

DRC900C CIRCULAR CHART RECORDER

TECHNICAL SPECIFICATIONS

OVERVIEW

The DRC900C series includes microprocessor-based circular chart recorders that provide one of the most cost-effective solutions for dependable pen-drawn analog traces. The DRC901C recorder variant supports a chart size of 10 inches with one and two pen options plotting on a pre-printed chart. The recorder is available with and without local display options.

The DRC901C has a variety of features, such as a capacitive touch display for viewing the process variable and local configuration. The recorder supports monitoring and configuration over Bluetooth and Modbus communication.

One pen and two pen models of DRC901C accept inputs from a variety of sensors or transmitters within the configurable range limits.

It is easy to set up and configure to match a wide range of applications such as food processing, environmental monitoring, machine monitoring, flow, water, and waste monitoring, for use on furnaces and ovens, packaging machines, and numerous other processes.

Features

Charts — Over 200 preprinted charts are available to meet specific recording needs.

Ink Cartridge — Disposable fiber-tip ink cartridge for dependable recording with minimum maintenance.

Universal Power — Eliminates the concern with matching the local power requirements.

Universal Inputs — Accepts standard thermocouple types, RTDs, mA, mV, or voltage inputs through simple configuration.

Thermocouple Failsafe — Configurable upscale or down- scale burnout.



Fig. 1. DRC901C Recorder (2 Pen with Display model is shown for reference)

Features, continued

User Configurable — Allows you to set up or alter operating parameters to fit your requirements. A capacitive touch display with English language prompts is available for set up and monitoring. With the help of the EasySet app, the device can be configured and log the data and Firmware can be upgraded.

Bluetooth Configuration — The DRC901C offers Bluetooth connectivity and allows users to view recorder parameters via the EasySet app, which is compatible with Android and iOS.

Calibration — The recorder supports field calibration for the inputs to align with the published factory specifications, in case of any deviations. The recorder stores both factory and field calibration values in memory. The user can select field or factory calibration as required.

Features, continued

Firmware – DRC901C supports secure firmware upgrades for CPU and IO by using the EasySet app.

Quality/Support – For technical assistance, refer below link:

<https://process.honeywell.com/us/en/secure/request-support>.

Input Processing

The input can be one of any standard low-level electrical signals which can be selected by the user.

Ranges can be configured, expanded, and compressed within the range limits to meet the specific measurement needs by using the touch graphic display or by using the EasySet app.

Users can select upscale or downscale break protection for most actuations. Input samples are taken at a rate of once every 200 milliseconds. Each input is isolated from the other to ensure that the signals do not affect the other inputs.

A digital filter value of 1 second on the recorder provides input signal smoothing or with the display, this can be changed from 0 seconds to 120 seconds of filtering to match the application need.

The recorder provides a wide selection of linear and non-linear inputs for the user to select which one best meets the need. By adding the display, a full range of selections is available to the user. The non-linear inputs can be set so the microprocessor linearizes the input, thus allowing mixed input actuation for two pen models to record the process variable on a linear chart. This can be bypassed by recording on a non-linear chart.

Microprocessor Controlled Recording

Both the chart and the pens are driven by stepper motors, which are controlled by the microprocessor to ensure precise operation. This capability allows for configurable chart speeds without requiring any changes to motors or gears. The microprocessor uses the configured range selection and input data to determine the proper pen position and then positions the pen accurately to the correct chart position without requiring slide wire feedback or drive cables.

Operator Interface/ Configuration

Since microprocessor control replaces the previous electro-mechanical recording mechanisms, the configuration of the recorder is determined primarily by its software. The configuration is easily set up by selecting the pre-configured range, actuation, and chart speed.

An optional touch graphic display, featuring English language prompts, provides additional flexibility to view the process variable (PV). It also allows users to configure input parameters such as sensor type, ranges, chart speed, and sensor alarms.

