

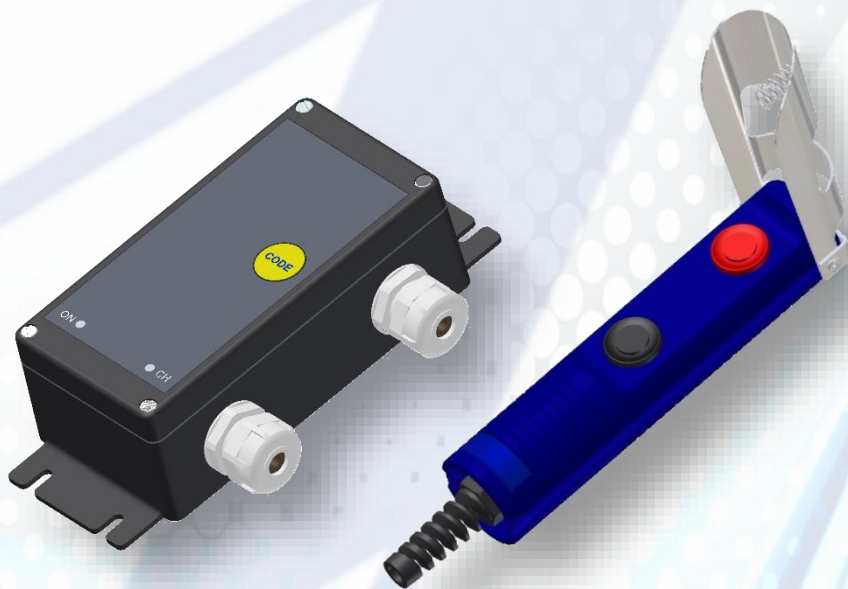
Delta DE212

DEADMAN SYSTEM

Failsafe, Wired Deadman Control

for Aero Plane Refuelling Trucks and Dispensers

Operation and Installation Manual



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1. INTRODUCTION

Delta DE212 is a deadman system for aircraft refuelling trucks and dispensers. The DE212 system can operate wireless or wired.

This document describes the CU212-1S, the control unit installed in the drivers cabin, and the CB212-1S, the handheld unit, which are the two main components of the wired deadman.

The wired deadman differs from the wireless as it needs a cable connection between the two units to carry the needed signals.

The DE212-1S/F wired deadman is designed for failsafe operation.

The DE212-1S wired system is designed to operate the deadman valve and also comprises a stop button on the handheld unit, making it possible to "emergency-stop" the refuelling from a remote position.

The DE212 has a built in timer system, with timeout warning outputs for light and beeper. The standard timer is set to 2 minutes with the warning signals 30 seconds before the refuelling will shut down.

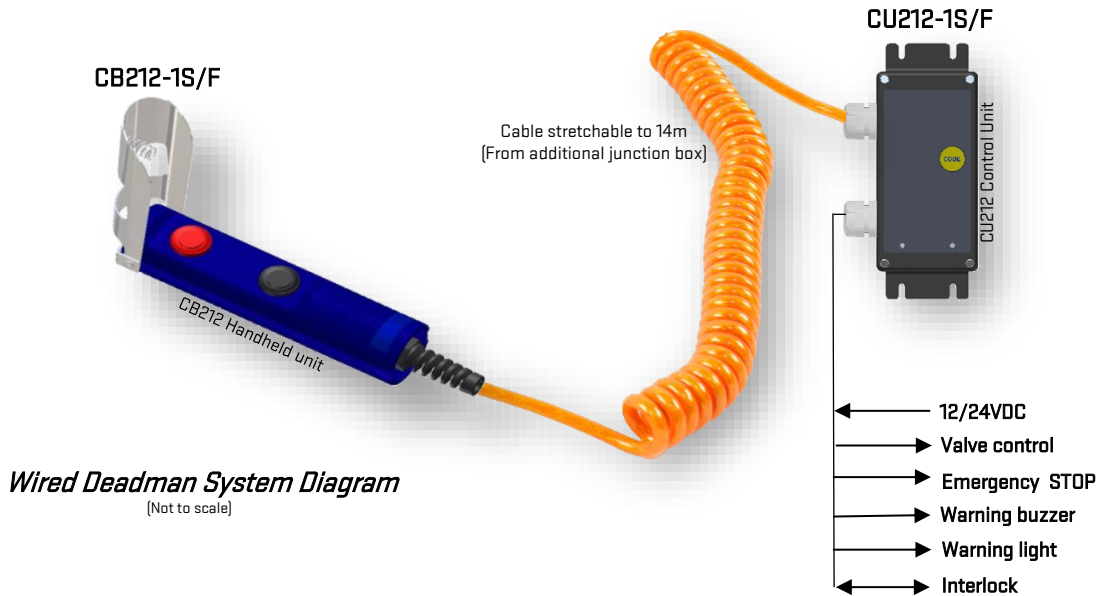
If the control unit is connected to a simple ON-OFF handswitch, the control unit has to be set to none failsafe operation, this can be selected by a qualified technician.

