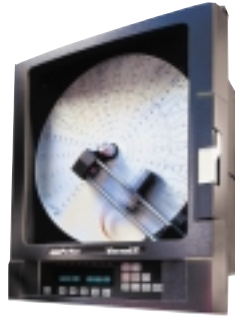


- DATA RECORDING
  - LIMIT CAPABILITY
  - PROFILING
- C I R C L E  
C H A R T  
R E C O R D E R S



# Process Automation

2006 Product Catalog

*PARTLOW™ brand*



 **DANAHER**  
INDUSTRIAL CONTROLS

## Introduction to Partlow & Danaher Industrial Controls

## About Us

*Process Control and Validation... Made Simple™*

### About Partlow and Danaher Industrial Controls Over 80 Years Strong...

Partlow offers the world's broadest range of reputable brand name mechanical, analog and digital micro-based temperature controller and circle chart recorder products to satisfy a full range of industrial applications including temperature, pressure, level and flow.

### A Reputable Brand with an established legacy of performance experience, you can rely on...

Partlow™ - is a respected U.S. leader in rugged and reliable circle chart recorders and state-of-the-art single loop and multi-loop temperature controllers servicing industry and machine builders in their process automation applications for over 80 years (since 1920). From quality validation to trend analysis and product safety applications, Partlow brand basic to high end controller and recorder products offer excellent value. Partlow circle chart recorder products, furthermore, provide the additional benefit of a paper document record of process control results for traceability. Partlow has been a division of Danaher Industrial Controls Group since 1993.

### No Supplier Offers More Process Control and Validation Solutions....

DICG Partlow brand controllers and recorders come in a variety of types, sizes and accessory options. Consider just a few of the following of our controller and recorder varieties:

### Recorder Product Types/Varieties

#### Basic

- Recording

#### General Purpose / Application - Industry Specific

- Flow
- Humidity
- 12" Large Display Chart

#### High-End

- Profiling
- Totalizing

In the following pages, you will find the comprehensive range of temperature, process controls, circle chart recorders and related accessories available from Partlow. Our extensive network of process automation distributors are ready to provide knowledgeable responsive local technical support, along with our own group of factory based engineers and customer service personnel who are immediately available and only a phone call away to assist you.

*We invite you to read on and look forward to serving you!*

**GENERAL INFORMATION**

**ABOUT US**

**PAGE**

INTRODUCTION TO PARTLOW & DANAHER INDUSTRIAL CONTROLS ..... Inside Front Cover  
 COMPLETE PROCESS AUTOMATION SOLUTIONS ..... 2  
 PARTLOW KEY ADVANTAGES ..... 3  
 TECHNOLOGY OVERVIEW ..... 5  
 RECORDER APPLICATIONS FOR INDUSTRY ..... 6

**SERVICE & TECHNICAL SUPPORT**

CUSTOMER CARE & SUPPORT ..... 7  
 CUSTOM PRODUCTS ..... 7  
 DOING BUSINESS WITH DANAHER INDUSTRIAL CONTROLS ..... Inside Rear Cover

**RECORDER BASICS**

RECORDER BASICS OVERVIEW ..... 8  
 RECORDER FUNCTIONALITY ..... 9  
 RECORDER BASICS SELECTION STEPS ..... 11  
 RECORDER MODEL SELECTION ..... 12

**CIRCULAR CHART RECORDER PRODUCT RANGE**

**BASIC RECORDERS**

MRC 5000™ RECORDING CONTROLLER ..... 14

Basic  
Recorders

**GENERAL-PURPOSE RECORDERS**

MRC 7000™ RECORDER ..... 18  
 MRC 7000™ PROFILE CONTROLLER ..... 18

General-Purpose  
Recorders

**APPLICATION SPECIFIC RECORDERS**

MRC 7700™ RELATIVE HUMIDITY RECORDER/CONTR. .... 24  
 MRC 7800™ FLOW RECORDER ..... 28  
 MRC 8000™ RECORDING CONTROLLER ..... 32

Application Specific  
Recorders

**HIGH-END RECORDERS**

MRC 9000 VERSACHART™ 4 PEN COLOR RECORDING CONTROLLER/PROFILER ..... 36  
 MRC 9400 VERSA-EZ™ 4 PEN COLOR RECORDER WITH ALARMS ..... 40

High-End  
Recorders

**Experience**

No one understands factory and process automation better than Danaher Industrial Controls (DICG). When productivity, performance and cost are on the line and predictability, consistency and repeatability dictate success, our wide range of factory and process automation, measurement and sensing controls work for you, providing measurable results that put you in control of the critical production and process drivers that influence your world.

**Process Automation & Measurement Controls**

The ability to sense and track an established series of steps or operations in a manufacturing process such as temperature, flow and pressure with accuracy and predictability is made possible with DICG Partlow brand temperature and process controls, including controllers and recorders designed to validate critical process variables toward a desired result, outcome or product.

To understand the complete line of DICG process automation controls, including Partlow brand, refer to the DICG Website at:

[www.danaherindustrialcontrols.com](http://www.danaherindustrialcontrols.com)  
or  
[www.partlow.com](http://www.partlow.com)

**The Industry's Shortest Lead Times...**

At Partlow, we are obsessed with quick lead times. Due to thousands of possible "standard combinations" of configurations available, all Partlow recorders and controllers are built to order utilizing efficient "Just In Time" (JIT) manufacturing processes. Standard lead times on Partlow controllers and recorders is 3-5 days for most models. Our answer to your question "when can I get it?" is "when do you want it?" Rush orders are also available to meet your specific project needs or deadlines. Inquire with our Customer Service Representatives at **+1.800.390.6405**, or our Applications Engineers at **+1.800.866.6659**.

**...More Choices from a One Source Global Supplier**

**Other Reputable Controller-Recorder Brands to consider from DICG:**

**PMA™**

For over 75 years, PMA has developed leading edge digital process control and measurement technology. Key products include a complete line of bus and PLC systems used for temperature, pressure, flow and level applications. A respected European brand, PMA's slogan "*wir kriegen's geregelt*" is loosely translated to "*close the loop with PMA*". The PMA group was acquired in 2005 by Danaher Industrial Controls.

**WEST™**

Renowned European leader state-of-the-art, value packed single loop and multi-loop temperature controllers, West has served industry and machine builders process automation needs for over 50 years. West was among the first controller manufacturers to design a microprocessor based temperature controller and was on the forefront of the development of self-tune algorithms. More recently, West launched the first multi-loop controller to combine the integrity of a discrete controller with the benefits of bus integration. West has been a division of Danaher Industrial Controls since 1994.

**RUSTRAK™**

DC Signal, and Thermocouple strip recorder are custom classic products that have provided reliable results and traceability in process control in flow, PH, temperature and current/voltage applications for over 40 years.

**LFE™**

DIN electronic controllers are custom classics that have provided rugged and reliable control of process applications for over 50 years.

For precision control, quality validation, trend analysis and product safety applications, there's a Partlow brand controller or recorder especially suited to your needs – all providing excellent quality and value. The Partlow brand circle chart recorders featured in this catalog provide the inherent benefit of traceability via a paper document record that validates process control results. In addition, some models include built-in process control and alarm capabilities and/or specialized application specific features.

**Recorder Advantages:**



**Controller Advantages:**










- Range of circle chart products from basic 1-pen, one process to sophisticated multiple input, multiple equation recorders.
- Reliable operation in rugged environments
- High/low limit requirements for critical applications
- Provides printed paper document for quality validation, trend analysis, regulatory compliance and product safety
- Delivers data traceability for customer's finished product, including FDA applications
- Process variables can be seen at a glance for quick effective process management
- Provides excellent value for data collection per data point (1-4 pts)

- Range of controller types to choose from including limit device, valve motor drive and profile to fit your budget and application need.
- Choice of standard size front to panel DIN models and behind the panel models
- Reliable operation and control in all applications
- Jumperless input configuration and auto-detect output module hardware on all new generation Plus Series controllers for fast, easy setup
- Flexible plug-in output modules
- Fast input sample rates
- High visibility LED's and protection ratings for different environment conditions

**Note:** This catalog will assist you in choosing the right Circle Chart Recorder for your specific application. For information on complimentary Partlow Brand Process, Limit and Profile Controllers, request our short form line brochure or full line controller product catalog.



● Standard ● Optional

INDUSTRIAL-DUTY CIRCLE CHART RECORDERS							
	BASIC	GENERAL-PURPOSE/APPLICATION SPECIFIC				HIGH-END	
							
MODEL NUMBER	MRC 5000	MRC 7000	MRC 7700	MRC 7800	MRC 8000	MRC 9400 VersaEZ	MRC 9000 VersaChart
TYPE	Digital	Digital	Digital	Digital	Digital	Digital	Digital
	Recorder	Recorder/Controller/Proler	RH Proler/Recorder/Controller	Flow Recorder	Recorder/Controller	Recorder	Recorder/Controller/Proler
	FTP	FTP	FTP	FTP	FTP	FTP	FTP
Dimensions (WxDxH), Inches	14 (356mm) x 3.8 (97mm) x 14 (356mm)	15 (384mm) x 3.6 (92mm) x 13 (335mm)	15 (384mm) x 3.6 (92mm) x 13 (335mm)	15 (384mm) x 3.6 (92mm) x 13 (335mm)	14 (359mm) x 7.8 (197mm) x 17 (426mm)	14 (359mm) x 7.8 (197mm) x 17 (426mm)	14 (359mm) x 7.8 (197mm) x 17 (426mm)
FUNCTION							
Digital	●	●	●	●	●	●	●
Recorder	●	●	●	●	●	●	●
Controller		●	●		●		●
Proler		●	●				●
Flow Recorder				●		●	●
RH Humidity Controller			●				●
CHART							
10	●	●	●	●			
10-12						●	●
12					●		
CHART ROTATION							
24 Hr	●	1.0 to 999.9 hours	1.0 to 999.9 hours	1.0 to 999.9 hours	1.0 to 999.9 hours	●	6 to 9999 hours
7 Day	●					●	
12 Hr	●					●	
48 Hr	●					●	
DISPLAY							
Single 4-digit	●	●	●	●	●	40 Char. VFD <sup>1</sup>	40 Char. VFD <sup>1</sup>
Dual 4-digit Displays		●	●	●	●	●	●
Max. # of Pens	2	2	2	2	2	4	4
INPUTS							
DC Linear V	●	●	●	●	●	●	●
DC Linear mA/DC Linear mV	●	●	●	●	●	●	●
Thermocouple/RTD	●	●	●	●	●	●	●
Remote Setpoint		●	●		●		●
OUTPUTS							
Max. # of Outputs	4	8 <sup>2</sup>	8 <sup>2</sup>	8 <sup>2</sup>	8 <sup>2</sup>	8 Alarms	8
Relay	●	●	●	●	●	●	●
SSR Driver		●	●	●	●	●	●
DC Linear		●	●	●	●	●	●
OUTPUT FUNCTION							
Control Output 1	●	●	●		●		●
Control Output 2	●	●	●		●		●
Max. # of Alarms	4	4	4	4	4	8	16
Alarm 1	●	●	●	●	●	●	●
Alarm 2	●	●	●	●	●	●	●
Alarm 3	●	●	●	●	●	●	●
Alarm 4	●	●	●	●	●	●	●
Retransmission		●	●		●	●	●
COMMUNICATIONS							
RS-232						●	●
RS-485	●	●	●		●	●	●
PC Configuration	●					●	●
AGENCY APPROVALS							
UR & cUR	●	●	●	●	●	●	●
CE	●	●	●	●	●	●	●
NEMA 3	●	●	●	●	●	●	●
NEMA 4X	●	●	●	●	●	●	●
POWER SUPPLY							
24VDC (Transmitter)	●	●	●	●	●	●	●
90-264VAC	●					●	●
115VAC OR 230VAC		●	●	●	●		
RECORD/CONTROL TYPES							
PID		●	●		●		●
ON/OFF Control	●	●	●		●		●
High/Low Limit	●	●					
Totalizing Flow Recorder				●		●	●
Wet Bulb/Dry Bulb RH Record			●				●
Data Logging				●			
Manual Tune		●	●	●	●	●	●
ENCLOSURE TYPES							
Plastic or Glass Window	Plastic (std.)	Plastic (std.)	Plastic (std.)	Plastic (std.)	●	●	●
Door Lock	●	●	●	●	●	●	●
Sealed Conduit		●	●	●	●	●	●

<sup>1</sup>Vacuum Fluorescent Display <sup>2</sup>Dependent upon the output type

## Recorder Applications for Industry

**Recorder Products... for Control You Can Measure™**

## About Us

### Real Answers to Your Real Process Automation Control Problems...

Danaher Industrial Controls Partlow™ brand circle chart recorder products have been helping customers with their temperature and process control needs for a over 80 years. Our broad product range is used on an incredibly wide variety of industrial applications. With over 150,000 recorders in service, representing many thousands of individual customer applications, chances are we have experience solving temperature or process control problem very similar to yours.

### A reputable brand with an established legacy of performance experience, you can rely on...

Reliable Partlow™ brand circle chart recorders provide rugged, reliable and versatile control of your process applications. From quality validation to trend analysis and product safety applications, Danaher Industrial Controls basic to high-end recorder products offer excellent value. Recorder products provide the additional benefit of a paper document record of process control results for traceability.

### Typical Applications

The following are just a few of the more common controller and recorder industrial applications:

#### Environmental Control

- Temperature
- Humidity
- Pressure

#### Process Control

- Liquid Level
- Flow
- PH



**Typical Application – Steam Boiler Plant**

### Environmental Control

*Environmental control*, as its name implies, refers to critical process variables such as *temperature*, *humidity* and *pressure* that are critical in process applications such as ovens:

#### Temperature Control

Temperature controllers provide closed-loop control of industrial and laboratory heating and cooling processes. In a typical temperature (environmental control) application, temperature is sensed using a thermocouple (T/C) or RTD input device whereby the measured temperature is constantly compared to a user specified setpoint. When the actual temperature deviates from the set point, an output signal and or high/low alarm is produced regarding the status of the heating elements in refrigeration, compressors, etc

#### Humidity Control

In a typical humidity control application, recorders are used to determine humidity level. Humidity can be calculated using a wet-bulb (RTD or T/C) input sensor w/ a sock that lays in a pan of water and a dry-bulb (RTD or T/C) input sensor. Humidity is calculated by using the dry bulb temperature and the difference between the dry bulb and wet bulb (referred to as the 'depression'). The difference in the wet-bulb and dry bulb input signals are then recorded and monitored by a circle chart recorder.

#### Pressure Control

Controllers can further be used to monitor and provide feedback on process variables such as pressure that can be vital in laboratory, test chambers or industrial heating and cooling applications. In a pressure tracking application, controllers monitor pressure using a transducer that feeds a signal back to the controller whereby the measured pressure is constantly compared to a user specified setpoint. When the actual pressure deviates from the set point, an output signal is triggered by the controller that sends out a 4-20mA output signal to a valve allowing it to adjust the air or steam pressure back to the specified setpoint. Pressure is critical in food canning applications, where the food must be heated and cooked for sterilization purposes as well as pressurized to prevent the can from bursting during the cooking process.

**Process Control**

Process control can involve many different variables from liquid level and flow control to pH control. Consider the following application examples:

**Liquid Level/Flow Control**

Controllers can be used to monitor and track liquid level. A liquid level sensor input continually compares a vessel's actual liquid level to a user specified setpoint. When the actual liquid level deviates from the setpoint, an output signal is sent to control valves or pumps which maintain the level within the specified parameters. In a typical gas flow application, a valve motor drive controller can be used to control the gas flow on a gas burner within a production line. Again, a user entered setpoint is compared to actual flow rate allowing the controller to maintain the required rate.

