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DDV1016AM(-D)-N Dual Detector Installation Sheet

EN DA DE ES FR IT NL PL PT SV

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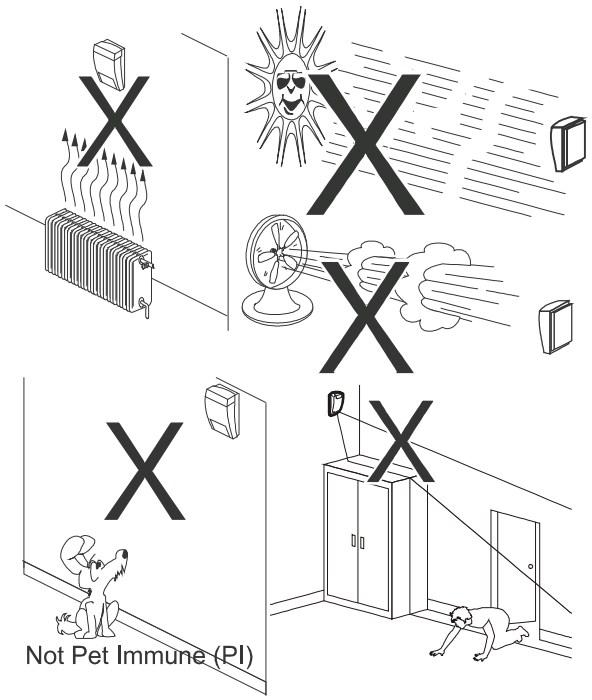

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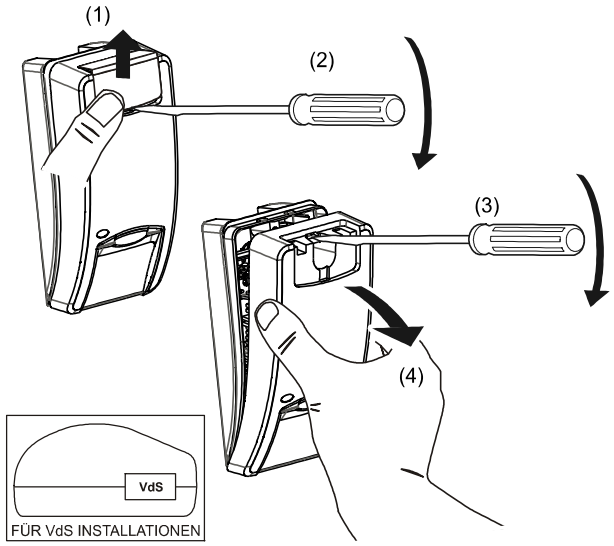

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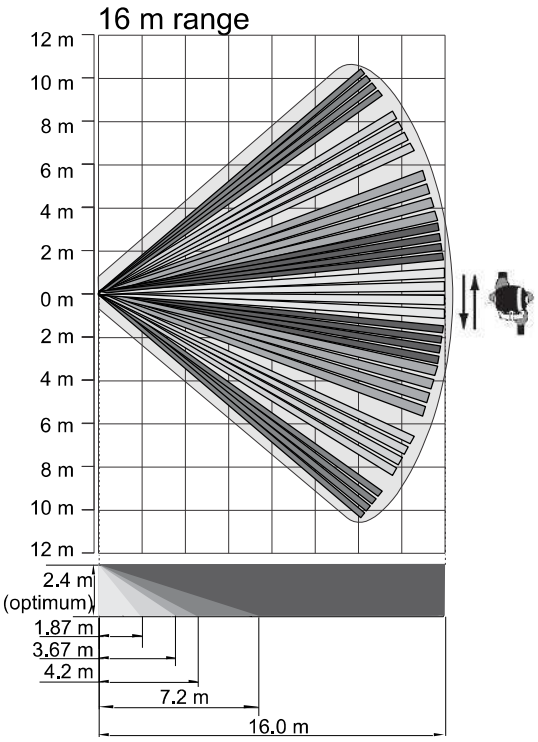

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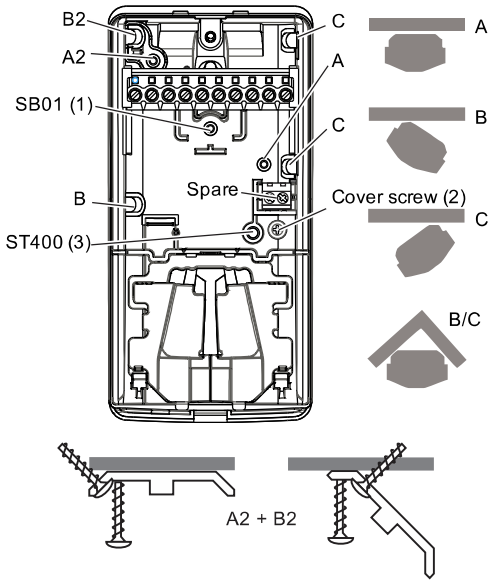

Note for INCERT installations: Outer curtain sets (1 and 9) have 12 m range.

