CD52 Bandit

Non-Intrusive Pig Passage Signaler
(ATEX-IECEx and UKCA Certification)

USER GUIDE

CDI

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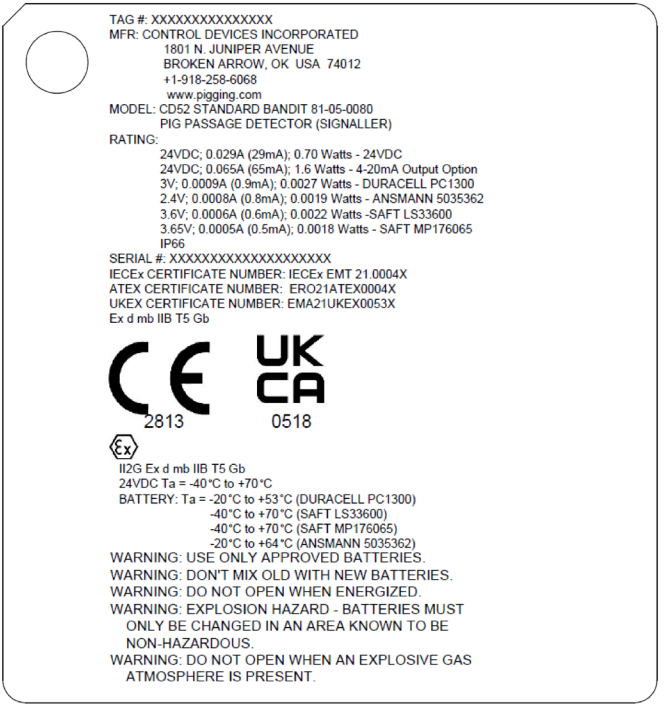
Information in this document is subject to change without notice and applies only to the version of software, hardware, or firmware described on the title page.

The software, hardware, and firmware described in this document are designed, manufactured and written by CDI. The software and firmware

The CD52 product is covered under United States Patent No. 6,489,771 B1

The TRAXALL family of transmitters is covered under United States Patent No. 9172406.

Document Number 89-03-0066-00
Revision 17 AUG 2021



TAG FOR CD52 BANDIT 81-05-0080 (STANDARD)

NOTE

Pages 11-18 are controlled as copies of document 89-17-0025-00 Rev A released under ECR 01111801.

WARNING

Any operation involving work on pipelines containing gases or liquids under pressure is potentially hazardous. It is necessary, therefore, to follow correct procedures in the use of this equipment to maintain a safe working environment.

No person should use this equipment unless fully aware of potential hazards of working with pressurized pipelines and trained in the procedures stated in this manual.

The purchaser of this equipment is responsible for the training and competence of operators and the manner in which it is used.

Contact CDI immediately should any difficulty arise in the use of this equipment.

WARNING

Field repair of flamepath-related components of these units is not authorized

WARNING

Always use caution when opening any CDI transmitter that has been in a pressurized environment.

It is possible for pressurized liquid or gas to leak into a transmitter and remain there even after the transmitter has been removed from the pipeline.

Always point the transmitter away from yourself or others when opening a cover or end cap.

CONTENTS

INTRODUCTION

The CD52 Bandit is a computerized electronic device for non-intrusive detection of pipeline pigs equipped with either a permanent magnet or 22 Hz electromagnetic transmitter.

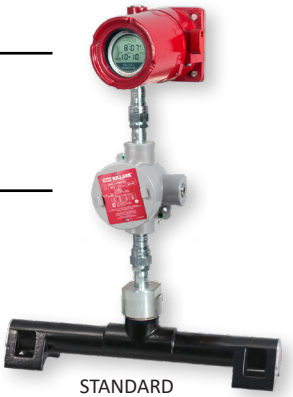
The Bandit accomplishes this by a proprietary and patented magnetic field antenna array located in its base and attached to (or near) the pipeline. This antenna array signals an on-board computer if and when a pig passage has occurred.

When a pig passage is detected, the time and date of passage are recorded into the on-board memory of the Bandit and displayed on an LCD screen.

In addition to the most recent pig passage time and date, the Bandit remembers the dates and times of the previous nine pig passages as well. An operator may quickly and easily retrieve the dates and times of the 10 most recent pig passages via the Bandit's user interface.

The CD52 Bandit is available in several configurations:

- Rigid stalk extension-mounted ("standard")
- Extended flex-cable*
- Extended pipe*
- Portable**
- Flex-cable, extended-pipe, and portable
- 4-20mA Current Loop Interface***



STANDARD

*Contact CDI for customer-specified length
**CD52 Portable models are battery powered only and have no junction
***Optional configuration for SCADA network communication (see next page)

EXTENDED PIPE

FLEX CABLE

FLEX CABLE w/STAINLESS BASE

PORTABLE

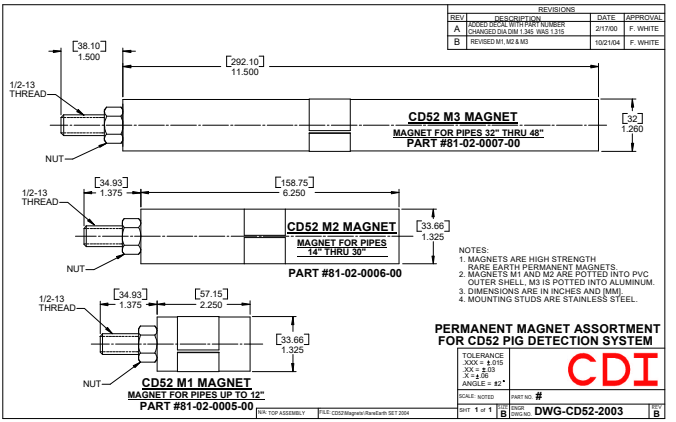
PORTABLE w/STAINLESS BASE

Detection Methods

The CD52 Bandit detects pig passages via two very distinct methods: permanent magnets and electromagnetic transmitters. The advantages to each method are discussed below.

Permanent Magnets

The Bandit will detect rare earth permanent magnets attached to a pipeline pig. Magnets for this purpose are sold by CDI and are available for pipelines from 2 in. to 60 in. [50.8 mm to 1524 mm].



NOTE: Where pipe wall thickness exceeds 25.4 mm [1 in.], a custom magnet design may be required. Please consult CDI for an evaluation of deployment options.

Advantages of Permanent Magnets

- Small
- Inexpensive
- Low maintenance
- Batteries are not required

Despite these benefits, because of the permanent magnet's static magnetic field, it may be difficult to locate a pig that is stalled, obstructed, or otherwise immobilized in a pipeline. In these situations, an active (electromagnetic) transmitter is the recommended option.

Electromagnetic Transmitters

The CD52 Bandit detects active electromagnetic transmitters. CDI offers the largest family of pipeline pig location and tracking transmitters in the industry.

Our Transmitters operate by emitting electromagnetic fields at a very low frequency (between 15 and 32 Hz). This makes CDI's pig tracking transmitters safe and reliable for use in any onshore or offshore environment and any pipeline product (water, oil, gas, ammonia, carbon dioxide, etc.).

Many models even have the ability to remain dormant until activated by preconfigured pipeline pressure.

CDI T-Series and Inline Inspection (ILI) 22 Hz Electromagnetic Transmitters

CDI X-Series Adjustable-frequency Electromagnetic Transmitters

Another advantage of CDI's active transmitters is the ease of locating an immobilized pig. A stuck pig can easily be detected by walking the pipeline from the last known location using a handheld active locater system. With that in mind, CDI is proud to offer our customers the *TRAXALL Multi-source Pig Location and Tracking System.*

TRAXALL receivers are ideal for tracking, locating, and pinpointing CDI X-Series electromagnetic transmitters, pigging industry-standard 22 Hz "Legacy" transmitters, and magnetic-flux leakage (MFL) pigs.

It is possible to use both a permanent magnet and a transmitter in the same pig. This will not prevent the Bandit from successfully recording a passage. Regardless of which type of transmission source you use, the Bandit will detect it.

Advantages of Electromagnetic Transmitters

- Safe and reliable in any environment
- Many models are programmable
- Quickly and easily located with a handheld device

SETUP & OPERATION

Power Options

Battery Operation

The Bandit in its standard configuration is powered by D-Cell alkaline or lithium batteries. These batteries are required by ATEX-IECEx standards to maintain system certification:

BATTERY	TYPE	QUAN.	MIN. LIFE SPAN
NON-RECHARGEABLE			
DURACELL® PROCELL (PC1300)	ALKALINE	2 CELLS	1 YEAR
SAFT LS 33600	Li-SOCl2	1 CELL	1 YEAR
RECHARGEABLE			
SAFT MP176065	Li-Ion	1 PACK	1 YEAR
ANSMANN 5035362	NiMH	2 CELLS	6 MONTHS

NOTE: Battery types Duracell PC1300, SAFT LS 33600, and ANSMANN 5035362 are standard cells and may be obtained from CDI or other distributors. The SAFT MP176065 cell is custom-configured for the CD52 and must be purchased from CDI.

24VDC Operation

WARNING:
Always remove batteries before placing the unit into storage and/or configuring for 24 VDC operation.
Failure to do so may result in damage and may void warranty.
Operating from 24VDC power with batteries installed invalidates ATEX approval.

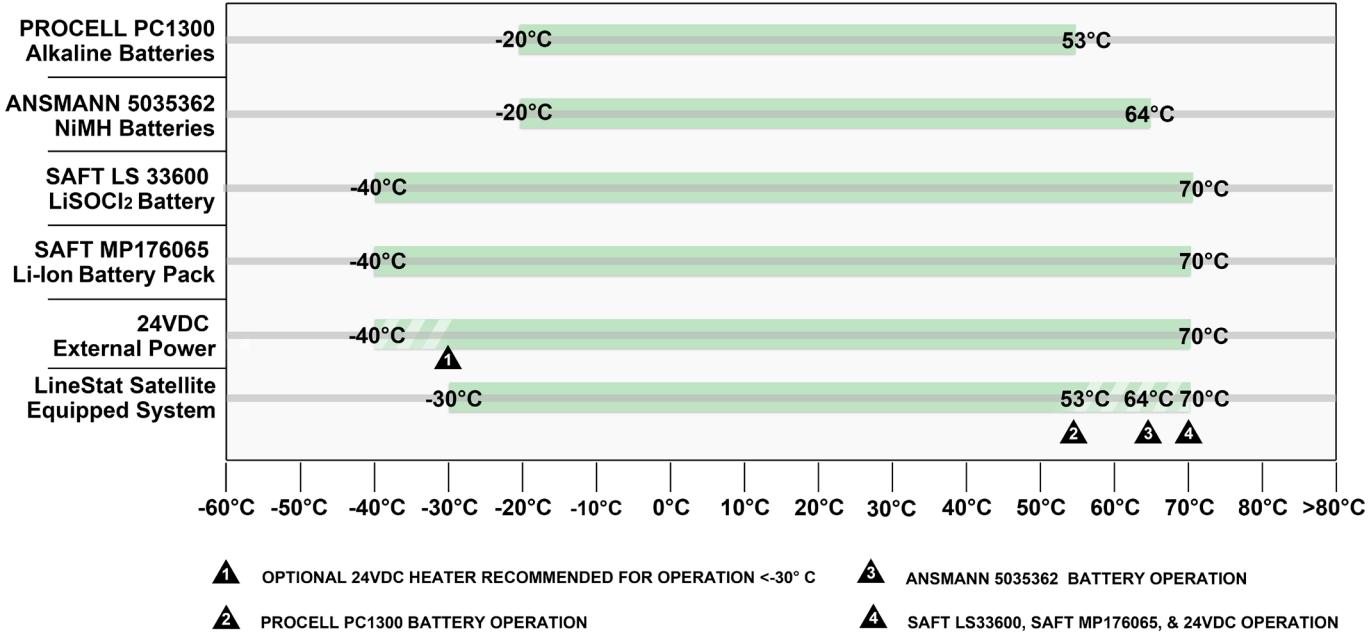
NOTE: In extreme cold (below -30°C) temperatures, 24 VDC will be necessary to power the recommended internal heating element option (see pg. 38).

NOTE: Bandits with optional 4-20mA Current Loop Interface configuration require 24 VDC power. They cannot be powered by batteries.

See the Power Configuration chart on the following page to determine which power option is required for your conditions.

Power Configuration

Green indicates ATEX–IECEx certified temperature range



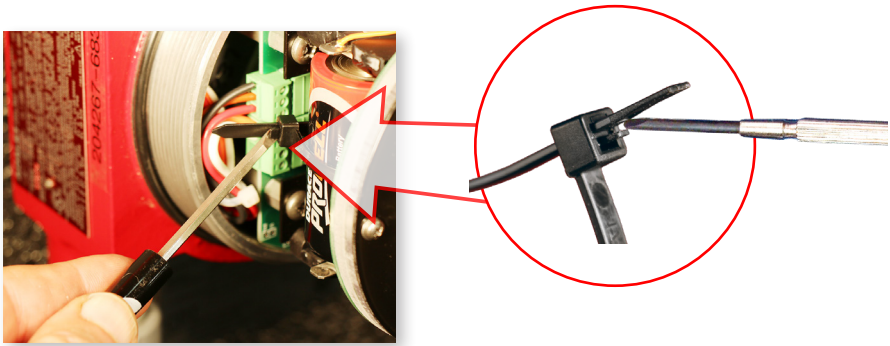
Battery Installation

NOTE: The battery cable ties are releasable. Do not cut them.
NOTE: Models configured for Alkaline and NiMH operation require two batteries. Lithium-thionyl chloride (Li-SOCl2) configured models require only one battery and are equipped with single-cell battery holders. Rechargeable Lithium-Ion (Li-Ion) models are equipped with a special battery pack holder.

WARNING: Units must be factory configured for Li-SOCl2 and Li-Ion operation. Do not install lithium batteries into a standard alkaline battery-configured unit.

To install D-cell batteries:

1. Unscrew and carefully remove front cover
2. If old batteries are in place, pull cable-tie release tab (use small screwdriver or fingernail) to disengage cable-tie.



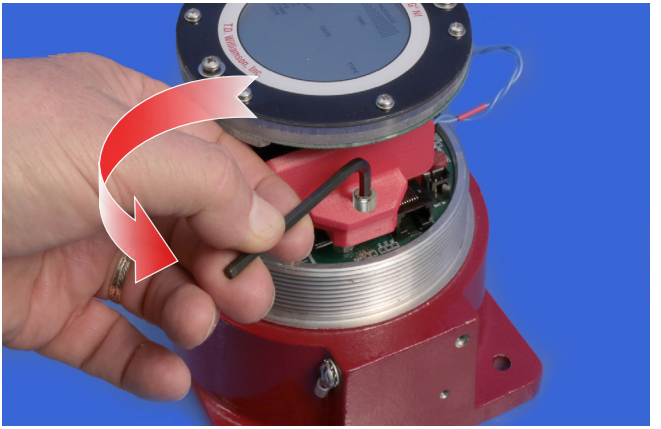
3. Duracell/Ansmann:
Insert new batteries,
both with positive (+) side up.