**pH Control**

In water treatment and monitoring applications, a pH sensor monitors a process and transmits to a recorder that records the inputs and continually compares the process value to the specified setpoint. A controller can actuate a relay output that turns on dosing pumps to either increase or decrease the acid or base of the liquid to ensure that the optimum pH level is maintained.



**Typical Application – Bottling Line**

**Partlow Recorders By Market**

Put DICG Partlow brand process and temperature control technology to work for you in your manufacturing operation to monitor, track and validate a specific process to ensure optimum efficiency, quality output and reduced incidence of waste.

As a leading supplier in the temperature and process controls industry, Danaher Industrial Controls Partlow brand process recorders can help you design the perfect solution for your specific application need

**Typical Recorder Industries/Applications include:**

- Plastics Processing
- Packaging – Plastics Shrink Wrapping
- Glass Manufacture – Melting & Annealing
- Food and beverage processing - Dairy & Smokehouses
- Woodworking - Kilns
- Healthcare – Blood Banks
- Tourism – Cruise Line Water Treatment
- Tourism – Airline Food Storage
- Metal processing
- Production of fine chemicals & pharmaceuticals
- Environmental monitoring
- Power generators/utility
- Offices, labs, computer rooms
- Wastewater monitoring & recording
- Textile production
- Heat treating

*And much more...*

For more detailed information on Danaher Industrial Controls Partlow brand recorder product applications and markets, we invite you to browse our industry solutions on our website at [www.partlow.com](http://www.partlow.com) which have been classified by market and application for your convenience.



**Expert Technical Support**

At DICG, we employ a professional staff of Application Engineers whose full time responsibility is to help you select the proper recorder or controller, install it correctly and get it up and running to your satisfaction. These friendly and knowledgeable people are available during business days from **7:30 am to 4:45 pm Central Standard Time (CST)**.

**Partlow - Customer Care**

Danaher Industrial Controls  
2100 W. Broad Street  
Elizabethtown, North Carolina  
Phone: **+1.800.390.6405** / +1.910.862.2511  
Fax: +1.910.879.5486  
Email: [partlow.custserv@dancon.com](mailto:partlow.custserv@dancon.com)

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Email: [partlow.techsupport@dancon.com](mailto:partlow.techsupport@dancon.com)  
Website: **www.partlow.com**

**Regional Offices & Territory Managers**

DICG Distributors are supported by Regional Account Managers who are also available to assist you with any of your unusually demanding applications, present on site customer seminars, determine your custom product needs or respond to any of your high volume requirements. To find the Partlow Territory Manager nearest you, simply refer to the Territory Manager Locator on the **www.partlow.com** website or contact us directly at **+1.800.390.6405**.

**If you don't see exactly what you need in this catalog, call us....**

DICG Partlow will modify standard catalog products to fit your unique needs. In fact, many of our now popular features and options began as special customer requests.

Our willingness to "customer-ize" our products is one of the many factors that differentiates DICG Partlow brand products from our competition. DICG Partlow is capable of developing fully custom product designs should your application demand it and the business opportunity support it. Simply call our Applications Support Hotline at **+1.800.866.6659** or detail your application design, performance and cost requirements to us using the **Application Assistance Form** (available online at [www.partlow.com](http://www.partlow.com)). Our Application Engineers will review your specifications and contact you with a recommendation.

**Global Network of Service Partners**

DICG sells its products through a network of highly skilled and trained Partlow distributors that offer a variety of value-added services, from pre-sale consultation and support to systems integration. They have the experience and flexibility to deliver a solution to meet your specific application need and are ready to assist you in selecting and applying DICG Partlow brand recorder/controller products. To find the Partlow Distributor nearest you, simply refer to the Distributor Locator on the [www.partlow.com](http://www.partlow.com) Website or contact us directly at **+1.800.390.6405**.

**Record / Control Capabilities**

Select from many popular control functions including PID, ON/OFF Control, High-Low Limit, Totalizing, Manual Tune, Flow, Wet/Dry Bulb for powerful control at an economical price; *Control capabilities vary by Partlow model – see individual specifications for details.*

**Power Supply**

Most standard voltages are supported by Partlow recorder products including 115 and 230 VAC. *See individual specifications for details.*

**Display**

Available in single 4-digit or dual 4-digit display versions, or 40 character VFD (model dependent) for reliable monitoring and simple programming.

**Inputs**

Thermocouple, RTD, DC Linear Volt/mA and remote setpoint available for precise process control. *See individual product specifications for details.*

**Outputs**

Relay, SSR driver, DC Linear options available on most all Partlow recorder models; Up to 8 alarms available on high-end Versa-EZ and Versachart models for optimal system performance.

**Chart Size / Rotation**

Most Partlow brand recorder models are available in chart sizes of 10-12 inches (model dependent) for high resolution and visibility of process variables; 12 Hr, 24 Hr, 48 Hr, 72Hr and 7 Day, chart rotation options available for reliable process value display and validation. Other rotation options from 0.1 to 9999 Hrs available (model dependent) *See individual product specifications for details.*

**Communications**

Popular communications options include RS-232, RS-485 and PC Configuration promoting quick easy programming and set-up procedures. *See individual product specifications for details.*

**Pens**

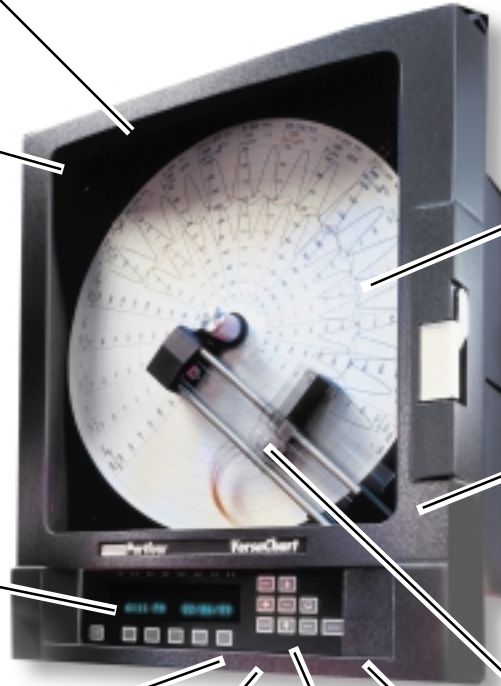
Choose from 1 to 4 pen models; available in red or green for accurate documentation and integrity of critical data variables.

**Agency Approvals**

Partlow recorders are rated and available with the following agency approvals UR/cUR, CE, FM, NEMA 3 and NEMA 4X to comply with user process application and operating environment needs.

**Enclosure Types**

Optional plastic or glass window front, door lock and/or sealed conduit versions available to suit virtually any user application need.



## Principles of Operation

Partlow offers a wide variety of Recorder and Controller models and accessories designed for temperature, process and environmental control applications. However, only Recorders provide a paper chart showing process results for over time.

## Recorder - Controller Selection Modes/Technologies Comparison

The common categories of closed-loop temperature and process controllers are General Purpose Limit, Valve Motor Drive (VMD) and Profile controllers. Other Partlow brand controller distinctions include *mechanical* versus digital (electronic) microprocessor based controllers and front-to-panel versus behind the panel DIN construction.

### Mechanical (Analog) vs Digital

#### Microprocessor based Recorders/Controllers

Mechanical temperature controllers are self-operating, requiring no operating power but are usually limited in their functionality and accuracy compared to digital microprocessor based controllers. ON-OFF controllers are available with one or two switches, for heating, cooling, or heat-cool applications. Proportional units are for use with position proportioning motors, pneumatic devices, or provide time proportioning outputs. Some mechanical controllers also have dual setpoints for alarming or auxiliary heating.

The mechanical, non-indicating, temperature controllers are self-operating, ON-OFF controllers for use in a wide variety of applications. They provide simple control and require no operating power except when a recording feature is included.

### Mechanical Recorder Advantages:

- Suited for mobile application
- Simple control
- Low or no operating power required

### Limitations:

- Low accuracy
- Limited in their functionality versus microprocessor-based models

## ON/OFF or Limit Device Controls

ON/OFF is the simplest form of control, similar to the principle used in almost all domestic appliance thermostats. Based on a sensor and setpoint, power is turned on and off to a heater element or cooling device.

Limit Control is used for processes which require an extra device for safety reasons. Power to control the element is switched through the contacts on the limit device, which “drop out” if the temperature goes above or below a specified range. Many limit controllers are factory mutual (FM) approved and have latching relays which require a front panel reset to re-engage the contacts.

### ON/OFF & Limit Device Advantages

- Simplest form of control
- Involve only one parameter that needs to be tuned
- Minimizes control element cycling
- Provides fast output reaction
- Low cost controller

### Limitations

- Low accuracy
- Minimizes control element cycling

### Profile Recorders/Controllers

Profiling controllers, also called Ramp-Soak controllers, are controllers that will allow the operator to program a number of setpoints and the time to sit at each set point. The changing of the setpoints are called “Ramp” and the time to sit at each set point is called “Soak”. One ramp and one soak is considered to be one segment. A profiler offers the ability to enter a number of segments to allow complex temperature “profiles”. There are many applications for a profiling controller. The profiles are often referred to as “recipes” by the operator and are often kept on a computer and downloaded via a communications channel directly into the controller as needed.

#### Profile Recorders/Controller Advantages

- Moderate to high accuracy (model dependent)
- Allow operator to program a number of setpoints and the time to sit at each set point.
- Ability to enter a number of segments to allow complex temperature “profiles” for enhanced control

#### Limitations

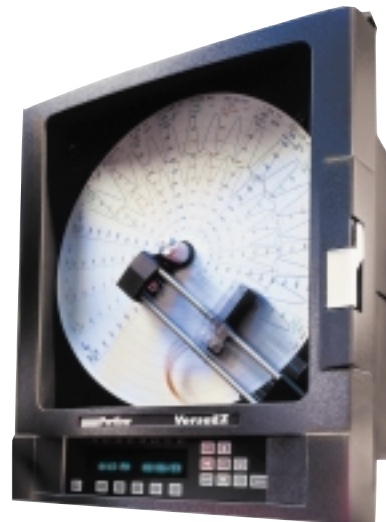
- High-End models may be expensive, but can be a good value in some applications

### Front-to-Panel (FTP) Mounting

All Partlow circle chart recorders are front panel mounted with a glass or plastic windowed hinged front door/cover. The windowed door allows visibility of the recorder’s digital display and chart, and swings open for easy access for chart replacement and control settings.



**MRC 7800™**  
**Basic Flow Recorder**



**MRC 9400 - VersaEZ™**  
**High-End Digital Recorder**

**The choice is simple with Partlow brand...**

Before you can select the ideal recorder, be sure to assess your process control application requirements. Key questions to ask yourself about your process application from a *Form, Fit and Function* perspective include:

**FORM/FIT**

- Where will the unit need to be mounted and will it be required to be read by the machine operator
- Are there any unique application requirements and or environmental conditions that will affect your recorder?  
(For example, limited space, high ambient temperature, dust/dirt protection, explosive/corrosive environment, other.)  
Product housings come rated with various agency approvals and environmental protection ratings (i.e., NEMA4X/IP65) and some may be better suited for certain application environments than others.
- What power voltage is available?  
(120 VAC, 120/240 VAC, 12-24 VAC, 12-24 VDC)
- If this is a temperature control application, what is the temperature range of the application?




**FUNCTION**





- What specific purpose(s) will the recorder/controller serve? What do you want to control or drive?  
(For example, will a temperature controller drive an electric heating element, gas burner, gas valves, etc.?)
- What process or steps (recipe) will the recorder/controller be required to go through and track?
- How many controllers or recorders does your process require for the task? One or multiple?
- How many control loops do you need?
- What type of control action do you need?  
*Direct acting (cooling), reverse acting (heating), time/temp profiling (ramping), retransmit, etc.*
- What process tasks such as temperature, pressure, pH or flow require monitoring and controlling?
- What type of control mode do you intend to use?  
(ON/OFF, PID)
- What type of sensor(s) do you intend to use?  
(Thermocouple, 2- or 3-wire RTD, infrared, other)
- Do you intend to use process inputs?  
(4-20mA DC/0-5 VDC)
- Do you intend to use event outputs?  
(Available as a option on profiling controller/recorder models only)
- What type of control output do you need?  
(Relay, SSR driver, triac, linear)
- Do you need alarm outputs?
- Do you need communication?



Partlow offers three categories of circle chart recorders to suit virtually any customer application need. The table below allows quick comparison of performance capabilities and high level specifications of *Basic*, *General-Purpose/Industry-Application Specific* and *High-End* circle chart recorder models.

For detailed specifications of these models, refer to the page numbers provided beneath the product photos.

Circle Chart Recorder Category:	Basic	General-Purpose	Application/Industry Specific
	<p>MRC 5000™ Basic Digital Recorder</p>  <p>Page 14</p>	<p>MRC 7000™ General-Purpose Controller/ Recorder/Profiler</p>  <p>Page 18</p>	<p>MRC 7700™ General-Purpose Humidity Controller/ Recorder/Profiler</p>  <p>Page 24</p>
Type:	Front to panel (FTP), digital	Front to panel (FTP), digital	Front to panel (FTP), digital
Size:	10" dia. chart	10" dia. chart	10" dia. chart
Display:	1 4 digit, 0.56" LED	1 or 2, 4 digit, 0.56" LED	1 or 2, 4 digit, 0.56" LED
Pens:	1 or 2 (red/green)	1 or 2 (red/green)	1 or 2 (red/green)
Inputs:	1 or 2; universal (thermocouple, RTD, DC linear mA/mV); user-selectable	1-2; universal (thermocouple, RTD, DC linear mA/mV); remote setpoint	1-2; universal (thermocouple, RTD, DC linear V, DC Linear mA); user-selected
Outputs:	1-4; relay	1-8; relay or SSR driver; 1-4 DC Linear (dependent on output type)	1-8; relay, SSR driver, 1-4 DC Linear (dependent on output type)
Output Function:	Process control, high/low limit, alarm	Process control, high/low limit, alarm	Alarm (process, deviation/band), control, event and retransmission
Control:	ON/OFF, limit	PID, limit, profile	PID, ON/OFF, profile
Communications:	RS-485 Serial (MODBUS® RTU)	RS-485 Serial (Partlow ASCII)	RS-485 Serial (Partlow ASCII)
Input Power:	90-264 VAC std	Optional 115-230 VAC	Optional 115-230 VAC
Agency Approvals:	CE, CSA, UL, NEMA3, NEMA 4X (optional), FM (limit only)	UR, cUR, optional CE, optional NEMA 3	UR, cUR, optional CE, optional NEMA 3
Ideal For:	Basic digital recording applications with shallow depth panel requirements (process validation, trend analysis, regulatory compliance, product safety)	Record, profile and security functionality for reliability in diverse industry applications	Record, control and security functionality designed specifically for RH applications

Application/Industry Specific		High-End Circle Chart Recorders	
<p><b>MRC 7800™</b> General-Purpose Flow Recorder</p>  <p>Page 28</p>	<p><b>MRC 8000™</b> General-Purpose Recording Controller</p>  <p>Page 32</p>	<p><b>MRC 9000™ VersaChart</b> Full Version High-End 4-Pen Color Recorder/Profiler</p>  <p>Page 36</p>	<p><b>MRC 9400™ VersaEZ</b> Simplified High-End 4-Pen Color Recorder w/ Alarms</p>  <p>Page 40</p>
Front to panel (FTP), digital	Front to panel (FTP), digital	Front to panel (FTP), digital	Front to panel (FTP), digital
10" dia. chart	12" dia. chart	10, 11 or 12" dia. chart	10, 11 or 12" dia. chart
Single, 8 digit (std); dual 8 digit (opt); 0.36" LED	1 or 2, 4 digit, 0.56" LED	Single, 40-Char 5mm vacuum fluorescent	Single, 40-Char 5mm vacuum fluorescent
1 or 2 (red/green)	1 or 2 (red/green)	1 - 4 (4 colors)	1 - 4 (4 colors)
1-2, DC linear V, DC Linear mA/mV	1-2; universal (thermocouple, RTD, DC linear V, DC Linear mA/mV); user-selected; remote setpoint	4; universal (RTD, DC linear V, DC Linear mA/mV)	4; universal (RTD, DC linear V, DC Linear mA/mV)
1-8; relay, SSR driver; 1-4 DC Linear (dependent on output type)	1-8; relay or SSR driver, 1-4 DC Linear (dependent on output type)	1-8 relay or SSR driver; 1-4 mA outputs	1-8 relay or SSR driver; 1-4 mA outputs
Alarm (process)	Control and alarm (process, deviation/ band)	Alarms (process, deviation/band hysteresis), retransmission	Alarms (process, deviation/band), retransmission
N/A	PID, ON/OFF	PID, totalizing	None (totalizing optional)
RS-485 Serial (Partlow ASCII)	RS-485 Serial (Partlow ASCII)	RS-232/485 Serial (MODBUS® RTU)	RS-232/485 Serial (MODBUS® RTU)
Optional 115-230 VAC	Optional 115-230 VAC	85-265 VAC, 50/60 Hz	85-265 VAC, 50/60 Hz
UR, cUR, optional CE, optional NEMA 3	UR, cUR, optional CE, NEMA 3, optional NEMA 4X	UR, cUR, CE, NEMA 3, optional NEMA 4	UR, cUR, CE, NEMA 3, optional NEMA 4
Flow and rate tracking with optional totalizing capability	Flow and rate tracking with optional totalizing capability	Demanding process control applications - temp, pressure and RH	Demanding process applications - temp, pressure and RH



### 1 & 2 Pen Digital Chart Recorder

#### DESCRIPTION

Designed with the latest innovations in recording technology, enclosures and functionality, the MRC 5000 is slim, trim and simple. The MRC 5000 is a digital circle chart recorder capable of measuring, recording and controlling up to two process variables from a variety of inputs.

