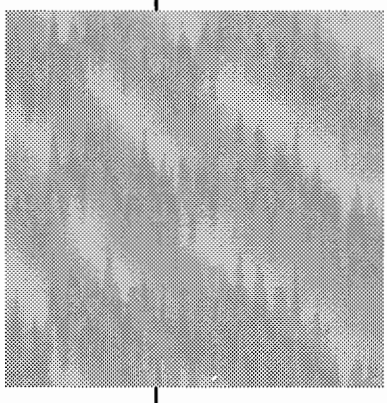
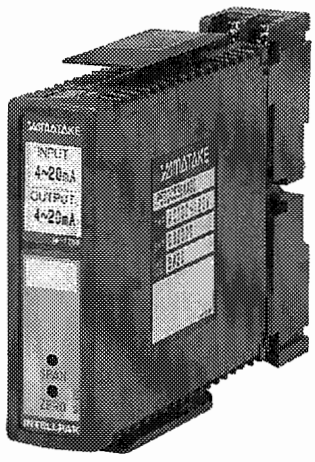
YAMATAKE

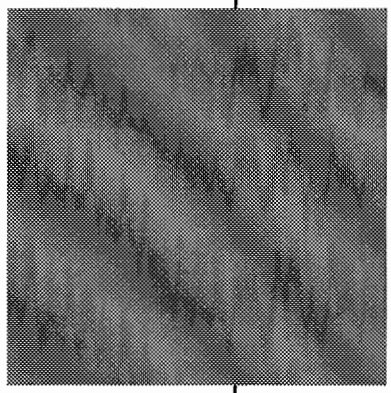
No. CP-UM-1337E

IntellpaK DC Isolator
IP50DCS (Standard Speed Isolator)
IP50DCE (High Speed Isolator)

User's Manual







Yamatake Corporation

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1. Introduction and Specifications

1. INTRODUCTION

The Intellpak IP50DCS, DCE is a thin plug-in system DC isolator to isolated the input, output and power supply from one another. This equipment isolates various levels of signals from the other circuits, and amplifies and converts them into unified signals in the measurement control system.

2. SPECIFICATIONS

Input part	Input type	DC voltage, and DC current. Refer to Table 1.	
	Input impedance	Refer to Table 1.	
Output part	Output type	DC voltage, DC current. Refer to Table 2.	
	Allowable load resistance	Refer to Table 2.	
General specifications	Accuracy	± 0.1% FS at the reference temperature of 23°C	
	Response time	Standard speed type: 25ms at the response of 90% High speed type: 120μs at the response of 90%	
	Power supply type	AC	DC
	Rated power voltage	100 to 120V AC 50/60Hz common	24V DC
	Operating power voltage	80 to 132V AC 50/60Hz	24V DC ± 10%
	Power consumption	Approx. 4.5VA	Approx. 2.2VA
	Starting current	—	0.11A or less
	Peak value and width of current with power ON	10A or less, 1ms	5A or less, 1ms
	Insulation resistance	100MΩ or more between I/O terminal and power terminal when measured by 500V DC megger.	
	Dielectric strength	2000V AC, 1 min between I/O terminal and power terminal	
	Power supply characteristic	± 0.1% FS/90 to 132V AC	± 0.1% FS/24V DC ± 10%
	Temperature characteristic	± 0.15% FS/10°C	
	Operating ambient temperature	– 5 to +55°C, non-freezing	
	Storage ambient temperature	– 20 to +70°C, non-freezing	
	Operating ambient humidity	90% RH or less, non-dewing	
	Storage ambient humidity	90% RH or less, non-dewing	
	Vibration resistance	4.9m/s² or less, 10 to 60Hz, 2h in each direction of X, Y and Z (with vibration-absorbing bracket)	Not applicable when mounted on DIN rail
	Shock resistance	490m/s² or less, 3 times each upward and downward	
	Case material	Heat-resisting ABS resin	
	Case color	Gray, Munsell 2.5PB3.5/1	
	Wiring terminal screw	M3.5	
	Installation	Installed on wall or DIN rail	
	Mass	Approx. 220g (including the base socket)	

Standard accessories	Base socket, Part No. QN719A
Auxiliary parts (option)	Vibration-absorbing bracket, Part No. QN718A

