**Draft Annex to draft Commission Delegated Regulation (EU) …/… amending Commission Delegated Regulation (EU) 2019/945 as regards the introduction of class C5 and C6 UAS**

(1) Paragraph 4 of Part 1 of the Annex is replaced by the following:

'(4) be safely controllable with regard to stability, manoeuvrability and the command and control link performance, by a remote pilot following the manufacturer's instructions, as necessary under all anticipated operating conditions including following the failure of one or, if appropriate, more systems;';

(2) Point (a) of paragraph (8) of Part 1 of the Annex is replaced by the following:

'(a) the characteristics of the UA including but not limited to the:

— UA class;

— UA mass (with a description of the reference configuration) and the maximum take-off mass (MTOM);

— general characteristics of allowed payloads in terms of mass, dimensions, interfaces with the UA and other possible restrictions;

— equipment and software to control the UA remotely; and

— a description of the behaviour of the UA in case of a loss of the command and control link;';

(3) Paragraph 4 of Part 2 of the Annex is replaced by the following:

'(4) be safely controllable with regard to stability, manoeuvrability and the command and control link performance, by a remote pilot following the manufacturer's instructions, as necessary under all anticipated operating conditions including following the failure of one or, if appropriate, more systems;';

(4) Paragraph 7 of Part 2 of the Annex is replaced by the following:

'(7) in case of a loss of the command and control link, have a reliable and predictable method for the UA to recover the command and control link or terminate the flight in a way that reduces the effect on third parties in the air or on the ground;';

(5) Paragraph 11 of Part 2 of the Annex is replaced by the following:

(6) '(11) have a unique serial number of the UA compliant with standard ANSI/CTA-2063-A *Small Unmanned Aerial Systems Serial Numbers*;';

(7) Paragraph 12 of Part 2 of the Annex is replaced by the following:

'(12) have a direct remote identification system that:

(a) allows the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively

following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensures, in real time during the whole duration of the flight, thedirect periodic broadcast from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received directly by existing mobile devices within the broadcasting range:

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point; and

(c) ensures that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v;';

(8) Paragraph 13 of Part 2 of the Annex is replaced by the following:

(13) be equipped with a geo-awareness function that provides:

(a) an interface to load and update data containing information on airspace limitations related to UA position and altitude imposed by the geographical zones, as defined by Article 15 of Implementing Regulation (EU) 2019/947, which ensures that the process of loading or updating such data does not degrade its integrity and validity; and

(b) a warning alert to the remote pilot when a potential breach of airspace limitations is detected; and (c) information to the remote pilot on the UA's status as well as a warning alert when its positioning or navigation systems cannot ensure the proper functioning of the geo-awareness function;';

(9) Paragraph 16 of Part 2 of the Annex is replaced by the following:

'(16) be equipped:

(a) with lights for the purpose of controllability of the UA; and

(b) with at least one green flashing light for the purpose of conspicuity of the UA at night to allow a person on the ground to distinguish the UA from a manned aircraft;';

(10) Point (a) of paragraph 18 of Part 2 of the Annex is replaced by the following:

'(a) the characteristics of the UA including but not limited to the:

— class of the UA;

— UA mass (with a description of the reference configuration) and the maximum take-off mass (MTOM);

— general characteristics of allowed payloads in terms of mass, dimensions, interfaces of with the UA and other possible restrictions;

— equipment and software to control the UA remotely;

— the procedures to upload the UAS operator registration number into the electronic identification system;

— reference of the transmission protocol used for the direct remote identification emission;

— sound power level;

— description of the behaviour of the UA in case of a loss of the command and control link, and the method to recover the UA; and

— the procedures to upload the airspace limitations into the geo-awareness function;'

(11) A new paragraph 20 of Part 2 of the Annex is added:

'(20) if equipped with a network remote identification system it shall:

(a) allow the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensure, in real time during the whole duration of the flight, the transmission from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received through a network;

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point; and

(c) ensure that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v.';

(12) Paragraph 3 of Part 3 of the Annex is replaced by the following:

‘(4) be safely controllable with regard to stability, manoeuvrability and the command and control link performance, by a remote pilot with adequate competency as defined in Implementing Regulation (EU) 2019/947 and following the manufacturer's instructions, as necessary under all anticipated operating conditions including following the failure of one or, if appropriate, more systems;’;

(13) Paragraph 7 of Part 3 of the Annex is replaced by the following:

‘(7) unless tethered, in case of a loss of the command and control link, have a reliable and predictable method for the UA to recover the command and control link or terminate the flight in a way that reduces the effect on third parties in the air or on the ground;’;

(14) Paragraph 8 of Part 3 of the Annex is replaced by the following:

‘(8) unless tethered, be equipped with a command and control link protected against unauthorised access to the command and control functions;’;

