Serial Number _____

CHECKMATE™
REFERENCE MANUAL

CHECKMATE™ Instrument
CORROSOMETER® Probes

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Chapter 1
Introduction

The CheckMate™ is the next evolution in handheld corrosion monitoring instruments. It is capable of reading all Corrosometer® (electrical resistance) corrosion probes with an enhanced resolution of 0.1 probe divisions (0.01% probe span). The CheckMate™ also features a reduced measurement cycle while still maintaining high accuracy. As with its predecessors, this portable unit has built-in memory that stores readings for later retrieval, however the CheckMate™ can store readings for up to 204 individual probes, with 10 readings per probe. Furthermore, the CheckMate™ makes transferring its stored data to a PC a much simpler process than before, using the included Corrdata® CSV program.

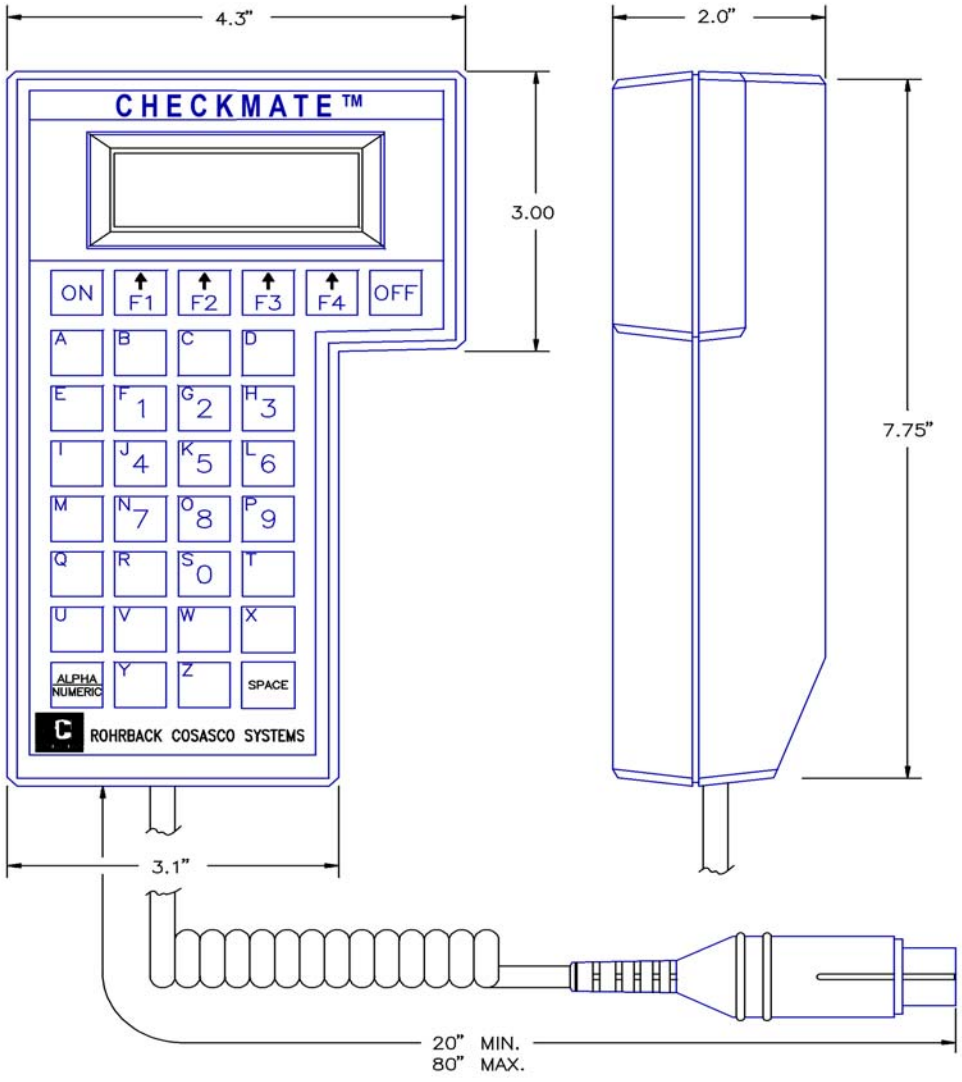


Figure 1.1 CheckMate™ Instrument

Chapter 2
Specifications

CheckMate™ Instrument

Physical

- ✓ Dimensions: 7.75"H x 4.30"W x 2"D (196.8 mm x 109.2 mm x 50.8 mm)
- ✓ Weight: 1.5 lb. (0.68 kg)
- ✓ Temperature range:

  Operating - $0^{o}F$ to $122^{o}F$ ($-18^{o}C$ to $50^{o}C$)

  Storage - $0^{o}F$ to $150^{o}F$ ($-18^{o}C$ to $70^{o}C$)
- ✓ Splash-proof enclosure with sealed membrane keyboard

Electrical

- ✓ Compatible with all Corrosometer© probes
- ✓ Measurement resolution: 0.1 probe divisions (0.01% of probe span)
- ✓ Measurement repeatability: ± 1 division (0.1% of probe span)
- ✓ Rapid measurement cycle of 30 seconds
- ✓ Memory for up to 204 probes (with 10 readings per probe)
- ✓ Reads probes on extension cable of up to 200ft (61m)

- ✓ Power Supply: 6 AA Alkaline cells
- ✓ Battery Life: 900 probe readings (typical)

- ✓ Automatic power shutoff in 2 minutes after reading or non-use
- ✓ Four Line Liquid Crystal Display (LCD)
- ✓ Supplied with:
  - Corrosometer© test probe
  - 6 AA batteries
  - CheckMate™ to computer cable (including DB25 to DB9 adapter)
  - CD-ROM with Corrdata© CSV PC software and manual

Hazardous Area Certification

- ✓ Intrinsically safe
- ✓ North America: UL/ULc (IEC) AEx and Ex ib IIC T4
- ✓ Europe: ATEX EEx ib IIC T4
- ✓ CE compliant (EMC)

Chapter 3
Installation

<u>NOTE:</u> Each CheckMate™ instrument is carefully tested, inspected and packaged prior to shipment. Before unpacking the instrument, please inspect the packaged materials for shipping damage and retain all damaged packaged materials to support any claim against your freight carrier should this become necessary.

Unpacking

Carefully remove the instrument from its package. Included in the package you should find:

CheckMate™ Instrument

- ✓ Handheld CheckMate™ instrument
- ✓ Corrosometer© test probe
- ✓ 6 AA batteries
- ✓ CheckMate™ to computer cable (including DB25 to DB9 adapter)
- ✓ CD-ROM with software and manual

Intrinsic Safety

The CheckMate™ instrument is designed for safe use in the harshest of field environments. It has undergone a rigorous design phase to obtain certification for Class I, Zone 1 hazardous locations.
The hazardous area certifications for North America are:

	UL/ULc (IEC) AEx and Ex ib IIC T4
And for Europe:	ATEX EEx ib IIC T4 CE (EMC)

Care must be taken with intrinsically safe systems to maintain their carefully designed integrity. The major features to note:

1. Batteries must be replaced in a safe area even though the unit is intrinsically safe, since standard alkaline batteries are only safe if housed in a suitable enclosure.

2. The instrument is intrinsically safe when used with six 1.5V, size AA alkaline batteries: Duracell MN1500, Energizer E91 or EN91, or Ray-O-Vac 815. Batteries must be changed only in non-hazardous area. Do not mix batteries of different age or part number.

3. Absolutely no substitution of parts or unauthorized repairs may be undertaken or the certifications are rendered invalid.

4. Reference EC-Type examination certificate for conditions of safe use. (See Appendix A)

Battery Installation

The CheckMate™ is supplied with a set of six 1.5 Volt AA alkaline batteries. To install these batteries, remove the access panel on the back of the unit (see Figure 3.1) with the provided Allen Key and install the batteries with the polarities as indicated on the unit.

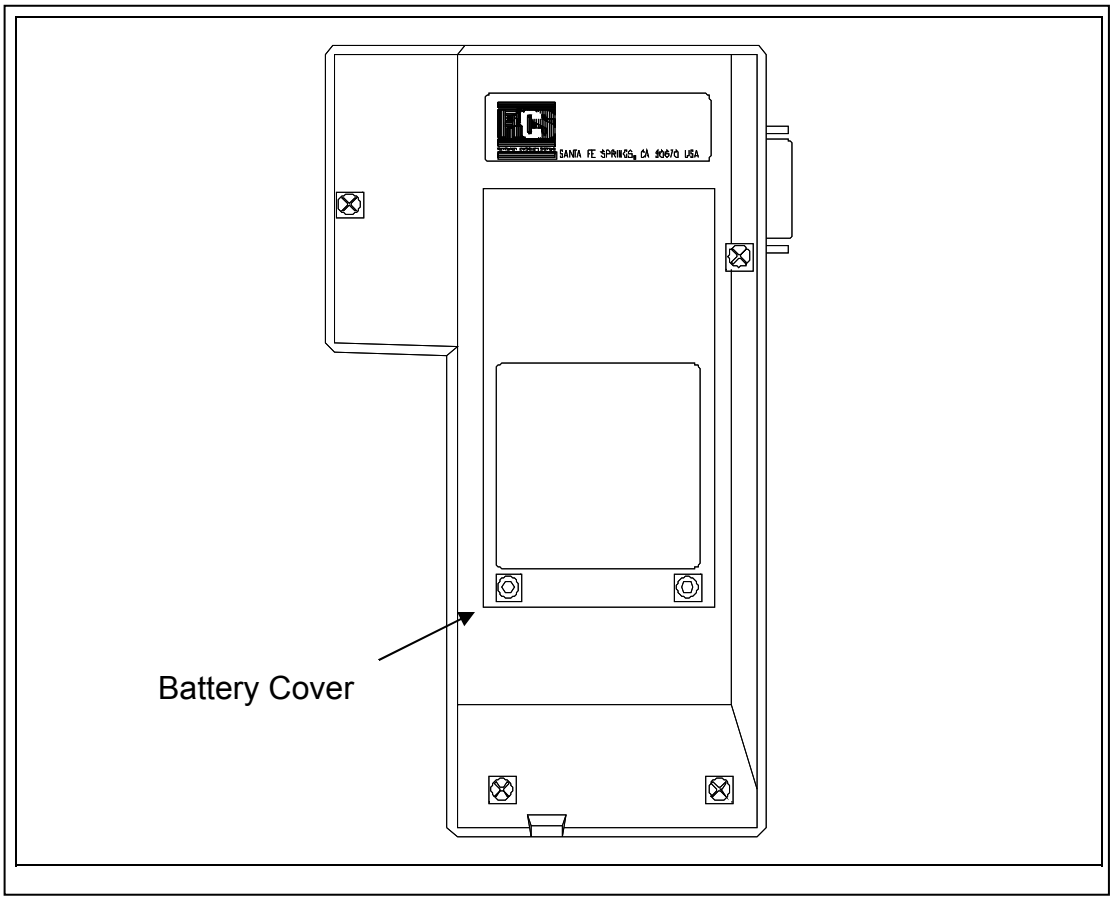


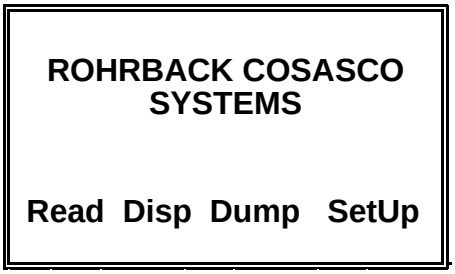
Figure 3.1 Battery Cover of CheckMate™ Instrument

A secondary, back up battery for stored readings in the CheckMate™ is provided by lithium batteries mounted internally within the unit. These batteries should provide 7-10 years of back up capacity. Replacement of these batteries requires the unit to be returned to Rohrback Cosasco Systems or an authorized dealer.

To check that the unit is operational, press the **ON** button. The screen should appear as shown below:

If the batteries are low or in need of replacement, a warning screen will appear as follows:

If batteries are good, the instrument will sequence directly to the **Standby** display as below:



The battery is tested both at initial switch on, and during probe measurement.

Chapter 4
System Configuration and Setup

CheckMate™ Keypad

The CheckMate™ features a 34-key keypad, with keys for the alphabet A through Z and numerals 0 through 9. The numerals are shared with letters F through P and S. Switch between these letters and the numbers using the “Alpha/Numeric” key. There are also four soft keys, F1 through F4 (as shown below). The soft keys are multi-function keys used to make on-screen selections.

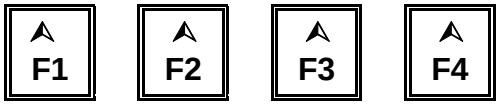


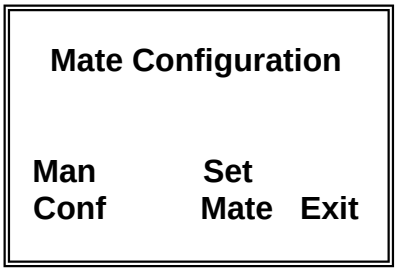
Figure 4.1 CheckMate™ Function Keys

Setting the Time and Date on the CheckMate™

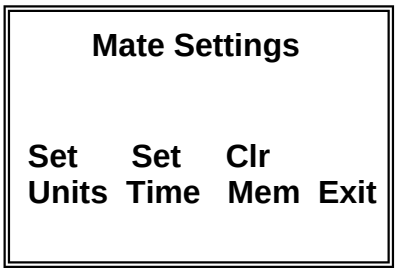
The CheckMate™ has its own clock so that individual probe readings are automatically time and date stamped.

To set the internal clock for Time and Date:

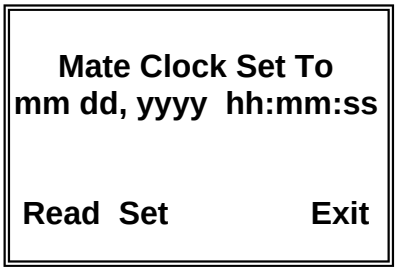
From the Standby display, press **SetUp (F4)** to go to the **Mate Configuration** display:



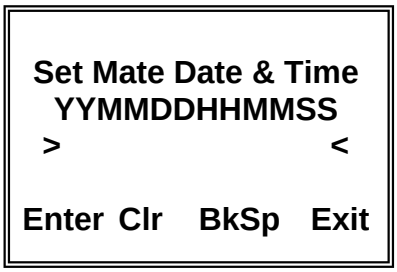
Press **Set Mate (F3)** to go to the **Mate Settings** display:



Press **Set Time (F2)** to go to the **Mate Clock Set To** display:



Press **Set (F2)** to go to the Set Mate Date & Time display:



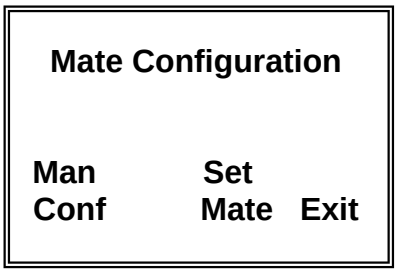
From the keyboard, enter the last two digits of the year followed by the number of the month followed by the date followed by the time in hours followed by the time in minutes followed by 00. When the time is set correctly, press **Enter** to start the clock. To update the clock on the **Mate Clock Set To** display, press **Read (F1)**. Press **Exit** to go to the **Mate Settings** screen. Press **Exit** again to return to the **Mate Configuration** screen. Press **Exit** again to return to the **Standby** screen.

