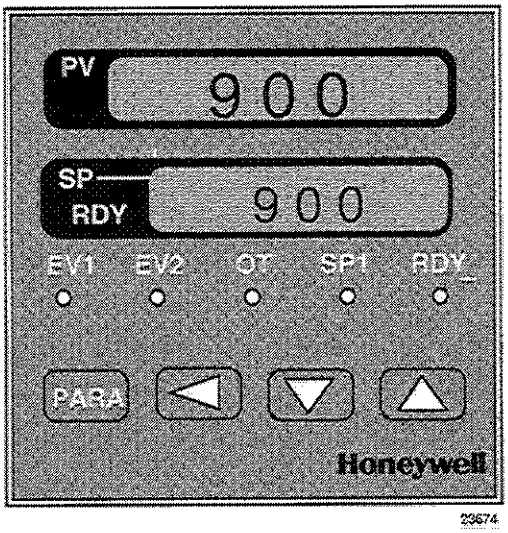
UDC900 Digital Indicating Controller Specification

Overview

The UDC900 Universal Digital Controller is a microprocessor-based, 1/16 DIN Temperature controller with auto-tuning. This compact controller is available for either panel or socket mounting. The large and easy-to-read displays and tactile keyboard make the UDC900 easy to set-up and operate. (Figure 1)

The UDC900 is fully dedicated to monitor and control temperatures in a wide range of applications in industries such as Plastics and Semiconductors, Food and Beverage, Packaging, Painting and Coating, and Environmental Chambers.

It also satisfies the requirements for process interruptions (Run/Ready), Timers, and Heater Break Alarms.



(appears larger than actual size)

Figure 1 - UDC900 Digital Indicating Controller

Features

Dual Displays - Two 4-digit displays with 7-segments can be set to display PV, Setpoint, Control Output, Event Setting values, or Heater Current values.

Easy Configuration - Two different configuration levels (Set-up mode and Parameter mode) provide easy access to the parameters and their values or selections.

Universal Switching Power - Operates on any line voltage from 85 to 264 Vac 50/60 Hz without jumpers.

Thermocouple and RTD Inputs - Models available for Thermocouple (T/C) and Resistance Temperature Detector(RTD), range selectable through keyboard configuration. (See Table 1)

Features, continued

DIN Rail Mounting - Provides for simple installation on a wall or inside cabinets. Socket mounting allows easy (plug-in) maintenance.

Auto Tuning - Allows user entered tuning parameters or automatic calculation of appropriate values. A user-entered manual reset is provided for Proportional only control.

Auto-tune provides process response identification and readjustment of PID parameters on:

- Process Start-up
- Setpoint Change
- Process Disturbance

A front panel indicator flashes when Auto-tune is active.

Run/Ready Key- Front panel key (or external contacts) allows:

- Process Interruptions
- Batch Processing
- Optional Remote Control
- Displays remain active.

Features, continued

On/Off Control with Hysteresis - On/Off control with differential gap to reduce output cycling.

Setpoint Limits- User specified setpoint limits provide additional operating security.

Data Security- None or up to three levels of keyboard security protect all but setpoint, event presets and Run/Ready key, or all but setpoint and Run/Ready key, or all changes.

Non-volatile memory assures data integrity on power loss.

Quality/Support - The UDC900 is covered by a 2-year warranty and backed up by technical assistance.

Optional Features (Fig. 4)

Two Digital Inputs - Allow remote switching of external DC power source to select one of the following:

- Switch between two Setpoints
- Start event timers
- Release Latched Alarms
- Control Run/Ready states
- Stop/Start Auto -tuning

Two Alarm/Event Relays - In addition to Alarm Output operation, on-delay timers for process events are also available.

Current Transformer Input **(Heater Break Alarm)** - Detects heater line breaks and overcurrent, also detects final control device short circuit. The detection display range is 0 to 50A.

Physical Description

The controller is housed in a 3.9 inch(100mm) deep, polycarbonate case with a dark gray ABS Resin bezel, that can be panel mounted in a 1/16 DIN cutout or socket mounted. (See Figures 5 & 7)

All power, input, and output wiring are connected to screw terminals on the rear of the controller.
See Figure 6 for Panel mounted (T) type or Figure 7 for Socket mounted (S) type.

Inputs

Each analog input is sampled twice a second. The sampled signal is amplified and then converted to a digital signal which is passed to the microprocessor.

The primary input can be one of various Thermocouple (T/C) or Resistance Temperature Detector (RTD) actuations (See Table 1). All ranges are keyboard configurable.

Upscale or Downscale burnout indication is provided.

Two optional digital inputs with external DC power may be used to alter control states or start timed events remotely.

Block Diagram

Figure 2 is a basic Function Block Diagram of the UDC900.