The graphic display allows the user to view the process variable (PV), and modify the parameters using the touch display, and totalizer.

The configuration data and display actions are selected using an integral touch graphic display.

Operator Interface/ Configuration, continued

The display can also be set to toggle between Input 1 and Input 2. The display can also be set to blank (turn off) if the operator does not want to see a displayed value.

Diagnostics

Each DRC901C has built-in diagnostics that check critical recorder operations and provide error detection or messages to alert the user of potential faults. This self-test is run each time the recorder is powered up. In addition to this, a built-in step pattern test can be run on demand to ensure proper pen and chart drive motor operation; this draws a special test pattern on the chart thus providing a record of the recorder's proper operation.

Construction

All DRC901C recorders are manufactured with a rugged, durable, molded case designed to withstand most industrial environments. The front panel door is designed for IP54 and to protect the internal electrical components from harsh industrial environments. The recorder comes standard with an acrylic window.

Knockouts in the side and bottom of the case accept conduit connections for convenient entry of field wiring.

The removable connectors also allow for easier servicing without having to disconnect the field wiring.

Accuracy Specifications

Performance	
Number of Inputs	One-pen model: One Input
	Two-pen model: Two inputs
Typical Accuracy	

Types of Input Actuations	Range		Reference Accuracy*		Temp Stability# ± Degrees Error
	°F	°C	± °F	± °C	Per 1 Degree ΔT
Thermocouples B	140 to 3300 140 to 500 500 to 1000 1000 to 3300	60 to 1816 60 to 260 260 to 538 538 to 1816	49 10 5	27 5.5 2.8	1.00 0.50 0.25
E	−454 to 1832 −454 to −202 −202 to 1832	−270 to 1000 −270 to −130 −130 to 1000	45 2.8	25 1.6	0.50 0.20
E (low)	−200 to 1100	−129 to 593	2	1.1	0.15
J	0 to 1600	−18 to 871	2	1.1	0.16
J (low)	20 to 770	−7 to 410	1.8	1.0	0.07
K	−320 to 2500	−196 to 1371	4.5	2.5	0.25
K (low)	−20 to 1000`	−29 to 538	2.1	1.2	0.10
Ni-Ni Moly	32 to 2500 32 to 500 500 to 2500	0 to 1371 0 to 260 260 to 1371	2.0 1.4	1.2 0.8	0.10 0.20
Nicrosil-Nisil	0 to 2192	−18 to 1200	3.0	1.7	0.22
R	0 to 3100 0 to 500 500 to 3100	−18 to 1704 −18 to 260 260 to 1704	8.0 3.6	4.4 2.0	0.10 0.25
S	0 to 3100 0 to 500 500 to 3100	−18 to 1704 −18 to 260 260 to 1704	8.0 3.6	4.4 2.0	0.10 0.25
T	−420 to 700	−251 to 371	3.9	2.2	0.11
T (low)	−200 to 600	−129 to 316	1.8	1.0	0.10
W5W26	0 to 4200 0 to 600 600 to 3600 3600 to 4200	−18 to 2316 −18 to 316 316 to 1982 1982 to 2316	5.6 5.2 6.4	3.2 3.0 3.6	1.00 0.30 0.20
RTD Platinum					
100Ω**	−300 to 900	−184 to 482	2.8	1.6	0.15
100Ω (low)**	−130 to 392	−90 to 200	1.6	1.0	0.15
100Ω (T)***	−238 to 482	−150 to 250	2.0	1.1	0.15

