

IP50/51

IntellpaK Compact Signal Converters



The IP50 and IP51 are compact, lightweight, high-accuracy signal converters, available in both AC and DC models. Features include a high-efficiency hybrid IC for high-density applications and high-speed response, suitable for process control of pressure and flow.

- IP50AVA/AVC Mean value computing unit
- IP50DBE/DBC Signal distributor
- IP50DCD DC converter (non-isolation type)
- IP50DCS/DCE DC isolator
- IP50DRA/DRC Gradient response computing unit
- IP50FLA/FLC First order delay computing unit
- IP51FVD Pulse/DC signal converter
- IP51FZC Pulse isolator
- IP50MSS/MSD Monitor switch
- IP50RVA/RVC Reverser
- IP50SQA/SQC Square root extraction computing unit
- IP50SL/SH Selector
- IP50TC/RD/PM mV/I converter
- IP51VFD/VFS DC/pulse converter
- IP50BRA/BRC Ratio/bias setting unit
- IP51FVL Pulse/DC converter

CONVERTERS

• IP50AVA/AVC Mean value computing unit

The IntellpaK IP50AVA/AVC is a thin, plug-in type, mean value computing unit that converts two DC signal inputs to a single DC output which is equivalent to the mean value of the two input signals.

• IP50DCD DC converter (non-isolation type)

The IntellpaK IP50DCD is a thin, plug-in type, non-isolated DC converter used to amplify and convert each level of an input signal to a standard signal for a measurement control system.

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• IP50DBE/DBC Signal distributor

The IntellpaK IP50DBE/DBC is a signal distributor for supplying electric power to a 2-wire on-site transmitter and extracting standard 4-20mAdc or 1-5Vdc signals from the transmitter.

• IP50DCS/DCE DC isolator

The IntellpaK IP50DCS/DCE is a thin, plug-in type, DC isolator used to isolate input, output and power supplies mutually. Each signal level is isolated from the other circuits and the input signals are amplified and converted to a single standard signal that is output for use in a measurement control system.

Specifications			
Input signal	4 to 20mAdc		
Output signal	4 to 20mAdc or 1 to 5Vdc		
Accuracy	±0.1% FS at 23°C		
Response time	25ms at 90% response		
Power	Isolation type: 100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz Non-isolation type: 100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc	
Power consumption	Approx. 6.0VA	Approx. 2.0VA	Approx. 2.6VA
Ambient temperature	-5 to +55°C (without freezing)		
Ambient humidity	90% RH max. (no condensation allowed)		
Mass	Approx. 200g (including base socket)		
Accessories	QN718A vibration-absorbing bracket 81404381-001 current-check diode 81404382-001 250Ω resistor for 1 to 5V conversion		

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	Standard speed type: 25ms at 90% response High speed type: 120µs at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50DRA/DRC** Gradient response computing unit

The IntellPaK IP50DRA/DRC is a thin, plug-in type gradient response computing unit that produces a DC signal output changing in a fixed gradient against an input DC signal. If the input signal changes at a rate higher than the gradient initially set, the output signal changes with the set gradient but follows the input if it is slower than the set gradient.

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Gradient	0.5 to 40s variable (against input 0 → 100% variation)	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50FLA/FLC** First-order delay computing unit

The IntellPaK IP50FLA/FLC is a thin, plug-in type, first-order delay computing unit that produces a DC signal output after a first-order delay is processed for the DC signal input.

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	0.5 to 20s variable at 63% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP51FVD** Pulse/DC signal converter

The IntellPaK IP51FVD is a thin, plug-in type, pulse/DC converter that converts an input pulse signal to an output analog signal of a voltage or current proportional to the frequency of the input pulse signal.

Specifications			
Input type	AC voltage pulse, DC voltage pulse, ON/OFF pulse		
Output type	DC voltage, DC current		
Response time for output	Input frequency upper limit value	Response time*1	Dropout frequency*2
	50 to 100Hz · FS	Approx. 2s	Approx. 2.5Hz
	101 to 200Hz · FS	Approx. 1s	Approx. 5Hz
	201 to 500Hz · FS	Approx. 0.5s	Approx. 10Hz
	501Hz · FS to 100kHz · FS	Approx. 0.2s	Approx. 25Hz
	Notes: *1: At 90% response time *2: When input frequency value is reduced below dropout frequency, output is set to zero (selectable by DIP switch)		
Accuracy	±0.1% FS at 23°C		
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc	
Power consumption	Approx. 5.5VA	Approx. 2.7VA	
Ambient temperature	-5 to +55°C (without freezing)		
Ambient humidity	90% RH max. (no condensation allowed)		
Mass	Approx. 200g (including base socket)		
Accessories	QN718A vibration-absorbing bracket		

• **IP51FZC** Pulse isolator

The IntellPaK IP51FZC is a thin, plug-in type pulse isolator which receives a pulse signal from each sensor or controller as an input, and processes the waveform, isolation and level conversion for the input signal to produce the most suitable pulse signal output required for a measurement control system.

