Loop Installation
and
Operating Instructions

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Contents

Introduction

A loop is a metal detector that is used as an activator to open doors. It consists of a number of turns of wire connected to a loop detector. A field is created around the wire. A vehicle passing near the wire will change the field. The loop detector senses the change and sends a signal to the door controller to open the door.

A loop is made up of a saw cut in the floor near the door. A length of wire is installed in the saw cut and sealed in place. The size and location of the loop, the number of turns of wire used and some of the detector settings will vary from one application to the next.

This instruction book will explain installation, operation and troubleshooting of loops.

NOTE: This manual is intended for the Loop Detector only. Installation and operation information specific to your door is detailed in the Installation, Owner's and System 3 Drive and Control manuals that were shipped with the door.

The installation and operation of the loop is not difficult providing you follow the procedures outlined in this manual. Any unauthorized changes to these procedures, or failure to follow the steps as outlined, will automatically void our warranty. Any changes to the working parts, assemblies, or specifications as written, not authorized by Rytec Corporation, will also cancel our warranty. The responsibility for the successful operation and performance of this loop lies with the owner of the door.

DO NOT INSTALL, OPERATE, OR PERFORM MAINTENANCE ON THIS LOOP UNTIL YOU READ AND UNDERSTAND THE INSTRUCTIONS IN THIS MANUAL.

If you have any questions, contact your Rytec representative or call the Rytec Customer Support Department at 800-628-1909. Always refer to the serial number of the door that your floor loop is connected to when calling the representative or Customer Support. Refer to the installation manual or the owner's manual provided with your door for the location of the serial number plate.

The wiring connections and schematics in this manual are for general information purposes only. A wiring schematic is provided with each individual door specifically covering the control panel and electrical components of that door. That schematic was shipped inside the control panel.

All electrical and mechanical work must be performed in accordance with local and state building codes by qualified installers and electricians.

This product is covered by the Rytec door warranty. The warranty is in the door owner's manual.

How to use manual

Throughout this manual, the following key words are used to alert the reader of potentially hazardous situations, or situations where additional information to successfully perform the procedure is presented:

⚠WARNING

WARNING is used to indicate the potential for personal injury, if the procedure is not performed as described.

⚠CAUTION

CAUTION is used to indicate the potential for damage to the product or property damage, if the procedure is not followed as described.

IMPORTANT: IMPORTANT is used to relay information CRITICAL to the successful completion of the procedure.

NOTE: NOTE is used to provide additional information to aid in the performance of the procedure or operation of the door, but not necessarily safety related.

Loop layout

There are a number of loop layouts that can be used. Figure 1 shows a single loop layout. It can be used on doors without metal parts on the door panels.

Single Loop

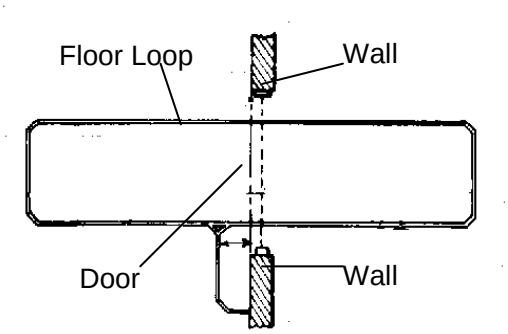

Figure 1

Figure 2 shows a double loop layout. It is used on doors where metal is a part of the door panel, for example roll doors with metal bottom bars. It is also used in applications where there is an expansion joint in the floor in the door area and you don't want to cut through the expansion joint.

Double Loop

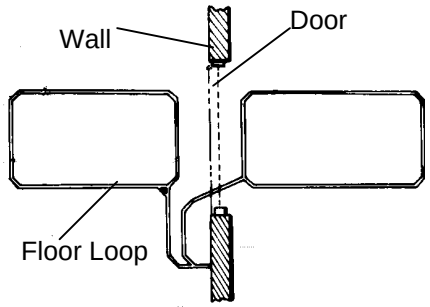

Figure 2

A double loop layout consists of two individual loops. The loops should be the same size or within 25% of each other in size. They should be an equal distance from the metal parts of the door panel. We suggest 18". Also the two individual loops should be connected in parallel at the control box.

The rectangle is a common shape used for a loop. Figure 3 shows some things to consider when laying out a rectangular loop.