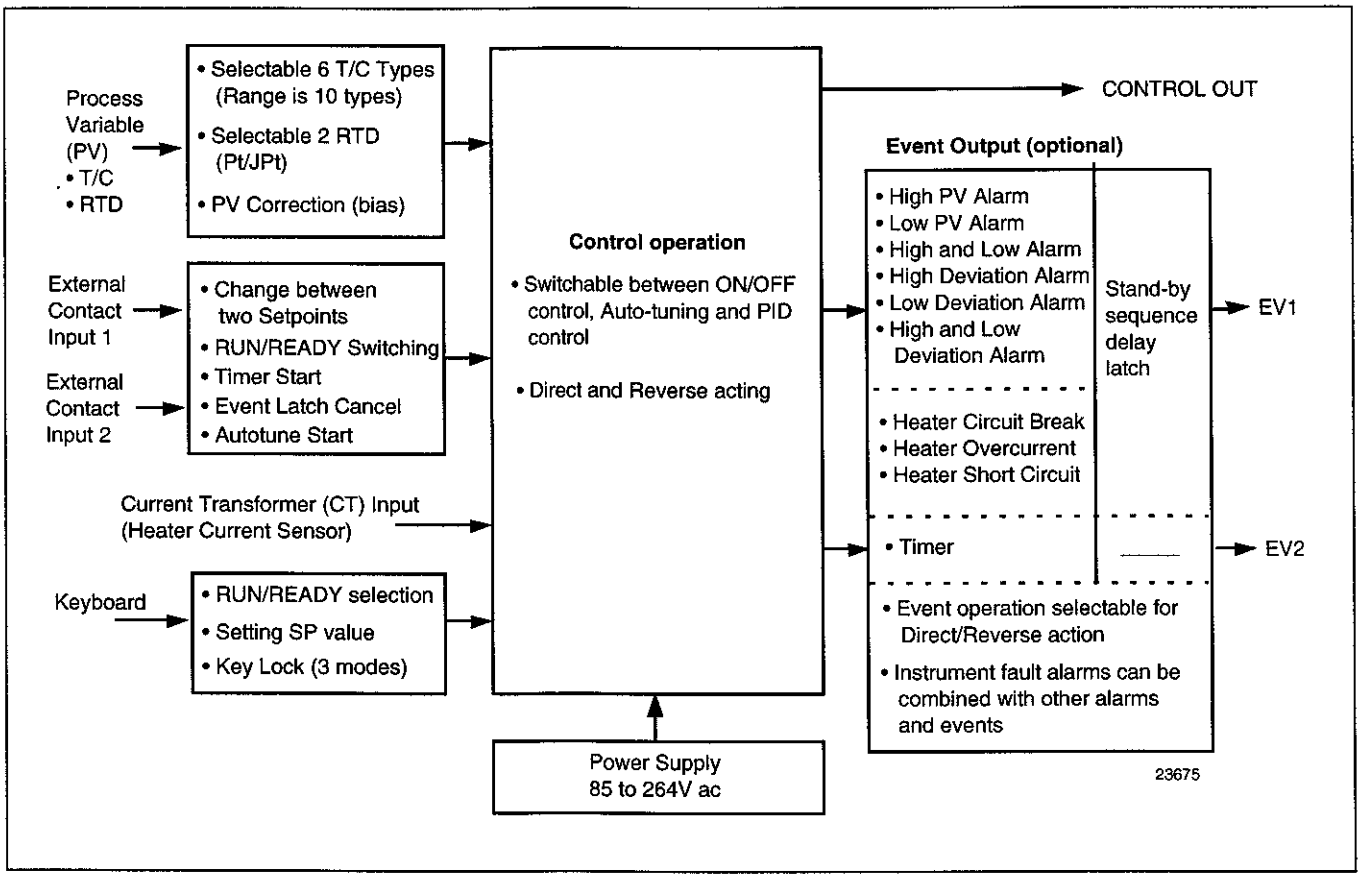


Figure 2 - UDC900 Digital Indicating Controller Function Block Diagram

Operator Interface

Figure 3 shows the function of the displays, indicators, and keys.

