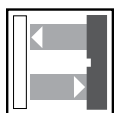




FE7W Series Collision Avoidance Sensors

- Collision avoidance sensor for Automatic Guided Vehicles (AGVs)
- Multiple scanners enclosed in a single housing
- 3-lobe scanning—one frontal and two 45° side scanners
- 8 operating frequencies



Diffuse Mode

See page 728

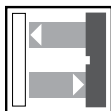
Sensing Range: 3 m

Outputs: NPN, PNP

Two independently adjustable scanning zones enable 2-stage operation.

1. When an object is detected in the first zone (output 1), up to 3 meters, the AGV speed is reduced.
2. When an object is detected in the second, shorter zone (output 2), up to 2.5 meters, the AGV stops.

See pages 728-730 for FE7W Series specifications, wiring and dimensions.



Diffuse Mode

Specifications

SENSING RANGE	3 m	3 m
SENSITIVITY ADJUSTMENT	Yes	Yes
MODEL NUMBER(S)	FE7W-DA5K •	FE7W-DB5K
	FE7W-DA5K-907* •	—
	FE7W-DD5K	FE7W-DE5K
OUTPUT: Transistor	-DA or -DB	NPN normally open
	-DD or -DE	PNP normally open
LOAD CURRENT	100 mA max.	100 mA max.
VOLTAGE DROP	≤ 1 VDC	≤ 1 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION	Yes	Yes
REVERSE POLARITY PROTECTION	Yes	Yes
SUPPLY VOLTAGE	18-30 VDC	18-30 VDC
LED(s)	Yes (3)	Yes (3)
CURRENT CONSUMPTION	≤ 70 mA	≤ 70 mA
OPERATING MODE	Light on	Dark on
RESPONSE TIME	≤ 80 ms	≤ 80 ms
READINESS DELAY	≤ 100 ms	≤ 100 ms
SWITCHING FREQUENCY	6 Hz	6 Hz
PROTECTION (IEC)	IP64	IP64
LIGHT SOURCE	Infrared LED	Infrared LED
AMBIENT LIGHT RESISTANCE	≤ 10,000 lux	≤ 60,000 lux
TEMPERATURE RANGE	WORKING	+14 °F to +140 °F
	STORAGE	-4 °F to +158 °F
HOUSING MATERIAL		Polycarbonate
	LENS	Plastic
APPROVALS	CE UL SP	CE UL SP
ELECTRICAL CONNECTION	2-meter cable, PVC covered, 10-conductor, #22 AWG	2-meter cable, PVC covered, 10-conductor, #22 AWG
ADDITIONAL DATA	See pages 729-730	

*-907 indicates three triple-turn potentiometers for increased resolution. Other versions have three single-turn potentiometers.

- ⚡ Stocked item
- Typical delivery 4 weeks or less
Consult factory for all other models

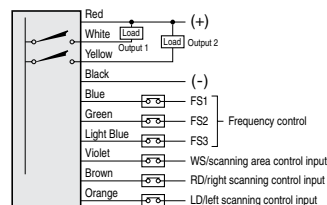
Wiring Diagrams

DC



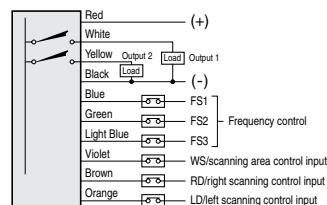
Cable Connection

FE7W-DA5K, FE7W-DB5K



OUTPUT 1: Front far lobe
OUTPUT 2: Front near lobe and side lobes

FE7W-DD5K, FE7W-DE5K



OUTPUT 1: Front far lobe
OUTPUT 2: Front near lobe and side lobes

Note:

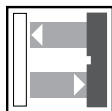
Control inputs ON ≤ 1.5V, OFF ≥ 5V

Wiring:

1. Wire the supply and sensor load per the circuit diagram
2. To activate the special features of the FE7W, which include frequency selection (FS1, FS2, and FS3), beam width changeover (WS), and the right and left scanning lobes (RD and LD), the specific control inputs must be used.
3. The power supply and output cable should not be wired in the same conduit with AC control wiring. Either place the wiring in a separate conduit or with wiring to other low voltage, low current solid state devices.
4. Terminate leadwire with devices that provide a solid mechanical connection, e.g., crimp style terminals, self-lifting pressure plates.
5. Leadwire can be extended up to 100 meters. When extending leads, use #22AWG or larger leadwires