Saft LS 33600:
Insert new battery,
positive (+) side up.

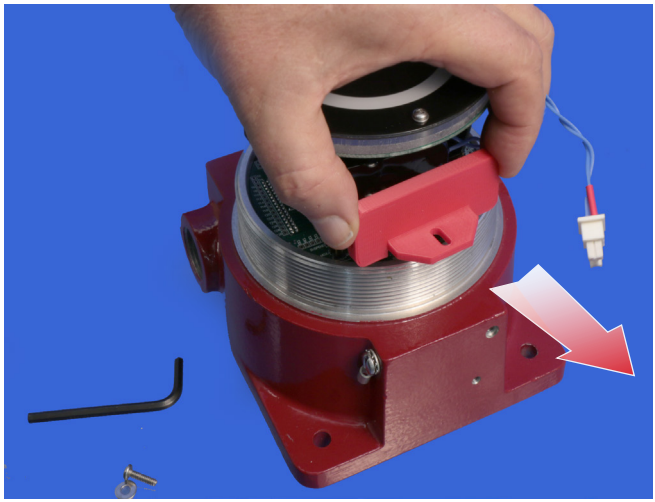
To remove and replace Saft MP176065 rechargeable battery pack:

1. Unscrew and carefully remove front cover.

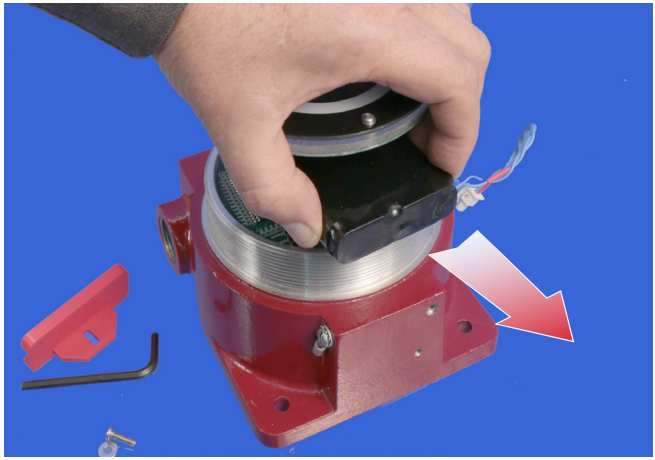
2. Remove retainer capscrew.



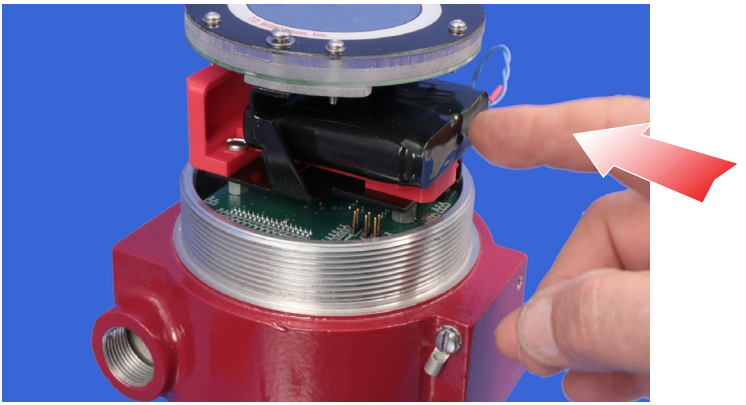
3. Remove retainer and disconnect battery pack power lead.



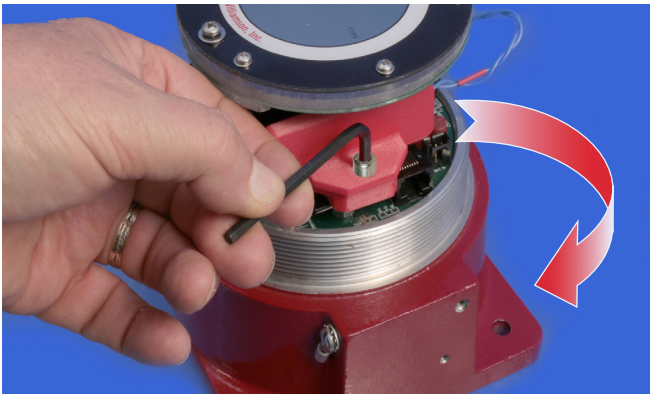
4. Remove battery pack.



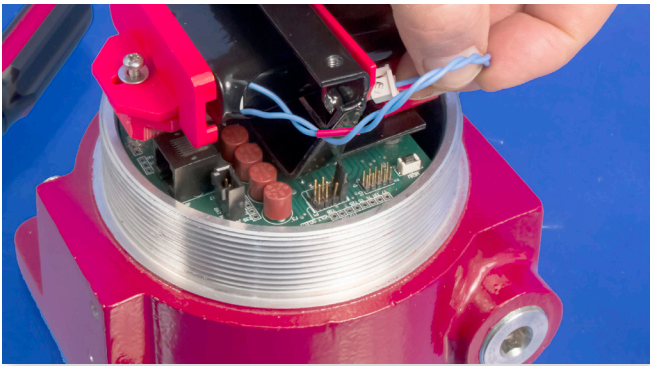
5. Recharge and replace battery pack.



6. Replace retainer and retainer capscrew.



7. Reconnect battery pack power lead.



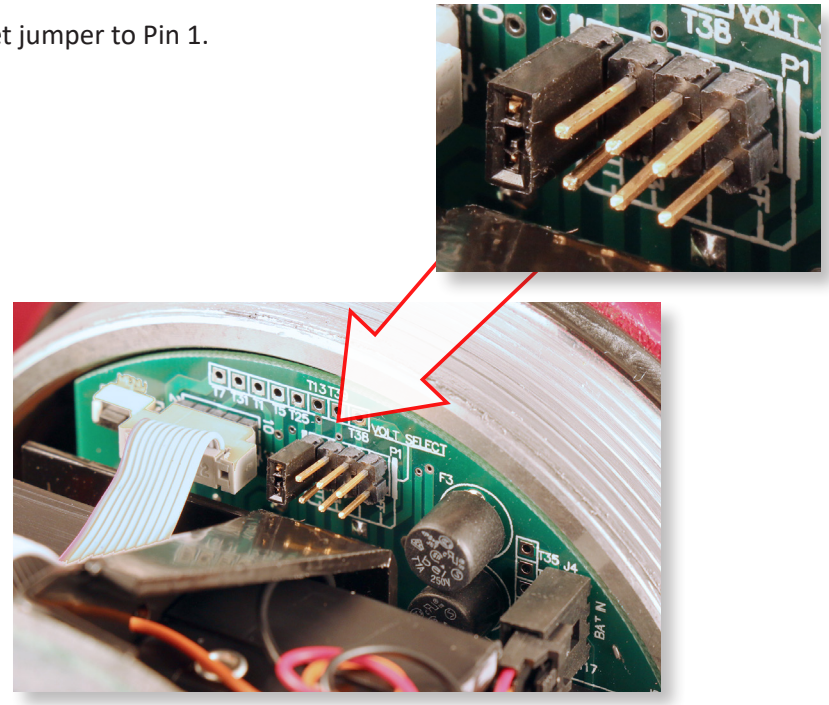
User Board Jumper Settings

The CD52 Bandit user board contains a jumper block which has been factory set for battery or 24 VDC power source, depending on specification at time of order. If power source is to be changed (for example, if your CD52 was ordered and shipped as a 24 VDC-powered unit and you desire instead to operate it with batteries), you must re-set the jumper as shown:*

Board Settings for Battery Power

NOTE: Set jumper before installing batteries.

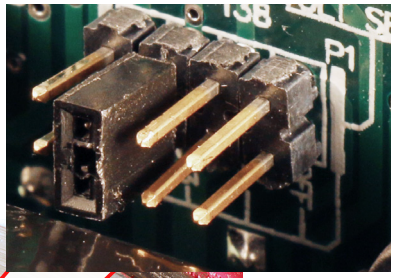
Set jumper to Pin 1.

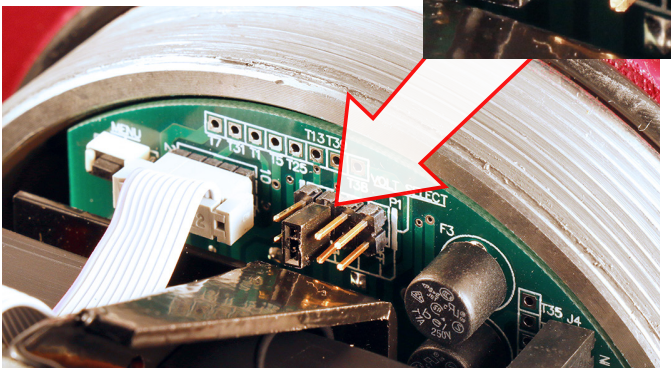


***4-20mA Current Loop Interface models are pre-set for 24 VDC power and cannot be reconfigured for battery operation.**

Board Settings for 24 VDC Power

Set jumper to Pin 2.





Replace front cover.

ATEX/IECEx WARNINGS

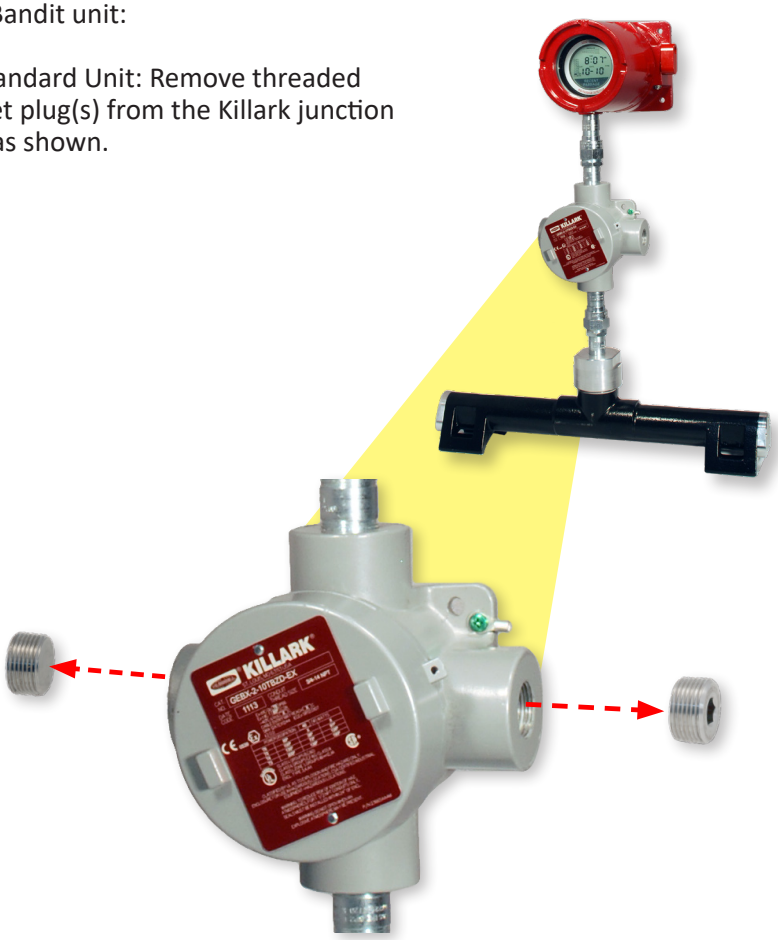
Tamb = –40°C ~ +70°C (24 VDC OPERATION)
Tamb = –20°C ~ +53°C (DURACELL 1300 ALKALINE BATTERY OPERATION)
Tamb = –20°C ~ +64°C (ANSMANN 5035362 NiMH BATTERY OPERATION)
Tamb = –40°C ~ +70°C (SAFT LS 33600 LiSOCl$_2$ BATTERY OPERATION)
Tamb = –40°C ~ +70°C (SAFT MP176065 Li-Ion BATTERY OPERATION)

WARNING: FOR SYSTEMS WITH TWO D-CELL BATTERY HOLDERS
USE ONLY DURACELL PC1300 OR ANSMANN 5035362 1.5V BATTERIES
FOR SYSTEMS WTH ONE D-CELL BATTERY HOLDER
USE ONLY SAFT LS33600 3.6V CELL
FOR SYSTEMS WITH NON-STANDARD BATTERY HOLDER
USE ONLY SAFT MP176065 3.6V BATTERY PACK
WARNING: DO NOT MIX OLD WITH NEW BATTERIES
WARNING: DO NOT OPEN WHEN ENERGIZED
WARNING: EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS
WARNING: DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT
WARNING: WHEN FITTED WITH RECHARGEABLE BATTERIES, REMOVE BATTERY CELLS TO NON-EXPLOSIVE AREA FOR RECHARGING

24 VDC & SCADA Connections

It is the customer's responsibility to provide their own wiring and conduit for 24 VDC power and SCADA.* CDI recommends routing 24 VDC and SCADA wiring through separate conduits. To route 24 VDC and SCADA into the Bandit unit:

1. Standard Unit: Remove threaded outlet plug(s) from the Killark junction box as shown.



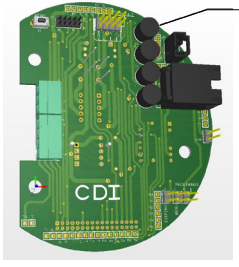
CAUTION: Induction from looped 24VDC power and relay cables could trigger a false passage when stowed in close proximity to the Bandit antenna. Position any cable loops as far from antenna as possible.

* SCADA (Supervisory Control and Data Acquisition) compatible standard relay contacts can be used for passage annunciation (lights, horns, etc.) where an unmanned passage must be monitored. SCADA-compatible 4-20mA option allows connection to plant automation equipment using current loop interfacing.

This drawing details the critical safety components used for each powering option available for ATEX Ex rated CD52s. Failure to install and maintain the exact componets specified voids the ATEX rating for use in explosive environmants.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE PER ECR 01111802	2/2/2018	NT

Power Configuration: External 24 VDC.
These components are always present also acting as secondary backup safety devices for battery powered configurations.



