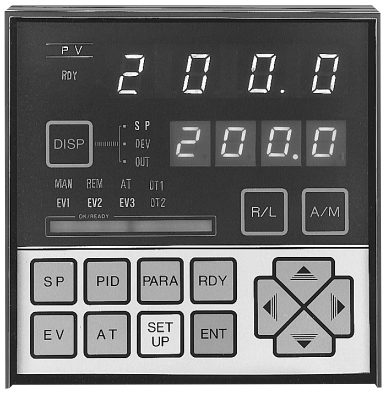
YAMATAKE

Specification

DigitroniK

Digital Indicating Controller SDC200

FEATURES

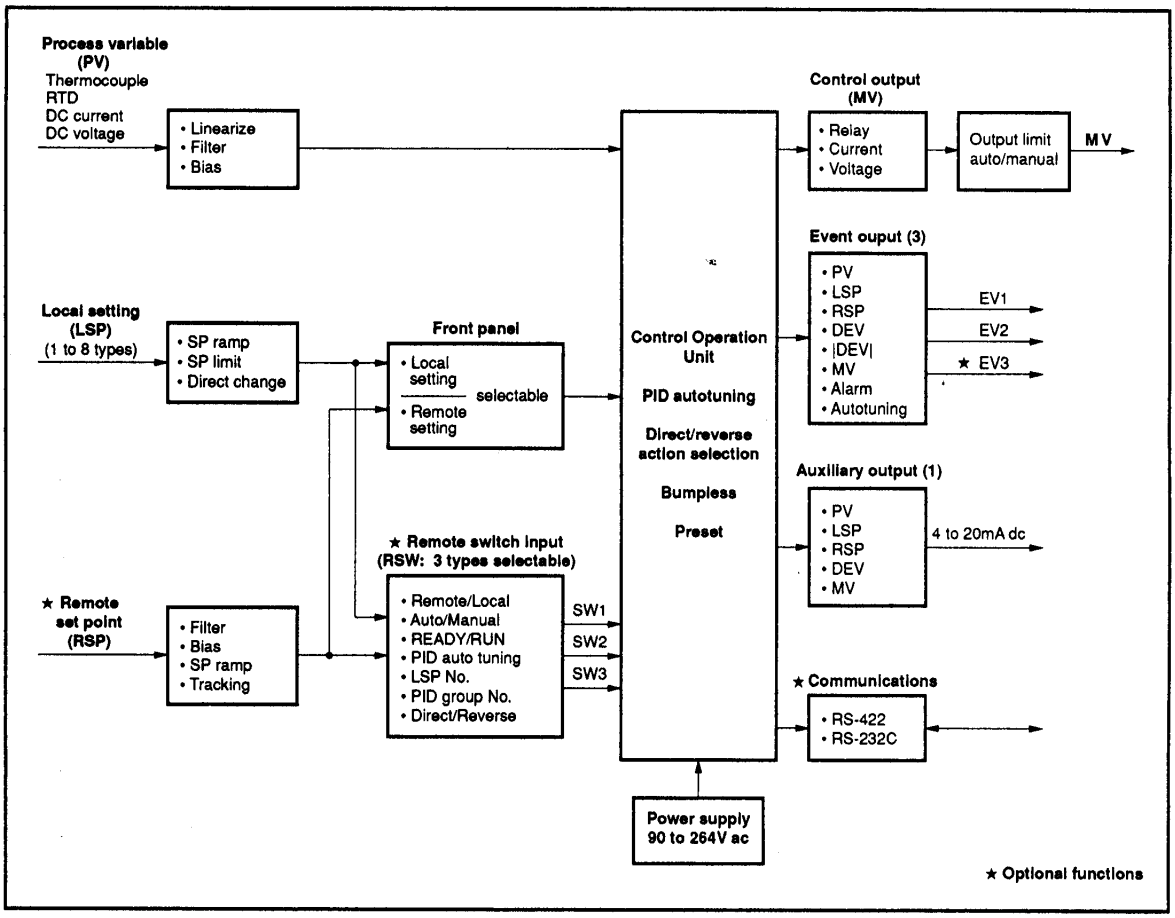


The DigitroniK SDC 200 is an accurate and compact (96mm x 96mm) digital indicating controller. The SDC200 is a multifunctional controller, to which a thermocouple signal, RTD signal, a DC voltage or DC current, etc. can be applied as input signals.

Its advanced PID autotuning capabilities, and heating/cooling control actions make it ideal for time proportional PID (ON/OFF), position proportional PID, continuous PID and heat/cool PID control. This instrument outputs a relay contact signal, voltage signal or current signal.

- *Accuracy up to ±0.2% FS*
- *From 1 to 8 set points*
- *Autotuning system uses up to three sets of PID control constants, as standard.*
- *Green bar OK lamp indicates normal operation at a glance*
- *Multirange system for each group of inputs.*
- *Change rate can use the SP ramp function.*
- *8 types of events can be set.*
- *Optional functions for a broad spectrum of applications.*
  - ★ *Communications*
  - ★ *Events*
  - ★ *Remote setting input*
  - ★ *External switch input*
  - ★ *Auxiliary output*