2. Type Number

Configuration of Type Number

I	II	III	IV	V	0

Example: IP50DCS10ADT0

I	II	III	IV	V	Contents
Basic type No.	Input type	Output types	Power voltage	Additional processing	
IP50DCS					Standard speed type DC isolator
IP50DCE					High speed type DC isolator
Selected from Table 1. ►					
	Selected from Table 2. ►				
			A		100 to 120V AC 50/60Hz common
			D		24V DC
				0	None
				T	With tropical zone processing
				D	With test data
				B	With tropical zone processing, and test data
				Y	Traceability prover compatibility product

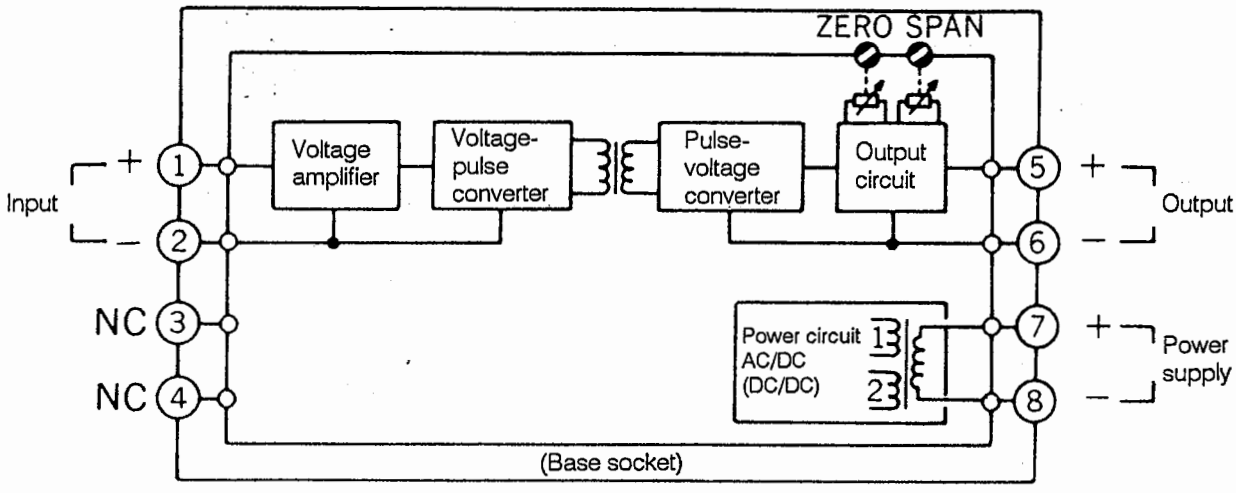
Table 1. Input Type

Additional type No.	Input type	Input impedance	Additional type No.	Input type	Input impedance
10	0 – 10mV	1 MΩ	23	± 1V	1 MΩ
11	0 – 100mV	1 MΩ	24	± 5V	1 MΩ
12	0 – 1V	1 MΩ	25	± 10V	1 MΩ
13	0 – 5V	1 MΩ	30	0 – 10μA	1 kΩ
14	1 – 5V	1 MΩ	31	0 – 100μA	100 Ω
15	0 – 10V	1 MΩ	32	0 – 1mA	100 Ω
16	0 – 50mV	1 MΩ	33	0 – 10mA	50 Ω
17	0 – 60mV	1 MΩ	34	0 – 16mA	50 Ω
18	0 – 30V	1 MΩ	35	0 – 20mA	50 Ω
19	0 – 50V	1 MΩ	36	4 – 20mA	50 Ω
20	± 10mV	1 MΩ	40	± 1mA	100 Ω
21	± 50mV	1 MΩ	41	± 20mA	50 Ω
22	± 100mV	—	—	—	—