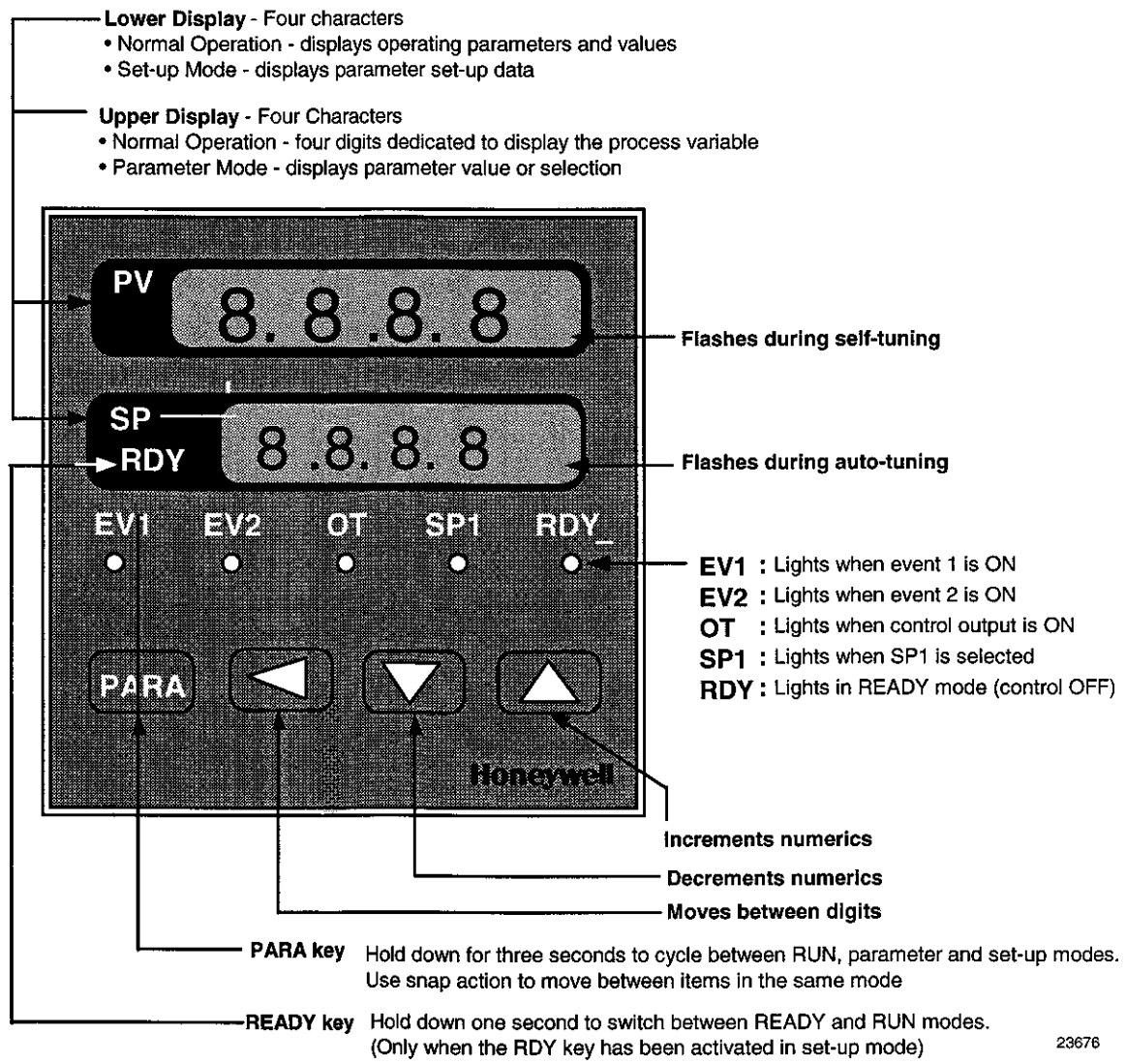


Figure 3 - Operator Interface

Specifications

Design

PV Input	**Type of Inputs**	Thermocouple and Resistance Temperature Detector (RTD) -See Table 1.
	Sampling Cycle	500ms
	Process Variable Offset(PV)	-1999 to 9999 or -199.0 to 999.9
	Input Bias Current	*Thermocouple Input:* 0.5μA or less *RTD Input:* Approx. 1mA (current input terminal A)
	Line Break Burnout Display	*Thermocouple Input:* Upscale and alarm display (AL01) *RTD Input: (refer to Figure 6 RTD wiring Diagram)* Resistor or break in line A : Upscale and AL01 Break in line B : Downscale, AL02 and AL03 Break in line C : Upscale, AL01 and AL03 Breaks in 2 or 3 lines : Upscale, AL01 and AL03 or Downscale, AL02 and AL03 A and B short-circuited : Downscale and AL02 A and C short-circuited : Downscale and AL02
Indications and Settings	**PV, SP Indication Method**	4-digit, 7-segment LED *PV*: Upper Green Display *SP*: Lower Amber Display
	Setpoints	1 or Optional 2 points
	Accuracy	±0.5% FS ±1 digit (display value conversion under normal conditions) however, thermocouple negative range is ±1% FS +1 digit.
	Indication Range	See Table 1 for details.
	Indicator Setting Units	*Thermocouple Input:* 1°C *RTD Input:* 1°C, 0.1°C (depends on Input type)
	Setting Value (SP) Limit	*Lower Limit:* Lower range value limit to upper setpoint limit *Upper Limit:* Lower setpoint limit to upper range value limit
	Function Display System	Green 4-digit, 7-segment LED (also used for indication PV)
	Status Display	*EV1, EV2:* Red LED *OT(control output), RDY(Ready):* Green LED *SP1:* Amber LED
	Key Lock (Four Modes)	• None • All keys locked • Keys other than SP setting and RDY keys locked • Keys other than SP setting, event setting, RDY keys locked
CE Conformity (Europe)	**Statement**	This product is in conformity with the protection requirements of the following European Council Directives: **73/23/EEC**, the Low Voltage Directive, and **89/336/EEC**, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.
	Product Classification:	Class I: Permanently Connected, Panel Mounted Industrial Control Equipment (Model DC9TXXXXXXX are only conformed to EN61010-1-1993 for 73/23/EEC) (EN 61010-1) *Models DC9-S-XX-X-X-XX-X are not CE approved*
	Enclosure Rating	Panel Mounted Equipment, this controller must be panel mounted. Terminals must be enclosed within the panel.
	Installation Category (Overvoltage Category):	Category II: Energy-consuming equipment supplied from the fixed installation. Local level appliances, and Industrial Control Equipment. (EN 61010-1)
	Pollution Degree:	Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 664-1)
	EMC Classification:	Group 1, Class A, ISM Equipment (EN 55011, emissions), Industrial Equipment (EN 50082-2, immunity)
	Method / EMC Assessment	Technical File (TF)
	Approvals	UL and CSA pending

