Smart HCFA, Creative Future

HTEMEC

2018

PLC Selection Guide

To be the most valuable industrial automation system service provider

Smart HCFA, Creative Future

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ABOUT US

HCFA aims to be the most valuable industrial automation product & service provider. Founded in 2011, we specializes in industrial automation filed and provide a series of industrial automation solutions for different kinds of customers. As a National High-tech Enterprise, our main products include PLC (Programmable Logic Controller),HMI (Human Machine Interface), Inverter, Servo drive and motor, motion controller and industrial robot.

- Strong R&D team: huge investment in R&D to design cutting-edge products;
- Self-developed ERP system: complete control of product development, purchasing & manufacturing;
- Rigorous SFCS barcode management: process control, traceability system
- Superior supply chain: global sourcing of raw materials to ensure product performance and stability

Control

PLC & Motion controllers
Robot and manipulator controllers
CNC controllers
Analog & Communication control modules
Tension control & temperature control modules

Drive

Servo drives
Servo motors
General-purpose vector control inverters
New-energy drives
Photovoltaic inverters

Sensing

High precision magneto-optical encoders
Machine vision
Photoelectric sensors
Proximity sensors
Temperature sensors

Visualization

Display and control terminals
HMI & touch screen
IoT Equipment network
ERP/MES/SFCS

CONTENTS

ABOUT US

PLC

PLC New Product

	A1P	A2P/A2C	A8P/A8C
Control points	30	128	256
Command speed	0.5/3.7us	0.5/3.7us	0.05/0.6us
BUS speed	None	2byte/ms	20byte/ms
Control axis	2 axes	2+32 axes	4+32+32 axes
Motion control	Not provided	Not provided	Provided
ETHERCAT	Not provided	Not provided	Provided
IEC61131-3	Not provided	Not provided	Not provided

PLC

A1P/ A2P Specifications

Items		A1P	A2P
Operation control method		Cyclic operation ofy stored program, with interrupt instruction	
I/O control method		Batch processing method (when END instruction is executed), I/O refresh instruction and pulse catch are available	
Programming language		Relay symbolic language + step ladder (Step ladder can be used to produce an SFC style program)	
Program capacity	Internal EEPROM	8000 steps EEPROM (without battery), with password protection function Including comments and file register, up to 8000 steps	
	Memory Box	EEPROM 8000 steps	
	Write during RUN	Provided (Program can be changed during RUN)	
Real-time	Clock function *1	Built-in 1980 to 2079 (with correction for leap year), 2- or 4-digit year, accuracy within ±45 seconds/month at 25°C	
Number of instructions	Sequence control & Step ladder instructions	Sequence control instructions: 27 Step ladder instructions: 2	
	Applied instructions	85	89
Operation processing time	Basic instructions	0.5 to 0.7 μs/instruction	
	Applied instructions	3.7 to hundreds μs	
I/O points	Input points	X000 ~ X017 16 points (octal) not extendable	X000 ~ X177 128 points (octal) With expansion modules
	Output points	Y000 ~ Y015 14 points (octal) not extendable	X000 ~ X177 128 points(octal) With expansion modules
	Total points (With expansion modules)	—	128 points
Input/output relay		Based upon input & output specification	
Auxiliary relay	General	M0~M383 384 points	
	EEPROM back-up*2	M384 ~ M511 128 points	
	Capacitor back-up*3	—	M512~M1535 1024 points
	Special function	M8000~M8255 256 points	
State relays	Initial state (EEPROM back-up)*2	S0~S9 10 points	
	EEPROM back-up*2	S10~S127 118 points	
	Capacitor back-up*2	—	S128~S999 872 points
Timers (ON delay)	100ms	T0 to T62 63 points (0.1 ~ 3,276.7s)	T0 ~ T199 200 points(0.1 ~ 3,276.7s)
	10ms	M8028 ON, T32 ~ T62 can be used as 10ms counter(0.01 ~ 327.67s)	T200 ~ T245 46 points(0.1 ~ 327.67s)
	1ms	T63 1 points (0.001 ~ 32.767s)	
	1ms accumulation	—	T246 ~ T249 4 points (0.001 ~ 32.767s) Back-up of capacitor during power off*1
	100 ms accumulation	—	T250 ~ T255 6 points (0.1 ~ 3,276.7s) Back-up of capacitor during power off*1
Analog potentiometer		VR1：D8030，VR2：D8031 2 points（0~255）	
Counters	16 bit rising counter *2	C0 ~ C15 16 points (0 ~ 32,767 counts)	
	16 bit rising counter & EEPROM back-up*2	C16 ~ C31 16 points(0 ~ 32,767 counts)	
	16 bit rising counter & capacitor back-up*1	—	C32 ~ C199 168 points (0 ~ 32,767 counts)
	32 bit two-way counter	—	C200 ~ C219 20 points (-2,147,483,648 ~ +2,147,483,647 counts)
	32 bit two-way counter & capacitor back-up*1	—	C220 ~ C234 15 points (-2,147,483,648 ~ +2,147,483,647 counts)
High speed counters	32 bit two-way counter & EEPROM back-up*2	C235 ~ C255 [1 phase] 60kHz/2 points, 10kHz/4 points [2 phase] 30kHz/1 point, 5kHz/1 point	
Data registers (32 bits when used in pair)	General (16 bit)	D0~D127 128 points	
	EEPROM back-up (16 bit)*2	D128~D255 128 points	
	Capacitor back-up (16 bit)*1	—	D256~D7999 7744 points
	File & EEPROM back-up	D1000 ~ D2499 1500 points (max.)	D1000 ~ D7999 7000 points (max.)
	Special function (16 bit)	D8000~D8255 256 points	
	Index (16 bit)	V0~V7，Z0~Z7 16 points	
Pointers	For JUMP and CALL branch	P0~P63 64 points	P0~P127 128 points
	For input interrupt	I 0□□~I 5□□ 6 POINTS	
Nesting	For master control	N0~N7 8 POINTS	
Constants	Decimal(K)	16 BIT: -32,768 TO +32,767 32 BIT: -2,147,483,648 TO +2,147,483,647	
	Hexadecimal (H)	16 BIT: 0000 TO FFFF 32 BIT: 00000000 TO FFFFFFFF	

*1: Fully charged after 30 minutes and the present value can be maintained for 10 days. If selecting battery card TX1N-BAT-BD, it can be maintained for 5 years.
*2: The back-up area and non-back-up area is fixed.(cannot be changed by parameters)
To keep the value, PLC must be continuously energized for more than 5 minutes.

Items		HCA8P/HCA8C
Operation control method		Cyclic operation of stored program (dedicated LSI), with interruption instruction
I/O control method		Batch processing method (when executing END instruction) instruction refresh and pulse catch
Programming language		Relay symbolic language + step ladder (Step ladder can be used to produce an SFC style program)
Program capacity	Memory capacity(max.)	64000 steps (including comment, file register, max.64000 steps) Comment: max.6350 points (50 points/ 500 steps) ; File register: max.7000 points (500 points/ 500 steps)
	Program capacity & mode	Built-in 64k Flash
	Memory box	Optional
	Write during RUN	Provided(Program can be modified while the PLC is running.)
Real time clock	Clock function	Built-in 1980 to 2079 (with correction for leap year) , 2- or 4-digit year, accuracy within ±45 seconds/month at 25°C
Kinds of instructions	Sequence control & Step ladder	Sequence control instructions: 29 Step ladder instructions: 2
	Applied instruction	209
Processing speed	Basic instruction	0.05 μs/instruction
	Applied instruction	0.6 to several 100 μs/instruction
I/O configuration	①Input points when using extension modules	248 points or less — Total points: 256 points or less
	②Output points when using extension modules	248 points or less
	③Remote I/O points (CC-Link)	224 points or less
	Total points (all above)	384 points or less
Input /output relay	Input relay	X000 ~ X367 248 points. The device numbers are in octal. The total number of input and output points is 256.
	Output relay	Y000~Y367 248 points. The device numbers are in octal. The total number of input and output points is 256.
Auxiliary relay	For general use	M0~M499 500 points
	For keeping use[modifiable]	M500~M1023 524 points
	For keeping use[fixed]	M1024~M7679 6656 points
	For special functions	M8000~M8511 512 points
State relays	Initial state	S0~S9 10 points
	For general use	S10~S499 490 points
	For keeping use[modifiable]	S500~S899 400 points
	For annunciator	S900~S999 100 points
	For keeping use[fixed]	S1000~S4095 3096 points
Timers(ON delay)	100ms	T0~T191 192 points 0.1~3276.7 s
	100 ms[for sub or interrupt program]	T192~T199 8 points 0.1~3276.7 s
	10ms	T200~T245 46 points 0.01~327.67 s
	1 ms accumulation	T246~T249 4 points 0.001~32.767 s
	100 ms accumulation	T250~T255 6 points 0.1~3276.7 s
	1ms	T256~T511 256 points 0.001~32.767 s
Counters	For general use, rising (16 bits) [modifiable]	C0~C99 100 points 0~32,767 counts
	For keeping use, rising (16 bits) [modifiable]	C100~C199 100 points 0~32,767 counts
	For general use, rising (32 bits) [modifiable]	C200~C219 20 points -2,147,483,648~+2,147,483,647 counts
	For keeping use, rising (32 bits) [modifiable]	C220~C234 15 points -2,147,483,648~+2,147,483,647 counts
High speed counters	1-phase 1-count input, two-way (32 bits) [modifiable]	C235~C245 — Up to 8 points can be used in range from C235 to C255. [For keeping use] The retentive status can be changed by parameter settings. Counting from -2,147,483,648 to +2,147,483,647 ●Hardware counter : 1-phase: 100 kHz x 6 points, 10 kHz x 2 points 2-phase: 50 kHz (multiply by 1), 50 kHz (multiply by 4) ●Software counter : 1-phase: 40kHz 2-phase: 40 kHz (multiply by 1), 10 kHz (multiply by 4) ●High-speed counter
	1-phase 2-count input, two-way (32 bits) [modifiable]	C246~C250
	2-phase 2-count input, two-way (32 bits) [modifiable]	C251~C255
Data register (32 bits when used in pair)	For general use (16 bits) [modifiable]	D0~D199 200 points
	For keeping use (16 bits) [modifiable]	D200~D511 312 points
	For keeping use (16 bits) [fixed]<File register>	D512~D7999 7488 points(File register can be set in every 500 points starting from D1000)
	For special use (16 bits)	D8000~D8511 512 points
	For index use (16 bits)	V0~V7 , Z0~Z7 16 points
Extension register (16 bits)		R0 to R32767 32768 points Retained by battery during power failure
Extension file register (16 bits)		Er0 to ER32767 32768 points Usable only when memory cassette is mounted
Pointers	For branching of JUMP and CALL	P0 to P4095 4096 points For CJ instructions and CALL instructions
	Input interruption	I0□□~I5□□ 6 points — The total number of input interruption and counter interruption is 3 points or less
	Timer interruption	I6□□~I8□□ 3 points
	Counter interruption	I010 to I060 6 points For HSCS instructions
Nesting	For master control	N0 to N7 8 points For MC instructions
Constant	Decimal number (K)	16-bit : -32,768~+32,767 32-bit : -2,147,483,648~+2,147,483,647
	Hexadecimal number(H)	16-bit : 0~FFFF 32-bit : 0~FFFFFFFF
	Real number (E)	32-bit -1.0×2^{128}~-1.0×2^{-126} , 0 , 1.0×2^{-126}~1.0×2^{128}Decimal-point and exponential notations can be used.
	Character string (" ")	Character string : Designation by characters enclosed with " "Up to 32 one-byte characters can be used as an instruction constant.