Table 2. Output Type

Additional type No.	Output type	Allowable load resistance	Additional type No.	Output type	Allowable load resistance
A	4 – 20mA	750 Ω max.	R	± 10V	5 kΩ min.
B	1 – 5mA	3 kΩ max.	—	—	—
C	2 – 10mA	1.5 kΩ max.	—	—	—
D	0 – 1mA	15 kΩ max.	—	—	—
E	0 – 10mA	1.5 kΩ max.	—	—	—
F	0 – 16mA	937 Ω max.	—	—	—
G	0 – 20mA	750 Ω max.	—	—	—
H	1 – 5V	2.5 kΩ min.	—	—	—
J	0 – 10mV	10 kΩ min.	—	—	—
K	0 – 100mV	100 kΩ min.	—	—	—
L	0 – 1V	500 Ω min.	—	—	—
N	0 – 5V	2.5 kΩ min.	—	—	—
P	0 – 10V	5 kΩ min.	—	—	—

3. Circuit Block Diagram

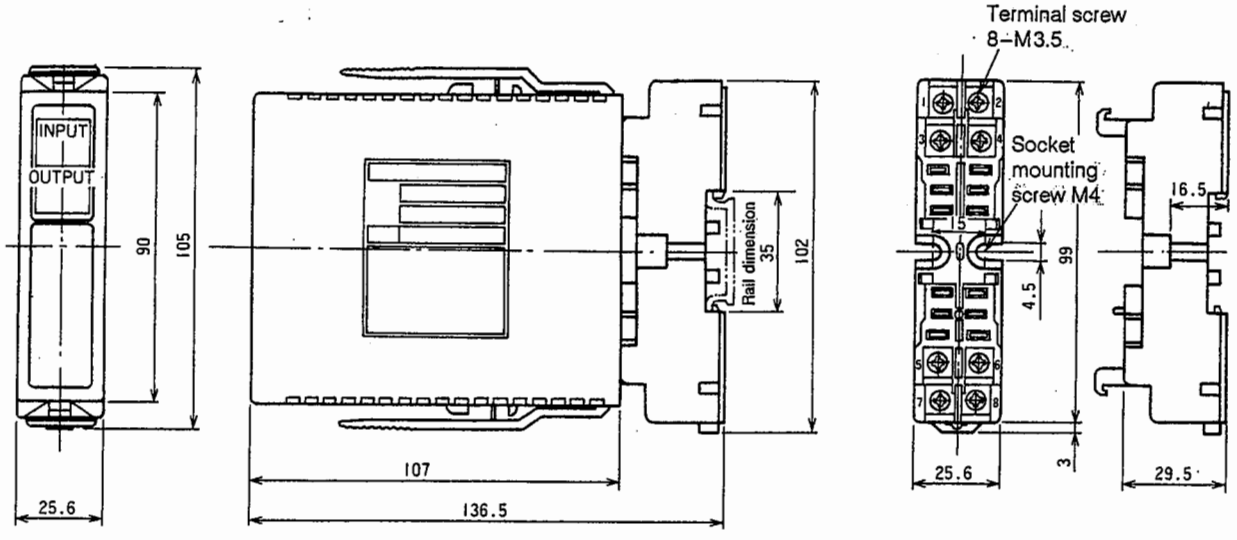


4. External Dimension Drawing

External Dimension Drawing

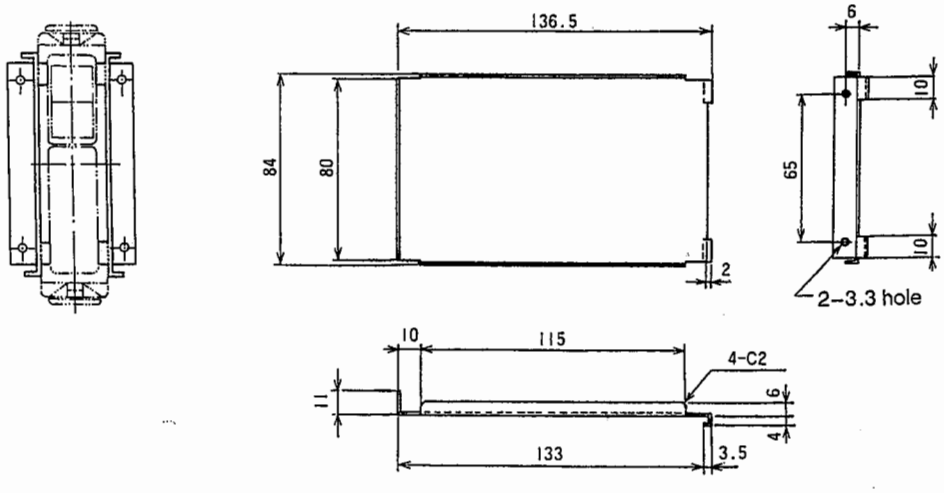
Unit: mm

Base socket Part No. QN719A



With the Vibration-Absorbing Bracket Mounted

Vibration-absorbing bracket Part No. QN718A



Material: Cold-rolled steel plate SPCC t1
Galvanized, and chrome processed

5. Installation

1. CAUTIONS IN INSTALLATION

(1) Handling

When removing or mounting the main unit from/to the socket, be sure to turn OFF the power supply and the input signal in advance to prevent the occurrence of problems.

(2) Installation

(a) When the equipment is to be installed in places where there is excessive dust or chips, house it in a dust-proof cabinet which has heat radiation function.