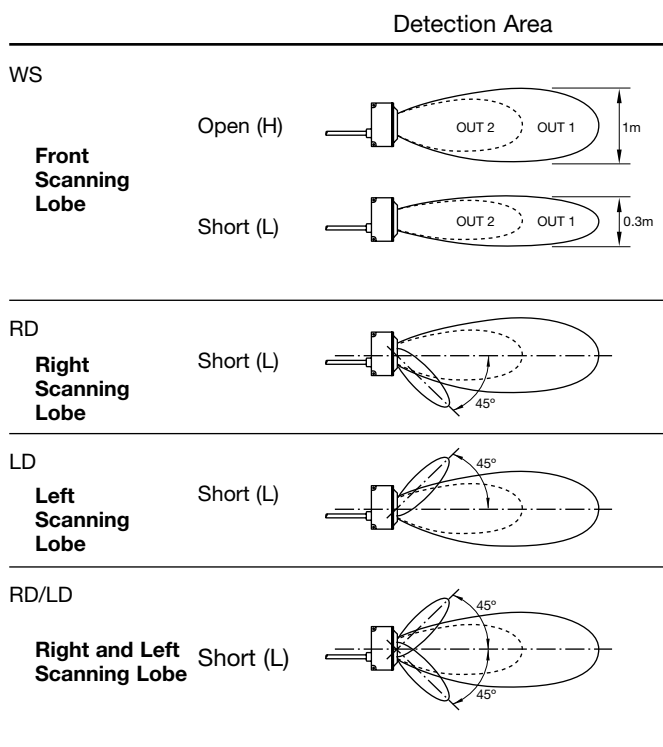
When extending leadwires, consider how the resultant voltage drop or potential noise pickup may affect your application.

6. If a voltage regulator is used for the power source, it should be well grounded.



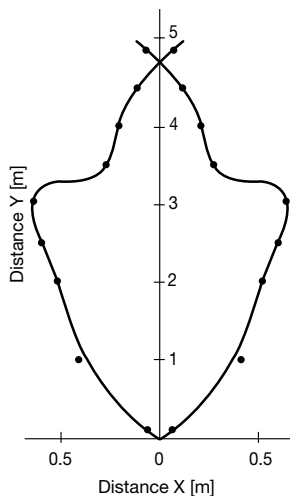
Diffuse Mode

EXTERNAL CONTROL INPUT

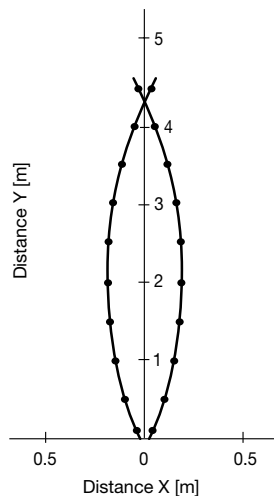


BEAM DIAMETER

Wide Beam

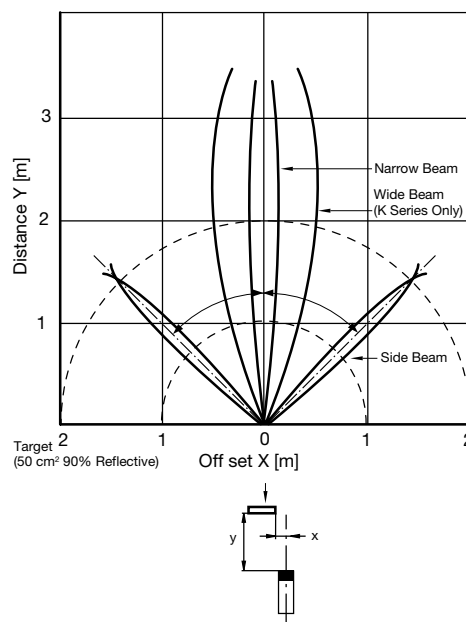


Narrow Beam

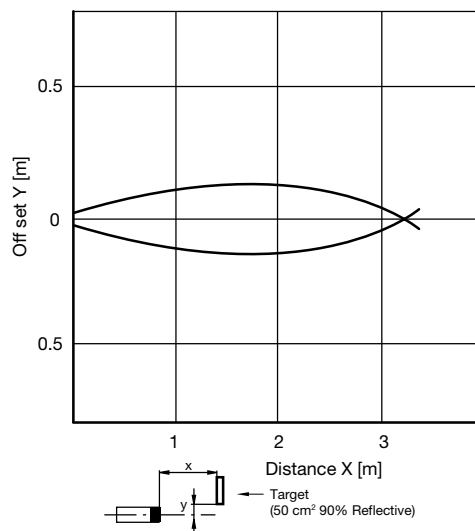


EFFECTIVE BEAM SHAPE

Horizontal (Top view, typical)