NOTE: ***The hour is set on the military 24 hour clock, where 00:00 hours is midnight at the start of the day, and 12:00 is mid-day.***

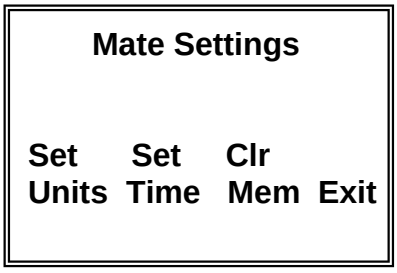
Setting the Engineering Units

To set the Engineering Units:

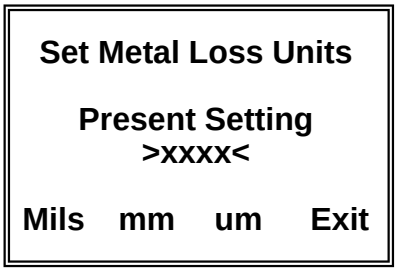
From the **Standby** display, press **SetUp (F4)** to go to the **Mate Configuration** display:



Press **Set Mate (F3)** to go to the **Mate Settings** display:



Press **Set Units (F1)** to go to the **Set Metal Loss Units** display:



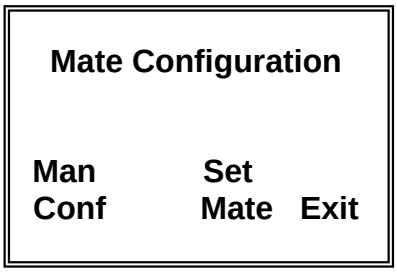
Select and press **Mils (F1)** for mils (0.001") and mils/year or press **mm (F2)** for millimeters and mm/year or **um (F3)** for micrometers and um/year.

After the selection is made and correctly displayed on the display, press **Exit** to set the units and return to the **Mate Settings** display. Press **Exit** again to return to the **Mate Configuration** display. Press **Exit** again to return to the **Standby display**.

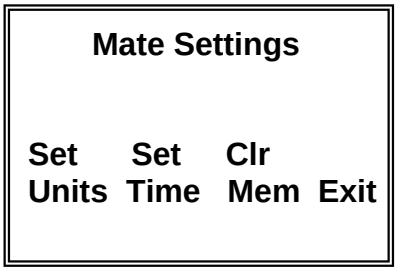
Clearing Memory on CheckMate™

Normally it will not be necessary to clear the memory on the CheckMate™ unless extraneous entries have been made, for example, when initially experimenting with the system. Alternatively, if the equipment is to be transferred to a new location, then it is recommended to clear the memory to avoid confusion with any previously collected data. To clear the memory, proceed as follows.

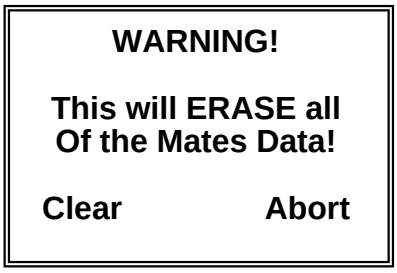
From the **Standby** display, press **SetUp (F4)** to go to the **Mate Configuration** display:



Press **Set Mate (F3)** to go to the **Mate Settings** display:



Press **Clr Mem (F3)** to go to the clear memory confirmation screen:



Press **Clear (F1)** to clear all memory.
Note: this will clear readings stored in internal memory.

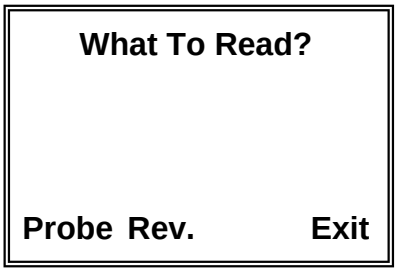
Chapter 5
Reading CORROSOMETER® Probes

CORROSOMETER® probes can be read using three different procedures: **Quick, ID** and **New**.

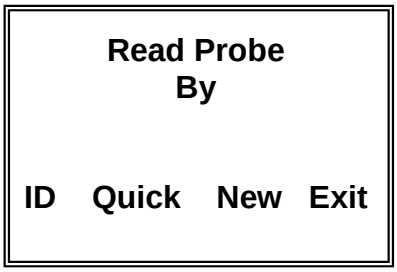
The **Quick** reading allows the user to read a probe and view the result in approximately 30 seconds. The result of a **Quick** read can also be saved for future reference, calculation of corrosion rate and/or downloading to a PC.

To do a **Quick** read-

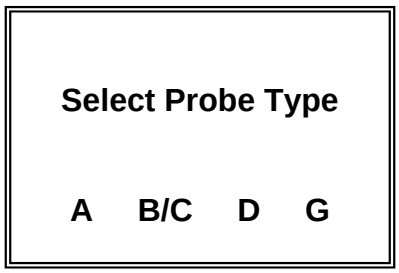
From the **Standby** screen, press **Read (F1)** to go to the **What To Read?** Display:



Press **Probe (F1)** to go to the **Read Probe By** display:

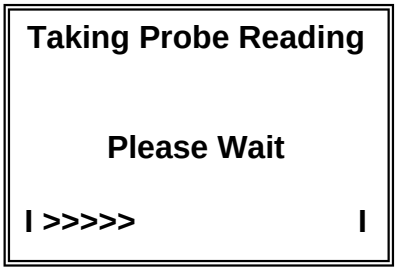


Press **Quick (F2)** to go to the **Select Probe Type** display:

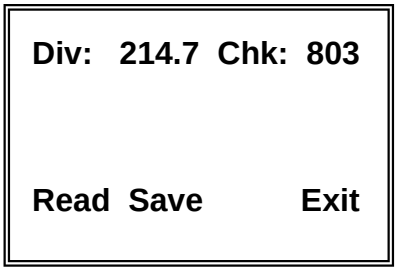


Select and press **A (F1)** for Wire Loop type probes or press **B/C (F2)** for Tube Loop/Strip Loop type probes or **D (F3)** for Cylindrical type probes or **G (F4)** for Model 610 Atmospheric Probes only. If you are unsure of the element type, this information can be found on the probe packaging, etched on the probe body adjacent to the connector or in Table 5.1 Probe Type Identification.

Immediately after pressing the key for the probe type selection the instrument will automatically go to the **"Measure"** mode and display:



A series of > symbols will accumulate from left to right across the display to indicate the progression of the measurement function At the conclusion of the measurement function (approximately 30 seconds) the CheckMate™ will display the probe reading and the check reading in divisions. A typical displayed reading is shown below:



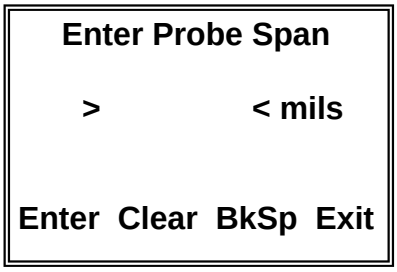
The **Div:** reading is the cumulative metal loss (corrosion) of the probe element on a scale of 1,000 divisions. In the example above 214.7/1000 (two-hundred fourteen point seven one-thousandths of the element has been consumed by corrosion. In engineering units this metal loss would be expressed as 214.7/1000 or 0.2147 times the probe span.

The **Chk:** reading is a measure of probe functionality or integrity. The initial value for CORROSOMETER® probes is 800 ±50 divisions. It is recommended that a **CHECK** reading be taken and recorded immediately after unpacking a probe as it will be the value to which all subsequent **CHECK** readings will be compared. The general rule is that the **CHECK** reading should not vary by more than 1% (±10 divisions) from the initial value. If there is more than a 1% change, it is an indication of a loss in probe integrity and replacement is required.

To reread the probe, press the **Read (F1)** key and another reading will be taken and displayed.

If the reading is to be saved in memory for later viewing, for corrosion rate calculation or for downloading to a PC the following procedure should be followed:

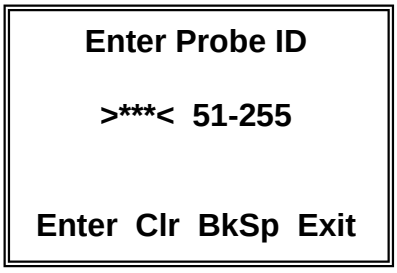
Press the **Save** key to go to the **Enter Probe Span** display:



From the keypad, enter the span of the probe element in **mils**. The span in mils is shown on the probe packaging or it can be found in Table 5.1. Note**:** If Type G for the Model 610 Atmospheric Probes is selected, the span is entered in Angs (Angstroms).

Pressing **Clear (F2)** will clear the value previously set so that a new span can be entered. Pressing **BkSp (F3)** backs up one space each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Read Probe By** display.

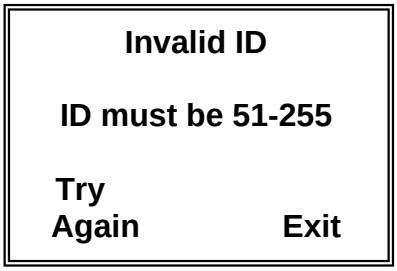
Press **Enter** to go to the **Enter Probe ID** display:



The instrument will automatically assign the next free ID number. If this is not acceptable you may press **Clr (F2)** and manually assign an ID from the keypad. Pressing **BkSp (F3)** backs up one space for each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Read Probe By** display.

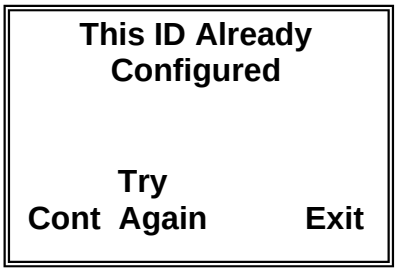
Press **Enter (F1)** to go to the **Enter Probe Tag** display

Note: If an invalid ID has been selected, the **Invalid ID** display appears:



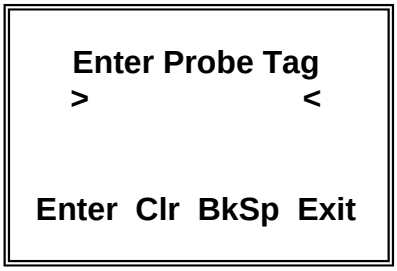
Press **Try Again (F1)** to return to the **Enter Probe ID** display. Pressing **Exit (F4)** returns to the **Read Probe By** display.

Note: If the ID selected has already been configured, the **This ID Already Configured** display appears:



Press **Cont (F1)** to continue to the **Enter Probe Tag** display if you want to continue to use this ID number.

Press **Try Again (F1)** to return to the **Enter Probe ID** display. Pressing **Exit (F4)** returns to the **Read Probe By** display.

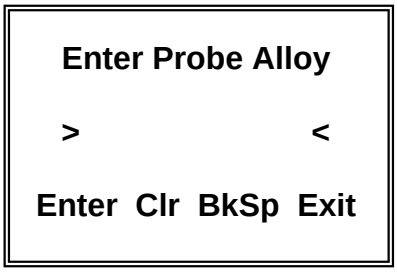


Enter Clr BkSp Exit

The **Enter Probe Tag** display allows the user to enter up to twelve (12) alpha or numeric characters to uniquely identify the monitoring location. This can be a Tag No., location or process name.

Pressing **Clr (F2)** clears a previously entered ID. Pressing **BkSp (F3)** backs up one space for each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Read Probe By** display.

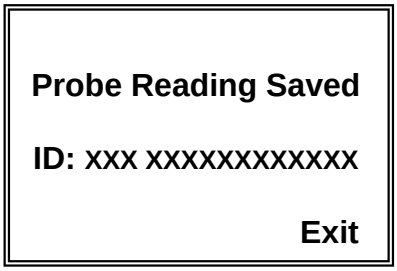
Press **Enter (F1)** to go to the **Enter Probe Alloy** display:



The **Enter Probe Alloy** display allows the user to enter up to eight (8) alpha or numeric characters to identify the alloy of the probe element for reference purposes only. It does not affect the calculation of corrosion rates.

Pressing **Clr (F2)** clears a previously entered ID. Pressing **BkSp (F3)** backs up one space for each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Read Probe By** display.

Press **Enter** to go to the **Probe Reading Saved** display:

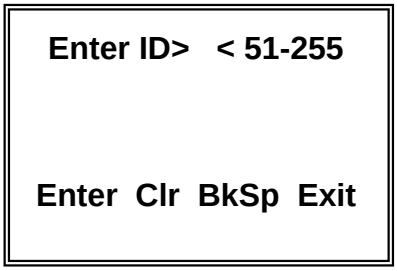


Where XXX is the ID of the location and XXXXXXXXXXXXX is the Probe Tag.

Press **Exit** to return to the **Read Probe By** display.

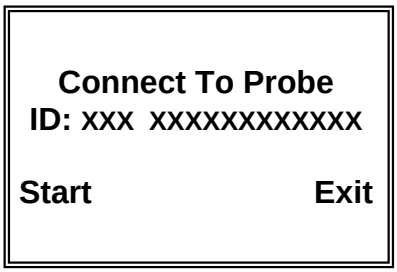
To read a probe by **ID**-

Press **ID (F1)** to go to the **Enter ID> < 51-255** display:



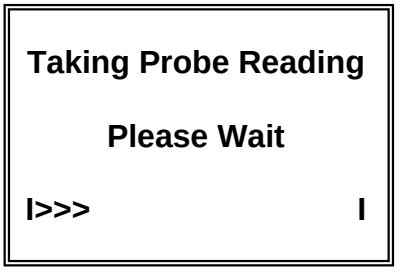
Enter the ID number of the probe and press **Enter (F1)**

The CheckMate™ will check the ID number to determine its validity. If the ID is valid, the **Connect To Probe** display will appear. If the ID is found to be invalid, the **ID Not Found** message will appear and the **Exit** key should be pressed to return to the **Taking Probe Reading** display.