BASIC FUNCTION BLOCK DIAGRAM



SPECIFICATIONS

PV input	**Type of input**	Thermocouple, RTD, DC voltage, DC current. See the model selection guide for inputs ranges.	
	Input sampling cycle	0.25 sec.	
	Input digital filter	0.0 to 120.0 sec. variable (filter is off at 0.0 sec.)	
	Input bias	−100 to +100U variable (U: °C, kgf/cm²G, %, and other industrial units, including decimal point positioning.	
	Input impedance	Thermocouple input: 1MΩ min.	
		Voltage input: 1MΩ min.	
		Current input: 100Ω max.	
	Allowable wiring resistance	Thermocouple input: 250Ω max.	
		RTD input: 4Ω max.	
	Burnout	Thermocouple input: Upscale	
		RTD input: Upscale (when resistance element or "A" wire of RTD is broken)	Downscale: Less than −10% FS Upscale: More than 110% FS Overscale output value is settable.
		Current input: Downscale	
Data display and setting	**PV constant indication system**	4 digits, 7-segment LED indication	
	Storage system	Non-volatile EPROM	
	Range	Thermocouple, RTD input: See model selection guide [type of inputs/ranges].	
		Programmable range input (mV, V, mA): −1999 to +9999 (to 3 decimal places)	
	Accuracy	±0.2% FS ±1U under standard conditions See the model selection guide table [type of inputs/ranges].	
		Provide D19: ±0.3%FS ±1U. B18 (0 to 260°C, 0 to 500°F): ±5%FS ±1U. T44 (−200 to −45°C / −300 to −50°F): ±0.6% FS ±1U	
	Setting range	Thermocouple input: 1, 0.1°C or 1°F (Differs according to the type of input and ranges.)	
		RTD input: 1, 0.1°C or 1, 0.1°F (Differs according to the type of input and ranges.)	
		Programmable range input (mV, V, mA): 1. 0.1, 0.01, 0.001 (to 3 decimal places)	
	Setting system	Local: standard Direct change is enabled. LSP direct change: This function can change the LSP (local set point) without changing operation using the ENT key.	
		Remote system: Option (remote/local selectable, RSP tracking possible) RSP tracking: This function copies RSP (remote) onto LSP (local) automatically when RSP is changed over to LSP. Whether this function is provided or not can be selected.	

Control output

SDC 200 0D	SDC 200 6D	SDC 200 2G	SDC 200 5G	SDC 200 3D•AK•5K•9K•BK
Relay contact output	Voltage output	Relay contact output for Modutrol motor	Current output	Voltage/current/relay contact output
Time proportional PID	Time proportional PID	Position proportional PID	Continuous PID	Heat/cool PID
3 PID groups	3 PID groups	3 PID groups	3 PID groups	One PID group each for heat and cool
Autotuning	Autotuning	Autotuning	Autotuning	Without autotuning
Output ratings Relay contact: SPDT Resistive load: 250V ac 5A	Output ratings Opening voltage: 22.5V dc ±10% Internal resistance: 1.5kΩ ±10%	Output ratings Relay contact: 2SPDT Resistive load: 250V ac 0.5A 24V ac 2A Applicable motors: M904 • M6284 Inrush current: 1A Max. Motor feedback resistance: 100 to 2500Ω Power consumption: 50VA Max.	Output ratings Output current: 4 to 20mA dc Allwable load resistance: 600Ω Max. Output accuracy: ±0.2% (under standard conditions) Output update cycle: 0.25 sec.	Output ratings

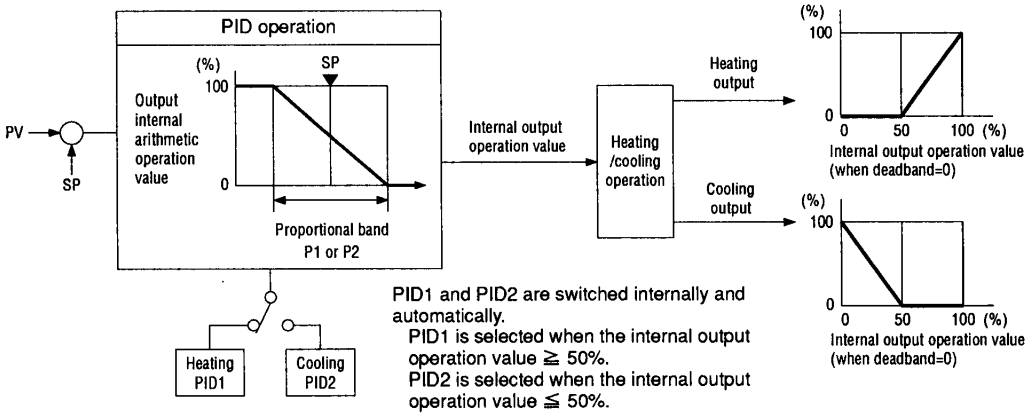
Type	Output 1 for heat	Output 2 for cool
3D	SPDT	SPDT
AK	4 to 20mA dc	SPDT
5K	4 to 20mA dc	4 to 20mA dc
9K	22.5V dc ±10%	SPDT
BK	4 to 20mA dc	22.5V dc ±10%

Notes: 1, 2, 3

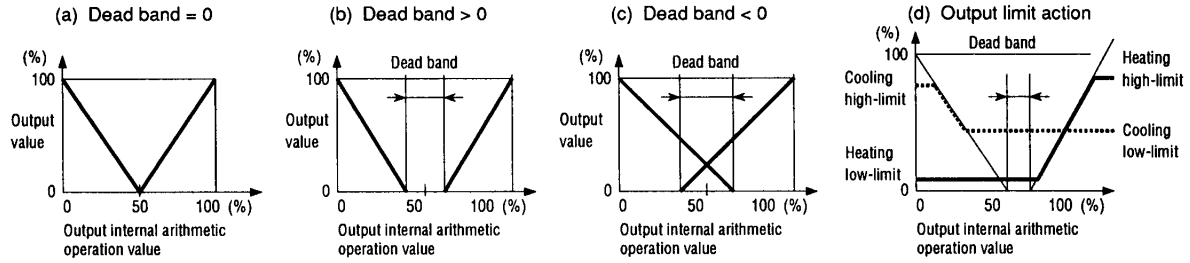
Control output

Notes: 1. Other ratings
For SPDT, same as SDC 200 0D
For 22.5V dc, same as SDC 200 6D
For 4 to 20mA dc, same as SDC 200 5G
2. Output 1 can be changed to cool, and output 2 to heat.