Specifications		
Input type	AC voltage pulse, DC voltage pulse, ON/OFF pulse	
Output type	One-shot non-contact output, open collector output, pulse voltage output	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 5.5VA	Approx. 2.7VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50MSS/MSD** Monitor switch

The IntellPaK IP50MSS/MSD is a thin, plug-in type, monitor switch that generates a signal by actuating the relay contacts on and off, or an open collector output on and off if an input DC signal surpasses a set value.

Specifications		
Input type	DC voltage, DC current	
Output type	Relay output, open collector output	
Accuracy	±0.2% FS at 23°C	
Response time	Relay output: 100ms, Open collector output: 25ms	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50RVA/RVC** Reverser

The IntellPaK IP50RVA/RVC is a thin, plug-in type, reverser that produces a DC signal output from a reversed input DC signal. For example, in the case of a 4-20mA input signal, the output would be reversed to be 20mA for a 4mA input and 4mA for a 20mA input.

Specifications		
Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50SQA/SQC** Square root extraction computing unit

The IntellpaK IP50SQA/SQC is a thin, plug-in type, square root extraction computing unit which receives a DC signal input having square-law characteristics and generates a DC signal output equivalent to the square root of the input signal.

Specifications

Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.2% FS at 23°C	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50SL/SH** Selector

The IP50SL/SH IntellpaK is a thin, plug-in type, selector which receives two DC signal inputs and generates an output by automatically selecting either the high signal (high selector) or the low signal (low selector).

Specifications

Input type	DC voltage, DC current	
Output type	DC voltage, DC current	
Accuracy	±0.1% FS at 23°C	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50TC/RD/PM** mV/I converter

The IP50TC/RD/PM IntellpaK is a thin, plug-in type, mV/I converter which receives an input signal from a thermocouple, resistance bulb or potentiometer and then generates a DC output voltage or current.

Specifications

Input type	T/C, RTD, potentiometer	
Output type	DC voltage, DC current	
Accuracy	±0.4% FS (IP50TC), ±0.2%FS (IP50RD), ±0.1%FS (IP50PM)	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 5.5VA	Approx. 2.7VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP51VFD/VFS** DC/pulse converter

The IntellpaK IP51VFD/VFS is a thin, plug-in type, DC/pulse converter which receives an input analog signal voltage or current at each level and generates an output pulse signal of a frequency proportional to the analog value.

Specifications

Input type	DC voltage, DC current	
Output type	One-shot non-contact output, open collector output, voltage pulse output	
Response time for output	1 to 10V FS: 20µs + 1/f out (f out: output frequency) (at 90% response) 20 to 50mA FS: 20µs + 1/f out Other than the above: 1ms + 1/f out	
Accuracy	±0.1% FS at 23°C	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 5.5VA	Approx. 2.7VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP50BRA/BRC** Ratio/bias setting unit

The IntellpaK IP50BRA/BRC is a thin, plug-in type, ratio/bias setting unit that multiplies a ratio against the DC input signal to produce an output signal after adding bias.

Specifications

Input type	1 to 5Vdc, 4 to 20mAdc	
Output type	1 to 5Vdc, 5 to 1Vdc, 4 to 20mAdc, 20 to 4mAdc	
Calculation accuracy	±0.3% FS at 23°C (at ratio=100% and bias=0%)	
Ratio setting accuracy	±0.2% FS	
Bias setting accuracy	±0.3% FS	
Ratio setting	10 to 399%	
Bias setting	-99 to +99%	
Response time	25ms at 90% response	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

• **IP51FVL** Pulse/DC converter

The IntellpaK IP51FVL is a thin, plug-in type, pulse/DC converter designed for extremely slow pulses. It receives a slow input pulse signal, calculates the frequency from the cycle with a built-in microprocessor, and generates an analog signal output of a voltage or current proportional to the calculated frequency.

