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WorkZone PreView[®] Sensor Manual

WZPV5210, WZPV5215
FPV5210, FPV5215
Operating Manual

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FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the **party responsible for compliance could void the user's authority to operate** the equipment.

NOTE: This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference.

PATENTS

Patented under one or more of the following U.S. Patents:

5345471, 5523760, 5457394, 5465094, 5512834, 5521600, 5682164, 5630216, 5510800, 5661490, 5609059, 5774091, 5757320, 5581256, 5832772, 5519400, 5767953, 5767627, 5589838, 5563605, 5661385, 5517198, 5610611, 5883591, 5805110, 5754144, 7088284, and 7215278.

Other patents have been applied for.

TRADEMARKS

The names of actual companies and products mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

Product Description

The WorkZone PreView® is a solid-state, pulsed radar object detection system designed to alert vehicle operators to the presence of obstacles. The sensor detects both moving and stationary objects in a pre-defined coverage area and can report the distance of the closest object via visual range indicators (display) and an audible signal (display or buzzer) to the vehicle operator. See separate display and/or buzzer manual and installation guide as applicable.



Sensor/Antenna Description

The antenna assembly transmits and receives low power 5.8GHz radar signals. It then processes the returned signals to determine if an object has reflected any energy back to the sensor and reports this to the operator display mounted in the vehicle cab. The sensor is designed to process and report detections within ½ of a second allowing the vehicle operator to quickly respond to any object within the detection zone. All connections to a vehicle are accomplished at the sensor. Power is typically obtained from the vehicle reverse lights.

The WorkZone PreView® sensor has a continuous Built In Self Test which notifies the operator of sensor failure within a fraction of a second.

Object Detection Capability

The PreView® System is a blind spot collision warning system designed to supplement other safety practices and/or devices. The machine operator is always the first line of defense when safely operating a vehicle.

The detection distance for the WZPV5210 & FPV5210 is 10FT (3M) & the WZPV5215 & FPV5215 is 15FT (4.5M). The WorkZone PreView® system can detect most objects within this detection zone. However, there are some instances where objects can go undetected. Obstacle size, shape, relative location, and composition are all factors determining if, when and where an object is detected. The PreView® system operates by transmitting a pulse of very low power electromagnetic energy. Any energy that strikes an object reflects a certain amount of this energy back to the PreView® sensor. If the returned energy is of sufficient magnitude, it is used to indicate object presence and determine the object's distance. While the PreView® system can resolve multiple objects, only the object closest to the vehicle is reported since it represents the most significant collision threat.

The amount of energy returned is based on a few factors:

Size - a larger object usually reflects more energy than a smaller object.

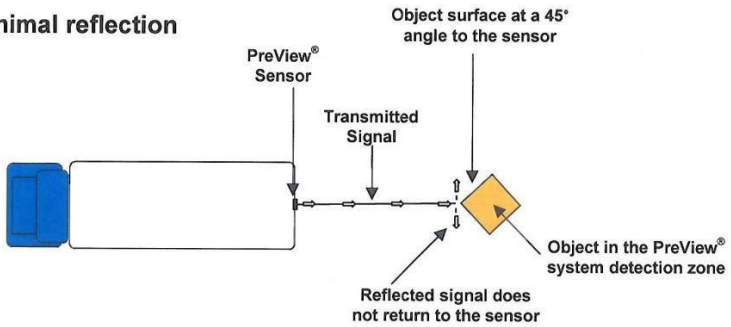
Composition - a metal object typically reflects more energy than a non-metallic object. A metallic object at the edge of the maximum detection zone might be detected, whereas a wood object may not.

Scattering - a solid object reflects more energy than a non-solid object such as tree branches, gravel, bushes, etc.

Shape - complex shapes cause energy to be returned in a very non-uniform way. Very small variations or movement can change detection status.

Angle - an object flat side perpendicular to the sensor will reflect more energy than an object at an angle. See below for an example of how angle can affect return energy.

Minimal reflection



Full reflection

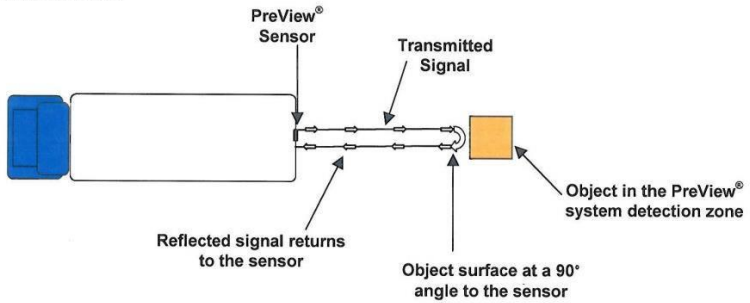


Figure 1. Object Reflection

Sensor Installation

Sensor/Antenna Location

The WorkZone PreView® sensor mounting location is integral to proper system operation. Ideally the sensor should be mounted on the rear as close to the center of the vehicle as possible at roughly 36" (1M) +/- 12" (0.3M) above the ground. The sensor face should be perpendicular to the ground with the "PreView" graphic in normal position. Select a location that will provide some protection from impact and debris while allowing an unobstructed view of the target hazard area.