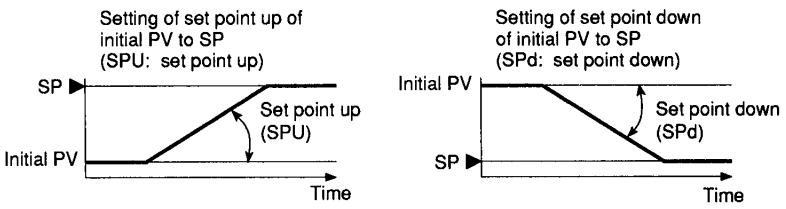
Notes: 3. Heat/cool control



PID1 and PID2 are switched internally and automatically.
PID1 is selected when the internal output operation value ≧ 50%.
PID2 is selected when the internal output operation value ≦ 50%.



Proportional band (P): %FS	**SDC 200 0D**	**SDC 200 6D**	**SDC 200 2G**	**SDC 200 5G**	**SDC 200 3D•AK•5K•9K•BK**
	0.0 to 999.9	0.0 to 999.9	0.1 to 999.9	0.1 to 999.9	0.1 to 999.9
	On/off control action is done when P=0.0	On/off control action is done when P=0.0	On/off control action is impossible.	On/off control action is impossible.	On/off control action is impossible.
Cycle time: Sec.	5 to 120	1 to 60	—	—	Type / Output 1 for heat / Output 2 for cool 3D: 5 to 120 / 5 to 120 AK: — / 5 to 120 5K: — / — 9K: 1 to 60 / 5 to 120 BK: — / 1 to 60
Integral time (I): Sec.	0 to 3600	0 to 3600	0 to 3600	0 to 3600	0 to 3600
	PD action is done when I=0.	PD action is done when I=0.	PD action is done when I=0.	PD action is done when I=0.	PD action is done when I=0.
Derivative time (D): Sec.	0 to 1200	0 to 1200	0 to 1200	0 to 1200	0 to 1200
	PI action is done when D=0	PI action is done when D=0	PI action is done when D=0	PI action is done when D=0	PI action is done when D=0
Manual reset: U	0 to 100	0 to 100	0 to 100	0 to 100	0 to 100
Differential gap: U	0 to 100	0 to 100	—	—	—
Dead zone: % output	—	—	0.5 to 25.0	—	–100 to 5.0
	% OUTPUT: Same meaning as %PB Formula to get actual dead zone value: DZ(U) = FS × PB/100 × DZ/100				
Output limiter Lower limit: %	0 to upper limit	0 to upper limit	0 to upper limit	–10 to upper limit	0 to upper limit
Output limiter Upper limit: %	Lower limit to 100	Lower limit to 100	Lower limit to 100	Lower limit to 110	Lower limit to 100
Set point ramp (SP ramp)	Function: Setting SP value change rate Effective when SPU≠0 and SPd≠0. Setting range: 0 to 999.9U/min. or hour 0 to 9999U/min. or hour Setting: By local SP or remote SP				
Output action direct/reverse selection	Possible	Possible	Possible	Possible	—
Auto/manual selection	Auto ↔ manual: Bumpless/preset outputs are selectable when auto/manual modes are selected. On/off action: On/off control action of 0D and 6D is possible in automatic mode.				



<table>
<tr><td rowspan="11">Event
(EV1, 2)</td><td>No. of channels</td><td colspan="4">Standard 2 outputs (EV1 output, EV2 output) and optional output (EV3 output) can be selected for 8 types of events. The same event can be selected twice.</td></tr>
<tr><td>Output action</td><td colspan="4">On-off action</td></tr>
<tr><td>Output rating</td><td colspan="4">Relay contact SPST relay Contact rating: 120V ac 1A, 240V ac 0.5A resistive load</td></tr>
<tr><td rowspan="9">Type
Setting range
Differential gap</td><td>Event symbol</td><td>Setting range</td><td>Differential gap</td><td>Event type</td></tr>
<tr><td>PV</td><td>–1999 to +9999</td><td>0 to 100U</td><td>Process variable</td></tr>
<tr><td>DEV</td><td>–1999 to +9999</td><td>0 to 100U</td><td>Deviation</td></tr>
<tr><td>|DEV|</td><td>0 to 9999</td><td>0 to 100U</td><td>Absolute deviation</td></tr>
<tr><td>MV</td><td>Lower limit to upper limit %</td><td>0 to 10%</td><td>Control output</td></tr>
<tr><td>RSP</td><td>–1999 to +9999</td><td>0 to 100U</td><td>Remote set point</td></tr>
<tr><td>Alarm</td><td>—</td><td>—</td><td>Turns on during alarm display</td></tr>
<tr><td>Autotuning</td><td>—</td><td>—</td><td>Turns on during execution of autotuning</td></tr>
<tr><td>SP</td><td>–1999 to +9999</td><td>0 to 100U</td><td>Actual set point</td></tr>
<tr><td>On delay time</td><td colspan="4">0 to 9999 sec. for PV, DEV, |DEV|, MV, RSP & SP</td></tr>
<tr><td>Stand by sequence</td><td colspan="4">Selectable for PV, DEV, |DEV|, MV, RSP & SP</td></tr>
<tr><td rowspan="17">Optional function 1