Specifications, continued

Design, continued

Control Output	**Output Types**	*Model OD:* Relay Contacts *Model 6D:* Voltage Pulse (for SSR drive)
	Control Action	Three actions can be selected: • On/Off Control • Self-tuning (adaptive control) see **note** • Control using fixed PID value **Note** : SDC self-tuning automatically adjusts control constants during SP value changes, disturbances or load changes. Control constants can also be fixed.
	Output Rating	*Model OD* Contact Type: SPDT / Contact Rating: 250V ac 3A (resistive load) *Model 6D* Open Voltage: 22.5V dc ±15% / Internal Resistance: 1120½±10%
	Cycle Time (Self Tune & PID)	*Model OD:* 5 to 120 seconds *Model 6D:* 1 to 120 seconds
	PID Control	*Proportional Band:* 0.1 to 999.9 sec. *Integral Time:* 0 to 3600 sec.(PD operational when I=0) *Derivative Time:* 0 to 1200 sec.(PI operational when D=0) *Manual Reset* 0 to 100% (only when I=0)
	On/Off Control	*Differential Gap:* 0 to 9999 or 0.0 to 999.9
	Control Action Switching	Direct/Reverse switchable
	Run/Ready Switching	Front panel RDY key/external contacts (control output off in READY mode)
External Contact Inputs	**Number of Inputs**	2 Points (optional)
	Function	SP (two setting values) change, Run/Ready switching, timer start, event latch cancel, auto-tuning start/stop.
	Input Rating	12 to 24Vdc (External Supply)
	Detection min. hold time	200ms
Alarm/Event Relays	**Number**	2 (optional)
	Contact Rating	SPST contacts, 250Vac, 1A resistive Load
	Process alarm/event action	High PV, Low PV, High and Low PV, High/Low Deviation from SP
	Process Alarm/Event Functions	*Standby:* On power-up and RUN, process condition causing alarm/event ON status is only active after OFF process condition exists. *Latch:* Relay stays ON after process condition clears, until manually reset. *Delay:* ON status is delayed by user specified time Delay Time: 0 to 999 sec.
	Timer	On time delay. Time: 1 to 999 sec.
	Fault Alarm	ON status for controller diagnostics
	Heater Break/Overcurrent alarm	ON status for open circuit or high current
	Normal/inverted relay action	Relay action can be set to Direct (non-energized relay) or Reverse (energized relay) for an OFF status input.
	Hysteresis	A differential gap of 1 to 9999 or 0.0 to 999.9

Continued next page

Specifications, continued

Design, continued

Current Transformer Input (Heater Current Sensor)	**Number of Inputs**	1 Point (option)
	Detection Functions	*Control Output ON:* Detection of heater line break or overcurrent *Control Output OFF:* Detection of final control device short-circuit
	Current detection accuracy	±5% FS
	Detection Display range	0 to 50A
	Output	Output relays can be selected from Event 1 and Event 2
	Detection min. time	*Line Break Output:* Control Output min. ON time 300ms or more *At Short Circuit:* Control Output min. OFF time 300ms or more

General

General Specifications	**Memory Backup**	Non-volatile semiconductor memory
	Power Supply Voltage	85 to 264V ac, 50/60 Hz
	Power Consumption	7VA Max. (depends on operating conditions)
	Insulation Resistance	Across power terminals and secondary terminals: 500Vdc, 20M½ or more
	Dialectic Strength	Across power terminals and secondary terminals: 1500Vac for 1 minute
	Operating Conditions	*Ambient Temperature:* 0 to 50°C *Ambient Humidity:* 10 to 90% RH (no condensation) *Vibration Resistance:* 2.0m/s^2 (0.2G) or less *Mounting Angle:* Reference Plane ±10°
	Shipping and Storage Conditions	*Ambient Temperature:* 20 to 70°C *Ambient Humidity:* 10 to 95% RH (no condensation) *Package Drop Test:* Drop Height: 60cm
	Materials of Mask and Case	*Mask:* ABS Resin *Case:* Polycarbonate
	Installation	*S Type:* Socket Mounted (Mounted in a special Socket) *T Type:* Panel Mounted (Using dedicated mounting bracket) See Figure 5 - Dimensions.
	Wiring	See Figures 6 and 7.
	Weight (Mass)	*S Type:* Approx. 300g (including socket) *T Type:* Approx. 200g (including mounting bracket)