In HC series, we have PLC with built-in positioning instructions as well as low cost pulse output modules.

Pulse output function and instruction list for HCA1P/HCA2P, HCA8P/HCA8C PLC

Model description & Appearance		HCA8P/HCA8C PLC	HCA1P/HCA2P
Characteristics		 Built-in positioning instruction in PLC main unit. 4 separated axis with configurable speed. Low costs, high performance in multi-axis control. Simplified process by (D)TBL	 Built-in positioning instruction in PLC main unit. 2 independent axes with configurable speed. Low costs, high performance in fixed-length feeding control
	Axis Numbers	4 axes	2 axes
	Control Axis Numbers	Independent 4 axes	Independent 2 axes
	Interpolation function	×	×
	Max Frequency	100KHz (differential 200KHz)	100KHz
	Programming Language	Sequence control program	Sequence control program
	Corresponding basic units	Transistor output unit	Transistor output unit
Pulse output instruction	PLSY	O	O
	PLSR	O	O
	Pulse mode	Pulse train(direction controlled by sequence program)	Pulse train(direction controlled by sequence program)
Positioning instruction	[D]ABS	O	O
	DSZR	O	×
	ZRN	O(No DOG search function)	O(No DOG search function)
	PLSV	O	O
	DRVI	O	O
	DRVA	O	O
	DVIT	O	×
	[D]TBL	O	×
	Pulse mode	Pulse direction	Pulse direction

*1 : DOG: ON-deceleration; DOG: OFF-Stop

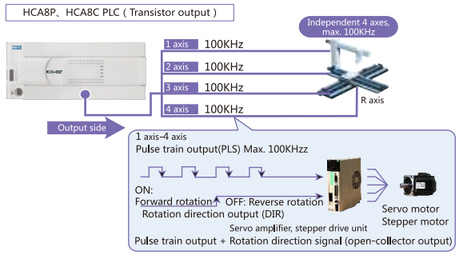
■ Positioning function for HCA8P/HCA8C PLC(Main Unit: Transistor output)

HCA8P/HCA8C Built-in Function Characteristics

1) No need to use special expansion module for positioning, economic system configuration
2) Reciprocating positioning can be realized by a single PLC
3) 8 standard dedicated positioning command.
4) Independent 4 axes, Max. 100kHz pulse train output (Y000、Y001、Y002、 Y003), max.200kHz differential output.

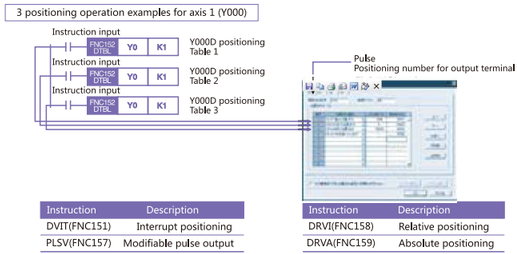
■ System configuration

HCA8P、HCA8C PLC (Transistor output)



■ Batch positioning instruction settings ([D]TBL)

3 positioning operation examples for axis 1 (Y000)



Instruction	Description
DVIT(FNC151)	Interrupt positioning
PLSV(FNC157)	Modifiable pulse output

Instruction	Description
DRVI(FNC158)	Relative positioning
DRVA(FNC159)	Absolute positioning

■ Specifications

Items	Specifications	
Pulse output specification	Independent 4 axes, Max. 100kHz pulse train output (Y000、Y001、Y002、 Y003). With rotation direction signal output	
Output specification (Y001~Y002)	Transistor output: Open collector (Please make sure to use the main unit of transistor output) Range for voltage/ current:DC5~24V /10~100mA	
Programming language	Positioning instructions (8) : ABS,ZRN,DSZR,PLSV,DRVI,DRVA,[D]TBL,DVIT	Pulse output instructions (2): PLSY,PLSR

High-speed signals from encoder and sensor can be counted in PLC with high-speed counters.
High-Speed control can be realized by simple programming with high-speed counters in PLC.

■ Function of high-speed counters

Model	Type	Counter No Maximum response frequency		Maximum Frequency of high-speed processing instruction		High-speed processing instructions					Counting transmission	2 phase double counting function
				Comparison /Resetting	HSZ	High-speed comparison	High-speed reset	Interval comparison	Counting interruption	Form comparison		
HCA1P HCA2P HCA2C	1-phase 1-count	C235-C236 Max 2 points: Max 60kHz*1		30kHz*2	—	○	○	×	×	×	×	—
		C237-C245 Max 4 points: Max 10kHz*1		10kHz*2	—							
	1-phase 2-count	C246 Max 1 point: Max 60kHz*1		30kHz*2	—							
		C247-C250 Max 2 points: Max 10kHz*1		10kHz*2	—							
	2-phase 2-count	C251 Max 1 point: Max 30kHz*1		15kHz*2	—							×
		C252-C255 Max 2 points: Max 5kHz*1		5kHz*2	—							
HCA8P HCA8C	1-phase 1-count	C235-C240 Max 6 points: Max 100kHz		40kHz*7								
		C244(OP), C245(OP) Max 2 points: Max. 10kHz		10kHz*7								—
		C241-C245 Max 3 points: Max 40kHz		40kHz*7	(40- times using instruction)/4*8							
	1-phase 2-count	C246,C248(OP) Max 2 points: Max 100kHz		40kHz*7								
		C247-C250 Max 2 points: Max 40kHz		40kHz*7		○	○	○	○	○	○	—
	2-phase 2-count	C251,C253 Max 2 points, Max 50kHz(×1, ×4)	x1	40kHz*7								
			x4	10kHz*74	(40- times using instruction)/4*8							○
		C252,C253(OP), C254,C255 Max 2 points: Max 40kHz	x1	40kHz*7	(40- times using instruction)/4*8							
			x4	40kHz*8	(40- times using instruction)/4*8							○

*1: The total frequency can reach 60kHz(max.)(2-phase counting is calculated by input frequency x2) when using high-speed counter and pulse density instruction.
*2: The total frequency can reach 30kHz(max.)(2-phase counting is calculated by input frequency x2) when using high-speed counter and pulse density instruction.
*3: The total frequency can reach 20kHz(max.)(2-phase counting is calculated by input frequency x2) when using high-speed counter, pulse output instruction and pulse density instruction.
*4: The total frequency can reach 1kHz(max.)(2-phase counting is calculated by input frequency x2) when using high-speed counter, pulse output instruction and pulse density instruction.
*5: The total frequency can reach 5.5kHz(max.)(2-phase counting is calculated by input frequency x2) when using high-speed counter, pulse output instruction and pulse density instruction.
*6: For the response frequency used with HSCT, please refer to the corresponding manual.
*7: The total frequency can reach 80kHz(max.)(2-phase 4 multiplication-counting is calculated by input frequency x4).
8: The total frequency can be obtained by [80kHz-1. 5 times using HSZ instruction]((2-phase 4 multiplication-counting is calculated by input frequency x4)

●Function of high-speed counters

Normal PLC counter upper limit is about 10Hz. But for HCFA HC-A series PLC, high-speed pulse input can be counted.