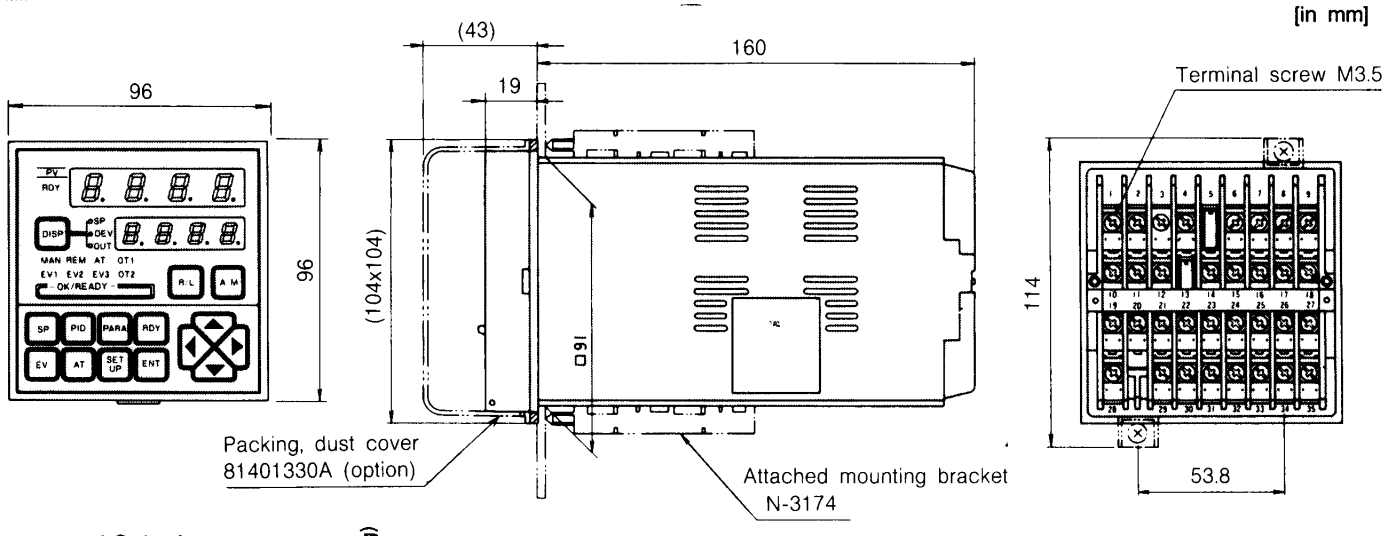
Isolation:
Complete isolation between input and output (except RSW input)</td><td rowspan="8">RS-422 communications

Note: 4. CMC 400 protocol converter is used for RS-422 communications.</td><td rowspan="3">Communication system</td><td>Network</td><td colspan="2">1-to-16 units max. multidropped (slave mode only)</td></tr>
<tr><td>Mode</td><td colspan="2">Half-duplex</td></tr>
<tr><td>Synchronization</td><td colspan="2">Start/stop</td></tr>
<tr><td rowspan="5">Interface system</td><td>Transmission</td><td colspan="2">Balanced (differential)</td></tr>
<tr><td>Type</td><td colspan="2">Serial</td></tr>
<tr><td>Signal line</td><td colspan="2">3 transmit/receive lines</td></tr>
<tr><td>Transmission speed</td><td colspan="2">1200, 2400, 4800, 9600bps</td></tr>
<tr><td>Communication distance</td><td colspan="2">300m max.</td></tr>
<tr><td rowspan="3">Data format</td><td>Others</td><td colspan="2">Conforms to RS-422.</td></tr>
<tr><td>Character configuration</td><td colspan="2">11 bits/character</td></tr>
<tr><td>Format</td><td colspan="2">1 start bit, even parity, 1 stop bit (standard)</td></tr>
<tr><td rowspan="9">RS-232C communications</td><td>Data length</td><td colspan="2">8-bit binary</td></tr>
<tr><td rowspan="3">Communication system</td><td>Network</td><td colspan="2">Peer-to-peer (slave mode only)</td></tr>
<tr><td>Mode</td><td colspan="2">Half-duplex</td></tr>
<tr><td>Synchronization</td><td colspan="2">Start/stop</td></tr>
<tr><td rowspan="5">Interface system</td><td>Transmission</td><td colspan="2">Unbalanced</td></tr>
<tr><td>Type</td><td colspan="2">Serial</td></tr>
<tr><td>Signal line</td><td colspan="2">3 transmit/receive lines</td></tr>
<tr><td>Transmission speed</td><td colspan="2">1200, 2400, 4800, 9600bps</td></tr>
<tr><td>Communication distance</td><td colspan="2">15m max.</td></tr>
<tr><td rowspan="3">Message character</td><td>Others</td><td colspan="2">Conforms to RS-232C</td></tr>
<tr><td>Character configuration</td><td colspan="2">11 bits/character</td></tr>
<tr><td>Format</td><td colspan="2">1 start bit, event parity, 1 stop bit (standard)</td></tr>
<tr><td rowspan="10">Optional function 2</td><td>Data length</td><td colspan="2">8-bit, ASCII</td></tr>
<tr><td>Event (EV)</td><td>EV 3</td><td colspan="2">Specifications are the same as those in EV1 and EV2 except that the output contact is SPDT.</td></tr>
<tr><td rowspan="3">Remote switch input (RSW)</td><td>Function</td><td colspan="2">Three items can be selected from non-operation, auto/manual, remote/local, READY/RUN, AT, and LSP No. PID No., direct/reverse action.</td></tr>
<tr><td>Input</td><td colspan="2">3 channels</td></tr>
<tr><td>Input rating</td><td colspan="2">Dry contact, Off terminal voltage: 5V±1V, Turn-on current: 6mA ±2mA</td></tr>
<tr><td rowspan="6">Remote setting (RSP)</td><td>Type of input</td><td colspan="2">1 to 5V dc or 4 to 20mA dc selectable (4 to 20mA is default)</td></tr>
<tr><td>Input indication accuracy</td><td colspan="2">±0.2%FS±1U under standard conditions (FS: 1 to 5V or 4 to 20mA full span input)</td></tr>
<tr><td>Input sampling cycle</td><td colspan="2">0.25 sec.</td></tr>
<tr><td>Input digital filter</td><td colspan="2">0.0 to 120.0 variable (Filter is off at 0.0.)</td></tr>
<tr><td>Input scaling</td><td colspan="2">Indicating values corresponding to input 0% FS and 100% FS can be set.</td></tr>
<tr><td>Isolation</td><td colspan="2">Complete isolation between RSP input and PV input / MV output / AUX output.</td></tr>
</table>