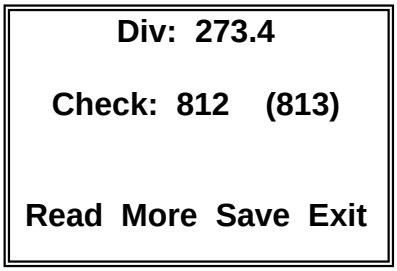
After connecting the CheckMate™ to the probe, press the **Start** key to begin the measurement function and the **Taking Probe Reading** screen will appear

Pressing the **Exit** key will return to the **Read Probe By** screen:



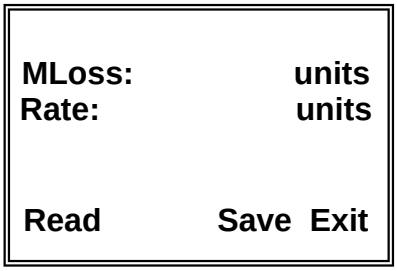
A series of > symbols will accumulate from left to right across the screen to indicate the

progression of the measurement function At the conclusion of the measurement function (approximately 30 seconds) the CheckMate™ will display the probe reading, the current check reading and the initial check reading in divisions. The initial check reading in divisions will be shown in parenthesis (). A typical display is shown below:



where 273.4 is the **Metal Loss** reading in divisions, 812 is the present **Check** reading in divisions and (813) is the initial **Check** reading in divisions.

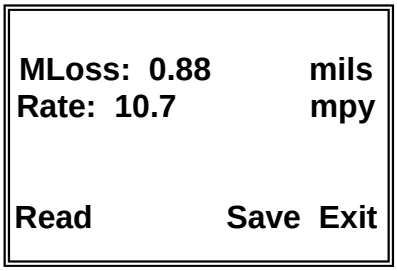
Pressing the **Read (F1)** key will return to the **Taking Probe Reading** display and automatically start a new measurement cycle. Press the **Save (F3)** to go to a display that allows the user to save the readings by pressing the **Yes (F1)** key which will go directly to the **Probe Reading Saved** display which is explained below or pressing the **No** key will discard the reading and return to the **Read Probe By** display. Press the **More (F2)** key to go to the **MLoss** and **Rate** display:



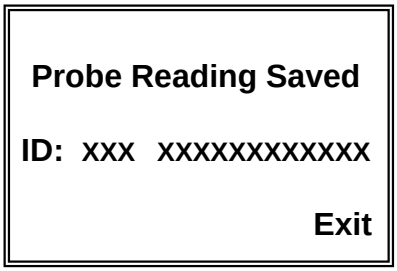
The cumulative metal loss, **MLoss**, in the engineering units originally selected will be displayed and the corrosion rate between the previous probe reading and the present probe reading will be automatically calculated. The corrosion rate, **Rate**, will be displayed in the engineering units originally selected per year.

Example: A T10 CORROSOMETER® probe (span 5 mils) was installed in a refinery overhead system on March 1, 2004. The initial probe reading of 97.3 divisions and check reading of 813 was made on March 1, 2004. On March 30, 2004, the probe was again read and the results were as shown in the typical display above, i.e. Div: 273.4 and Check: 812. The corrosion rate calculated between these two measurements would be equal to 10.7 mpy (mils per year).

The display for the example above would show:



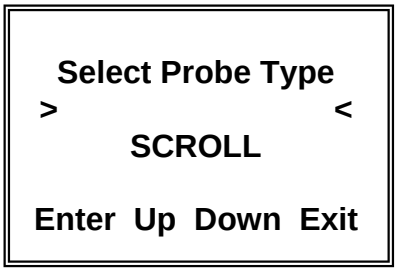
Press **Save** to go to the **Probe Reading Saved** display:



The present probe reading will be saved with the ID number and Tag Number as displayed. Pressing the **Exit** key will return to the **Read Probe By** display for reading of other probes.

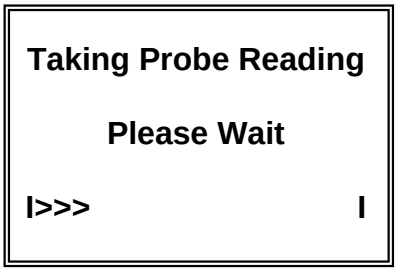
To read a **New** probe

Press **New** to go to the **Select Probe Type** display:

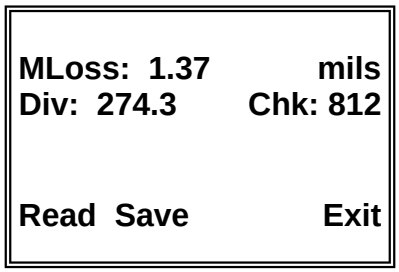


The probe type selections are **W80 WIRE**, **W65 WIRE**, **W45 WIRE**, **W40 WIRE**, **TF50**, **TF5**, **T50 CYLINDRICAL**, **T20 CYLINDRICAL**, **T10 CYLINDRICAL**, **T8 TUBE LOOP**, **T4 TUBE LOOP**, **S50 FLUSH**, **S40 FLUSH**, **S20 FLUSH**, **S10 FLUSH**, **S8 STRIP LOOP**, **S8 FLUSH**, **S4 STRIP LOOP**, **S4 FLUSH**, **S4 ATMOSPHERIC**, **OTHER** and **TEST PROBE CO**. You may scroll up through the list by repeatedly pressing the **Up (F2)** key or down through the list by repeatedly pressing the **Down (F3)** key. When the probe element selection is displayed, press the **Enter (F1)** key to accept the selection. The CheckMate™ will automatically proceed to the next display based on the selection.

If a standard CORROSOMETER® probe (element) is selected, the CheckMate™ will automatically go to the measure mode and the **Taking Probe Reading – Please Wait** display will appear:

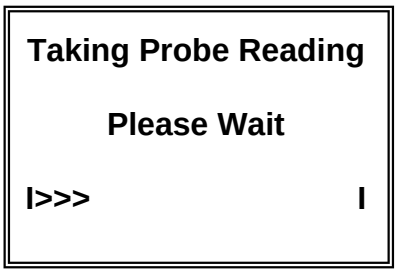


A series of > symbols will accumulate from left to right across the screen to indicate the progression of the measurement function. At the conclusion of the measurement function (approximately 30 seconds) the CheckMate™ will display the probe Metal Loss (**MLoss:**) in the engineering units originally selected, the in divisions (**Div:**) and the current check reading (**Chk:**) in divisions. A typical display is shown below:

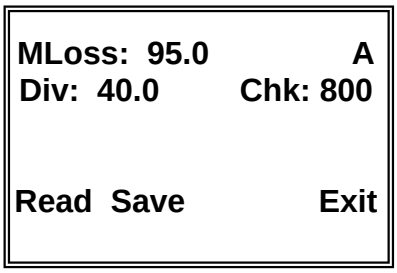


If a TF5 or TF50 high sensitivity atmospheric CORROSOMETER® probe has been selected, the CheckMate™ will go to a special **Enter Probe Span** display:

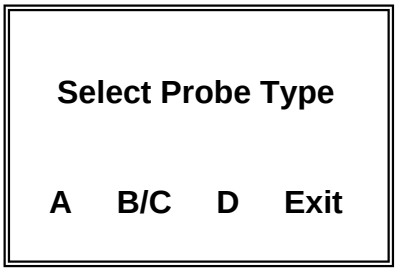
Using the numeric portion of the keypad, enter the probe span in Angstroms (Å). The packaging for the TF5 and TF50 CORROSOMETER® provides the specific span for the probe. Alternatively, the nominal span can be used without appreciable error. Pressing **Enter (F1)** will cause the CheckMate™ to automatically go to the measure mode and the **Taking Probe Reading – Please Wait** display will appear:



A series of > symbols will accumulate from left to right across the screen to indicate the progression of the measurement function At the conclusion of the measurement function (approximately 30 seconds) the CheckMate™ will display the probe Metal Loss (**MLoss:**) in angstroms, the reading in divisions (**Div:**) and the simulated check reading (**Chk:**) of 800 divisions (TF5 and TF50 high-sensitivity probes do not provide a check reading). A typical display is shown below:



If **OTHER** is selected from the probe type selections on the **Select Probe Type** display the CheckMate™ will go to a second **Select Probe Type** display that allows the select the specific probe element conversion equation required and enter specific probe spans (in mils) that may be special. The display is shown below:



Select and press **A (F1)** for Wire Loop type probes or press **B/C (F2)** for Tube Loop/Strip Loop type probes or **D (F3)** for Cylindrical type probes. If you are unsure of the element type, this information can be found on the probe packaging, etched on the probe body adjacent to the connector or in Table 5.1 Probe Type Identification.

CORROSOMETER or CORROTEMP Probe Element	Type	Span (mils)
Strip Loop S4	C	1
Flush Element S4 Atmospheric Element S4 Strip Loop S8 Tube Loop T4	B D C B	2
Flush Element S8 Atmospheric Element S8 Tube Loop T8	B D B	4
Flush Element S10 Cylindrical Element T10	B D	5
Flush Element S20 Cylindrical Element T20 Wire Loop Element W40	B D A	10
Wire Loop Element W45	A	11.25
Flush Element S40 Wire Loop Element W80	B A	20
Cylindrical Element T50	D	25

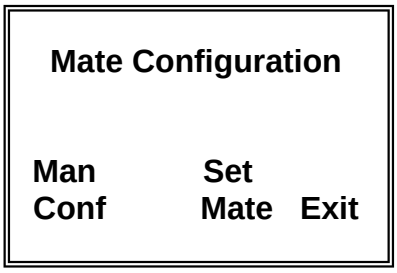
Table 5.1 CORROSOMETER and CORROTEMP Probe Types and Spans

CAUTION: ***CORROSOMETER Model 2500, 3500, or 4500 probes are designated as a "cylindrical" element, not a "tube" element which refers only to "tube loop" elements.***

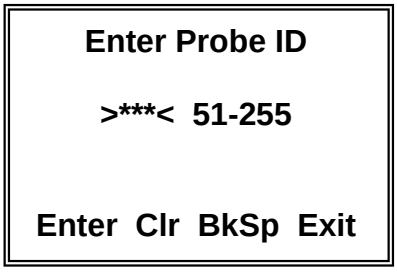
Chapter 6
Custom Probe Setup

Probes may also be configured manually by following the procedure below:

From the **Standby** display, press **SetUp (F4)** to go to the **Mate Configuration** display:

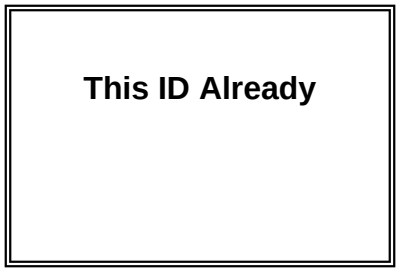


Press **Man Conf (F1)** to go to the **Enter Probe ID** display:



Enter a number between 51 and 255 and press **Enter (F1)** to go to the **Enter Probe Tag** display.

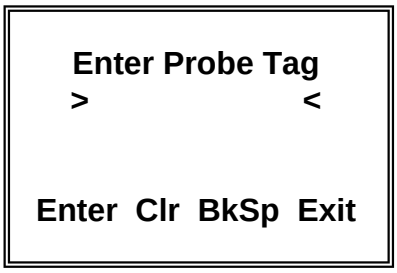
Note: If an invalid ID is entered, it is automatically cleared upon pressing **Enter (F1)**.
Note: If the ID selected has already been configured, the **This ID Already Configured** display appears:



Configured

Try
Cont Again Exit

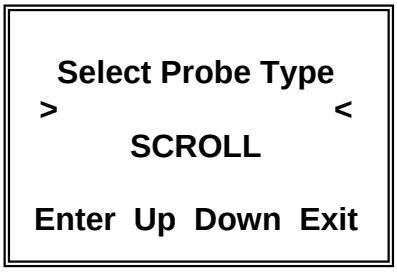
Press **Try Again (F2)** to return to the **Enter Probe ID** display or **Cont (F1)** to continue to the **Enter Probe Tag** display and reconfigure the ID. Pressing **Exit (F4)** returns to the **Mate Configuration** display.



Enter Clr BkSp Exit

In the **Enter Probe Tag** display, enter up to twelve (12) alpha or numeric characters to uniquely identify the monitoring location. This can be a Tag No., location or process name. Pressing **Clr (F2)** clears a previously entered ID. Pressing **BkSp (F3)** backs up one space for each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Mate Configuration** display.

Press **Enter (F1)** to go to the **Select Probe Type** display:

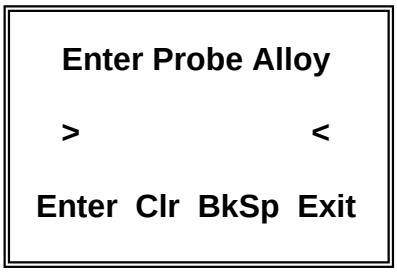


SCROLL

Enter Up Down Exit

The probe type selections are **W80 WIRE**, **W65 WIRE**, **W45 WIRE**, **W40 WIRE**, **TF50**, **TF5**, **T50 CYLINDRICAL**, **T20 CYLINDRICAL**, **T10 CYLINDRICAL**, **T8 TUBE LOOP**, **T4 TUBE LOOP**, **S50 FLUSH**, **S40 FLUSH**, **S20 FLUSH**, **S10 FLUSH**, **S8 STRIP LOOP**, **S8 FLUSH**, **S4 STRIP LOOP**, **S4 FLUSH**, **S4 ATMOSPHERIC**, **OTHER** and **TEST PROBE CO**. You may scroll up through the list by repeatedly pressing the **Up (F2)** key or down through the list by repeatedly pressing the **Down (F3)** key. When the probe element selection is displayed, press the **Enter (F1)** key to accept the selection

If a CORROSOMETER® probe (element) is selected, the CheckMate™ will automatically proceed to the **Enter Probe Alloy** display:

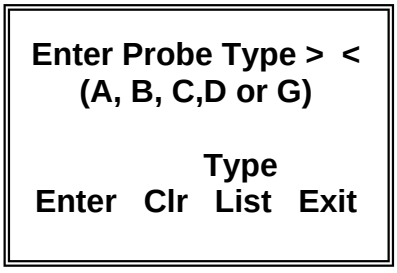


The **Enter Probe Alloy** display allows the user to enter up to eight (8) alpha or numeric characters to identify the alloy of the probe element for reference purposes only. It does not affect the calculation of corrosion rates.

If a TF5 or TF50 high sensitivity atmospheric CORROSOMETER® probe has been selected, the CheckMate™ will go to a special **Enter Probe Span** display:

Using the numeric portion of the keypad, enter the probe span in Angstroms (Å). The packaging for the TF5 and TF50 CORROSOMETER® provides the specific span for the probe. Alternatively, the nominal span can be used without appreciable error.

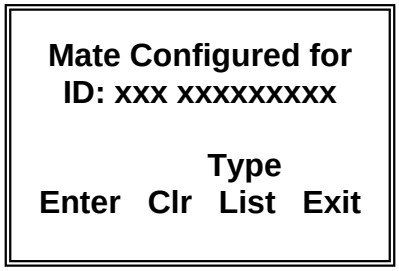
If **OTHER** is selected from the probe type selections on the **Select Probe Type** display the CheckMate™ will go to a second **Select Probe Type** display that allows the select the specific probe element conversion equation required and enter specific probe spans (in mils) that may be special. The display is shown below:



Enter **A** for Wire Loop type probes or enter **B** or **C** for Tube Loop/Strip Loop type probes or enter **D** for Cylindrical type probes. If you are unsure of the element type, this

information can be found on the probe packaging, etched on the probe body adjacent to the connector or in Table 5.1 Probe Type Identification.