●Number and allocation of high speed counters

The built-in high-speed counter use the general input X000-X007. Input mode and terminal No. based on the 1-phase, 2-phase or the function of start, reset of counters.

■ HCA8P、HCA8C、HCA1P、HCA2P

Input No.	1-phase 1-count input												1-phase 2-count output						2-phase 2-count input					
	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C244 (OP)	C245	C245 (OP)	C246	C247	C248	C248 (OP)	C249	C250	C251	C252	C253	C253 (OP)	C254	C255
	H/W	H/W	H/W	H/W	H/W	H/W	S/W	S/W	S/W	S/W	H/W	S/W	H/W	H/W	S/W	S/W	H/W	S/W	S/W	H/W	S/W	H/W	S/W	S/W	S/W
X000	U/D						U/D			U/D				U	U			U		A	A			A	
X001		U/D					R			R				D	D			D		B	B			B	
X002			U/D					U/D				U/D			R			R			R			R	
X003				U/D				R				R				U	U		U			A	A		A
X004					U/D				U/D							D	D		D			B	B		B
X005						U/D			R							R			R			R			R
X006										S	U/D							S						S	
X007												S	U/D						S						S

U: Increasing input D: Decreasing input A:A-phase input B:B-phase input R:Reset input S: Start input
*1: H/W (hardware counter) can be changed to S/W (software counter) by combining with high speed processing instruction.
* OP function is provided by HCA8/ HCA8C.

[Example] When using C238(1-phase 1-count), it can be switched to 「X003 high-speed input terminal」automatically.
When using C252(2-phase 2-count, with reset), it can be switched to 【X000 A-phase input】 【X001 B-phase input】 【X002 reset input】 automatically.
The remaining inputs are used as the general inputs.
Furthermore, the input filter of highs-peed input terminal is adjusted to 0 (20μs~50μs) automatically.

HCA1P

General Stand-alone Type

Controllable I/O:10~34 points
Main Unit I/O:10/14/20/30 points

•More cost-effective

New appearance, CPU and power board design
Low cost and cost performance improved by 10%

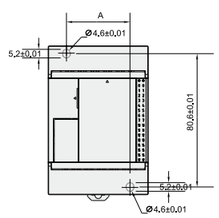
•More reliable

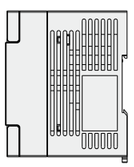
New vibration resistance connector
Greater transistor output 200V/ 1. 5A
More reliable built-in power supply and thermal design

•Functionality improved

NPN & PNP compatible
Built-in 485 interface, Ethernet communication board
A2P supports A8C series right-side extension module and downloading at power-failure

■ HCA1P Dimensions





Models	W (mm)	H (mm)	D (mm)
HCA1P-8X6Y(14 points)	60.5	90	75
HCA1P-12X8Y(20 points)	75.5	90	75
HCA1P-16X14Y(30 points)	100	90	75

HCA1P
General Stand-alone Type
Controllable I/O:10~34 points
Main Unit I/O:10/14/20/30 points

■ HCA1P Main Units

HCA1P-6X4YR-A AC D R	HCA1P-8X6YR-A AC D R	HCA1P-12X8YR-A AC D R	HCA1P-16X14YR-A AC D R
HCA1P-6X4YT-A AC D T	HCA1P-8X6YT-A AC D T	HCA1P-12X8YT-A AC D T	HCA1P-16X14YT-A AC D T
HCA1P-6X4YR-D DC D R	HCA1P-8X6YR-D DC D R	HCA1P-12X8YR-D DC D R	HCA1P-16X14YR-D DC D R
HCA1P-6X4YT-D DC D T	HCA1P-8X6YT-D DC D T	HCA1P-12X8YT-D DC D T	HCA1P-16X14YT-D DC D T
Input : 6 points	Input : 8 points	Input : 12 points	Input : 16 points
Output : 4 points	Output : 6 points	Output : 8 points	Output : 14 points

AC AC Power Supply DC DC Power Supply D DC input R Relay output T Transistor output

■ Specifications

	Item	Specifications
Power Supply	Power supply	AC power:100~240V AC DC power: 24V DC
	Power consumption*1	AC power: 19W（6X4Y，8X6Y），20W（12X8Y），21W（16X14Y） DC power : 6W（6X4Y），6.5W（8X6Y），7W（12X8Y），8W（16X14Y）
	Maximum input current	AC power:max.15A/5ms or less(at AC100V), max.25A/5ms or less(at AC200V) DC power:max.10A/100μs (at DC24V)
	Power supply(24VDC)	AC power: 24VDC/400mA
	Input Spec.	24VDC 7mA/5mA no voltage contact, or NPN open collector transistor input
	Output Spec.	Relay output:2A/1 point, 8A/4points COM ≤250V AC, ≤30V DC Transistor output:0.5A/1 point,0.8A/4 points COM 5V~30V DC
	I/O & Special function expansion	Increase digital or analog I/O points with expansion board
Performance	Program memory	2,000 steps(EEPROM),no battery, Comment input, Write during RUN Transmit storage box available (max. 2000 steps)
	Timer function	Integrated real-time clock (With time setting/ time comparison instruction)
	Instruction	Standard:27 step ladder:2 Applied instruction:85
	Cycle time per log. Instruction	Standard:0.5~0.7μs special:3.7~hundreds μs
	High speed processing	With I/O refresh instruction, input filter adjustment instruction and input interruption, pulse catch function
	Max integrated I/O point	36 points(Additional increase 4 input and 2 output points with expansion board)
	Auxiliary relay & timers	Auxiliary:512 points timer:64 points
	Counter	General 16-bit up counter:32 points High speed 32-bit up/ down counter: (1 phase)60KHz/2 points,10KHz/4 points(2 phase),30KHz/1 point,5KHz/1point
	Data registers	General:256 points,Index:16 points,File:1,500 points(max.)
Others	Internal communication port	Built-in communication port RS422/485
	Data communication	N:N network, parallel link, PC link, programming communication

*1 : Including the input current (5 or 7mA per point)

HCA2P

General Expansion Type

Controllable I/O: 24~128 points
Main Unit I/O:24/40/60 points

●More cost-effective

New appearance, CPU and power board design
Low cost and cost performance improved by 10%

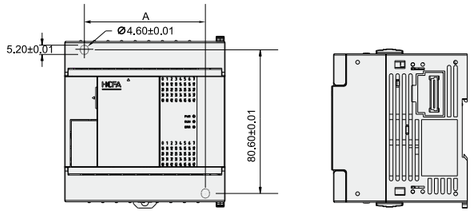
●More reliable

New vibration resistance connector
Greater transistor output 200V/ 1. 5A
More reliable built-in power supply and thermal design

●Functionality improved

Input compatible NPN &PNP
Built-in 485 interface, Ethernet communication board
A2P supports A8C series right-side extension module and downloading at power-failure

■ HCA2P Dimensions



Models	W (mm)	H (mm)	D (mm)
HCA2P-14X10Y(24 points)	90	90	82
HCA2P-24X16Y(40 points)	130	90	82
HCA2P 36X24Y(60 points)	175	90	82

HCA2P
General Expansion Type
Controllable I/O: 24~128 points
Main Unit I/O:24/40/60 points

■ HCA2P Main Units

HCA2P-14X10YR-A AC D R	HCA2P-24X16YR-A AC D R	HCA2P-36X24YR-A AC D R
HCA2P-14X10YR-D DC D R	HCA2P-24X16YR-D DC D R	HCA2P-36X24YR-D DC D R
HCA2P-14X10YT-A AC D T	HCA2P-24X16YT-A AC D T	HCA2P-36X24YT-A AC D T
HCA2P-14X10YT-D DC D T	HCA2P-24X16YT-D DC D T	HCA2P-36X24YT-D DC D T
Input : 14 points	Input : 24 points	Input : 36 points
Output : 10 points	Output : 16 points	Output : 24 points

AC AC Power Supply　DC DC Power Supply　D DC input　R Relay output　T Transistor output

■ Specifications

	Item	Specifications
Power Supply	Power supply	AC power:100~240V AC　DC power: 24V DC
	Power consumption*1	AC power: 30W（14X10Y），32W（24X16Y），35W（36X24Y） DC power: 15W（14X10Y），18W（24X16Y），20W（36X24Y）
	Maximum input current	AC power:30A (max.)/5ms(at 100V AC), 50A/5ms(at 200V AC) DC power:25A(max.)/1ms(at 24V DC), 22A/0.3ms(at 12V DC)
	Power supply(24VDC)	AC power: 24V DC 400mA
	Input Spec.	24VDC 7mA/5mA no voltage contact, or NPN open collector transistor input
	Output Spec.	Relay output:2A/1 point,8A/4points COM ≤250V AC, ≤30V DC Transistor output:0.5A/1 point,0.8A/4 points COM 5V~30V DC
	I/O & Special function expansion	Increase digital or analog I/O points with expansion board and HCA8C series I/O extension blocks
Performance	Program memory	8,000 steps of built-in program memory (EEPROM),no battery, comment input, write during RUN Transmit storage box available(max. 8000 steps)
	Timer function	Integrated real-time clock(with time setting, time comparison instruction and leap year correction)
	Instruction	Standard:27 step ladder:2 Applied instruction:89
	Cycle time per log. Instruction	Standard:0.5~0.7μs Applied instruction:3.7~hundreds μs
	High speed processing	With I/O refresh, input filter adjustment instruction and input interruption, pulse catch function
	Max integrated I/O point	134 points
	Auxiliary relay & timers	Auxiliary relay:1,536 points　timer:256 points
	Counter	General:200 points(16 bit up counter) 35 points(32 bit up/ down counter) High speed 32 bit up/down counters: (1 phase)60KHz/2 points,10KHz/4 points(2 phase),30KHz/1 point,5KHz/1point
	Data registers	General:8,000 points,Index:16 points,File:7,000 points(max.)
Others	Internal communication port	Built-in communication port RS422/485
	Special expansion	Analog, positioning modules
	Data communication	N:N network, parallel link, PC link, programming communication