With more than 15 years of experience in developing and producing deadman systems, the DE212 system has all the security needed for a safe and reliable operation.

For special applications, the control unit has inputs for deadman function override and STOP.

The DE212 system is based on the latest technology and has the flexibility to meet new operational demands by upgrading the software in the control unit.

1.1 SYSTEM DIAGRAM

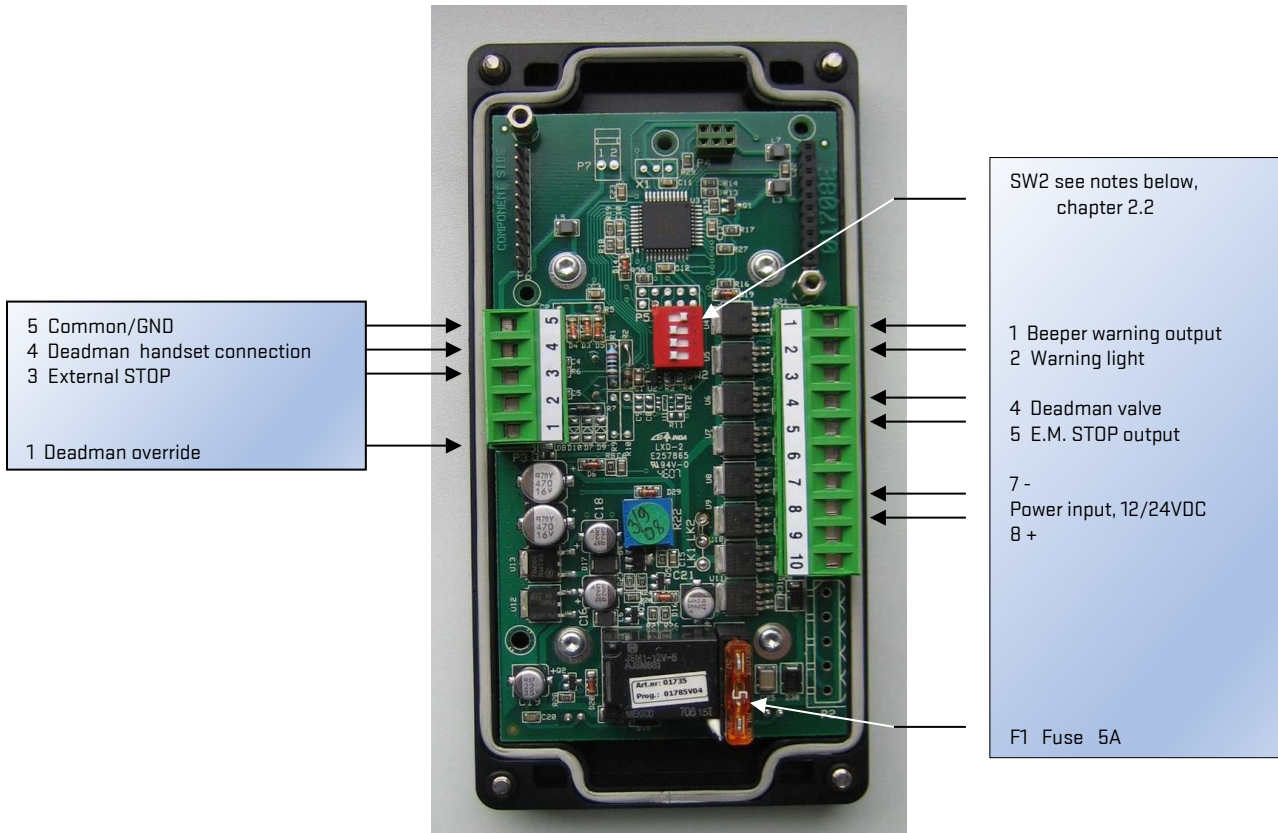


2. INSTALLATION

2.1 CONTROL UNIT, CU212-1S CONNECTIONS

The power supply can be 12 or 24VDC, and is connected as described. See figure below.

Connections to the PCB in the control unit.



P1	Output Signals
1	DC-output signal to horn/beeper
2	Warning light signal
3	Not in use <i>(Do not connect)</i>
4	Deadman output
5	STOP output, normally activated, 12/24V output
6	Not in use <i>(Do not connect)</i>
7	Minus-pole/GND, for input voltage
8	Plus-pole for input voltage, 12/24V
9	Not in use <i>(Do not connect)</i>
10	Not in use <i>(Do not connect)</i>

P3	Input Signals
1	Deadman Override Active at low input, 0V
2	Not in use <i>(Do not connect)</i>
3	External STDP Active at low input, 0V
4	Deadman cable input (+5V)
5	Deadman cable input (0V)

NOTE: 0V is normally the same Potential as chassis/GND.