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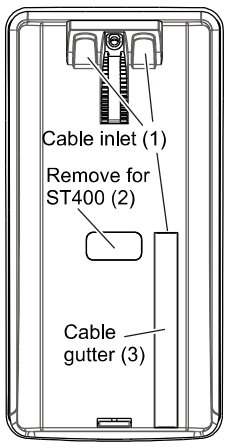

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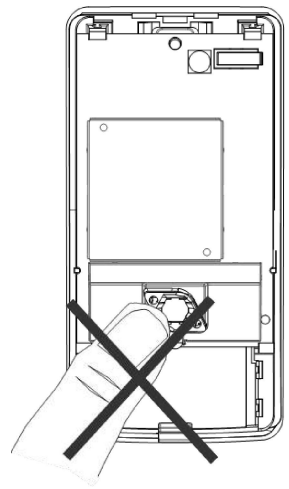

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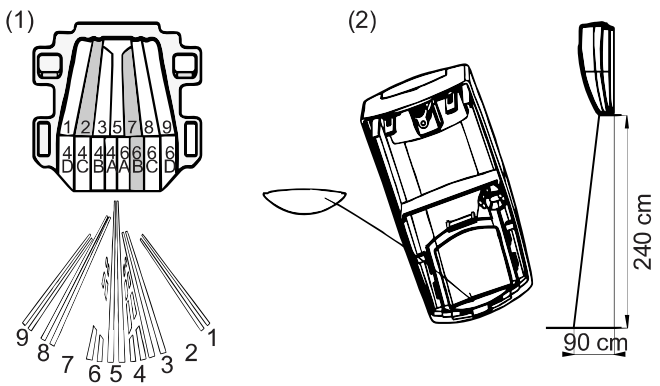

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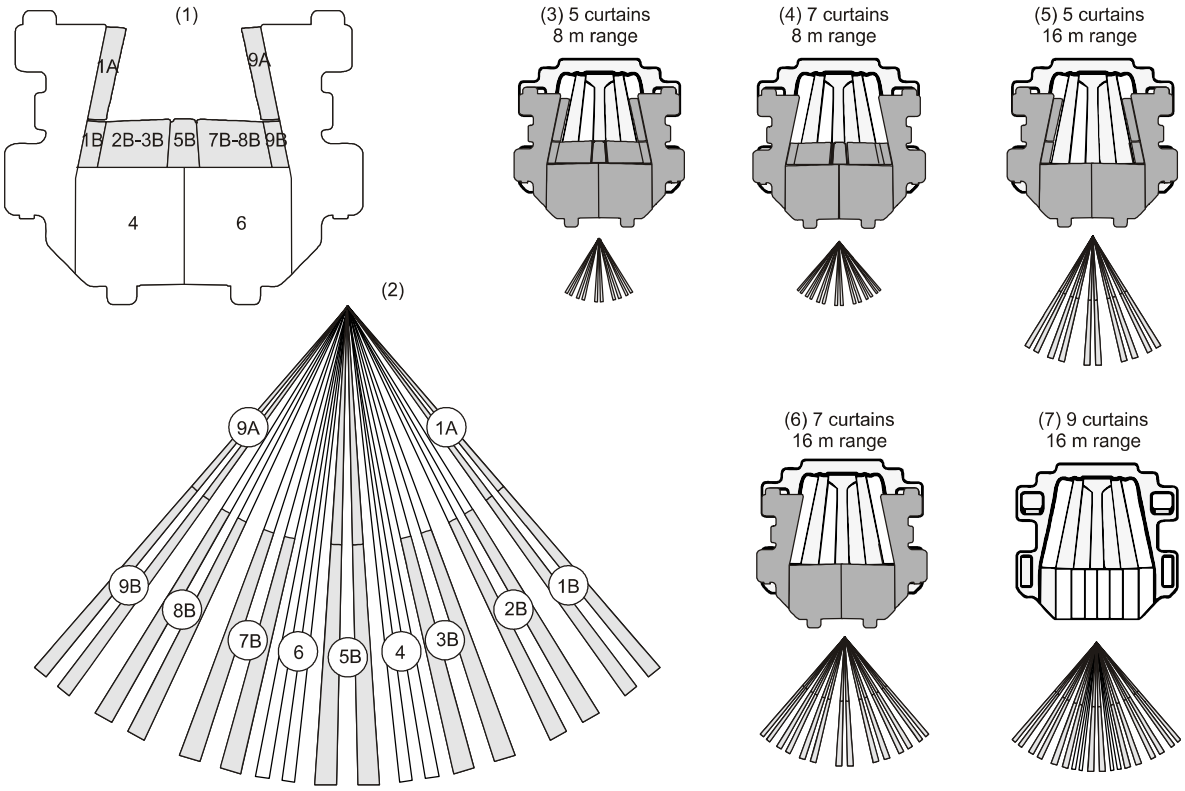