*1 : Including the input current (5 or 7mA per point)

■ Extension Devices

●Conversion blocks	●Right-side special function blocks			●Right-side I/O block		
HCA8C-CNV5V-TX2N	HCA8C-4AD	HCA8C-4PT	HCA8C-1PG	HCA8C-16EX	HCA8C-8EX8EYT-C	HCA8C-4EX4EYT
	HCA8C-4DA	HCA8C-4TC	HCA8C-2PG	HCA8C-16EYR	HCA8C-8EX	HCA8C-16EX-C
	HCA8C-8AD	HCA8C-2HC	HCA8C-4PG	HCA8C-16EYT	HCA8C-8EYR	HCA8C-16EYT-C
	HCA8C-4AD2DA	HCA8C-2LC	HCA8C-4GM	HCA8C-8EX8EYR	HCA8C-8EYT	
	HCA8C-4AD4DA	HCA8C-4WK		HCA8C-8EX8EYT	HCA8C-4EX4EYR	

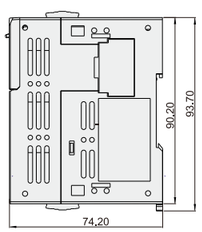
HCA8C

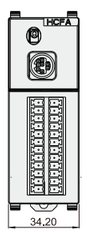
High-speed and compact blocks

Controllable I/O:16~256 points
Main Unit I/O:16/32/64/96 points

- New High speed and ultra-thin PLC
- Ultra high-speed, High Performance, More Functions
- Built-in 4 Pulse Train Outputs (100KHz / 200KHz)
- Built-in 6 100kHz & 2 10kHz high speed counter
- Built-in 2 Communication Ports (RS422 +RS485)

HCA8C Dimensions





Models	W (mm)	H (mm)	D (mm)
HCA8C	34.20	93.70	74.20

HCA8C

High-speed and compact block
Controllable I/O:16~256 points
Main Unit I/O:16/32/64/96 points

HCA8C Main Units

HCA8C-8X8YR
HCA8C-8X8YT-P0
HCA8C-8X8YT-P3
HCA8C-8X8YT-P4
HCA8C-8X8YT-D2
Input: 8 points
Output: 8 points

HCA8C-16X16YT-P0
HCA8C-16X16YT-P3
HCA8C-16X16YT-P4
Input: 16 points
Output: 16 points

HCA8C-32X32YR
HCA8C-32X32YT-P4
Input: 32 points
Output: 32 points

Specifications

	Item	Specifications
Power Supply	Power supply (24V DC)	DC POWER: 24V DC, 350 mA
	Input Spec.	Support NPN (sink input type) and PNP (source input type)
	Output Spec.	Relay Output:2A/1 point, 8A/4 points COM, 8A/8 points COM, 250 VAC, 30 VDC or less Transistor Output: 0.5 A/1 point,0. 8A/4points COM, 1,6 A/8points COM, 5~30V DC
	I/O extension	HCA8C Series input/output extension blocks can be connected. Up to 7 HCA8C Series special function units/blocks can be connected
Performance	Built-in switch	Built-in RUN/STOP switch, RUN/STOP operation can also be realized by input terminal or peripheral device
	Data registers	General:8,000 points,Expansion:32,768 points,File:32,768 points(Memory cassette should be installed), Index:16 points
	Program memory	Built-in 64KM SRAM memory
	Clock function	Built-in real-time clock to have the time control
	Instruction	Support pulse outputs, high-speed processing, positioning, zero return Maximum number of input/output points is 256 points,.
	Processing speed	Standard:0.050μs/basic instruction + 0.170μs /applied instruction
	High speed processing	[I phase] 100kHz [2 phase] 50kHz 4-axis pulse output
	Max integrated I/O point	384 points (including input/output points of main units, input/output extension blocks, remote I/O)
	Auxiliary relay& timers	Auxiliary:7,680 points timer:512 points
	Counter	General:200 points (16 bit) 35 points (32 bit) High speed counters: [1 phase]100KHz/6 points,10KHz/2 points [2 phase]50KHz/2 point (4 times available) [I phase] 200kHz [2 phase] 100kHz with high speed adapter
	Remote debugging of program	Programming software enables you to remotely transfer the program and monitor the PLC operation through a modem connected to the RS-232C expansion board
	Write during RUN	The programming software for personal computer enables you to modify the program while the PLC is running.
Others	Communication ports	RS422/RS232/RS485
	Special expansion	Expansion modules with communication function and special function can be connected.
	Provided data communication	Programming communication, parallel link, MODBUS master/ slave station, PC link, inverter communication

Extension Devices

Conversion blocks		Left-side extension blocks		Right-side extension blocks			
●Conversion blocks	●Communication blocks	●Temperature input	●Analog blocks	●Special extension blocks	●Input extension blocks	●Output extension blocks	●I/O extension blocks
HCA8C-CNV-TX2N needed for HCA8 /TX2N series blocks	HCA8C-C24-ADP	HCA8C-4PT-4DP HCA8C-4PNK-ADP	HCA8C-4AD-ADP HCA8C-4DA-ADP HCA8C-3A-ADP	HCA8C-4AD HCA8C-4DA HCA8C-4PT HCA8C-4TC HCA8C-4WK HCA8C-2HC	HCA8C-8EX HCA8C-16EX HCA8C-16EX-C	HCA8C-8EYR HCA8C-8EYT HCA8C-8EYT-C HCA8C-16EYR HCA8C-16EYT HCA8C-16EYT-C	HCA8C-8EX8EYR HCA8C-8EX8EYT HCA8C-4EX4EYR HCA8C-4EX4EYT HCA8C-8EX8EYT-C

HCA8P

• More reliable design

More reliable built-in power supply, dielectric withstand voltage improved, more reliable thermal design, new vibration resistance connector, greater transistor output 200V/ 1.5A, 485 communication insulation and EFT 4KV, PCBA coating processing

High-speed High-performance Extension

Controllable I/O:48~256 points
Main Unit I/O: 48/64/80 points

• More user friendly

NPN&PNP input, newly-added reset switch, support downloading in power off state, high contrast I/O display LCD

• Modular design

Common CPU and power board design, support A8C series right-side extension blocks, smaller size, newly-added A8P left-side extension block, support Ethernet and analog block

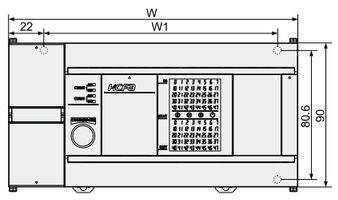
• Safety design

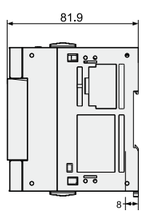
Independent power supply (red terminal input) to prevent input point burn out caused by electric-shock and incorrect wiring, three segment security encryption function

• High performance

Newly-upgraded dual-core structure, 50ns basic instruction, Bus processing speed improved by 10 times>A8, built-in 64K memory, 8-ch 200K high-speed input + 4-ch 200K high-speed output, built-in 3 communication ports, support MODBUS and new-added ETHERCAT block

■ HCA8P Dimensions





Models	W(mm)	W1(mm) Mounting hole spacing	Weight (K g)
HCA8P-24X24YT□	180.7	146.2	0.85
HCA8P-32X32YT□	218.8	184.2	1.00
HCA8P-40X40YT□	284	249.4	1.20

HCA8P

High-speed High-performance Extension
Controllable I/O:48~256 points
Main Unit I/O: 48/64/80 points

■ HCA8P Main Units

HCA8P-24X24YR-A AC D R
HCA8P-24X24YT-A AC D T
HCA8P-24X24YR-D DC D T
HCA8P-24X24YT-D DC D R
Input : 24 points
Output : 24 points

HCA8P-32X32YR-A AC D R
HCA8P-32X32YT-A AC D T
HCA8P-32X32YR-D DC D T
HCA8P-32X32YT-D DC D R
Input : 32 points
Output : 32 points

HCA8P-40X40YR-A AC D R
HCA8P-40X40YT-A AC D T
HCA8P-40X40YR-D DC D T
HCA8P-40X40YT-D DC D R
Input : 40 points
Output : 40 points

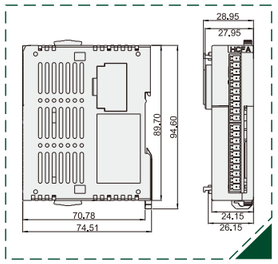
AC AC Power Supply DC DC Power Supply D DC input R Relay output T Transistor output