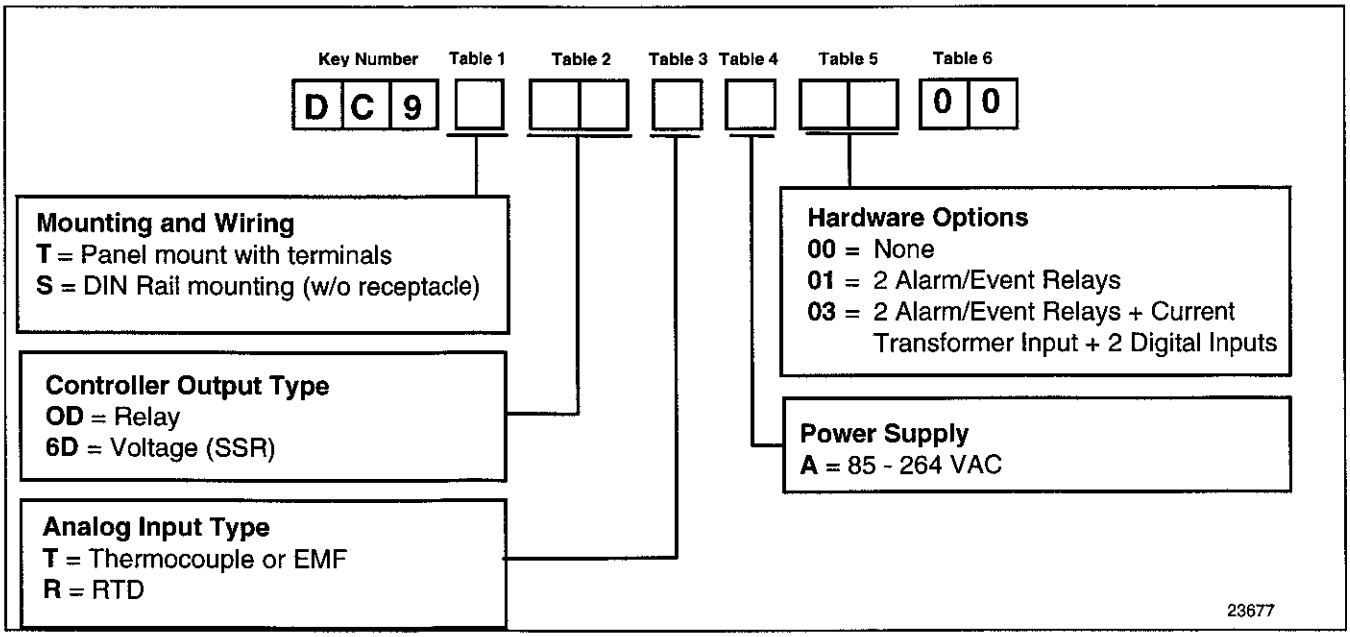
INGECO Z.S.
Leandro N.Alem 1351/53
-(1871)-Dock Sud
Buenos Aires-Argentina
T.E.:4201-5316/4222-9821
FAX:4222-9821

Specifications (continued)

Table 1 - Input Actuations

PV Input	Ranges _F	Ranges _C
Thermocouples		
K	0 to 2200	0 to 1200
K	0 to 1100	0 to 600
K	0 to 700	0 to 400
K	-300 to 700	–200 to 400
J	0 to 1500	0 to 800
J	-300 to 700	–200 to 400
E	0 to 1100	0 to 600
T	–300 to 700	–200 to 400
DIN U	–300 to 700	–200 to 400
DIN L	0 to 1500	0 to 800
RTD		
Pt100	-300 to 700	-200 to 500
Pt100	0 to 300	0 to 200
Pt100	0.0 to 300.0	0.0 to 200.0
JPt100	-300 to 700	–200 to 500
JPt100	0 to 300	0 to 200
JPt100	0.0 to 300.0	0.0 to 200.0

