

Radar Sensoren  
Radar sensors  
DéTECTEURS à radar

R600V.DAE0-11209335

Radarsensor für Boden- und Pflanzenabstand (für Sprayeranwendungen)

Radar sensor for ground & crop distance (for sprayer applications)

DéTECTEURS radar approprié à la mesure de la distance du sol et des plantes (pour des pulvérisateurs)



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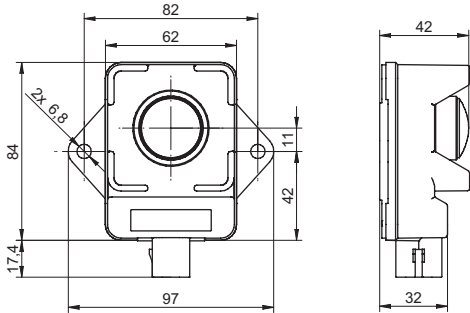
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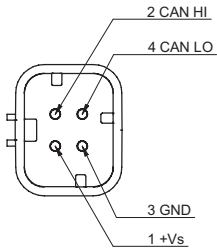
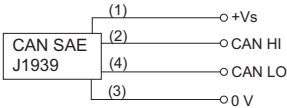
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Abmessungen Dimensions Dimensions



- Alle Masse in mm
- All dimensions in mm
- Toutes les dimensions en mm

Elektrischer Anschluss Connection diagram Schéma de raccordement



- Vor dem Anschliessen des Sensors die Anlage spannungsfrei schalten.
- Disconnect power before connecting the sensor.
- Mettre l'installation hors tension avant le raccordement du détecteur.

Technische Daten

|                                |                |
|--------------------------------|----------------|
| Erfassungsbereich Sd           | 0,3 ... 5 m    |
| Öffnungswinkel                 | 6° (3dB)       |
| Betriebsspannungsbereich +Vs   | 9 ... 32 VDC   |
| Stromaufnahme max. (ohne Last) | 160 mA         |
| Ausgangsschaltung              | CAN (5V)       |
| logische Schnittstelle         | CAN SAE J1939  |
| Baud Rate                      | 250 kBaud      |
| kurzschlussfest                | ja             |
| verpolungsfest                 | ja, Vs zu GND  |
| Arbeitstemperatur              | -40 ... +70 °C |
| Lagertemperatur                | -40 ... +85 °C |
| Schutzart                      | IP 68/69K      |

Technical data

|                                    |                |
|------------------------------------|----------------|
| sensing distance Sd                | 0,3 ... 5 m    |
| aperture angle                     | 6° (3dB)       |
| voltage supply range +Vs           | 9 ... 32 VDC   |
| current consumption max. (no load) | 160 mA         |
| output circuit                     | CAN (5V)       |
| logical interface                  | CAN SAE J1939  |
| baud rate                          | 250 kBaud      |
| short circuit protection           | yes            |
| reverse polarity protection        | yes, Vs to GND |
| operating temperature              | -40 ... +70 °C |
| storage temperature                | -40 ... +85 °C |
| protection class                   | IP 68/69K      |

Données techniques

|                                   |                  |
|-----------------------------------|------------------|
| Portée de détection Sd            | 0,3 ... 5 m      |
| Angle d'ouverture                 | 6° (3dB)         |
| Plage de tension +Vs              | 9 ... 32 VDC     |
| Consommation max. (sans charge)   | 160 mA           |
| circuit de sortie                 | CAN (5V)         |
| interface logique                 | CAN SAE J1939    |
| vitesse de transmission           | 250 kBaud        |
| Protégé contre courts-circuits    | oui              |
| Protégé contre inversion polarité | oui, Vs vers GND |
| Température de fonctionnement     | -40 ... +70 °C   |
| Température de stockage           | -40 ... +85 °C   |
| Classe de protection              | IP 68/69K        |