■ Specifications

	Item	Specifications
Power Supply	Power supply	AC power:100~240V AC DC power: 24V DC
	Power consumption*1	AC power: 40W（24X24Y），45W（32X32Y），50W（40X40Y） DC power: 35W（24X24Y），40W（32X32Y），45W（40X40Y）
	Maximum input current	AC power:max.30A/5ms(at 100V AC),45A/5ms(at 200V AC)
	Power supply(24VDC)	DC power:400mA(16M,32M) 600mA(48M,64M,80M,128M)
	Input Spec.	24V DC 5mA~7mA (No voltage contact, sink input: NPN open collector transistor input, source input: PNP open collector input)
	Output Spec.	Relay Output:2A/1 point 8A/4points COM 8A/8points COM ≤AC250V, ≤DC30V Transistor Output:0.5A/1 point 0.8A/4 points 1.6A/8 points, COM DC5V~30V
	I/O & Special function expansion	HCA8C series extension blocks/ units can be connected.
Performance	Program memory	64,000 steps RAM(battery provide) Option: Flash memory cassette of 64,000 steps (With(out) program transmission function), Flash memory cassette of 16,000 steps
	Time function	Integrated real-time clock accuracy within ±45 seconds/month at 25°C(with correction for leap year)
	Instruction	Standard:27 step ladder:2 Applied instruction:209
	Processing speed	Standard:0.05s/ instruction Applied instruction:0.642~ several hundreds /instruction
	High speed processing	With I/O refresh instruction, input filter adjustment instruction, input interruption, timer interruption, high-speed counting interruption and pulse catch function
	Max integrated I/O point	384 points(including the I/O points of main unit, extension blocks and remote devices)
	Auxiliary relay& timers	Auxiliary:7,680 points timer:512 points
	Counter	16-bit counter:200 points 32-bit counter: 35 points High speed 32-bit counters: [1 phase]100KHz/6 points,10KHz/2 points [2 phase]50KHz/2 point (4 times available) [I phase] 200kHz [2 phase] 100kHz with high speed adapter
	Data registers	General:8,000 points,Expansion:32,768 points, File register(Memory cassette should be installed):32,768 points,Index:16 points
Others	Communication ports	RS422+RS232+RS485
	Special adapter	For analog: Max. 4 For communication : Max. 2 (with expansion board)
	Special expansion	HCA8C right-side special extension block and units can be connected.
	Provided data communication	RS-232C,RS-485,RS-422,N:N network, parallel link, PC link

■ Extension Devices

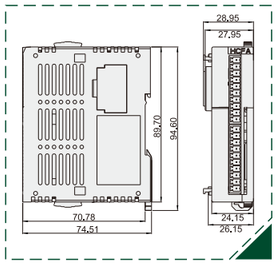
●Conversion blocks	●Right-side special function blocks				●Right-side I/O block		
HCA8C-CNV5V-TX2N	HCA8C-4AD	HCA8C-4PT	HCA8C-1PG	HCA8C-MNET-M	HCA8C-16EX	HCA8C-8EX8EYT-C	HCA8C-4EX4EYT
	HCA8C-4DA	HCA8C-4TC	HCA8C-2PG	HCA8C-MNET-8X8YT	HCA8C-16EYR	HCA8C-8EX	HCA8C-16EX-C
	HCA8C-8AD	HCA8C-2HC	HCA8C-4PG	HCA8C-MNET-16X16YT	HCA8C-16EYT	HCA8C-8EYR	HCA8C-16EYT-C
	HCA8C-4AD2DA	HCA8C-2LC	HCA8C-4GM	MNET-SV	HCA8C-8EX8EYR	HCA8C-8EYT	
	HCA8C-4AD4DA	HCA8C-4WK			HCA8C-8EX8EYT	HCA8C-4EX4EYR	



HCA8C-4AD Analog input block

1) High accuracy analog input block with 16 bits binary (voltage),15 bits binary (current) Resolution
2) 4 channels voltage input (-10V~+10V DC) or current input (-20 mA ~+20mA, 4mA~20mA)
3) Either "voltage input" or "current input" can be specified for each channel.

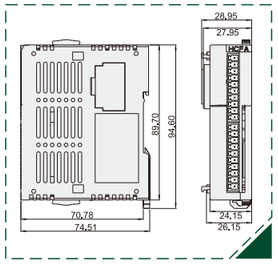
Item	Voltage input	Current input
Analog input range	-10 V to +10 V DC (Input resistance:250kΩ)	-20 mA to +20 mA DC, 4mA to 20mA (Input resistance:250 Ω)
Absolute maximum input	±15V	±30mA
Digital output	16 bits with sign, binary	15 bits with sign, binary
Resolution	0.32mV(20V * 1/64000) 2.5 mV (20V*1/8000)	1.25μA (40mA* 1/32000) 5.00μA (40mA* 1/8000)
Overall accuracy	• Ambient temperature: 25℃± 5℃ ±0.3% (±60mV) for 20V full scale • Ambient temperature: 0℃ to 55℃ ±0.5% (±100mV) for 20V full scale	• Ambient temperature: 25℃± 5℃ ±0.5% (±200μA) for 40mA full scale Same accuracy (±200μA) for 4mA to 20mA input • Ambient temperature: 0℃ to 55℃ ±1% (±400μA) for 40 mA full scale Same accuracy (±400μA) for 4mA to 20mA input
A/D conversion time	500μs * the number of used input channel	
Insulation method	• The photocoupler is used to insulate the analog input area from the PLC. • The DC/DC converter is used to insulate the power supply line from the analog input area. • Channels are not insulated from each other.	
Power supply	24V DC +20%-15%, 100mA (It is necessary to connect a 24V DC power supply to the terminal block.)	
Occupied points	8 points (can be either inputs or outputs)	
Applicable PLC	HCA8P/HCA8C	



HCA8C-4DA Analog output block

1) High accuracy analog output block with 16 bits binary (-32000~+32000)
2) 4 channels voltage input (DC-10V~+10V) or current input (0 mA ~+20mA, 4mA~20mA)
3) Either "voltage output" or "current output" can be specified for each channel.

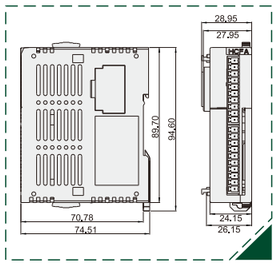
Item	Voltage output	Current output
Analog output range	-10 V to +10 V DC (External load: 1k ~ 1MΩ)	0 mA to +20 mA DC, 4mA to 20mA (External load:500 Ω or less)
Offset value	-10V ~ +9V	0mA ~ 17mA
Gain value	-9V ~ +10V	3mA ~ 30mA
Digital input	12 bits, binary (0 to 4000)	12 bits, binary (0 to 4000)
Resolution	0.32mV(20V/64000)	0.63μA(20mA/32000)
Overall accuracy	• Ambient temperature: 25℃± 5℃ ±0.3% (±60mV) for 20V full scale • Ambient temperature: 0℃ to 55℃ ±0.5% (±100mV) for 20V full scale	• Ambient temperature: 25℃± 5℃ ±0.3% (±60μA) for 20mA full scale • Ambient temperature: 0℃ to 55℃ ±0.5% (±100μA) for 20mA full scale
D/A conversion time	1ms (Not related to the number of selected channels)	
Insulation method	• The photocoupler is used to insulate the analog input area from the PLC. • The DC/DC converter is used to insulate the power supply line from the analog input area. • Channels are not insulated from each other.	
Power supply	24V DC +20%-15%, 160mA (It is necessary to connect a 24V DC power supply to the terminal block.)	
Occupied points	8 points (can be either inputs or outputs)	
Applicable PLC	HCA8P/HCA8C	



HCA8C-8AD Analog input block

1) High accuracy analog input block with 16 bits binary (-32000 to 32000) Resolution
2) 4 channels voltage output (-10V~+10V DC) or current output (0 mA ~+20mA, 4mA~20mA)
3) Either "voltage input" or "current input" can be specified for each channel.

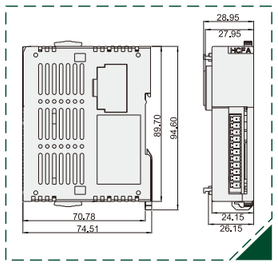
Item	Voltage input	Current input
Analog input range	-10 V to +10 V DC (Input resistance: 1MΩ)	-20 mA to +20 mA DC, 4mA to 20mA (Input resistance:250 Ω)
Absolute maximum input	±15V	±30mA
Digital input	16 bits with sign , binary	15 bits with sign, binary
Resolution	0.32mV(20V×1/64000) 2.5mV(20V×1/8000)	1.25μA(40mA×1/32000) 5.00μA(40mA×1/8000)
Overall accuracy	• Ambient temperature: 25℃± 5℃ ±0.3% (±60mV) for 20V full scale • Ambient temperature: 0℃ to 55℃ ±0.5% (±100mV) for 20V full scale	• Ambient temperature: 25℃± 5℃ ±0.5% (±200μA) for 40mA full scale Same accuracy (±200μA) for 4mA to 20mA input • Ambient temperature: 0℃ to 55℃ ±1% (±400μA) for 40 mA full scale Same accuracy (±400μA) for 4mA to 20mA input
A/D conversion time	500μs * the number of used input channel	
Insulation method	• The photocoupler is used to insulate the analog input area from the PLC. • The DC/DC converter is used to insulate the power supply line from the analog input area. • Channels are not insulated from each other.	



HCA8C-4AD4DA/ HCA8C-4AD2DA Analog input/ output block

1) High resolution for input is 16 bits binary (-32000 to 32000), resolution for output is 12.5 binary (-3000 to 3000)
2) 4 channels voltage input/ output (-10V~+10V DC) or current input/ output (0 mA ~+20mA, 4mA~20mA)
3) Either "voltage input/ output" or "current input/ output" can be specified for each channel.

