USER'S MANUAL

TG Operator Control Units

05/2025

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HETRONIC
A METHODE ELECTRONICS COMPANY

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1. Safety

1.1 Intended Use

Your radio remote control is designed for remote operation of machines and systems using safe wireless communications technology. Any modification, reconstruction or extension of the systems without a written agreement of Hetronic may lead to the loss of your warranty and guarantee claims.
Hetronic assumes no liability for damages resulting out of the non-observance of this operating manual. All persons, working with this radio remote control must
Be suitably trained and qualified as required by the safety regulations.
Strictly comply with the contents of this operating manual.
Before starting the radio remote control you must have read and fully understood this operating manual. The Safety Checklist in Appendix B is intended to be followed before each time the OCU is powered up for operation.

1.2 Symbol Notation

The following symbols are used in this operating manual. The safety alert symbol is used in decals on the unit and with proper operation procedures in this manual.
Understand the safety message. It contains important information about personal safety on or near the unit.

	**STOP!** This symbol gives you warning of imminent danger of life, risk of accident and risk of injury, as well as damage to property in case of non-observance of the working instructions.
	**ATTENTION!** This symbol advises against a possible damage to the system in case of non-observance of the working instructions.
	**TIP!** This symbol points to features and information which allow for an easier handling or operation.

1.3 Practices and Laws

Practice safe working precautions for the benefit of yourself and others.
Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.

1.4 Required Operator Training

The original purchaser of this unit was instructed by the seller on safe and proper operation. If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation. ALWAYS read and understand the documentation for any machine to be controlled by radio remote control.

1.5 Possible Sources of Danger

This device is part of a system that makes remote control via wireless radio signals possible. The transmission of control commands can take place around obstacles and out of the operator's direct line of sight. Take the following precautions to prevent accidental start-up and possible injury or damage:


Switch "OFF" the OCU when it is not in use. Unless the OCU has user access control password configured, remove the battery if unit is placed away from the operator.


Disconnect the power supply from the MCU before any assembly, maintenance or repair work is done.


AVOID SYSTEM DAMAGE - ALWAYS disconnect MCU power supply and control wiring before welding on any part of the machine.


Never remove or alter any of the safety features.

ALWAYS confirm that the machine and radio remote control Stop functions work properly **BEFORE** beginning any machine operation.

1.6 Protective Features

This OCU is equipped with electronic and mechanical safety features. Control signals from other OCUs cannot be processed because transmission coding is unique to each system.

1.7 STOP in case of EMERGENCY

Push the emergency stop on the machine.

1.8 Caring for your OCU

The enclosure materials employed on the OCU have been carefully selected to minimise maintenance requirements.

Always use genuine chargers and accessories. Cheaper ones that are not compatible or made for going with your OCU can harm the unit or lessen its lifespan.

Do not keep your OCU stored in a closed container for extended periods of time unless it is powered off and the battery is removed from the unit. Charging the OCU in a closed container is a potential fire hazard and may shorten its lifespan. Lithium-Ion batteries give off heat when charging and when discharging. Keep your battery percentage between 40%-80% for longer battery life.

Clean your OCU regularly. Use damp cloth or alcohol wipes to clean the unit's exterior surfaces. Do not use aggressive cleaning agents that may inadvertently damage the unit.

2. Introduction and Functional Description

We congratulate you on the purchase of your new Hetronic push button OCU. You have chosen a high quality product. Familiarise yourself with the unit before using it for the first time. In addition please carefully refer to the operating instructions and the safety advise given in this manual. Only use the product as instructed and only for the intended field of application. Keep these instructions in a safe place. If you pass the product on to anyone else, please ensure that you also pass on all the documentation with it.

2.1 Production and System Numbers

Before contacting your dealer or Hetronic about service, repair or replacement parts, note the equipment Production and System numbers. These numbers are located on the silver label affixed to the unit.