IMPORTANT!

Before permanently installing the PreView® Sensor on the vehicle, verify that the selected sensor mounting location provides a clear detection zone. Temporarily attach the sensor in the proposed mounting location, apply power to the system, and verify that nothing is being detected. See display manual.

Sensor/Antenna Mounting

1. See Installation Guide and supplied manuals.
2. Select the appropriate sensor mounting location.
3. The correct mounting configuration is with the sensor's text in normal reading position.
4. Using the drill template, scribe position marks through the holes. Drill 1/4" (6mm) holes centered at the marks.
5. A 1" diameter clearance hole is required for the sensor connector and mating cable connector.
6. Secure the sensor to the vehicle with the four supplied 10-24 UNC button head screws, washers and nuts or equivalent. Apply a maximum torque of 22 in-lbs when securing the sensor.

Sensor Power Connection

Refer to installation guide for further details.

The sensor mating connector is fully waterproof if mated properly. The cable connector requires the collar (coupling ring) to be turned to the right until it locks. This may be difficult to do if the space is tight. Minimize the cable bend radius to six inches if possible to eliminate strain on the connector.

Aux. Output Electrical Connection

This sensor provides an auxiliary output that can be used to activate an external backup alarm or other device (blue wire). Depending on the system ordered, the cable provided may or may not have provisions to access this output. The aux. output is activated whenever an object is detected. The output is switched from a high impedance state to ground when active and is protected against an over current condition. The maximum operating current is approximately 1 amp, this includes any inrush current. For alarms or other devices that meet the 1 amp maximum current, connect the aux. output wire on the interconnect harness to the ground wire of the alarm or device. For alarms or devices that exceed the 1 amp current limit an intermediary relay must be used.

PreView® Daily Maintenance

Detach this page and place with daily operator maintenance procedures.

Safety Message to Operators of Vehicles with PreView® Systems

1. The PreView® system is intended as an Object Detection System and should not be relied upon as your first line of defense for the safe operation of the vehicle. It should be used in conjunction with established safety programs and procedures to augment the safe operation of the vehicle, ground personnel, and adjacent property. Should the system become inoperative, it could jeopardize the safety or lives of those who depend on the system for safety.
2. Testing and inspection of the system in accordance with these instructions and record of the results should be listed on the daily maintenance report. The units on operating vehicles must be tested each day prior to the vehicle's operation. Results of this test must be recorded in the maintenance log.
3. People operating this equipment MUST check for proper operation at the beginning of every shift or safety inspection period.
4. People's lives depend on the proper installation of this product in conformance with these instructions. It is necessary to read, understand and follow all instructions shipped with the product.
5. Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.
6. The PreView® Object Detection System is intended for commercial use. Proper installation of a back-up aid requires a good understanding of truck electrical systems and procedures, along with proficiency in the installation.
7. Store these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

Testing and Maintenance

NOTE: A walk around test shall be performed every day to verify proper function of the system and to familiarize the operator with the zone of detection. More frequent inspections should be performed when:

- The vehicle is operating in a particularly dirty or harsh environment.
- The operator has reason to suspect the system has been damaged.

This test should be performed with two people, one who remains in the cab (the operator), and one who walks through the sensor field at the rear of the vehicle (the assistant).

1. Clean the sensor face of any accumulation of dirt, mud, snow, ice, or debris.
2. Visually inspect the attached wiring and cable and verify that they are properly secured, not chafing or dangling free where they could become snagged and damaged. Inspect the Radar Sensor and Operator Display Module and verify that they are securely attached to the vehicle.
3. Set the park brakes, start the vehicle, depress and hold the vehicle brake and place the vehicle in reverse.
4. Verify the green "POWER" light is illuminated on the in-cab display.
5. The area to the rear of the vehicle should be clear of obstacles for a distance of 8 meters. If the display shows any indicator other than the green light then there are objects to the rear of the vehicle that will interfere with the test. Move the vehicle to a clear area and proceed.
6. The assistant should move to just behind the rear corner of the vehicle in sight of the operator's mirrors. He should then walk toward the centerline of the vehicle parallel to the rear, while the operator notes when the display buzzer sounds, signifying the sensor has detected the object.
7. The assistant should continue walking through the area at the rear of the vehicle while the operator notes the area that detection occurs.
8. Next, walk from the center of the rear of the vehicle straight back, away from the vehicle. When the display quits sounding the detection limit has been reached.
9. Move halfway back and remain still for a few seconds, the display should continue to sound, demonstrating the system's ability to detect a still object.
10. The assistant should walk the complete rear of the vehicle while the operator notes the detection edges of the entire coverage area.
11. After the test the operator and the assistant need to communicate the details on the detection zone.

For questions, call +1.844.787.2327 toll free in the USA. Call +1.208.323.1000 or send a fax request to +1.208.323.1034 for outside the USA, or submit an online request at www.precos.com/contact-us/

A safety specialist will respond within 24 hours.