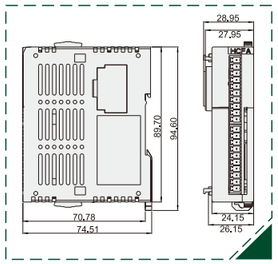
Item	Voltage input	Current input
Analog input range	-10 V to +10 V DC (Input resistance: 1MΩ) Absolute max. input: ±15V	-20 mA to +20 mA DC, 4mA to 20mA (Input resistance:250 Ω) Absolute max. input:: ±30mA
Digital output	16 bits with sign, binary 12 bits with sign, binary	15 bits with sign, binary
Resolution	• 312.5 μV (20V×1/64000) at -10 to 10V input • 50 μV (20mV×1/4000) at -100 to 100mV input	•10μA(40mA×1/4000) at -20 to 20mA input •1.25μA (40mA× 1/32000) at -20 to 20mA input • 10μA (40mA×1/4000) at 4 to 20mA input •1.25μA (40mA× 1/32000) at 4 to 20mA input
Overall accuracy	• Ambient temperature: 25℃± 5℃ ±0.3% (±60mV) for 20V full scale • Ambient temperature: 0℃ to 55℃ ±0.5% (±100mV) for 20V full scale	• Ambient temperature: 25℃± 5℃ ±0.3% (±120μA) for 40mA full scale Same accuracy (±120μA) for 4mA to 20mA input • Ambient temperature: 0℃ to 55℃ ±5% (±200μA) for 40 mA full scale Same accuracy (±200μA) for 4mA to 20mA input
Item	**Voltage output**	**Current output**
Analog output range	-10 V to +10 V DC (External load resistance: 2kΩ to 1MΩ)	0 mA to +20 mA DC, 4mA to 20mA (External load resistance: 500 kΩ or less)
Digital output	12.5 bits with sign, binary	11.5 bits, binary
Resolution	• 3.3mV (20V×1/6000) at -10 to 10V output	• 6.6μA (40mA×1/6000) at 0 to 20mA/ 4 to 20mA output)
Overall accuracy	• Ambient temperature: 25℃± 5℃ ±0.5% (±100mV) for 20V full scale • Ambient temperature: 0℃ to 55℃ ±1.0% (±200mV) for 20V full scale	• Ambient temperature: 25℃± 5℃ ±0.5% (±200μA) for 40mA full scale Same accuracy (±200μA) for 4mA to 20mA input • Ambient temperature: 0℃ to 55℃ ±1.0% (±200μA) for 40 mA full scale Same accuracy (±400μA) for 4mA to 20mA input



HCA8C-4TC Thermocouple input block

1) Getting ℃ or ℉ data by reading appropriate buffer memories
Type K: -100 to 1200°C Type J: -100 to 600°C
2) 4 input channels
3) Thermocouple type K or J sensor input block
4) Accurate Resolution Ratio: 0.1℃ or 0.72℉(type K) 0.1℃ or 0.54℉(type J)

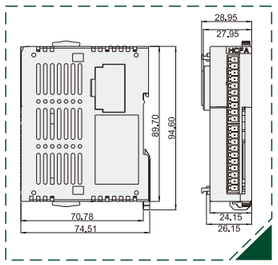
Item	Centigrade (°C)		Fahrenheit (°F)	
	Getting ℃ or ℉ data by reading appropriate buffer memories			
Input signal	Thermocouple type K or J (either can be used for each channel), 4 channels, JIS C 1602-1981			
Rated temperature range	Type K	-100℃ to 1200℃	Type K	-100℃ to 1200℃
	Type J	-100℃ to 600℃	Type J	-100℃ to 600℃
Digital output	Type K	-1000 to 12000	Type K	-1480 to 21920
	Type J	-1000 to 6000	Type J	-1480 to 11120
Resolution	Type K	0.1℃	Type K	0.72℉
	Type J	0.1℃	Type J	0.54℉
Total accuracy calibration point	± (0.5% full scale +1°C) Freezing point of pure water: 0°C /32℉			
Conversion speed	(4ms ± 2%) × 4 channels (unused channels are not converted)			
Power supply	24V DC +20% -15% 50mA (It is necessary to connect a 24 V DC power supply to the terminal block.)			
Insulation method	• The photocoupler is used to insulate the analog input area from the PLC • DC/DC converter is used to insulate the power supply from analog input area. • Channels are not insulated from each other.			
Occupied points	8 points (can be either inputs or outputs)			
Applicable PLC	HCA8C			



HCA8C-2HC High speed counting block

1) 2-channel encoder inputs
2) Frequency measurement function, Max. 60K
3) Counting range: When 32-bit is specified : -2,147,483,648 to +2,147,483,647
When 16-bit is specified : 0 to 65,535

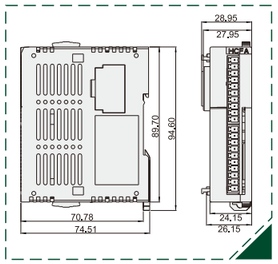
Item			Item	
Input signal	Signal level (select by dial switch)	Phase A Phase B PRESET	[A24+],[B24+],[P24+]	24V DC±10%, 8mA or less
			[A12+],[B12+],[P12+]	12V DC±10%, 8mA or less
			[A5+],[B5+],[P5+]	3.0V to 5.5V DC, 12.5mA or less
		DISABLE	[Xd24]	10.8V to 26.4V DC 15mA or less
			[Xd5]	5V DC±10%, 8mA or less
	Max. frequency	1-phase input	1 input	200kHz
			2 input	100kHz
		2-phase input	1 edge count	200kHz
			2 edge count	
			4 edge count	
	Frequency measurement	Max. frequency		60kHz
Counting specification	Range	When 32-bit is specified : -2,147,483,648 to +2,147,483,647 When 16-bit is specified : 0 to 65,535.		
	Comparison type	When the present value of the counter matches with the compare value, the output is set ON in 30μs and is switched OFF by a reset command in 100μs.		
Output signal	Output type	Transistor output		
	Output capacity	5V ~ 24V DC, 0.5A		
Occupied I/O points		8 points ((can be either inputs or outputs)		



HCA8C-4PT Platinum resistor input block

1) Input range: -100 to 600 °C, Resolution: 0.1 °C, Overall accuracy: 1%
2) 4 input channels

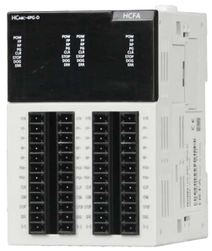
Item	A8C-4PT	
	Getting ℃ or ℉ data by reading appropriate buffer memories	
Input signal	4 input channels, 3-wire PT100	
Sensor current	0.5mA Sensor: 100Ω PT100	
Rated temperature range	Centigrade (°C)	Fahrenheit (°F)
	-100℃ to 600℃	-148℉ to 1112℉
Digital output	16 bit binary stored	
	-1000 to 6000	-1480 to 11120
Resolution	0.1℃	0.18℉
Overall accuracy	±1% full scale	
Conversion speed	4 channel 54ms	

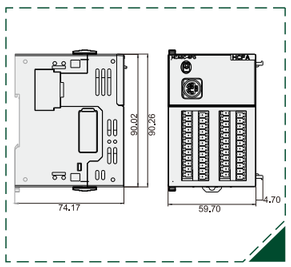


HCA8C-2LC Loading and tension input block

1) 2-channel 4-wire or 6-wire load cell
2) 24 bits internal resolution
3) Communication ports RS485, with MODBUS function

Item	Specification
Rated voltage/ power consumption	DC24V (+10% -10%) / 2W
Voltage range limit	≤ 30VDC
Max. current consumption	104 mA
Input signal range	±40mVDC
Sensibility	+5VDC ±10%
Internal resolution	24 bit
Communication ports	RS-485
Applicable sensor type	4-wire or 6-wire load
Temperature deviation	±0.1uV/℃
Linearity error	≤0.02%
Response time	2,10,25,50,160ms× the number of channels × averaging number
Load Cell eigenvalues	0 ~ 8 mV/V
Max. output current	5VDC * 300 mA
Allowable load capacity	≥40 Ω
Common mode rejection (50/ 60Hz)	Typical value 100dB
Insulation method	• The photocoupler is used to insulate the analog input area from the PLC • DC/DC converter is used to insulate the power supply from analog input area. • Channels are not insulated from each other.
Connection with HCA8C main unit	Connected to the right side of main unit. The block No.(0 ~ 7) is numbered automatically from the one closest to the main unit.