2.2 Before Operating Your Wireless Control Unit

Confirm that the installation of all your system components has been properly completed. Before start-up, **ALWAYS** confirm that the machine and radio remote control Stop functions work properly.
Understand all Safety Precautions provided in the manuals and review control functions and operation of the machine and this radio remote control system. When not in use, turn the OCU off and store in a safe place to prevent unauthorized use. Ensure that the USB Dongle (which acts as a security key to program the OCU) is kept in a separate but safe and secure place. If the machine does not respond properly, immediately stop operation. Turn off the OCU and report the condition to your supervisor.
Turn off the OCU before any maintenance work is done. Always have fresh batteries on hand or an optional rechargeable battery pack in the battery charger to ensure the availability of a fully charged battery. Installation, setup, and service must be performed by authorized and qualified personnel only.

2.3 Unit Labels

2.3.1 Blank Rating Plate

1. Specific approvals, such as CE, FCC, IC, etc.
2. Type of OCU
3. Frequency and RF Unit
4. Eleven-digit Production Number
5. Eleven-digit System Number

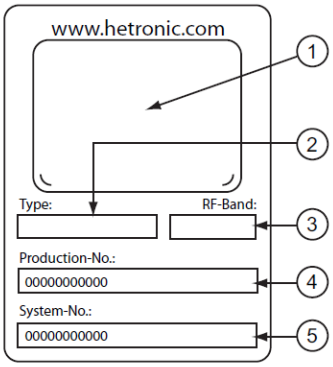


Figure 1. *Blank Rating Plate*

2.3.2 Read User Manual

The "Read User Manual" symbol on the OCU acts as a reminder for the user to thoroughly read through the manual before attempting to operate the system. The User Manual must always be placed in a safe and easily accessible place when not being used for when there is the need to refer to it.

3. Your TG OCU

3.1 General Description

The TG is an ergonomically-designed, programmable radio control OCU capable of transmitting up to 12 on/off functions to control a machine. A Diagnostic LED Status Light on the face of the unit provides continuous operating status information:
- Green (flashing) - transmitting telegram
- Red (flashing) - transmitting STOP telegram
- Red (steady) - Low Battery
- Red/Green (slow pulsing) – Configuration Mode
- Red/Green (flashing) - Invalid Memory Key

Your OCU is encased in a rugged IP65 rated housing, is battery-powered, and comes equipped with built-in low battery detection. Standard equipment includes a battery adapter case for 3 AA size alkaline batteries. For your convenience, there are optional rechargeable battery systems available.

3.2 TG Basic Features

- Removable key power switch
- E-stop switch
- 1 2-detent start pushbutton
- 1 2-detent horn pushbutton
- 8 2-speed motion pushbuttons
- 2 2-detent latching/momentary option pushbuttons
- Sleep mode
- 100 m (300 ft.) range
- Internal antenna
- Shoulder strap