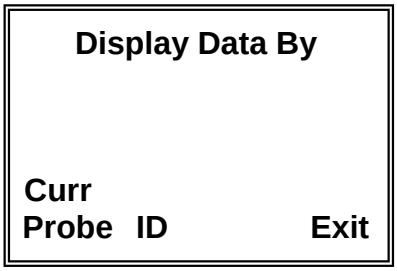
Pressing **Enter (F1)** will go to the **ID Configured** display:



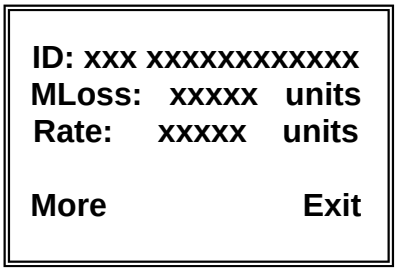
Chapter 7
Displaying Data on the CheckMate™

Probe reading data can be displayed on the CheckMate™ either by the probe currently attached or by ID. The data includes the Tag ID, Metal Loss, Corrosion Rate, Divisions and Check Readings.

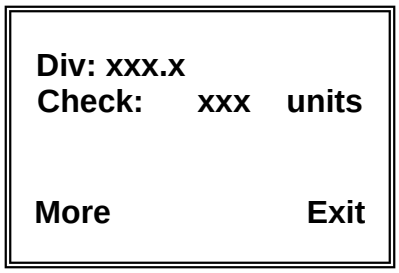
From the **Standby** screen, press **Disp (F2)** to go to the **Display Data By** display:



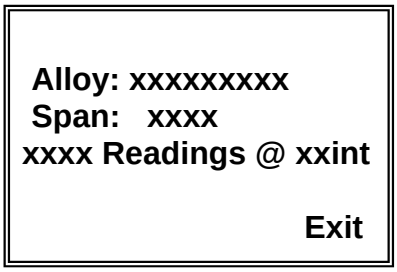
Press **Curr Probe (F1)** to go directly to the current probe display or press **ID (F2)** to select the probe by ID.



Press **More (F1)** to go to the second screen of information:



Press **More (F1)** one more time to go to the third screen of information:



Chapter 8
Transferring Data to the PC

Probe reading data is downloaded to the PC using the CheckMate™ to PC program, Corrdata© CSV. It is a simple, Windows compatible program that allows fast download of data stored in the CheckMate™ to a Comma Separated Value (CSV) file. This file can then be opened with Excel or another comparable spreadsheet program.

Installation

The Corrdata CSV program can be found on the CD-ROM included with the instrument. Insert the auto run CD-ROM and follow the on screen instructions to install. The default installation directory is C:\Program Files\RCS\Corrdata CSV.

Configuring Corrdata CSV

When installation is complete, click on the Start Menu to launch the program. Click on the Select menu, then Data Directory to choose the location for where to save the CSV files. Next, from the Select Menu, place a check next to the COM port to be used.

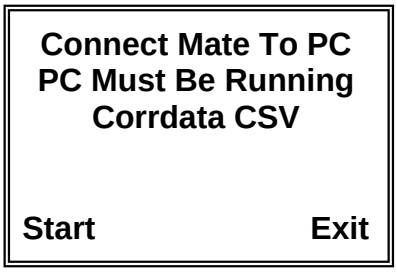
Connect the CheckMate™ to the PC

Connect the CheckMate™ instrument to the 9 pin COM port on the back of the PC using the provided cable. Make sure this is the same COM port as selected previously (in most cases this will be COM 1, however verify this in device manager).

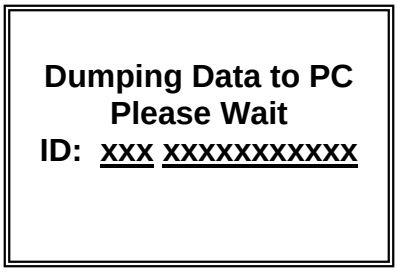
Now click on the large button: “Get CHECKMATE Data and Make Excel (CSV) Files. Click OK on the window that appears next.

CheckMate™ Procedure

From the **Standby** screen of the CheckMate™, press **Dump (F2)** to go to the **Start Dump** display:

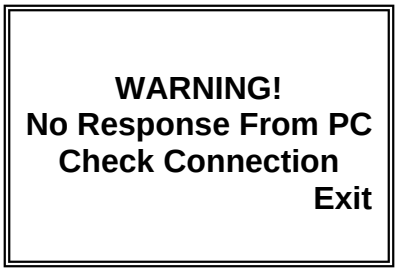


Press **Start (F1)** to begin downloading data to the PC.



The CSV files are saved by tag number and ID in a folder called DataFiles under the directory created previously. They may be opened using Excel or a similar spreadsheet program.

If the CheckMate™ is not connected to the PC properly, or the PC is not running Corrdata CSV, the following screen may be displayed.



Make sure that Corrdata CSV software is running, that the correct COM port is checked in the Select menu, and that the CheckMate™ is connected to that COM port using the supplied cable.

If data is still not transferred after checking the connection between the PC and CheckMate™, please see the Troubleshooting section (Chapter 9) for further help.

Chapter 9
Troubleshooting Guide

Symptom	Problem	Solution
CheckMate™ will not turn on.	Batteries not installed.	Install batteries (see Chapter 3)
	Battery voltage low.	Install new batteries.
	Batteries installed incorrectly.	Check the polarities as indicated on the unit.
CheckMate™ turns off before 2 minutes auto shutdown.	Battery voltage low.	Install new batteries.
CheckMate™ will not transfer data to the computer.	Corrdata CSV is not running.	Launch Corrdata CSV from the Start Menu. Click the Get Data button and then OK.
	Cable is not connected properly.	Check that the cable is fully plugged into CheckMate™ and that the other end is fully plugged into the 9 pin serial port on the back of the PC.
		Check that the COM port selected in Corrdata CSV is the actual COM port to which the CheckMate™ is connected.
CheckMate™ not reading probe.	No probe connected to CheckMate™	Connect probe to CheckMate™

Appendix A
EC-Type Examination Certificate

[1]
[2]

EC-TYPE EXAMINATION CERTIFICATE

Equipment or Protective System intended for use in Potentially explosive atmospheres Directive 94/9/EC

[3] EC-Type Examination Certificate Number: **DEMKO 05 ATEX 0417899X**

[4] Equipment or Protective System: **Portable Corrosometer Data Terminal, Models CheckMate, Part No. 723601 and CheckMate Plus, Part No. 723601-1**

[5] Manufacturer: **Rohrback Cosasco Systems Inc**

[6] Address: **11841 E Smith Ave, Santa Fe Springs CA 90670 USA**

[7] This equipment or protective system and any acceptable variation there to is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no: **0417899**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 E incl. A1 + A2 EN 50020:2002 E

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EC-Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of this Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by the certificate.

[12] The marking of the equipment or protective system shall include the following:

Ex II 2G EEx ib IIC T4

On behalf of UL International Demko A/S

Herlev, 2005-04-19

Karina Christiansen
Certification Manager

UL International Demko A/S
Lyskaer 8, P.O. Box 514
DK-2730, Herlev, Denmark
Telephone: +45 44856565
Fax: +45 44856500

[13]

Schedule

[14]

EC-TYPE EXAMINATION CERTIFICATE No.

DEMKO 05 ATEX 0417899X

[15] Description of Equipment or protective system:
The CheckMate/CheckMate Plus is a handheld corrosometer and data recorder intended for use with Rohrback Cosasco Systems Inc. remote data collectors (RDC's) and corrosion probes in a Hazardous Location, and also with a computer in a Non-Hazardous Location via the PC Isolator Cable. It is intended to provide transfer of stored corrosion data from the RDC's (DEMKO 04 ATEX 0307914X) and also to program the RDC's. It may be connected directly to a corrosion probe for a corrosion measurement or to a test probe of known resistance for system checks and troubleshooting. Software is the only difference between the CheckMate and the CheckMate Plus instruments.

Types comprised by the Certificate
Model CheckMate, Part No. 723601
Model CheckMate Plus, Part No. 723601-1

Electrical Data
9V supply from six size AA 1.5V alkaline batteries:
Duracell MN1500, Energizer E91, EN91 or Rayovac 815 alkaline type.

RS232 Data Port from Pin 2 and Pin 3 to Pin 5:
Uo = 11.1 V, Io = 22.4 mA, Po = 63 mW, Co = 1.9 uF, Lo = 70 mH
Ui = 11.1 V, Ii = 45.9 mA, Pi = 127.4 mW, Ci = 0, Li = 0

Probe Port from Probe A to Probe F:
Uo = 5.88 V, Io = 0.594 A, Po = 0.873 W, Co = 43 uF, Lo = 100 uH
Ui = 5.88 V, Ii = 79.4 mA, Pi = 116.7 mW, Ci = 96 pF, Li = 0.32 uH

Probe Port from Probe B, C, D or E to Probe F:
Uo = 5.88 V, Io = 79.4 mA, Po = 116.7 W, Co = 43 uF, Lo = 5.6 mH
Ui = 5.88 V, Ii = 4.9 mA, Pi = 7.3 mW, Ci = 96 pF, Li = 0.32 uH

Probe Port from Probe A, B, C, D and E to Probe F:
Uo = 5.88 V, Io = 1.07 A, Po = 1.573 W, Co = 43 uF, Lo = 31 uH
Ui = 5.88 V, Ii = 0.667 A, Po = 0.98 W, Co = 96 pF, Li = 0.32 uH

Temperature Data
$-20°C \leq Ta \leq 50°C$

Routine Tests
Tests are performed per 11.1.1 of EN 50020:2002 on the PC Isolator Cable P/N 723240.

UL International Demko A/S
Lyskaer 8, P.O. Box 514
DK-2730, Herlev, Denmark
Telephone: +45 44856565
Fax: +45 44856500

[16] Report No.:
Project Report No.: 0417899 (Hazardous Locations Testing)

Drawings:

Drawing Number	Sheets	Rev.	Date	Title
006436	1	E	08 Apr 05	Marking Label
723203	8	H	01 Apr 05	Interconnect Control Drawing
723601	1	C	14 Mar 05	Complete Unit Assembly
723215	2	-	30 Sep 03	Enclosure Case Top
723214	2	-	30 Sep 03	Enclosure Case Bottom
723045	1	A	14 Mar 05	Keyboard Static Guard
723629	1	-	18 Feb 05	Battery Access Door
723612	2	G	21 Mar 05	Circuit Board Schematic
723610	1	M	08 Apr 05	Board Assembly and Parts List
723611	11	G	07 Mar 05	Circuit Board Trace Layout
723618	1	C	21 Mar 05	Internal Battery Supply Cable
723616	1	D	21 Mar 05	Internal RS232 Serial Cable
723619	1	D	24 Mar 05	External Probe Cable
723623	1	C	24 Mar 05	External CheckMate/RDC Cable
723235	1	B	21 Mar 05	CheckMate Test Probe Assembly
044054	1	S	24 Oct 03	CheckMate Test Probe Material
006438	1	B	21 Mar 05	CheckMate Test Probe Marking
723240	1	B	24 Mar 05	PC Isolator Cable Assembly
723243	1	A	21 Mar 05	PC Isolator Cable Schematic
723241	1	B	08 Apr 05	PC Isolator PCB Assembly
723242	1	-	14 Mar 05	PC Isolator PCB Specifications
723032	5	G	26 May 94	PC Isolator PCB Artwork
006447	1	A	24 Mar 05	PC Isolator Cable Marking
CheckMate Instrument	7	-	18 Mar 05	Component Safety Assessment
CheckMate Instrument	1	-	07 Apr 05	Aggregate Capacitance Table
PC Isolator Cable PCB	1	-	22 Mar 05	Component Safety Assessment

[17] Special conditions for safe use:
The CheckMate/CheckMate Plus instrument is intrinsically safe when connected in accordance with interconnect control drawing No. 723203 which is supplied with each unit. Downloading of stored data to a computer is performed only in the non-hazardous area and only with PC Isolator Cable Part No. 723240. Alkaline battery replacement is only performed in the non-hazardous area.

[18] Essential Health and Safety Requirements
The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in ANNEX III to Directive 94/9/EC of the European Parliament and the Council of 23 March 1994.

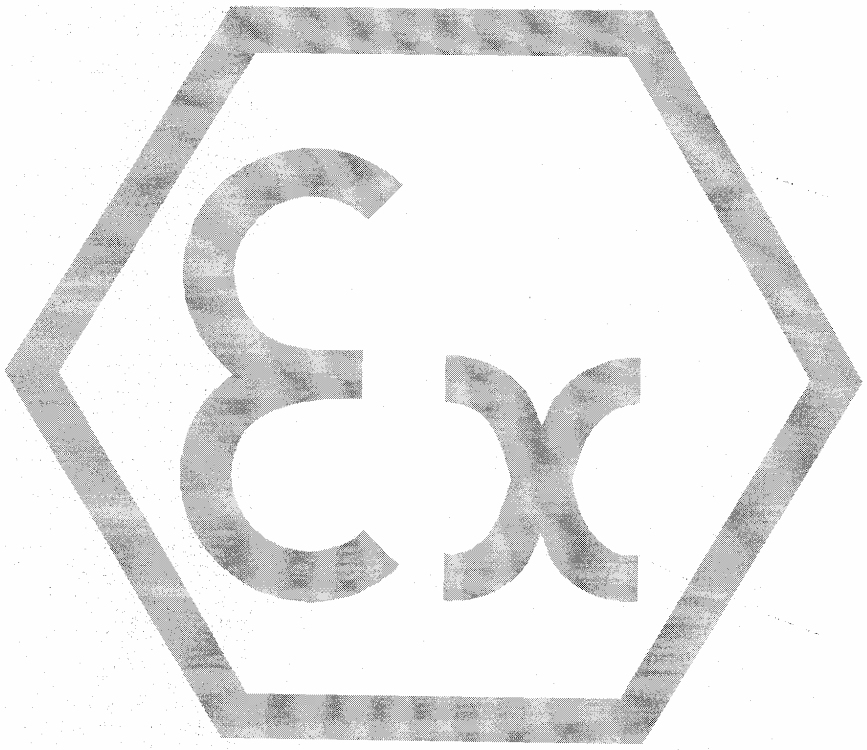
UL International Demko A/S
Lyskaer 8, P.O. Box 514
DK-2730, Herlev, Denmark
Telephone: +45 44856565
Fax: +45 44856500