Finding a place to install this recorder is easy, with its compact panel depth and short protrusion from the front panel. The mode switch, located next to the display, provides two functions. When in the PROG/CAL/TEST position, it provides access to program parameters, calibration facilities and test functions. Hardware options are matrix selectable and are shipped with default settings. The MRC 5000 directly connects to either thermocouple, RTD, mVDC, VDC, or mA DC inputs. Changes in input type are easily accomplished in the field through programming. This instrument has a universal power supply, 90–264VAC line voltage at 50–60Hz.

## MRC 5000™

*Slim... Trim... Simple for Basic Digital Recording At Its Best!*

#### APPLICATIONS:

Ideal for basic digital recording applications with shallow depth panel requirements.

- Process Validation
- Trend Analysis
- Regulatory Compliance
- Product Safety
- Temperature
- pH
- Level

#### INDUSTRIES

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

#### FEATURES/BENEFITS

- Easy and simple in every aspect of operation: programming, testing and calibration
- Standard easy read display saves setup time, ensures proper configuration and allows for field calibration
- Completely assembled slim/trim design—no assembly required—reduces your panel depth and saves you money
- Wide range of power operation
- More standard input selections, time rotations and optional features
- Value priced basic recording

**MRC 5000™**

*Slim... Trim... Simple for Basic  
Digital Recording At Its Best!*

**Basic Recorders****1 & 2 Pen Digital Chart Recorder****SPECIFICATIONS****STANDARD FEATURES**

**Functionality:** Record only or high/low limit and record/control.

**Display:** 4 digit; 0.56" high, red, seven segment LED, 3 button keypad.

**Modes:** Program, Calibrate, Test and Run; Normal/Display or blank.

**Status Indicators:** Four red LED alarm status indicators; one green LED pen 2 indicator.

**Chart:** 10" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are 0–100 range. 24 hour rotation default setting.

**Chart Drive:** DC Stepper Motor.

**Chart Rotation:** User-configurable: 8 hrs, 12 hrs, 24 hrs, 48 hrs or 7 days.

**Chart Range:** Bottom and top of span –9999 to 9999 units.

**Pen Type:** One or two disposable fiber tip pen.

**Pen Color:** Pen 1 (red); Pen 2 (green).

**Memory Backup:** Non-volatile EEPROM for configuration parameters, calibration and alarm setpoint data.

**Construction/Enclosure:** Injection molded Noryl case; acrylic window cover.

**OPERATING CHARACTERISTICS**

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.3 to 100Hz @ 0.2g.

**ELECTRICAL**

**Power Consumption:** 18VA max.

**Line Voltage:** 90–264VAC, 47–63Hz.

**OUTPUTS**

**Control Outputs:** Relay option; SPDT, contacts rated 5A resistive at 115VAC, 2.5A resistive at 230VAC, 1/8HP at 230VAC (single phase), 250VA at 115/230V.

**Alarm Outputs:** Process high or low; up to two process alarms for each of two inputs.

**INPUTS**

**Thermocouple:** J, K, T, R, S.

**RTD:** 100 ohm, platinum; 0.00385 ohms/ohm/°C.

**Volts:** 0–10 VDC.

**DC Millivolts:** 0–25mV, 0 to 50mV; 10–50mV, 0–5V and 1–5V.

**DC Milliamps:** 0–20mA; 4–20mA; internal 4.7 ohm shunt resistor

**Impedance:** >100K ohms for TC and mV inputs; 100K ohms for 5V inputs; 4.7 ohms for mA inputs.

**RTD Excitation Current:** 150 microamps, typical.

**Input Scan Rate:** 1 scan/sec for non-RTD inputs; 1 scan/1.2 sec for RTD inputs.

**PERFORMANCE****GENERAL:**

**Input Measurement Error:** Type J, K, T, R, S and RTD  $\pm 0.25\%$  of span  $\pm 1$  degree. mA, mV and VDC:  $\pm 0.25\%$  of scaled span plus 1 least significant digit.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:**  $\pm 0.2^\circ\text{C}$  @ 25°C.

**Cold Junction Compensation Rejection:**  $\pm 0.04^\circ\text{C}$  deviation from 25°C.

**Linearization Error:** TCs:  $\pm 0.25^\circ\text{C}$  typical;  $\pm 0.5^\circ\text{C}$  worst case with exceptions. RTDs:  $\pm 0.1^\circ\text{C}$  typical;  $\pm 0.3^\circ\text{C}$  worst case.

**Common Mode Rejection:** >120dB @50/60Hz; 260VAC max.

**Normal Mode Rejection:** 85dB minimum @ 60Hz or greater.

**Isolation:** Inputs are a common ground signal.

**Chart Accuracy:** Recording: 0.5% of chart span. Chart Rotation:  $\pm 0.5\%$  of rotation time.

**COMMUNICATIONS INTERFACES**

**Communications Port:** RS-485 serial, half duplex.

**Protocol:** MODBUS RTU.

**Bit Rate:** 9600/sec.

**Parity:** Odd.

**Address:** User-configurable, 1–247.

**RATINGS/AGENCY APPROVALS**

**Safety:** UL1092, UL916 and QUXY File E67237, CSA Spec 142 File E67237, CE EN61010-1 1993.

**Immunity:** CE EN50082-2:1992.

**Emissions:** EN50081-1:1992 and EN50081-2:1994; EN55022 Class B.

**Limit Device:** FM Approved File J.I.1D8a1.AF (Class 3545).

**Other:** ISO 9002 registered.

**PROTECTION**

NEMA 3 standard; NEMA 4X optional; optional door lock.

**PHYSICAL DIMENSIONS**

**Width:** 14" (356mm).

**Depth:** 3.8" (97mm); panel depth: 2.5" (64mm); panel protrusion: 1.3" (33mm).

**Height:** 14" (356mm).

**Weight:** 15 lbs (6.8kg).

**Mounting/Mounting Position:** Panel or wall; up to 30° backward or forward tilt from vertical; up to 10° side tilt from vertical.

**Retrofit Adaptor Plate:** Will fit Partlow MRC7000 and ARC4100 cutouts.

**OPTIONS/ACCESSORIES**

Optional process or High/Low Limit alarms.

Optional configuration port.

Optional digital communications.

Optional adaptor plate for convenient retrofit into MRC7000 and 4100 cutouts.

NEMA 4X protection optional.

**WARRANTY**

2 years.



**PARTLOW™ brand**

**1 & 2 Pen Digital Chart Recorder**

**MRC 5000™**

*Slim... Trim... Simple for Basic  
Digital Recording At Its Best!*

**MODELS**

Code 1: Model	Code 2: Pen 1 Option	Code 3: Pen 2 Option	Code 4: Pen 1 Outputs	Code 5: Pen 2 Outputs	Code 6: Communications Option	Code 7: Enclosure Options	Code 8: Operating Voltage	Code 9: Suffix
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
MRC5000 Recorder/Controller	1 Recorder Only 2 Recording Controller* 4 High/Low Limit*†	0 None 1 Recorder Only 2 Recording Controller* 4 High/Low Limit*†	0 None 1 One Relay 2 Two Relays	0 None 1 One Relay 2 Two Relays	0 Recorder Only 1 Configurator Port 2 RS-485 3 Configurator Port and RS-485	1 Standard-NEMA 3 2 Door Lock 3 NEMA 4X	1 Standard-90 To 240VAC 3 Standard Voltage & Transmitter Power Supply 5 CE 7 CE & Standard Voltage & Transmitter Power Supply	BLANK - None AA Alarms and Communications Connectivity Option (Allows for later field installation of both options)

\* Does not include a relay. Order relays in output options.  
† High/Low limit device is Factory Mutual approved.

**BASIC RECORDERS**



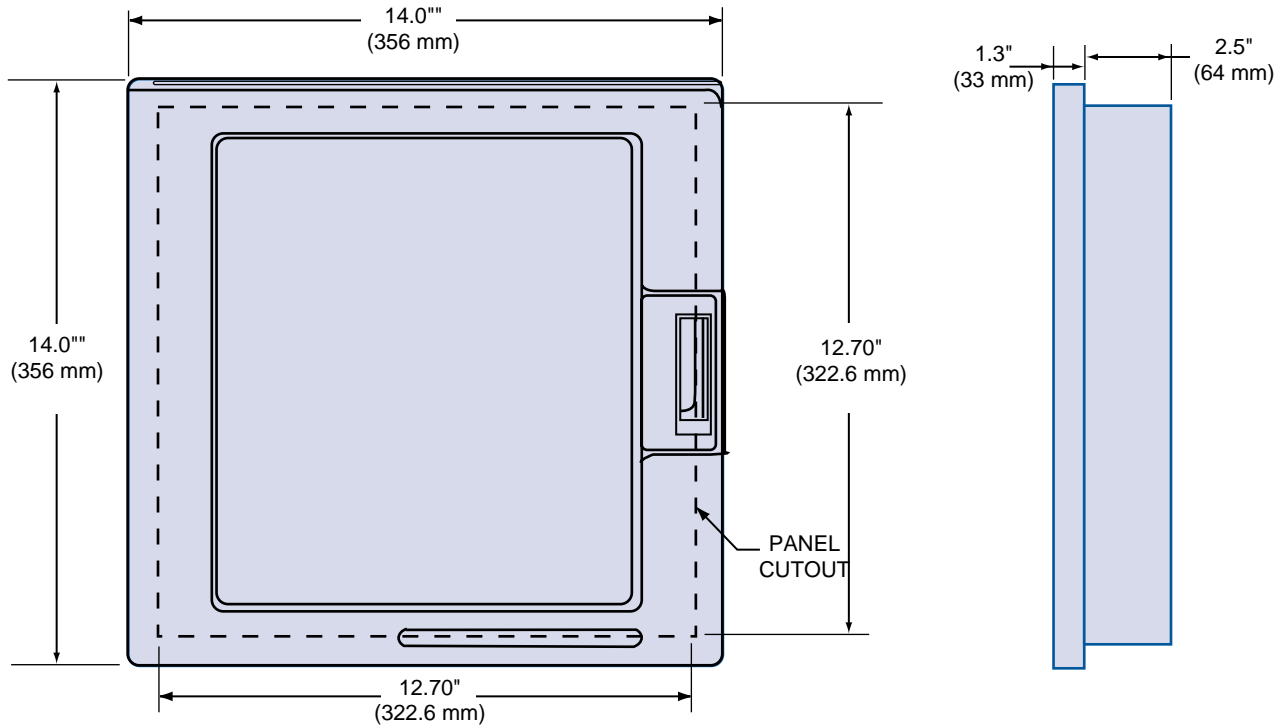
# MRC 5000™

*Slim... Trim... Simple for Basic  
Digital Recording At Its Best!*

*Basic Recorders*

**1 & 2 Pen Digital Chart Recorder**

## DIMENSIONS



BASIC RECORDERS

Made in USA.

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### Recorder/Controller/Profiler

#### DESCRIPTION

The MRC7000 Recorder/Controller is a microprocessor based circular chart instrument capable of measuring, displaying, recording and controlling up to two process variables from a variety of inputs.

Record and control functions, alarm settings and other parameters are easily configured via the keys on the front cover and self-prompting displays.

All user entered data can be protected against unauthorized changes via the MRC7000 Enable Mode security system.

## MRC 7000™

*Proven Recording Reliability that Became the Industry Standard!*

#### APPLICATIONS:

Record, profile and security functionality for reliability in diverse industry applications

- Process Validation
- Trend Analysis
- Regulatory Compliance
- Product Safety
- Temperature
- pH
- Level

#### INDUSTRIES

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

#### FEATURES/BENEFITS

- Micro-based recording with controller or profiler options with programming setpoint profile capability in one instrument
- Two displays allow you to see critical process values at the same time (on 2 pen units)
- Easy, straightforward programming allows you to configure your recorder with a logical step-by-step process using a simple keypad
- Optional true time based profiling capability puts you in control of your process
- Reliability—maintenance free recording for years to come

## MRC 7000™

Proven Recording Reliability that  
Became the Industry Standard!

## Recorder/Controller/Profiler

## SPECIFICATIONS

## STANDARD FEATURES

**Functionality:** Digital; Available in four configurations: Record only, High/Low limit optional, Controlling Recorder, Profiling Controlling Recorder.

**Display:** One digital display (std.); 2nd display with 2 pen (optional); 0.56" high, red, seven segment LED; 3 button keypad; automatic and decimal point positioning. Two alarm indications possible per pen.

**Status Indicators:** 7 LED status indicators – Out 1, 2, Man (Ramp, Soak or Seg 1–6 for profiler option only), one green LED pen 2 indicator, ALRM1/ALRM2 with red LEDs.

**Chart:** 10" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are 0–100 range. 24 hour rotation default setting.

**Chart Drive:** DC Stepper Motor.

**Chart Rotation:** User configurable from 0.1 and 999.9 hours per revolution.

**Chart Range:** Bottom and top of span –9999 to 9999 units.

**Pen Type:** One or two disposable fiber tip pen.

**Pen Color:** Pen 1 (red); Pen 2 (green).

**Memory Backup:** Battery; 5 year normal life.

**Construction/Enclosure:** Structural foam enclosure with plastic cover standard.

## OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

**Electro Static Discharge:** No effect from 5000V static charge over the entire area.

**RFI:** Degradation due to RF fields to recording and output accuracy to 8% at spot frequencies in the range of 100–1000MHz.



## ELECTRICAL

**Power Consumption:** 25VA max.  
**Line Voltage:** 115V or 230VAC ±10%, 50–60Hz.

## OUTPUTS

## CONTROL OUTPUTS:

**Relay:** SPST/SPDT; 115VAC 5.0A Resistive, 1/8HP, 250VA; 230VAC 2.5A Resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Current:** 0–20mA or 4–20mA; 0–650 ohm maximum load.

**ALARM/EVENT OUTPUTS (Options):**  
**Relay:** SPST/SPDT; 115VAC 5.0A resistive, 1/8HP, 250VA. 230VAC 2.5A resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Process Alarm:** Direct (High) or Reverse (Low) –9999 to 9999 units.