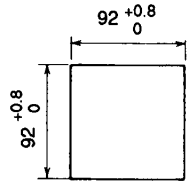
Optional function 2	**Auxiliary output (AUX)**	Type of output	Select one output from PV, SP, DEV, RSP and MV.
		Output rating	4 to 20mA dc Allowable load resistance: 600Ω Max.
		Output scaling	An output value corresponding to 4 to 20mA dc can be set. Reverse scaling is also possible.
		Output accuracy	±0.2% under normal conditions
		Output update cycle	0.25 sec.
General Specifications	**Rated power voltage**	90 to 264V ac 50Hz to 60Hz	
	Power consumption	18VA under standard conditions	
	Insulation resistance	50MΩ Min. by a 500V dc megger between case or ground terminal and power terminals	
	Dielectric strength	1500V ac, 1 min. between case or ground terminal and power terminals	
	Vibration resistance	0.5G Max. (10 to 60Hz in X, Y, and Z directions, 2 hours each)	
	Shock resistance	50G Max. in vertical direction, 3 times, while packed	
	Allowable ambient temperature	0 to 50°C	
	Storage temperature	–20 to +70°C	
	Allowable ambient humidity	10 to 90%RH	
	Construction	Mask: Multilon Case: Heat resistant ABS resin	
	Color	Black, equivalent to Munsell code N2.5	
	Mounting	Panel flush mount	
	Installation	Vertical plane ±10°	
	Weight	Approx. 1kg	
	Standard accessories	Mounting bracket: 1 set Part No. N3174 Unit indicating label: 1 sheet Part No. N3132	
	Auxiliary parts (optional)	Dust cover: Part No. 81401330A	
		Soft cover: Part No. 81403361-001	

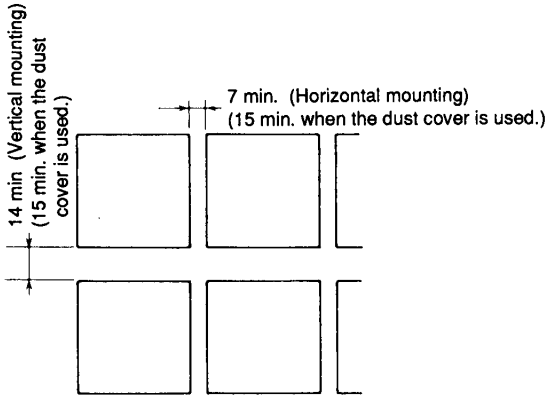
DIMENSIONS

[in mm]

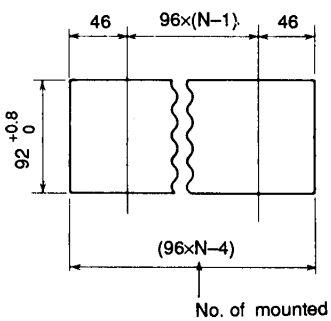


Panel Cutout:





Vertical and horizontal mounting panel cutout sizes (recommended)



Panel cutout size for closed mounting (recommended)

MODEL SELECTION GUIDE

I	II	III	IV	V	VI	VII

Example: SDC2005GK09A00701

I	II	III	IV	V	VI	VII	Contents (O: Included, – : Not included)
Basic Model No.	Control action	Input type range	Power supply	Optional function 1	Optional function 2	Additional processing	
SDC 200							Digital controller
	0D						Time proportional PID: Relay contact, 250v ac 5A, resistive load
	6D						Time proportional PID: Voltage 22.5V dc ±10%
	2G						Position proportional PID: M/M drive relay contact, 250V ac 0.5A, 24V ac 0.5A, resistive load
	5G						Continuous PID: Current 4 to 20mA dc
	3D						Output 1: Time proportional PID: Relay contact 250V ac 5A, resistive load Output 2: Time proportional PID: Relay contact 250V ac 5A, resistive load
	AK						Output 1: Time proportional PID: Current 4 to 20mA dc, resistive load, max. 600Ω Output 2: Time proportional PID: Relay contact 250V ac 5A, resistive load
	5K						Output 1: Continuous PID: Current 4 to 20mA dc, resistive load, max. 600Ω Output 2: Continuous PID: Current 4 to 20mA dc, resistive load, max. 600Ω
	9K						Output 1: Time proportional PID: Voltage 22.5V dc ±10%, internal resistance 1.5kΩ ±10% Output 2: Time proportional PID: Relay contact 250V ac 5A, resistive load
	BK						Output 1: Continuous PID: Current 4 to 20mA dc, resistive load 600Ω max. Output 2: Time proportional PID: Voltage 22.5V dc ±10%, internal resistance 1.5kΩ ±10%
Selected from ▶ Table 1.							
			A				90 to 264V ac, 50/60Hz
				0			None
				A			RS-422 communications provided
				B			RS-232 communications provided

		Event 3	External switch input	Remote setpoint	Auxiliary output	Application control action								
		EV3	RSW	RSP	AUX	0D	2G	5G	6D	3D	AK	5K	9K	BK
00		–	–	–	–	O	O	O	O	O	O	O	O	O
01		–	O	–	–	O	O	O	O	O	O	O	O	O
02		O	O	–	–	O	–	O	O	–	–	O	–	–
03		–	O	O	–	O	O	O	O	O	O	O	O	O
04		O	O	O	–	O	–	O	O	–	–	O	–	–
05		–	O	–	O	O	O	O	O	O	O	–	O	O
06		O	O	–	O	O	–	O	O	–	–	–	–	–
07		–	O※	O	O	O	O	O	O	O	O	–	O	O
08		O	O	O	O	O	–	O	O	–	–	–	–	–