(b) Avoid exposing the equipment to vibration and shocks as much as possible, since they may cause malfunctions.

(3) Wiring

(a) Don't lay the power line, input signal line, and output signal line near a noise generator, or relay drive line.

(b) Avoid clamping these lines together with a noise superimposed line or putting them together in the same duct.

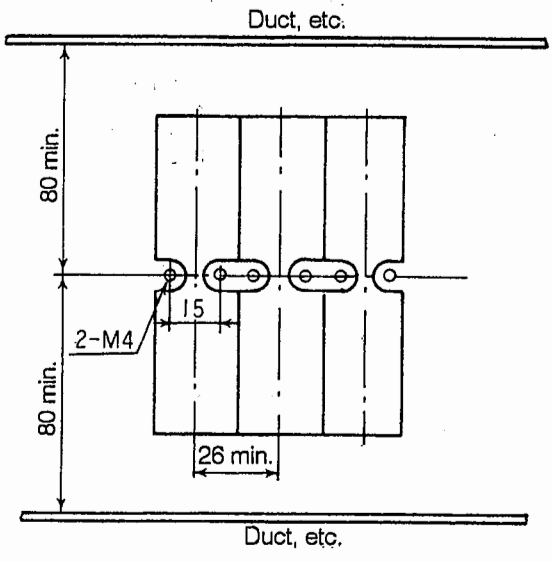
(c) This equipment can be operated as soon as the power supply is turned ON. However, for optimum performance, allow 30 minutes of energizing time.

(4) Short circuit of output terminals

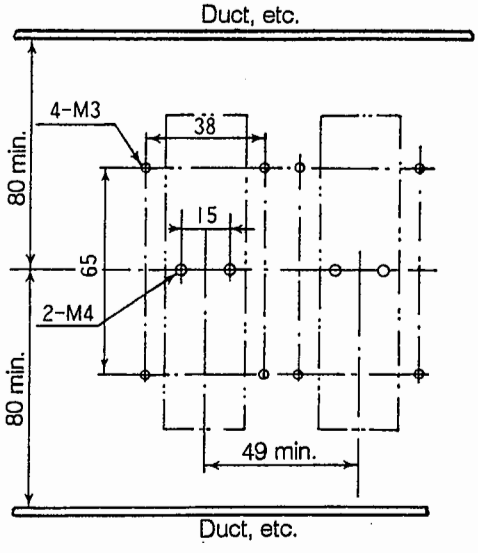
With the voltage output, avoid shorting the output terminals for a long time.

2. INSTALLATION METHOD

Lateral installation and vertical space



Installation on vibration-absorbing bracket and vertical space



Cautions:

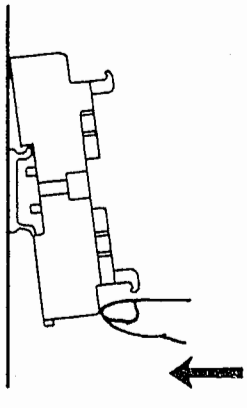
① When installing the equipment on a wall subject to vibration, use the vibration-absorbing bracket (option, QN718A). Where there is vibration, the equipment cannot be installed on the DIN rail.

② When the output of the main unit is to be A/D converted, use the integral A/D converter. When the high speed A/D converter for sequential comparison, etc. is to be used, check operation in advance in the combination.