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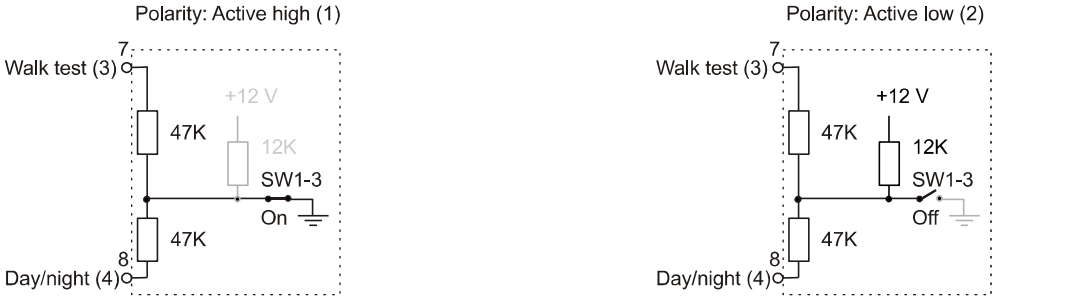

Walk test On = Pin 7 to +12 V
Walk test Off = Pin 7 to GND or floating
Night (armed) = Pin 8 to +12 V
Day (disarmed) = Pin 8 to GND or floating

Walk test On = Pin 7 to GND
Walk test Off = Pin 7 to +12 V or floating
Night (armed) = Pin 8 to GND
Day (disarmed) = Pin 8 to +12 V or floating

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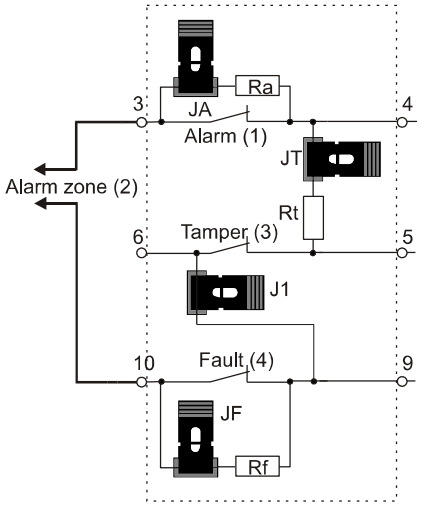

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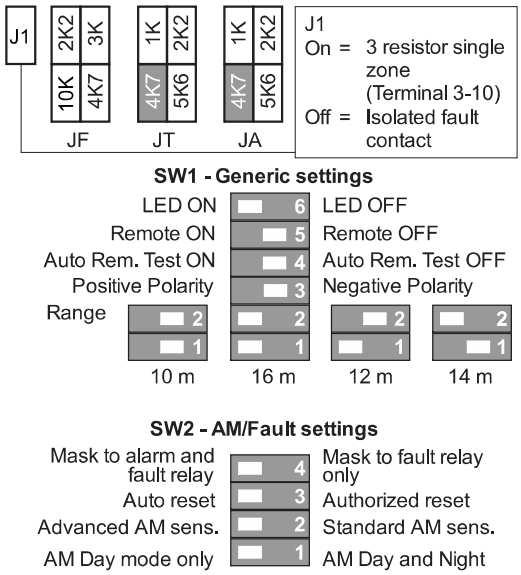