Schedule DEMKO 05 ATEX 0417899X

On behalf of UL International Demko A/S

Herlev, 2005-04-19

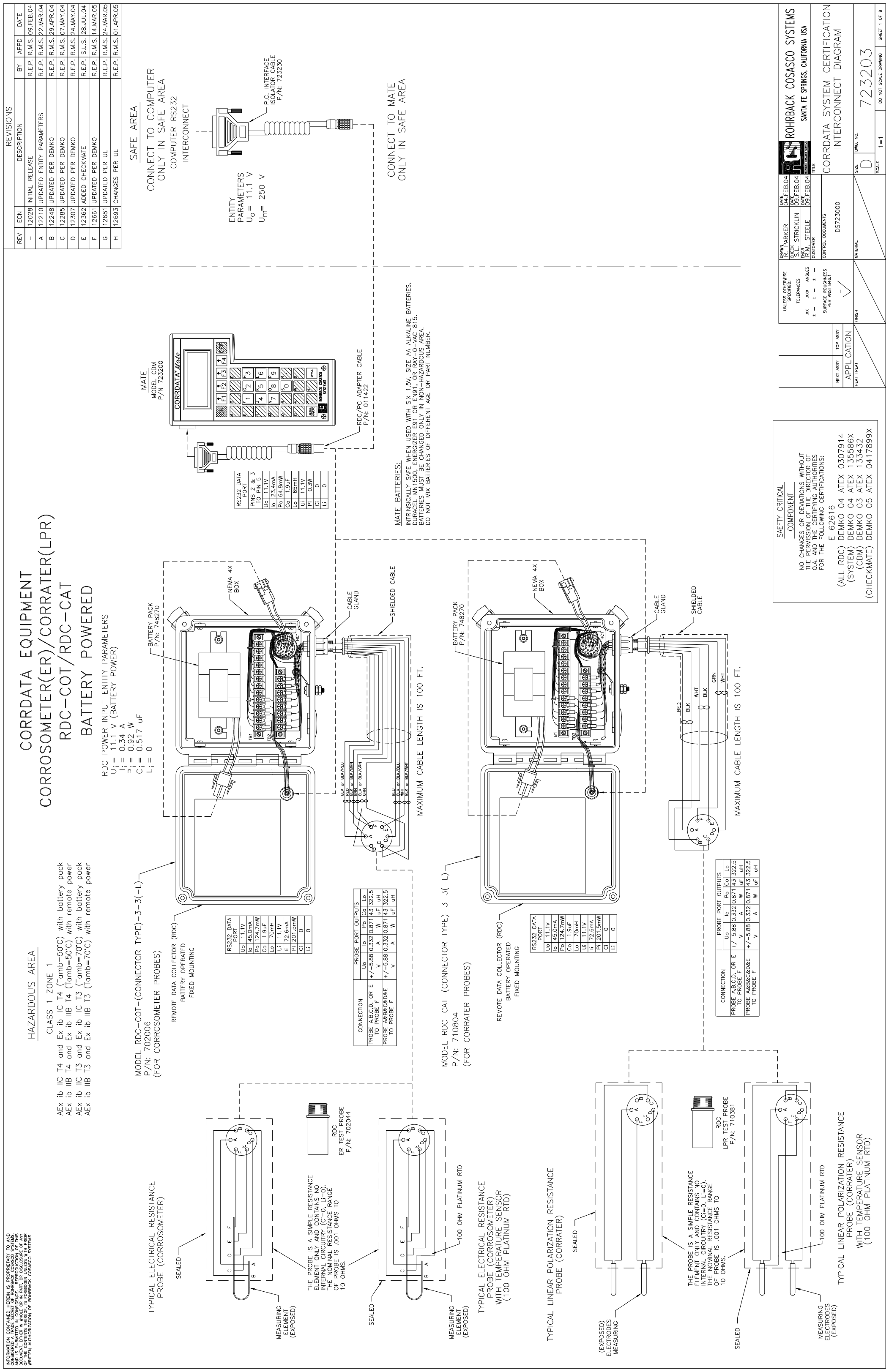
Karina Christiansen
Certification Manager

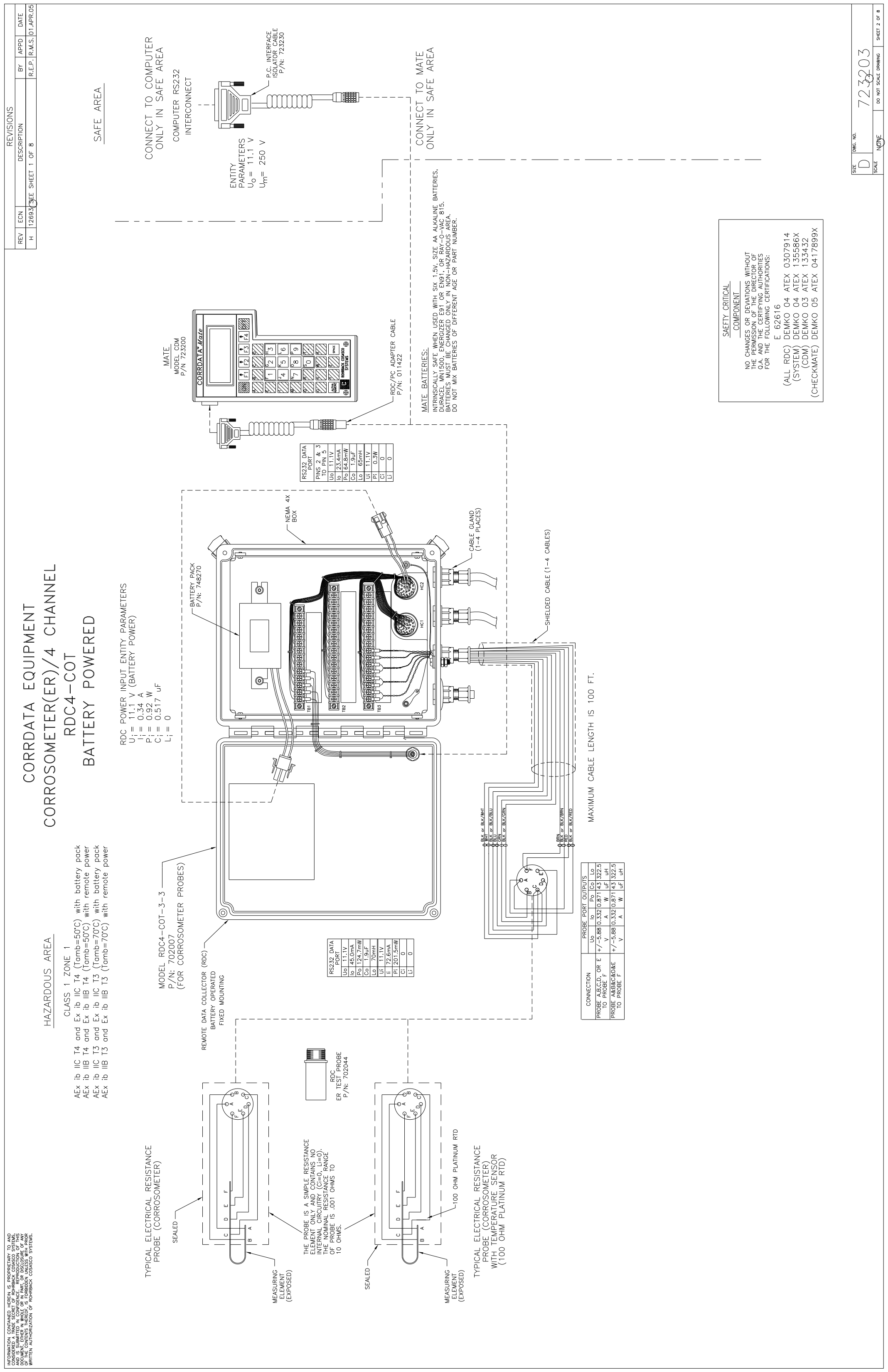


Certificate: 05 ATEX 0417899X
Report: 0417899

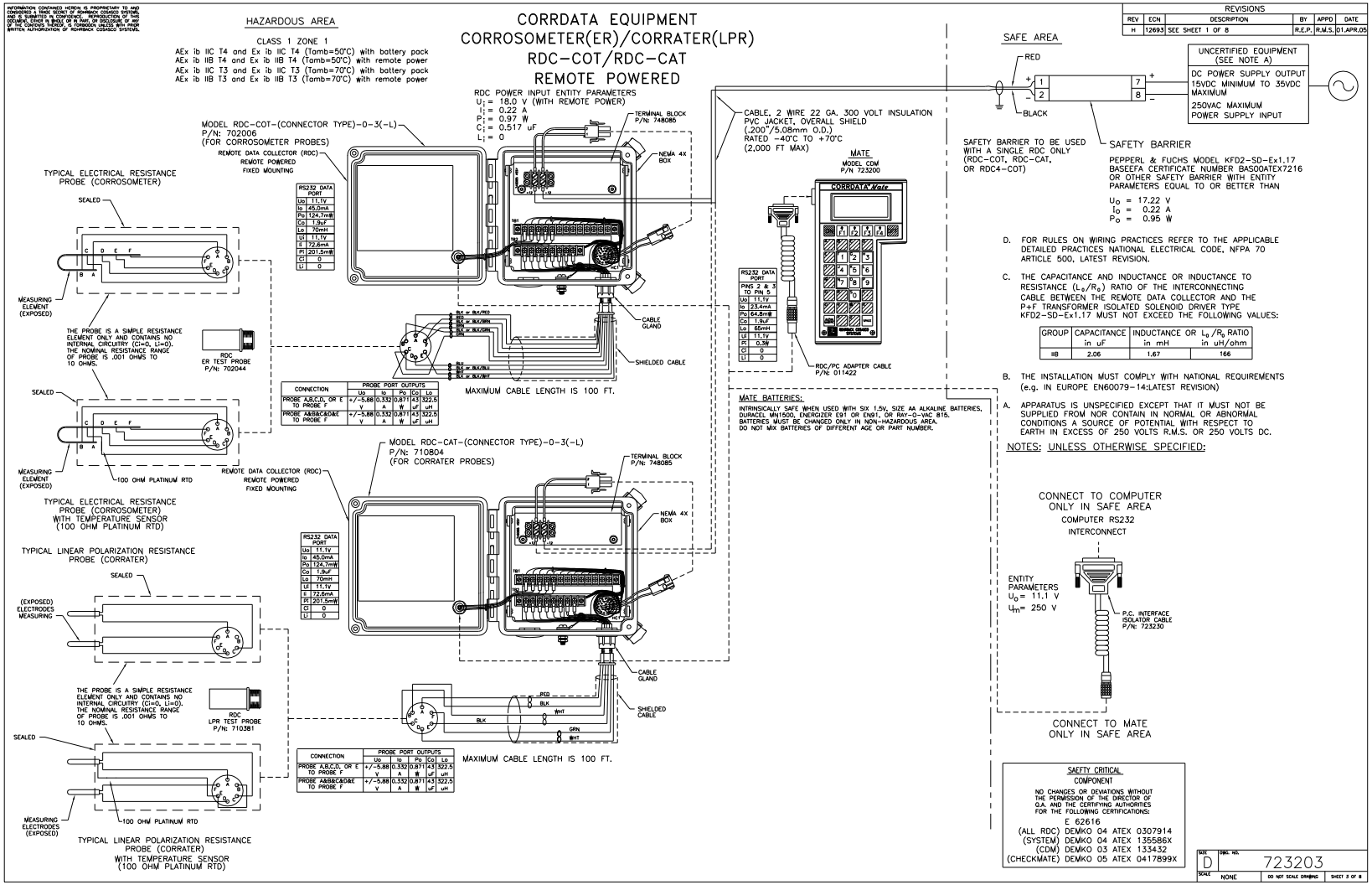
UL International Demko A/S
Lyskaer 8, P.O. Box 514
DK-2730, Herlev, Denmark
Telephone: +45 44856565
Fax: +45 44856500