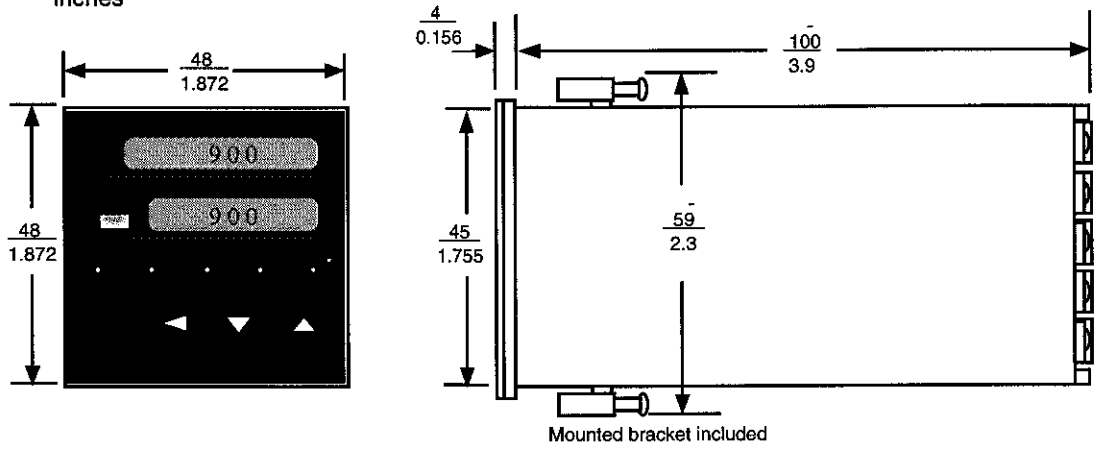
Model Number Interpretation



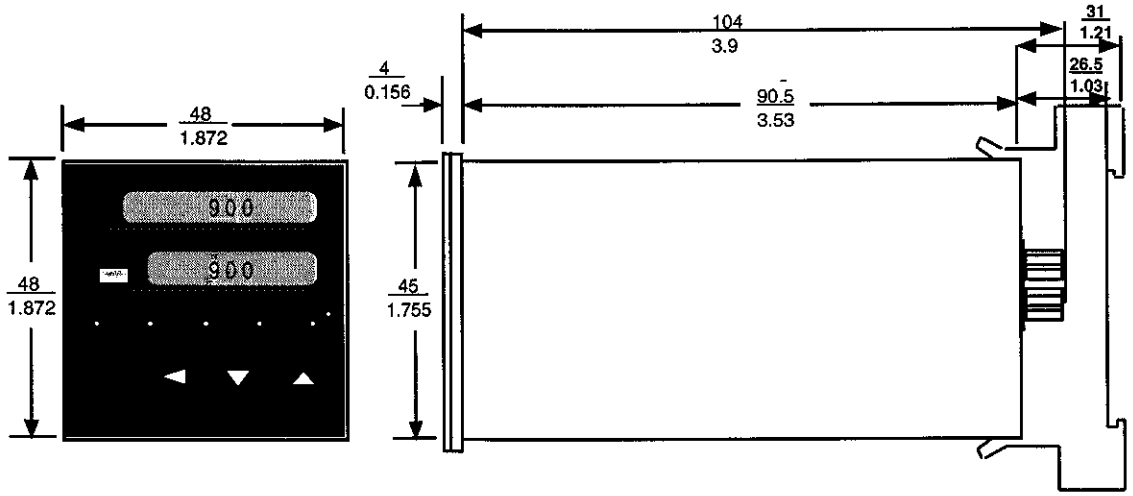
Dimensions

mm
inches

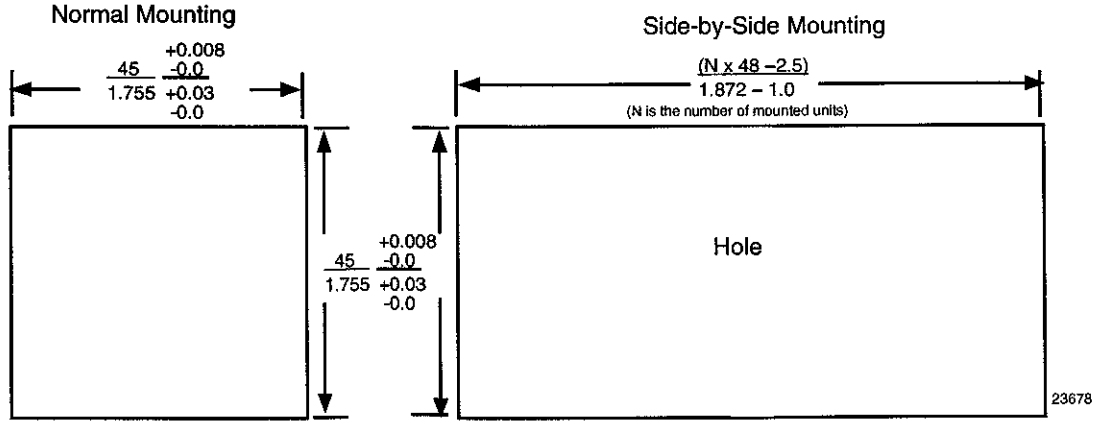
Panel Mounted (T) Type



Socket Mounted (S) Type



Panel Cutout



Note: When three units are mounted close together horizontally, the maximum allowable ambient temperature is 45 degrees C