Performance, continued

Reference Accuracy

Types of Input Actuators (Linear)	Range	Reference Accuracy*	Temp Stability# ± Degrees Error Per 1 Degree ΔT
Milliamperes DC	0 to 20	0.1 % F.S	0.005 %/°F
	4 to 20	0.1 % F.S	0.005 %/°F
Millivolts DC	0 to 10	0.2 % F.S	0.005 %/°F
	0 to 100	0.1 % F.S	0.005 %/°F
	0 to 200	0.1 % F.S	0.005 %/°F
Volts DC	0 to 1	0.2 % F.S	0.005 %/°F
	0 to 2	0.2 % F.S	0.005 %/°F
	0 to 5	0.1 % F.S	0.005 %/°F
	1 to 5	0.1 % F.S	0.005 %/°F
	0 to 10	0.1 % F.S	0.005 %/°F
	2 to 10	0.1 % F.S	0.005 %/°F

*Accuracy at reference conditions 22°C (± 2°C) and includes reference junction calibration of ± 0.01°C using the standard "ice bath" method of calibration.

**IEC Alpha = 0.00385

***Alpha = 0.00391

#Temperature Stability - Interpreted as % of Full Span per Degree ΔT change in ambient from Reference condition.

Notes:

- Total Accuracy = Reference Accuracy + CJC Accuracy (T/C input types only).
- Factory calibration source have typical variations of ± 10 μV for mV /Volts Inputs and ± 0.3Ω for RTDs which means recalibration may be required to achieve stated accuracy.
- The RTD accuracy is tested for 3-Wire configuration.
- Tolerance for mA input types includes tolerance of external 10 ohms shunt resistors (0.1% tolerance).
- For field calibration of mV/TC, the accuracy of the calibrating source shall be ±0.02% or better.
- For field calibration of RTD, the accuracy of resistance decade box shall be ±0.02% or better for 0 to 500 ohm range with resolution of 0.01 ohm.

Physical Specifications

Specification	Description
Pen	Disposable fiber-tip ink cartridge, line length per cartridge more than 1000 ft (305 m) - One Pen Model: Pen 1 (Purple). - Two Pen Model: Pen 1 (Purple) and Pen 2 (Red). Note: Only pen 1 (purple) references the chart timeline.
Chart	- Recorder chart speeds set as part of configuration for 8 hours, 12 hours, 24 hours, or 7 days. - Chart speed selectable from 1 hour to 744 hours.
Chart Size	10.24-inch (260 mm) diameter chart with standard preprinted markings and a calibrated width of 4 inch (100 mm).
Chart Drive	DC Stepper Motor
Chart Rotation Accuracy	± 0.5% of rotation time
Chart Recording Accuracy	Up to 1.5% of chart span reference accuracy
Chart Span Step Response Time	7 seconds maximum
Digital Display (Optional)	4.0 inch, Capacitive touch display - Resolution: 480x800 - Backlight life > 20,000 hours
Display Digit Resolution	Digital Readout: 8 digits, Display can be set for 0, 1 (XXX.X) or 2 (XX.XX) or 3 (XXX.XXX) decimal position, °F or °C units. Input range can be scaled from –999 to 9999 and bias of –999 to 9999.
Sensor Burnout	Selectable for None, Up, or Down with critical warning indicator and Input Fail Status message.
Totalizer	- Totalizers (1 per pen); 8 digits displayed - Resettable with remote (digital) input. - Rate can be set for seconds, minutes, hours, days, or millions per day, scale factor by 10's from 1 to 1 x 10⁸. - Programmable low flow cutoff value.
Alarms	User can see the alarm that appears on the Honeywell EasySet app or HMI (Display). Type: Input PV (Based on PV or deviation) State: High or Low (Based on PV or deviation) Hysteresis: 0 % to 100 % of input span
Transmitter Power	24 VDC ± 10 %, 100 mA maximum output.
Indicators	- Channel PV display (INP 1 and 2) - Process Variables Units (mA, mV, V, °F, °C, etc.) - Bluetooth - Totalizer - Password Lock - Input warning (Burnout, Fail, Out of range, etc.)
Minimum Input Span	The range is fully configurable within the span limitation of the sensing element.
Overall Dimensions (Width x Height x Depth)	14in x 14in x 5.8in (356.6mm X 356.2mm X 147.8mm)
Panel Cutout (Width x Height)	12.7in x 12.7in (322.56mm x 322.56mm)