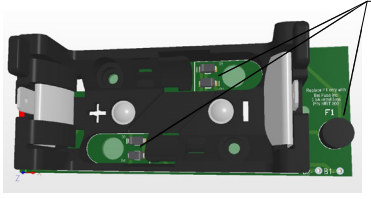
Ex safety components are fuses F1, F2, F3, F4

F1, F2, F4
Manufacturer: BEL Fuse Inc.
Mfg. P/N: MRT 500
Rating: 500 mA @ 250 V

F3
Manufacturer: BEL Fuse Inc.
Mfg. P/N: MRT 1
Rating: 1 A @ 250 V

80-01-0003-xx USER PCBA

Power Configuration: Two D-cells Duracell PC1300 Alkaline or Ansmann NiMH.
These components are only present and acting as primary safety devices for the dual D-cell battery powered configuration.



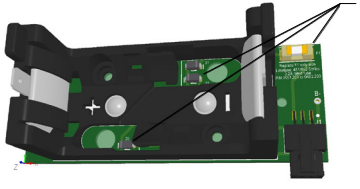
Ex safety components are fuse F1 diodes D1, D2, D3, D4

F1
Manufacturer: BEL Fuse Inc.
Mfg. P/N: MRT 500
Rating: 500 mA @ 250 V

D1, D2, D3, D4
Manufacturer: Microsemi Commercial Components Group
Mfg. LSM115JE3/TR13
Rating: SCHOTTKY 15V 1A

80-01-0100-00 CD52 BATTERY PROTECTION PCBA

Power Configuration: Single D-cell SAFT LS 33600 primary Lithium.
These components are only present and acting as primary safety devices for the single D-cell Li battery powered configuration.



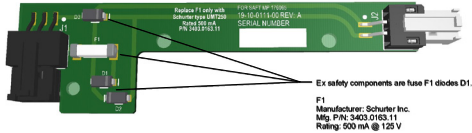
Ex safety components are fuse F1 diodes D1, D2, D3

F1
Manufacturer: Littelfuse Inc.
Mfg. P/N: 0451.200 or 0453.200
Rating: 0.2A @ 125 V

D1, D2, D3
Manufacturer: Microsemi Commercial Components Group
Mfg. LSM115JE3/TR13
Rating: SCHOTTKY 15V 1A

80-01-0119-00 CD52 BATTERY MODULE (3.5V Li) PCBA

Power Configuration: Single pack SAFT MP 176065 secondary Lithium.
These components are only present and acting as primary safety devices for the rechargeable Li battery powered configuration.



Ex safety components are fuse F1 diodes D1, D2, D3

F1
Manufacturer: Schurter Inc.
Mfg. P/N: 3403.0163.11
Rating: 500 mA @ 125 V

D1, D2, D3
Manufacturer: Microsemi Commercial Components Group
Mfg. LSM115JE3/TR13
Rating: SCHOTTKY 15V 1A

80-01-0141-00 CD52 BATTERY PROTECTION FOR SAFT MP 176065 PCBA

		NAME	DATE
	DRAWN	NT	1/18/2018
	CHECKED	NT	1/19/2018
	ENG APPR.	NT	1/19/2018
	MFG APPR.		
	Q.A.		
	PRINT DATE/ TIME		2/2/2018 10:27:04
	MODIFIED DATE		1/25/2018

CDI

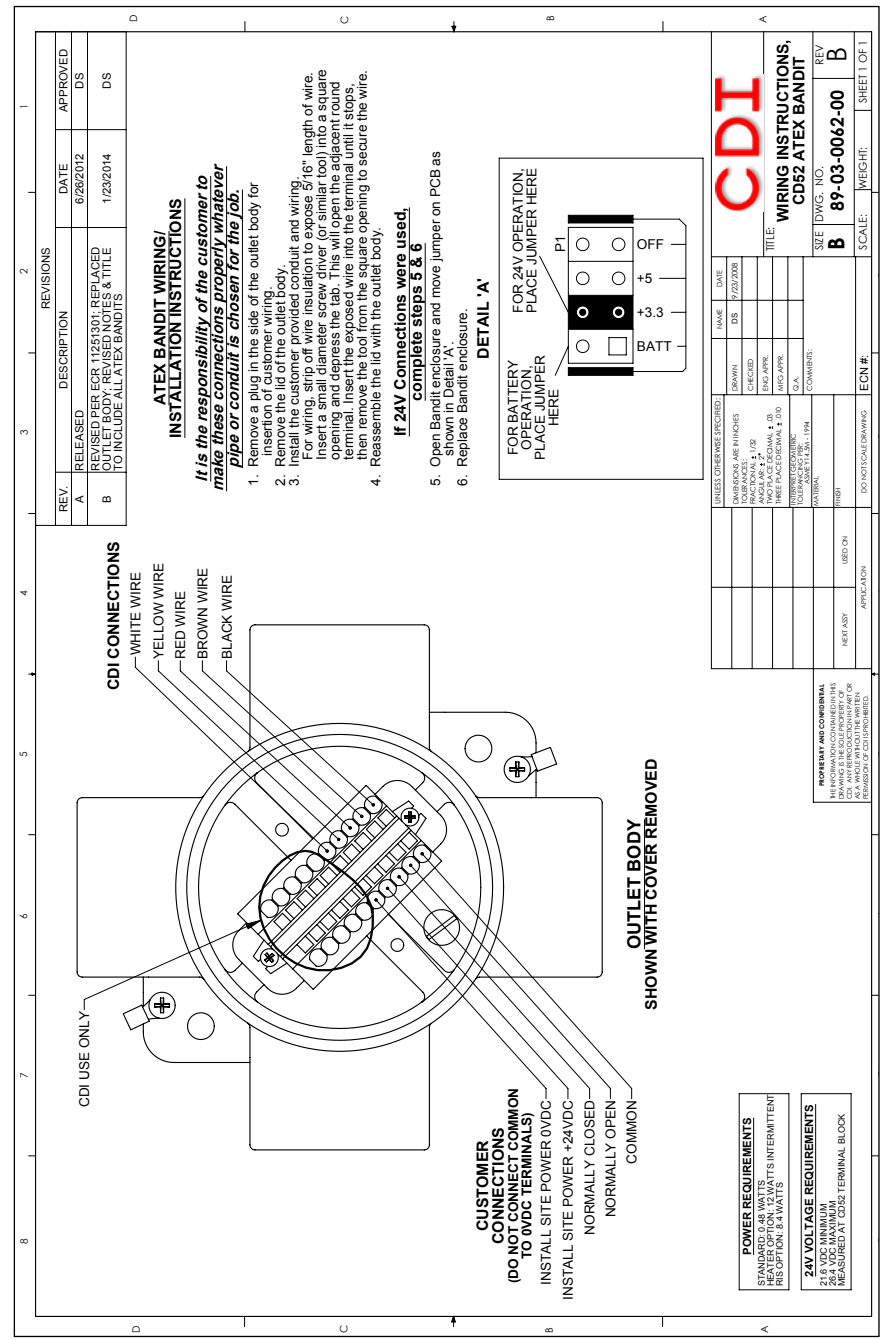
TITLE: CD52 ATEX SAFETY COMPONENTS DETAILS AND INSTALLATION

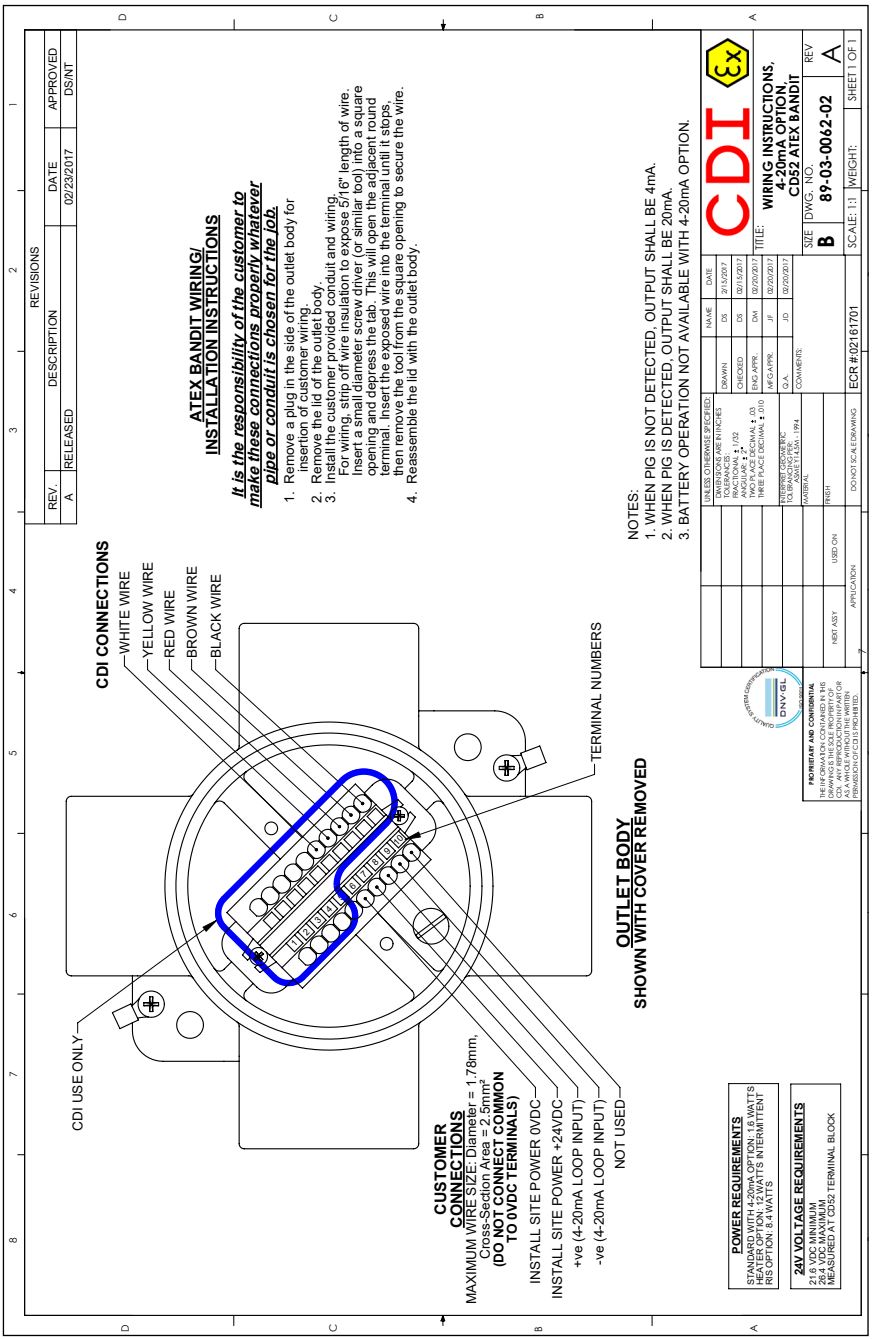
NEXT ASSY | USED ON
APPLICATION

COMMENTS:
PCB Number :
Assembly Number : N.A.

SIZE	DWG. NO.	REV
B	89-17-0026-00	A

SCALE: NONE | ECR #: 01111802 | SHEET 1 of 1


REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 6/26/2012 DS
B REVISED PER ECR 11251301; REPLACED OUTLET BODY; REVISED NOTES & TITLE TO INCLUDE ALL ATEX BANDITS 1/23/2014 DS
ATEX BANDIT WIRING/
INSTALLATION INSTRUCTIONS
It is the responsibility of the customer to make these connections properly whatever pipe or conduit is chosen for the job.
1. Remove a plug in the side of the outlet body for insertion of customer wiring.
2. Remove the lid of the outlet body.
3. Install the customer provided conduit and wiring.
For wiring, strip off wire insulation to expose 5/16" length of wire. Insert a small diameter screw driver (or similar tool) into a square opening and depress the tab. This will open the adjacent round terminal. Insert the exposed wire into the terminal until it stops, then remove the tool from the square opening to secure the wire.
4. Reassemble the lid with the outlet body.
If 24V Connections were used, complete steps 5 & 6
5. Open Bandit enclosure and move jumper on PCB as shown in Detail 'A'.
6. Replace Bandit enclosure.
DETAIL 'A'
FOR BATTERY OPERATION, PLACE JUMPER HERE
FOR 24V OPERATION, PLACE JUMPER HERE
P1
OFF
+5
+3.3
BATT
CDI CONNECTIONS
WHITE WIRE
YELLOW WIRE
RED WIRE
BROWN WIRE
BLACK WIRE
CDI USE ONLY
OUTLET BODY
SHOWN WITH COVER REMOVED
CUSTOMER CONNECTIONS
(DO NOT CONNECT COMMON TO 0VDC TERMINALS)
INSTALL SITE POWER 0VDC
INSTALL SITE POWER +24VDC
NORMALLY CLOSED
NORMALLY OPEN
COMMON
POWER REQUIREMENTS
STANDARD: 0.48 WATTS
HEATER OPTION: 12 WATTS INTERMITTENT
RIS OPTION: 8.4 WATTS
24V VOLTAGE REQUIREMENTS
21.6 VDC MINIMUM
24.4 VDC MAXIMUM
MEASURED AT CD52 TERMINAL BLOCK
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CDI. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CDI IS PROHIBITED.
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR: ± 1°
TWO PLACE DECIMAL ± .03
THREE PLACE DECIMAL ± .010
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5M - 1994
MATERIAL
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
NAME DATE
DRAWN DS 7/23/2008
CHECKED
ENG APPR.
MFG APPR.
Q.A.
COMMENTS:
ECN #:
CDI
TITLE: WIRING INSTRUCTIONS, CD52 ATEX BANDIT
SIZE B
DWG. NO. 89-03-0062-00
REV B
SCALE:
WEIGHT:
SHEET 1 OF 1


REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 02/23/2017 DS/NT
ATEX BANDIT WIRING/
INSTALLATION INSTRUCTIONS
It is the responsibility of the customer to make these connections properly whatever pipe or conduit is chosen for the job.
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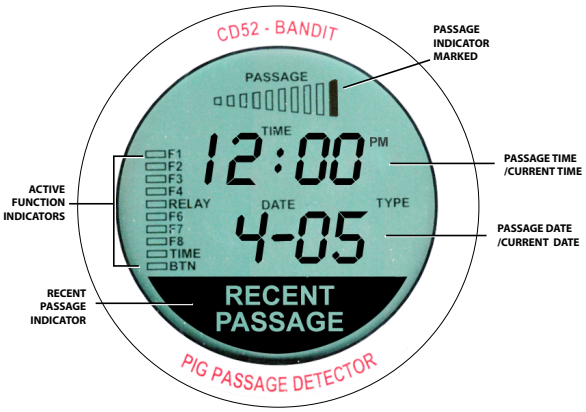
2. Remove the lid of the outlet body.
3. Install the customer provided conduit and wiring.
For wiring, strip off wire insulation to expose 5/16" length of wire. Insert a small diameter screw driver (or similar tool) into a square opening and depress the tab. This will open the adjacent round terminal. Insert the exposed wire into the terminal until it stops, then remove the tool from the square opening to secure the wire.
4. Reassemble the lid with the outlet body.
CDI CONNECTIONS
WHITE WIRE
YELLOW WIRE
RED WIRE
BROWN WIRE
BLACK WIRE
CDI USE ONLY
TERMINAL NUMBERS
OUTLET BODY
SHOWN WITH COVER REMOVED
NOTES:
1. WHEN PIG IS NOT DETECTED, OUTPUT SHALL BE 4mA.
2. WHEN PIG IS DETECTED, OUTPUT SHALL BE 20mA.
3. BATTERY OPERATION NOT AVAILABLE WITH 4-20mA OPTION.
CUSTOMER CONNECTIONS
MAXIMUM WIRE SIZE: Diameter = 1.78mm, Cross-Section Area = 2.5mm²
(DO NOT CONNECT COMMON TO 0VDC TERMINALS)
INSTALL SITE POWER 0VDC
INSTALL SITE POWER +24VDC
+ve (4-20mA LOOP INPUT)
-ve (4-20mA LOOP INPUT)
NOT USED
POWER REQUIREMENTS
STANDARD WITH 4-20mA OPTION: 1.6 WATTS
HEATER OPTION: 12 WATTS INTERMITTENT
RIS OPTION: 8.4 WATTS
24V VOLTAGE REQUIREMENTS
21.6 VDC MINIMUM
24 VDC NOMINAL
MEASURED AT CD52 TERMINAL BLOCK
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR ± 2°
TWO PLACE DECIMAL ± .03
THREE PLACE DECIMAL ± .010
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5M - 1994
MATERIAL
FINISH
DO NOT SCALE DRAWING
NEXT ASSY USED ON
APPLICATION
DRAWN DS 2/1/2017
CHECKED DS 02/1/2017
ENG APPR. DM 02/20/2017
MFG APPR. JF 02/20/2017
Q.A. JD 02/20/2017
COMMENTS:
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CDI. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CDI IS PROHIBITED.
ECR # 02161701
CDI
WIRING INSTRUCTIONS, 4-20mA OPTION, CD52 ATEX BANDIT
SIZE B
DWG. NO. 89-03-0062-02
REV A
SCALE: 1:1
WEIGHT:
SHEET 1 OF 1

The User Interface

The Bandit's user interface display contains much information for an operator, yet is quite simple and easy to read.



This display automatically cycles between showing the most recent pig passage time, date and the actual real-time every seven (7) seconds. This allows the operator to approach the Bandit on site and see the most recent pig passage time and verify the internal clock is set correctly – all without touching the unit.

Passage Time / Current Time

These display segments normally alternate between showing the most recent pig passage and the actual real-time as known by the unit. When the real-time is displayed, the colon will blink (momentarily appear) and the "TIME" Active Function Indicator segment will display.

When the most recent pig passage time is displayed, the colon display will be constant (non-blinking) and the "TIME" Active Function Indicator segment will not display.

Passage Date / Current Date

These segments normally alternate between displaying the real-time date and the date of the most recent pig passage. This date is in American format (MONTH–DATE; the year is not displayed). Therefore, 4–05 would be April 5th, with the year assumed to be current year.

Recent Passage Indicator

The Recent Passage Indicator segment at the lower half of the Bandit's display area indicates that a pig passage has been recently detected. The behavior of this segment conveys information about how recently the pig passage occurred.

When a pig passage occurs, the segment will blink once per second for one full hour after the pig passage. After one hour, the display will switch to a constant-on mode. This feature allows an operator to quickly determine how recently a pig has passed.

Therefore, a constant-on segment indicates a pig passage has occurred within the last 12 hours but more than one hour ago.

RECENT PASSAGE SEGMENT STATUS

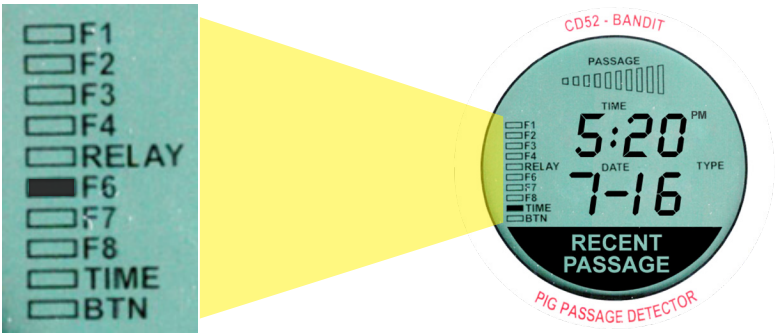
	**MEANING**
SEGMENT NOT LIT	**No passage detected within the last 12 hours**
SEGMENT BLINKING	**Passage was detected within the last one hour**
SEGMENT LIT, NOT BLINKING	**Passage was detected more than one hour ago, but less than 12 hours ago**

Displayed Passage Indicator

The Displayed Passage Indicator is a cone-shaped array of 10 segments. Each one of these individual segments represents one of the 10 pig passage times recorded in the Bandit's memory. The larger the segment, the more recent the pig passage.

Active Function Indicators

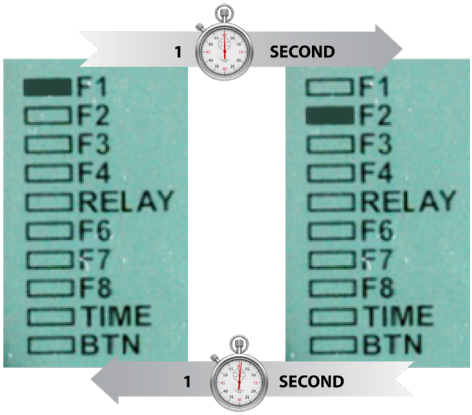
The Active Function Indicators are an array of 10 rectangular LCD segments aligned vertically along the left-hand side of the display.



Note: some of the segments are reserved for future functions and/or customer-requested applications.

F1	**Unit is in Suspend Mode***
F2	**Unit is in Suspend Mode***
F3	**Reserved**
F4	**Reserved**
RELAY	**Internal contact relay engaged**
F6	**Reserved**
F7	**Reserved**
F8	**Reserved**
TIME	**Real-time currently displayed**
BTN	**User Interface Lever currently engaged**

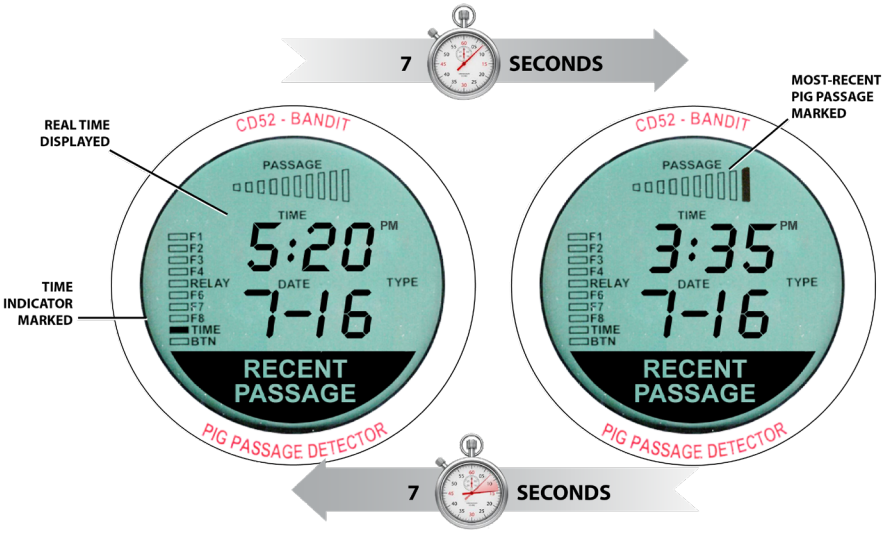
* Suspend Mode feature is available only on the portable Bandit (see pg. 32).
When in Suspend Mode the Active Function Indicator LCD will cycle between F1 and F2 every second.



Display Rotation

During normal operation the Bandit automatically cycles between two display screens. The first screen shows time and date of the most recent pig passage. The second screen is the current (real) time.

For example: If a Bandit unit records its most recent pig passage at 3:35 PM on July 16, and the real time is 5:20 PM, the operator will see two displays alternating every seven seconds as shown here:



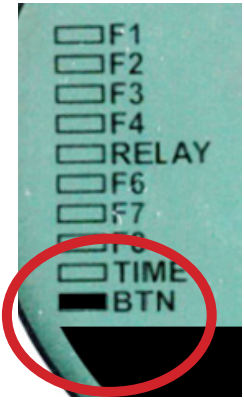
Interface Lever

The pivoting lever on the side of the unit has several functions:

- Retrieving dates/times of the last ten passages
- Clearing the recent passage indicator
- Set the real-time clock

The lever contains a small magnet that actuates a reed switch. Rotating this lever controls all aspects of the Bandit's user interface. In its neutral (disengaged) position, the red lever hangs down. To activate, rotate the bottom of the lever away from you.

Any time the Bandit's lever is activated, the "BTN" display segment will confirm contact.

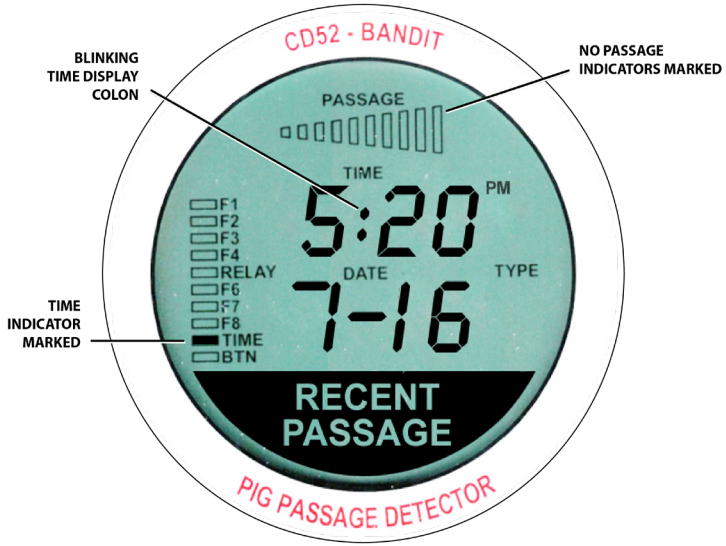


To ensure Bandit's availability under adverse conditions (wind, icing, vandalism, etc.) that could move the lever into the engaged position while unattended, the unit will automatically override the lever setting after one minute and 45 seconds, and automatically return to normal operation.

Real-time Display

The primary purpose of the real-time display is to allow an operator to quickly and easily confirm the clock is set to the correct time.
(See pg. 31 for instructions on setting the clock.)

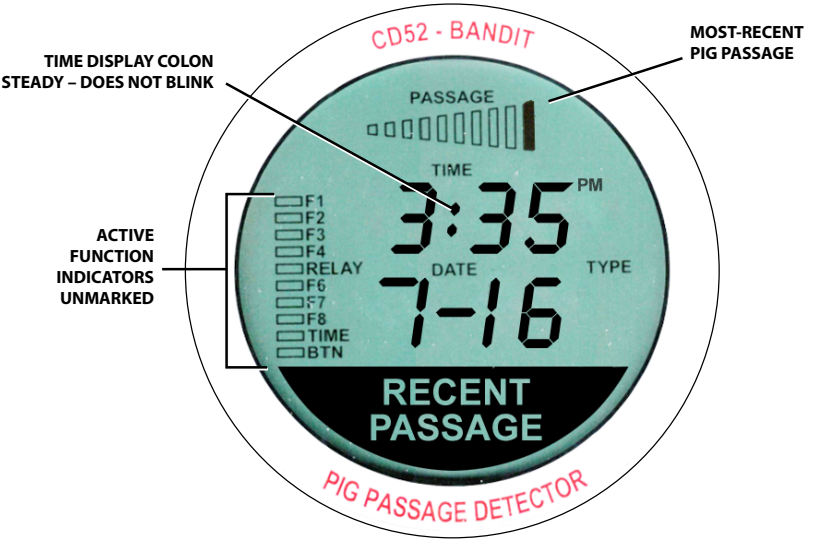
The real-time display has the following characteristics:



Most Recent Pig Passage Display

Pig passages are captured and indicated on the display of the Bandit. Typically, the operator is interested in the time and date of the most recent passage. By default the Bandit displays this information. Anyone can approach a unit and see the most recent passage data without interaction.

When displaying the time of the most recent passage, the display will appear as shown:

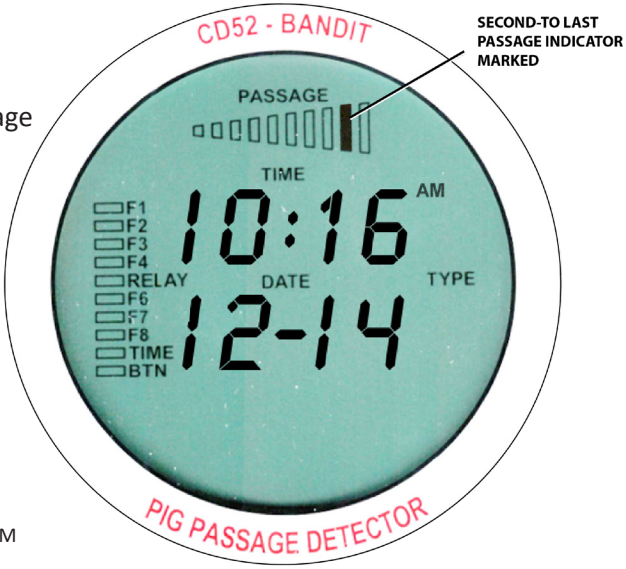


Previous Pig Passages

Use the Interface lever to review pig passage dates and times other than the most recent. Simply rotate the bottom of the lever away from you and toward the rear of the unit.

Hold the handle in this position until you notice the BTN LCD segment marked as shown.

The display will change showing the second most recent pig passage with the date and time. The 10 bars represent pig passages. The largest bar represents the most recent passage. The smallest bar represents the oldest pig passage stored in memory.



After one lever press, the screen should appear as shown here.

This display indicates that the second most-recent pig passage occurred at 10:16 AM on December 14th.

Repeatedly pressing and releasing the lever will toggle through the recorded pig passages and change the Displayed Passage Indicator segment to the corresponding indicator. Moving to the oldest passage in memory requires a total of nine (9) lever activations, after which the Displayed Passage Indicator segments loop back to the first passage.

To exit this mode and return to the normal operating mode of cycling between the most recent passage time and the real (current) time, simply allow the lever to hang in its disengaged position for a period of twenty-five (25) seconds. Normal display cycling will resume.