Technische Änderungen vorbehalten

Tecnical specifications subject to change

Sous réserve de modifications techniques

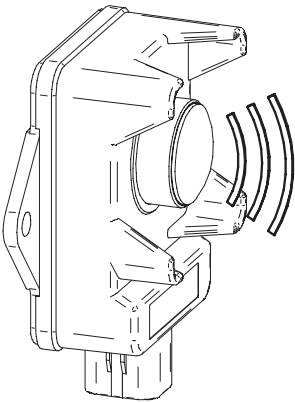
FCC Compliance Statement

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.  
NOTICE: Changes or modifications made to this equipment not expressly approved by Baumer may void the FCC authorization to operate this equipment.  
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.  
Radiofrequency radiation exposure Information: This equipment complies with FCC exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada Compliance Statement

This device complies with Industry Canada licence-exempt RSS standard(s). 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. This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.  
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps. Ce transmetteur ne doit pas être placé au même endroit ou utilisé simultanément avec un autre transmetteur ou antenne.

| Status / Status / Condition                             | Code                                                      |
|---------------------------------------------------------|-----------------------------------------------------------|
| Sensor voll funktionfähig (Objekt detektiert)           | 100 ms grüne LED an / green LED on / LED verte alluminée  |
| Sensor fully operational (object detected)              | 900 ms LED aus / off / éteinte                            |
| Capteur complètement opérationnel (object détecté)      |                                                           |
| Sensor voll funktionfähig (kein Objekt detektiert)      | wie oben / as above / comme ci-dessus                     |
| Sensor fully operational (no object detected)           | zusätzlich / with additional / avec supplémentaire        |
| Capteur complètement opérationnel (anun object détecté) | 100 ms gelbe LED an / yellow LED on / LED jaune alluminée |
| Elektronikfehler                                        | 50 ms rote LED an / red LED on / LED rouge alluminée      |
| Hardware fault                                          | 50 ms LED aus / off / éteinte                             |
| Défaut de matériel                                      |                                                           |
| CAN Abwurf (Fehlfunktion)                               | 50 ms magenta LED an / on / alluminée                     |
| CAN bus off (malfunction)                               | 150 ms LED aus / off / éteinte                            |
| Arrêt du bus CAN (dysfonctionnement)                    |                                                           |
| Adresszuweisung fehlgeschlagen                          | 50 ms magenta LED an / on / alluminée                     |
| Address claim failed                                    | 50 ms LED aus / off / éteinte                             |
| Assigment d' adresse failli                             |                                                           |
| Warten auf Adresszuweisung                              | 500 ms magenta LED an / on / alluminée                    |
| Waiting for Master ECU adress claim                     | 500 ms LED aus / off / éteinte                            |
| En attendre il assignment d' adresse du maître ECU      |                                                           |
| Andere / other / autre                                  | blaue LED / blue LED / LED bleue                          |



CAN Kommunikation - CAN communication - communication CAN

Grundinformation CAN - basic information CAN - informations de base CAN

|                       |                                                  |                    |
|-----------------------|--------------------------------------------------|--------------------|
| ISO Name              | Manufacturer code:                               | 343 (Baumer Group) |
| ISO name              | ECU instance:                                    | 0                  |
| Nom ISO               | Function instance:                               | 1                  |
|                       | Function:                                        | 0                  |
|                       | System:                                          | 0                  |
|                       | System instance:                                 | 0                  |
|                       | Industry group:                                  | 2                  |
|                       | Arbitration capable:                             | 1                  |
| Geräteadresse         | Unterstützt / supports „commanded address“ /     |                    |
| Device address        | supporte adresse commandée (PGN 0xFED8)          |                    |
| Adresse de l'appareil | im Bereich / in range / dans l' interval:        |                    |
|                       | 0x80 ... 0xCF (Standard / default / défaut 0x80) |                    |

Boden- und Pflanzenabstand CAN Nachricht - ground and crop CAN message - Message CAN, distance du sol es des plantes