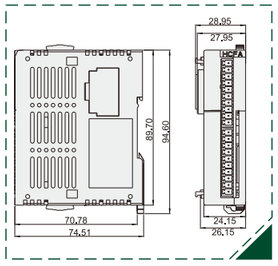


HCA8C-4PG / HCA8C-4PG-D Pulse positioning block

1) Support 4 channels pulse output
2) Built-in T-/S-shaped acceleration/ deceleration function
3) Multiple position control modes

Item		Specification	
		HCA8C-4PG	HCA8C-4PG-D
Drive power supply	Input signal	24 V DC ± 10% Current consumption 40 mA or less	
	Output signal	For pulse output: 5 to 24 V DC Current consumption 35 mA or less For CLR signal: 5 to 24 V DC Current consumption 20 mA or less	For pulse output: 50V DC Current consumption 20 mA or less
Number of control axes		Four axes	
Positioning operation	Method	Increment, Absolute	
	Unit	PLS,um,10-4 inch,mdeg	
	Unit magnification	1x,10x,100x,300x	
	Range	-2,147,483,648 to 2,147,483,647 PLS	
	Operation speed	Hz, cm/min, inch/min, 10deg/min	
	Output frequency	200KHz	2.4MHz
	Acceleration/ deceleration process	Trapezoidal acceleration/deceleration: 1 to 32,767 ms Approximate S-shaped acceleration/deceleration: 1 to 5,000 ms	
Occupied I/O points		8 points (Can be either input or output points)	

(Plan to launch)

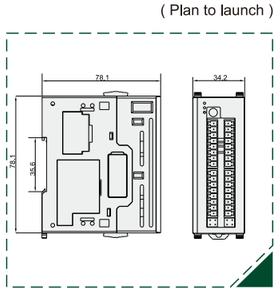


HCA8C-1PG & HCA8C-2PG Pulse positioning block

1) Support 1/2 channels pulse output
2) Built-in T-/S-shaped acceleration/ deceleration function
3) Multiple position control modes

Item		Specification
Drive power supply	Input signal	24 V DC ± 10% Current consumption 40 mA or less
	Output signal	For pulse output: 5 to 24 V DC Current consumption 35 mA or less For CLR signal: 5 to 24 V DC Current consumption 20 mA or less
Number of control axes	One/ two axes	
Positioning operation	Method	Increment, Absolute
	Unit	PLS,um,10-4 inch,mdeg
	Unit magnification	1x,10x,100x,300x
	Range	-2,147,483,648 to 2,147,483,647 PLS
	Operation speed	Hz, cm/min, inch/min, 10deg/min
	Output frequency	1Hz ~ 200kHz
	Acceleration/ deceleration process	Trapezoidal acceleration/deceleration: 1 to 32,767 ms Approximate S-shaped acceleration/deceleration: 1 to 5,000 ms
Occupied I/O points	8 points (Can be either input or output points)	

(Plan to launch)

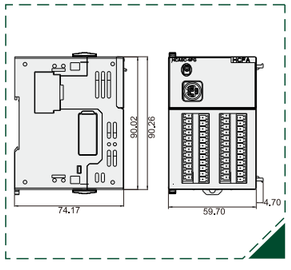


HCA8C-4WK Temperature control block

1) 4-channel temperature controller integrated into one block
2) Built-in 4 CT input, with function of heater disconnection alarm
3) Built-in MODBUS protocol, 16 blocks can be connected in parallel.
4) Balanced automatic heating function
5) Interference suppression
6) Support temperature input, 4 channels are insulated from each other.
7) Sampling period: 0.25s. High speed sampling processing.

Item	Specification
Power supply voltage	21. 6~26. 4V DC (Permissible voltage change range)
Power consumption	Max. 140mA(24VDC)
Sensor input	1. Temperature, current, low-voltage input: a) Thermocouple input K/J/E/T/R/S/B/N type b) Platinum resistance input PT100/JPT100 (3-wire) c) DC voltage input 0～10mV/100mV/1V DC d) DC current input 4～20mA DC /0～20mA DC 2. High-voltage input: a) DC voltage input (0～5V DC / 1~5V DC / 0~10V DC) Input impedance: 1M Ω
Number of inputs	4 points. Sampling period: 0.25s
Input accuracy	± 1 degree (Type K thermocouple)
Control method	ON/ OFF control
Control output	Relay contacts output/ voltage pulse output/ current output/ triac output
Special function	Alarm/ heater disconnection detection/ MODBUS communication
Ambient temperature	-10～50°C (No condensation or freezing)
Ambient humidity	25~85%RH
Temperature when stored	-25~65°C (No condensation or freezing)

(Plan to launch)



HCA8C-4GM/ 4-axes motion control block

1) 4 axes motion control, 2-4 axes linear interpolation, 2 axes circular interpolation, 3 axes spiral interpolation and customized interpolation are available.
2) Max. pulse output frequency: 4Mpps
3) Support G code imported
4) Independent control and table detection
5) Customization is available.

Item		Specification
Drive power supply	Input signal	24 V DC ±10% Current consumption 40 mA or less
	Output signal	For pulse output: 5 to 24 V DC Current consumption 35 mA or less For CLR signal: 5 to 24 V DC Current consumption 20 mA or less
Number of control axes		Four axes
Positioning operation	Method	Increment, Absolute
	Unit	PLS,um,10-4 inch,mdeg
	Unit magnification	1x,10x,100x,300x
	Range	-2,147,483,648 to 2,147,483,647 PLS
	Operation speed	Hz, cm/min, inch/min, 10deg/min
	Output frequency	1Hz ~ 4MHz
	Acceleration/ deceleration process	Trapezoidal acceleration/deceleration: 1 to 32,767 ms Approximate S-shaped acceleration/deceleration: 1 to 5,000 ms
Occupied I/O points		8 points (Can be either input or output points)

Specification

Model name	Input Points	Input Type	Output Points	Output Type	Connection type	Number of I/O points occupied	5V DC power capacity(mA)
HCA8C-4EX4EYR	4	DC24V	4	Relay	Terminal block	16(Note)	40
HCA8C-4EX4EYT	4	DC24V	4	Transistor	Terminal block	16(Note)	40
HCA8C-8EX	8	DC24V	—	—	Terminal block	8	25
HCA8C-8EYR	—	—	8	Relay	Terminal block	8	30
HCA8C-8EYT	—	—	8	Transistor	Terminal block	8	30
HCA8C-8EX8EYR	8	DC24V	8	Relay	Terminal block	16	60
HCA8C-8EX8EYT	8	DC24V	8	Transistor	Terminal block	16	60
HCA8C-8EX8EYT-C	8	DC24V	8	Transistor	Terminal block	16	60
HCA8C-16EX	16	DC24V	—	—	Terminal block	16	30
HCA8C-16EYR	—	—	16	Relay	Terminal block	16	50
HCA8C-16EYT	—	—	16	Transistor	Terminal block	16	50
HCA8C-16EX-C	16	DC24V	—	—	Connector	16	30
HCA8C-16EYT-C	—	—	16	Transistor	Connector	16	50

Note: Even though HCA8C-4EX4EYR and HCA8C-4EX4EYT have 4 input points and 4 output points, actually they occupy 8 input points and 8 output points in PLC main unit respectively.
If more extension blocks needed to be connected, please take care of the total number of I/O points.

Item		Specification			
Ambient temperature		0 to 55°C when operating and -25 to 75°C when stored			
Vibration resistance	When installed on DIN rail	Frequency	Acceleration	Half amplitude	10 times for X,Y,Z direction (total 80 minutes)
		10~57(Hz)	—	0.035(mm)	
		58~150(Hz)	4.9(m/s2)	—	
	When installed directly		—	0.07(mm)	
			9.8(m/s2)	—	
Shock resistance		147 m/s2 Acceleration, Action time: 11ms, 3 times by half-sine pulse in each direction X, Y, and Z			
Noise resistance		By noise simulator at noise voltage of 1,000 Vp-p, noise width of 1 μs, rise time of 1 ns and period of 30 to 100 Hz			
Dielectric withstand voltage		AC power type: 1.5kV AC for one minute			
Insulation resistance		5MΩor more by 500V DC megger			
Grounding		Class D grounding(grounding resistance: 100 Ωor less) <Common grounding with a heavy electrical system is not allowed.>			
Working atmosphere		Free from corrosive gas, flammable gas or excessive conductive dusts			
Working altitude		<200m			

Transistor output specification

Item				Transistor output specification
External power supply			DC5~30V	
Max. load	Resistance load	Main unit	Y000~Y003 0.3A/ 1 point Y004~Y017 0.1A/1 point	Make sure that the total load current of resistance load per common terminal (16 points) is 1.6A or less.
		HCA8C-16EYT	0.1A/1 point	
		HCA8C-16EYT-C	0.3A/1 point	Make sure that the total load current of resistance load per common terminal (16 points) is 1.6A or less.
		HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR	0.5A/1 point	The total load current of resistance load per common terminal (16 points) should be the following:4 points/common: 0.8A; 8 points: 1.6A
		HCA8C-8EYR	1A/1 point	Make sure that the total load current of resistance load per common terminal (4 points) is 2A or less.
	Inductive load	Main unit	Y000~Y003 7.2W/1 point (DC24V) Y004~Y017 2.4W/1 point (DC24V)	Make sure that the total load current of 16 inductive load points should be 38.4W/ 24VDV or less.
		HCA8C-16EYT	2.4W/1 point(DC24V)	
		HCA8C-16EYT-C	7.2W/1 point(DC24V)	
		HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR	12W/1 point(DC24V)	
		Main unit	Y000~Y003 0.9W/1 point (DC24V) Y004~Y017 0.3W/1 point (DC24V)	Make sure that the total load current of 16 inductive load points should be: 4.8W/ 24VDV or less.
	Lamp load	HCA8C-16EYT	0.3W/1 point (DC24V)	
		HCA8C-16EYT-C	1W/1 point (DC24V)	
		HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR	1.5W/1 point (DC24V)	
		HCA8C-8EYR	3W/1 point (DC24V)	
Open circuit leakage current			0.1mA or less/ 30V DC	
ON voltage			1.5V	
Response time	OFF-ON	Main unit	Y000~Y003 5μs or less/ 10mA or more (5 to 24VDC) Y004~Y017	
		Extension blocks	0.2ms or less/ 100mA or more (24VDC)	
	ON-OFF	Main unit	Y000~Y003 5μs or less/ 10mA or more (5 to 24VDC) Y004~Y017	
		Extension blocks	0.2ms or less/ 100mA or more (24VDC)	
		Circuit insulation	Photocoupler insulation	
Operation display		Main unit	Monitored by the display module	
		Extension blocks	LED on panel lights when photocoupler is driven.	