Panel Depth	4.2in (106.4mm)
Panel Protrusion	1.63" (41.4mm)
Mounting	Panel mounting, and Surface mounting (Panel or Wall).
Case	Molded, foamed-Noryl with gasket door to meet IP54 enclosure requirements.
Weight (Max)	10.8 lbs (~5.0 kg)
Color	Case: Black Door: Gray (standard). Glass Window: Acrylic
Analog Input Specifications	
Input Impedance	- Current loop resistance: 10Ω, use $\pm$ 0.1% external resistor. - Volts >1MΩ, all other 10MΩ.
Reproducibility	0.15 percent of the span.
Input Sampling Rate	Input sampled at every 200 mS.
Analog Input Lead Wire Resistance	T/C and RTD: 50 ohms per lead maximum.
Input Isolation	Functional Isolation: - Channel to Channel Dielectric strength 1KVdc. - Channel to Chassis : 1KVdc.
CJC Accuracy	$\pm$ 0.5 $^{\circ}$ C ($\pm$ 0.9 $^{\circ}$ F)
Noise Rejection (at 50/60Hz) +/-2%	- Common mode 5Hz = -120dB - Normal Mode: 5Hz = -100dB
Input Filter	First Order: 0 to 120 sec
Wiring Connections	- Single 12-Pin terminal block connector (5 mm pitch) (see Fig. 3.). - Wire Gauge: 22-12 AWG.

Communications Specifications

Bluetooth Low Energy (BLE) Technology: Bluetooth® 5.2		
Description	Range	Units
Frequency	2.40 to 2.48	GHz
RX Sensitivity	-92 to -102	dBm
TX Power	Up to 12	dBm
Range (Typ)*	Up to 50	Meters
*The maximum Bluetooth range is based on the Line of Sight (LOS).		

Environmental Specifications

Environmental and Operation Conditions				
Parameter	Reference	Rated	Extreme ²	Transport and Storage
Ambient Temperature	67 °F to 77 °F 19 °C to 25 °C	58 °F to 131 °F 15 °C to 55 °C	32 °F to 131 °F 0 °C to 55 °C	-22 °F to 158 °F -30 °C to 70 °C
Relative Humidity (% RH)	50 ± 3 ¹	10 to 90 ¹	5 to 90 ¹	5 to 95 ¹
Vibration				
Frequency (Hz)	0	0 to 70	0 to 200	0 to 200
Acceleration (g)	0	0.1	0.5	0.5
Mechanical Shock				
Acceleration (g)	0	5	5	5
Duration (ms)	0	30	30	30
Mounting Position from Vertical				
Tilted Forward	5°	5°	5°	Any
Tilted Backward	5°	30°	90°	Any
Tilted to Side (±)	5°	10°	20°	Any
Power Requirements				
Voltage (VRMS)	120 to 240	100 to 240	90 to 264	N/A
Frequency (Hz)	60 or 50	60 or 50	48 to 62	N/A
Power Consumption	20 VA maximum			

¹ The maximum rating only applies up to 104 °F (40 °C). For higher temperatures, the RH specification is derated to maintain constant moisture content.