NOTES:

- Input voltage should be 12 or 24VDC. Max 35VDC
- All outputs gives 12/24V out when activated, max 3,5A per output, total load: 5A.
- Note that the potential between the minus pole and ground/GND, must not be greater than 50VDC/AC peak.
- Deadman cable input has no polarity requirements.
- The warning outputs operates as follows: when the deadman function is activated, the warning light is activated at the same time. When 30 seconds remain of the timer period, the warning light output change from a steady signal to an intermitted signal during the last 30 seconds of the time period. During the intermitted signal, the beeper warning goes active, with a steady signal as long as the warning light signal is intermitted.

2.2 CHANGE OF FUNCTIONS BY SW2.

NOTE: Switch SW2 is located on the printed circuit board inside the control unit.

The state of all 4 single switches of SW2 will be read, stored and activated by the control units microprocessor if the CODE-button on the front is pressed and hold for more than 3 sec. when switching on the control unit.

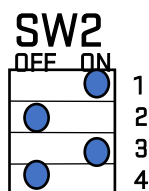
After this 3 sec. the green "ON" led on the front turns on (lights up), indicating that the process is finished successful.

When the control unit is connected to the power supply, this SW2-reading-process can also easily be initiated by pulling out the fuse F1/5A and push it back into its socked.

- **Deadman function, with or without timer.**
This selection will done by SW2-1.
For timed deadman, set SW2-1 to ON. For no timer, set F2-1 to OFF
- **Deadman override enabled/disabled**
To enable the deadman override input set SW2-3 to ON.
To disable the deadman override input, set SW2-3 to OFF.
- **Type of handswitch, failsafe / not failsafe**
The CU212-1S can operate with other handswitches as the failsafe CB212-1S.
If a handswitch with an ordinary ON/OFF switch is used, (not failsafe) the control unit CU212-1S has to be set for NOT FAILSAFE operation:
To set the control unit for using a failsave CB212-1S handswitch, set SW2-4 to ON
To set the control unit for using a NON-FAILSAFE handswitch, set SW2-4 to OFF

NOTE: The external STOP input is always enabled.

Standard factory setting of SW2 switches:



1. Deadman timer enabled/disabled
2. Not in Use
3. Deadman override input enabled/disabled
4. Type of Handswitch Failsafe/Not failsafe

2.3 INSTALLING THE CONTROL UNIT

The control unit should normally be placed in the drivers cabin. It must not be installed in EX area. Make sure that the control unit is easy accessible for service.

The control unit CU212-1S, has two cable glands. One is for the input signal from the deadman handle, the second is for input power and for output and input signals.

It is recommended to use 0,5 to 0,75mm² cable, and to use soft and multicore cables.

When connecting the cables, take off the two connectors, P1 and P3, from the printed circuit board, and connect the cables to the connectors while they are free to move and easy to keep in the right position.

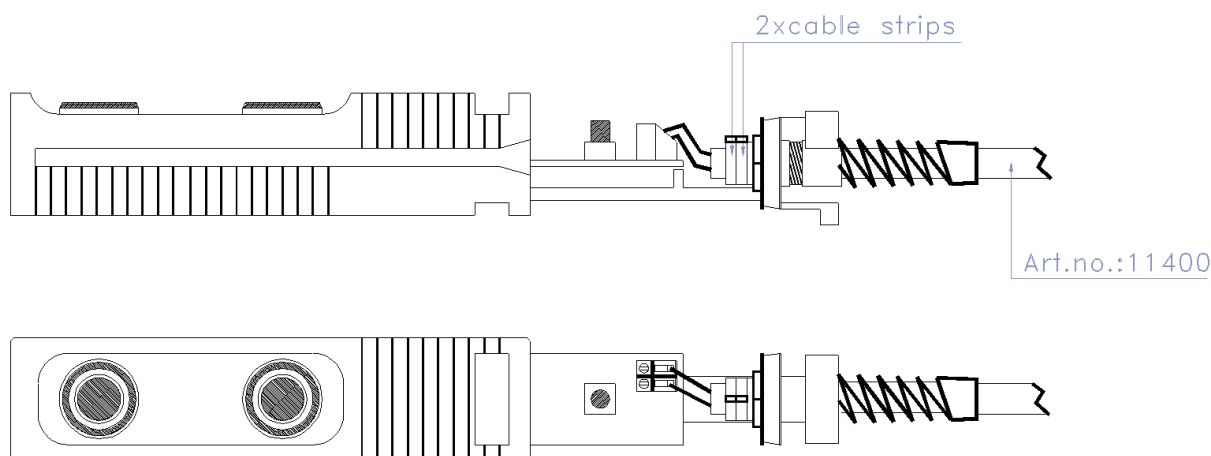
When all cables are connected, replace the connectors to the printed circuit board and fasten the front panel to the bottom section.