Specifications

Input type	DC voltage pulse, ON/OFF pulse	
Output type	DC voltage, DC current	
Response time for output	Input pulse interval + 1s max. (0 to 90%) Input pulse interval x 2 + 1s max. (0 to 90%) at application of power supply	
Accuracy	±0.2% FS at 23°C	
Power	100/110/120Vac 50/60Hz, 200/220/240Vac 50/60Hz	24Vdc
Power consumption	Approx. 4.5VA	Approx. 2.2VA
Ambient temperature	-5 to +55°C (without freezing)	
Ambient humidity	90% RH max. (no condensation allowed)	
Mass	Approx. 200g (including base socket)	
Accessories	QN718A vibration-absorbing bracket	

Selection Guide

I II III IV V Example: IP50AVC11ADT0

● IP50AVA/AVC, IP50DBE/DBC, IP50DCD, IP50DCS/DCE

Segment	Model No. selection				Description		
I	Basic No.	IP50AVA	↓		Non-isolation type, mean value computing unit		
		IP50AVC	↓		Isolation type, mean value computing unit		
		IP50DBE	↓		Non-isolation type, signal distributor		
		IP50DBC	↓		Isolation type, signal distributor		
		IP50DCD	↓		Non-isolation type, DC converter		
		IP50DCS	↓		Standard speed type, DC isolator		
II	Input type	00	○	○	4 to 20mA, 2-wire type signal generator		
		01	○	○	4 to 20mA, 2-wire type signal generator (corresponding to a smart communicator)		
		10	○	○	0 to 10mV Input impedance: 1MΩ		
		11	○	○	0 to 100mV Input impedance: 1MΩ		
		12	○	○	0 to 1V Input impedance: 1MΩ		
		13	○	○	0 to 5V Input impedance: 1MΩ		
		14	○	○	1 to 5V Input impedance: 1MΩ		
		15	○	○	0 to 10V Input impedance: 1MΩ		
		16	○	○	0 to 50mV Input impedance: 1MΩ		
		17	○	○	0 to 60mV Input impedance: 1MΩ		
		18	○	○	0 to 30V Input impedance: 1MΩ		
		19	○	○	0 to 50V Input impedance: 1MΩ		
		20	○	○	±10mV Input impedance: 1MΩ		
		21	○	○	±50mV Input impedance: 1MΩ		
		22	○	○	±100mV Input impedance: 1MΩ		
		23	○	○	±1V Input impedance: 1MΩ		
		24	○	○	±5V Input impedance: 1MΩ		
		25	○	○	±10V Input impedance: 1MΩ		
		30	○	○	0 to 10μA Input impedance: 1kΩ		
		31	○	○	0 to 100μA Input impedance: 100Ω		
		32	○	○	0 to 1mA Input impedance: 100Ω		
		33	○	○	0 to 10mA Input impedance: 50Ω		
		34	○	○	0 to 16mA Input impedance: 50Ω		
		35	○	○	0 to 20mA Input impedance: 50Ω		
		36	○	○	4 to 20mA Input impedance: 50Ω		
		40	○	○	±1mA Input impedance: 100Ω		
		41	○	○	±20mA Input impedance: 50Ω		
		III	Output type	A	○	○	4 to 20mA Load resistance: 750Ω max. 4 to 20mA (IP50DBE/DBC)
				B	○	○	1 to 5mA Load resistance: 3kΩ max.
				C	○	○	2 to 10mA Load resistance: 1.5kΩ max.
				D	○	○	0 to 1mA Load resistance: 15kΩ max.
				E	○	○	0 to 10mA Load resistance: 1.5kΩ max.
				F	○	○	0 to 16mA Load resistance: 937Ω max.
				G	○	○	0 to 20mA Load resistance: 750Ω max.
				H	○	○	1 to 5V Load resistance: 2.5kΩ min. 1 to 5V (IP50DBE/DBC)
				J	○	○	0 to 10mV Load resistance: 10kΩ min.
				K	○	○	0 to 100mV Load resistance: 100kΩ min.
				L	○	○	0 to 1V Load resistance: 500Ω min.
				N	○	○	0 to 5V Load resistance: 2.5kΩ min.
				P	○	○	0 to 10V Load resistance: 5kΩ min.
				R	○	○	±10V Load resistance: 5kΩ min.
IV	Power			A	○	○	100/110/120Vac 50/60Hz
				B	○	○	200/220/240Vac 50/60Hz
				D	○	○	24Vdc
				V	Option	00	○
T0	○	○	Tropicalization				
D0	○	○	With inspection data				
B0	○	○	Tropicalization + inspection data				
Y0	○	○	With traceability certification				

• A circle (○) denotes availability.