Figure 5 - UDC900 Controller dimensions - not to scale

Wiring Diagrams

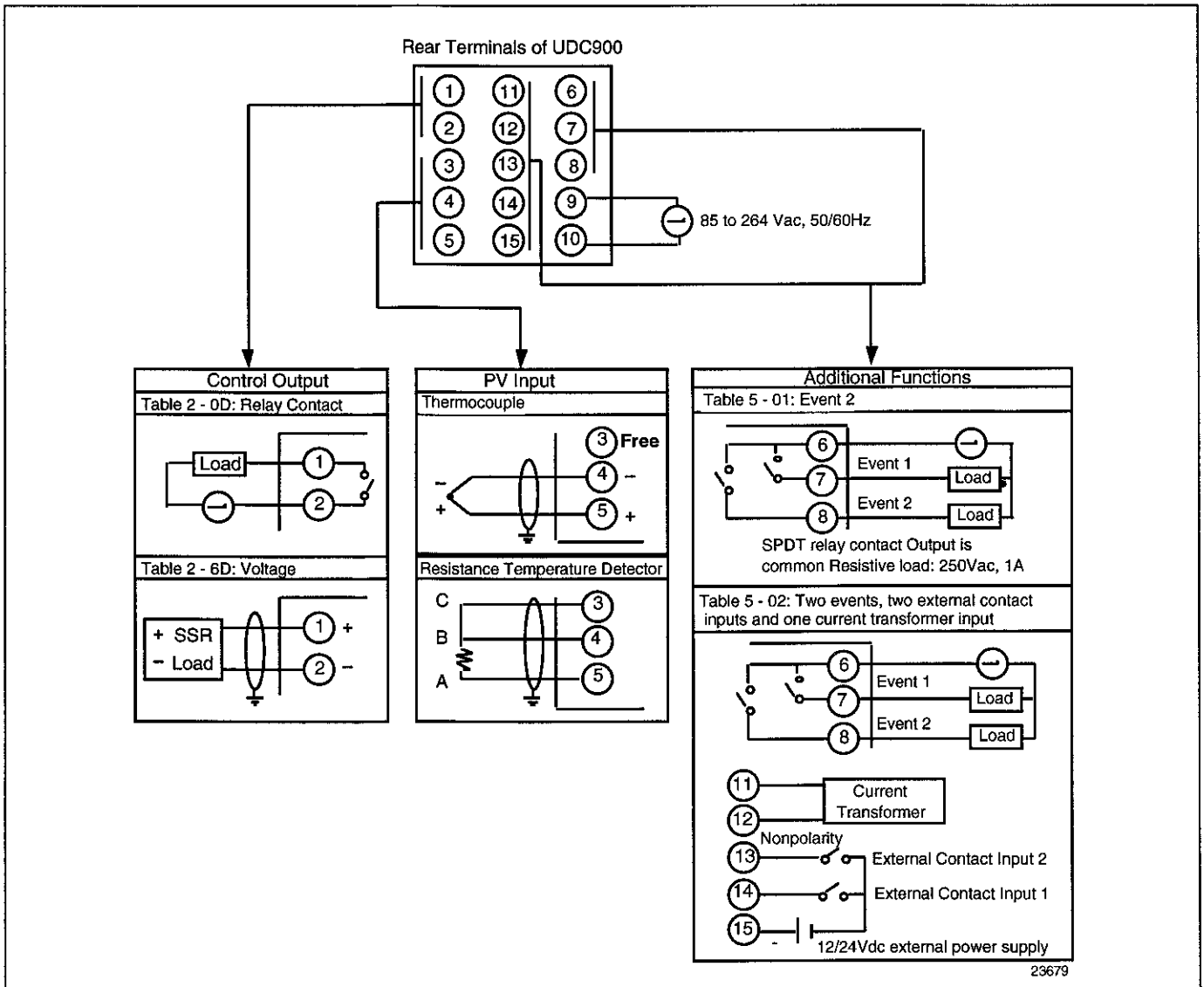


Figure 6 - Wiring Diagram for Panel Mounted (T) Type

Continued next page

Wiring Diagrams, continued

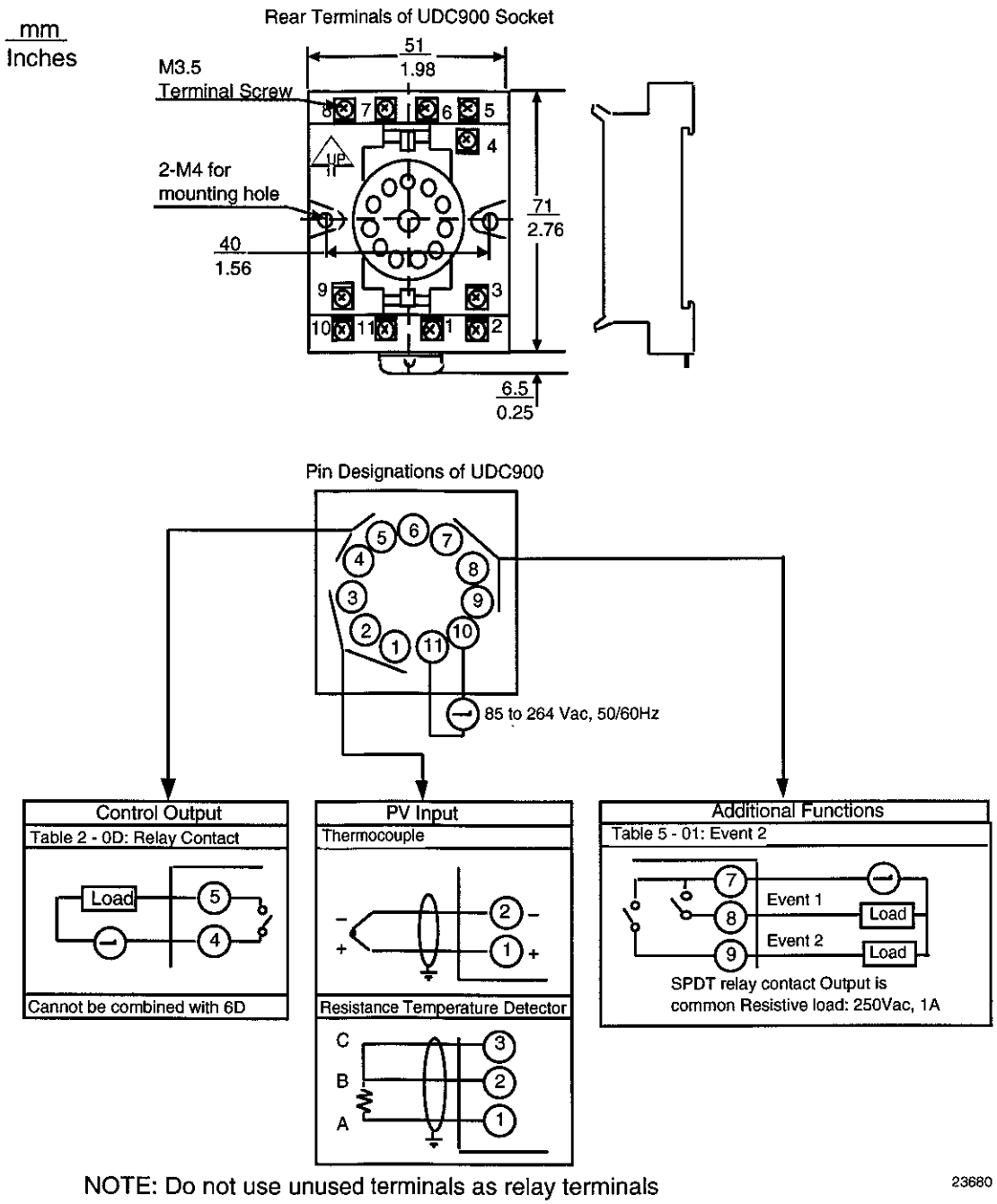


Figure 7 - Wiring Diagram for Socket Mounted (S) Type - Not CE Approved Model

Ordering Information

For the complete ordering information, request Model Selection Guide:
51-51-16-52 for UDC900 Digital Indicating Controller or contact your local Honeywell Sales Office.

Honeywell offers a full line of Sensors and Final Control Devices for use with the UDC900 Digital Indicating Controller. These devices include:

Thermocouples, RTDs
Valve, Actuators, and Electric Motors.

Specifications are subject to change without notice.

Distributor :

Industrial Automation and Control

Honeywell Inc.