3. MOUNTING AND REMOVING TO/FROM THE DIN RAIL

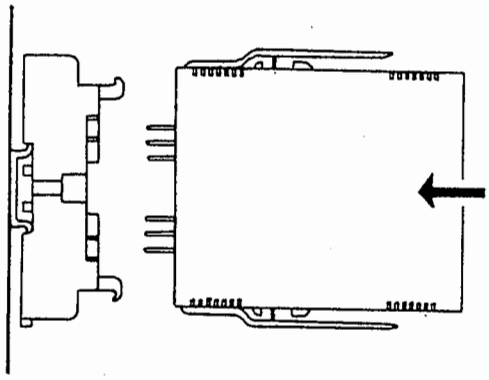
(1) How to fix the socket

Hook the click to the rail with the slider on the socket bottom-down, and push in the lower part of the socket in the direction of the arrow, as shown in the figure, until it is fixed.



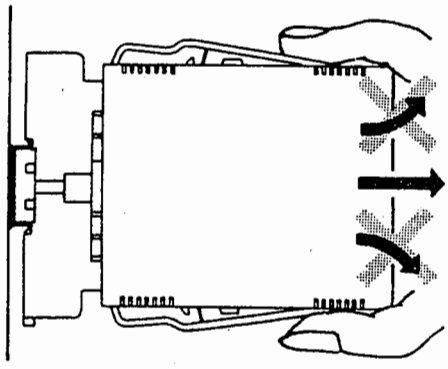
(2) How to fix the main unit to the socket

Set the main unit so that the label can be properly read, and insert it straight and level. At this time, insert it until the hooks are restored to a parallel position with the main unit case, and they are completely engaged with the projection of the socket.



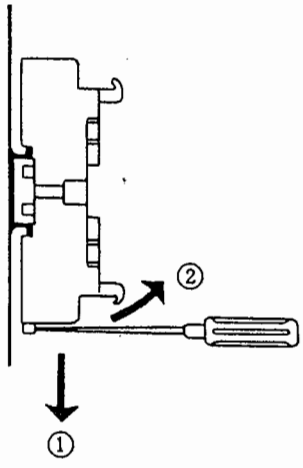
(3) How to remove the main unit from the socket

Push in the main unit, and spread the upper and lower hooks simultaneously, and then extract the main unit forward. Note that the socket may be damaged if both hooks are not spread sufficiently.

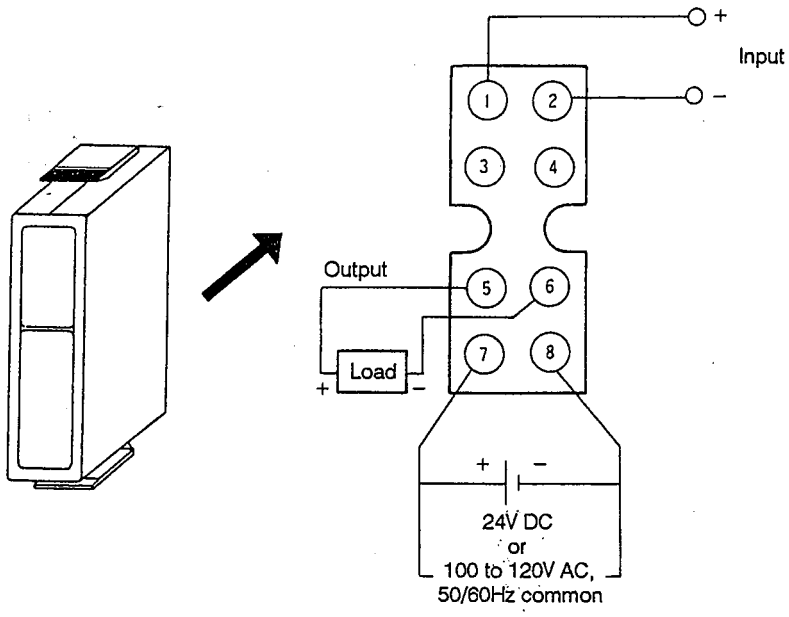


(4) How to remove the socket

Insert a screwdriver in the slider groove of the socket. While pulling the screwdriver in the direction of the arrow as shown in the figure, draw the lower part of the socket forward until it is removed.