**Deviation Alarm:** Direct (Deviation above setpoint) or Reverse (Deviation below setpoint) –3000 to 3000 units.

**Deviation Band Alarm:** 1 to 3000 units.

**Alarm Hysteresis:** 0–300 units (width of hysteresis band).

## INPUTS

**Thermocouple:** J, K, T, R, S, B, C, E, N.

**RTD:** 100 ohm, platinum; 0.00385 ohms/ohm/°C.

**Volts:** 0–5 VDC or 1–5VDC.

**DC Millivolts:** 0–25mV, 0–50mV or 10–50mV.

**DC Milliamps:** 4–20mA or 0–20mA used with appropriate shunt resistor.

**Remote Setpoint Input (optional):** 0–5VDC, 1–5VAC, 0–20mA, 4–20mA (recording controller only); accommodated with an internal 249 ohm jumper selectable shunt resistor.

## PERFORMANCE

## GENERAL:

**Input Measurement Error:** Type J, K, T, E, N, C, T/C and RTD ±0.25% of reading plus 1 degree @ 25°C; Type R, S, B, C, T/C ±0.25% of span @ 25°C.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:** ±0.2% @ 25°C.

**Cold Junction Compensation Rejection:** ±0.04% deviation from 25°C.

**Common Mode Rejection:** 90dB minimum; 24VAC maximum for RTD input; 115VAC max for other inputs.

**Normal Mode Rejection:** 85dB minimum @ 60Hz or greater.

**Chart Accuracy:** Recording: 0.5% of span. Chart Rotation: ±0.5% of rotation time.

**Process Value Output Error Limit:** 0.5% of span.

**Record Error Limit:** ±0.5% of chart span or better typically; ±1.0% of chart span maximum.

**CONTROL PARAMETERS (optional):**  
**Proportional Band Output 1/Output 2:** 1 to 3000 units.  
**Manual Reset (Integral):** –1500 to 1500 units.  
**Auto Reset (Integral):** 0.0–100.0 repeats/minute.  
**Rate Derivative:** 0.0–10.0 minutes.  
**Cycle Time Output 1/Output 2:** 1 to 240 seconds.  
**Position Proportioning Sensitivity:** 0.0–50.0%.

**ON/OFF Hysteresis:** 0–300 units (width of hysteresis band).

**First/Second Output Position:** –1000 to 1000 units.

**Control Action:** Direct or Reverse.

**Automatic Transfer Function:** User-selectable to transfer from manual to automatic control when setpoint is reached; can be disabled.

**Anti-Reset Windup:** Auto-reset is disabled when the process is outside of the proportional band.

**Auto/Manual:** Bumpless transfer.

**Manual Output:** 0–100%.

**Output Limiting:** High/Low 0–100%.

**Setpoint Limiting:** High/Low Limit: –9999 to 9999 units.

# MRC 7000™

**Proven Recording Reliability that  
Became the Industry Standard!**

## Recorder/Controller/Profiler

### SPECIFICATIONS (Continued)

PERFORMANCE (continued)	COMMUNICATIONS INTERFACES	OPTIONS/ACCESSORIES
<p><b>PROFILE PARAMETERS (optional):</b>  <b>Programmable Profiles:</b> 8 user-programmable profiles.  <b>Segments:</b> 1–6 segments per profile.  <b>Ramp and Soak:</b> 1 ramp and soak per segment.  <b>Profile Time Base:</b> User-selectable; Choose from hours and tenths (HHH.T); hours and minutes (HH.MM) or minutes and seconds (MM.SS).  <b>Profile Interruption Action:</b> Upon return of AC power either go to OFF mode, continue profile, go to HOLD mode, or restart profile at beginning.  <b>Profile Loop Count:</b> 1–9999; 0 = continuous.  <b>Profile End Control:</b> User-selectable; hold at last setpoint; Abort (all outputs off or 0%); transfer to another profile.  <b>Assured Soak:</b> Deviation Hold after Ramp Up or Down; 1–3000 units; 0 = No Auto Hold.  <b>Pen Profiling Configuration:</b> Pen 1 only or Pen 1 and 2.  <b>Remote Run/Hold (optional):</b> User-selectable; override Run/Hold key; allow Run/Hold key function.  <b>Event Output(s):</b> Up to 3 event outputs possible; each event can be set on or off for each ramp and soak.</p>	<p><b>Communications Port:</b> RS-422/485 serial, half duplex.  <b>Protocol:</b> Partlow ASCII  <b>Bit Rate:</b> User-configurable 300, 600, 1200, 2400, 4800 or 9600/sec.  <b>Address:</b> User-configurable for each pen 0–99.</p>	<p>RS-485 communication option.                  24V DC power supply option.                  115 or 230VAC input option.                  NEMA 3 protection optional; CE compliance optional.</p>
	RATINGS/AGENCY APPROVALS	WARRANTY
	<p><b>Safety:</b> UL 1092 File E67237; CSA Spec C22.2 File LR39885.  <b>Immunity:</b> Optional CE compliance.  <b>Other:</b> ISO 9002 registered.</p>	<p>3 years.</p>
	PROTECTION	
	<p>NEMA 3 enclosure optional; CE compliance optional.                  Enable Mode security system</p>	
	PHYSICAL DIMENSIONS	
	<p><b>Width:</b> 15.13" (384mm).  <b>Depth:</b> 3.63" (92mm).  <b>Height:</b> 13.19" (335mm).  <b>Weight:</b> 20 lbs (9.1kg).</p>	

GENERAL-PURPOSE RECORDERS

**PARTLOW™ brand**

**Recorder/Controller/Profiler**

**MRC 7000™**

*Proven Recording Reliability that Became the Industry Standard!*

**MODELS (Recorder Only)**

Code 1: Model	Code 2: Pen 1	Code 3: Pen 2	Code 4: Relay (SPST) Outputs*	Code 5: SSR Driver Outputs*	Code 6: 4-20mA Outputs	Code 7: Transmitter Power Supply	Required Zeros	Code 8: Digital Communications	Code 9: Enclosure Options	Code 10: Operating Voltage	Code 11: Option Suffix
<b>7</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>0 0</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRC7000 Recorder	1 Recorder Only 4 High or Low Limit††	0 None 1 Recorder Only	0 None 1 One SPST 2 Two SPST 4 Four SPST 6 Six SPST 7 One SPDT 8 Two SPDT 9 Two SPDT and Two SPST	0 None 1 One 2 Two 4 Four 6 Six 8 Eight	0 None 1 One Standard 2 Two Standard 3 Three Standard 4 Four Standard	0 None 1 24VDC Regulated /Isolated	<b>0 0</b>	0 None 2 RS-485 Total Access	2 Standard Cover (Plastic Windows) 4 Door Lock** 6 Sealed Conduit Connections 7 4 & 6 Combined**	1 115VAC 2 115/230VAC <b>CSA APPROVED</b> 4 115VAC 5 115/230VAC	BLANK - None N3 NEMA † AW RTD Depression on Pen 2 AD 0/100 mVDC Input AE N3 plus AW CE CE Compliance

\* Total quantity of SPST Relays and SSR Drivers must be less than or equal to eight. When SPDT Relays are included, the total must be less than or equal to six. With Limit, only 1 selectable Alarm is available.

\*\* This option comes with a structural foam cover.

†N3 - NEMA type protection for wet environments.

NOTE: 4-20mA inputs are accommodated using the 1-5V input and a 250 ohm Shunt Resistor, P/N 64411701 or the 10-50mA input and a 2.5 ohm Shunt Resistor, P/N 64411702 Order as Separate Line Item.

††High/low limit device is Factory Mutual approved.



**PARTLOW™ brand**

**Recorder/Controller/Profiler**

**MRC 7000™**

*Proven Recording Reliability that Became the Industry Standard!*

**MODELS (Recording Controller/Profiler)**

Code 1: Model	Code 2: Pen 1	Code 3: Pen 2	Code 4: Relay (SPST) Outputs*	Code 5: SSR Driver Outputs*	Code 6: 4-20mA Outputs	Code 7: Transmitter Power Supply	Code 8: Pen 1 Auxiliary Input	Code 9: Pen 2 Auxiliary Input	Code 10: Digital Communications	Code 11: Enclosure Options	Code 12: Operating Voltage	Code 13: Option Suffix
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRC7000 Recording/ Profile Controller	2 Recording Controller	0 None	0 None	0 None	0 None	0 None	0 None	0 None	0 None	2 Standard Cover (Plastic Windows) 4 Door Lock*** 6 Sealed Conduit Connections	1 115VAC 2 115/230VAC <b>GSA APPROVED</b> 4 115VAC 5 115/230VAC	BLANK - None N3 NEMA 1 AW RTD Depression on Pen 2 AD 0/100 mVDC Input AE N3 plus AW CE CE Compliance
	3 Recording Profile Controller	1 Recorder Only	1 One SPST	1 One	1 One	1 24VDC Regulated /Isolated	1 Position Proportioning	1 Position Proportioning	2 RS-485 Total Access	7 4 & 6 Combined***		
	2 Recording Controller	2 Recording Controller	2 Two SPST	2 Two	2 Two	2 Three Standard	2 Remote Setpoint	2 Remote Setpoint				
			4 Four SPST	4 Four	4 Four	3 Standard	3 Remote Run/Hold**					
			6 Six SPST	6 Six	3 Three							
			7 One SPDT	8 Eight	4 Four							
			8 Two SPDT									
			9 Two SPDT and Two SPST									

\* Total quantity of SPST Relays and SSR Drivers must be less than or equal to eight. When SPDT Relays are included, the total must be less than or equal to six.

\*\* Applies to Model 73XXXXXXXXXX.

\*\*\* This option comes with a structural foam cover.

†N3 - NEMA type protection for wet environments.

NOTE: 4-20mA inputs are accommodated using the 1-5V input and a 250 ohm Shunt Resistor, P/N 64411701 or the 10-50mA input and a 2.5 ohm Shunt Resistor, P/N 64411702ea.  
Order as Separate Line Item.

**GENERAL-PURPOSE RECORDERS**



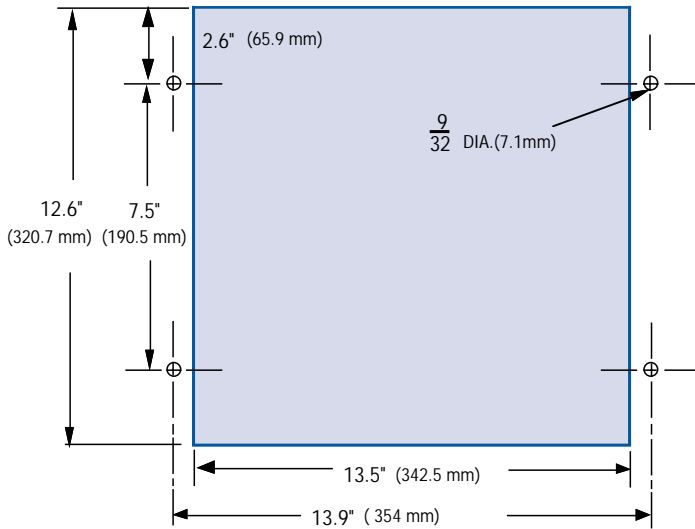
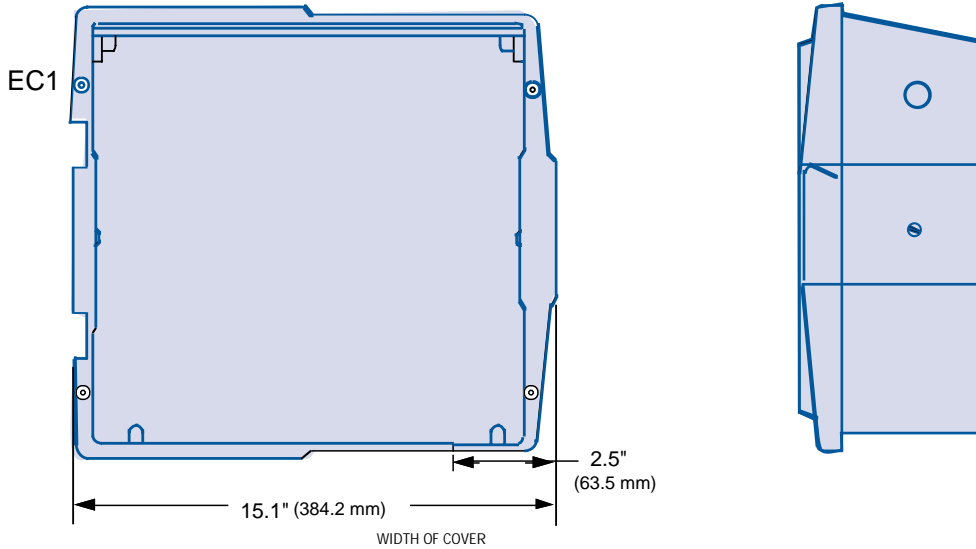
**DANAHER**  
INDUSTRIAL CONTROLS

# MRC 7000™

**Proven Recording Reliability that  
Became the Industry Standard!**

**Recorder/Controller/Profiler**

## DIMENSIONS



Panel cut-out for flush mounting

Made in USA.

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**MRC 7700™**  
*Proven Recording Reliability  
Designed Specifically for Relative  
Humidity Applications!*

**Relative Humidity Recorder/Controller**

**DESCRIPTION**

The MRC7700 Relative Humidity Recorder is a micro-processor based circular chart profile recorder capable of measuring, displaying, recording and controlling relative humidity and/or temperature using Dry Bulb and Wet Bulb temperatures from a variety of inputs.

Record and control functions, alarm settings and other parameters are easily configured via the keys on the front cover and self-prompting displays. NEMA 3 protection and sealed door lock optional.

**APPLICATIONS:**

Record, control and security functionality designed specifically for Relative Humidity Applications

- Process Validation, Trend Analysis
- Relative Humidity

**INDUSTRIES**

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

**FEATURES/BENEFITS**

- Micro-based recording controller with relative humidity profile capability
- Two displays—allowing you to see critical process values at the same time
- Easy, straightforward programming—allows you to configure your recorder with a logical step-by-step process using a simple keypad
- True time based profiling capability puts you in control of your process
- Reliability—maintenance-free recording for years to come

**MRC 7700™**

*Proven Recording Reliability Designed  
Specifically for Relative Humidity Applications!*

## Application Specific Recorders

### Relative Humidity Recorder/Controller

## SPECIFICATIONS

### STANDARD FEATURES

**Functionality:** Digital

**Display:** 2 digital displays: 0.56" high, red, seven segment LED; 3 button keypad; automatic and decimal point positioning. **Decimal Positions:** None, one, two or three decimal places.

**Programmable Profiles:** Up to 8 user programmable profiles on profile version.

**Status Indicators:** 7 LED status indicators: Out 1, 2, Man, Ramp, Soak, Seg 1–6; one green LED pen 2 indicator.

**Chart:** 10" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are 0–100 range. 24 hour rotation default setting.

**Chart Drive:** DC Stepper Motor.

**Chart Rotation:** User configurable from 0.1 and 999.9 hours per revolution.

**Chart Range:** Bottom and top of span –9999 to 9999 units.

**Pen Type:** One or two disposable fiber tip pen.

**Pen Color:** Pen 1 (red); Pen 2 (green).

**Memory Backup:** Battery; 5 year minimum life.

**Construction/Enclosure:** Structural foam enclosure with plastic cover standard.

### OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

**Electro Static Discharge:** No effect from 5000V static charge over the entire area.

**RFI:** Degradation due to RF fields to recording and output accuracy to 8% at spot frequencies in the range of 100–1000MHz.