01	None
D1	With test data
T1	Tropical treatment
B1	Tropical treatment with test data.
K1	With acid treatment.

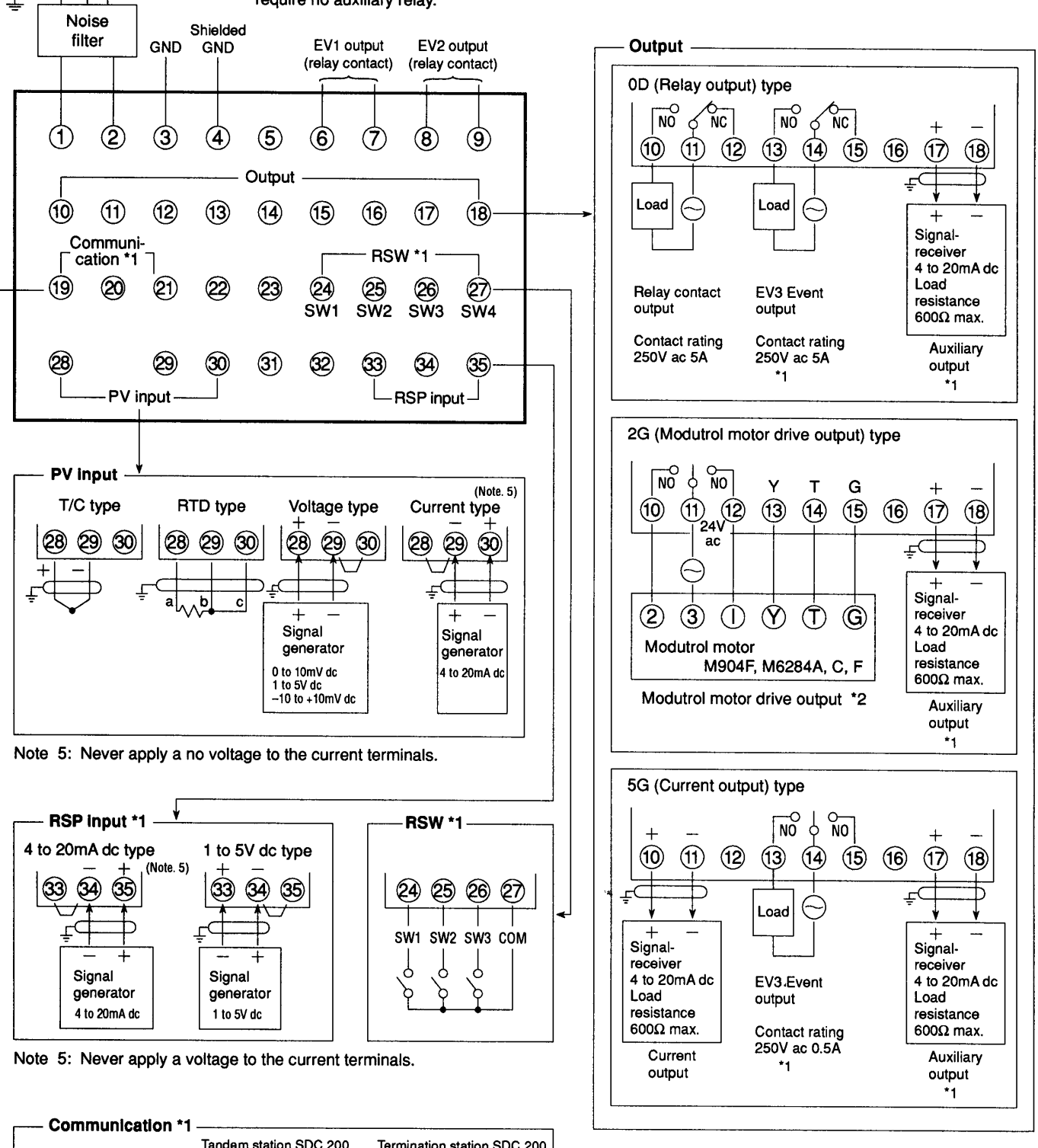
Table 1.: Type of Inputs / Ranges

Model No.	Type of input	Range		Resolution		PV range code	Multi-range
T44	Thermocouple T(CC)	−199.9 to +300.0°C	−300 to +700°F	0.1°C	1°F	6	Select-able
K04	Thermocouple K(CA)	0.0 to 400.0°C	0 to 750°F	0.1°C	1°F	12	
J08	Thermocouple J(IC)	0 to 800°C	0 to 1600°F	1°C	1°F	2	
E08	Thermocouple E(CRC)	0 to 800°C	0 to 1800°F	1°C	1°F	1	
K08	Thermocouple K(CA)	0 to 800°C	0 to 1600°F	1°C	1°F	11	
K09	Thermocouple K(CA)	0 to 1200°C	0 to 2400°F	1°C	1°F	3	
U13	Thermocouple N	0 to 1300°C	32 to 2372°F	1°C	1°F	9	
Y13	Thermocouple PLII	0 to 1300°C	32 to 2372°F	1°C	1°F	10	
R16	Thermocouple R(PR13)	0 to 1600°C	0 to 3100°F	1°C	1°F	4	
S16	Thermocouple S(PR10)	0 to 1600°C	0 to 3100°F	1°C	1°F	5	
B18	Thermocouple B(PR30-6)	0 to 1800°C	0 to 3300°F	1°C	1°F	0	
D19	Thermocouple PR40-2	0 to 1900°C	(0 to 3400°F)	1°C	1°F	8	
W23	Thermocouple W(WRe5-26)	0 to 2300°C	0 to 4200°F	1°C	1°F	7	
F50	JIS '89 Pt100 (equivalent to IEC & DIN)	−200 to +500°C	−300 to +900°F	1°C	1°F	20	Select-able
F46	"	−199.9 to +200.0°C	−300 to +400°F	0.1°C	1°F	21	
F32	"	−100.0 to +150.0°C	−150.0 to +300.0°F	0.1°C	0.1°F	32	
F36	"	−50.0 to +200.0°C	−50.0 to +400.0°F	0.1°C	0.1°F	31	
F33	"	−40.0 to +60.0°C	−40.0 to +140.0°F	0.1°C	0.1°F	30	