The installation of the control unit is now finished.

The cable used for the deadman handswitch is normally a coiled cable, witch can be stretched to about 14m.

Normally on a installation, the coiled cable is connected to a connection box, positioned at a central place of the dispenser, where the operator can reach all the needed positions by stretching the coiled cable. The cable between the control unit and the connection box is not a part of the delivery. See system diagram 1.2.

2.4 CABLE CONNECTION TO HANDHELD UNIT

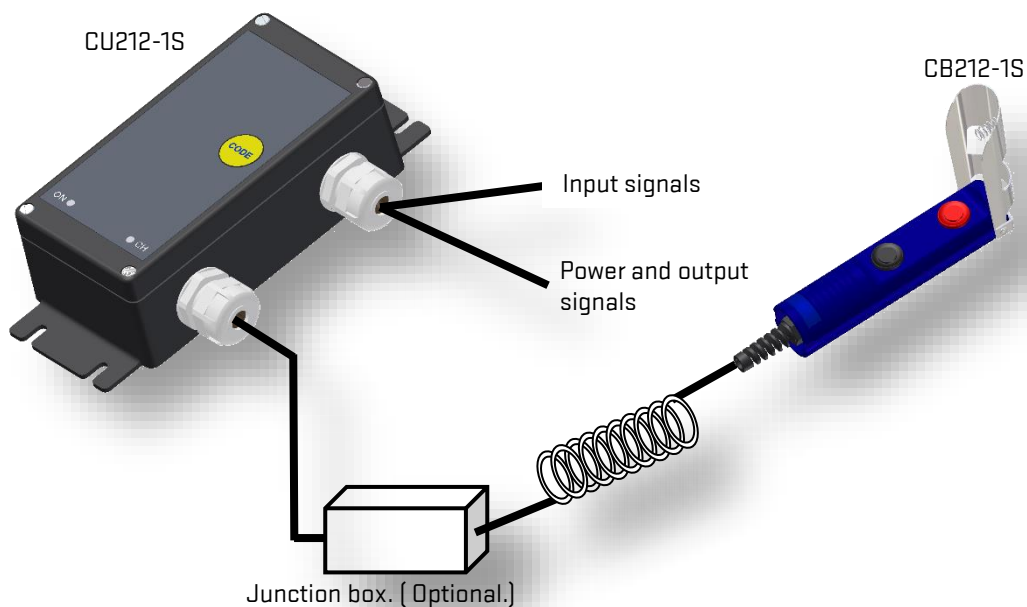


NOTE: There are no polarity restrictions when connecting the cable.

3. OPERATION

3.1 UNIT DESCRIPTION

System Diagram



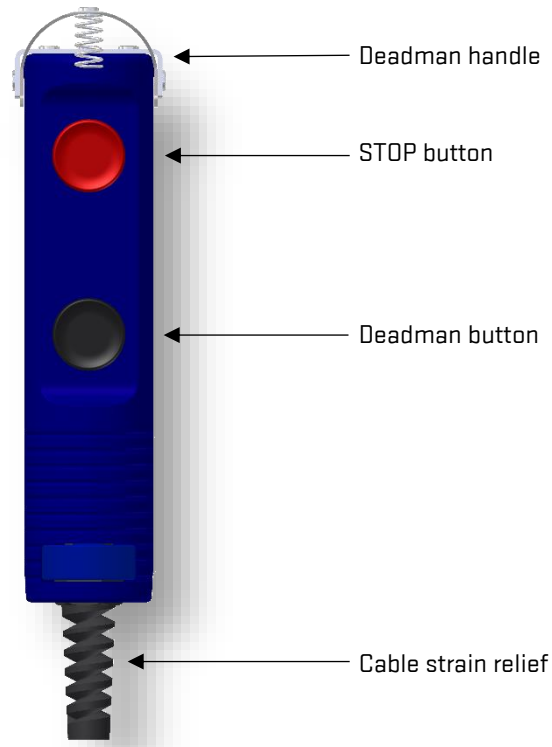
The complete system consists of the following parts:

- CU212-1S, control unit for installation in the drivers cabin.
- CB212-1S, handheld switch
- Connection box, optional, not included in the delivery.
- 14m coiled cable (not included, must be ordered separately).

Cables for power supply and output signals are not included.

3.2 FUNCTION DESCRIPTION

CB212-1S, Handheld unit.