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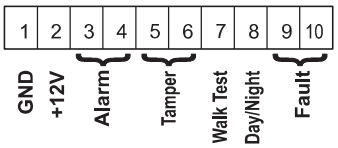

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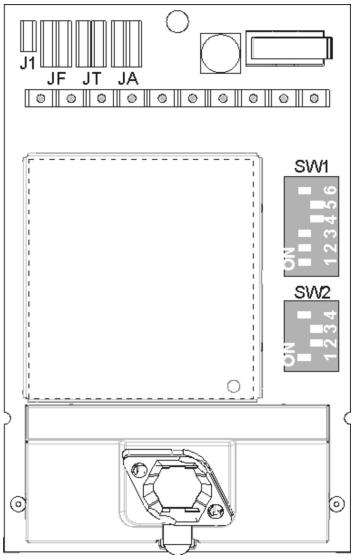

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Single zone EOL

Zone state	Value	Default
Tamper (short)	0 Ω	0 Ω
Normal	Rt	4.7 kΩ
Alarm	Rt+Ra	9.4 kΩ
Fault	Rt+Rf	14.7 kΩ
AM*	Rt+Ra+Rf	19.4 kΩ
Tamper (open)	∞	∞

* SW2-4 must be set to On.

EN: Installation Sheet

Description

DDV1016AM(-D)-N is a dual AM motion sensor.

It combines the patented PIR mirror optics technology with the patented Range Controlled Radar technology.

Installation guidelines

See Figure 1.

The detector is intended to be mounted on walls but can also be mounted on ceilings by using a mounting bracket.

Use the following guidelines to determine the best location to install the detector.

- Mount the detector so the expected movement of an intruder is across the detection pattern (see Figure 3).
- Mount the detector at a stable surface. For the allowed mounting height, see “Specifications” on page 7.
- Do not mount the detector within 0.5 m of metallic objects or within 1.5 m of fluorescent lights.
- Do not place objects in front of the detector that may prevent a clear line of sight.
- Place detectors at least 6 m apart, and use the short-range setting to avoid interference, when mounting detectors face to face.

The dual technology processing of this detector is very resistant to false alarm hazards. However, avoid potential causes of instability, such as:

PIR hazards:

- Direct sunlight on the detector
- Heat sources within the detector field of view
- Strong air draughts onto the detector
- Animals in the field of view
- Obscuring the detector field of view with large objects, such as furniture

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Microwave hazards:

- Mounting surface susceptible to vibrations
- Metal surfaces reflecting microwave energy
- Water movement through plastic pipes
- Moving or vibrating objects like fans, heating or air-conditioning ducts

AM hazards:

- Moving objects less then 1 m in front of the detector
- Small insects on the detector
- Modern fluorescent lighting in close proximity (within 1.5 m)

WARNING! The equipment is not earthed. Any external circuit connected to the equipment must be located within the same building and connected to a protective earthing conductor.

Wire insulation of cables connected to the equipment must conform to IEC 60332-1-2 and IEC 60332-1-3 or IEC 60332-2-2, depending on the wire cross sectional area, or IEC TS 60695-11-21, regardless of cross sectional area. Alternatively, such wires must comply with UL 2556 VW-1.

The detector power supply source must be power limited at 15 W.

We recommend that the detector is regularly walk tested and checked at the control panel.

To install the detector:

1. Lift off the custom insert (see Figure 2, items 1 and 2).
2. Using a screwdriver, carefully prise open the detector (see Figure 2, items 3 and 4).

   Caution: Do not touch the pyroelectric sensor (Figure 6).
3. Take out the cover screw (Figure 4, item 2).
4. Fix the base to the wall. For the allowed mounting height, see “Specifications” on page 7.

   See Figure 4. In all positions use a minimum of two M4 screws from the standards DIN 7505B, DIN 96, DIN 7996, or a screw with a head with 8 mm diameter and a flat surface.

   - For flat mounting, use screws in positions A.

   - For corner mounting, use screws in position B or C.

   Note for EN 50131 Grade 3 installations: Do not use mounting position C. It is required to use both mounting holes A2 and B2 for mounting positions A and B.