(15) Paragraph 13 of Part 3 of the Annex is replaced by the following:

‘(13) have a unique serial number of the UA compliant with standard ANSI/CTA-2063-A *Small Unmanned Aerial Systems Serial Numbers*;’;

(16) Paragraph 14 of Part 3 of the Annex is replaced by the following:

‘(14) have a direct remote identification system that:

(a) allows the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensures, in real time during the whole duration of the flight, the direct periodic broadcast from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received directly by existing mobile devices within the broadcasting range:

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point; and

(c) ensures that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v.’;

(17) Point (c) of paragraph 15 of Part 3 of the Annex is replaced by the following:

'(c) information to the remote pilot on the UA's status as well as a warning alert when its positioning or navigation cannot ensure the proper functioning of the geo-awareness function;';

(18) Paragraph 18 of Part 3 of the Annex is replaced by the following:

'(18) be equipped:

(c) with lights for the purpose of controllability of the UA; and

(d) with at least one green flashing light for the purpose of conspicuity of the UA at night to allow a person on the ground, to distinguish the UA from a manned aircraft;';

(19) Point (a) of paragraph 19 of Part 3 of the Annex is replaced by the following:

'(a) the characteristics of the UA including but not limited to the:

— class of the UA;

— UA mass (with a description of the reference configuration) and the maximum take-off mass (MTOM);

— general characteristics of allowed payloads in terms of mass, dimensions, interfaces of with the UA and other possible restrictions;

— equipment and software to control the UA remotely;

— the procedures to upload the UAS operator registration number into the electronic identification system;

— reference of the transmission protocol used for the direct remote identification emission;

— sound power level;

— description of the behaviour of the UA in case of a loss of the command and control link, and the method to recover the UA; and

— the procedures to upload the airspace limitations into the geo-awareness function;';

(20) A new paragraph 21 of Part 3 of the Annex is added:

'(21) if equipped with a network remote identification system it shall:

(a) allow the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensure, in real time during the whole duration of the flight, the transmission from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received through a network;

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point.'; and

(c) ensure that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v.';

(21) Paragraph 3 of Part 4 of the Annex is replaced by the following:

'(3) be safely controllable with regard to stability, manoeuvrability and the command and control link performance, by a remote pilot with adequate competency as defined in Implementing Regulation (EU) 2019/947 and following the manufacturer's instructions, as necessary under all anticipated operating conditions including following the failure of one or, if appropriate, more systems;';

(22) Paragraph 5 of Part 4 of the Annex is replaced by the following:

'(5) unless tethered, in case of a loss of the command and control link, have a reliable and predictable method for the UA to recover the command and control link or terminate the flight in a way that reduces the effect on third parties in the air or on the ground;';

(23) Paragraph 8 of Part 4 of the Annex is replaced by the following:

'(8) have a unique serial number of the UA compliant with standard ANSI/CTA-2063-A *Small Unmanned Aerial Systems Serial Numbers*;';

(24) Paragraph 9 of Part 4 of the Annex is replaced by the following:

'(9) have a direct remote identification system that:

(a) allows the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensures, in real time during the whole duration of the flight, the direct periodic broadcast from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received directly by existing mobile devices within the broadcasting range:

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point; and

(c) ensures that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v;';

(25) Point (c) of paragraph 10 of Part 4 of the Annex is replaced by the following:

'(c) information to the remote pilot on the UA's status as well as a warning alert when its positioning or navigation cannot ensure the proper functioning of the geo-awareness function;';

(26) Paragraph 12 of Part 4 of the Annex is replaced by the following:

'(12) unless tethered, be equipped with a command and control link protected against unauthorised access to the command and control functions;';

(27) Paragraph 14 of Part 4 of the Annex is replaced by the following:

'(14) be equipped:

(e) with lights for the purpose of controllability of the UA; and

(f) with at least one green flashing light for the purpose of conspicuity of the UA at night to allow a person on the ground to distinguish the UA from a manned aircraft;';

(28) Point (a) of paragraph 15 of Part 4 of the Annex is replaced by the following:

'(a) the characteristics of the UA including but not limited to the:

— class of the UA;

— UA mass (with a description of the reference configuration) and the maximum take-off mass (MTOM);

— general characteristics of allowed payloads in terms of mass, dimensions, interfaces with the UA and other possible restrictions;

— equipment and software to control the UA remotely;

— the procedures to upload the UAS operator registration number into the electronic identification system;

— reference of the transmission protocol used for the direct remote identification emission;

— sound power level;

— description of the behaviour of the UA in case of a loss of the command and control link, and the method to recover the UA; and

— the procedures to upload the airspace limitations into the geo-awareness function;';

(29) A new paragraph 17 of Part 4 of the Annex is added:

'(17) if equipped with a network remote identification system it shall:

(a) allow the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(b) ensure, in real time during the whole duration of the flight, the transmission from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received through a network;

i the UAS operator registration number;

ii the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

iii the time stamp, the geographical position of the UA and its height above the surface or take-off point;

iv the route course measured clockwise from true north and ground speed of the UA; and

v the geographical position of the remote pilot or, if not available, the take-off point;'; and

(c) ensure that the user cannot modify the data mentioned under paragraph (b) points ii, iii, iv and v.';

(30) Point (a) of paragraph 4 of Part 5 of the Annex is replaced by the following:

'(a) the characteristics of the UA including but not limited to the:

— class of the UA;

— UA mass (with a description of the reference configuration) and the maximum take-off mass (MTOM);

— general characteristics of allowed payloads in terms of mass dimensions, interfaces of with the UA and other possible restrictions;

— equipment and software to control the UA remotely; and

— description of the behaviour of the UA in case of a loss of the command and control link;';

(31) Part 6 of the Annex is replaced by the following:

PART 6

**Requirements for a direct remote identification add-on**

A direct remote identification add-on shall comply with the following:

(1) allow the upload of the UAS operator registration number in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and exclusively following the process provided by the registration system. The system shall not accept an invalid UAS operator registration number;

(2) have a unique serial number compliant with standard ANSI/CTA-2063-A *Small Unmanned Aerial Systems Serial Numbers*, affixed to the add-on and its packaging or its user's manual in a legible manner;

(3) ensure, in real time during the whole duration of the flight, the direct periodic broadcast from the UA using an open and documented transmission protocol, of at least the following data, in a way that it can be received directly by existing mobile devices within the broadcasting range:

(a) the UAS operator registration number;

(b) the unique serial number of the UA compliant with standard ANSI/CTA-2063-A;

(c) the time stamp, the geographical position of the UA and its height above the surface or take-off point;

(d) the route course measured clockwise from true north and ground speed of the UA; and

(e) the geographical position of the remote pilot or, if not available, the take-off point;

(4) ensure that the user cannot modify the data mentioned under paragraph (3) points ii, iii, iv and v; and

(5) be placed on the market with a user's manual providing the reference of the transmission protocol used for the direct remote identification emission and the instruction to:

(a) install the module on the UA; and

(b) upload the UAS operator registration number.';

(32) Paragraph 1 of Part 8 Module B is replaced by the following.

'1. EU-type examination is the part of a conformity assessment procedure in which a notified body examines the technical design of the product and verifies and attests that the technical design of the product meets the applicable requirements set out in Parts 1 to 6, 16 and 17.';

(33) Paragraph 1 of Part 9 is replaced by the following:

‘1. Conformity based on full quality assurance is the conformity assessment procedure whereby manufacturers fulfil the obligations set out in paragraphs 2 and 5, and ensure and declare on their sole responsibility that the product concerned satisfies the applicable requirements set out in Parts 1 to 6, 16 and 17.’;

(34) Paragraph 4 of Part 11 is replaced by the following:

‘4. Object of the declaration [*identification of the product allowing traceability; it may include a colour image of sufficient resolution where necessary for the identification of the products; in case of a kit of accessories, indicate the type of UAS to which the kit ensures the conversion*].’;

(35) Paragraph 5 of Part 11 is replaced by the following:

‘5. The object of the declaration described above is of class *... [include for UAS the class number as defined by Parts 1 to 5, 16 and 17 of this annex; for a kit of accessories, indicate the class into which the UAS is converted].’;*

(36) Part 15 is replaced by the following:

‘Part 15

**Maximum sound power level per class of UA (including transition periods)**

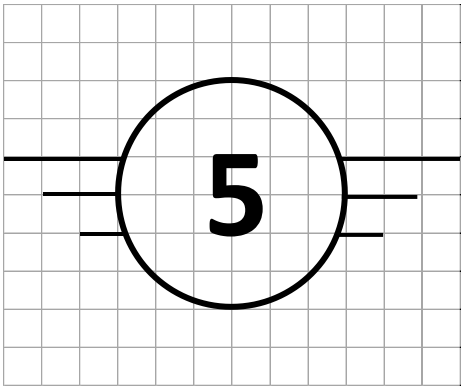
| UA class | MTOM *m* in gram | Maximum sound power level $L_{WA}$ in dB | | |
|---|---|---|---|---|
| | | as from entry into force | as from 2 years after entry into force | as from 4 years after entry into force |
| C1 and C2 | $m < 900$ | 85 | 83 | 81 |
| C2 | $900 \leq m < 4000$ | $85 + 18{,}5 \lg \frac{m}{900}$ | $83 + 18{,}5 \lg \frac{m}{900}$ | $81 + 18{,}5 \lg \frac{m}{900}$ |

(37) Two new Parts, Part 16 and Part 17, are added to the Annex to the Regulation.