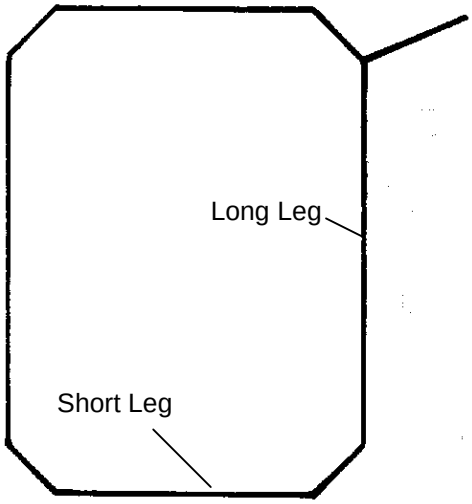

Figure 3

The long leg is generally the distance away from the door. It should extend away from the door far enough to allow the door to open before the vehicle reaches the door. The following formula can be used to calculate the ideal distance the loop should extend away from the door. Door opening time in seconds multiplied by the speed of the approaching vehicle in mph multiplied by 1.47 (1.47 converts mph to ft per sec) equals the ideal distance away from the door. The loop should not be longer than this. If it is shorter traffic will need to slow to increase safety.

The short leg of the loop should be between 1-1/2' and 7'. The loop should be slightly smaller than the vehicles being detected. Small vehicles may be lost in the field if the loop is too wide. Another consideration is that field height is related to the width of the loop. The wider the loop the higher the field is above the loop. A 6' wide loop will detect high bed vehicles better than a 1-1/2' wide loop. See figure 4.

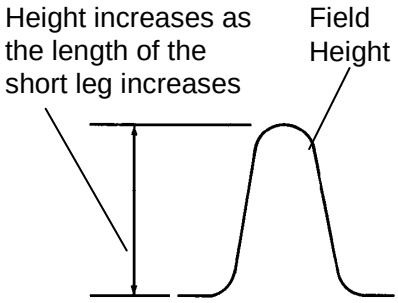

Figure 4

There are times when cross traffic will cause problems with a standard rectangular loop extending out from the door. Target loops, which are small loops located in a specific area, may help solve these problems. See figure 5.

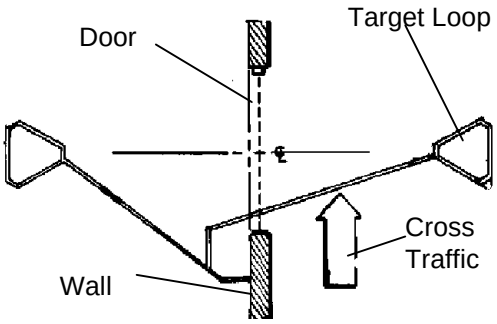

Figure 5

Loop Installation

Loops are generally installed by saw cutting the floor, installing wire and

sealing the wire into the cut. There are also preformed loops available in various sizes that can be installed during the installation of new floors.

Before installing the loop make sure the customer and dealer agree on the layout. Each application is different and many variables can affect the operation of the loop.

Installation Considerations

There are a number of things that can cause problems with loop operation. Avoid the following situations if possible.

Avoid installing the loop wires directly on metal objects such as reinforcing steel, conduits or pipes that are in the floor. Loop wires should be a minimum 2” above metal objects in the floor. Never run loop wires below metal objects. Metal objects running at right angles to the loop wires will have less effect on loop operation than metal running parallel to the loop wires.

Electrical cables or heat mats may cause false impulses to the loop resulting in erratic operation. Avoid installing loops around these objects.

If there are steel inspection covers or grids such as manhole covers in the area of the loop, sensitivity may be reduced. Also a cover may move due to vibration or traffic away from the door. The movement could be sensed by the loop causing the door to open when it shouldn’t.

Test Loop

⚠WARNING

The disconnect must be in the “OFF” position and properly locked and tagged before connecting the loop wires.

If there is any doubt about the potential operation of a loop, install a temporary loop on the floor before cutting the floor. Use the correct number of wraps of wire, tape the wire to the floor and protect the wire. Test with and without a typical vehicle. Also test the loop by turning on electrical equipment such as heat mats that are in the area. See the following instructions for the correct number of wraps. Refer to the schematic supplied with the door when making connections.

Layout the loop on the floor.

⚠WARNING

Check the floor for wires, heat mats or other hidden obstructions before cutting the concrete. Follow the saw operating procedures as outlined by the saw manufacturer.

Cut the floor using the proper saw and blade. A walk behind saw with a diamond, carbide or abrasive saw blade could be used. The groove should be 3/16” to 1/4” wide by 1-1/2” to 2” deep.

Cut the loop as it is laid out on the floor. Miter the corners. Avoid corners of less than 90 degrees. They put more strain on the wire and

may cause a highly sensitive area in the loop. The feeder slot allows the ends of the loop wire to run to the control box. It may have to be cut wider to allow for the twists in the feeder wire. See figure 6.