Specifications

SENSOR SPECIFICATIONS (Typical)

Transmitter:	Pulsed RF transmitter at 5.8GHz operating under FCC Part 15.249
Electronics:	Solid state
Connector:	Conxall 72x1-8PG series
Sealing:	Encapsulated to protect from dust and moisture to IP67.
Housing Material:	Polycarbonate radome
Dimensions:	4.38"H x 9.24"W x 1.75"D (11.1cm x 23.5cm x 4.4cm)
Weight:	1.92 lb. (0.87 kg)
Operating Temperature:	-40°F to +185°F (-40°C to +85°C)
Vibration:	25G RMS all three axes
Shock:	25G all three axes
Mounting:	Four 0.25" (6.4mm) diameter holes on 8.54" horizontal centers and 2.00" vertical centers. Unit is supplied with #10 SS screws for mounting purposes. Recommended torque is 22 inch-lbs.

ELECTRICAL SPECIFICATIONS

Input Voltage:	9-33VDC, over voltage protected to 150V
Input current:	0.2 amp maximum, inrush current limited to 1A
Polarity:	Negative ground, Polarity protected to 150V
Power Connection:	Two 20 AWG wires, connect to reverse signal lamp circuit

OPERATING CHARACTERISTICS

Detection Range:	WZPV5210 & FPV5210 - 10 feet (3m) WZPV5215 & FPV5215 - 15 feet (4.5m)
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COMMUNICATION

Physical Layer:	CAN 2.0B, 250 KB/s
Protocol Layer:	SAE J1939 Extended
Data Update Rate:	70 ms

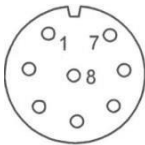
MAINTENANCE

Daily: Follow test and maintenance procedure.

REGULATORY COMPLIANCE

Compliant with FCC Part 15.249 (5725-5875MHz)	
FCC ID:	OXZWZPV2009
'CE' 'E' Mark	E11 10R-045212

PRODUCT MANUFACTURED IN THE USA



MATING END VIEW

CONNECTOR PIN OUT	
PIN	SIGNAL NAME
1	CAN HIGH
2	CAN LOW
3	BATTERY PWR INPUT (+)
4	GROUND
5	DISPLAY PWR OUTPUT (+)
6	DISPLAY GROUND
7	N/C
8	N/C

Warranty Information

MANUFACTURER STANDARD LIMITED WARRANTY AND LIMITATION OF LIABILITY

Manufacturer warrants that on the Date of Purchase this Product will conform to Manufacturer's published specifications for the product, which are available from Manufacturer on request, and Manufacturer warrants that the product is free from defects in materials and workmanship. This Limited Warranty for sensor extends for sixty (60) months from the date of purchase. Manufacturer will, at its option, repair or replace any product found by Manufacturer to be defective and subject to this Limited Warranty.

This Limited Warranty does not apply to parts or products that are misused; abused; modified; damaged by accident, fire or other hazard; improperly installed or operated; or not maintained in accordance with the maintenance procedures set forth in Manufacturer's Installation and Operating Instructions.

To obtain warranty service, you must ship the product(s) to the specified Manufacturer location within thirty (30) days from expiration of the warranty period. To obtain warranty service, call PRECO Electronics® Customer Service at +1.866.977.7236 or +1.208.323.1000, or fax your request to +1.208.323.1034. Customer Service will issue warranty authorization and further instructions. You must prepay shipping charges and use the original shipping container or equivalent.

EXCLUSION OF OTHER WARRANTIES: MANUFACTURER MAKES NO OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY. THE IMPLIED WARRANTIES FOR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED AND SHALL NOT APPLY TO THE PRODUCT. BUYER'S SOLE AND EXCLUSIVE REMEDY IN CONTRACT, TORT OR UNDER ANY OTHER THEORY AGAINST MANUFACTURER RESPECTING THE PRODUCT AND ITS USE SHALL BE THE REPLACEMENT OR REPAIR OF THE PRODUCT AS DESCRIBED ABOVE.

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Manufacturer shall have no further obligation or liability with respect to the product or its sale, operation and use, and Manufacturer neither assumes nor authorizes the assumption of any other obligation or liability in connection with such product.

This Limited Warranty gives you specific legal rights, and you may also have other legal rights, which vary, from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

Any oral statements or representations about the product, which may have been made by salesmen or Manufacturer representatives, do not constitute warranties. This Limited Warranty may not be amended, modified or enlarged, except by a written agreement signed by an authorized official of Manufacturer that expressly refers to this Limited Warranty.

PreView® Add-On Options:

PreView® Plus Camera/Monitor System – Ultimate safety and object detection system configurable with up to 4 cameras and 24 sensors.

PreView® Safety Alert System – The PreView® Radar Sensor detects an object in the blind spot. Once the object is detected, PreView® triggers the back-up alarm to either increase the sound of the alarm OR change the beep rate to alert pedestrians outside of the vehicle of the danger.

Custom System Configurations – Thanks to the advanced engineering by the PRECO Electronics® Engineers, the technology behind PreView® sensors can easily integrate or control your vehicles existing or new safety systems.



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