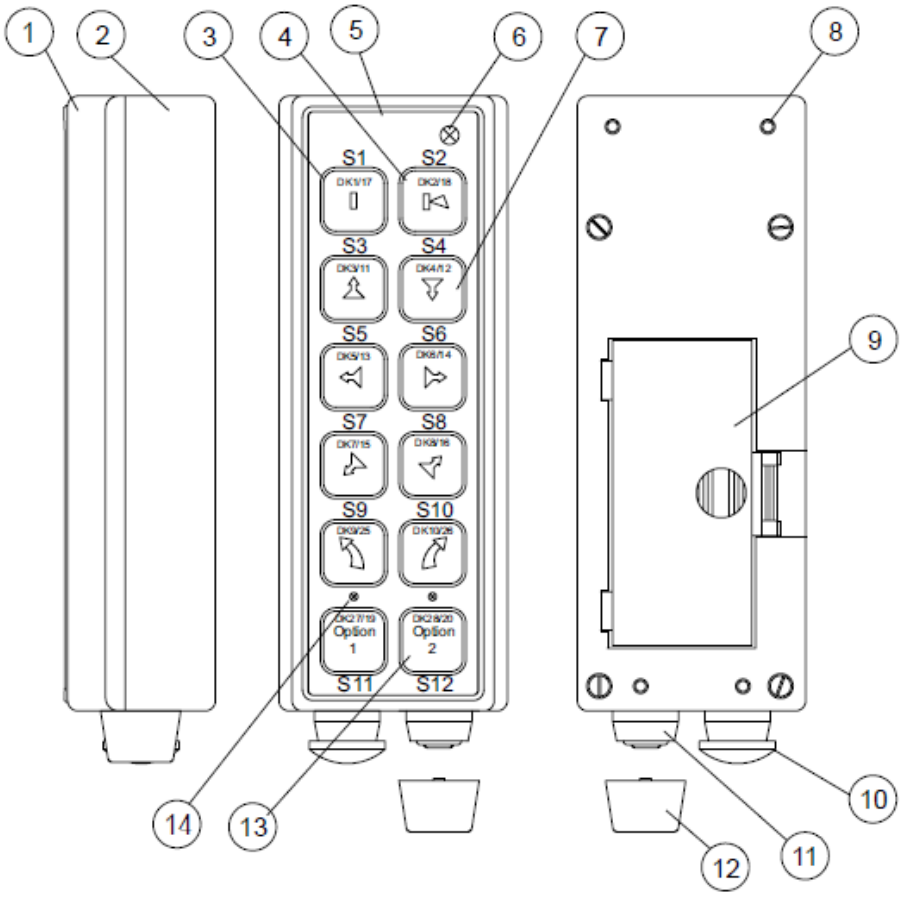


Figure 2. *TG OCU (Right, Front, Left)*

Feature #	Description
1	Upper housing
2	Lower Housing
3	Start Push-button
4	Horn Push-Button
5	Top Bezel and Membrane
6	Power LED
7	Motion Push-button
8	Carrying Belt Fastener
9	Battery
10	E-Stop Push-button
11	Key Switch
12	Key Cap
13	Option Push-buttons
14	Option Select LEDs

Table 1 : TG OCU Features

4. Operating Your OCU

4.1 Holding Your OCU

Hold the OCU upright with the front facing you. Confirm that you are able to easily read and understand any operation text or symbols. Complete the following procedures once a day, before the start of an operation and at all shift changes.

4.2 Visually Checking Your OCU

Always check the OCU for any physical damage before any operation. Check equipment for wear or damage and confirm that you can read and understand all of the safety labels. Never operate a OCU with worn out or damaged parts.

4.3 Powering Up and Starting Your OCU

NOTE: When the OCU is not being used by the operator, it must be stored in a safe place.
1. Confirm that all safety measures required by the equipment manufacturer have been followed.
2. Insert a fully charged battery into the battery compartment of the OCU.
3. Turn ON the MCU.
4. Place the key switch on the OCU in the OFF position and the E-Stop pushbutton in the OFF position (i.e. pull it out).
5. Turn the key switch to the ON position. The Power LED on the OCU flashes GREEN once and an acoustic pulse sounds to indicate there is a diagnostic test in progress.The LED on the OCU continuously flashes GREEN and a second acoustic pulse sounds to indicate successful diagnostic testing.
6. Press and release START (S1) to turn ON the OCU.
7. The system is now ready to use.

Result	Meaning
Diagnostic LEDs turn ON	Checking for Memory Key
All LDC segments flash ON and OFF	LCD screen is working
LEDs turn OFF	Memory Key check is complete
Green LED starts blinking and Settings Screen appears.	OCU data is being transmitted
NOTE: If the user display is activated, a welcome screen appears, and then the Settings Screen	
Operation screen appears	OCU is operational
NOTE: If Feedback is enabled, feedback status messages also appear on the screen.	

Table 2: OCU Results and Meanings

4.4 Turning OFF the OCU and Stopping the Radio Remote Control

The word STOP appears and the OCU sends an E-Stop telegram to the MCU for 2 seconds. Upon receiving the E-Stop telegram, the MCU goes into Safe Mode and turns OFF all MCU outputs.The OCU shuts off in about 2 seconds.