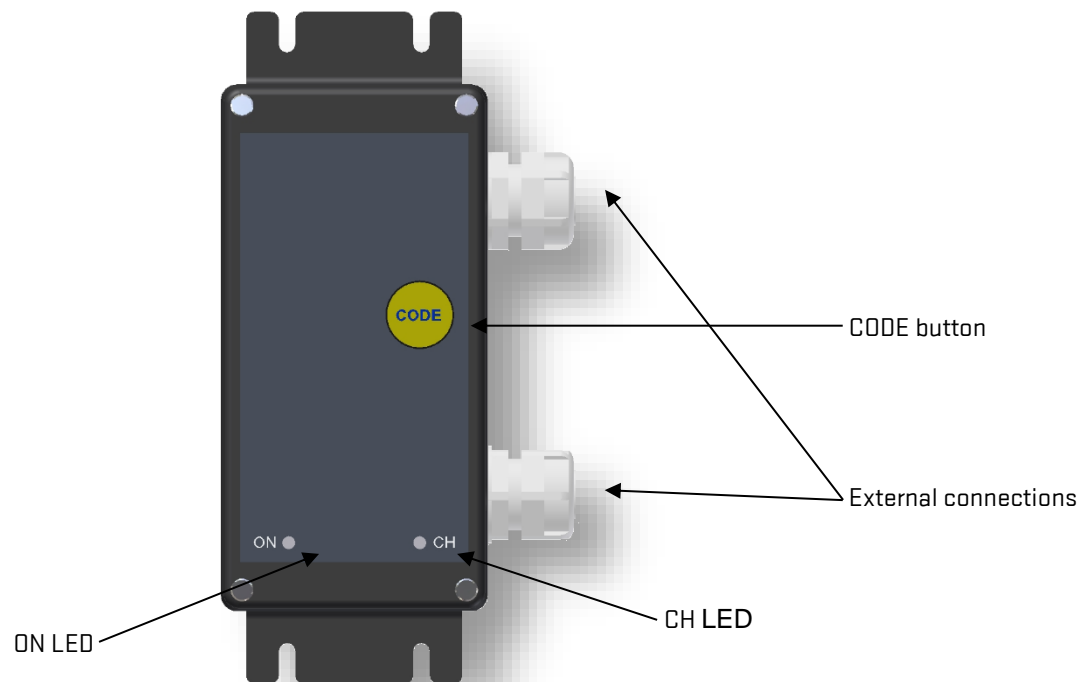
The functions of the handheld unit, CB212-1S, is controlled by electronic circuits at the printed circuit board inside the housing. The handheld unit has two push buttons, one black and one red. The black is the deadmans button, which can be operated by the lever or the directly to push the button.

The red button is the STOP button, intended for emergency stop of the fuelling process from a remote position. The electronic has a failsafe design, telling that the system will stop if something goes wrong. That is for instance if the cable short-circuits. This will immediately shut down the fuelling.

The wired deadman is normally delivered with a timer. When the handheld unit is operated, the fuelling process is allowed to continue. But only for 2 minutes. Within this time, the operator has to release and re-operate the handle quick, to make the fuelling continue.

If the handle is not reactivated, the fuelling will stop after the 2 minutes.

The last 30 seconds of the 2 minutes period, two output signals in the control unit can be used to warn the operator, and tell him that he has to re-operate the handle in order to avoid stopping the fuelling process.

CU212-1S, Control unit:

The front panel has two light diodes, LED's on the front panel. One is marked ON, and the other is marked CH. The ON is green, and is lit when the power is connected. The CH is yellow and is lit when the deadman switch is activated. The CODE pushbutton is only for "function-setup/configuration" purposes of the control unit.

Output signals are:

- Deadman output:** Active when the deadman handle is pressed, and timer is running.
- STOP output:** When control unit is powered, this output is active, supplying 12/24V. When the STOP button is activated, this output is switched off. If the cable is shorted, this output is also switched off.
- Warning light output:** Is active simultaneously with the deadman output. During the last 30 seconds of the timer period, it change from a steady signal to intermittent signal.. Is normally used to drive a lamp, visible for the operator.
- Beeper output:** During the last 30 seconds of the timer period (the intermittent period of the warning light output), this output is active. Is normally used to drive a beeper or horn to give a audio warning that the time period is running to an end.

NOTE: All outputs can supply a current of 3,5A, limited to 5A totally.

3.3 MAINTENANCE

This equipment should be kept as clean as possible at all times.

Physical damages that may result in cracks or holes on the cabinets should be repaired as soon as possible by competent personal. This, because there is a large risk of humidity, dirt and oil entering the unit. If the unit is, for example, exposed by hydraulic oil, it may cause severe damage on the circuit board. Hydraulic oil and other thin oils are largely penetrable, especially when the equipment housing is damaged. Dirty equipment should therefore always be cleaned.