   - To install the pry-off tamper ST400, use mounting positions A. ST400 mounting position is shown as item 3 in Figure 4. Open the outlet in the back plate (Figure 5, item 2).
5. Wire the detector (see Figures 4 and 12). Use back plate cable inlets (Figure 5, item 1) and cable gutter (Figure 5, item 3).
6. Select the desired jumper and DIP switch settings. See “Setting the detector” below for more information.
7. Remove the blinders and add the stickers, if required. See “Configuring the coverage pattern” on page 6 for more details.
8. For ceiling-mount applications, use the SB01 swivel-mount bracket. SB01 mounting position is shown as item 1 in Figure 4.

   Note: Using SB01 is not compliant with EN 50131 Grade 3 installations.
9. Close the cover, insert the cover screw, and place the custom insert.

Connections

See Figure 12.

Table 1: Detector Connections

Terminal	Label	Explanation
1, 2	GND, +12V	Power supply connection (9 to 15 V⎓, 12 V⎓ nominal)
3, 4	ALARM	Alarm relay output (33 Ω). Use jumper JA to set the onboard EOL resistor in series with the relay. See “Jumpers” below.
5, 6	TAMPER	Tamper switch output (0 Ω). Use jumper JT to set the onboard EOL resistor in series with the switch. See “Jumpers” below.
7	Walk test	This input enables and disables the LED (walk test On/Off). Walk test mode can only be entered when detector is in Day mode (pin 8). Active high or low is determined by SW1-3 (see “SW1-3: Polarity” on page 5).
8	Day / Night	This input switches the detector in day (show memory on the LED indicator) or night mode (activates the alarm memory and clears previous stored alarms). Active high or low polarity is determined by SW1-3 (see “SW1-3: Polarity” on page 5).
9, 10	Fault	Fault Relay output (33 Ω). Use jumper JF to insert one of the on-board EOL resistors in series with the relay. See “Jumpers” below for the correct resistor settings.

Notes

- Inputs 7 and 8 are only useable when SW1-5 is set to Remote on. See “SW1-5: Remote functionality” on page 6.
- The LED is only enabled when SW1-6 is set to LED on.

Figure 10 explains how to create a single zone with multiple resistor configuration.

Figure 10

(1) Alarm relay
(2) Alarm zone
(3) Tamper switch output
(4) Fault relay

Ra Alarm EOL resistor
Rt Tamper EOL resistor
Rf Fault EOL resistor

Setting the detector

See Figure 13 for jumpers and DIP switch location.

Jumpers

Jumpers set onboard EOL mode and value. The circuit is shown in Figure 10.

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JA: Set onboard alarm EOL resistor (Ra)

1 kΩ

2.2 kΩ

4.7 kΩ (factory default)

5.6 kΩ

Off: No onboard alarm EOL.

JT: Set onboard tamper EOL resistor (Rt)

1 kΩ

2.2 kΩ

4.7 kΩ (factory default)

5.6 kΩ

Off: No onboard tamper EOL.

JF: Set onboard fault EOL resistor (Rf)

2.2 kΩ

3 kΩ

10 kΩ

4.7 kΩ

Off: No onboard fault EOL (factory default).

J1: Set zone EOL mode

On: 3-resistor single zone.

Off: Isolated fault contact and 2-resistor zone.

Configuring the zone

To set up the zone, apply the following guidelines.

- Select appropriate EOL resistor values with JA, JT and JF. For example, setting of jumper JT determines Rt value.
- For isolated outputs remove JT and J1.
- Remove jumpers JA, JT and JF to exclude onboard EOL values.
- For dual resistor setting remove J1 and use terminal 3 and 6.

For a single zone with all onboard resistors set, the zone resistance can be the following.

Table 2: Zone resistance values

Zone state	Value	Default
Tamper (short)	0 Ω	0 Ω
Normal	Rt	4.7 kΩ
Alarm	Rt+Ra	9.4 kΩ
Fault	Rt+Rf	14.7 kΩ
AM	Rt+Ra+Rf	19.4 kΩ
Tamper (open)	∞	∞

DIP switches

Table 3: SW1, general settings

Switch	Values	
6: LED	On: LED on*	Off: LED off
5: Remote	On: Remote on	Off: Remote off*
4: Auto remote test	On: Auto remote test enabled	Off: Auto remote test disabled*
3: Polarity	On: Positive polarity	Off: Negative polarity*
1, 2: Radar range	1 On, 2 On: 16 m* 1 Off, 2 On: 14 m	1 On, 2 Off: 12 m 1 Off, 2 Off: 10 m

* Factory default

Table 4: SW2, AM settings

Switch	Values	
4: AM signalling	On: AM to fault and alarm relays*	Off: AM to fault relay only
3: Reset	On: Auto reset*	Off: Authorised reset
2: AM sensitivity	On: Advanced AM sensitivity*	Off: Standard AM sensitivity
1: AM day/night mode	On: AM day mode only*	Off: AM day and night

* Factory default

DIP switch SW1, general settings

SW1-1, SW1-2: Radar range

Use SW1-1 and SW1-2 to set the radar range exactly to fit the application. The radar is of a range-gating type which means that the range of detection is very accurate.