Appendix B
Interconnect Control Drawing

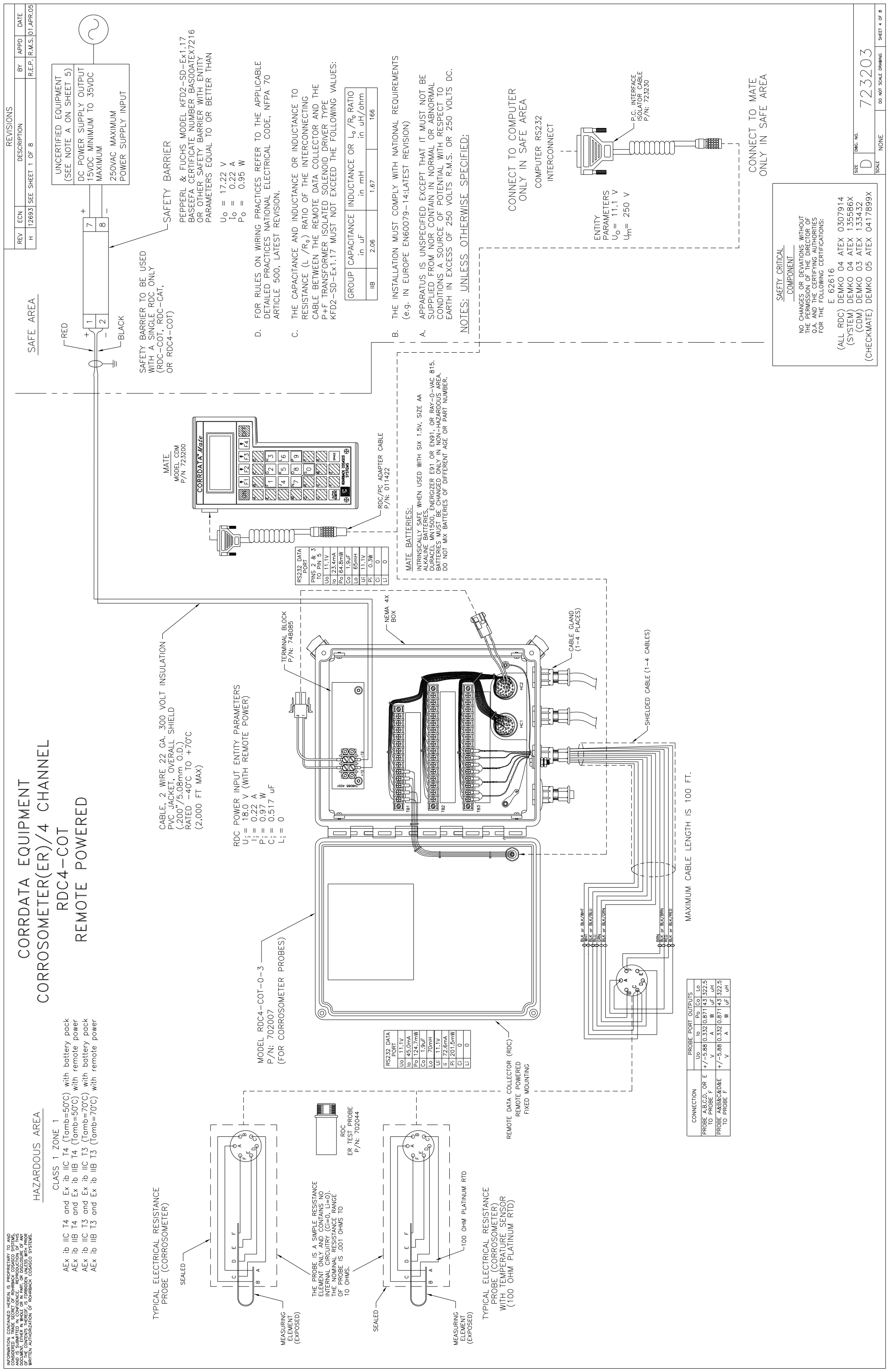

CORRDATA EQUIPMENT
CORROSOMETER(ER)/CORRATER(LPR)
RDC-COT/RDC-CAT
BATTERY POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
RDC POWER INPUT ENTITY PARAMETERS
Ui = 11.1 V (BATTERY POWER)
Ii = 0.34 A
Pi = 0.92 W
Ci = 0.517 uF
Li = 0
MODEL RDC-COT-(CONNECTOR TYPE)-3-3(-L)
P/N: 702006
(FOR CORROSOMETER PROBES)
REMOTE DATA COLLECTOR (RDC) BATTERY OPERATED FIXED MOUNTING
BATTERY PACK P/N: 748270
NEMA 4X BOX
CABLE GLAND
SHIELDED CABLE
MAXIMUM CABLE LENGTH IS 100 FT.
MODEL RDC-CAT-(CONNECTOR TYPE)-3-3(-L)
P/N: 710804
(FOR CORRATER PROBES)
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER)
SEALED
MEASURING ELEMENT (EXPOSED)
THE PROBE IS A SIMPLE RESISTANCE ELEMENT ONLY AND CONTAINS NO INTERNAL CIRCUITRY (Ci=0, Li=0). THE NOMINAL RESISTANCE RANGE OF PROBE IS .001 OHMS TO 10 OHMS.
RDC ER TEST PROBE P/N: 702044
100 OHM PLATINUM RTD
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
TYPICAL LINEAR POLARIZATION RESISTANCE PROBE (CORRATER)
(EXPOSED) ELECTRODES MEASURING
RDC LPR TEST PROBE P/N: 710381
TYPICAL LINEAR POLARIZATION RESISTANCE PROBE (CORRATER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
MATE
MODEL CDM
P/N 723200
RDC/PC ADAPTER CABLE P/N: 011422
MATE BATTERIES:
INTRINSICALLY SAFE WHEN USED WITH SIX 1.5V, SIZE AA ALKALINE BATTERIES, DURACELL MN1500, ENERGIZER E91 OR EN91, OR RAY-O-VAC 815. BATTERIES MUST BE CHANGED ONLY IN NON-HAZARDOUS AREA. DO NOT MIX BATTERIES OF DIFFERENT AGE OR PART NUMBER.
SAFE AREA
CONNECT TO COMPUTER ONLY IN SAFE AREA
COMPUTER RS232 INTERCONNECT
ENTITY PARAMETERS
Uo= 11.1 V
Um= 250 V
P.C. INTERFACE ISOLATOR CABLE P/N: 723230
CONNECT TO MATE ONLY IN SAFE AREA
SAEFTY CRITICAL COMPONENT
NO CHANGES OR DEVIATIONS WITHOUT THE PERMISSION OF THE DIRECTOR OF Q.A. AND THE CERTIFYING AUTHORITIES FOR THE FOLLOWING CERTIFICATIONS:
E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
REVISIONS
REV ECN DESCRIPTION BY APPD DATE
- 12028 INITIAL RELEASE R.E.P. R.M.S. 09.FEB.04
A 12210 UPDATED ENTITY PARAMETERS R.E.P. R.M.S. 22.MAR.04
B 12248 UPDATED PER DEMKO R.E.P. R.M.S. 29.APR.04
C 12285 UPDATED PER DEMKO R.E.P. R.M.S. 07.MAY.04
D 12307 UPDATED PER DEMKO R.E.P. R.M.S. 24.MAY.04
E 12362 ADDED CHECKMATE R.E.P. S.L.S. 28.JUL.04
F 12661 UPDATED PER DEMKO R.E.P. R.M.S. 14.MAR.05
G 12681 UPDATED PER UL R.E.P. R.M.S. 24.MAR.05
H 12693 CHANGES PER UL R.E.P. R.M.S. 01.APR.05
ROHRBACK COSASCO SYSTEMS
SANTA FE SPRINGS, CALIFORNIA USA
CORRDATA SYSTEM CERTIFICATION INTERCONNECT DIAGRAM
DS723000
APPLICATION
D 723203
1=1 DO NOT SCALE DRAWING SHEET 1 OF 8

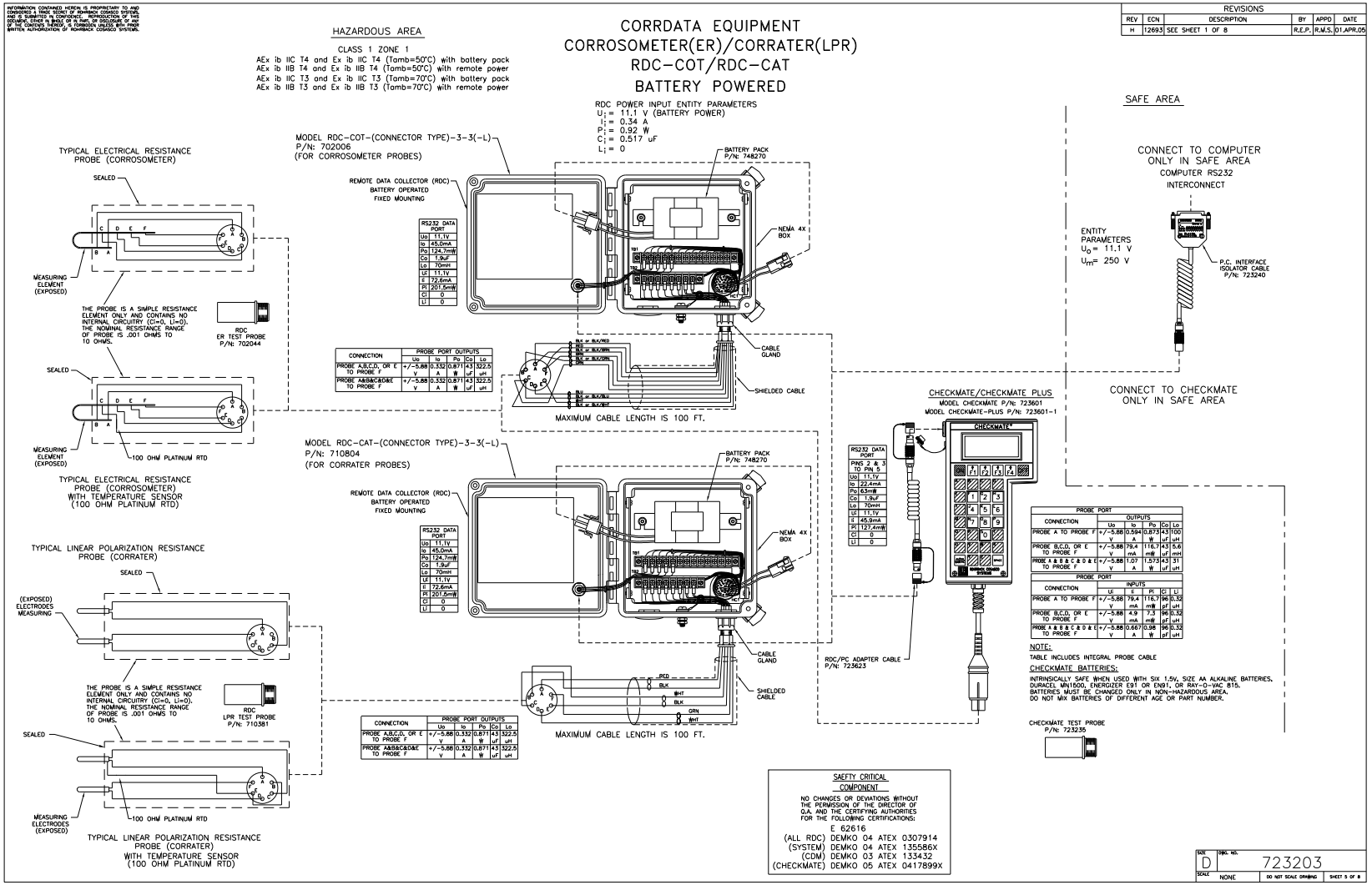


CORRDATA EQUIPMENT
CORROSOMETER(ER)/4 CHANNEL
RDC4-COT
BATTERY POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
SAFE AREA
CONNECT TO COMPUTER ONLY IN SAFE AREA
COMPUTER RS232 INTERCONNECT
P.C. INTERFACE ISOLATOR CABLE P/N: 723230
ENTITY PARAMETERS
CONNECT TO MATE ONLY IN SAFE AREA
MATE MODEL CDM P/N 723200
RDC/PC ADAPTER CABLE P/N: 011422
MATE BATTERIES:
RDC POWER INPUT ENTITY PARAMETERS (BATTERY POWER)
BATTERY PACK P/N: 748270
NEMA 4X BOX
CABLE GLAND (1-4 PLACES)
SHIELDED CABLE (1-4 CABLES)
MAXIMUM CABLE LENGTH IS 100 FT.
MODEL RDC4-COT-3-3
P/N: 702007
(FOR CORROSOMETER PROBES)
REMOTE DATA COLLECTOR (RDC) BATTERY OPERATED FIXED MOUNTING
RDC ER TEST PROBE P/N: 702044
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER)
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
SEALED
MEASURING ELEMENT (EXPOSED)
100 OHM PLATINUM RTD
SAFETY CRITICAL COMPONENT
E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
REVISIONS
723203



GROUP	CAPACITANCE in uF	INDUCTANCE OR Lo/Ro RATIO in mH	in uH/ohm
IIB	2.06	1.67	166


CORRDATA EQUIPMENT
CORROSOMETER(ER)/4 CHANNEL
RDC4-COT
REMOTE POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
SAFE AREA
CABLE, 2 WIRE 22 GA. 300 VOLT INSULATION
PVC JACKET, OVERALL SHIELD
(.200"/5.08mm O.D.)
RATED -40°C TO +70°C
(2,000 FT MAX)
RDC POWER INPUT ENTITY PARAMETERS
U = 18.0 V (WITH REMOTE POWER)
I = 0.22 A
P = 0.97 W
C = 0.517 uF
L = 0
MODEL RDC4-COT-0-3
P/N: 702007
(FOR CORROSOMETER PROBES)
REMOTE DATA COLLECTOR (RDC)
REMOTE POWERED
FIXED MOUNTING
MATE
MODEL CDM
P/N 723200
RDC/PC ADAPTER CABLE
P/N: 011422
TERMINAL BLOCK
P/N: 748085
NEMA 4X
BOX
CABLE GLAND
(1-4 PLACES)
SHIELDED CABLE (1-4 CABLES)
MAXIMUM CABLE LENGTH IS 100 FT.
TYPICAL ELECTRICAL RESISTANCE
PROBE (CORROSOMETER)
SEALED
MEASURING
ELEMENT
(EXPOSED)
THE PROBE IS A SIMPLE RESISTANCE
ELEMENT ONLY AND CONTAINS NO
INTERNAL CIRCUITRY (Ci=0, Li=0).
THE NOMINAL RESISTANCE RANGE
OF PROBE IS .001 OHMS TO
10 OHMS.
RDC
ER TEST PROBE
P/N: 702044
TYPICAL ELECTRICAL RESISTANCE
PROBE (CORROSOMETER)
WITH TEMPERATURE SENSOR
(100 OHM PLATINUM RTD)
100 OHM PLATINUM RTD
SAFETY BARRIER TO BE USED
WITH A SINGLE RDC ONLY
(RDC-COT, RDC-CAT,
OR RDC4-COT)
RED
BLACK
SAFETY BARRIER
PEPPERL & FUCHS MODEL KFD2-SD-Ex1.17
BASEEFA CERTIFICATE NUMBER BAS00ATEX7216
OR OTHER SAFETY BARRIER WITH ENTITY
PARAMETERS EQUAL TO OR BETTER THAN
Uo = 17.22 V
Io = 0.22 A
Po = 0.95 W
UNCERTIFIED EQUIPMENT
(SEE NOTE A ON SHEET 5)
DC POWER SUPPLY OUTPUT
15VDC MINIMUM TO 35VDC
MAXIMUM
250VAC MAXIMUM
POWER SUPPLY INPUT
REVISIONS
REV ECN DESCRIPTION BY APPD DATE
H 12693 SEE SHEET 1 OF 8 R.E.P. R.M.S. 01.APR.05
NOTES: UNLESS OTHERWISE SPECIFIED:
A. APPARATUS IS UNSPECIFIED EXCEPT THAT IT MUST NOT BE SUPPLIED FROM NOR CONTAIN IN NORMAL OR ABNORMAL CONDITIONS A SOURCE OF POTENTIAL WITH RESPECT TO EARTH IN EXCESS OF 250 VOLTS R.M.S. OR 250 VOLTS DC.
B. THE INSTALLATION MUST COMPLY WITH NATIONAL REQUIREMENTS (e.g. IN EUROPE EN60079-14:LATEST REVISION)
C. THE CAPACITANCE AND INDUCTANCE OR INDUCTANCE TO RESISTANCE (L/R) RATIO OF THE INTERCONNECTING CABLE BETWEEN THE REMOTE DATA COLLECTOR AND THE P+F TRANSFORMER ISOLATED SOLENOID DRIVER TYPE KFD2-SD-Ex1.17 MUST NOT EXCEED THE FOLLOWING VALUES:
GROUP | CAPACITANCE in uF | INDUCTANCE OR in mH | L/R RATIO in uH/ohm
IIB | 2.06 | 1.67 | 166
D. FOR RULES ON WIRING PRACTICES REFER TO THE APPLICABLE DETAILED PRACTICES NATIONAL ELECTRICAL CODE, NFPA 70 ARTICLE 500, LATEST REVISION.
CONNECT TO COMPUTER
ONLY IN SAFE AREA
COMPUTER RS232
INTERCONNECT
ENTITY
PARAMETERS
Uo = 11.1 V
Um = 250 V
P.C. INTERFACE
ISOLATOR CABLE
P/N: 723230
CONNECT TO MATE
ONLY IN SAFE AREA
SAFETY CRITICAL
COMPONENT
E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
723203
D
NONE