Selection Guide

I II III IV V Example: IP50DRA10ADT0

I II III IV V VI Example: IP51FVD12AA007322

● IP50DRA/DRC, IP50FLA/FLC, IP51FVD, IP51FZC

Segment	Model No. selection				Description		
I	Basic No.	IP50DRA	↓		Non-isolation type, gradient response computing unit		
		IP50DRC	↓		Isolation type, gradient response computing unit		
		IP50FLA	↓		Non-isolation type, first order delay computing unit		
		IP50FLC	↓		Isolation type, first order delay computing unit		
		IP51FVD	↓		Pulse/DC signal converter		
		IP51FZC	↓		Pulse isolator		
		II	Input type	10	○	○	0 to 10mV Input impedance: 1MΩ
				11	○	○	0 to 100mV Input impedance: 1MΩ
				12	○	○	0 to 1V Input impedance: 1MΩ
				13	○	○	0 to 5V Input impedance: 1MΩ
14	○			○	1 to 5V Input impedance: 1MΩ		
15	○			○	0 to 10V Input impedance: 1MΩ		
16	○			○	0 to 50mV Input impedance: 1MΩ		
17	○			○	0 to 60mV Input impedance: 1MΩ		
30	○			○	0 to 10μA Input impedance: 1kΩ		
31	○			○	0 to 100μA Input impedance: 100Ω		
32	○			○	0 to 1mA Input impedance: 100Ω		
33	○			○	0 to 10mA Input impedance: 50Ω		
34	○			○	0 to 16mA Input impedance: 50Ω		
35	○			○	0 to 20mA Input impedance: 50Ω		
36	○			○	4 to 20mA Input impedance: 50Ω		
III	Output type			12	○	○	AC voltage pulse input: peak-to-peak voltage detection for small signal level input
				14	○	○	DC voltage pulse input: for large signal level input such as proximity and photoelectric switches ON/OFF pulse input: for non-voltage contact such as an open collector
				A	○	○	4 to 20mA Load resistance: 750Ω max.
		B	○	○	1 to 5mA Load resistance: 3kΩ max.		
		C	○	○	2 to 10mA Load resistance: 1.5kΩ max.		
		D	○	○	0 to 1mA Load resistance: 15kΩ max.		
		E	○	○	0 to 10mA Load resistance: 1.5kΩ max.		
		F	○	○	0 to 16mA Load resistance: 937Ω max.		
		G	○	○	0 to 20mA Load resistance: 750Ω max.		
		H	○	○	1 to 5V Load resistance: 2.5kΩ min.		
		J	○	○	0 to 10mV Load resistance: 10kΩ min.		
		K	○	○	0 to 100mV Load resistance: 100kΩ min.		
		L	○	○	0 to 1V Load resistance: 500Ω min.		
		N	○	○	0 to 5V Load resistance: 2.5kΩ min.		
		P	○	○	0 to 10V Load resistance: 5kΩ min.		
		R	○	○	±10V Load resistance: 5kΩ min.		
		E	○	○	One-shot non-contact output		
		F	○	○	Open collector output Voltage pulse output		
		IV	Power	A	○	○	100/110/120Vac 50/60Hz
				B	○	○	200/220/240Vac 50/60Hz
D	○			○	24Vdc		
V	Option			00	○	○	None
		T0	○	○	Tropicalization		
		D0	○	○	With inspection data		
		B0	○	○	Tropicalization + inspection data		
		Y0	○	○	With traceability certification		
VI	Input range designation	(See Table 1)	○	○	(Select the code from Table 1 input range designation)		

• A circle (○) denotes availability.