Horizontal (Side view, typical)



Frequency Changoer Code Table

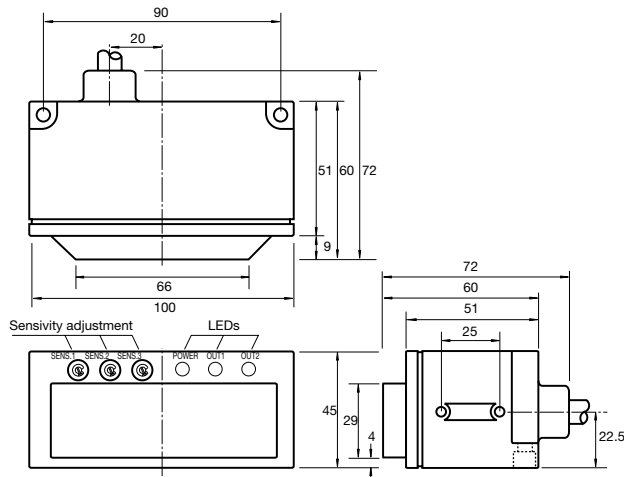
Each numbered frequency below corresponds with a specific operational frequency

	1	2	3	4	5	6	7	8
FS1 Input	○	○	○	○	●	●	●	●
FS2 Input	○	○	●	●	○	○	●	●
FS3 Input	○	●	○	●	○	●	○	●

○ ≥5VDC ● ≤1.5VDC

Dimensions (mm)

FE7W-DA5K, FE7W-DA5K-907, FE7W-DB5K



Mounting

- The FE7W is a long-range diffuse (proximity) scan device. Since a 3 meter diffuse scan control can see a 76mm diameter reflector at a distance of over 30 meters, take extreme care to prevent a shiny object or reflector from being in the path of the FE7W light beam. Building walls and wall hangings should be painted in matte finish, dark colors (preferably black) to help prevent the beam from reflecting back to the sensor and inadvertently operating stop or slow functions, particularly when an AGV is making a turn.

Notice

- If more than one FE7W is being used in the same area, assign different frequencies to them to prevent sensors from interfering with each other (refer to the frequency changeover code tables).

To prevent mutual interference, the FE7W Series permits use of up to eight different light pulse frequencies. If your system requires nine or more frequencies, merely adjust the frequencies within each specific work area as the AGVs arrive to help prevent no more than eight vehicles from being in the same vicinity at any time.
- If other photoelectrics are used in conjunction with the FE7W, their beam trajectory should be carefully oriented to minimize possible interference. The right/left sensing lobe, in particular, must be protected from interfering light as the AGVs maneuver through their service routes.

Sensitivity Adjustment

- The detection distance of this diffuse scan photoelectric sensor is dependent on the shape, size, and color of the target object. Scan range is increased when the object to be detected is brighter (more reflective), larger, or more perpendicular to the FE7W.
- Since the sensitivity adjustment and emitter/receiver are both located in the front of the housing, take care that your hand does not interfere with the beam when setting the range.
- The sensitivity of outputs 1 & 2 (OUT 1 & 2) can be adjusted independently of each other. We recommend adjusting OUT 1 (longer distance) first to check for the possible influence of background and surroundings, then adjust OUT 2.
- Use the furnished screwdriver to adjust sensitivity. Place object to be detected at a specified position and gradually turn sensitivity control variable resistor clockwise from the extreme counterclockwise position.

Keep turning until the operation indicator lights up or the output is changed from OFF to ON for light operate versions (ON to OFF for dark operate). Adjust each of the two detection zones in this manner. The LED indicators for OUT 1 & 2 are light-operated alignment indicators.

- After completing sensitivity adjustment, check the adjustment with the object removed to be sure the sensor was not influenced by the background and surroundings. Repeat this confirmation throughout the entire routing of the AGV.
- If you find the sensitivity adjustment was influenced by the background or surroundings, determine whether: 1) the detection distance should be reduced or, 2) the interfering object should either be removed, repositioned, or made less reflective by changing its angle or color. Refer to the section on mounting, item 1.
- The right and left sensing lobes (FE7W-DB5K and FE7W-DE5K listing only) have a common sensitivity adjustment. Both sides must be adjusted at the same time.
- When neither left nor right detection is required, turn the SENS.3 variable resistor fully counterclockwise (OFF position).
- When detection width switching (WS) is activated, the widths of both OUT1 and OUT 2 are changed simultaneously.
- To prevent tampering after the sensitivity pots have been set, cover them with the furnished rubber cap inserts.