10 m

14 m

12 m

16 m
Factory default.

SW1-3: Polarity

On: Positive polarity. Configures the inputs (WT and D/N) as “Active high”.

Off: Negative polarity. Configures the inputs (WT and D/N) as “Active low”. Factory default.

The functionality is explained in Figure 9.

Figure 9

(1) Polarity high
(2) Polarity low
(3) Walk test
(4) Day/night

This function also depends on the SW1-5 setting. See “SW1-5: Remote functionality” on page 6.

SW1-4: Auto remote test

On: Auto remote test on. Enables Auto remote test.

Off: Auto remote test off. Disables Auto remote test (factory default).

If auto remote test is enabled, the control panel can trigger the detector to perform a diagnostic test. This test is activated by switching to walk test mode (day mode and WT enabled). The detector activates the alarm relay if the test result is positive,

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and the fault relay if the test result is negative. After the test the detector continues with normal operation.

This function also depends on the SW1-5 setting. See “SW1-5: Remote functionality” below.

SW1-5: Remote functionality

On: Remote on. Enables WT and day/night inputs.

Off: Remote off. Disables WT and day/night inputs (factory default).

The following functionality depends on the Remote setting.

Table 5: Functions dependent on the Remote setting

Item	Description	SW1-5 Remote on	SW1-5 Remote off
SW1-3	Polarity	Selectable	Positive only
SW2-1	AM day/night mode	Selectable	AM day and night
SW2-3	Reset	Selectable	Auto reset
WT	WT input	Enabled	Disabled
D/N	D/N input	Enabled	Disabled
Other	Green Mode	Enabled in day mode with no WT	Disabled
	Alarm memory	Enabled in day mode with no WT	Disabled
	Remote test	Performed after switching to day mode with WT	Disabled

See also “Connections” on page 4.

SW1-6: LEDs

On: LEDs are enabled. See “LEDs and outputs” on page 7 for LED functionality.

Off: LEDs are disabled for any state.

DIP switch SW2, AM settings

SW2-1: AM day/night mode

On: AM day mode only. AM detection is only operating during the day mode (factory default).

Off: AM day and night. AM detection is always operating (day and night mode).

This function also depends on the SW1-5 setting. See “SW1-5: Remote functionality” above.

SW2-2: AM sensitivity

On: Advanced AM sensitivity. The detector signals the AM area masking (factory default).

Note: This is EN 50131 Grade 3 required configuration.

Off: Standard AM sensitivity. The detector signals the AM area approaching.

SW2-3: Reset

On: Auto reset. AM alarm state can be reset 40 s after the AM alarm occurs (factory default).

Off: Authorized reset. AM alarm state can only be reset after applying WT mode and day mode.

Notes

- For the advanced setting (SW2-2 is On) the source of AM alarm needs to be removed before AM reset is allowed.
- If the AM alarm cannot be reset with an auto reset or authorized reset, disconnect the power supply and reconnect again.
- A walk test should be performed to ensure the device settings are appropriate for its application.

This function also depends on the SW1-5 setting. See “SW1-5: Remote functionality” above.

SW2-4: AM signalling

On: AM to fault and alarm relays. AM alarm is signalled via both alarm and fault outputs (factory default).

Note: This is EN 50131 Grade 3 required configuration.

Off: AM to fault relay only. AM alarm is signalled via fault output.

AM calibration

During start-up the AM circuitry calibrates itself to its environment. It is important to make sure that there are no changes made to the environment within 1 m distance of the detector within 60 s after powering up, otherwise the detector may be vulnerable to false AM alarms and these alarms may be impossible to reset.

Configuring the coverage pattern

- Remove blinders (Figure 8, item 1) if necessary. The modified pattern is shown in Figure 8, items 3 to 7.