Part 16

**Requirements for a class C5 unmanned aircraft system and C5 accessories**

A class C5 UAS bears the following class identification label on the UA:




A class C5 UAS shall comply with the requirements defined in Part 4, except paragraphs (2) and (10). In addition, it shall comply with the following:

(2) be a rotorcraft or a tethered aircraft other than a fixed-wing aircraft;

(3) if it is equipped with a geo-awareness function, comply with paragraph (10) of Part 4;

(4) during flight provide the remote pilot with clear and concise information on the height of the UA above the surface or take-off point;

(5) unless tethered, be equipped with a low-speed mode selectable by the remote pilot and limiting the ground speed to not more than 5 m/s;

(6) unless tethered, provide means for the remote pilot to terminate the flight of the UA, which shall:

(a) be reliable, predictable and independent from the automatic flight control and guidance system; this applies also to the activation of this means;

(b) force the descent of the UA and prevent its powered horizontal displacement; and

(c) include means to reduce the effect of the UA impact dynamics;

(7) unless tethered, provide the remote pilot with means to continuously monitor the quality of the command and control link and receive an alert when it is likely that the link is going to be lost or degraded to the extent of compromising the safe conduct of the operation, and another alert when the link is lost; and

(8) in addition to the information indicated in point (15)(a) of Part 4, include in the user's manual a description of the means to terminate the flight.

A class C5 UAS may consist in a class C3 UAS fitted with an accessories kit that ensures the conversion of the UAS into a class C5 UAS. In this case, the class C5 label is affixed on the accessories kit.

An accessories kit may only ensure conversion of a class C3 UAS that complies with (1) and provides the necessary interfaces to the accessories.

The accessories kit shall not include changes to the software of the class C3 UAS.

The accessories kit shall be designed, and each accessory shall be identified, to ensure a complete and correct installation by a UAS operator on a class C3 UAS following the instructions provided by the manufacturer of the accessories kit.

The accessories kit may be placed on the market independently from the class C3 UAS of which they ensure the conversion. In this case, the manufacturer of the accessories kit shall place on the market a single conversion kit that shall:

(1) not alter the compliance of the class C3 UAS with the requirements of Part 4;

(2) ensure compliance of the UAS fitted with the accessories kit with all additional requirements defined in this Part with the exception of paragraph 3; and

(3) be accompanied by a user's manual providing:

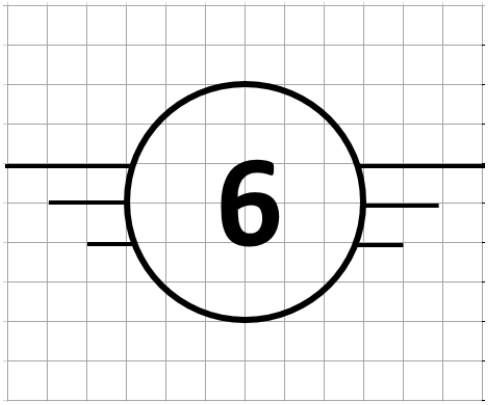
  (a) the list of all class C3 UAS to which the kit can be applied; and

  (b) instructions on how to install and operate the accessories kit.

Part 17

## Requirements for a class C6 unmanned aircraft system

A class C6 UAS bears the following class identification label on the UA:




A class C6 UAS shall comply with the requirements defined in Part 4, except paragraphs (2) and (10). In addition, it shall comply with the following:

(1) have a maximum ground speed in level flight of not more than 50 m/s;

(2) if it is equipped with a geo-awareness function, comply with paragraph (10) of Part 4;

(3) during flight provide the remote pilot with clear and concise information on the geographical position of the UA, its speed and its height above the surface or take-off point;

(4) provide means to prevent the UA from breaching the horizontal and vertical limits of a programmable flight volume;

(5) provide means for the remote pilot to terminate the flight of the UA, which shall:

(a) be reliable, predictable and independent from the automatic flight control and guidance system; this applies also to the activation of this means; and

(b) force the descent of the UA and prevent its powered horizontal displacement;

(6) provide means to programme the UA trajectory;

(7) provide the remote pilot with means to continuously monitor the quality of the command and control link and receive an alert when it is likely that the link is going to be lost or degraded to the extent of compromising the safe conduct of the operation, and another alert when the link is lost; and

(8) in addition to the information indicated in point (15)(a) of Part 4, include in the user's manual:

(a) a description of the means to terminate the flight;

(b) a description of the function that limits the access of the UA to certain airspace areas or volumes; and

(c) the distance most likely to be travelled by the UA after activation of the means to terminate the flight defined in paragraph (5), to be considered by the UAS operator when defining the ground risk buffer.