As a rule, the equipment should be sent to service as quick as possible when such damages occurs, without waiting till the equipment does not work any longer - it might be too late to do any repairs.

4. SPARE PARTS.

The following spare parts are available:

Order number	Type number	Item description
11400		Coiled cable, 14m long fully stretched.
01740	CU212-1S	Control Unit with 3 min. timer. (Not ATEX approved)
01741	CB212-1S	Complete Handswitch, with cable strain relief, but no cable.
01735		Control unit printed circuit board, with 3 min. timer.
01722		Printed circuit board, for handswitch
11399		Cable gland with gland nut and bending protection for handswitch
11431		Wall- mount, fixture for handswitch.

5. WARRANTY CONDITIONS

Complaints

When receiving the product the buyer must inspect it, and eventually complain any obvious faults or missing items within 8 days from reception. Acceptance of complaint will otherwise not be considered. Complaints of any faults that could only first be discovered after mounting and testing the product must be reported immediately after recognition.

Warranty

The warranty covers only damages caused by material faults and manufacturing errors.

The guaranty ceases 12 months after the delivery date.

Delta RC AS or appointed repair workshop, is bound to repair and replace defect parts in its products, free of charge, in its main workshop during its normal working hours. Packages being sent to and from Delta RC AS are in the responsibility of the purchaser, as he is also economically responsible for paying the transportation charges, toll, insurance and other related charges.

Should the warranty repair be done at the customer's location, there will be charges for cost of travelling, accommodation and dieting, conforming to the government's assertions. There will also be an additional charge of 50% of travelling time by the current repair regulations.

The warranty is cancelled if:

- a) There has been done any modification or attempts in the product without a written permission from Delta RC AS A/S.
- b) The product has been handled wrongly or has not been maintained properly.
- c) The payment conditions have not been fulfilled.

Repair work

Repair work done after the warranty period is charged at full cost. Packages being sent to and from Delta RC AS's workshop are on the purchaser's cost and risk.

If the repair work is done at the customer's location, by Delta RC AS serviceman, there will be charges for costs of travelling, accommodation, dieting, travelling time and hours of work.

Warranty exceeding 3 months after repair work is limited to cover only the fault that was repaired. A new fault after the repair must be pointed by the customer.

Any other defect or missing part during this period is not covered by the warranty. Should Delta RC AS offer a service unit during the warranty time, the purchaser pays for the transportation, insurance and a weekly rent.

6. TECHNICAL DATA

This equipment is designed for failsafe operation, meeting the stringent requirements for safe operation. It is in accordance to EU's demands to CE-label the equipment.

6.1 GENERAL SPECIFICATION

- * Temperature Range: Operational and storage: -25 to +65° C.
- * Shock Resistance: 2 m free-fall on concrete floor.
- * Cable: Coiled, 14m length fully stretched. 2 cores, cross area 0,75mm².

6.2 CONTROL UNIT, CU212-1S

- * Power Supply: 11 to 35 VDC. Voltage above 35VDC shuts down the receiver.
- * Power Consumption: Standby: 22 mA.
- * Outputs: Semiconductor output. Temperature and overload protected. Output voltage is equal to power input; 12/24 VDC. Each output, max 3,5A total load, 5A. Fused inside by 5A slow blow Auto fuse.
 - * Deadman output. Active when deadman switch is operated.
 - * Warning light output, active during operation of the deadman
 - * Beeper warning output
 - * STOP output. When control unit is powered, this output is active, output is 12/24V. When STOP is detected, this output is switched off.
- * Optional inputs
 - * The CU212-1S is programmed to operate with or without a none failsafe handswitch. To select a **none** failsafe handswitch, set SW2-1 to OFF. See chapter 2.
 - * Deadman override, low input activates the override function
 - * External STOP, low input activates STOP of deadman function.
- * Connections: Screw terminal on PCB connector.
- * Indicators:
 - Green light diode that indicates power on.
 - Yellow light diode that indicates active deadman.
- * Housing: ABS polycarbonate, class IP52.
- * Dimensions: L:160 mm, W: 80 mm, D: 60 mm.
- * Weight: 0.7 kg

