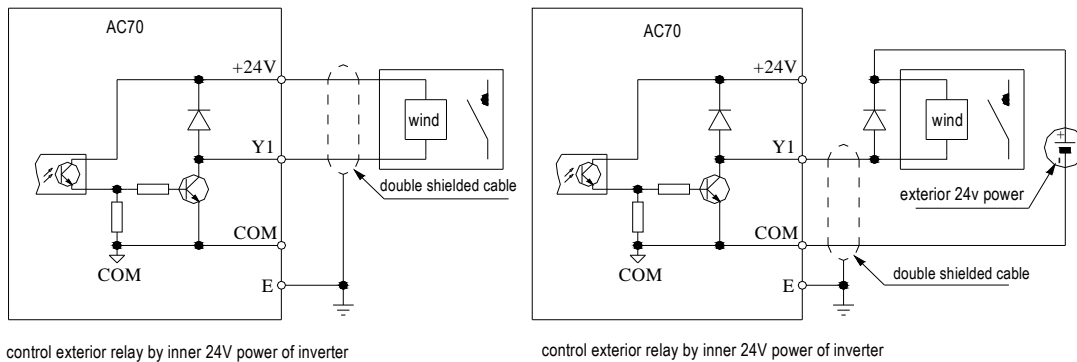


Chart 3-26: AC70 series inverter digital output signal connection mode

Analog output signal connection

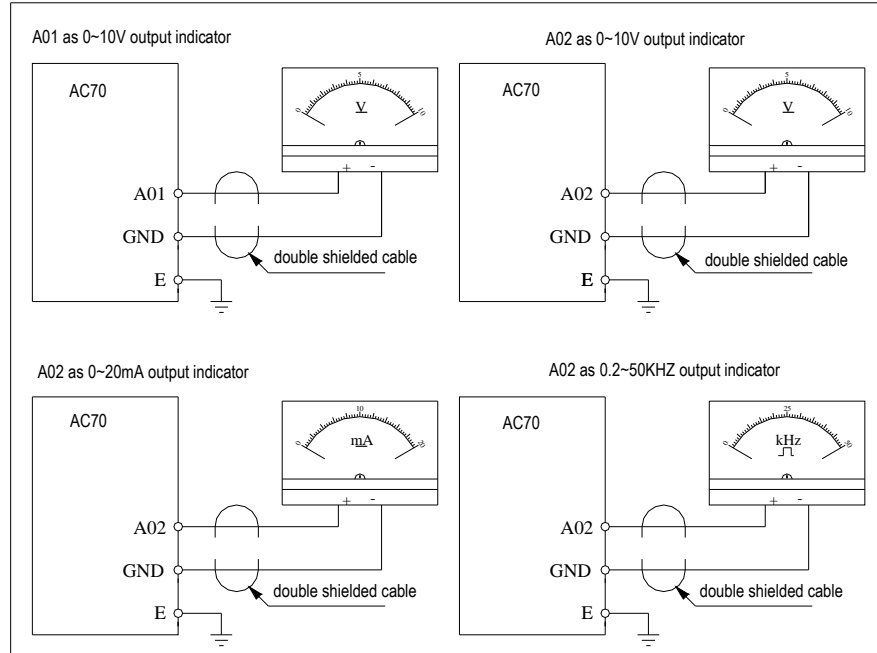


Chart 3-27:AC70 series inverter analog output signal connection mode

Connection of pulse input signal

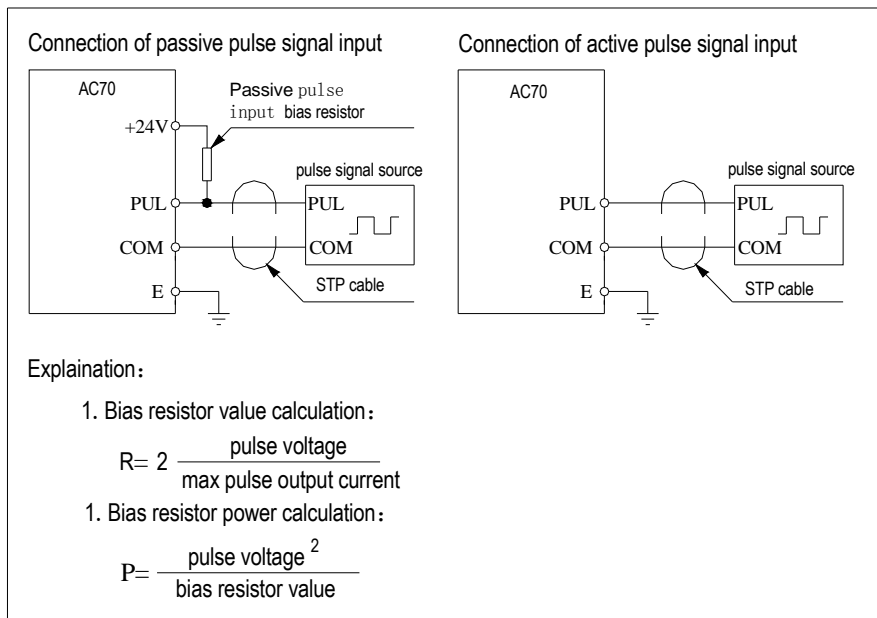


Chart 3-28: Pulse input signal connection mode of AC70 series inverter

Standby control system

Frequency inverter is composed of semiconductor, passive electronic component and driving part. All of them have useful time, which means these parts may happen characteristic change or out of use in normal working environment. And