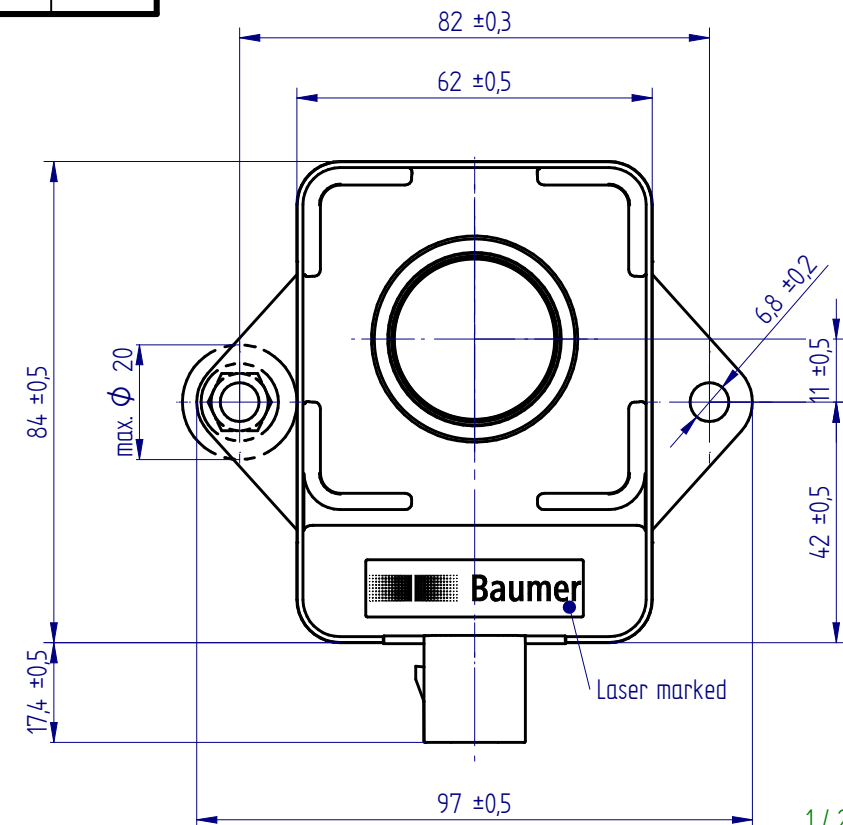
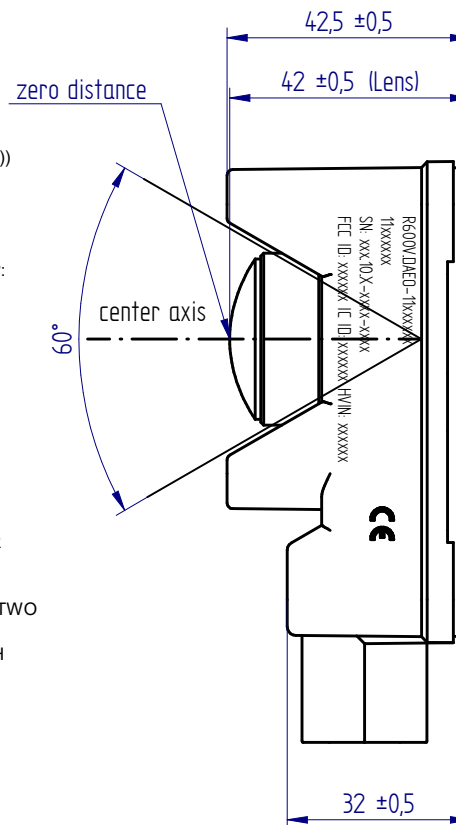
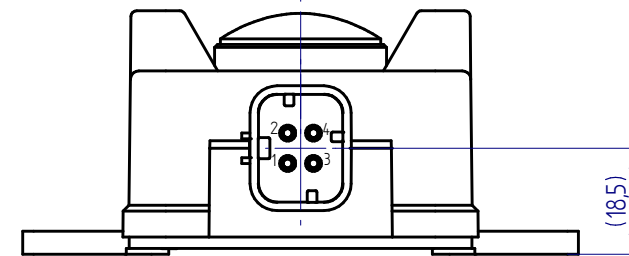
| PGN CAN Nachricht / CAN message / Message CAN : 0xC000 |      |                                 |                                    |                                                                                                                                                                                                                                      |
|--------------------------------------------------------|------|---------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start bit                                              | Bits | Abstand<br>offset<br>décaillage | Skalierung<br>scaling<br>écaillage | Beschreibung / description / description                                                                                                                                                                                             |
| 1                                                      | 2    | 0                               | 1                                  | Sensorstatus / Sensor status / état de capteur<br>0 = Kein Fehler / no error / Pas d' erreur<br>1 = Reversibler Fehler / reversible error / erreur reversible<br>2 = Irreversibler Fehler / irreversible error / erreur irréversible |
| 3                                                      | 7    | 0                               | 1%                                 | Konfidenz Pflanzenabstand / canopy confidence /<br>confiance en la distance par raportaux plantes<br>0% ... 100%                                                                                                                     |
| 10                                                     | 7    | 0                               | 1%                                 | Konfidenz Bodenabstand / ground confidence /<br>confiance en la distance par rapport au sol<br>0% ... 100%                                                                                                                           |
| 17                                                     | 16   | 0                               | 1mm                                | Pflanzenabstand / canopy distance / distance des plantes                                                                                                                                                                             |
| 33                                                     | 16   | 0                               | 1mm                                | Bodenabstand / ground distance / distance du sol                                                                                                                                                                                     |
| 49                                                     | 16   | 32768                           | 1                                  | Reserviert / reserved / reserve (Ausgabe / fixed to / fixé à: 0xffff)                                                                                                                                                                |