5. Theory of Operation

Your OCU works with a receiving device to transfer machine control commands via radio frequency to your machine. The OCU electronically generates a carrier frequency that allows it to communicate with the MCU without the use of cables or wires. The MCU then converts the carrier frequency information into discrete machine control outputs that interface with your machine's controls. Each OCU and MCU that comprises a system is programmed with a unique address code. This code ensures that machine operations are safe, and that other remote control equipment cannot unintentionally control your machine. The MCU only accepts commands from the OCU with the same address code. The MCU and OCU have the address code set at the factory.

5.1 Stop Function

The most important feature of the radio remote control system is the STOP function. When the OCU is turned on, it performs a self-test to confirm that communications are within designated parameters. If an error is detected, the OCU will not transmit any signals. The OCU sends the STOP pushbutton status along with the specified machine functions. This method confirms that ongoing operations are safe. If the STOP pushbutton (#10) is pressed, the data telegram changes so that only the stop command is transmitted. No other motion command data is sent.
This special data telegram places the MCU in Safe Mode, and the stop relays in the MCU open. All other machine functions are completely disabled in the MCU.
The STOP button (#10) on the OCU is only a remote stop and will operate only when the OCU is powered up.

Pressing the STOP pushbutton (#10) does not ensure the machine will come to a complete stop. STOP button functionality is subject to the wiring of MCU STOP relays to machine emergency stop circuit and controlled machine logic where applicable.

ALWAYS test the STOP function at the beginning of every operation session or when there is change of operator.

6. TG Battery

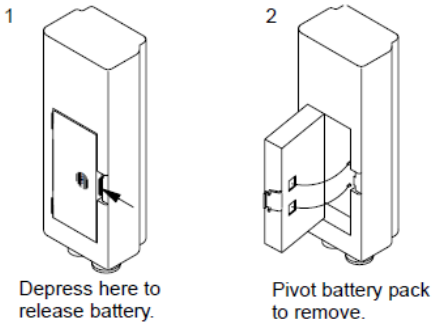
An acoustic pulse sounds to indicate a low battery warning. When the OCU signals, the battery must be changed immediately. Position the crane/machine into a safe place or safe condition within 30 seconds after hearing the signal.

The OCU will switch to the EMERGENCY STOP condition after 30 seconds

6.1 Rechargeable Batteries

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries (Optional)" on page 6.
2. Slide a fully-charged battery into the battery compartment on the back of the OCU as shown, and snap it into place

EXPLOSIVE GASES AND FLYING DEBRIS can cause death or serious injury. Use only Hetronic replacement rechargeable batteries. Use of unauthorized replacement batteries could cause a battery explosion resulting in injury or death of the operator or other people in the work area.

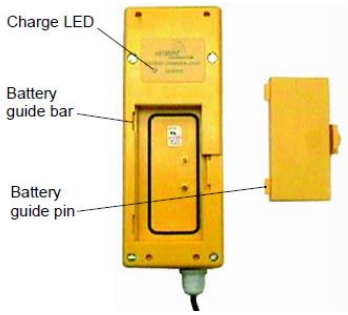


6.2 Changing the battery

1. Remove fully charged battery pack from the battery charger.
2. Insert the fully charged battery pack into OCU.
3. Place the spent battery pack into the battery charger for recharging.
4. The Radio Remote Control is ready for operation.
5. Follow the "Start-Up Procedure" and safety checks to begin operation

6.3 Recharging your Batteries

The batteries can be charged as follows:
1. Insert the battery with both guide pins in the corresponding guide bars into the battery compartment of the battery charger.
2. Press the battery on the marked spot until it latches into its compartment. The charge LED illuminates.
3. When the battery is fully charged, the charge LED flashes.
4. Leave the battery in the charger until it is needed. The charger supplies a "trickle" charge but will not over-charge the battery.