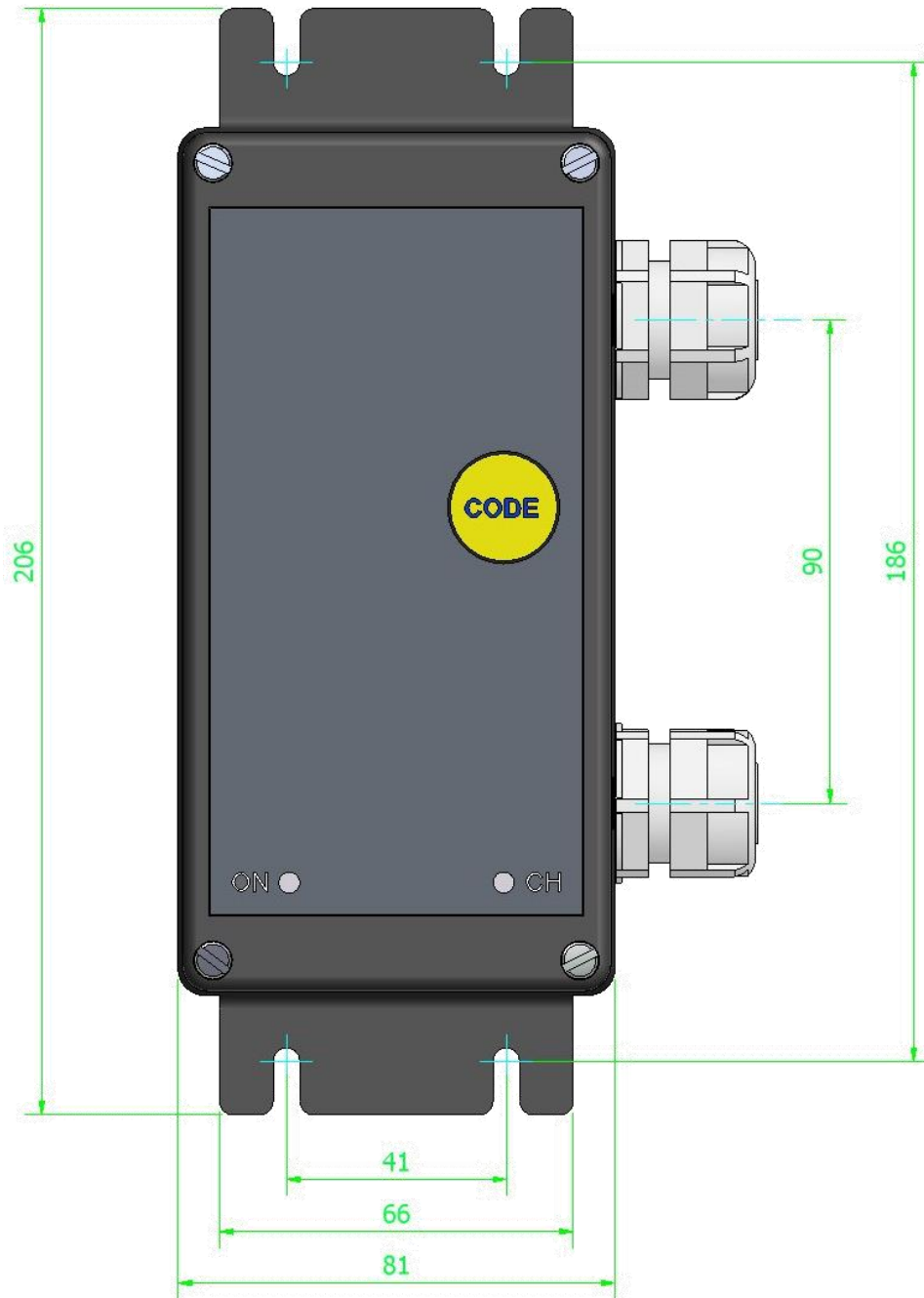
6.3 HANDSWITCH, CB212-1S FAILSAFE

- * Controls: Two pushbuttons; Deadman and STOP.
- * Operation: Deadman push button is operated by handle.
STOP is operated when handle is opened and STOP button pushed.
- * Connections: Screw terminals on PCB inside housing.
- * Housing: Polyamid 6, class IP65.
- * Dimensions: Length: 170 mm, diameter: 40 mm.
- * Weight: 0.3 kg