13. Jun 2021 10:27

NOTES:

1. ELECTRICAL SPECIFICATION:
  - a. VOLTAGE SUPPLY RANGE: 9V...32V (12VDC/24VDC VEHICLE POWER)
  - b. CURRENT CONSUMPTION: <160mA (averaged)
  - c. RADAR FREQUENCY: 122GHz...123GHz
2. OUTPUT FUNCTION:
  - a. CAN SAE J1939
  - b. BAUD RATE: 250kbaud (11209395) / 500kbaud (11228779)
  - c. OUTPUT CIRCUIT: CAN 5V without internal 120Ω terminator
  - d. CAN UPDATE RATE:  $\geq 1 \dots \leq 100$  Hz
  - e. SENSING RANGE, DYNAMIC FIELD DATA: 300mm...5000mm (center axis)
  - f. SENSING RANGE, STATIC TARGET: 390mm...5000mm (center axis)
  - g. BLIND RANGE: 300mm (object detection limited)
3. MECHANICAL DATA:
  - a. RECTANGULAR HOUSING: 97 x 84 x 42.5mm (without connector)
  - b. DIAMETER MOUNTING HOLES: 6.8mm±0.2mm
  - c. RECOMMENDED SCREWS: M6 ACC. MBM 10105
  - d. INSTALLATION TORQUE: Screw with property class 10.9: max torque of screw 12Nm...15Nm, Screw with property class 8.8: max torque of screw 10Nm...12Nm
  - e. ENCLOSURE MATERIAL: POLYAMID (GLASS FIBER REINFORCED)
  - f. MOUNTING PLATE: ALUMINUM (COATED WITH CATAPHORETIC PAINTING (KTL))
  - g. LENS MATERIAL: Polyetherimid (PEI)
4. AMBIENT CONDITIONS:
  - a. STORAGE TEMPERATURE: -40°C...+85°C
  - b. OPERATING TEMPERATURE: -40°C...+70°C
5. SENSOR MEETS FOLLOWING REQUIREMENTS OF EMC AND ENVIRONMENT ACC. FSP:
  - a. EMC AGRICULTURAL MACHINERY EN ISO 14982 (12V/24V-SYSTEM)
  - b. EMC CONSTRUCTION MACHINERY EN 13309 (12V/24V-SYSTEM)
  - c. EMC EARTH MOVING MACHINERY ISO 13766 (12V/24V-SYSTEM)
  - d. EUROPE: RADIO EQUIPMENT AND REPEALING DIRECTIVE (RED) 2014/53/EU
  - e. USA / CDN: COMPLIANCE STATEMENTS SEE PAGE 2, CHAPTER 11 OF THIS DRAWING
  - f. EMC (Industrial) ACC. TO EN 61000-6-2 / EN 61000-6-3
  - g. PROTECTION CLASS ISO 20653: IP69K
  - h. PARTICLE IMPACT EN ISO 20567-1 (GRAVEL ACC. TO EN111242)
  - i. RANDOM VIBRATION IEC 60068-2-64 (5Hz...2000Hz, 11.55 Grms)
  - j. OPERATING MECHANICAL SHOCK IEC 60068-2-27 (50g)
6. PART IS MARKED WITH BAUMER LOGO; PART NUMBER; DATE CODE, SERIAL NUMBER
7. MOUNTING RECOMMENDATION:
  - a. REQUIRED FLATNESS OF THE SENSOR MOUNTING SURFACE  $\leq 0.2\text{mm}/100\text{mm}$
  - b. DIRECT MOUNTING ONTO A STEEL PLATE WITH A THICKNESS OF 6mm WITH TWO M6 SCREWS
  - c. INDIRECT MOUNTING ONTO A STEEL PLATE WITH A THICKNESS OF 3mm WITH TWO M6 SCREWS AND TWO FLANGE NUTS
8. LED FUNCTIONS (LED INSIDE LENS)
  - a. SENSOR FULLY OPERATIONAL: GREEN LED blinking
  - b. NO OBJECT DETECTED: GREEN / YELLOW blinking
  - c. CAN BUS WAITING ON MASTER OR ERRORS: MAGENTA LED blinking
  - d. HW FAULT: RED LED blinking
9. Intended use / application policy:
  - a. The suitability and functionality of a Baumer product and its performance under different applications and / or end-use cases can only be verified by testing, and shall ultimately be the responsibility of the customer.
  - b. The product shall not be used:
    - For functional safety applications and in potentially explosive atmospheres.
    - In the direct control and modification of the state of function of the machine.
  - c. Possible malfunctions and failed measurements of the sensor must be intercepted at the system level and shall not lead to unsafe situations in the system.
  - d. The customer shall perform its own safety assessment to account for sensor behavior in particular situations (e.g. distance fluctuations in static situations, operator caused distance manipulation by hand or other objects).
  - e. Safety relevant information must be communicated to the end-user.
10. Recommended free space around radar lens  
Rotational cone with an angle of  $\pm 30^\circ$  around sensor center axis  
Sensitivity and detection of objects near the blind range can be influenced by disturbing objects (e.g. metal boom structures or water hose) within this free space. Moving objects up to  $60^\circ$  outside of free space should be avoided. Further testing is recommended to define a smaller free space.

| Mating Connector<br>AMPSEAL 16 |        |
|--------------------------------|--------|
| 776524-1                       |        |
| PIN 1                          | +Vs    |
| PIN 2                          | CAN HI |
| PIN 3                          | GND    |
| PIN 4                          | CAN LO |