6.4 Battery Disposal

AVOID ENVIRONMENTAL POLLUTION. Recycle your rechargeable batteries according to local recycling rules and regulations. If you have questions or problems operating your
battery charger, please contact your dealer or Hetronic. Standard Hetronic rechargeable batteries are the
nickel metal hydride type. These batteries have no "memory effect" when charging a battery that is not fully discharged.

6.5 Prolonged Battery Life

Avoid battery misuse, over charging, overheating or regular dropping. This can cause permanent damage to the cells.

Never keep a fully charged battery at elevated temperatures. Battery pack does not die suddenly but the runtime gradually shortens as the capacity fades.

Keeping the charge in the 40% to 80% range will prolong battery life.

Unfortunately there is no avoiding fact that battery has a finite life, after which they will certainly degrade. Following these basic tips can help delay the inevitable.

7. Troubleshooting

If your TG OCU does not operate after normal start-up, follow the recommended troubleshooting sequence to help isolate the cause and determine corrective action. If you need more information, contact your nearest Hetronic dealer.

PROBLEM	PROBABLE CAUSE	CORRECTION
System will not initialize after normal start-up procedure	E-Stop switch engaged	Pull out E-Stop switch. Restart system by pressing Start.
	Batteries fully discharged	Check battery to ensure a full charge. Replace with fully charged battery if necessary.
	No power to the MCU	Check the diagnostic LEDs in the MCU to be sure power is applied. Ensure that the system is properly grounded.
The OCU is turned on, but does not transmit (Power LED not flashing)	Battery is discharged	Replace battery with a fully charged battery.
	Broken key switch	Check wiring on key switch. Replace key switch, wiring or contact element.
	Coder board failure	Contact Hetronic or your Dealer.
OCU is transmitting (Power LED flashing), but crane/machine will not respond	E-Stop switch engaged	Pull out the E-Stop pushbutton and press the Start pushbutton
	OCU out of range	Take the OCU back into the range of the MCU. Press the Start pushbutton.
	A motion function was not in OFF position when OCU turned on	Ensure that all control devices are in OFF (neutral) position when the Start button is activated.
	MCU power off	Turn on power to MCU.
	Blown fuse in MCU	Check all fuses. Replace if necessary.
	E-Stop failure in OCU	Check E-Stop pushbutton for damage. Check wiring to contact element for broken or disconnected wires. Repair or replace E-stop pushbutton or wiring.
	E-Stop failure in MCU. Red E-Stop LED on PCB is illuminated	Contact Hetronic or your Dealer
	OCU/MCU frequency channels do not match	Check frequency settings to be sure OCU and MCU are set to same frequency channel NOTE: Always match the OCU frequency channel to the MCU. NEVER change the MCU frequency channel. Contact Hetronic or your Dealer.
	ADMO address codes of OCU and MCU do not match	Check that the ADMO address code is the same for the OCU and MCU. Contact Hetronic or your Dealer.
All crane/machine motions operate intermittently	MCU antenna connection is loose or missing	Tighten or replace antenna.
	External antenna (if used) has loose connection, poor grounding or interference	Tighten antenna and ground connection. Contact Hetronic or your Dealer for more information on external antennas.
	Surge suppressors not installed on contactors	Install RC type surge suppressors on all magnetic contactors that are controlled by the radio remote control system
	Control wiring too close to high power machine wiring	Control wiring must be run separately from high power machine wiring.
	Connector inside MCU is loose	Check all connectors, reseat if necessary.
	Another Hetronic OCU may be interfering with the system. NOTE: This does not apply for STD-402 RF modules	If another Hetronic system is located within 75 meters, the frequency channels must be at least 2 channels apart. If another system is within 20 meters, the channels must be at least 3 channels apart. Contact Hetronic or your Dealer for assistance.
Some crane/machine motions operate intermittently	Crane/machine motion wiring may be loose.	Check wiring from MCU to plug and from plug to crane/machine motion actuator.
	Connector inside MCU is loose	Check all connectors, reseat if necessary.
	Surge suppressors not installed on contactors	Install RC type surge suppressors on all magnetic contactors that are controlled by the radio remote control system.
	Control wiring too close to power wiring	Control wiring must be run separately from high power machine wiring.