### ELECTRICAL

**Power Consumption:** 25VA max.

**Line Voltage:** 115V ±10%, 50–60Hz standard; Optional 115/230VAC±10%, 50–60Hz.

### INPUTS

**Thermocouple:** J, K, T, R, S, E, B, N, C.

**RTD:** 100 ohm, platinum; 0.00385 ohms/ohm/°C.

**Volts:** 0–5 VDC; 1–5 VDC.

**DC Milliamps:** 4–20mA, 0–20mA.

### OUTPUTS

**CONTROL OUTPUTS:**

**Relay:** SPST/SPDT; 115VAC 5.0A Resistive, 1/8HP, 250VA; 230VAC 2.5A Resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Current:** 0–20mA or 4–20mA; 0–650 ohm maximum load.

**ALARM/EVENT OUTPUTS (Options):**

**Relay:** SPST/SPDT; 115VAC 5.0A resistive, 1/8HP, 250VA. 230VAC 2.5A resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Process Alarm:** Direct (High) or Reverse (Low) –9999 to 9999 units.

**Deviation Alarm:** Direct (Deviation above setpoint) or Reverse (Deviation below setpoint) –3000 to 3000 units.

**Deviation Band Alarm:** Open or closed 1 to 3000 units.

**Alarm Hysteresis:** 0–300 units (width of hysteresis band).

### PERFORMANCE

**GENERAL:**

**Input Measurement Error:** Type J, K, T, E, N, C, T/C and RTD ±0.25% of reading plus 1 degree @ 25°C; Type R, S, B, C, T/C ±0.25% of span @ 25°C.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:** ±0.2% @ 25°C.

**Cold Junction Compensation Rejection:** ±0.04% deviation from 25°C.

**Common Mode Rejection:** 90dB minimum; 24VAC maximum for RTD input; 115VAC maximum for other inputs.

**Normal Mode Rejection:** 85dB minimum @ 60Hz or greater.

**Chart Accuracy:** Recording: 0.5% of span. Chart Rotation: ±0.5% of rotation time.

**Algorithm Accuracy:** Typically better than 1%; however, actual user accuracy will be dependent upon the quality of the sensors used, the proper installation of the sensors, the input correction adjustments and the barometric pressure adjustments.

**Scan Rate:** 1 scan/second.

**Noise Rejection:** Normal mode: 85dB minimum at 60Hz or greater. Common mode: 90dB minimum at 115VAC maximum.

**Sensor Fault Detection:** Displays SNSR for sensor break; outputs go off; PV output to 100%; event status remains the same; fault detection is not a function for 0–5V or 0–20mA inputs.

**Transmitter Power Supply:** Provides up to 40mA of current at 24VDC.

**Process Value Output Error Limit:** 0.5% of span.

**Record Error Limit:** ±0.5% of chart span or better typically; ±1.0% of chart span maximum.

**PROFILE PARAMETERS (optional):**

**Programmable Profiles:** 8 user-programmable profiles.

**Segments:** 1–6 segments per profile.

**Ramp and Soak:** 1 ramp and soak per segment.

**Profile Time Base:** User-selectable; choose from hours and tenths (HHH.T), hours and minutes (HH.MM) or minutes and seconds (MM.SS).

**Profile Interruption Action:** Upon return of AC power either go to OFF mode; continue profile, go to HOLD mode or restart profile at beginning.

**Profile Loop Count:** 1–9999; 0 = continuous.

**Profile End Control:** User-selectable; hold at last setpoint; Abort (all outputs off or 0%); transfer to another profile.

**Assured Soak:** Deviation Hold after Ramp Down/Ramp Up; 1–3000 units; 0 = No Auto Hold.

**Pen Profiling Configuration:** Pen 1 only or Pen 1 and 2.

**Remote Run/Hold:** User-selectable; override Run/Hold key; Allow Run/Hold key function.

**Event Output(s):** Up to 3 event outputs possible; each event can be set on or off for each ramp and soak.

# MRC 7700™

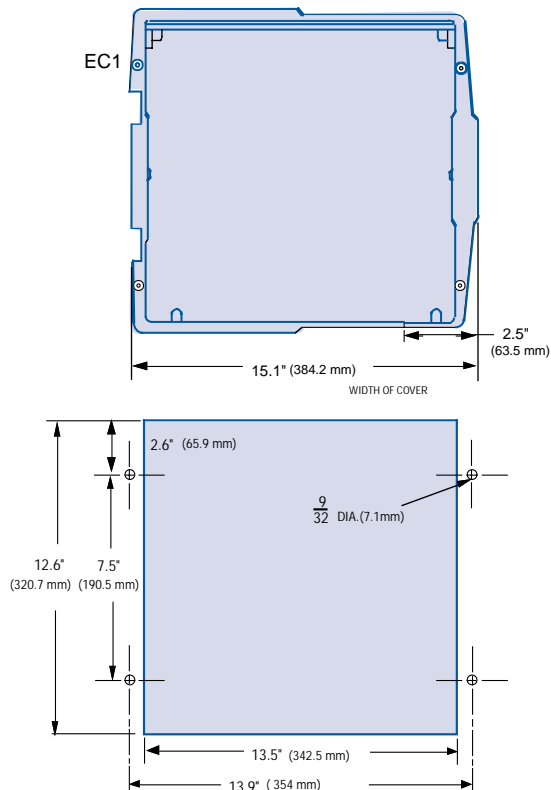
**Proven Recording Reliability Designed  
Specifically for Relative Humidity Applications!**

## Recorder/Controller/Profiler

### SPECIFICATIONS (Continued)

COMMUNICATIONS INTERFACES	PROTECTION	OPTIONS/ACCESSORIES
<p><b>Communications Port:</b> RS-422/485 serial, half duplex.</p> <p><b>Protocol:</b> Partlow ASCII</p> <p><b>Bit Rate:</b> User-configurable 300, 600, 1200, 2400, 4800 or 9600/sec.</p> <p><b>Address:</b> User-configurable for each pen 0–99.</p>	<p>NEMA 3 enclosure optional; CE compliance optional.</p>	<p>RS-485 communication option.</p> <p>24V DC transmitter power supply option.</p> <p>115 or 230VAC input option.</p> <p>Door lock and sealed conduit/connector option.</p> <p>CE compliance optional.</p>
RATINGS/AGENCY APPROVALS	PHYSICAL DIMENSIONS	WARRANTY
<p><b>Safety:</b> L 1092 File E67237; CSA Spec C22.2 File LR39885, CE EN61010-1 1993/1995</p> <p><b>Immunity:</b> CE EN50082-1:1992</p> <p><b>Emissions:</b> CE EN55011:1991</p> <p><b>Limit Device:</b> N/A</p> <p><b>Other:</b> ISO 9002 registered.</p>	<p><b>Width:</b> 15.13" (384mm).</p> <p><b>Depth:</b> 3.63" (92mm).</p> <p><b>Height:</b> 13.19" (335mm).</p> <p><b>Weight:</b> 20 lbs (9.1kg).</p> <p><b>Mounting/Mounting Position:</b> Panel or wall.</p>	<p>3 years.</p>

### DIMENSIONS



Panel cut-out for flush mounting



Made in USA.

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PARTLOW™ Brand

MRC 7700™

**Recorder/Controller/Profiler**

*Proven Recording Reliability that Became the Industry Standard!*

## MODELS

Code 1: Model	Code 2: 1 Pen / 2 Pen Options	Code 3: Relay (SPST) Outputs*	Code 4: SSR Driver Outputs*	Code 5: 4-20mA Outputs	Code 6: Transmitter Power Supply	Code 7: Pen 1 Auxiliary Input	Code 8: Pen 2 Auxiliary Input	Code 9: Digital Communications	Code 10: Enclosure Options	Code 11: Operating Voltage	Code 12: Option Suffix
77	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRC7700 Recorder/ Controller/ Profiler	1 One Pen Recorder 2 One Pen Recording Controller	0 None 1 One SPST 2 Two SPST 4 Four SPST 6 Six SPST	0 None 1 One 2 Two 4 Four 6 Six 8 Eight	0 None 1 One Standard 2 Two Standard 3 Three Standard 4 Four Standard	0 None 1 24VDC Regulated /Isolated	0 None 1 Position Proportioning 2 Remote Setpoint 3 Remote Run/Hold****	0 None 1 Position Proportioning 2 Remote Setpoint	0 None 2 RS-485 Total Access	2 Standard Cover (Plastic Windows) 4 Door Lock** 6 Sealed Conduit Connections 7 4 & 6 Combined**	1 115VAC 2 115/230VAC <b>CSA APPROVED</b> 4 115VAC 5 115/230VAC	BLANK - None N3 NEMA + CE CE Compliance

\* Total quantity of SPST Relays and SSR Drivers must be less than or equal to eight.

†N3 - NEMA type protection for wet environments.

\*\* This option comes with a structural foam cover.

\*\*\*Applies to Models 773XXXXXXXXXX and 776XXXXXXXXXX.

**NOTE:** 4-20mA inputs are accommodated using the 1-5V input and a 250 ohm Shunt Resistor, P/N 64411701 or the 10-50mA input and a 2.5 ohm Shunt Resistor, P/N 64411702  
Order as Separate Line Item(s).





## Flow Controller

### DESCRIPTION

The MRC 7800 Flow Controller is a microprocessor based circular chart recorder capable of measuring, displaying, recording and totaling flow process variables. Record functions, alarm settings and other parameters are easily configured from the front mounted keypad and self-prompting displays.

All user data can be protected from unauthorized changes by the Enable Mode security system. The MRC7800 is protected against loss of data from AC power failures by a standard battery backup system.

Applications for the MRC 7800 include process validation, trend analysis, regulatory compliance and product safety. Flow tracking is available with the optional totalizing capability.

## MRC 7800™

*Proven Recording Reliability  
Designed Specifically for Flow  
Applications!*

### APPLICATIONS:

- Process Validation, Trend Analysis, Regulatory Compliance, Product Safety
- Flow/Rate Tracking with optional totalizing capability

### INDUSTRIES

Harsh water environments, sewage treatment, effluent flow, water treatment, etc.

### FEATURES/BENEFITS

- Micro-based recording controller
- Two displays, allowing you to see critical process values at the same time
- Easy, straightforward programming—allows you to configure your recorder with a logical step-by-step process using a simple keypad
- High reliability—eliminates cost of process downtime
- Up to 8 relay or solid state outputs for use as totalizer presets
- Up to 4 analog outputs for process retransmission

# MRC 7800™

*Proven Recording Reliability  
Designed Specifically for Flow Applications!*

## Flow Controller

### SPECIFICATIONS

#### STANDARD FEATURES

**Modes:** Digital; choice of Record or Diverse Record/Totalizer combination functions.

**Display:** One 8-digit display (std.); second display optional; 0.36" high, red, seven segment LED; 3 button keypad; automatic and decimal point positioning; **Decimal Positions:** None, one, two or three decimal places.

**Status Indicators:** 7 LED status indicators: Out 1, 2; one green LED pen 2 indicator; LED indicators ALRM1 and ALRM2.

**Chart:** 10" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are 0–100 range. 24 hour rotation default setting.

**Chart Drive:** DC Stepper Motor.

**Chart Rotation:** User configurable from 0.1 and 999.9 hours per revolution.

**Chart Range:** Bottom and top of span –9999 to 9999 units.

**Pen Type:** One or two disposable fiber tip pen.

**Pen Color:** Pen 1 (red); Pen 2 (green).

**Memory Backup:** Battery; 5 year minimum life.

**Construction/Enclosure:** Injection molded Noryl case; acrylic window cover.

#### OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

**Electro Static Discharge:** No effect from 5000V static charge over the entire area.

#### ELECTRICAL

**Power Consumption:** 25VA max.

**Line Voltage:** 115V or 230VAC ±10%, 50–60Hz.

#### INPUTS

**Thermocouple:** N/A.

**RTD:** N/A.

**Volts:** 0–5 VDC\*; 1–5 VDC\*.

**DC Milliamps:** 4–20mA, 0–20mADC.

**DC Millivolts\*:** 0–100mV (can be scaled to any portion of this range).

\* Accomplished by removal of a shunt resistor factory installed on the input terminals.

#### OUTPUTS

**Relay:** SPST/SPDT; 115VAC 5.0A Resistive, 1/8HP, 250VA; 230VAC 2.5A Resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Current:** 0–20mA or 4–20mA; 0–650 ohm maximum load.

**Process Alarm:** Direct (High) or Reverse (Low); 0 to 9999 units.

**Deviation Alarm:** N/A.

**Deviation Band Alarm:** N/A.

**Alarm Hysteresis:** 0–300 units (width of hysteresis band).

#### PERFORMANCE

**GENERAL:**

**Input Measurement Error:** mA, mV, and VDC ±0.25% of scaled span or better typically; ±1 least significant digit @ 25°C.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Isolation:** N/A.

**Chart Accuracy:** ±1% of chart span.

**Noise Rejection:** Common Mode: 90dB minimum; 24VAC maximum for RTD input; 115VAC max for other inputs. Normal Mode: 85dB minimum @ 60Hz or greater.

**Transmitter Power Supply:** Provides up to 42mA of current at 24 VDC.

#### COMMUNICATIONS INTERFACES

**Communications Port:** N/A

**Protocol:** N/A

**Bit Rate:** N/A

**Address:** N/A

#### RATINGS/AGENCY APPROVALS

**Safety:** UL 1092 File E67237; CSA Spec C22.2 File LR39885, CE EN61010-1 1993/1995.

**Immunity:** CE EN50082-1:1992

**Emissions:** CE EN55011:1991

**Limit Device:** N/A

**Other:** ISO 9002 registered.

#### PROTECTION

NEMA 3 optional

#### PHYSICAL DIMENSIONS

**Width:** 15.13" (384mm).

**Depth:** 3.63" (92mm).

**Height:** 13.19" (335mm).

**Weight:** 20 lbs (9.1kg).

**Mounting/Mounting Position:** Panel or wall.

#### OPTIONS/ACCESSORIES

24V DC power supply option.

115 or 230VAC input option.

Door lock and sealed conduit/connector option.

NEMA 3 protection optional.

Totalizing flow option.

#### WARRANTY

3 years.

**Flow Controller**

**MRC 7800™**

*Proven Recording Reliability  
Designed Specifically for Flow  
Applications!*

**MODELS**

Code 1: Model	Code 2: Pen & Totalization Selection	Code 3: Relay (SPST) Outputs*	Code 4: SSR Driver Outputs*	Code 5: 4-20mA Outputs	Code 6: Transmitter Power Supply	Code 7: Data Logging Options	Required Zeros	Code 8: Enclosure Options	Code 9: Operating Voltage	Code 10: Option Suffix
<b>78</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>0 0</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRC7800 Flow Recorder	5 One Pen Recorder	0 None	0 None	0 None	0 None	0 None		2 Standard Cover (Plastic Windows)	1 115VAC 2 115/230VAC <b>CSA APPROVED</b>	BLANK - None N3 NEMA †
	6 One Pen Rec. w/ Totalization	1 One SPST	1 One	1 One Standard	1 24VDC Regulated /Isolated	1 Data Logged In Memory**		4 Door Lock***		
	7 Two Pen Recorder	2 Two SPST	2 Two	2 Two Standard				6 Sealed Conduit Connections	4 115VAC	
	8 Two Pen Rec. w/ Totalization	4 Four SPST	4 Four	3 Three Standard				7 4 & 6 Combined****	5 115/230VAC	
	9 One Pen Recorder with Totalization and second display	6 Six SPST	6 Six	4 Four Standard						
		7 One SPDT	8 Eight							
		8 Two SPDT w/ Totalization	9 Two SPDT and Two SPST							
		9 One Pen Recorder with Totalization and second display								

\* Total quantity of SPST Relays and SSR Drivers must be less than or equal to eight.  
When SPDT Relays are included, the total must be less than or equal to six.

\*\* Available only on units with totalization.

\*\*\* This option comes with a structural foam cover.

†N3 - NEMA type protection for wet environments.