F01	"	0.0 to 100.0°C	0.0 to 200.0°F	0.1°C	0.1°F	34	
F03	"	0.0 to 300.0°C	0.0 to 500.0°F	0.1°C	0.1°F	33	
F05	"	0.0 to 500.0°C	0.0 to 900°F	0.1°C	1°F	29	
P46	JIS '89 JPt100 (old JIS Pt100)	−199.9 to +200.0°C	−300 to +400°F	0.1°C	1°F	22	
P32	"	−100.0 to +150.0°C	−150.0 to +300.0°F	0.1°C	0.1°F	26	
P36	"	−50.0 to +200.0°C	−50.0 to +400.0°F	0.1°C	0.1°F	25	
P33	"	−40.0 to +60.0°C	−40.0 to +140.0°F	0.1°C	0.1°F	24	
P01	"	0.0 to 100.0°C	0.0 to 200.0°F	0.1°C	0.1°F	28	
P03	"	0.0 to 300.0°C	0.0 to 500.0°F	0.1°C	0.1°F	27	
P05	"	0.0 to 500.0°C	0.0 to 900°F	0.1°C	1°F	23	
C01	Current 4 to 20mA dc linear	Programmable	−1999 to +9999	–	–	40	Select-able
L02	Voltage −10 to +10mV dc linear	Programmable	−1999 to +9999	–	–	42	
M01	Voltage 0 to 10mV dc linear	Programmable	−1999 to +9999	–	–	41	
V01	Voltage 1 to 5V dc linear	Programmable	−1999 to +9999	–	–	45	

WIRING

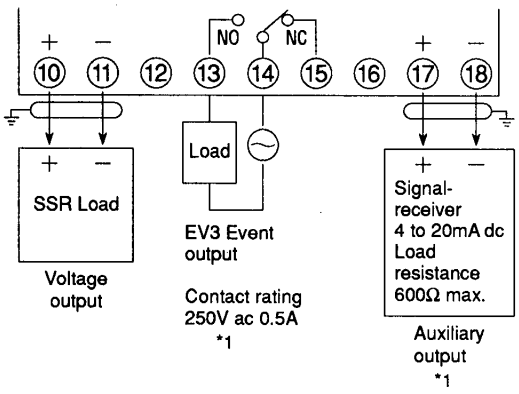
Instrument power supply
90 to 264V ac

Notes: 1. Optional
2. Always use an auxiliary relay when a 100/200V ac type Modutrol motor is used.
Recommended Modutrol motors M904F, M6284A, C, F require no auxiliary relay.

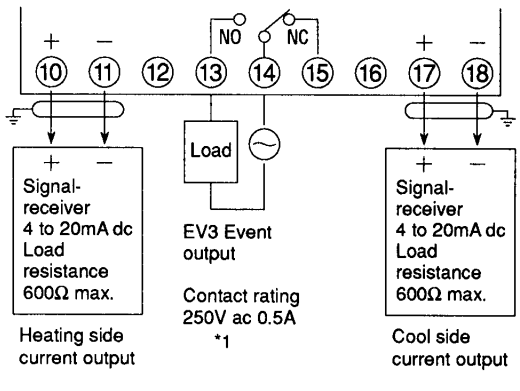


Output

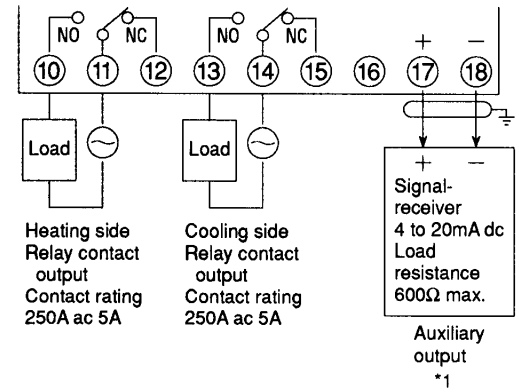
6D (Voltage output) type



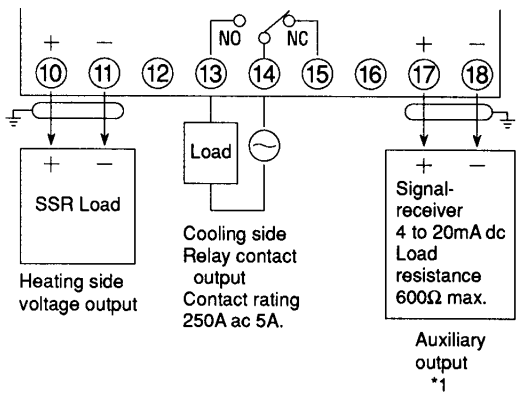
5K (Heating/cooling: Current + Current) type