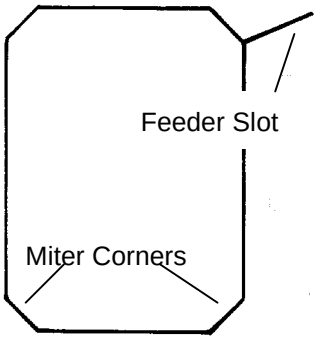

Figure 6

Clean and dry the slot in the floor.

Determine the number of turns of wire that should go into the loop. A loop is one continuous piece of wire wrapped around the slot in the floor a number of times. Using the wrong number of turns could affect the sensitivity of the loop. See the chart in Figure 7.

LOOP AREA (square feet)	NUMBER OF TURNS
6-12	6
12-20	5
20-60	4
60-240	3
240-up	2

Figure 7

The wire used should have a rating for direct burial. Use a wire with waterproof and abrasion resistant insulation. If moisture penetrates the insulation due to poor insulation or damage during installation the loop operation may be affected. The wire should be 16 gauge, 19 strand copper with crosslink polyethylene insulation (XLPE) or equivalent.

Install the wire in the slot. Allow enough wire for the feeder wire. The feeder wire will extend from the loop to the control box. Do not damage or twist the wire when it is placed in the slot. Wrap the wire around the loop the correct number of times. Twist the feeder wire a minimum of 5 twists per foot. The twists must extend back to the control box. Failure to twist the wire may result in erratic loop operation. The feeder wires can be routed to the control box in conduit after they leave the feeder slot cut in the floor. See figure 8.

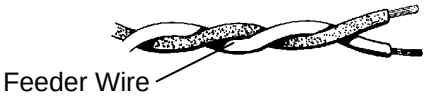

Figure 8

Splicing the wire or feeder is not recommended. If splicing is required the joint must be soldered and waterproofed.

If the loop is installed over an expansion joint or crack in the floor leave a loop in the wire at that point. The extra wire will allow the floor to move without breaking the wire. The saw cut may have to be expanded at that point to allow for the extra wire.

⚠WARNING

The disconnect must be in the "OFF" position and properly locked and tagged before connecting the loop wires.

To ensure that there are no problems with the loop connect the feeder wires to the terminal strip in

the control box and test the loop operation before sealing the slot in the floor. If you have two loops they are connected in parallel. Refer to the schematic supplied with the door when making connections. See the section on loop detector set up if required.

Fill the slot in the floor. The wires must be tight in the slot. If the wires are loose vibration may cause false activation of the loop. Use backer rod and sealant suitable for the application. Backer rod is a foam rod sized to fit snug in the slot. It holds the wire tight in the slot but will flex slightly if the floor shifts. The backer rod is installed over the wire and the sealant over the backer rod. The sealant should be somewhat flexible when cured but not soft enough to allow debris to be pushed through to the wire. The sealant should be Bondo P606 sealer or equivalent. Bondo speed set P610 is added if the loop is installed in a cold temperature (below freezing). Figure 9 shows wires sealed in the saw cut.

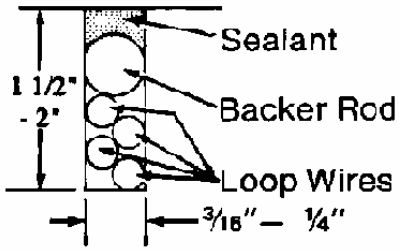

Figure 9

The loop should be ready for operation. Refer to the schematic supplied with the door when making connections. Adjust the detector as required. See Detector Set Up.

Detector Set Up

Figure 10 shows an overview of the loop detector. The detector shown is a 2-channel detector. A 1-channel detector will only have dip switches 1 – 4 and one red and one green LED. Settings are separate but adjusted the same way for both detectors.

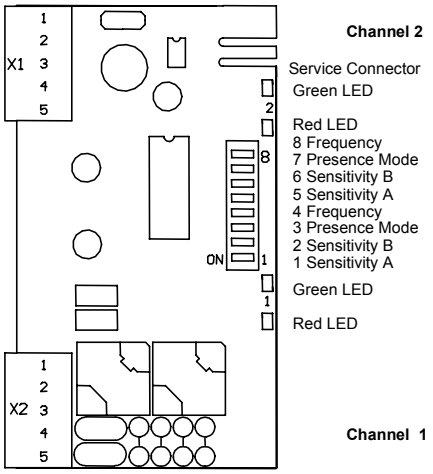

Figure 10

Sensitivity Adjustment

The sensitivity adjustment allows you to determine how much a vehicle has to change the loop field before the door will open. A higher sensitivity may be necessary to pick up smaller vehicles like bicycles while a lower setting will work for large fork trucks. Keep the setting as low as possible but high enough to pick up traffic passing through the door. If it set too high there may be false tripping of the loop. See figure 11 for sensitivity adjustments.