6.4 DIMENSIONS

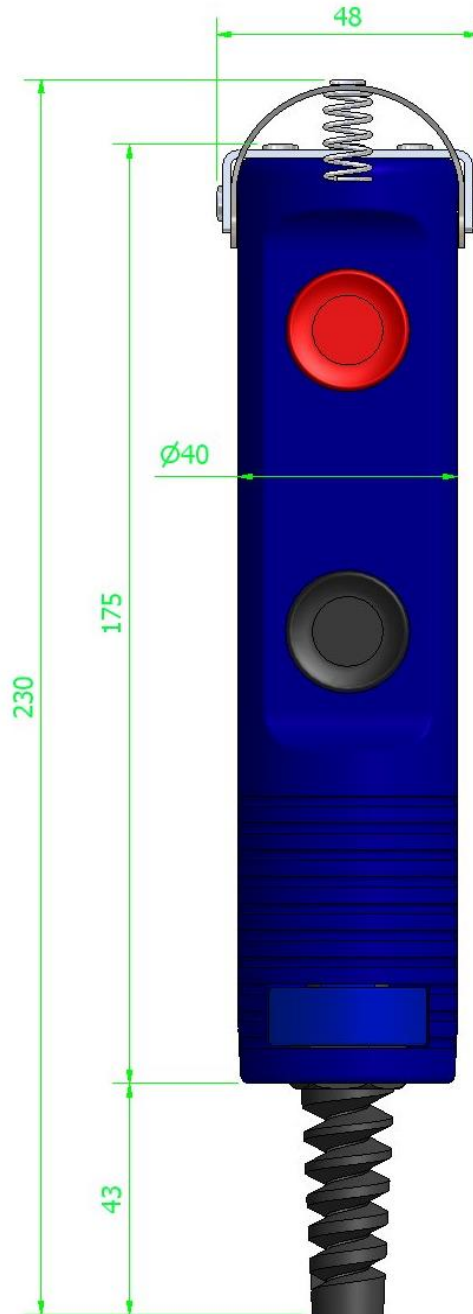
6.4.1 Control Unit

All dimensions in mm.



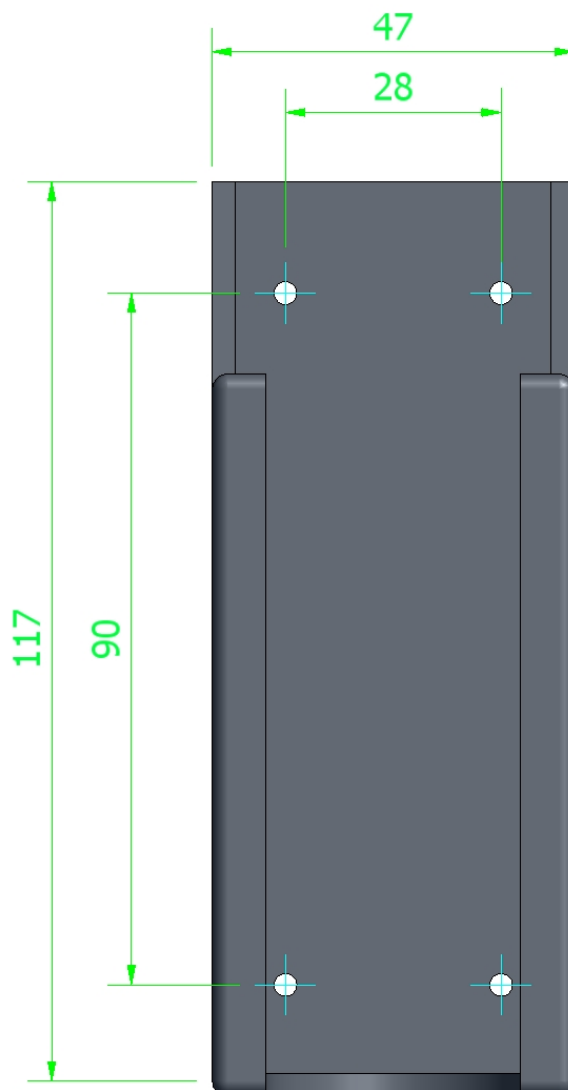
6.4.2 Handswitch

All dimensions in mm.



6.4.3 Wall-mount for Handswitch

All dimensions in mm.



Delta RC AS AS reserves the right to change the specifications and upgrade its products without any previous written notice.

7. ENVIRONMENTAL INFORMATION

Care has been taken while producing this units, to ensure that all excess materials are disposed properly, and recycled accordingly. Please help us with this process in the future.

This means:

Do not dispose this devices into the trash when discarding.

To minimize pollution and ensure environment protection, please recycle properly, to ensure the smallest possible environmental footprint.

The PCB (Printed Circuit Board) in this units should be disposed as E-waste.

E-waste is electrical and electronic equipment of any kind that has been discarded. This includes practically anything powered by an electrical source (e.g., from a power socket or a battery).

The batteries should be disposed properly at a battery recycling facility.

The housings should be disposed as general waste.

Please look for these symbols at the recycling facility:



PCB's



Batteries



Housings

European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) directive.

The European Union's WEEE directive requires that products sold into EU countries must have the crossed-out wheeled bin label on the product (or the package in some cases). As defined by the WEEE directive, this crossed-out wheeled bin label means that customers and end-users in EU should not dispose of electronic and electrical equipment or accessories as household waste. Customers and end-users in EU countries should contact their local equipment supplier or service centre for information on the waste collection system in their country.



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Delta RC AS reserves the right to make changes without further notice to the product, to improve reliability, functions and design. Delta RC AS does not assume any liability arising out of the application or use of the product if used according to this document.

This manual is printed on chlorine-free recycleable paper.



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