In the U.S.A.: Honeywell Industrial Automation and Control, 16404 North Black Canyon HWY., Phoenix, AZ 85023, (800) 343-0228
In Europe: Honeywell S.A., 80084 Amiens Cedex 2, (33) 22.54.56.56
Honeywell Control System Ltd., Honeywell House, Bracknell, UK-RG 12 1 EB, (44) 1344 826000
In Japan: Yamatake-Honeywell Co. Ltd., Nagai Int'l Bldg., 2 - 12 - 19 Shibuya-Ku, Tokyo 150 Japan, 81-3-3486-2051
In Asia: Honeywell Asia Pacific Inc., Room 3213-3225, Sun Hung kai Centre, No. 30 Harbor Road, Wanchai, Hong Kong, (852) 829-8298
In the Mediterranean: Africa and Middle East Region, Honeywell SpA, Via Vittor Pisani 13, 20124 Milano, Italy (39-2) 67731
Honeywell Pacific Division: Honeywell Pty Ltd., 5 Thomas Holt Drive, North Ryde Sydney, NSW Australia 2113, (61-2) 353 7000
In Canada: The Honeywell centre, 155 Gordon Baker Road., Ontarion M2H 3N7, 1-800-461-0013
In Latin America: Honeywell Inc.,14505 Commerce Way, Suite 500, Miami Lakes, Florida 33016-1556, (305) 364-2300