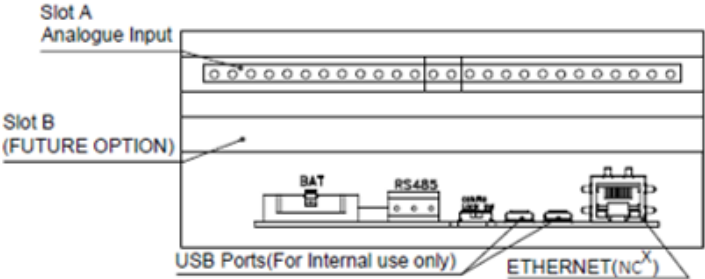
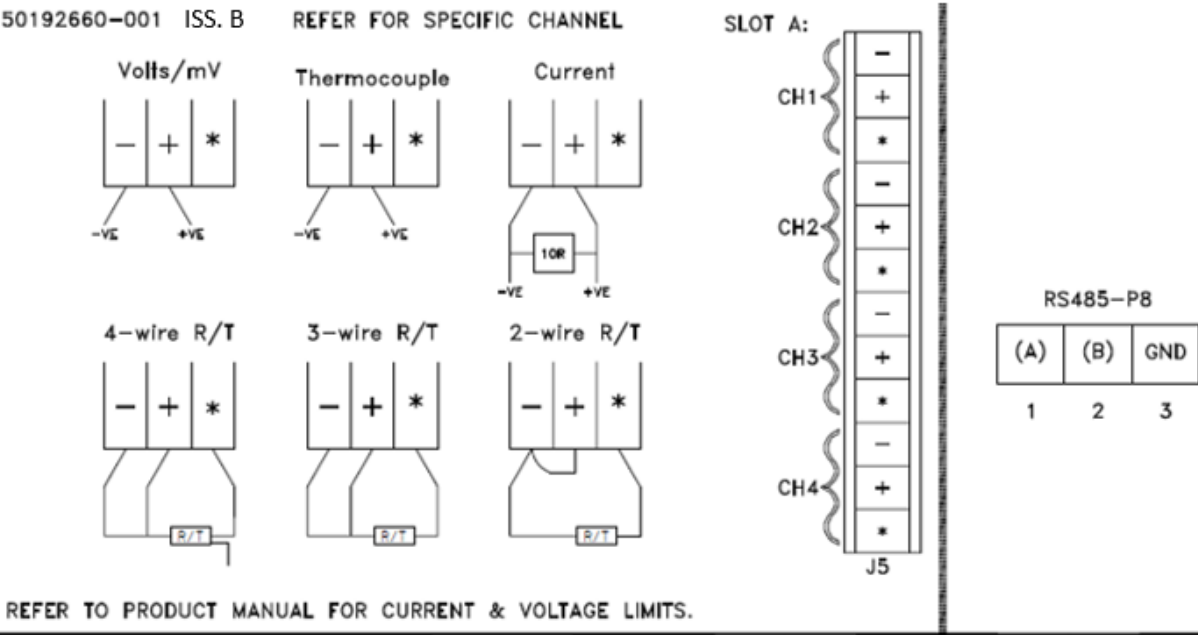
² The performance specifications are guaranteed under rated operating conditions although unit can still operate with extreme range. CSA certification is based on rated conditions while also covering extreme conditions.

General Reference Data	
Static Charge Effects	Exposed panel surface capable of withstanding a discharge from a 250-pf capacitor charged to 8 KV through 100Ω.
Line Noise Effects	Field terminals for connecting the power line to the recorder can withstand the IEEE Surge Withstanding Capability Test to the level of 2 KV.

Approvals and Certifications

Parameter	Description
Regulatory Certifications	CE Mark EMC Directive: 2014/30/EU Low Voltage Directive: 2014/35/EU RoHS Directive: 2011/65/EU
	FCC Approval 47 CFR Part 15 Subpart B and Subpart C
	Bluetooth SIG Listed
	Safety Certification CSA C22.2 No. 61010-1-12, UPD1:2015, UPD2:2016, AMD1:2018 UL 61010-1 3rd ed (Rev. Jun 6, 2023)
IP Rating	Ingress Protection Class: IP54
CE Conformity (Europe) (Optional)	This product is in conformity with the protection requirements of the following European Council Directives: 2014/35/EU, the Low Voltage Directive, and 2014/30/EU, 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/Surface Mounted Industrial Control Equipment with protective earthing (grounding). (EN 61010-1).
Enclosure Rating	Terminals must be enclosed within the panel. Front panel designed for IP54.
Installation Category (Over-voltage Category)	Category II: Energy-consuming equipment supplied from the fixed installation. Local level appliances, and Industrial Control Equipment (EN 61010-1). Group 1, Class A, ISM Equipment (EN 55011/CISPR 11, emissions), Industrial Equipment (EN 61326-1, immunity).
Pollution Degree	Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 664-1).