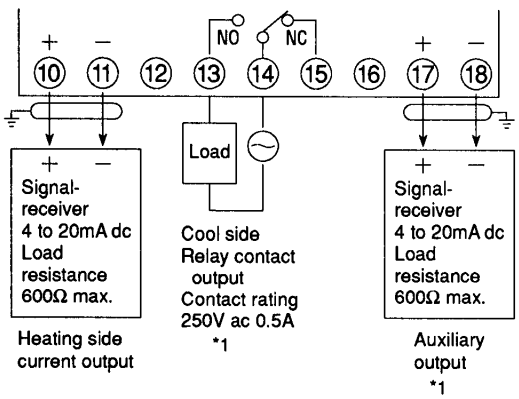
3D (Heating/cooling: Relay + Relay) type



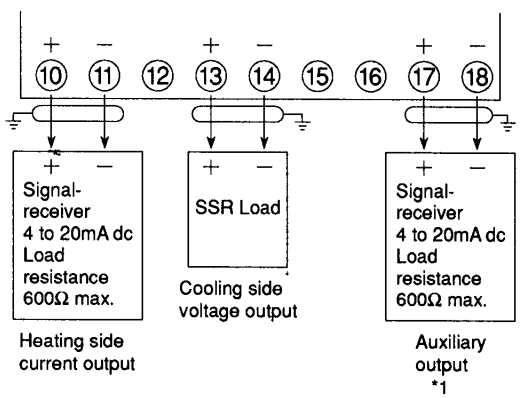
9K (Heating/cooling: Voltage + Relay) type



AK (Heating/cooling: Current + Relay) type



BK (Heating/cooling: Current + Voltage) type



WIRING PRECAUTIONS

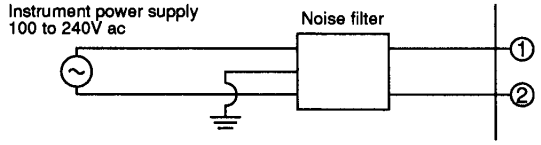
1. Isolation

The section bounded by a solid line (———) is isolated from the rest of the circuit.
The section bounded gy a dotted line (-------) is not isolated from the rest of the circuit.

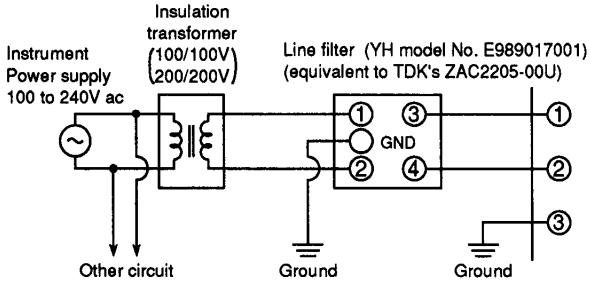
<table>
<tr><td colspan="2">Loader interface</td><td>Motor feedback
Potentiometer input</td></tr>
<tr><td rowspan="2">Remote setpoint</td><td rowspan="6">Digital
circiut</td><td>Current output (Control output)</td></tr>
<tr><td>Current output (Auxiliary output)</td></tr>
<tr><td rowspan="4">PV input</td><td>Voltage output (Control output)</td></tr>
<tr><td>Relay output (Control output)</td></tr>
<tr><td>Event output 1</td></tr>
<tr><td>Event output 2</td></tr>
<tr><td colspan="2">Remote switch input</td><td>Communication I/O</td></tr>
</table>

2. Power supply noise

(1) Noise reduction techniques
Always use a noise filter to suppress as much as possible the influence of noise, even if noise is not obvious.



(2) When noise is obvious
If noise is observable, suppress it by using an insulation transformer and line filter.



3. Noise

Possible noise sources are:
Relays and contacts, electromagnetic coils, solenoid valves, power lines (specifically, those higher than 100V ac), motor commutators, phase angle control SCRs, radio equipment, welding machines, high voltage ignition devices, etc.

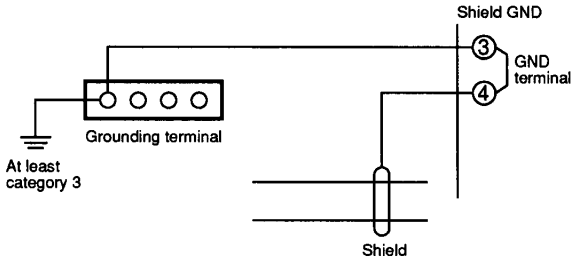
(1) Suppression techniquies for quick rising noise
A CR filter is effective for quick rising noise.
Recommended filter:
YH model No. E989010001
(equivalent to Matsuo Electric 953M500333311)

(2) Suppression technique for noise with large peaks:
A varistor is effective for reducing noise with large peaks.
However, care should be taken to avoid shorting if varistor is faulty.
Recommended varistor:
YH model No. E968010471 (for 100V ac)
E968011821 (for 200V ac)

4. Grounding

Ground the SDC 200 at a single point to GND terminal 3. Connect no jumper wiring. Prepare a grounding terminal board separately if grounding of a shield wire is difficult.

Grounding type:
At least category 3 (100Ω max.)
Grounding wire:
Soft steel wire (AWG14) of more than 2mm^2.
Grounding wire length:
20m max.



5. Wiring operation

(1) Do not bundle the rimary and secondary power lines together, and do not run them in the same wireing conduit or duct after carrying out noise countermeasures.

(2) Run the input/output and communication lines more than 50cm from drive power or power lines of higher than 100V ac. Do not run these wires in the same wiring conduit or duct.

6. Check after wiring

After wiring, be sure to check the connecting line conditions.
CAUTION: incorrect wiring may cause incorrect operation and instrument failure.

⚠ RESTRICTIONS ON USE

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment. Accordingly, when used in the applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- **Safety devices for plant worker protection**
- **Start/stop control devices for transportation and material handling machines**
- **Aeronautical/aerospace machines**
- **Control devices for nuclear reactors**

Never use this product in applications where human safety may be put at risk.

Specifications are subject to change without notice.

YAMATAKE

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