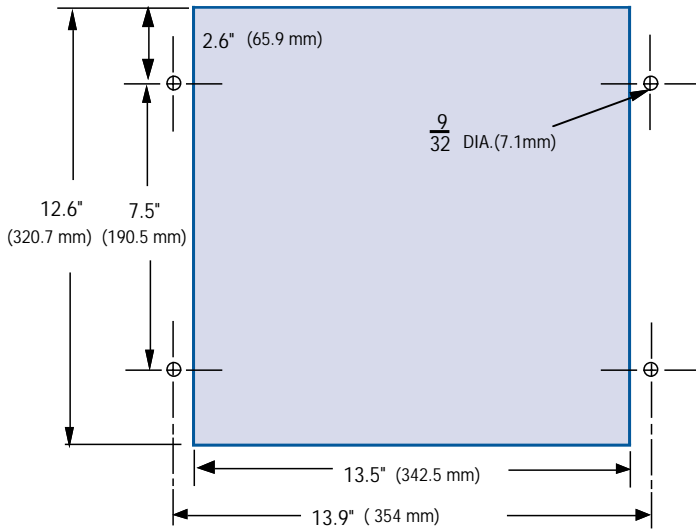
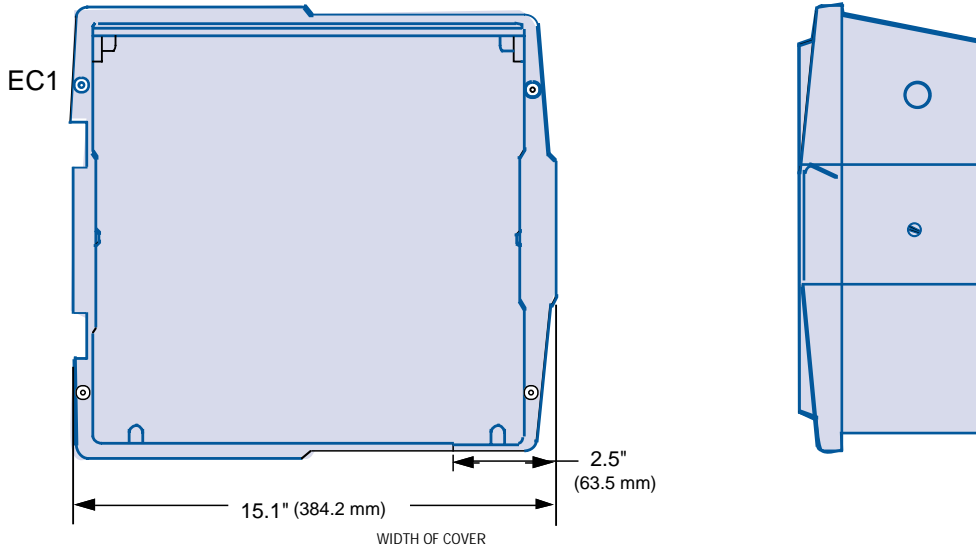
NOTE: 4-20mA inputs are accommodated using the 1-5V input and a 250 ohm Shunt Resistor, P/N 64411701 (provided with the unit) or the 10-50mA input and a 2.5 ohm Shunt Resistor, P/N 64411702

**MRC 7800™**

**Proven Recording Reliability Designed  
Specifically for Flow Applications!**

**Flow Controller**

**DIMENSIONS**



Panel cut-out for flush mounting

Made in USA.

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APPLICATION SPECIFIC RECORDERS



**MRC 8000™**  
*Rugged, Reliable and Refined  
12 Inch Diameter Recording for  
Larger Recording Areas!*

**12 Inch 1 & 2 Pen Recorder/Controller**

**DESCRIPTION**

The MRC 8000 incorporates numerous refinements over its 10" MRC 7000™ sibling, including a larger 12 inch recording area, as well as the incorporation of optional isolated 4–20mA outputs to provide the highest resolution and accuracy available in a recorder of this type.

The MRC 8000 is offered in two versions: a basic recorder and a recording controller. Both may be specified as either single pen or dual pen units. Each version is capable of measuring, recording and displaying temperature, pressure, level, flow and other process variables. The MRC 8000 includes isolated universal inputs and a list of optional capabilities including: transmitter power supply, 5A relay outputs, auxiliary inputs for remote setpoints, RS-485 communications, door lock and NEMA 4X enclosure.

**APPLICATIONS:**

- Process Validation
- Trend Analysis
- Regulatory Compliance
- Product Safety:
  - Temperature
  - Pressure
  - pH
  - Level
  - Flow

**INDUSTRIES**

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

**FEATURES/BENEFITS**

- 12" Micro-based recording controller with remote setpoint capability
- Two large displays—allow you to see critical process values at the same time on 2 pen models
- Easy, straightforward programming—allows you to configure your recorder with a logical step-by-step process using a simple keypad
- High resolution of recorder process variables for better record accuracy
- Reliability—maintenance free recording for years to come

APPLICATION SPECIFIC RECORDERS

## MRC 8000™

*Rugged, Reliable and Refined 12 Inch  
Diameter Recording for Larger Recording Areas!*

## 12 Inch 1 &amp; 2 Pen Recorder/Controller

## SPECIFICATIONS

## STANDARD FEATURES

**Modes:** Digital; record or controller functionality.

**Display:** Two 4-digit digital displays: 0.56" high, red, seven segment LED; 3 button keypad; automatic and decimal point positioning.

**Status Indicators:** Red LEDs for ALRM1/ALRM2 (Recorders); yellow, red LEDs MAN, OUT1/OUT2, ALRM.

**Chart:** 10" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are 0–100 range. 24 hour rotation default setting.

**Chart Drive:** DC Stepper Motor.

**Chart Rotation:** User configurable from 0.1 and 999.9 hours per revolution.

**Chart Range:** Bottom and top of span –9999 to 9999 units.

**Pen Type:** One or two disposable fiber tip pen.

**Pen Color:** Pen 1 (red); Pen 2 (green).

**Memory Backup:** Battery backed SRAM; 5 year minimum life.

**Construction/Enclosure:** Gasketed cover, case and windows. Structural foam case and cover with plastic or glass window area.

## OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

## ELECTRICAL

**Power Consumption:** 25VA max.

**Line Voltage:** 115V or 230VAC ±10%, 50–60Hz.

## INPUTS

**Thermocouple:** J, K, T, R, S, E, B, N, C.

**RTD:** 100 ohm, platinum; 0.00385 ohms/ohm/°C

**RTD Excitation Current:** 330 microamps, typical.

**DC Voltage:** 0–25mV, 0–50mV, 10–50mV, 0–5V, 1–5V.

**DC Current:** 4–20mA or 0–20mA used with appropriate external shunt resistor.

**Remote Setpoint Input:** 0–5VDC, 1–5VDC, 4–20mA, or 0–20mA with shunt resistor.

## OUTPUTS

## CONTROL OUTPUTS:

**ON/OFF:** Assignable to alarm and control outputs.

**Relay:** SPDT; 115VAC 5.0A resistive, 1/8HP, 230VAC, 230VAC 2.5A resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Current:** Assignable to process value or setpoint transmission or control outputs; 0–20mA or 4–20mA nominal output span; 650 ohm

## ALARM/EVENT OUTPUTS (Options):

**Number:** Up to two process alarms for each of two inputs. Type: Process high/low (recorder); process, deviation and band (controller).

**Relay:** SPDT; 115VAC 5.0A resistive, 1/8HP, 230VAC; 230VAC 2.5A resistive, 1/8HP, 250VA.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Process Alarm:** Direct (High) or Reverse (Low) –9999 to 9999 units.

**Deviation Alarm:** Direct (deviation above setpoint) or Reverse (deviation below setpoint) –3000 to 3000 units.

**Deviation Band Alarm:** Open or closed 1 to 3000 units.

**Alarm Hysteresis:** 0–300 units.

## PERFORMANCE

## GENERAL:

**Input Measurement Error:** Type J, K, T, E, N, C, T/C and RTD ±0.25% of reading plus 1 degree @ 25°C; Type R, S, B, C, T/C

**Ambient Temperature Error:** 0.04% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:** ±0.2% @ 25°C.

**Cold Junction Compensation Rejection:** 0.04% deviation from 25°C.

**Linearization Error:** TCs: ±0.25°C typical; ±0.5°C worst case with exceptions; RTDs: ±0.1°C typical; ±0.3°C worst case.

**Noise Rejection:** Common Mode Rejection: 90dB minimum; 24VAC maximum for RTD input; 115VAC max for other inputs; Normal Mode Rejection: 85dB minimum @ 60Hz or greater.

**Isolation:** N/A.

**Chart Accuracy:** Recording: 0.5% of span.

**Chart Rotation:** ±0.5% or rotation time..

**Chart Accuracy:** Recording: 0.5% of span.

**Chart Rotation:** ±0.5% or rotation time.

**Resolution:** 0.15% of chart span.

**Dead Band:** 0.3% of chart span.

**Process Value Output Limit:** N/A.

**Record Error Limit:** N/A.

## CONTROL PARAMETERS:

**Proportional Band Output 1/Output 2:** 1 to 3000 units.

**Manual Reset (Integral):** –1500 to 1500 units.

**Auto Reset (Integral):** 0–100 repeats/minute.

**Rate Derivative:** 0–10 minutes.

**Cycle Time Output 1/Output 2:** 1–240 seconds.

**Position Proportioning Sensitivity:** 0.0–50.0%.

**ON/OFF Hysteresis:** 0–300 units (width of hysteresis band).

**First /Second Output Position:** –1000 to 1000 units.

**Control Action:** Direct or reverse.

**Automatic Transfer Function:** User-selectable to transfer from manual to automatic control when setpoint is reached; can be disabled.

**Anti-Reset Windup:** Auto-reset is disabled when the process is outside of the proportional band.

**Auto/Manual:** Bumpless transfer.

**Manual Output:** 0–100%.

**Output Limiting:** High/Low 0–100%.

**Setpoint Limiting:** High/Low limit: –9999 to 9999 units.





**MRC 8000™**

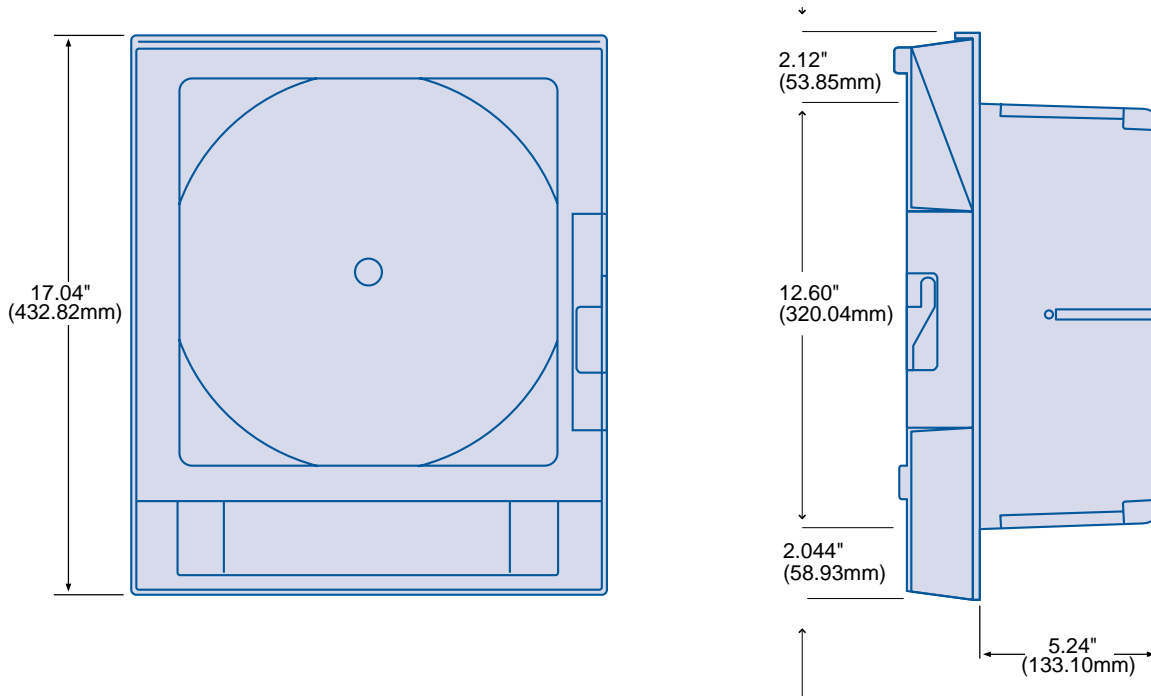
*Rugged, Reliable and Refined 12 Inch  
Diameter Recording for Larger Recording Areas!*

**12 Inch 1 & 2 Pen Recorder/Controller**

**SPECIFICATIONS**

COMMUNICATIONS INTERFACES	PROTECTION	OPTIONS/ACCESSORIES
<p><b>Communications Port:</b> RS-485 serial, half duplex.</p> <p><b>Protocol:</b> Per ASCII and ANSI X3.28 subcategories 2.5 &amp; A4.</p> <p><b>Bit Rate:</b> User configurable; 300, 600, 1200, 2400, 4800 or 9600/sec.</p> <p><b>Configuration:</b> Monitor: Read only. Normal: Read and write.</p>	<p>NEMA 3 standard; NEMA 4 optional; CE compliance optional.</p>	<p>Plastic or glass window option.</p> <p>24V DC transmitter power supply option.</p> <p>Door lock option.</p> <p>NEMA 4 protection option; CE compliance option.</p> <p>5A relay output option.</p> <p>Remote setpoint/position proportioning option.</p> <p>RS-485 communication option.</p> <p>115 or 230VAC input option.</p> <p>Door lock and sealed conduit/connector option.</p>
RATINGS/AGENCY APPROVALS	PHYSICAL DIMENSIONS	WARRANTY
<p><b>Safety:</b> UL 1092/916 and QUXY File E67237; CSA Spec 142 File E67237; CE EN60010-1 1993/1995.</p> <p><b>Immunity:</b> CE EN50082-1:1992</p> <p><b>Emissions:</b> CE EN55022:1987 Class A.</p> <p><b>Limit Device:</b> N/A</p> <p><b>Other:</b> ISO 9002 registered.</p>	<p><b>Width:</b> 14.12" (359mm).</p> <p><b>Depth:</b> 7.75" (197mm).</p> <p><b>Height:</b> 16.77" (426mm).</p> <p><b>Weight:</b> 20 lbs (9.1kg).</p> <p><b>Mounting/Mounting Position:</b> Panel or wall.</p>	<p><b>3 years.</b></p>

**DIMENSIONS**



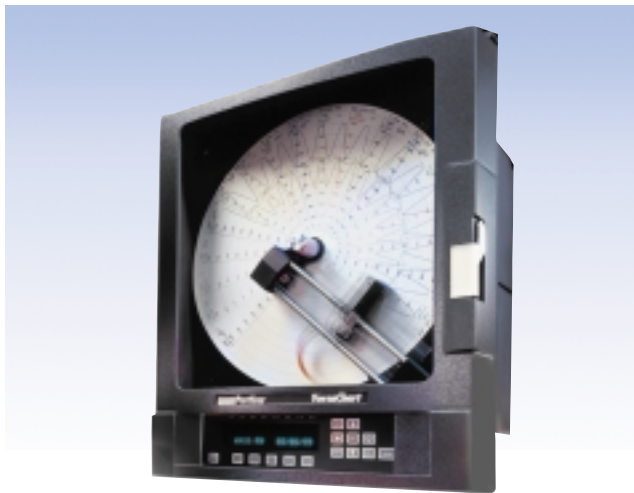
APPLICATION SPECIFIC RECORDERS

**PARTLOW™ brand****12 Inch 1 & 2 Pen Recorder/Controller****MRC 8000™****Rugged, Reliable and Refined  
12 Inch Diameter Recording for  
Larger Recording Areas!****MODELS**

Code 1: Model	Code 2: Pen 1	Code 3: Pen 2	Code 4: Relay (SPST) Outputs*	Code 5: SSR Driver Outputs*	Code 6: 4-20mA Outputs	Code 7: Transmitter Power Supply	Code 8: Pen 1 Aux. Input	Code 9: Pen 2 Aux. Input	Code 10: Digital Communications	Code 11: Enclosure Options	Code 12: Operating Voltage	Code 13: Option Suffix
<b>8</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>0 0</b>
MRC8000 12 Inch Chart Recorder / Controller	1 Recorder Only	0 None	0 None	0 None	0 None	0 None	0 None	0 None	0 None	1 Glass Window NEMA 3 2 Glass Window NEMA 4X 3 Glass Window NEMA 3 w/Door Lock 4 Plastic Window NEMA 3 5 Plastic Window NEMA 4X 6 Plastic Window NEMA 3 w/Door Lock	1 115VAC 2 115/230VAC <b>With CE</b> 4 115VAC 5 115/230VAC	
	2 Recording Controller	1 Recorder Only	1 One SPST	1 One Two	1 One Two	1 24VDC Regulated /Isolated	1 Position Propor- tioning	1 Position Propor- tioning	2 RS-485 Total Access			
		2 Recording Controller	2 Two SPST	2 Two Four	2 Two		2 Remote Setpoint	2 Remote Setpoint				
			4 Four SPST	4 Four								

\* The total quantity of SPST Relays and SSR Drivers must be less than or equal to four.