Input Wiring



X DO NOT CONNECT

Fig. 3. Input Wiring Configuration

Physical Considerations

The recorder can be mounted flush in a panel or on the surface of a panel or wall using the mounting kit supplied with the recorder. Adequate access space must be available at the back of the panel for installation and servicing.

Dimensions

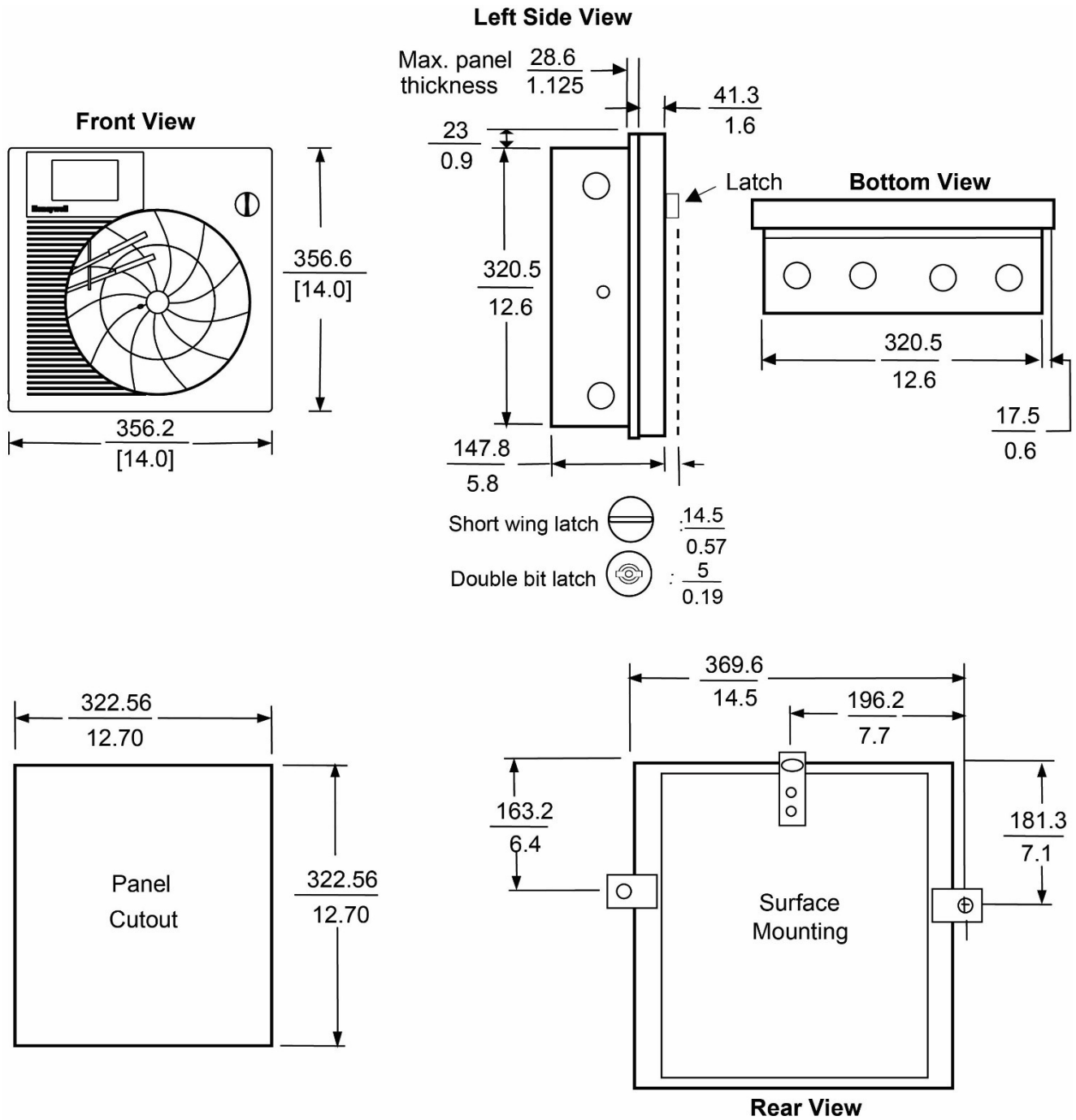


Fig. 2. DRC901C Recorder Dimensions

Honeywell EasySet - Device Configuration Application

Honeywell EasySet is an intuitive application that can be installed on mobile devices and tablets running Android platform.

Key Features:

- Graphical user interface.