Clearing the "Recent Passage" Flag

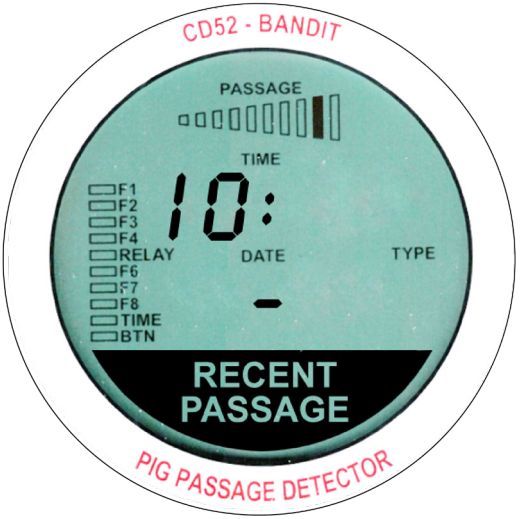
The Recent Passage LCD segment will blink for one hour after a pig passage then remain on for an additional 11 hours. However, you may wish to manually terminate the blinking cycle (for example, when the Bandit is used in a portable application or on a launcher or receiver). To clear the recent passage display, rotate the Interface Lever into the "activated" position (see pg. 27) and hold it there for a period of four (4) seconds. Once cleared, release the lever to return the unit to normal operation.

Removing the "Recent Passage" message from the screen will not affect anything in memory. The most recent pig passage time and date will cycle every few seconds.

Setting the Clock

Occasionally it will be necessary to set the unit's real-time clock (see note.) To do so, hold the lever in the activate position for a period of eight (8) seconds. After eight seconds you will see the majority of the Bandit's display go blank. Release the lever, and then briefly press and release it one time. You should then see a display similar to this:

NOTE: the unit calendar does not automatically compensate for a leap year, so it will be necessary to re-set the unit every February 29 to ensure accuracy.



The Bandit is now prepared to set the hour portion of the clock. To change the hour, simply rotate the lever to the activate position and hold it there. You should notice the BTN segment lights and the hour digits begins to increase at a rate of one hour per second.

Continuing to hold the lever in the activated position will cause the hours to increase until they reach “12”, and then wrap to “1” (The Bandit uses 12-hour, not 24-hour time).

Hold the lever in the activated position until the digit reaches the desired hour and then release. The display will jump to the minute portion of the time to set. The same method is used to set the minutes. Simply press and hold the lever to increment the digits, and release to move to the date.

Repeatedly pressing and releasing the lever while in clock set mode causes the unit to cycle through the following clock set options:

1. **HOURS**
2. **MINUTES**
3. **AM/PM**
4. **DAY**
5. **MONTH**

To end the clock set mode, simply release the lever. Normal Bandit operation will return in twenty-five (25) seconds and the clock will be set to the time indicated.

Portable Models

The portable Bandit is designed for temporary location/relocation from one tracking site to the next. It is identical to standard units in function and operation, with two notable exceptions:

- Battery power only
- Suspend Mode push button

The Suspend Mode button is located on the back. When pressed, all Bandit functions are paused to prevent inadvertent triggering of the unit during repositioning. The Active Function Indicator LCD (pg. 26) will alternate between F1 and F2 every second.

When the portable Bandit is repositioned, pressing the Suspend button a second time readies the portable Bandit to resume passage detection. The Active Function Indicator F1–F2 cycle will cease.

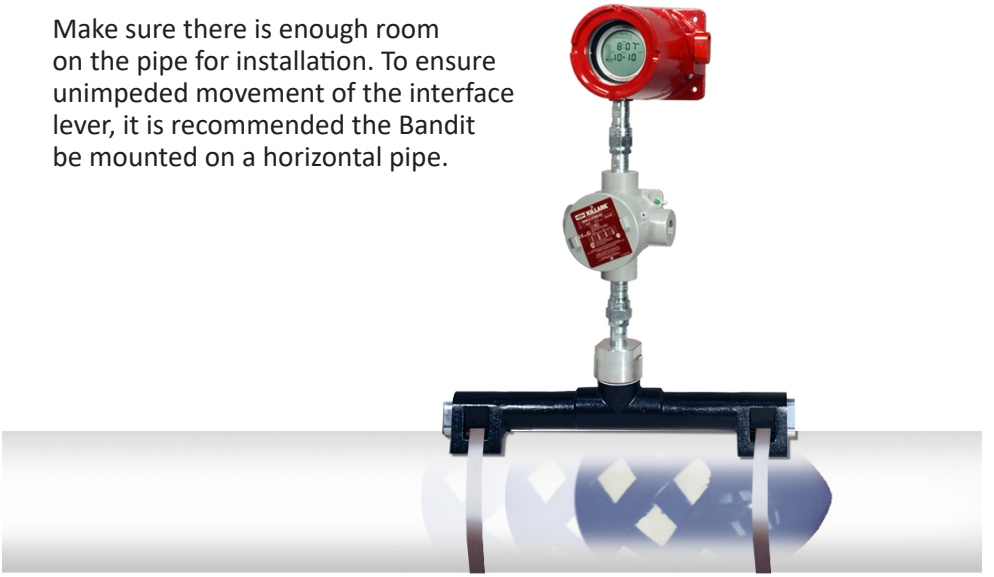
NOTE: To avoid inadvertent triggering of a false passage, the portable Bandit should be put into Suspend Mode before reviewing previous passages. Exit Suspend Mode when you are finished reviewing previous passages.

INSTALLATION

Standard and Stainless Steel Units

The Bandit can be installed on pig launchers, receivers, and all pipelines from 50.8 mm to 1,524 mm [2 in. to 60 in.]. The Bandit's base is 508 mm [20 in.] long.

Make sure there is enough room on the pipe for installation. To ensure unimpeded movement of the interface lever, it is recommended the Bandit be mounted on a horizontal pipe.



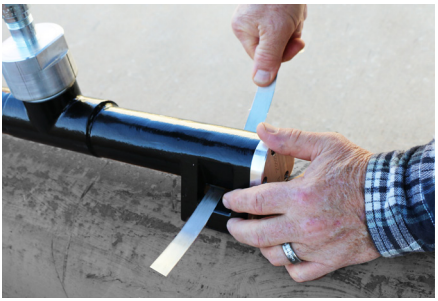
1: Prep Banding

Prepare the band and buckle. Slide the buckle over the band and crimp in place.

NOTE: Banding material and band tension tool options are stocked by CDI. (See pg. 38)

2: Attach Base

Set the base on the pipeline. Loop the free end of the band through the slots at one end of the base.



Continue looping the free end around the pipe until it meets the buckle at the other end of the band.

NOTE: The standard CD52 antenna base (shown here) is of cast aluminum and must be handled with care. Do not over-torque bands.

If required, use electrical insulators (see pg. 38) to electrically isolate the CD52 Bandit from the pipeline to prevent corrosion.

Slide the free end of the band through the buckle.

3: Attach Tensioning Tool

Thread free end through both jaws of tension tool.

Tighten the tension on the band using the tension tool.

NOTE: Do not over-torque bands on cast aluminum antenna base.

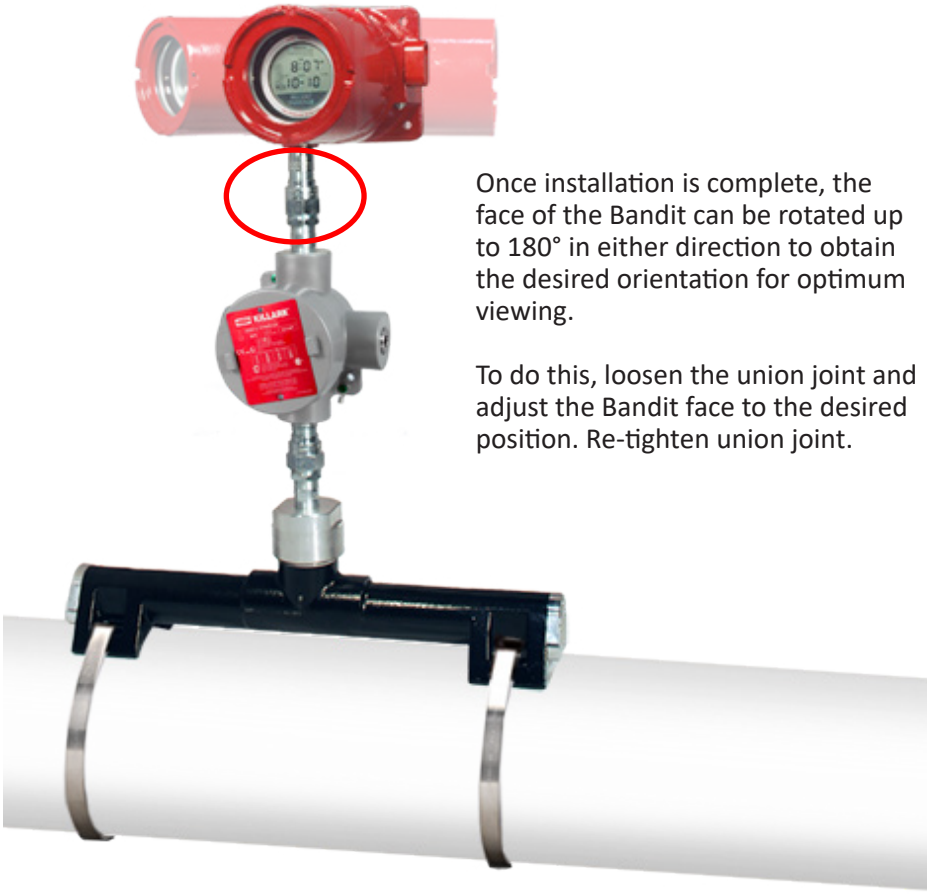
4: Cut Excess

Raise the tension tool to bend the band back over the buckle.

Pull the cutoff lever and cut off the excess banding material.

5: Secure Buckle

Secure the buckle. Bend the end of the band down by lightly tapping with a hammer. Using a hammer, bend the two locking tabs over the end of the band.



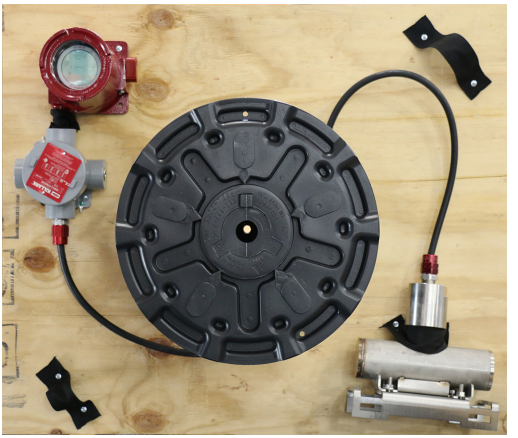
Once installation is complete, the face of the Bandit can be rotated up to 180° in either direction to obtain the desired orientation for optimum viewing.

To do this, loosen the union joint and adjust the Bandit face to the desired position. Re-tighten union joint.

NOTE: Loosen union joint only enough to rotate Bandit. Do not disassemble union.

Armored Flex Cable Units

Bandit units configured with armored flex cable are shipped mounted on a plywood sheet with webbing straps. Special unpacking procedures should be followed:



NOTE: Prepare an unobstructed 6 m x 6 m [20 ft x 20 ft] area before unpacking.

Required tools/materials:

- Screw gun or Phillips screwdriver

1. **Lift mounted assembly** with webbing handles only.

2. **Remove antenna base unit strap** using Phillips screw driver.

3. **Uncoil cable.** This requires two (2) personnel. Person #1 will hold antenna base (while supporting cable) and walk in an ever-widening circle. While walking, Person #1 will continually untwist the antenna base to prevent cable from kinking.

NOTE: Maintain a 152 mm [6 in.] minimum bend radius to avoid kinking or breaking the aluminum cable armor.

Person #2 will be responsible for uncoiling cable at the plastic spool.

4. **Startup procedure** is identical to that of standard units.

SPECIFIC CONDITION OF USE:
The integral cable between the junction boxes/enclosures (the flex cabling) shall be effectively clamped to prevent pulling or twisting.

OPTIONAL EQUIPMENT

Remote Indicator System (RIS)

The RIS consists of four high-luminosity LEDs that, when pig passage occurs, can be seen over distances as great as 100 meters [328 ft].

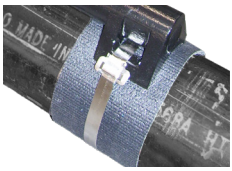
The RIS may be added to any Bandit System.

Pipeline Banding Kits

Type 201 or 316 stainless steel banding and band installation tool can mount conventional or stainless steel Bandit antennas to any pipeline.

As an alternative, nylon straps with type 304 stainless steel ratchets provide quick installation/removal.

Cathodic Protection Base Mounting

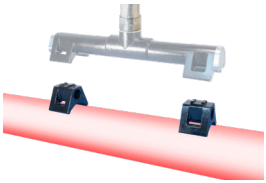


Cathodic protection insulation matting is available to protect pipeline coating and to provide electrical isolation between the pipeline and CD52 Bandit.

Heater

A 24 VDC internal heater is recommended for operation in temperatures below –30°C [–22°F].

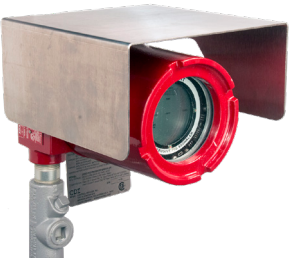
Heat Risers



Heat riser insulators for the CD52 Bandit allow the system to be used on geothermal pipelines or other environments where pipeline surface temperatures exceed 80°C [176°F].

NOTE: Heat risers enable the CD52 Bandit to operate with pipeline temperatures greater than 80°C [176°F]. However, if the *ambient air environment* of the system is greater than 70°C [158°F], it will be operating outside of ATEX/IECEx Certification.

Sunshade



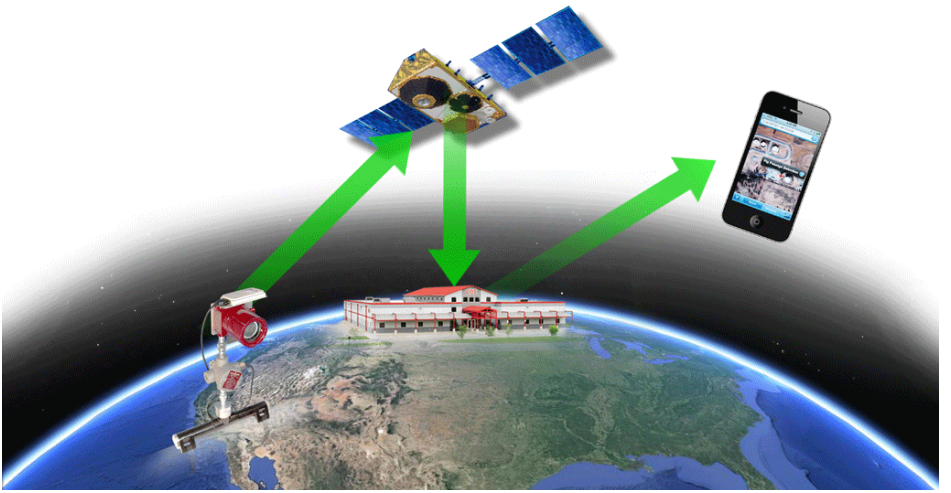
The 316 stainless steel sunshade can help protect the Bandit from intense sunlight by reducing overall temperature inside, thus prolonging the life of the electronic components. The sunshade is available for all Bandit variants.