Selection Guide

I II III IV V Example: IP50MSD10ADT0

● IP50MSS/MSD, IP50RVA/RVC, IP50SQA/SQC, IP50SL/SH

Segment	Model No. selection				Description		
I	Basic No.	IP50MSS	↓		One-output monitor switch (for output type A or C)		
		IP50MSD	↓		Two-input monitor switch		
		IP50RVA	↓		Non-isolation type, reverser		
		IP50RVC	↓		Isolation type, reverser		
		IP50SQA	↓		Non-isolation type, square root extraction computing unit		
		IP50SQC	↓		Isolation type, square root extraction computing unit		
		IP50SLA	↓		Non-isolation type, low selector		
		IP50SLC	↓		Isolation type, low selector		
II	Input type	10	○	○	0 to 10mV Input impedance: 1MΩ		
		11	○	○	0 to 100mV Input impedance: 1MΩ		
		12	○	○	0 to 1V Input impedance: 1MΩ		
		13	○	○	0 to 5V Input impedance: 1MΩ		
		14	○	○	1 to 5V Input impedance: 1MΩ		
		15	○	○	0 to 10V Input impedance: 1MΩ		
		16	○	○	0 to 50mV Input impedance: 1MΩ		
		17	○	○	0 to 60mV Input impedance: 1MΩ		
		30	○	○	0 to 10μA Input impedance: 1kΩ		
		31	○	○	0 to 100μA Input impedance: 100Ω		
		32	○	○	0 to 1mA Input impedance: 100Ω		
		33	○	○	0 to 10mA Input impedance: 50Ω		
		34	○	○	0 to 16mA Input impedance: 50Ω		
		35	○	○	0 to 20mA Input impedance: 50Ω		
		36	○	○	4 to 20mA Input impedance: 50Ω		
		III	Output type	A	○	○	4 to 20mA Load resistance: 750Ω max.
				B	○	○	1 to 5mA Load resistance: 3kΩ max.
				C	○	○	2 to 10mA Load resistance: 1.5kΩ max.
				D	○	○	0 to 1mA Load resistance: 15kΩ max.
				E	○	○	0 to 10mA Load resistance: 1.5kΩ max.
F	○			○	0 to 16mA Load resistance: 937Ω max.		
G	○			○	0 to 20mA Load resistance: 750Ω max.		
H	○			○	1 to 5V Load resistance: 2.5kΩ min.		
J	○			○	0 to 10mV Load resistance: 10kΩ min.		
K	○			○	0 to 100mV Load resistance: 100kΩ min.		
L	○			○	0 to 1V Load resistance: 500Ω min.		
N	○			○	0 to 5V Load resistance: 2.5kΩ min.		
P	○			○	0 to 10V Load resistance: 5kΩ min.		
R	○			○	±10V Load resistance: 5kΩ min.		
A	○			○	One relay output (1a1b) for IP50MSS		
B	○			○	Two relay outputs (1a x 2, HH operation) for IP50MSD		
C	○			○	One open collector output (H operation) for IP50MSS		
D	○			○	Two open collector outputs (HL operation) for IP50MSD		
E	○			○	Two relay outputs (1a x 2, LL operation)		
F	○			○	Two relay outputs (1a x 2, LH operation)		
IV	Power			A	○	○	100/110/120Vac 50/60Hz
				B	○	○	200/220/240Vac 50/60Hz
				D	○	○	24Vdc
				Y0	○	○	With traceability certification
V	Option			00	○	○	None
				T0	○	○	Tropicalization
				D0	○	○	With inspection data
				B0	○	○	Tropicalization + inspection data
		Y0	○	○	With traceability certification		

• A circle (○) denotes availability.