it will cause product fault. To avoid production stop led by the fault, we suggest preparing standby control system when using the inverter.

Chart 3-29 is a standby control system for manual switch to power supply driving motor at inverter fault. Standby control systems such as power supply Y/ Δ step-down start way driving motor, power supply self-coupling reduction voltage start mode driving motor, power supply soft start mode driving motor or standby inverter system can be chose to use according the actual requirement and environment.

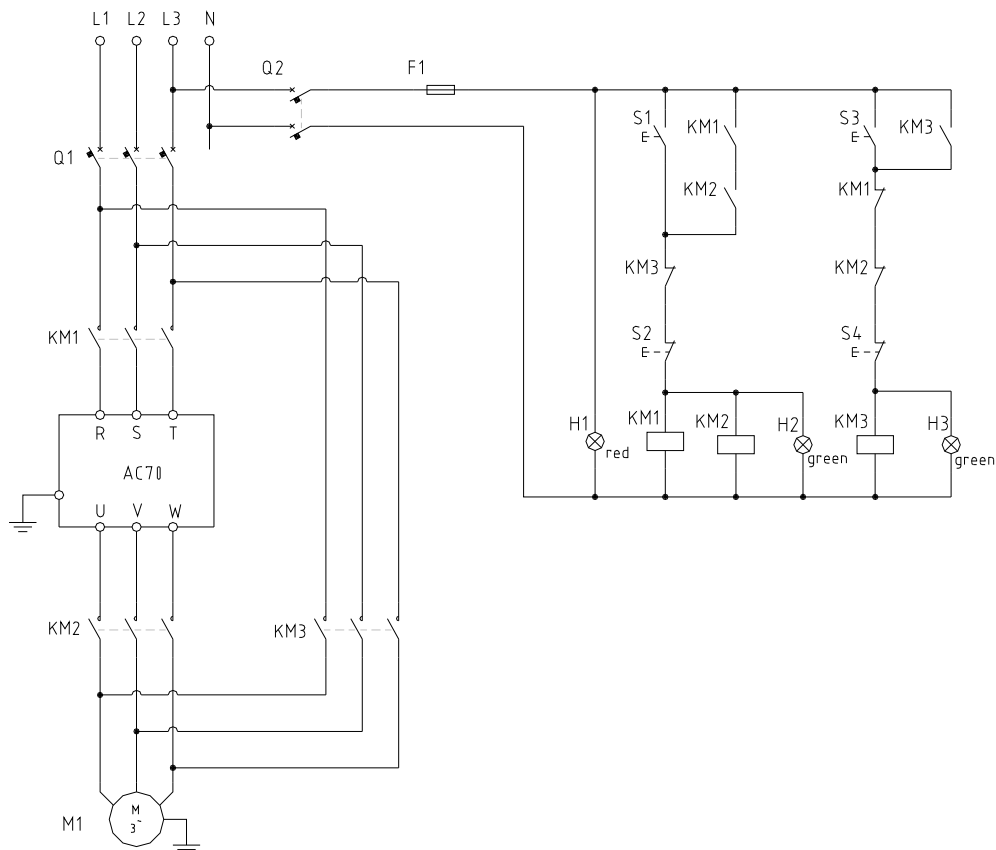


Chart 3-29: Standby control system of power supply directly driving mode