CORRDATA EQUIPMENT
CORROSOMETER(ER)/CORRATER(LPR)
RDC-COT/RDC-CAT
BATTERY POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
SAFE AREA
RDC POWER INPUT ENTITY PARAMETERS
Ui = 11.1 V (BATTERY POWER)
Ii = 0.34 A
Pi = 0.92 W
Ci = 0.517 uF
Li = 0
MODEL RDC-COT-(CONNECTOR TYPE)-3-3(-L)
P/N: 702006
(FOR CORROSOMETER PROBES)
REMOTE DATA COLLECTOR (RDC)
BATTERY OPERATED
FIXED MOUNTING
BATTERY PACK
P/N: 748270
NEMA 4X
BOX
CABLE
GLAND
SHIELDED CABLE
MAXIMUM CABLE LENGTH IS 100 FT.
TYPICAL ELECTRICAL RESISTANCE
PROBE (CORROSOMETER)
SEALED
MEASURING
ELEMENT
(EXPOSED)
THE PROBE IS A SIMPLE RESISTANCE
ELEMENT ONLY AND CONTAINS NO
INTERNAL CIRCUITRY (Ci=0, Li=0).
THE NOMINAL RESISTANCE RANGE
OF PROBE IS .001 OHMS TO
10 OHMS.
RDC
ER TEST PROBE
P/N: 702044
100 OHM PLATINUM RTD
TYPICAL ELECTRICAL RESISTANCE
PROBE (CORROSOMETER)
WITH TEMPERATURE SENSOR
(100 OHM PLATINUM RTD)
MODEL RDC-CAT-(CONNECTOR TYPE)-3-3(-L)
P/N: 710804
(FOR CORRATER PROBES)
TYPICAL LINEAR POLARIZATION RESISTANCE
PROBE (CORRATER)
(EXPOSED)
ELECTRODES
MEASURING
RDC
LPR TEST PROBE
P/N: 710381
MEASURING
ELECTRODES
(EXPOSED)
TYPICAL LINEAR POLARIZATION RESISTANCE
PROBE (CORRATER)
WITH TEMPERATURE SENSOR
(100 OHM PLATINUM RTD)
CONNECT TO COMPUTER
ONLY IN SAFE AREA
COMPUTER RS232
INTERCONNECT
ENTITY
PARAMETERS
Uo = 11.1 V
Um = 250 V
P.C. INTERFACE
ISOLATOR CABLE
P/N: 723240
CONNECT TO CHECKMATE
ONLY IN SAFE AREA
CHECKMATE/CHECKMATE PLUS
MODEL CHECKMATE P/N: 723601
MODEL CHECKMATE-PLUS P/N: 723601-1
RDC/PC ADAPTER CABLE
P/N: 723623
CHECKMATE TEST PROBE
P/N: 723235
NOTE:
TABLE INCLUDES INTEGRAL PROBE CABLE
CHECKMATE BATTERIES:
INTRINSICALLY SAFE WHEN USED WITH SIX 1.5V, SIZE AA ALKALINE BATTERIES.
DURACEL MN1500, ENERGIZER E91 OR EN91, OR RAY-O-VAC 815.
BATTERIES MUST BE CHANGED ONLY IN NON-HAZARDOUS AREA.
DO NOT MIX BATTERIES OF DIFFERENT AGE OR PART NUMBER.
SAEFTY CRITICAL
COMPONENT
NO CHANGES OR DEVIATIONS WITHOUT
THE PERMISSION OF THE DIRECTOR OF
Q.A. AND THE CERTIFYING AUTHORITIES
FOR THE FOLLOWING CERTIFICATIONS:
E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
REVISIONS
REV ECN DESCRIPTION BY APPD DATE
H 12693 SEE SHEET 1 OF 8 R.E.P. R.M.S. 01.APR.05
SIZE D
DWG. NO. 723203
SCALE NONE
DO NOT SCALE DRAWING
SHEET 5 OF 8

CORRDATA EQUIPMENT
CORROSOMETER(ER)/4 CHANNEL
RDC4-COT
BATTERY POWERED

REVISIONS					
REV	ECN	DESCRIPTION	BY	APPD	DATE
H	12693	SEE SHEET 1 OF 8	R.E.P.	R.M.S.	01-APR-05

HAZARDOUS AREA

CLASS 1 ZONE 1

AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power

RDC POWER INPUT ENTITY PARAMETERS
U_i = 11.1 V (BATTERY POWER)
I_i = 0.34 A
P_i = 0.92 W
C_i = 0.517 uF
L_i = 0

TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER)

SEALED

MEASURING ELEMENT (EXPOSED)

THE PROBE IS A SIMPLE RESISTANCE ELEMENT ONLY AND CONTAINS NO INTERNAL CIRCUITRY. (Ci=0, Li=0). THE NOMINAL RESISTANCE RANGE OF PROBE IS .001 OHMS TO 10 OHMS.

RDC ER TEST PROBE P/N: 702044

SEALED

MEASURING ELEMENT (EXPOSED)

100 OHM PLATINUM RTD

TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)

MODEL RDC4-COT-3-3
P/N: 702007
(FOR CORROSOMETER PROBES)

REMOTE DATA COLLECTOR (RDC)
BATTERY OPERATED
FIXED MOUNTING

BATTERY PACK P/N: 748270

NEMA 4X BOX

CABLE GLAND (1-4 PLACES)

SHIELDED CABLE (1-4 CABLES)

MAXIMUM CABLE LENGTH IS 100 FT.

RS232 DATA PORT	
Uo	11.1V
Io	45.0mA
Po	124.7mW
Co	1.9uF
Lo	70mH
Ui	11.1V
Ii	72.6mA
Pi	201.5mW
Ci	0
Li	0

CONNECTION	PROBE PORT OUTPUTS				
	Uo	Io	Po	Co	Lo
PROBE A,B,C,D, OR E TO PROBE F	+/-5.88 V	0.532 A	0.871 W	43 uF	322.5 uH
PROBE A&B&C&D&E TO PROBE F	+/-5.88 V	0.532 A	0.871 W	43 uF	322.5 uH

SAFE AREA

CONNECT TO COMPUTER ONLY IN SAFE AREA

COMPUTER RS232 INTERCONNECT

ENTITY PARAMETERS
U_o = 11.1 V
U_m = 250 V

P.C. INTERFACE ISOLATOR CABLE P/N: 723240

CONNECT TO CHECKMATE ONLY IN SAFE AREA

CHECKMATE/CHECKMATE PLUS
MODEL CHECKMATE P/N: 723601
MODEL CHECKMATE-PLUS P/N: 723601-1

RDC/PC ADAPTER CABLE P/N: 723623

RS232 DATA PORT PINS 2 & 3 TO PIN 5	
Uo	11.1V
Io	22.4mA
Po	63mW
Co	1.9uF
Lo	70mH
Ui	11.1V
Ii	45.9mA
Pi	127.4mW
Ci	0
Li	0

PROBE PORT					
CONNECTION	OUTPUTS				
	Uo	Io	Po	Co	Lo
PROBE A TO PROBE F	+/-5.88 V	0.594 A	0.873 W	43 uF	100 uH
PROBE B,C,D, OR E TO PROBE F	+/-5.88 V	79.4 mA	116.7 mW	43 uF	5.6 mH
PROBE A & B & C & D & E TO PROBE F	+/-5.88 V	1.07 A	1.573 W	43 uF	31 uH

PROBE PORT					
CONNECTION	INPUTS				
	Ui	Ii	Pi	Ci	Li
PROBE A TO PROBE F	+/-5.88 V	79.4 mA	116.796 mW	0.32 pF	uH
PROBE B,C,D, OR E TO PROBE F	+/-5.88 V	4.9 mA	7.3 mW	96 pF	0.32 uH
PROBE A & B & C & D & E TO PROBE F	+/-5.88 V	0.667 A	0.98 W	96 pF	0.32 uH

NOTE:
TABLE INCLUDES INTEGRAL PROBE CABLE

CHECKMATE BATTERIES:
INTRINSICALLY SAFE WHEN USED WITH SIX 1.5V, SIZE AA ALKALINE BATTERIES, DURACEL MN1500, ENERGIZER E91 OR EN91, OR RAY-O-VAC 815. BATTERIES MUST BE CHANGED ONLY IN NON-HAZARDOUS AREA. DO NOT MIX BATTERIES OF DIFFERENT AGE OR PART NUMBER.

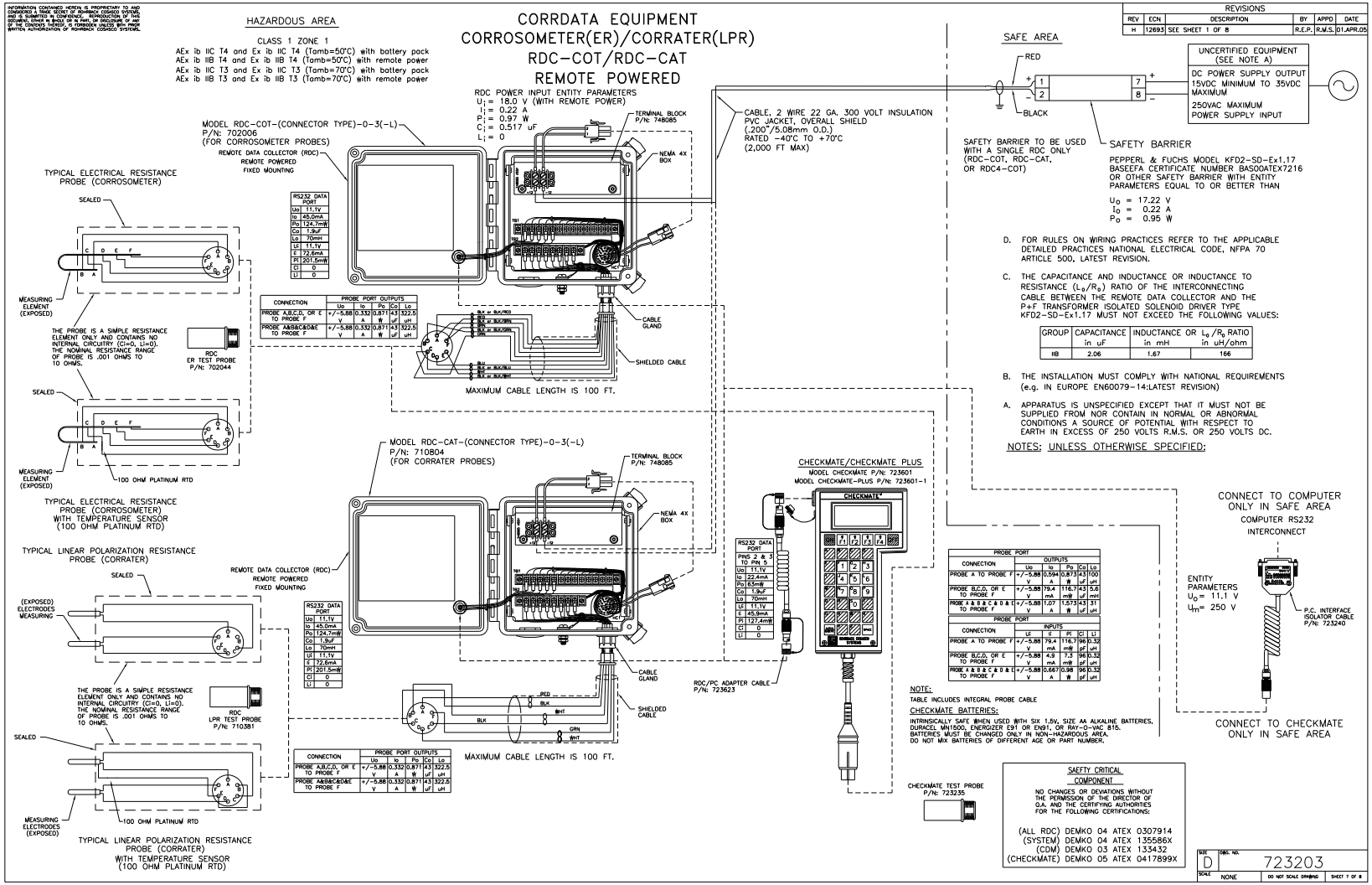
CHECKMATE TEST PROBE P/N: 723235

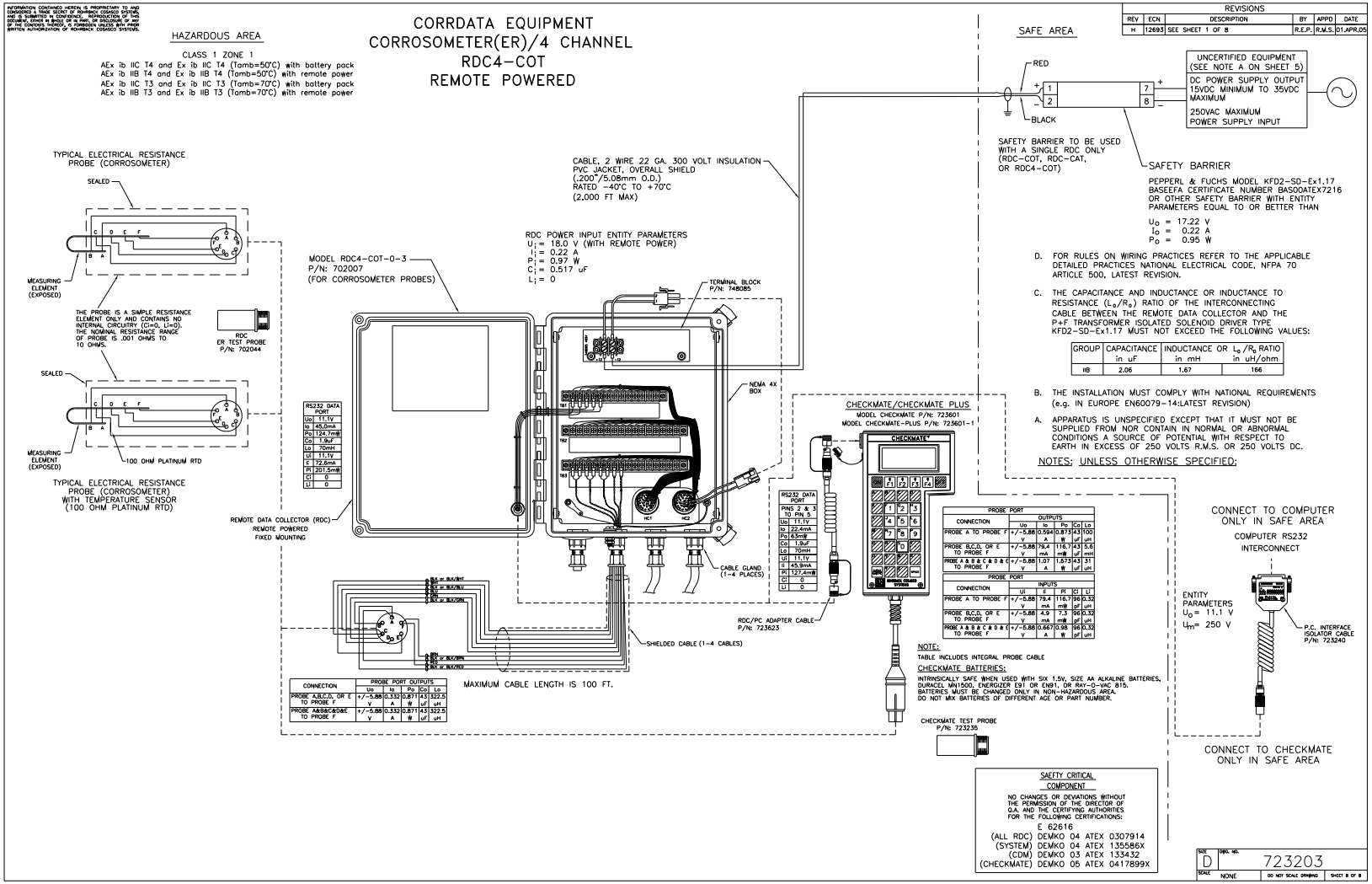
SAFETY CRITICAL COMPONENT

NO CHANGES OR DEVIATIONS WITHOUT THE PERMISSION OF THE DIRECTOR OF Q.A. AND THE CERTIFYING AUTHORITIES FOR THE FOLLOWING CERTIFICATIONS:

E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X

SIZE	DWG. NO.	
D	723203	
SCALE NONE	DO NOT SCALE DRAWING	SHEET 6 OF 8


CORRDATA EQUIPMENT
CORROSOMETER(ER)/CORRATER(LPR)
RDC-COT/RDC-CAT
REMOTE POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
RDC POWER INPUT ENTITY PARAMETERS
Ui = 18.0 V (WITH REMOTE POWER)
Ii = 0.22 A
Pi = 0.97 W
Ci = 0.517 uF
Li = 0
MODEL RDC-COT-(CONNECTOR TYPE)-0-3(-L)
P/N: 702006
(FOR CORROSOMETER PROBES)
REMOTE DATA COLLECTOR (RDC)
REMOTE POWERED
FIXED MOUNTING
TERMINAL BLOCK P/N: 748085
NEMA 4X BOX
CABLE GLAND
SHIELDED CABLE
MAXIMUM CABLE LENGTH IS 100 FT.
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER)
SEALED
MEASURING ELEMENT (EXPOSED)
THE PROBE IS A SIMPLE RESISTANCE ELEMENT ONLY AND CONTAINS NO INTERNAL CIRCUITRY (Ci=0, Li=0). THE NOMINAL RESISTANCE RANGE OF PROBE IS .001 OHMS TO 10 OHMS.
RDC ER TEST PROBE P/N: 702044
100 OHM PLATINUM RTD
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
MODEL RDC-CAT-(CONNECTOR TYPE)-0-3(-L)
P/N: 710804
(FOR CORRATER PROBES)
TYPICAL LINEAR POLARIZATION RESISTANCE PROBE (CORRATER)
(EXPOSED) ELECTRODES MEASURING
RDC LPR TEST PROBE P/N: 710381
MEASURING ELECTRODES (EXPOSED)
TYPICAL LINEAR POLARIZATION RESISTANCE PROBE (CORRATER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
CABLE, 2 WIRE 22 GA. 300 VOLT INSULATION PVC JACKET, OVERALL SHIELD (.200"/5.08mm O.D.) RATED -40°C TO +70°C (2,000 FT MAX)
SAFE AREA
RED
BLACK
UNCERTIFIED EQUIPMENT (SEE NOTE A)
DC POWER SUPPLY OUTPUT 15VDC MINIMUM TO 35VDC MAXIMUM
250VAC MAXIMUM POWER SUPPLY INPUT
SAFETY BARRIER TO BE USED WITH A SINGLE RDC ONLY (RDC-COT, RDC-CAT, OR RDC4-COT)
SAFETY BARRIER
PEPPERL & FUCHS MODEL KFD2-SD-Ex1.17
BASEEFA CERTIFICATE NUMBER BAS00ATEX7216
OR OTHER SAFETY BARRIER WITH ENTITY PARAMETERS EQUAL TO OR BETTER THAN
Uo = 17.22 V
Io = 0.22 A
Po = 0.95 W
D. FOR RULES ON WIRING PRACTICES REFER TO THE APPLICABLE DETAILED PRACTICES NATIONAL ELECTRICAL CODE, NFPA 70 ARTICLE 500, LATEST REVISION.
C. THE CAPACITANCE AND INDUCTANCE OR INDUCTANCE TO RESISTANCE (Lo/Ro) RATIO OF THE INTERCONNECTING CABLE BETWEEN THE REMOTE DATA COLLECTOR AND THE P+F TRANSFORMER ISOLATED SOLENOID DRIVER TYPE KFD2-SD-Ex1.17 MUST NOT EXCEED THE FOLLOWING VALUES:
B. THE INSTALLATION MUST COMPLY WITH NATIONAL REQUIREMENTS (e.g. IN EUROPE EN60079-14:LATEST REVISION)
A. APPARATUS IS UNSPECIFIED EXCEPT THAT IT MUST NOT BE SUPPLIED FROM NOR CONTAIN IN NORMAL OR ABNORMAL CONDITIONS A SOURCE OF POTENTIAL WITH RESPECT TO EARTH IN EXCESS OF 250 VOLTS R.M.S. OR 250 VOLTS DC.
NOTES; UNLESS OTHERWISE SPECIFIED:
CHECKMATE/CHECKMATE PLUS
MODEL CHECKMATE P/N: 723601
MODEL CHECKMATE-PLUS P/N: 723601-1
RDC/PC ADAPTER CABLE P/N: 723623
CHECKMATE TEST PROBE P/N: 723235
CONNECT TO COMPUTER ONLY IN SAFE AREA
COMPUTER RS232 INTERCONNECT
ENTITY PARAMETERS Uo= 11.1 V Um= 250 V
P.C. INTERFACE ISOLATOR CABLE P/N: 723240
CONNECT TO CHECKMATE ONLY IN SAFE AREA
NOTE:
TABLE INCLUDES INTEGRAL PROBE CABLE
CHECKMATE BATTERIES:
INTRINSICALLY SAFE WHEN USED WITH SIX 1.5V, SIZE AA ALKALINE BATTERIES, DURACEL MN1500, ENERGIZER E91 OR EN91, OR RAY-O-VAC 815. BATTERIES MUST BE CHANGED ONLY IN NON-HAZARDOUS AREA. DO NOT MIX BATTERIES OF DIFFERENT AGE OR PART NUMBER.
SAEFTY CRITICAL COMPONENT
NO CHANGES OR DEVIATIONS WITHOUT THE PERMISSION OF THE DIRECTOR OF Q.A. AND THE CERTIFYING AUTHORITIES FOR THE FOLLOWING CERTIFICATIONS:
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(COM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
REVISIONS
REV | ECN | DESCRIPTION | BY | APPD | DATE
H | 12693 | SEE SHEET 1 OF 8 | R.E.P. | R.M.S. | 01.APR.05
SIZE D
DWG. NO. 723203
SCALE NONE
DO NOT SCALE DRAWING
SHEET 7 OF 8


CORRDATA EQUIPMENT
CORROSOMETER(ER)/4 CHANNEL
RDC4-COT
REMOTE POWERED
HAZARDOUS AREA
CLASS 1 ZONE 1
AEx ib IIC T4 and Ex ib IIC T4 (Tamb=50°C) with battery pack
AEx ib IIB T4 and Ex ib IIB T4 (Tamb=50°C) with remote power
AEx ib IIC T3 and Ex ib IIC T3 (Tamb=70°C) with battery pack
AEx ib IIB T3 and Ex ib IIB T3 (Tamb=70°C) with remote power
SAFE AREA
REVISIONS
REV ECN DESCRIPTION BY APPD DATE
H 12693 SEE SHEET 1 OF 8 R.E.P. R.M.S. 01.APR.05
UNCERTIFIED EQUIPMENT (SEE NOTE A ON SHEET 5)
DC POWER SUPPLY OUTPUT 15VDC MINIMUM TO 35VDC MAXIMUM
250VAC MAXIMUM POWER SUPPLY INPUT
RED
BLACK
SAFETY BARRIER TO BE USED WITH A SINGLE RDC ONLY (RDC-COT, RDC-CAT, OR RDC4-COT)
SAFETY BARRIER
PEPPERL & FUCHS MODEL KFD2-SD-Ex1.17
BASEEFA CERTIFICATE NUMBER BAS00ATEX7216
OR OTHER SAFETY BARRIER WITH ENTITY PARAMETERS EQUAL TO OR BETTER THAN
Uo = 17.22 V
Io = 0.22 A
Po = 0.95 W
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER)
SEALED
MEASURING ELEMENT (EXPOSED)
THE PROBE IS A SIMPLE RESISTANCE ELEMENT ONLY AND CONTAINS NO INTERNAL CIRCUITRY (Ci=0, Li=0). THE NOMINAL RESISTANCE RANGE OF PROBE IS .001 OHMS TO TO OHMS.
RDC ER TEST PROBE P/N: 702044
100 OHM PLATINUM RTD
TYPICAL ELECTRICAL RESISTANCE PROBE (CORROSOMETER) WITH TEMPERATURE SENSOR (100 OHM PLATINUM RTD)
CABLE, 2 WIRE 22 GA. 300 VOLT INSULATION PVC JACKET, OVERALL SHIELD (.200"/5.08mm O.D.) RATED -40°C TO +70°C (2,000 FT MAX)
RDC POWER INPUT ENTITY PARAMETERS
Ui = 18.0 V (WITH REMOTE POWER)
Ii = 0.22 A
Pi = 0.97 W
Ci = 0.517 uF
Li = 0
MODEL RDC4-COT-0-3
P/N: 702007
(FOR CORROSOMETER PROBES)
TERMINAL BLOCK P/N: 748085
NEMA 4X BOX
RS232 DATA PORT
Uo 11.1V
Io 45.0mA
Po 124.7mW
Co 1.9uF
Lo 70mH
Ui 11.1V
Ii 72.6mA
Pi 201.5mW
Ci 0
Li 0
REMOTE DATA COLLECTOR (RDC)
REMOTE POWERED
FIXED MOUNTING
CABLE GLAND (1-4 PLACES)
RDC/PC ADAPTER CABLE P/N: 723623
SHIELDED CABLE (1-4 CABLES)
MAXIMUM CABLE LENGTH IS 100 FT.
CHECKMATE/CHECKMATE PLUS
MODEL CHECKMATE P/N: 723601
MODEL CHECKMATE-PLUS P/N: 723601-1
CHECKMATE TEST PROBE P/N: 723235
RS232 DATA PORT
PINS 2 & 3 TO PIN 5
Uo 11.1V
Io 22.4mA
Po 63mW
Co 1.9uF
Lo 70mH
Ui 11.1V
Ii 45.9mA
Pi 127.4mW
Ci 0
Li 0
PROBE PORT
CONNECTION | OUTPUTS Uo Io Po Co Lo
PROBE A TO PROBE F | +/-5.88 V | 0.594 A | 0.873 W | 43 uF | 100 uH
PROBE B,C,D, OR E TO PROBE F | +/-5.88 V | 79.4 mA | 116.7 mW | 43 uF | 5.6 mH
PROBE A & B & C & D & E TO PROBE F | +/-5.88 V | 1.07 A | 1.573 W | 43 uF | 31 uH
PROBE PORT
CONNECTION | INPUTS Ui Ii Pi Ci Li
PROBE A TO PROBE F | +/-5.88 V | 79.4 mA | 116.7 mW | 96 pF | 0.32 uH
PROBE B,C,D, OR E TO PROBE F | +/-5.88 V | 4.9 mA | 7.3 mW | 96 pF | 0.32 uH
PROBE A & B & C & D & E TO PROBE F | +/-5.88 V | 0.667 A | 0.98 W | 96 pF | 0.32 uH
NOTE:
TABLE INCLUDES INTEGRAL PROBE CABLE
CHECKMATE BATTERIES:
INTRINSICALLY SAFE WHEN USED WITH SIX 1.5V, SIZE AA ALKALINE BATTERIES, DURACEL MN1500, ENERGIZER E91 OR EN91, OR RAY-O-VAC 815. BATTERIES MUST BE CHANGED ONLY IN NON-HAZARDOUS AREA. DO NOT MIX BATTERIES OF DIFFERENT AGE OR PART NUMBER.
PROBE PORT OUTPUTS
CONNECTION | Uo Io Po Co Lo
PROBE A,B,C,D, OR E TO PROBE F | +/-5.88 V | 0.332 A | 0.871 W | 43 uF | 322.5 uH
PROBE A&B&C&D&E TO PROBE F | +/-5.88 V | 0.332 A | 0.871 W | 43 uF | 322.5 uH
SAFETY BARRIER TO BE USED WITH A SINGLE RDC ONLY (RDC-COT, RDC-CAT, OR RDC4-COT)
D. FOR RULES ON WIRING PRACTICES REFER TO THE APPLICABLE DETAILED PRACTICES NATIONAL ELECTRICAL CODE, NFPA 70 ARTICLE 500, LATEST REVISION.
C. THE CAPACITANCE AND INDUCTANCE OR INDUCTANCE TO RESISTANCE (Lo/Ro) RATIO OF THE INTERCONNECTING CABLE BETWEEN THE REMOTE DATA COLLECTOR AND THE P+F TRANSFORMER ISOLATED SOLENOID DRIVER TYPE KFD2-SD-Ex1.17 MUST NOT EXCEED THE FOLLOWING VALUES:
GROUP | CAPACITANCE in uF | INDUCTANCE in mH | Lo/Ro RATIO in uH/ohm
IIB | 2.06 | 1.67 | 166
B. THE INSTALLATION MUST COMPLY WITH NATIONAL REQUIREMENTS (e.g. IN EUROPE EN60079-14:LATEST REVISION)
A. APPARATUS IS UNSPECIFIED EXCEPT THAT IT MUST NOT BE SUPPLIED FROM NOR CONTAIN IN NORMAL OR ABNORMAL CONDITIONS A SOURCE OF POTENTIAL WITH RESPECT TO EARTH IN EXCESS OF 250 VOLTS R.M.S. OR 250 VOLTS DC.
NOTES: UNLESS OTHERWISE SPECIFIED:
CONNECT TO COMPUTER ONLY IN SAFE AREA
COMPUTER RS232 INTERCONNECT
ENTITY PARAMETERS Uo = 11.1 V Um = 250 V
I.S. INTERFACE ISOLATOR CABLE P/N: 723240
CONNECT TO CHECKMATE ONLY IN SAFE AREA
SAFETY CRITICAL COMPONENT
NO CHANGES OR DEVIATIONS WITHOUT THE PERMISSION OF THE DIRECTOR OF Q.A. AND THE CERTIFYING AUTHORITIES FOR THE FOLLOWING CERTIFICATIONS:
E 62616
(ALL RDC) DEMKO 04 ATEX 0307914
(SYSTEM) DEMKO 04 ATEX 135586X
(CDM) DEMKO 03 ATEX 133432
(CHECKMATE) DEMKO 05 ATEX 0417899X
SIZE D DWG. NO. 723203
SCALE NONE DO NOT SCALE DRAWING SHEET 8 OF 8