Selection Guide

I II III IV V Example: IP50TCAKEAA00

I II III IV V VI Example: IP50TCA0KAA0001C1

● IP50TC/RD/PM, IP51VFD/VFS, IP50BRA/BRC, IP51FVL

Segment	Model No. selection				Description		
I	Basic No.	IP50TCA	↓		Non-isolation type, T/C converter (for T/C input only)		
		IP50TCC	↓		Isolation type, T/C converter (for T/C input only)		
		IP50RDA	↓		Non-isolation type, RTD converter (for RTD input only)		
		IP50RDC	↓		Isolation type, RTD converter (for RTD input only)		
		IP50PMA	↓		Non-isolation type, potentiometer converter (for potentiometer input only)		
		IP50PMC	↓		Isolation type, potentiometer converter (for potentiometer input only)		
		IP51VFD	↓		DC pulse converter		
		IP51VFS	↓		DC pulse converter with dropout function		
		IP50BRA	↓		Non-isolation type, ratio/bias setting unit		
		IP50BRC	↓		Isolation type, ratio/bias setting unit		
		IP51FVL	↓		Pulse/DC converter		
		II	Input type	10	○	○	0 to 10mV Input impedance: 1MΩ
				11	○	○	0 to 100mV Input impedance: 1MΩ
12	○			○	0 to 1V Input impedance: 1MΩ		
13	○			○	0 to 5V Input impedance: 1MΩ		
14	○			○	1 to 5V Input impedance: 1MΩ		
15	○			○	0 to 10V Input impedance: 1MΩ		
16	○			○	0 to 50mV Input impedance: 1MΩ		
17	○			○	0 to 60mV Input impedance: 1MΩ		
30	○			○	0 to 10μA Input impedance: 1kΩ		
31	○			○	0 to 100μA Input impedance: 100Ω		
32	○			○	0 to 1mA Input impedance: 100Ω		
33	○			○	0 to 10mA Input impedance: 50Ω		
34	○			○	0 to 16mA Input impedance: 50Ω		
35	○			○	0 to 20mA Input impedance: 50Ω		
36	○			○	4 to 20mA Input impedance: 50Ω		
11	○			○	ON/OFF pulse, corresponding to non-voltage contact and open collector		
13	○			○	Voltage pulse, corresponding to proximity switch and photoelectric switch		
(See Table 2)	○			○	(Select the code from Table 2 input type)		
III	Output type			A	○	○	4 to 20mA Load resistance: 750Ω max.
				B	○	○	1 to 5mA Load resistance: 3kΩ max.
				C	○	○	2 to 10mA Load resistance: 1.5kΩ max.
				D	○	○	0 to 1mA Load resistance: 15kΩ max.
				E	○	○	0 to 10mA Load resistance: 1.5kΩ max.
				F	○	○	0 to 16mA Load resistance: 937Ω max.
				G	○	○	0 to 20mA Load resistance: 750Ω max.
				H	○	○	1 to 5V Load resistance: 2.5kΩ min.
				J	○	○	0 to 10mV Load resistance: 10kΩ min.
				K	○	○	0 to 100mV Load resistance: 100kΩ min.
				L	○	○	0 to 1V Load resistance: 500Ω min.
				N	○	○	0 to 5V Load resistance: 2.5kΩ min.
				P	○	○	0 to 10V Load resistance: 5kΩ min.
				R	○	○	±10V Load resistance: 5kΩ min.
				E	○	○	One-shot non-contact output
				F	○	○	Open collector output
				U	○	○	Voltage pulse output
				V	○	○	20 to 4mAdc
		V	○	○	5 to 1Vdc		
		IV	Power	A	○	○	100/110/120Vac 50/60Hz
B	○			○	200/220/240Vac 50/60Hz		
D	○			○	24Vdc		
Y0	○			○	With traceability certification		
V	Option	00	○	○	None		
		T0	○	○	Tropicalization		
		D0	○	○	With inspection data		
		B0	○	○	Tropicalization + inspection data		
		Y0	○	○	With traceability certification		
		VI	Temp. range designation (See Table 3)	○	○	(Select the code from Table 3 temperature range designation)	
Input range designation (See Table 1)	○	○		(Select the code from Table 1 input range designation)			
	○	○		(Select the code from Table 4 input range designation)			

• A circle (○) denotes availability.

Note: IP50TC/RD/PM: In case of the standard input ranges (Table 2), the relevant type No. should be entered in [II], but nothing need be entered in [VI].

For the semi-standard ranges, the relevant type No. including the temperature range should be entered in [II], and further the 4-digit code for specifying the temperature range, which is derived from Table 3, should be entered in [VI].

■ Table 1 Input range designation

A		Pulse frequency designation in hertz (Hz)		Count/minute or count/hour designation	
Symbol	Multiplier	Multiplier: Select from A 3 significant digits		Multiplier: Select from A 2 significant digits Unit: M (count/minute) H (count/hour)	
1	x 10		Example (1) 0Hz to 73.2kHz 0Hz to 73200Hz (2) 0Hz to 96.3Hz 0Hz to 732 x 100 0Hz to 963 x 0.1 7322 9639		Example (1) 0 to 3000 pulses/min (2) 0 to 200000 pulses/hr 0 to 30 x 100 pulses/min 0 to 20 x 10 ⁴ M302 H204
2	x 100				
3	x 1000				
4	x 10 ⁴				
5	x 10 ⁵				
8	x 1				
9	x 0.1				
G	x 0.01				
H	x 10 ⁻³				
J	x 10 ⁻⁴				