Sensitivity level	Channel 1: DIP-switch 1, 2 Channel 2: DIP-switch 5, 6
1 Low (0,27% Δf/f)	 **OFF/OFF**
2 (0,09% Δf/f)	 **ON/OFF**
3 (0,03% Δf/f)	 **OFF/ON**
4 High (0,01% Δf/f)	 **ON/ON**

Figure 11

Presence Mode

This setting allows you to determine how long a vehicle can be parked on the loop before the detector tunes the vehicle out and the door closes. Possible settings are 5 minutes or infinite. If the detector is set for 5 minutes a vehicle parked on the loop for more than 5 minutes will no longer be detected and the door will close. See figure 12 for settings.

Holding time	Channel 1: DIP-switch 3 Channel 2: DIP-switch 7
5 minutes	 **OFF**
infinite	 **ON**

Figure 12

Frequency

Crosstalk can happen between adjacent loops. During crosstalk the operation of one loop interferes with the operation of a loop close to it. Frequency settings are used to allow 2 loops installed close to each to work properly. The frequency settings of the 2 loop detectors should be different. Use figure 13 to adjust the frequency.

Frequency	Channel 1: DIP-switch 4 Channel 2: DIP-switch 8
low	 **OFF**
high	 **ON**

Figure 13

LED-Display

The LED's on the detector indicate various operating conditions of the detector. The green LED indicates the detector is operable. The red LED indicates the loop is activated. See figure 14 for the various conditions.

Green LED	Red LED	Detector Condition
Off	Off	No supply voltage
Flashes	Off	Indicates loop frequency – at start-up
On	Off	Detector ready, nothing detected
On	On	Detector ready, vehicle detected
Off	On	Problem with wiring in floor

Figure 14

Connections/Outputs

The input and output connections of the loop detector are done through plug-in connectors on the detector

and main control circuit board. Floor wiring connects to a terminal strip in the control box. Reference Figure 15 for terminals.

Control Type	Terminals Used
System 3	IL1, IL2 (Channel 1) IL3, IL4 (Channel 2)
Spiral Board	S1 (Channel 1) S2 (Channel 2)

Figure 15

Loop Troubleshooting

If there is a problem with loop operation check the following:

Determine if the detector operates properly.

If the detector is good and/or the detector LED's indicate a problem with the in floor wiring troubleshoot the floor wiring.

Look for loose connections in the control box or damage to the wire above the floor.

Check the wiring under the floor with an insulation tester or Meg Ohmmeter. A meg ohmmeter is capable of pushing high voltage through the wire, which will bleed through abrasions or cuts to ground. A standard meter is not capable of pushing the high voltage.

Check for continuity. Remove the feeder wires from the terminal strip. See figure 16.

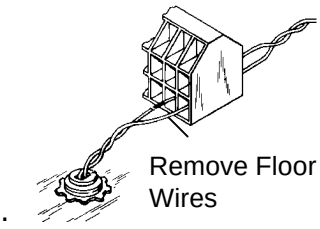

Figure 16

Measure continuity between the two wires. The meter reading should be near zero. The wire will have some resistance. A broken wire will show very high resistance. See figure 17.

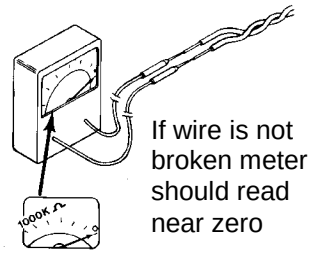

Figure 17

If the wire is not broken check for leakage to the conduit. There should be no leakage. See figure 18.

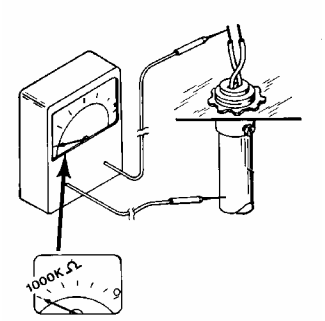

Figure 18

Check for leakage between the wire and floor. Scratch the concrete and measure between the floor and the wire. If the reading is anything but maximum indicates leakage. See figure 19.

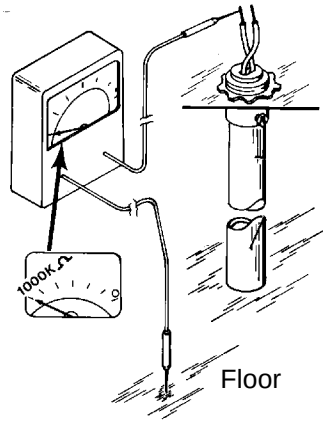

Figure 19

If you found leakage or a broken wire you most likely will have to replace the in floor wiring.