LineStat

TRAXALL LineStat is a global, value-added satellite-based event notification service provided by CDI and targeted primarily to the oil and gas pipeline industry. LineStat provides notification to email addresses and SMS text messaging telephone numbers of remote events from both fixed position and portable equipment.

Some of the details included in event notification messages are date, time, GPS position, battery status, and vibration.

This information is transmitted via satellite without use of cellular networks and without need of a wired infrastructure.



WARRANTY

All equipment sold by Control Devices, Incorporated (CDI) is warranted for a period of one (1) year from the date of shipment to Purchaser, providing the instrument or equipment has not been modified, abused or used for purposes other than that for which it was designed.

Batteries, probes, leads, magnets and other consumables subject to wear are not covered by this warranty. CDI will repair or replace faulty equipment during the warranty period when the cause is a defect arising from faulty design, materials or workmanship.

Making a Warranty Claim

Equipment being considered for warranty repair, or a representative sample thereof, must be returned to CDI at the Purchaser's expense. The equipment must be accompanied by the Purchaser's written order* describing the defect(s) and authorizing CDI to invoice the Purchaser for any charges not covered by the warranty.

Upon receipt of the equipment and Purchase Order, CDI will examine the equipment and make a determination of the nature and cause of the defect. If the defect is not covered by the warranty, CDI will quote to Purchaser the cost for replacement or repair equipment, and will not proceed until Purchaser delivers a written acceptance of the quotation.

During the one year warranty, CDI will bear the cost to return units repaired under the warranty back to the Purchaser's domestic premises. CDI will return units to foreign countries at Purchaser's expense.

* Contact CDI at 1–800–580–4234, ext 143 for *CDI RMA Form FM–03–0089*

Care and Maintenance

Equipment designed by CDI is protected against the environment in which it is intended to operate. Much of the equipment is designed for prolonged use in the field without any special maintenance other than routine battery replacements. It is the Purchaser's responsibility to insure that proper precautions are taken during installation and operation so that weather seals are in place, routine maintenance occurs, etc. Failure to perform these operations nullifies this warranty.

CDI equipment should only be operated by qualified personnel who are familiar with any and all manuals and procedures for said equipment's operation.

Operating equipment while in a damaged condition nullifies this warranty.

Service and Repairs

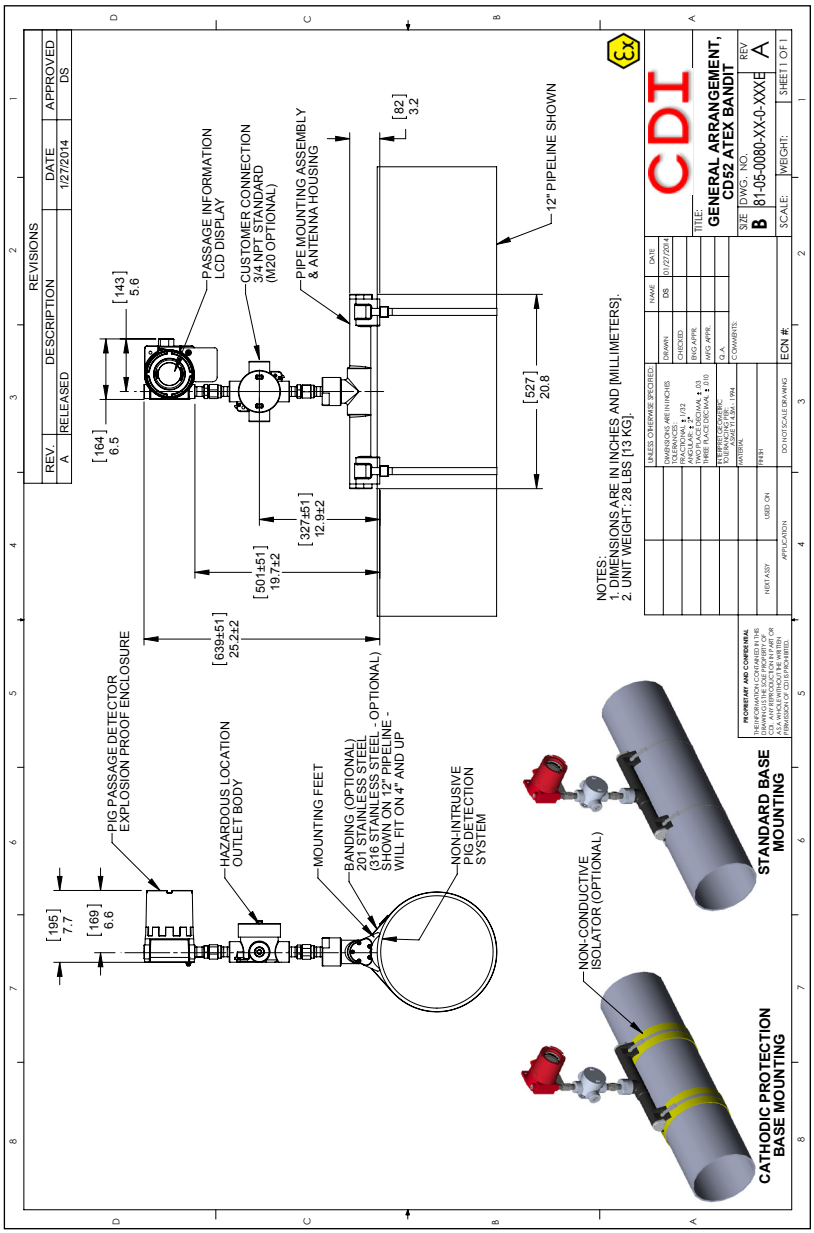
Cost for repairs not covered by the warranty or carried out after the warranty period has expired will be charged at the current hourly or set service rate, plus the cost of materials, upon approval by Purchaser.

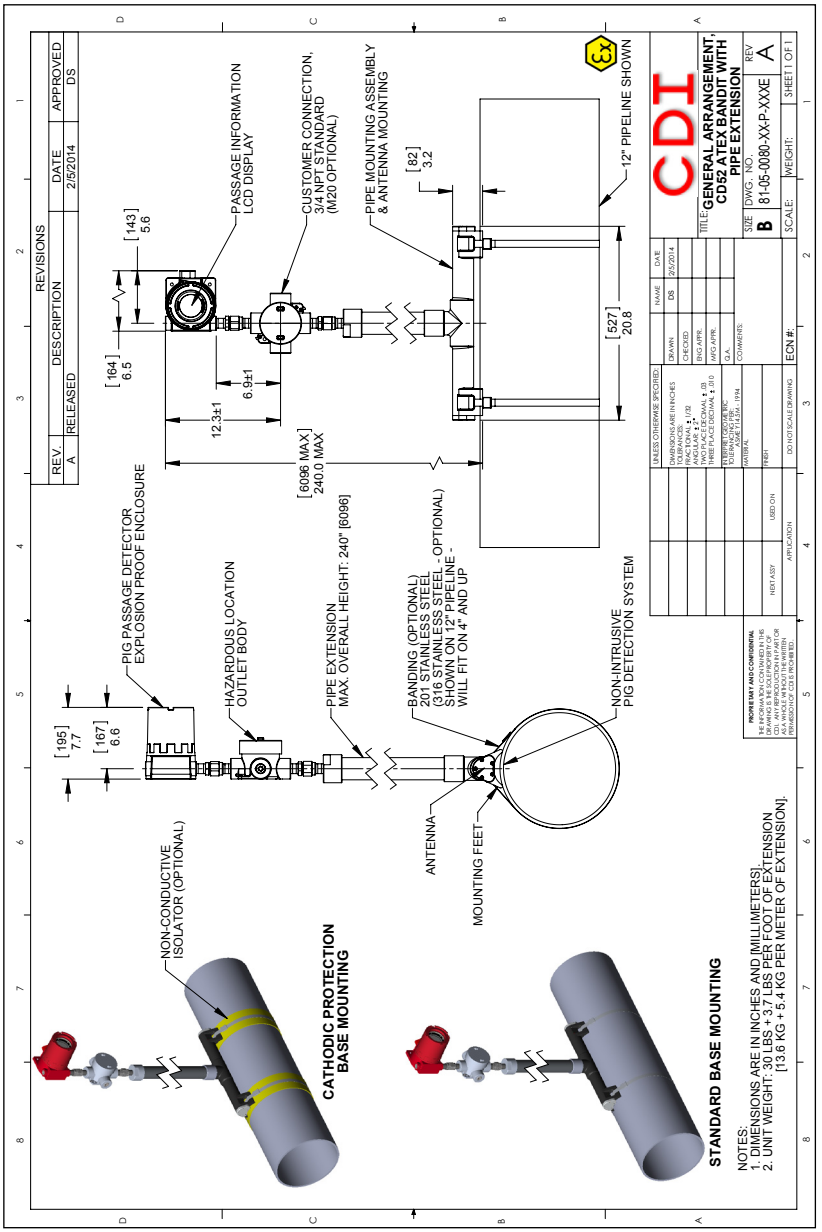
Equipment for repair must be sent at the Purchaser's expense and be accompanied by the Purchaser's written order describing the defect and authorizing CDI to invoice the Purchaser for labor, materials and return delivery cost.

No service or repair will be undertaken until an approved written order is received from the Purchaser.

Operating equipment while in a damaged condition nullifies this warranty.

GENERAL ARRANGEMENT DRAWINGS




REVISIONS
REV
DESCRIPTION
DATE
APPROVED
A
RELEASED
2/5/2014
DS
[195] 7.7
[167] 6.6
[164] 6.5
[143] 5.6
12.3±1
6.9±1
[6096 MAX] 240.0 MAX
[82] 3.2
[527] 20.8
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
HAZARDOUS LOCATION OUTLET BODY
PIPE EXTENSION MAX. OVERALL HEIGHT: 240" [6096]
BANDING, (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL - OPTIONAL) SHOWN ON 12" PIPELINE - WILL FIT ON 4" AND UP
NON-INTRUSIVE PIG DETECTION SYSTEM
PASSAGE INFORMATION LCD DISPLAY
CUSTOMER CONNECTION, 3/4 NPT STANDARD (M20 OPTIONAL)
PIPE MOUNTING ASSEMBLY & ANTENNA MOUNTING
12" PIPELINE SHOWN
ANTENNA
MOUNTING FEET
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
CATHODIC PROTECTION BASE MOUNTING
STANDARD BASE MOUNTING
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. UNIT WEIGHT: 30 LBS + 3.7 LBS PER FOOT OF EXTENSION [13.6 KG + 5.4 KG PER METER OF EXTENSION].
PROPRIETARY AND CONFIDENTIAL
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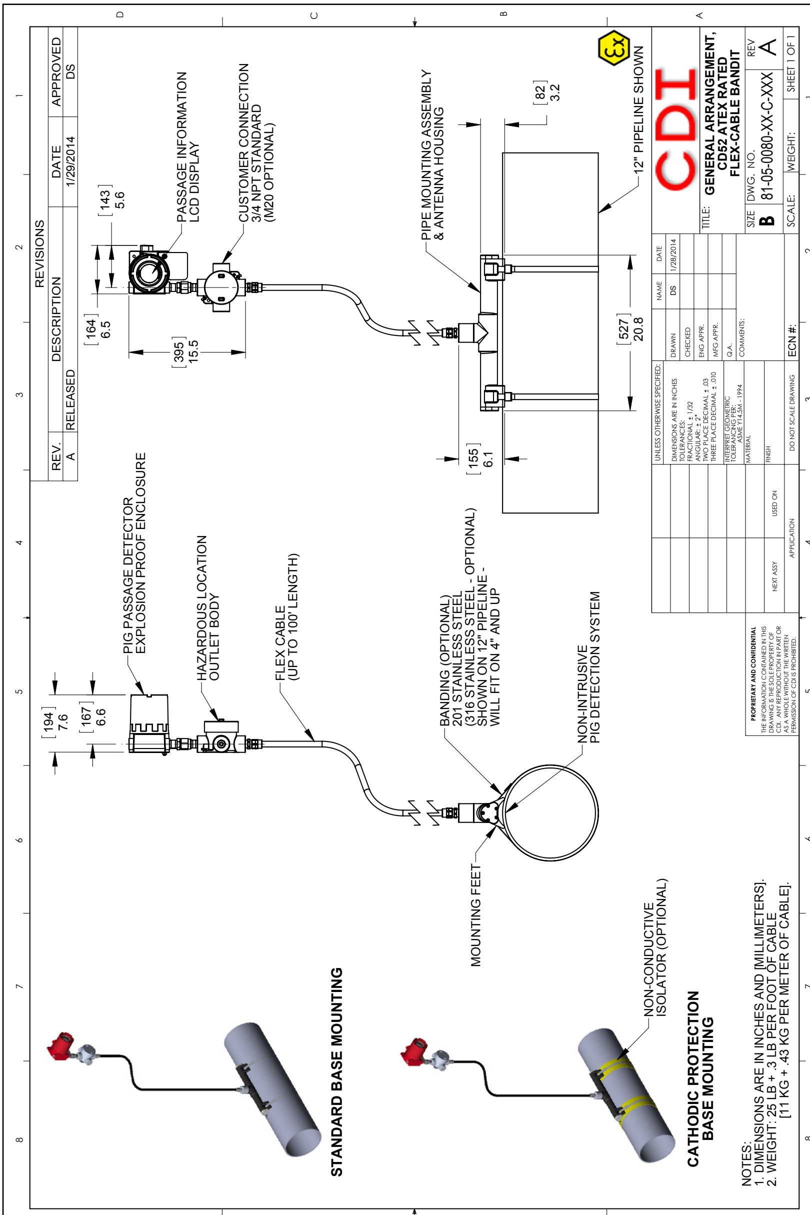
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR: ± 2°
TWO PLACE DECIMAL ± .03
THREE PLACE DECIMAL ± .010
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5M - 1994
MATERIAL
FINISH
DO NOT SCALE DRAWING
NEXT ASSY
USED ON
APPLICATION
DRAWN
CHECKED
ENG APPR.
MFG APPR.
Q.A.
COMMENTS:
NAME
DS
DATE
2/5/2014
ECN #:
CDI
TITLE: GENERAL ARRANGEMENT, CD52 ATEX BANDIT WITH PIPE EXTENSION
SIZE
B
DWG. NO.
81-05-0080-XX-P-XXXE
REV
A
SCALE:
WEIGHT:
SHEET 1 OF 1