■ Table 2 Input type

(1) Thermocouple input: applies to IP50TCA and IP50TCC

Input type	Type No.	Input type and range	Type No.	Input type and range	Type No.	Input type and range
Standard range	KE	K 0 to 250°C	ED	E 0 to 200°C	WK	WRe5-20 0 to 600°C
	KF	K 0 to 300°C	EE	E 0 to 250°C	WL	WRe5-20 0 to 800°C
	KH	K 0 to 400°C	EF	E 0 to 300°C	WM	WRe5-20 0 to 1000°C
	KJ	K 0 to 500°C	EH	E 0 to 400°C	WN	WRe5-20 0 to 1200°C
	KK	K 0 to 600°C	EJ	E 0 to 500°C	WP	WRe5-20 0 to 1300°C
	KL	K 0 to 800°C	EK	E 0 to 600°C	WQ	WRe5-20 0 to 1400°C
	KM	K 0 to 1000°C	TE	T 0 to 250°C	WR	WRe5-20 0 to 1600°C
	KN	K 0 to 1200°C	TF	T 0 to 300°C	WS	WRe5-20 0 to 1800°C
	JD	J 0 to 200°C	RM	R 0 to 1000°C	WT	WRe5-20 0 to 2000°C
	JE	J 0 to 250°C	RN	R 0 to 1200°C	WU	WRe5-20 0 to 2300°C
	JF	J 0 to 300°C	RP	R 0 to 1300°C	-	-
	JH	J 0 to 400°C	RQ	R 0 to 1400°C	-	-
	JJ	J 0 to 500°C	RR	R 0 to 1600°C	-	-
	JK	J 0 to 600°C	-	-	-	-
	K1	K 0 to 100°C	E1	E 0 to 100°C	R4	R 0 to 400°C
	K2	K 0 to 150°C	E2	E 0 to 150°C	R5	R 0 to 500°C
	K3	K 0 to 200°C	T1	T 0 to 100°C	R6	R 0 to 600°C
	J1	J 0 to 100°C	T2	T 0 to 150°C	R7	R 0 to 800°C
	J2	J 0 to 150°C	T3	T 0 to 200°C	-	-
	Semi-standard range (span specification)	OK	Temperature range span: 100°C or more within K 0 to 1200°C	• Determine the 4-digit temperature range code from Table 3, and enter the result in [VI]. • The lower limit value of the range should be the span value x 1.5 or less.		
OJ		Temperature range span: 100°C or more within J 0 to 600°C				
OE		Temperature range span: 100°C or more within E 0 to 600°C				
OT		Temperature range span: 150°C or more within T 0 to 300°C				
OR		Temperature range span: 400°C or more within R 0 to 1600°C				
OW		Temperature range span: 600°C or more within WRe5-20 0 to 2300°C				

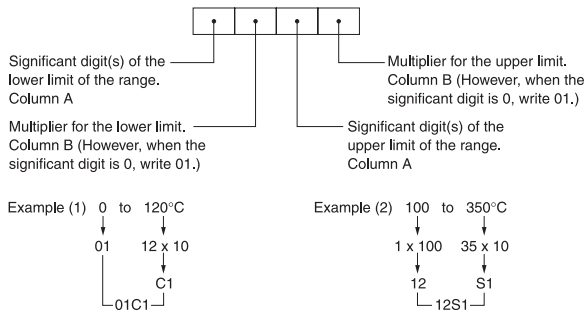
(2) Resistance temperature detector input: applies to IP50RDA and IP50RDC