Relay output specification

Item			Relay output specification
External power supply			30V DC or less, 250V DC or less
Max. load	Resistance load	HCA8C-16EYT	2A/ 1 point The total load current of 16 resistance load points is 8A or less.
		HCA8C-16EYR	2A/ 1 point The total load current per common terminal should be the following: 4 output points/ common: 8A; 8 output points/ common: 8A
	Inductive load	HCA8C-16EYT HCA8C-16EYR	80VA
Minimum load			5V DC 2mA (reference value)
Open circuit leakage current			—
Response time	OFF-ON		Approx.10ms
	ON-OFF		Approx.10ms
Circuit insulation			Mechanical insulation
Display of output operation			Supplying power to the relay coil will light the LED indicator lamp on panel.

24VDC input specification

Item			24V DC input specification	
			Main unit/ HCA8C input extension blocks	HCA8C input extension blocks
Input signal voltage			24V DC +20% -15% Ripple Voltage (p-p) 5% or less	
Input impedance	Main unit	X000~X005	3.9kΩ	4.3kΩ
		X006 , X007	3.3kΩ	
		X010~X017	4.3kΩ	
	HCA8C input extension blocks		4.3kΩ	
Input signal current	Main unit	X000~X005	6mA / DC24V	5mA / DC24V
		X006 , X007	7mA / DC24V	
		X010~X017	5mA / DC24V	
	HCA8C input extension blocks		5mA / DC24V	
Input sensitivity current	NO Main unit	X000~X005	3.5mA or more	3.5mA or more
		X006 , X007	4.5mA or more	
		X010~X017	3.5mA or more	
	NO HCA8C input extension blocks		3.5mA or more	
	OFF		1.5 mA or less	1.5 mA or less
Input response time			Approx. 10ms	Approx. 10ms
Input signal form			NPN or PNP input	
Circuit insulation			Photocoupler insulation	
Input operation display	Main unit HCA8C extension blocks		Turning on the input will light the LED indicator lamp	

Terminal layout

◆ Extension blocks (Connector):

X0	X10	Y0	Y10	X0	Y0
X1	X11	Y1	Y11	X1	Y1
X2	X12	Y2	Y12	X2	Y2
X3	X13	Y3	Y13	X3	Y3
X4	X14	Y4	Y14	X4	Y4
X5	X15	Y5	Y15	X5	Y5
X6	X16	Y6	Y16	X6	Y6
X7	X17	Y7	Y17	X7	Y7
●	●	COM	COM	S/S	COM
S/S	●	●	●	S/S	COM
HCA8C-16EX-C		HCA8C-16EYT-C		HCA8C-8EX8EYT-C	

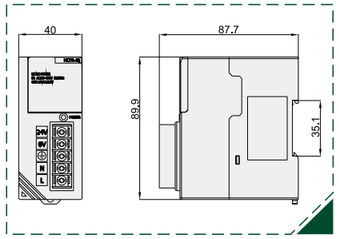
◆Extension blocks (8-pin terminal block):

●	●	●
●	●	●
X0	X0	Y0
X1	X1	Y1
X2	X2	Y2
X3	X3	Y3
S/S	X4	Y4
Y0	X5	Y5
Y1	X6	Y6
Y2	X7	Y7
Y3	S/S	COM
COM	S/S	COM
HCA8C-4EX4EYT HCA8C-4EX4EYR	HCA8C-8EX	HCA8C-8EYT HCA8C-8EYR

◆ Extension blocks (16-pin terminal block):

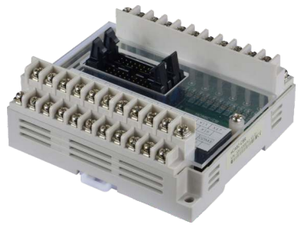
X0	X0	Y0
X1	X1	Y1
X2	X2	Y2
X3	X3	Y3
X4	X4	Y4
X5	X5	Y5
X6	X6	Y6
X7	X7	Y7
S/S	S/S1	COM1
S/S	S/S1	COM1
Y0	X10	Y10
Y1	X11	Y11
Y2	X12	Y12
Y3	X13	Y13
Y4	X14	Y14
Y5	X15	Y15
Y6	X16	Y16
Y7	X17	Y17
COM	S/S2	COM2
COM	S/S2	COM2
HCA8C-8EX8EYT HCA8C-8EX8EYR	HCA8C-16EX	HCA8C-16EYT HCA8C-16EYR

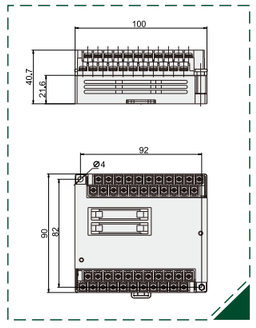
HCA8C-POWER / Power input module



Characteristics:
HCA8C-POWER Independent switching power supply
Power supply: Input 85-264VAC;
Output 24VDC/1. 5A

HCA8C-CBR/CBT

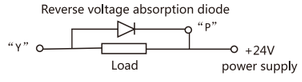




HCA8C- CBR/ T is the I/O terminal block, used with HCA8C- 16X16YT together. Terminal blocks convert I/O terminals of connector type PLC into terminal blocks and become convenient for the end users to make the wiring.
We have two kinds:
Relay output HCA8C- CBR and Transistor output HCA8C- CBT.

Wiring

1. Connect the HCA8C main unit and HCA8C-CB terminal block correspondingly by terminal wiring. PNP(source) or NPN(sink) input mode can be selected by S/S terminal. There are four COM ports for output and each COM corresponds to four output points. (Note: Connect the four COM ports when using transistor output, that is the output shares a COM port).
2. When HCA8C-CB terminal block is connected to extension blocks(such as HCABC-16EX/YET-C), the external power should be supplied to the input terminal of "24V" and "0V", as shown in the right figure. If connected with the main unit, the 24V power supply in the main unit will be used and no need for the external power supply.
3. HCA8C-CB output is built in the function of the reverse voltage absorption. Connect the power line to the output "P" point, then to "Y" point if you want to use this function, as shown in the right figure.



Input/output specification

HCA8C-CBR/T can be used with the following main unit and extension blocks to realize the conversion of connector type. So the parameter of HCA8C- CBR/T should keep the same to the ones in main unit and extension blocks. For details, refer to the parameters of HCA8C main unit and extension blocks.

Models	Input		Output		Connection type	I/O occupied points	5VDC power supply capacity(mA)
	Points	Type	Points	Type			
HCA8C-16X16YT-P0-P4	16	DC24V	16	Transistor	Connector	32	350
HCA8C-16EX-C	16	DC24V	—	—	Connector	16	30
HCA8C-16EYT-C	—	—	16	Transistor	Connector	16	50
HCA8C-8EX8EYR-C	8	DC24V	8	Transistor	Terminal block	16	60

PLC naming rule

HCA8P—	16X	16Y	R	—P4	—D
HCA1P, HCA2P HCA8C, HCA8P etc. PLC main unit and extension block series	Input points X: Main unit input EX: Extension input	Output points Y: Main unit output EY: Extension output	Output type R: Relay output T:Transistor output	ADP: Left extension block ESS: PNP output P*:Open collector pulse output D*:Differential pulse output	None: AC power D: 24VDC

General hardware specifications

Item	Specifications			
Ambient temperature	● HCA1P, HCA2P：: 0 to 55°C when operating and -20 to 70°C when stored ● HCA8P, HCA8C: 0 to 55°C when operating and -20 to 70°C when stored			
Ambient relative humidity	● HCA1P, HCA2P:35 to 85%RH (no condensation) when operating ● HCA8P, HCA8C: 5 to 95% RH(no condensation) when operating			
Vibration resistance		Frequency (Hz)	Acceleration (m/s2)	Half amplitude (mm)
	When installed on DIN rail	10~57Hz	—	0.035mm
		57~150Hz	4.9m/s²	—
	When installed directly	10~57Hz	—	0.075mm
		57~150Hz	9.8m/s²	—
Shock resistance	147 m/s2 Acceleration, Action time: 11ms, 3 times by half-sine pulse in each direction X, Y, and Z			
Noise resistance	By noise simulator at noise voltage of 1,000 Vp-p, noise width of 1 μs, rise time of 1 ns and period of 30 to 100 Hz			
HCA1P、HCA2P、HCA8P	Dielectric withstand voltage	AC power type: 1.5kV AC for one minute DC power type: 500V AC for one minute	According to JEM-1021, between all the terminal and ground terminal	
	Insulation resistance	5MΩor more by 500V DC megger		
HCA8C	Dielectric withstand voltage	1.5kV AC for one minute or 500V AC for one minute	According to JEM-1021, between each terminal and ground terminal	
	Insulation resistance	5MΩor more by 500V DC megger		
Grounding	Class D grounding(grounding resistance: 100 Ωor less) <Common grounding with a heavy electrical system is not allowed.>			
Working atmosphere	Free from corrosive gas, flammable gas or excessive conductive dusts			
Working altitude	<2000m			