|                                                                                                                             |                                                                                       |     |            |          |                                                                                                                               |            |          |                 |                                           |          |                            |      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----|------------|----------|-------------------------------------------------------------------------------------------------------------------------------|------------|----------|-----------------|-------------------------------------------|----------|----------------------------|------|
| This drawing is OUR PROPERTY and may not be copied, recreated or made available to any third party without prior permission | Qty                                                                                   |     | Item       |          | Pos.                                                                                                                          |            | Material |                 | Remarks                                   |          |                            |      |
|                                                                                                                             | Mod                                                                                   | Rev | Drawn      | Approved | Mod                                                                                                                           | Rev        | Drawn    | Approved        | <div><div></div><div>deasured</div></div> | Project  | 10714028 Off Highway Radar |      |
|                                                                                                                             |                                                                                       | a   | 13.01.2021 | cg       |                                                                                                                               | 13.01.2021 | rma      | Replaced by     |                                           |          |                            |      |
|                                                                                                                             |                                                                                       |     |            |          |                                                                                                                               |            |          | Replacement for |                                           |          |                            |      |
|                                                                                                                             |                                                                                       |     |            |          |                                                                                                                               |            |          |                 |                                           |          |                            |      |
|                                                                                                                             | R600V.DAE0-11209335 /-11228779                                                        |     |            |          |                                                                                                                               |            |          |                 | Scale<br>1:1                              | Drawn    | 28.03.2019                 | cg   |
|                                                                                                                             | Ground & Crop (Spray drift suppression)                                               |     |            |          |                                                                                                                               |            |          |                 |                                           | Checked  | 28.03.2019                 | rma  |
|                                                                                                                             |                                                                                       |     |            |          |                                                                                                                               |            |          |                 |                                           | Approved | 15.04.2019                 | wemi |
|                                                                                                                             |  |     | Baumer     |          | Baumer Electric AG<br>Postfach · Hummelstrasse 17 · CH-8501 Frauenfeld<br>Phone +41 (0)52 728 11 22 · Fax +41 (0)52 728 11 44 |            |          |                 | 11209335 RZ.00016                         |          | A                          |      |

10/17

13. Jun 2021

A

B

C

D

E

F

11. Compliance Statements:

a. FCC Compliance 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.  
NOTICE: Changes or modifications made to this equipment not expressly approved by Baumer may void the FCC authorization to operate this equipment.  
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cau se harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.  
Radiofrequency radiation exposure Information:  
This equipment complies with FCC exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.  
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

b. Canada Compliance Statement

This device complies with Industry Canada licence-exempt RSS standard(s).  
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.  
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.  
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:  
(1) l'appareil ne doit pas produire de brouillage, et  
(2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.  
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.  
Ce transmetteur ne doit pas être place au même endroit ou utilise simultanément avec un autre transmetteur ou antenne.

2 / 2

|                                                                                                                             |                                                                                                                                                                                    |      |            |          |                 |      |          |             |          |                     |                                    |            |      |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|----------|-----------------|------|----------|-------------|----------|---------------------|------------------------------------|------------|------|
| This drawing is OUR PROPERTY and may not be copied, recreated or made available to any third party without prior permission | Qty                                                                                                                                                                                | Item |            |          |                 | Pos. | Material |             |          | Remarks             |                                    |            |      |
|                                                                                                                             | Mod                                                                                                                                                                                | Rev  | Drawn      | Approved |                 | Mod  | Rev      | Drawn       | Approved | <div>debarred</div> | Project 10714028 Off Highway Radar |            |      |
|                                                                                                                             |                                                                                                                                                                                    | a    | 13.01.2021 | cg       | 13.01.2021      |      | rma      | Replaced by |          |                     |                                    |            |      |
|                                                                                                                             |                                                                                                                                                                                    |      |            |          | Replacement for |      |          |             |          |                     |                                    |            |      |
|                                                                                                                             | R600V.DAE0-11209335 /-11228779                                                                                                                                                     |      |            |          |                 |      |          |             |          | Scale<br>1:1        | Drawn                              | 28.03.2019 | cg   |
|                                                                                                                             | Ground & Crop (Spray drift suppression)                                                                                                                                            |      |            |          |                 |      |          |             |          |                     | Checked                            | 28.03.2019 | rma  |
|                                                                                                                             |                                                                                                                                                                                    |      |            |          |                 |      |          |             |          |                     | Approved                           | 15.04.2019 | wemi |
|                                                                                                                             | <div><div></div><div>Baumer</div></div> <div>Baumer Electric AG<br/>Postfach · Hummelstrasse 17 · CH-8501 Frauenfeld<br/>Phone +41 (0)52 728 11 22 · Fax +41 (0)52 728 11 44</div> |      |            |          |                 |      |          |             |          | 11209335 RZ.00016   |                                    | A          |      |