REVISIONS
REV. | DESCRIPTION | DATE | APPROVED
A | RELEASED | 1/29/2014 | DS
PASSAGE INFORMATION
LCD DISPLAY
CUSTOMER CONNECTION
3/4 NPT STANDARD
(M20 OPTIONAL)
PIPE MOUNTING ASSEMBLY
& ANTENNA HOUSING
12" PIPELINE SHOWN
[143] 5.6
[164] 6.5
[395] 15.5
[82] 3.2
[527] 20.8
[155] 6.1
PIG PASSAGE DETECTOR
EXPLOSION PROOF ENCLOSURE
HAZARDOUS LOCATION
OUTLET BODY
FLEX CABLE
(UP TO 100' LENGTH)
BANDING (OPTIONAL)
201 STAINLESS STEEL
(316 STAINLESS STEEL - OPTIONAL)
SHOWN ON 12" PIPELINE -
WILL FIT ON 4" AND UP
NON-INTRUSIVE
PIG DETECTION SYSTEM
MOUNTING FEET
[194] 7.6
[167] 6.6
STANDARD BASE MOUNTING
NON-CONDUCTIVE
ISOLATOR (OPTIONAL)
CATHODIC PROTECTION
BASE MOUNTING
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 25 LB + .3 LB PER FOOT OF CABLE
[11 KG + .43 KG PER METER OF CABLE].
CDI
TITLE: GENERAL ARRANGEMENT,
CD52 ATEX RATED
FLEX-CABLE BANDIT
SIZE B
DWG. NO. 81-05-0080-XX-C-XXX
REV A
SCALE:
WEIGHT:
SHEET 1 OF 1
DRAWN DS 1/28/2014
CHECKED
ENG APPR.
MFG APPR.
Q.A.
COMMENTS:
ECN #:
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR: ± 2°
TWO PLACE DECIMAL ± .03
THREE PLACE DECIMAL ± .010
INTERPRET GEOMETRIC
TOLERANCING PER:
ASME Y14.5M - 1994
MATERIAL
FINISH
DO NOT SCALE DRAWING
NEXT ASSY
USED ON
APPLICATION
PROPRIETARY AND CONFIDENTIAL
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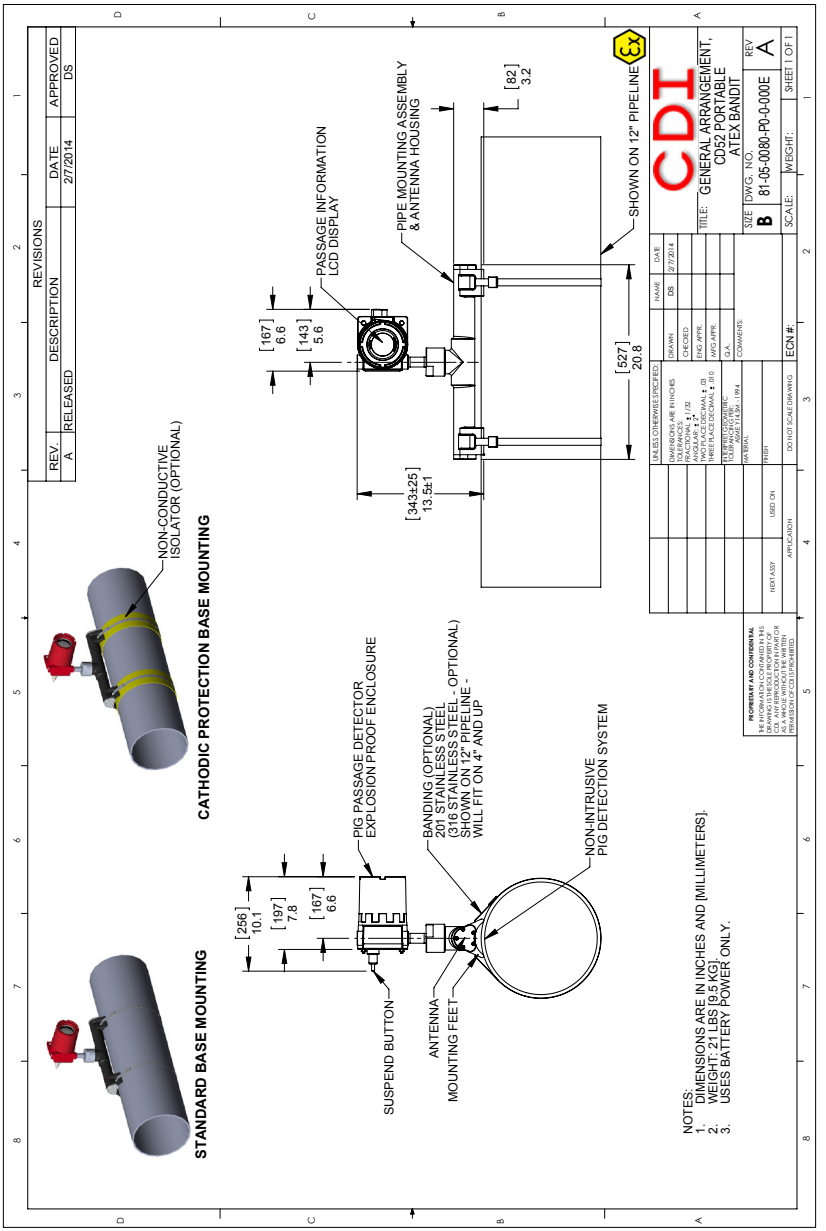
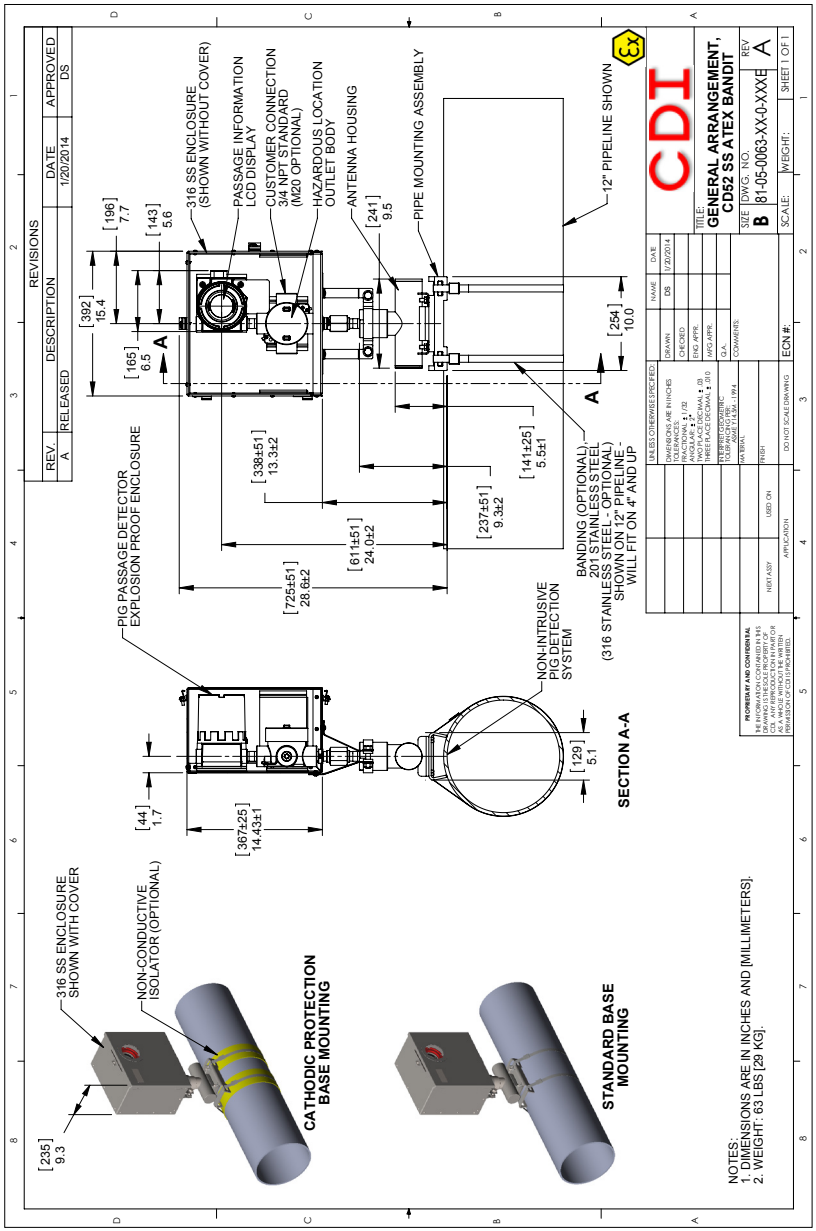
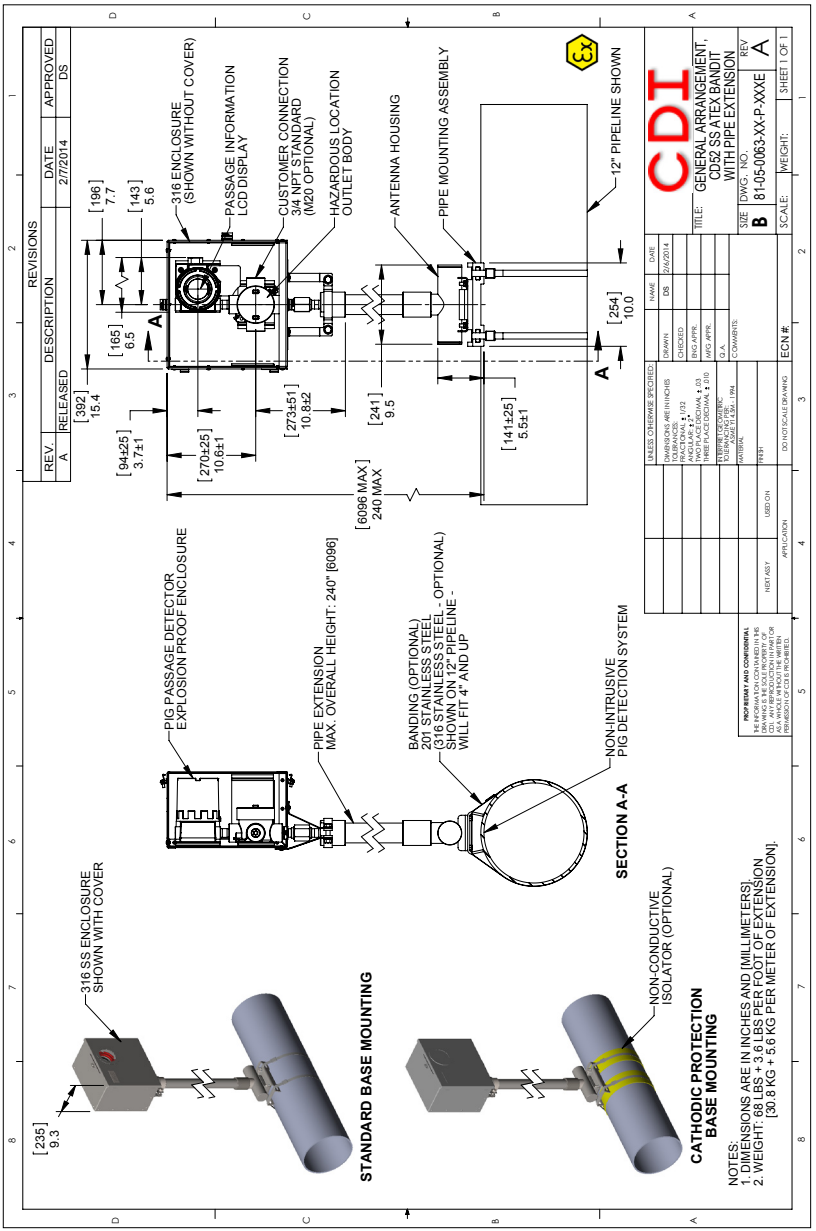
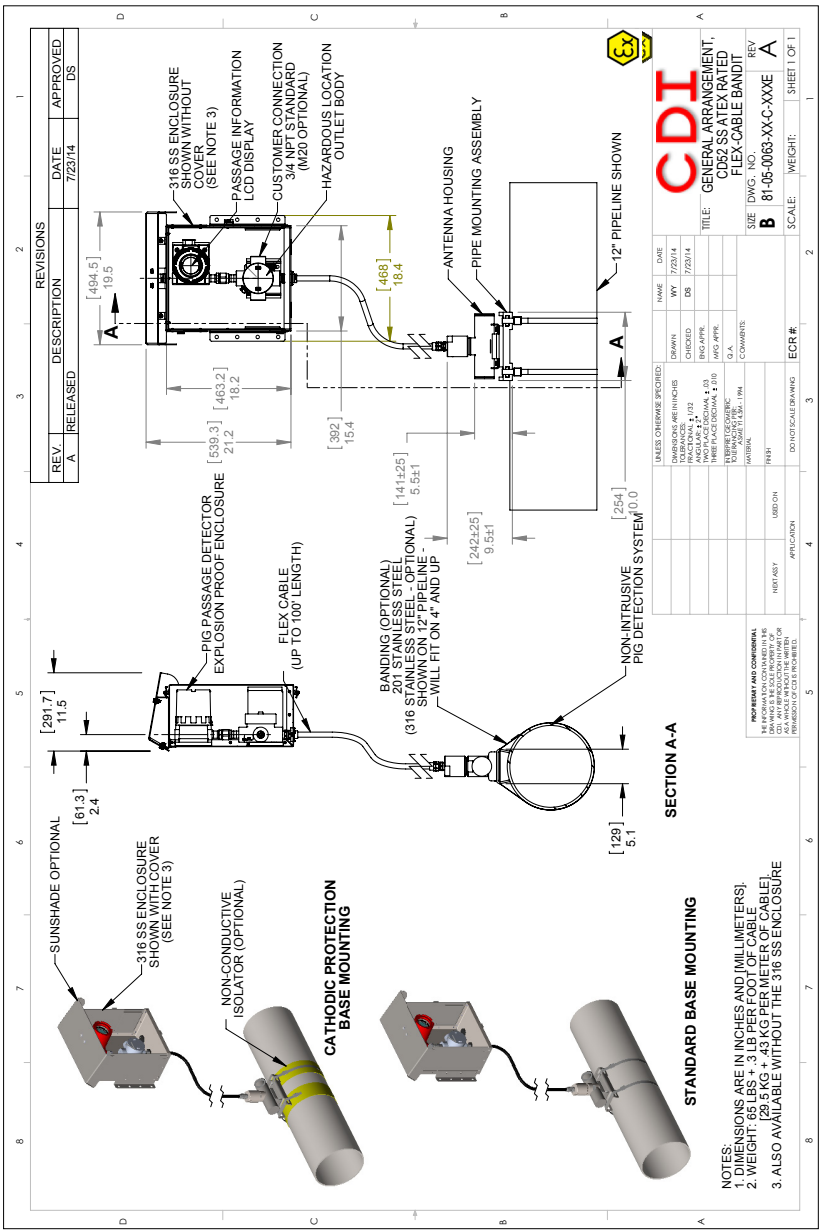
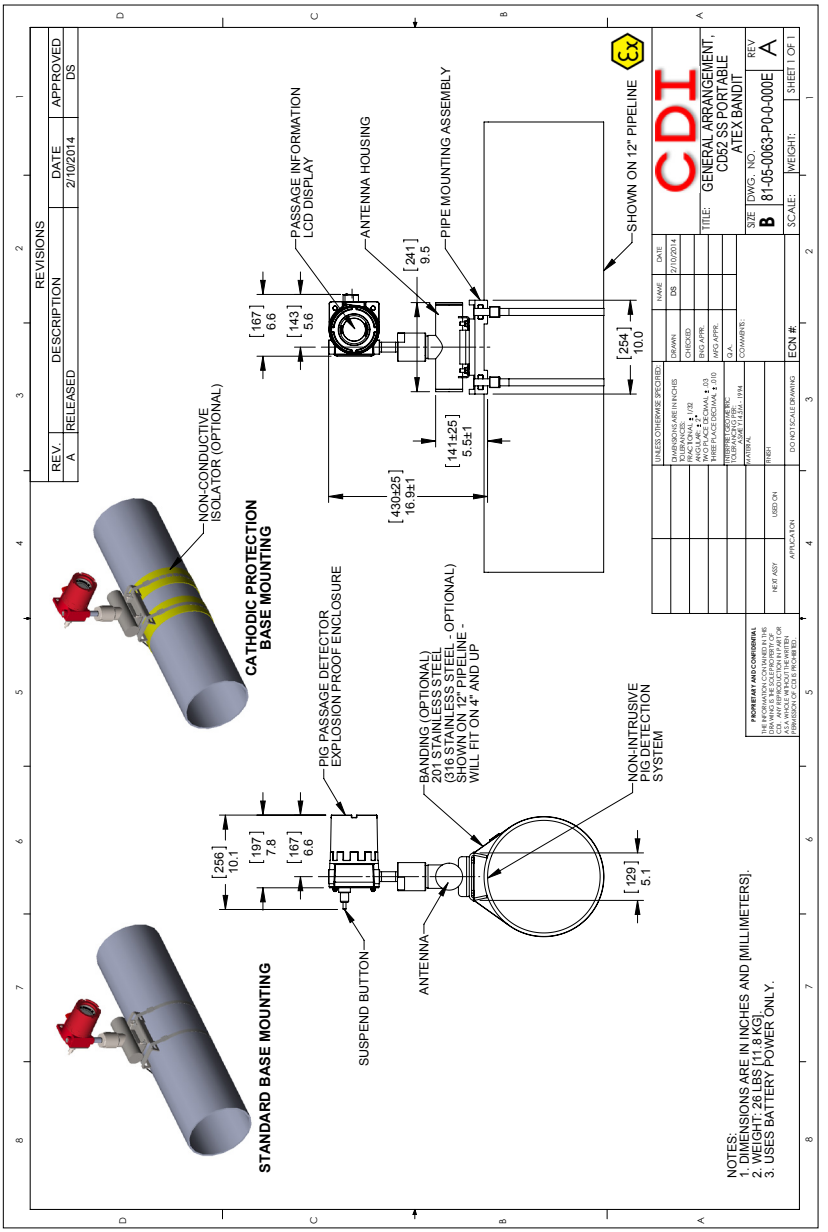

REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 2/7/2014 DS
STANDARD BASE MOUNTING
CATHODIC PROTECTION BASE MOUNTING
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
[256] 10.1
[197] 7.8
[167] 6.6
SUSPEND BUTTON
ANTENNA
MOUNTING FEET
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
BANDING (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL - OPTIONAL) SHOWN ON 12" PIPELINE - WILL FIT ON 4" AND UP
NON-INTRUSIVE PIG DETECTION SYSTEM
[167] 6.6
[143] 5.6
PASSAGE INFORMATION LCD DISPLAY
PIPE MOUNTING ASSEMBLY & ANTENNA HOUSING
[82] 3.2
[343±25] 13.5±1
[527] 20.8
SHOWN ON 12" PIPELINE
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 21 LBS [9.5 KG].
3. USES BATTERY POWER ONLY.
CDI
TITLE: GENERAL ARRANGEMENT, CD52 PORTABLE ATEX BANDIT
SIZE B
DWG. NO. 81-05-0080-P0-0-000E
REV A
SCALE:
WEIGHT:
SHEET 1 OF 1


REVISIONS
REV
DESCRIPTION
DATE
APPROVED
A
RELEASED
1/20/2014
DS
316 SS ENCLOSURE (SHOWN WITHOUT COVER)
PASSAGE INFORMATION LCD DISPLAY
CUSTOMER CONNECTION 3/4 NPT STANDARD (M20 OPTIONAL)
HAZARDOUS LOCATION OUTLET BODY
ANTENNA HOUSING
PIPE MOUNTING ASSEMBLY
12" PIPELINE SHOWN
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
NON-INTRUSIVE PIG DETECTION SYSTEM
BANDING (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL - OPTIONAL) SHOWN ON 12" PIPELINE - WILL FIT ON 4" AND UP
SECTION A-A
316 SS ENCLOSURE SHOWN WITH COVER
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
CATHODIC PROTECTION BASE MOUNTING
STANDARD BASE MOUNTING
[392] 15.4
[196] 7.7
[143] 5.6
[165] 6.5
[241] 9.5
[254] 10.0
[338±51] 13.3±2
[611±51] 24.0±2
[725±51] 28.6±2
[237±51] 9.3±2
[141±25] 5.5±1
[44] 1.7
[367±25] 14.43±1
[129] 5.1
[235] 9.3
UNLESS OTHERWISE SPECIFIED:
DRAWN
DS
1/20/2014
CHECKED
ENG APPR.
MFG APPR.
Q.A.
COMMENTS:
CDI
TITLE:
GENERAL ARRANGEMENT, CD52 SS ATEX BANDIT
SIZE
B
DWG. NO.
81-05-0063-XX-0-XXXE
REV
A
SCALE:
WEIGHT:
SHEET 1 OF 1
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
ECN #:
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 63 LBS [29 KG].


REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 2/7/2014 DS
316 ENCLOSURE (SHOWN WITHOUT COVER)
PASSAGE INFORMATION LCD DISPLAY
CUSTOMER CONNECTION 3/4 NPT STANDARD (M20 OPTIONAL)
HAZARDOUS LOCATION OUTLET BODY
ANTENNA HOUSING
PIPE MOUNTING ASSEMBLY
12" PIPELINE SHOWN
[392] 15.4
[196] 7.7
[143] 5.6
[165] 6.5
[94±25] 3.7±1
[270±25] 10.6±1
[273±51] 10.8±2
[6096 MAX] 240 MAX
[241] 9.5
[141±25] 5.5±1
[254] 10.0
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
PIPE EXTENSION MAX. OVERALL HEIGHT: 240" [6096]
BANDING (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL - OPTIONAL) SHOWN ON 12" PIPELINE - WILL FIT 4" AND UP
NON-INTRUSIVE PIG DETECTION SYSTEM
SECTION A-A
316 SS ENCLOSURE SHOWN WITH COVER
[235] 9.3
STANDARD BASE MOUNTING
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
CATHODIC PROTECTION BASE MOUNTING
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 68 LBS + 3.6 LBS PER FOOT OF EXTENSION
[30.8 KG + 5.6 KG PER METER OF EXTENSION].
UNLESS OTHERWISE SPECIFIED:
DRAWN DS 2/6/2014
CHECKED
ENG APPR.
MFG APPR.
Q.A.
COMMENTS:
CDI
TITLE: GENERAL ARRANGEMENT, CD52 SS ATEX BANDIT WITH PIPE EXTENSION
SIZE B
DWG. NO: 81-05-0063-XX-P-XXXE
REV A
SCALE:
WEIGHT:
SHEET 1 OF 1
ECN #:


REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 7/23/14 DS
316 SS ENCLOSURE SHOWN WITHOUT COVER (SEE NOTE 3)
PASSAGE INFORMATION LCD DISPLAY
CUSTOMER CONNECTION 3/4 NPT STANDARD (M20 OPTIONAL)
HAZARDOUS LOCATION OUTLET BODY
ANTENNA HOUSING
PIPE MOUNTING ASSEMBLY
12" PIPELINE SHOWN
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
FLEX CABLE (UP TO 100' LENGTH)
BANDING (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL OPTIONAL) SHOWN ON 12" PIPELINE WILL FIT ON 4" AND UP
NON-INTRUSIVE PIG DETECTION SYSTEM
SECTION A-A
SUNSHADE OPTIONAL
316 SS ENCLOSURE SHOWN WITH COVER (SEE NOTE 3)
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
CATHODIC PROTECTION BASE MOUNTING
STANDARD BASE MOUNTING
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 65 LBS + .3 LB PER FOOT OF CABLE [29.5 KG + .43 KG PER METER OF CABLE].
3. ALSO AVAILABLE WITHOUT THE 316 SS ENCLOSURE
CDI
GENERAL ARRANGEMENT, CD52 SS ATEX RATED FLEX-CABLE BANDIT
SIZE B DWG. NO. 81-05-0063-XX-C-XXXE REV A
SCALE: WEIGHT: SHEET 1 OF 1


REVISIONS
REV. DESCRIPTION DATE APPROVED
A RELEASED 2/10/2014 DS
STANDARD BASE MOUNTING
CATHODIC PROTECTION BASE MOUNTING
NON-CONDUCTIVE ISOLATOR (OPTIONAL)
PASSAGE INFORMATION LCD DISPLAY
ANTENNA HOUSING
PIPE MOUNTING ASSEMBLY
SHOWN ON 12" PIPELINE
PIG PASSAGE DETECTOR EXPLOSION PROOF ENCLOSURE
BANDING (OPTIONAL) 201 STAINLESS STEEL (316 STAINLESS STEEL - OPTIONAL) SHOWN ON 12" PIPELINE - WILL FIT ON 4" AND UP
NON-INTRUSIVE PIG DETECTION SYSTEM
SUSPEND BUTTON
ANTENNA
[256] 10.1
[197] 7.8
[167] 6.6
[167] 6.6
[143] 5.6
[241] 9.5
[430±25] 16.9±1
[141±25] 5.5±1
[254] 10.0
[129] 5.1
NOTES:
1. DIMENSIONS ARE IN INCHES AND [MILLIMETERS].
2. WEIGHT: 26 LBS [11.8 KG].
3. USES BATTERY POWER ONLY.
CDI
TITLE: GENERAL ARRANGEMENT, CD52 SS PORTABLE ATEX BANDIT
SIZE B
DWG. NO. 81-05-0063-P0-0-000E
REV A
SCALE:
WEIGHT:
SHEET 1 OF 1

SYSTEM SPECIFICATIONS

Detection Type:	Non-Intrusive, Magnetic
Devices Detected:	Permanent Magnets, 22 Hz Transmitters, and Adjustable-frequency (15-32 Hz) Transmitters
Detection Direction:	Bi-Directional
Passage Visual Indicator:	LCD blinks one hour after passage LCD holds steady for next 11 hours Auto-Resets at 12 hours
Passage Electrical Indicator:	Isolated Dry Contact Closure 4-20mA Current Loop Interface*
Detection Speed:	0.01 meter/sec to 20 meter/sec
Battery Life:	1.5 VDC alkaline: One full year minimum on two D-cell batteries NiMH: Six months minimum on two D-cell batteries between recharges Lithium ($LiSOCl_2$): One full year minimum on one D-cell battery Lithium (Li-Ion Rechargeable): One full year minimum between recharges
External Power:	24 VDC (21.6 to 26.4 VDC Allowable Range)
Enclosure:	Aluminum
Window:	Tempered Glass
System Certification:	SIRA 13ATEX 1381 II2G Ex d mb IIB T5 Gb IECEx CSA 13.0039/00 Ex d mb IIB T5 Gb INGRESS: IP66

* Models equipped with optional configuration for SCADA network communication

SYSTEM SPECIFICATIONS (cont.)

Line Sizes: 50.8 mm to 1524 mm [2 in. to 60 in.]
Pipe Wall Thickness: Up to 38.1 mm [1.5 in.]

NOTE: Where pipe wall thickness exceeds 25.4 mm [1 in.], a custom magnet design may be required. Please consult CDI for an evaluation of deployment options.

Pipe Mounting Assembly: Aluminum (316 Stainless Steel optional)
Banding and Buckles: 201 Stainless Steel (316 Stainless Steel optional)

Contact Closure: Electrically Isolated Double Pole – Double Throw
Available in normally-open or normally closed configurations w/customer-specified relay dwell time

Contact Closure Current Capacity: 2 Amps at 30 Volts DC

Operational Temperature Ranges:

POWER SOURCE	RANGE
24VDC	-40°C to +70°C
DURACELL® PROCELL (PC1300)	-20°C to +53°C
ANSMANN 5035362	-20°C to +64°C
SAFT LS 33600	-40°C to +70°C
SAFT MP176065	-40°C to +70°C

LineStat Satellite Equipped System: –30°C to 70°C* [–22°F to 158°F*]

Total Passage Count: 10 (First In, First Out)

Stored Passage Information: Time and Date of passages.
Information is stored through loss of power.

System Design Life: 20 years
Storage Life: 20 years

* Upper temperature limit determined by power option. Refer to Operational Temp Range chart, pg. 12.

PIG MAGNET MOUNTING

CD42-Tx and TRAXALL X-series electromagnetic transmitters and CD52-MX series magnets and can be mounted onto foam, uni-cast, or metal pigs.

Virtually any pig may be equipped to be detected by the CD52 Bandit system.

ABOUT CDI

CDI is a family-owned and operated business located in Broken Arrow, Oklahoma, just 12 miles from downtown Tulsa. Incorporated in 1982, CDI proudly manufactures products in the United States. CDI currently employs a dedicated team with experience in electronics and mechanical design, software and firmware programming, electronics manufacture, machining, and more.

All CDI products are designed and built completely in-house utilizing an on-premises machine shop boasting six fully-automated CNC machines as well as full-time electronics assembly personnel.