Category	Type No.	Input type and range	Type No.	Input type and range	Type No.	Input type and range
Standard range	FA	JIS Pt100Ω (IEC · DIN) 0 to 50°C	PA	Old JPt100Ω 0 to 50°C	NA	Ni508Ω 0 to 50°C
	FB	JIS Pt100Ω (IEC · DIN) 0 to 100°C	PB	Old JPt100Ω 0 to 100°C	NB	Ni508Ω 0 to 100°C
	FC	JIS Pt100Ω (IEC · DIN) 0 to 150°C	PC	Old JPt100Ω 0 to 150°C	NC	Ni508Ω 0 to 150°C
	FD	JIS Pt100Ω (IEC · DIN) 0 to 200°C	PD	Old JPt100Ω 0 to 200°C	ND	Ni508Ω 0 to 200°C
	FE	JIS Pt100Ω (IEC · DIN) 0 to 250°C	PE	Old JPt100Ω 0 to 250°C	NN	Ni508Ω -20 to +80°C
	FF	JIS Pt100Ω (IEC · DIN) 0 to 300°C	PF	Old JPt100Ω 0 to 300°C	NP	Ni508Ω -20 to +100°C
	FG	JIS Pt100Ω (IEC · DIN) 0 to 350°C	PG	Old JPt100Ω 0 to 350°C	NQ	Ni508Ω -20 to +50°C
	FH	JIS Pt100Ω (IEC · DIN) 0 to 400°C	PH	Old JPt100Ω 0 to 400°C	-	-
	FJ	JIS Pt100Ω (IEC · DIN) 0 to 500°C	PJ	Old JPt100Ω 0 to 500°C	-	-
	FK	JIS Pt100Ω (IEC · DIN) 0 to 600°C	PK	Old JPt100Ω 0 to 600°C	-	-
	FN	JIS Pt100Ω (IEC · DIN) -20 to +80°C	PN	Old JPt100Ω -20 to +80°C	-	-
	FP	JIS Pt100Ω (IEC · DIN) -20 to +100°C	PP	Old JPt100Ω -20 to +100°C	-	-
	FQ	JIS Pt100Ω (IEC · DIN) -50 to +50°C	PQ	Old JPt100Ω -50 to +50°C	-	-
	FR	JIS Pt100Ω (IEC · DIN) -50 to +100°C	PR	Old JPt100Ω -50 to +100°C	-	-
	FS	JIS Pt100Ω (IEC · DIN) -100 to +100°C	PS	Old JPt100Ω -100 to +100°C	-	-
	FT	JIS Pt100Ω-200 to +200°C (IEC · DIN)	PT	Old JPt100Ω -200 to +200°C	-	-
	Semi-standard range	OF	Temperature range with a span of 50°C or more within JIS Pt100Ω (IEC · DIN) -200 to +600°C.	• Determine the 4-digit temperature range code from Table 3, and enter the result in [VI]. Cautions: • When the lower limit value of the range is 0°C or more, that value should be the span value x 2 or less. • When the upper limit value of the range is less than 0°C, that value should be the span value x (-2) or more.		
		OP	Temperature range with a span of 50°C or more within the old JIS Pt100Ω (IEC · DIN) -200 to +600°C.			
ON		Temperature range with a span of 50°C or more within Ni508 -50 to +250°C.				

(3) Potentiometer input: applies to IP50PMA and IP50PMC

Category	Type No.	Rated resistance value	Zero variable range	Span variable range
Standard range	9A	50 to 500Ω	0 to 50% FS	50 to 100% FS
	9B	501 to 10kΩ		

■ Table 3 Temperature range designation (semi-standard range): applies to IP50TCA, IP50TCC, IP50RDA and IP50RDC



■ Table 4 Input range designation

A		Pulse frequency designation in hertz (Hz)
Symbol	Multiplier	
9	x 0.1	<p>Multiplier: Select from A 3 significant digits</p> <p>Example 0 to 16.6Hz = 166 x 0.1Hz 1669</p>
G	x 0.01	
H	x 10 ⁻³	
J	x 10 ⁻⁴	
—	—	

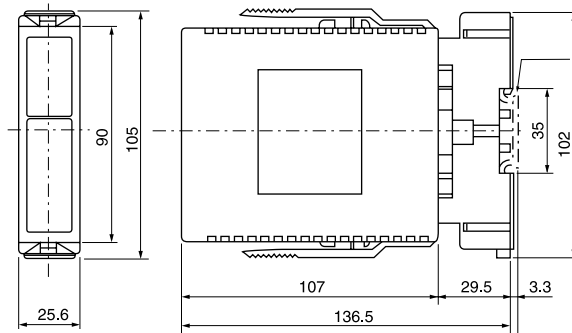
A						B	
Type No.	Significant Digits	Type No.	Significant Digits	Type No.	Significant Digits	Type No.	Multiplier
0	0	B	11	P	23	1	x 10
1	1	C	12	Q	24	2	x 100
2	2	D	13	R	25	3	x 1000
3	3	E	14	S	35	8	x 1
4	4	F	15	T	45	A	x (-10)
5	5	G	16	U	55	B	x (-100)
6	6	J	17	V	65	Y	x (-1)
7	7	K	18	W	75	—	—
8	8	L	19	X	85	—	—
9	9	M	21	Y	95	—	—
—	—	N	22	—	—	—	—

CONVERTERS

Dimensions

(Unit: mm)

• Models without a sensor for cold junction



• Models with a sensor for cold junction