6. Wiring



Terminal No.	Symbol		Contents
1	Input	+	Connect the specified input signal.
2		−	
3			Blank terminal
4			
5	Output	+	The signal based on the input/output specification is output.
6		−	
7	Power supply	+	Connect the power supply of the rated voltage.
8		−	

- When a DC current exceeding 50mA DC is to be input, apply an input signal of 60mV DC FS to this equipment in combination with a shunt.
- When a DC voltage exceeding 300V DC is to be input, apply an input signal of 1mA DC FS to this equipment in combination with a multiplier.

7. Adjustment

1. ZERO AND SPAN ADJUSTING METHOD

Since this equipment has been properly calibrated at the time of shipping, each trimmer of ZERO and SPAN need not be adjusted so far as the equipment is operated according to the manufacturing specifications.

If matching with the connected equipment or routine calibration is required, observe the following procedures. This calibration shall be made 30 min. after the power supply is turned ON, using a signal source (such as standard voltage, current generator), and measuring instruments (voltmeter, ammeter), whose accuracies are 10 times or more each as high as the tolerance of this equipment.

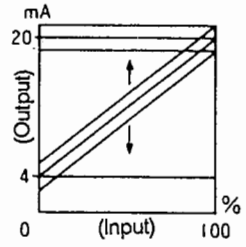
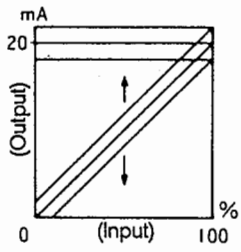
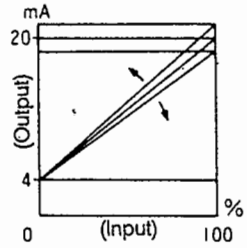
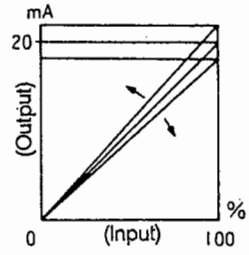
The adjustable range of zero and span are approx. +10% FS each. Multi-revolution trimmers are used for these adjustments. Note that these multi-revolution trimmers are not provided with stoppers.

1) Zero adjustment

   Apply a minimum value within the input range to the input terminals, and turn the zero trimmer until the output signal reaches the minimum value within the output range.

2) Span adjustment

   Apply a maximum value within the input range to the input terminals, and turn the span trimmer until the output signal reaches the maximum value within the output range.

		With the output of 4 to 20mA	With the output of 0 to 20mA
Zero adjustment	The zero point is shifted upward. ⟨↑⟩ZERO The zero point is shifted downward.		
Span adjustment	The span is widened. ⟨↑⟩SPAN The span is narrowed.		

2. OPERATION AGAINST CONDITIONS OUT OF RANGE

1) Excessively large input

When a signal exceeding the upper limit of the input range is input, the output signal is increased nearly proportional to the input up to approx. 120% FS. Even when a greater input signal is input, the output signal won't be increased beyond approx. 120% FS due to the operation of the built-in limiter circuit.

2) Excessively small input

If a signal lower than the lower limit of the input range is input, the output operation is as follows;

(a) With the current output, the output signal is reduced nearly propertional to the input down to approx. –20% FS, but no negative current is output.

(b) With the voltage output, the output signal is reduced nearly proportional to the input down to –120% FS. Even when a smaller signal is input, the output signal won't be reduced below approx. –120% FS due to the operation of the built-in limiter circuit.

3) Load out of range

(a) In case of current output

When the output exceeds the "allowable load resistance range", the output is nearly proportional to the input until the voltage between the output terminals becomes approx. 16V. If this range is exceeded, the output is saturated, causing a larger error.

(b) In case of voltage output

When the output is reduced below the "allowable load resistance range", the output is saturated, causing a larger error.

Specifications are subject to change without notice.

YAMATAKE

Yamatake Corporation

IBD Sensing and Control Department
Totate International Building
2-12-19 Shibuya Shibuya-ku Tokyo 150-8316 Japan
Phone: 81-3-3486-2311
Fax: 81-3-3486-2300

This has been printed on recycled paper.

Printed in Japan.
1st Edition: Issued in Feb., 1991
2nd Edition: Issued in May, 2000(B)