  Note: If both blinders are installed, the detector range is limited to 8 m (default).
- Modify the pattern by breaking out blinder parts (shown as gray in Figure 8, item 1). The corresponding curtain fragments are shown in Figure 8, item 2.
- Put the appropriate mirror stickers if necessary. See Figure 7, item 1 for details.

  Caution: Removing stickers can damage the mirror surface.
- When near objects directly under the detector, fit the mask to the inside of the window (default). This disables the part of the curtains looking down at the object, whose closeness might destabilize the detector. See Figure 7, item 2.

  Note: Reducing close-in field of view is not compliant with EN 50131 Grade 3 installations.

Self test

The detector continuously monitors the PIR, microwave and AM circuits. Defects are reported to the panel as technical faults.

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Walk testing the detector

There are two ways for switching on the walk test mode.

SW1-6 set to LED on, SW1-5 set to Remote off

In this mode the LED indication is always enabled (constant walk test mode).

SW1-6 set to LED on, SW1-5 set to Remote on

This setting enables the walk test input (pin 7) and the day/night input (pin 8). This allows the user to activate LED indication remotely by setting the detector into the day mode and activate the walk test.

Detector focusing

For the proper walk testing of the detectors, it is important to have them focused.

Focusing can be achieved by not generating signals (not moving) in a protected area for 20 s. This is not always needed, however, when a hyperactivity or low activity is noticed, the idle time before walk testing is recommended.

This allows you to simulate during walk testing a real scenario, when the system is armed and nobody is present within the protected area.

Green mode

When SW1-5 is set to Remote on, the radar is switched off during the day mode (with no WT) to reduce current consumption. The detector is then operating in PIR only mode.

Note: The Day/night line must be connected to the control panel for this mode to work.

This mode is not compliant with the EN 50131-2-4 standard.

Alarm memory

When SW1-5 is set to Remote on, alarms that occurred during the night mode are stored in the detector memory. They are indicated by flashing red LED when the unit switches to day mode (walk test disabled). The memory is cleared when the detector switches back to the night mode.

Note: Set SW1-6 to Off to prevent showing the alarm memory on the LEDs. See “SW1-6: LEDs” on page 6.

LEDs and outputs

To enable LEDs functionality, set SW1-6 to On, otherwise LEDs are disabled in any condition. See “SW1-6: LEDs” on page 6 for more details.

Table 6: LEDs and outputs

Status	Red LED	Yellow LED	Alarm relay	Fault relay	To reset
Start up	☼	☼	Closed	Closed	Automatically after 60 s
Low voltage	☼		Open	Open	Apply correct voltage
PIR intruder alarm			Closed	Closed	
Microwave intruder alarm			Closed	Closed	
Dual motion intruder alarm	☀		Open	Closed	Automatically after 3 s
Dual Alarm Memory	☼		Closed	Closed	Switch to the night mode
AM alarm		☀	Depends on SW2-4	Open	Depends on SW2-3
Technical fault		☼	Closed	Open	Successful walk test

☀ Continuously ON ☼ Normal blinking (1 Hz)

Specifications

Detector technology	Dual+AM
Range	10, 12, 14, 16 m selectable via SW1-1 and SW1-2
Viewing angle	78 degrees
PIR optics	9 high-density mirror curtains
Microwave frequency	5.8 GHz
Max microwave output at 1 m	0.003 µW/cm²
Memory function	Yes
Input power	9 to 15 V⎓ (12 V nominal)
Peak-to-peak ripple immunity	2 V (at 12 V⎓)
Detector start-up time	60 s
Current consumption	10 to 22 mA (11 mA nom.)
Mounting height	2.0 to 3.0 m
Target speed range:	
DDV1016AM-N	0.2 to 3.0 m/s
DDV1016AM-D-N	0.1 to 4.0 m/s
Alarm (NC) / Tamper relay characteristic	80 mA 30 V⎓, Form A
Fault relay characteristic	80 mA 30 V⎓, Form A
Alarm time	3 s
Operating temperature	−10 to +55°C
Relative humidity	95% max., noncondensing
Weight	120 g
Dimensions (H x W x D)	126 × 63 × 50 mm
IP/IK rating	IP30 IK04
Pry-off tamper	Yes

Regulatory information

Manufacturer	PLACED ON THE MARKET BY: Carrier Fire & Security Americas Corporation Inc. 13995 Pasteur Blvd Palm Beach Gardens, FL 33418, USA AUTHORIZED EU REPRESENTATIVE: Carrier Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands

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