NOTE: 4-20mA inputs are accommodated using the 1-5V input and a 250 ohm Shunt Resistor, P/N 64411701 or the 10-50mA input and a 2.5 ohm Shunt Resistor, P/N 64411702. The 250 ohm resistor is included for each input.



### Recording Controller/Profiler

#### DESCRIPTION

The VersaChart is perfect for demanding applications requiring a high performance recorder/controller with custom ramp/soak capability. The Versachart provides powerful time based profile capability and exceptional value per data. Using advanced printing technology, the Versachart produces a circle chart in four colors with alpha/ numeric chart characters for clear, accurate and readable charts that can be archived.

It is the only circle chart recorder to deliver up to 16 Profiles with up to 8 segments per profile. The profiling feature provides closed loop PID process control with the added capability of configurable setpoints as a function of time. Additionally, the profile feature includes actuators, parameters and a function block feature permitting logic equations. The entire recorder (recorder, controller and profile feature) is easy to setup with its innovative PC configuration port and available PC configuration software with security and single point data access features. A recovery feature is also part of the profile option which enables users to choose a course of action in the advent of power loss, preventing unnecessary process cycling. Finally, a guaranteed soak feature assures that the actual process variable during soak is within a pre-selected tolerance for the soak time to increase product quality and prevent waste/loss.

## MRC 9000™ VersaChart™

### Versatile Recorder, Powerful Controller!

#### APPLICATIONS:

- Demanding Process Validation
- Trend Analysis
- Regulatory Compliance
- Product Safety

#### Applications:

- Temperature, Pressure and Relative Humidity

#### INDUSTRIES

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

#### FEATURES/BENEFITS

- Micro-based recorder/controller with profile capability
- Four Pens and Four Colors
- Flexible chart sizes—Choose from 10–12" diameter
- Two displays—allowing you to see critical process values at the same time
- Easy, straightforward PC programming—allows you to configure your recorder with a logical step-by-step process using a simple keypad
- Time based profiling capability (including Four Process PID Loops, Recovery Action, Guaranteed Soak)—and up to 16 profiles— puts you in control of your process
- Reliability—maintenance free recording for years to come
- Excellent features/reasonable price

## MRC 9000™ VersaChart™

Versatile Recorder,  
Powerful Controller!

High-End  
Recorders

## Recording Controller/Profiler

## SPECIFICATIONS

## STANDARD FEATURES

**Modes:** Digital; record, controller or profile functionality.

**Display:** Two line, 40 character vacuum fluorescent display with 0.21" (5mm) high characters; 15 keys for programming and unit operation; display modes; automatic or manual sequencing; 3 display formats.

**Programmable Profiles:** Up to 8 user programmable profiles.

**Status Indicators:** 8 user-configurable red LED status indicators; real time clock for time and date stamping on chart output.

**Chart:** 10–12" circular chart; 100 charts furnished with each instrument.

**Chart Drive:** DC stepper motor.

**Chart Rotation:** User-configurable from 6 to 9999 hours per revolution.

**Chart Range:** Bottom and top of span –999999 to 999999 units.

**Pen Type:** Four disposable fiber tip pens.

**Pen Color:** Pen 1 (red); Pen 2 (green); Pen 3 (blue); Pen 4 (black).

**Memory Backup:** EEPROM and battery backed SRAM; 5 year minimum life.

**Construction/Enclosure:** Gasketed, cover, case and windows. Structural foam case and cover; optional door lock or glass window option.

## OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Ambient Temp.:** 0.04% of span per degree C deviation from 25°C.

**Humidity:** 0% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

**Electro Static Discharge:** N/A

## ELECTRICAL

**Power Consumption:** 60VA max.

**Line Voltage:** 90–264VAC 50/60Hz..

## INPUTS

**Thermocouple:** J, K, T, R, S, E, B, N, G, D, C, Ni/ Ni-Moly and Platinel II.

**RTD:** 100 ohm, platinum 100 or nickel 100, 1–2 wire; 0.00385 ohms or 0.00392/ohm/°C; –94° to 300°F (–70° to 150°C).

**RDT Excitation Current:** 1mA.

**DC Voltage:** 0 to 25mV, 0 to 100mV, 0 to 1V, 0 to 10V.

**DC Current:** 0–20mA or 4–20mA.

## OUTPUTS

## CONTROL OUTPUTS:

**Relay:** SPST; 5.0A resistive @ 115VAC; 2.5A resistive, 1/8HP @ 230VAC.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Current:** 0–20mA or 4–20mA; 650 ohm maximum load.

**ALARM/EVENT OUTPUTS (Options):**

**Number:** Up to four alarms for each of four process variables. Type: Process high/low and rate/rising and falling.

**Relay:** SPST/SPDT; 5.0A resistive @ 115VAC; 2.5A resistive @ 230VAC.

**SSR Driver:** Open collector output; short circuit protected @ 100mA max; provides 4VDC @ 20mA or 3VDC @ 40mA.

**Process Alarm:** Direct (High) or Reverse (Low) –999999 to 999999 units.

**Deviation Alarm:** Direct (deviation above setpoint) or Reverse (deviation below setpoint) –3000 to 3000 units.

**Deviation Band Alarm:** Open or closed 1 to 3000 units.

**Alarm Hysteresis:** Fully adjustable.

## PERFORMANCE

## GENERAL:

**Input Measurement Error:** ±0.25% of measurement span reference accuracy.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:** ±0.2% @ 25°C.

**Cold Junction Compensation Rejection:** 0 ±0.4°C from 25°C.

**Linearization Error:** TCs: ±0.25°C typical; ±0.5°C worst case with exceptions. RTDs: ±0.1°C typical; ±0.3°C worst case.

**Isolation:** 500VDC/350VAC.

**Chart Accuracy:** Recording: 0.3% of span. Chart Rotation: ±0.2 minutes for a 24 hour rotation, assuming all backlash removed, 6–9999 hours per revolution.



# MRC 9000™ VersaChart™

**Versatile Recorder,  
Powerful Controller!**

**Recording Controller/Profiler**

## SPECIFICATIONS

### PERFORMANCE (cont'd)

**Algorithm Accuracy:** N/A.  
**Scan Rate:** 2 scans/second; scan rate is programmable for each input with the limitation that a total of 16 measurements can be made in one second.  
**Noise Rejection:** Normal mode: 100dB minimum at 60Hz or greater. Common mode: 120dB minimum at 115VAC maximum.  
**Process Value Output Error Limit:** N/A.  
**Record Error Limit:** N/A.  
**Sensor Fault Detection:** Sensor break on all temperature controls, RTUs, 1 to 5 volt and 4–20mA inputs.  
**Transmitter Power Supply:** Up to 4 isolated 25mA @ 24VDC supplies available.  
**Data Backup:** EEPROM for input board and motherboard calibration data; battery backed SRAM for configuration data.

### COMMUNICATIONS INTERFACES

**Communications Port:** RS-232/485 serial, half duplex.  
**Protocol:** Modbus RTU.  
**Bit Rate:** User-configurable 1200, 2400, 4800, 9600 baud.  
**Address:** User-configurable, 1–247.

### RATINGS/AGENCY APPROVALS

**Safety:** UL 1092 File E67237; CSA Spec 142 File 67237; CE EN60010-1 1193/1995.  
**Immunity:** CE compliance EN50082-2.  
**Emissions:** CE compliance EN550081-1:1992; EN55022 Class A.  
**Hazardous Location:** ETL Listed Class 1 & II Division 2 and Class III, Division 1 & 2 Ref 56042.  
**Other:** ISO 9002 registered.

### PROTECTION

NEMA 3 standard; NEMA 4 optional.

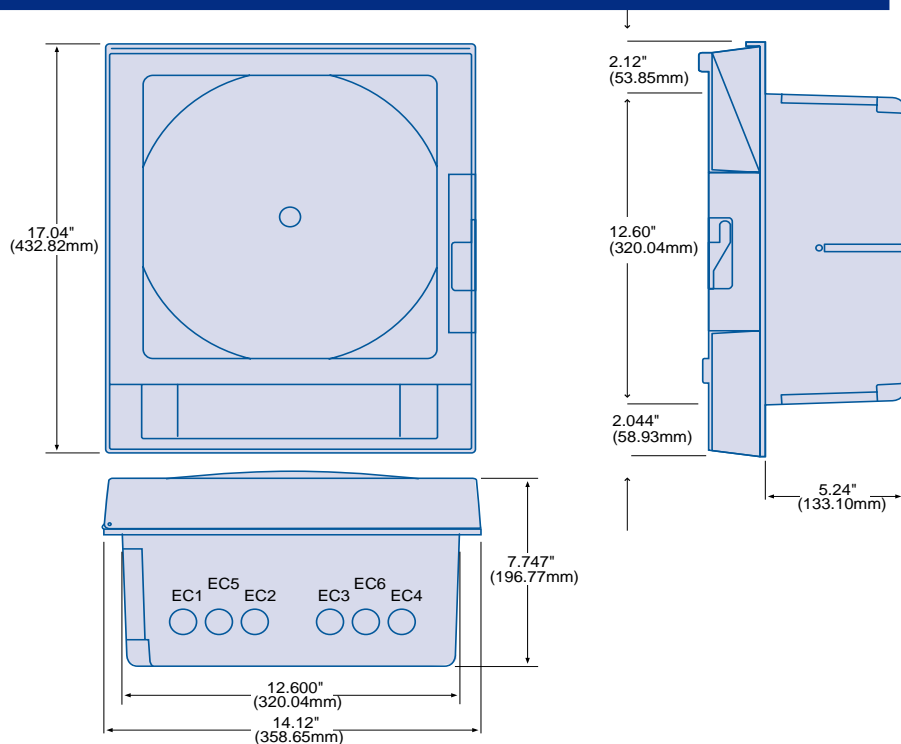
### PHYSICAL DIMENSIONS

**Width:** 14.12" (359mm).  
**Depth:** 7.75" (197mm).  
**Height:** 16.77" (426mm).  
**Weight:** 25 lbs (9.1kg).  
**Mounting/Mounting Position:** Panel or wall.

### OPTIONS/ACCESSORIES

Diverse pen options (see config.matrix for details).  
 Choose from up to 8 input options (see config.matrix for details).  
 Optional profiling feature—up to four loops in a single package.  
 NEMA 4 protection optional.  
 Diverse window and door lock options.  
 RS-232/485 communication option.

## DIMENSIONS



### WARRANTY

2 years.

APPLICATION SPECIFIC RECORDERS

**PARTLOW™ brand****Recording Controller/Profiler****MRC 9000™ VersaChart™**  
**Versatile Recorder,**  
**Powerful Controller!****MODELS**

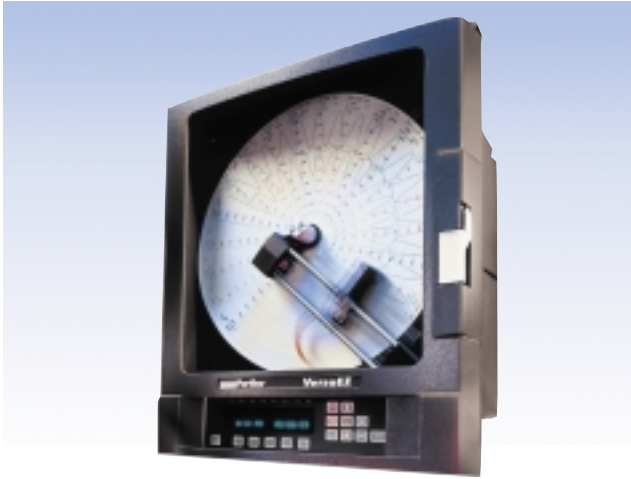
Code 1: Model	Code 2: Type	Code 3: Pens/Colors	Code 4: Universal Inputs	Code 5: Required Zero	Code 6: Relay Outputs*	Code 7: SSRD Outputs	Code 8: 4-20mA Outputs	Code 9: Transmitter Power Supply	Code 10: Math/ Totalizer	Code 11: Digital Communications	Code 12: Enclosure Options	Code 13: Case Type and Mounting
MRC9000 VersaChart 4 Color Recorder / Controller/ Profiler	1 Recorder Only 2 Controller 3 Profiler	1 One Trend, One Color*** 2 Two Trend, Two Colors** 3 Three Trend Pens, Three Colors** 4 Four Trend Pens, Four Colors 5 One Trend Pen, Four Colors 6 Two Trend Pens, Four Colors 7 Three Trend Pens, Four Colors	1 One Input 2 Two Inputs 3 Three Inputs 4 Four Inputs 6 Six Inputs 8 Eight Inputs	0	0 None 2 Two 4 Four 6 Six 8 Eight	0 None 2 Two 4 Four 6 Six 8 Eight SSR Drivers	0 None 1 One 4-20mA Non-Isolated 2 Two 4-20mA Non-Isolated 3 One 4-20mA Isolated 4 Two 4-20mA Isolated 5 Three 4-20mA Isolated 6 Four 4-20mA Isolated	0 None 1 One Supply 2 Two Supplies 3 Three Supplies 4 Four Supplies	0 None 1 Math 2 Totalizer 1 Math & Totalizer	0 None 1 RS-232 /RS-485	1 Glass Window 2 Glass Window w/Door Lock *** 3 Plastic Window 4 Plastic Window w/Door Lock ***	1 NEMA 3 Panel Mount 2 NEMA 4 Panel Mount
9				0								

\* Total quantity of SPDT Relays and SSR Drivers must be less than or equal to eight.

\*\* Pens/colors are added to the instrument in the following order: red, then green, then blue, and then black.

\*\*\* Door Lock N/A with NEMA 4





**MRC 9400™ VersaEZ™**  
*All Your Recording Needs  
Made E-Z!*

**4 Pen Recorder w/Alarms**

**DESCRIPTION**

The MRC 9400 VersaEZ will record up to four process variables on a circular chart. The circular chart sizes are 10", 11" or 12" with the unit shipped to you configured to record on 12" paper.

The VersaEZ is designed to provide you with a product that is user-friendly, and delivers a high quality unalterable printout of your process data.

Out of the box the VersaEZ is set up for most common applications. Given that there are many variables in the world of process control, no one set-up will cover all needs. Yet preconfigured as the VersaEZ is, it will minimize the amount of time you need to commit to programming. You need only change the parameters necessary to get your process running and documented.