- Secure log-on.
- Connects via Bluetooth.
- Read real-time data.
- Connect and configure the recorder to the Honeywell EasySet app in minutes.

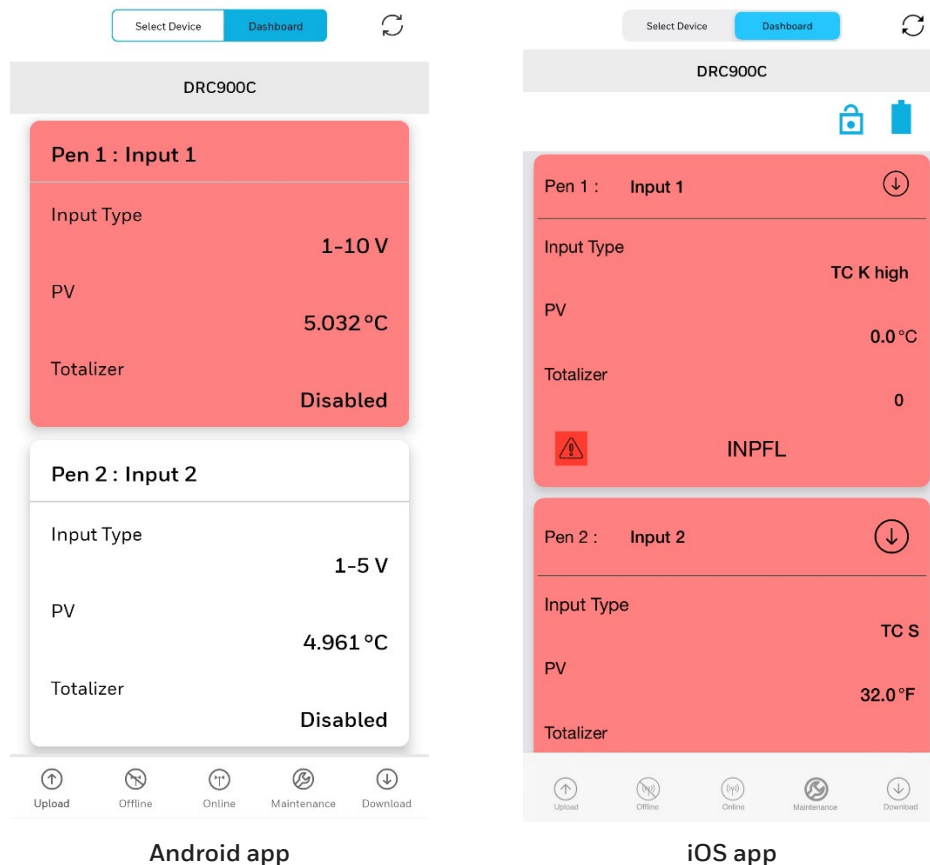


Fig. 4. Live Data Dashboard including Pen(s) Parameters

Note: The dashboard including pen 1 or pen 1 and pen 2 information is based on the recorder model selection. For example, the recorder with pen 1 support, displays pen 1 values only on the dashboard, whereas the recorder with pen 1 and pen 2 support, displays both the pen 1 and pen 2 values on the dashboard. For more information on the suitable recorder selection, refer to the Model Selection Guide (MSG).