**APPLICATIONS:**

- Process Validation
- Trend Analysis
- Regulatory Compliance
- Product Safety:
  - Temperature, Pressure and Relative Humidity

**INDUSTRIES**

Oven, chamber, furnaces, heat treating, food processing, harsh water environments

**FEATURES/BENEFITS**

- Pre-configured for you for E-Z installation and out-of-the box, plug and play capability
- Four pens and four colors
- Flexible chart sizes—choose from 10–12" diameter



# MRC 9400™ VersaEZ™

## All Your Recording Needs Made E-Z!

### High-End Recorders

#### 4 Pen Recorder w/Alarms

## SPECIFICATIONS

### STANDARD FEATURES

**Modes:** Digital; Record

**Display:** Two line, 40 character vacuum fluorescent display with 0.21" (5mm) high characters; 15 keys for programming and unit operation; display modes; automatic or manual sequencing; 3 display formats.

**Status Indicators:** 8 red LED alarm status indicators; real time clock for time and date stamping on chart output.

**Chart:** 10–12" circular chart; 100 charts furnished with each instrument. Unless otherwise specified, charts shipped with instrument are in 100 divisions.

**Chart Rotation:** User configurable 8, 12, 24 or 48 hrs or 7 days.

**Chart Range:** Bottom and top of span –999999 to 999999 units.

**Pen Type:** Disposable 4 pen fiber tip marker assembly.

**Pen Color:** Pen 1 (red); Pen 2 (green); Pen 3 (blue); Pen 4 (black).

**Memory Backup:** EEPROM and battery backed SRAM; 5 year minimum life.

**Construction/Enclosure:** Gasketed, cover, case and windows. Structural foam case and cover; optional door lock or glass window option.

### OPERATING CHARACTERISTICS

**Operating Temp:** 32° to 122°F (0° to 50°C).

**Storage Temp:** –40° to 149°F (–40° to 65°C).

**Humidity:** 10% to 90% non-condensing R.H.

**Vibration:** 0.5 to 100Hz @ 0.2g.

**Electro Static Discharge:** No effect from 5000V static charge over the entire area.

### ELECTRICAL

**Power Consumption:** 60VA max.

**Line Voltage:** 85–265VAC 50/60Hz.

### INPUTS

**Thermocouple:** J, K, T, R, S, E, B, N, G, D, C, Ni/Ni-Moly and Platinel II.

**RTD:** 100 ohm platinum, 2 or 3 wire; 0.00385 ohms/ohm/°C or 0.00392/ohms/ohm/°C.

**RDT Excitation Current:** 1mA.

**DC Voltage:** 0 to 25mV, 0 to 100mV, 0 to 1V, 0 to 10V.

**DC Current:** 0–20mA or 4–20mA.

**Impedance:** 25mV, 100mV, 1V > 10 megohms, 10V > 50 kohms, mA: 50 ohms.

### OUTPUTS

**ALARM (Options):**

**Number:** Up to 2 alarms for each of four process variables; Type: process high/low.

**Relay:** SPDT; 5A resistive @ 115VAC, 2.5A resistive @ 230VAC.

**Process Alarm:** Direct (High) or Reverse (Low).

**Alarm Hysteresis:** Fully adjustable.

**Retransmission:** 0–20mA or 4–20mA nominal into 650 ohm load map.

### PERFORMANCE

**GENERAL:**

**Input Measurement Error:** ±0.25% of measurement span reference accuracy.

**Ambient Temperature Error:** 0.01% of span per degree C deviation from 25°C.

**Cold Junction Compensation Error:** ±0.2% @ 25°C.

**Cold Junction Compensation Rejection:** 0 ±0.4°C from 25°C.

**Linearization Error:** TCs: ±0.25°C typical; ±0.5°C worst case with exceptions. RTDs: ±0.1°C typical; ±0.3°C worst case.

**Noise Rejection:** Normal Mode: 100dB minimum at 60Hz or greater. Common mode: 120dB minimum at 115VAC maximum.

**Isolation:** 500VDC/350VAC.

**Scan Rate:** 2 scans/second; scan rate is programmable for each input with the limitation that a total of 16 measurements can be made in one second.

**Chart Accuracy:** Recording: 0.3% of span. Chart Rotation: ±0.2 minutes for a 24 hour rotation, assuming all backlash removed, 6–9999 hours per revolution.

**Sensor Fault Detection:** Sensor break on all temperature controls, RTDs, 1 volt, 1 to 5 volt, 4–20mA, and millivolt inputs. Sensor high or low on all inputs, 5% above or below range.

**Transmitter Power Supply:** Up to 4 isolated 25mA @ 24VDC supplies available.

**Data Backup:** EEPROM for input board and motherboard calibration data; battery backed SRAM for configuration data.

### COMMUNICATIONS INTERFACES

**Communications Port:** RS-232/485 serial, half duplex.

**Protocol:** Modbus RTU.

**Bit Rate:** User-configurable 1200, 2400, 4800, 9600 baud.

**Address:** User-configurable, 1–247.

### RATINGS/AGENCY APPROVALS

**Safety:** UL 1092, UL916 and QUXY File E67237; CSA Spec 142 File 67237; CE EN60010–1 1993/1995.

**Immunity:** CE compliance EN50082-2.

**Emissions:** CE compliance EN50081-1; EN55022 Class A.

**Hazardous Location:** ETL Listed Class 1 & II Division 2 and Class III, Division 1 & 2 Ref 56042.

**Other:** ISO 9002 registered.

### PROTECTION

NEMA 3 optional

### PHYSICAL DIMENSIONS

**Width:** 14.12" (359mm).

**Depth:** 7.75" (197mm).

**Height:** 16.77" (426mm).

**Weight:** 25 lbs (9.1kg).

**Mounting/Mounting Position:** Panel or wall.

### OPTIONS/ACCESSORIES

Diverse pen options (see config matrix for details).

Choose from up to 4 input options (see config matrix for details).

Totalizer option.

NEMA 4 protection optional.

Diverse window and door lock options.

RS-232/485 communication option.

### WARRANTY

2 years.

**PARTLOW™ brand**

**4 Pen Recorder w//Alarms**

**MRC 9400™ VersaeZ™**

*All Your Recording Needs*

*Made E-Z!*

**MODELS**

Code 1: Model	Code 2: Pens/Colors	Code 3: Universal Inputs	Code 4: Required Zero	Code 5: Relay Outputs*	Code 6: Required Zero	Code 7: Process Retransmission (4-20mA Isolated Outputs)	Code 8: Transmitter Power Supply	Code 9: Totalizer	Code 10: Digital Communications	Code 11: Enclosure Options	Code 12: Case Type and Mounting
<b>94</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRC9400 VersaeZ 4 Pen Recorder with Alarms	1 One Trend, One Color** 2 Two Trend, Two Colors*** 3 Three Trend Pens, Three Colors*** 4 Four Trend Pens, Four Colors 5 One Trend Pen, Four Colors 6 Two Trend Pens, Four Colors 7 Three Trend Pens, Four Colors	1 One Input 2 Two Inputs 3 Three Inputs 4 Four Inputs	0 None 2 Two 4 Four 6 Six 8 Eight	0 None 1 One Supply 2 Two Supplies 3 Three Supplies 4 Four Supplies	0 None 1 Totalizer	0 None 1 RS-232 /RS-485	1 Glass Window 2 Glass Window w/Door Lock *** 3 Plastic Window 4 Plastic Window w/Door Lock ****	1 NEMA 3 Panel Mount 2 NEMA 4 Panel Mount			

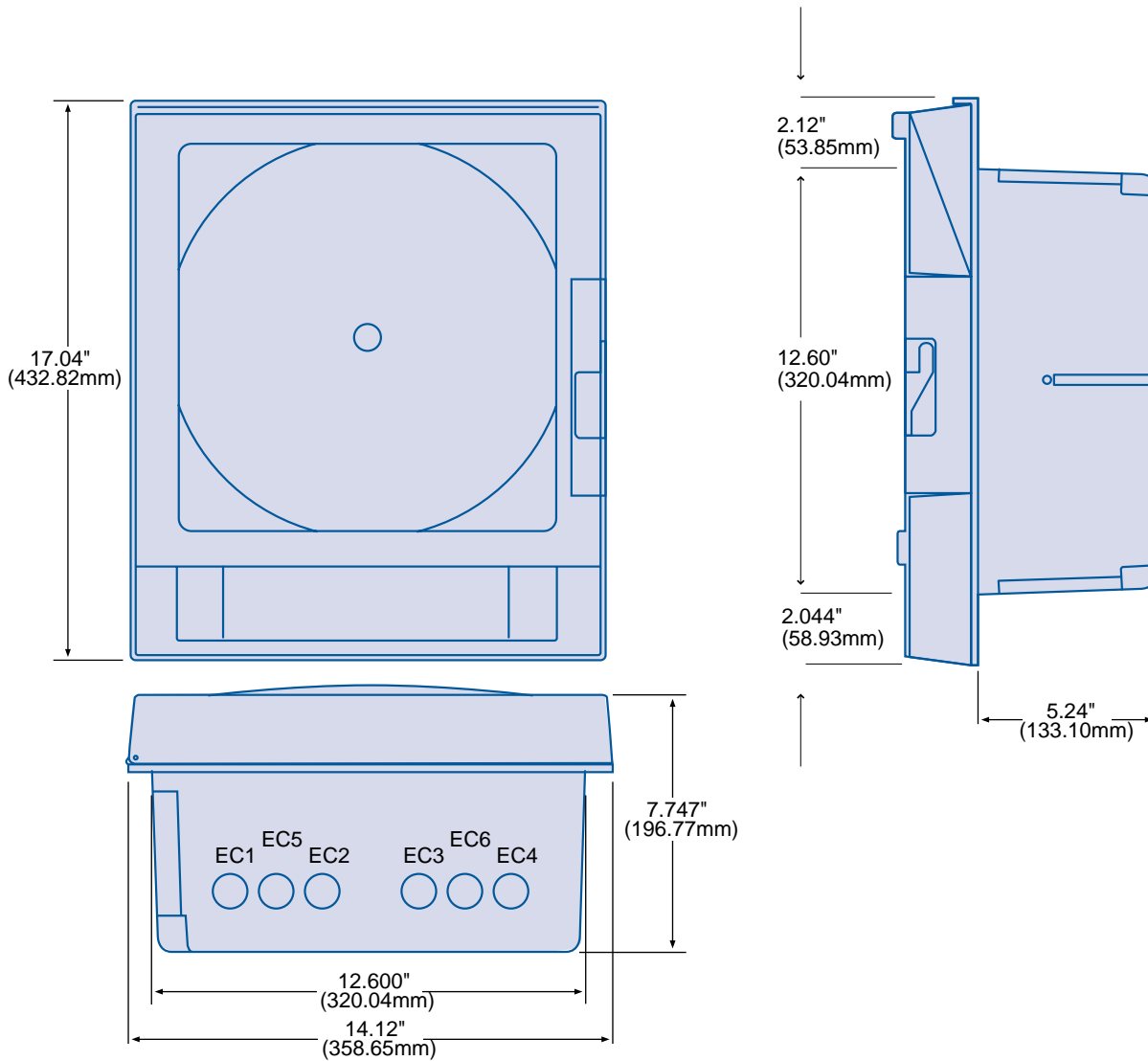
\* Total quantity of SPDT Relays must be less than or equal to eight.  
 \*\* Pens/colors are added to the instrument in the following order: red, green, blue, and black.  
 \*\*\* Door Lock N/A with NEMA 4

# MRC 9400™ VersaEZ™

**All Your Recording Needs  
Made E-Z!**

**4 Pen Recorder w/Alarms**

## DIMENSIONS



Made in USA.

\* Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective companies. All rights reserved.

Partlow™ brand and MRC 9000™ are trademarks of Danaher Industrial Controls Group. All rights reserved.

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## Doing Business with Partlow & Danaher Industrial Controls

## Contacts Us



We appreciate your interest in our products and look forward to serving you!

### Your Satisfaction is Important to Us...

If you are unsatisfied for any reason, please contact our Partlow Customer Care & Support Group immediately at Tel: **+1.800.390.6405**  
Email: [partlow.custserv@dancon.com](mailto:partlow.custserv@dancon.com)

### Warranty

DICG warrants its Partlow brand recorder products in this catalog to be free of defects in material and workmanship for a period of 1 to 3 years (model dependent). Recorder products which have extended their useful life in less than one year are not subject to the terms of this warranty. Nor are any Partlow brand recorder products that have been improperly used or damaged.

### Pricing

Partlow product prices for standard catalog products are available from your local distributor or from Partlow Customer Care.

### How to Order

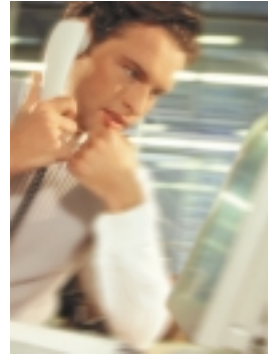
The products in this catalog may be ordered directly from the factory, on-line via our e-commerce system at [www.partlow.com](http://www.partlow.com) or via any one of our authorized Partlow distributors. DICG sells its Partlow brand products through a network of highly skilled and trained distributors. These distributors offer a variety of value-added services, from pre-sale consultation and support to systems integration. They have the experience and flexibility to deliver a monitoring, sensing and control solution to meet your specific application need(s).

For the name of a distributor nearest you, contact the factory or visit our distributor locator found on the [www.partlow.com](http://www.partlow.com) Website.

### DICG Partlow Terms & Conditions

All Partlow recorder sales are subject to DICG terms and conditions, which are fully described on our invoice or may be obtained from Customer Care.

### Special / Custom Products



If you don't see exactly what you need in this catalog, call us... or simply detail your application design, performance and cost requirements to us using the **Application Assistance Form** available online at [www.partlow.com](http://www.partlow.com) - service and support area. Our Application

Engineers will review your specifications and contact you with a recommendation.

### Repairs and RMA (Return Materials Authorization) Requests

Recorders are mechanical products with moving parts that may eventually require maintenance or repair. In many cases this can be performed by the customer. Maintenance and repair kit instructions are available from DICG Partlow. More complicated repairs must be performed at our factory in Elizabethtown, NC. For a RMA (Return Material Authorization Number) and repair instructions, call **+1.800.286.4890** (Repairs) for assistance.

*Process Automation Worldwide Brands:*

*Partlow™*

*PMA™*

*West™*

*Rustrak™*

*LFE™*



**A division of  
Danaher, a  
Fortune 500  
company with  
offices in 30  
countries around  
the world.**

**More Available.** With factories around the world, global sales and applications support, and an expansive network of distributors, we stay close to our customers -shortening lead times and fostering responsiveness. Three-day lead time is standard, with same-day shipments available on many of our products.

**More Selection.** We have a broad selection of controllers to meet application requirements in a variety of industries. User-configurable, accurate and flexible, with low, mid, or high level performance ranges, our controller products meet your system and budgetary requirements.

**More Reliable.** Our experience with more than 25,000 customers has taught us to design controllers that are reliable and durable, with quality standards that meet six sigma requirements.

For additional information or a full-line catalog, contact DICG Customer Service or visit our web site.



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Phone: +1 847.662.2666 • Fax: +1 847.662.6633

**Satellite Locations:**

**North America:** North Carolina, South Carolina, Connecticut, Massachusetts, New York, Canada, British Virgin Islands • **Europe:** United Kingdom, Italy, France, Germany, Spain, Slovakia • **Latin America:** Brazil • **Asia:** China, Japan, Korea, Singapore

**Customer Service:**

Tel.: +1.800.390.6405  
Fax: +1.910.879.5486  
partlow.custserv@dancon.com

**Technical Support**

Tel.: +1.800.866.6659  
Fax: +1.847.782.5277  
partlow.techsupport@dancon.com

[www.partlow.com](http://www.partlow.com) • [www.danaherindustrialcontrols.com](http://www.danaherindustrialcontrols.com)