Model Selection Guide (MSG)

DRC900C Digital Circular Chart Recorders

Model Selection Guide

Model Selection Guide

44-CL-16-01

Issue 1

Rev 05

Instructions

- Select the desired Key Number. The arrow to the right marks the selection available.
- Make one selection each from Tables I through IV, using the column below the proper arrow. A dot (•) denotes unrestricted availability. A letter denotes restricted availability.

Key Number I II III IV
 _____ - _____ - _____ - _____ - _____

KEY NUMBER

Selection	Availability
Digital Recorder Controller - 10" Circular Chart format	DRC901C ↓ ✓

TABLE I -

Display	None - Requires use of mobile app & Bluetooth (Note 2)	0 _ _ _	•	✓
	Local Touchscreen Display (Note 2)	1 _ _ _	•	✓
Pens	1 pen	_ 1 _ _	•	✓
	2 pens	_ 2 _ _	•	✓
Instrument Power/Transmitter Power				
Universal Power 90 to 264 VAC, 50/60 Hz and 24V DC Transmitter Power		_ _ 1 _	•	✓
Communications				
Standard RS485 Modbus RTU and Bluetooth		_ _ _ 0	•	✓

TABLE II - ANALOG INPUTS

Analog Inputs	Analog Inputs (Note 3)	4 _	•	✓
Future	Future	_ 0	•	✓

TABLE III - DOOR OPTIONS

Gray Door with Acrylic Window	G _ _	•	V
Standard Door Latch	_ 0 _	•	V
Door Lock with Key	_ K _	•	V
None	_ _ 0	•	V
Configuration Lockout/Chart Plate Seal	_ _ L	•	V

TABLE IV - APPROVALS / EXTENDED WARRANTY / DOCUMENTATION

CE, CSA and UL	A _ _ _	•	✓
No Additional Extended Warranty	_ 0 _ _	•	✓
Extended Warranty - Additional 1 Year	_ 1 _ _	•	✓
Extended Warranty - Additional 2 Years	_ 2 _ _	•	✓
Quick Start Guide - English	_ _ E _	•	✓
No certificate	_ _ _ 0	•	✓
Certificate of Conformance (F3391)	_ _ _ K	•	✓

Notes :

- Documentation Printed Quick Start Guide included in product packaging. The Quick Start Guide can also be accessed via a QR code on the device's Help screen. The product manual & spec sheet are available on Honeywell's website.
- Display Operation of non-display units requires use of the Honeywell EasySet mobile app on an Apple or Android device and Bluetooth communication. This is the only way to operate a non-display unit - there are NO dip switches like on DR4300. Units equipped with the optional touchscreen display can be operated with the display or via the EasySet app. Use of the EasySet app is required for firmware upgrades for both display and non-display units.
- Analog Inputs Analog Inputs (AI) are received via a 4-channel AI Card. 2-pen recorders may be configured to any two inputs at a time, and 1-pen recorders may be configured to any one input at a time. All 4 inputs transmit via Modbus.
- Charts Includes one box of 30755820-001, 0-100 Even "starter" charts, 24 hr on one side, 7 days on the other.

Ordering Information

For complete ordering information, see Model Selection Guide (MSG) of DRC901C Circular Chart Recorder.

Warranty/ Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and **is instead of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.** Specifications may change without notice. The information we supply is believed to be accurate and dependable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell website, it is up to the customer to determine the suitability of the product in the application.

Specifications are subject to change without notice.

For more information

To learn more about Honeywell's products or solutions, visit our website
<https://process.honeywell.com>
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FUTURE
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WE
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