Table 3 : Troubleshooting tips

8. Specifications

OCU	
Housing	Ergonomically designed PC-ABS blend housing, one-hand operation
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	950g (2.1 lb) including battery
Dimensions	Height: 255 mm (10 in.)
	Width: 88 mm (3.5 in.)
	Depth: 58 mm (2.3 in.)
Antenna	Internal
Power Supply Voltage Range	9.6 V NiMH rechargeable battery
Diagnostics	Status LED for operation and standard/advanced low battery detection
Operation Time	Up to 20 hrs continuous transmission*
Control Configuration	E-Stop pushbutton, Key power switch, 1 two-detent START pushbutton, 1 two-detent HORN pushbutton, 8 two-speed motion pushbuttons, 2 two-detent OPTION pushbuttons
Frequency Range	400 - 470 MHz
Power (RF Output)	10 mW max
Typical Operating Range	Typically 100 m
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Hamming Distance 3
Operating Temperature Range	-20℃ . . . 70℃ (-4℉ . . . 158℉)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Approx. 100 msec.
Standard Features	Fully programmable via Hetronic PC-Link
	Integrated LCD graphics display with feedback capability
	Combination stop/Memory Key cap that stores configuration settings
	Cable back-up ready
	Push button monitoring
	Hand and wrist strap

*assuming brand new, fully charged battery at 20°C temperature

Table 4 : OCU Technical Specification

9. Warranty, Service, Repairs and Maintenance

Before any service or maintenance intervention on remote controlled equipment always:
•Remove all electrical power from the equipment
•Follow lock out procedures

Hetronic products are covered by a guarantee/warranty against material, construction and manufacturing faults. During the guarantee/warranty period, Hetronic may replace the product or faulty parts. Work under guarantee/warranty must be carried out by Hetronic, or by an authorized service centre specified by Hetronic. Any modification, reconstruction or extension of the systems without a written agreement of Hetronic may lead to the loss of your warranty and guarantee claims.
The following are **not** covered by the guarantee/warranty:
Faults resulting from normal wear and tear
Consumables e.g. batteries
Products that have been subject to unauthorized modifications
Faults resulting from incorrect installation and use

Maintenance and Preventive Care
•Repairs and maintenance must be carried out by qualified personnel
•Only use original Hetronic spare parts
•Contact your representative for service or any other assistance
•Keep the product in a clean, dry place
•Keep battery contacts clean
•Wipe off dust using a slightly damp, clean cloth
•Keep rubber over-mould clean
•Remove dust from inside gaps, docking recesses and battery contacts using a vacuum. Special care must be taken when cleaning the battery compartment of the OCU as detachment of the pressure balance element may lead to ingress protection problems
NEVER USE:
•Abrasive cleaning solutions or high-pressure water jets.
•Sharp, pointed objects or any hard items as these may tear the over-mould or rubber parts.
•Compressed air as this may lead to ingress protection issues.
•Petroleum based solvents including Diesel and Gasoline to clean the unit as these may react with the silicone rubber of the joystick gaiter.

10. Regulatory Information

For regulatory information, please refer to the Regulation Booklet

www.hetronic.com

Appendix A

Definition of terms

The following terms are used throughout the User Manual and may be unfamiliar to some operators.

Term	Definition
baud rate	The transmitting speed measured in bits per second.
hamming distance	A measurement of data transmission safety. The amount of failures in the data stream which has to occur during the transmission in order to create a wrong signal. A low hamming distance means that the test is not very sensitive to data transmission errors and could potentially be unsafe. A high hamming distance means that the system is very sensitive and could potentially be unreliable due to potential noise interference.

Appendix B

B.1 Operator Safety Basics

Before starting your shift, you should make sure that the equipment has a current inspection certificate and that the necessary inspections and risk assessment checks have been carried out and are up to date. Also, the equipment must be operated in accordance with the manufacturer's instructions.
Furthermore, it is of utmost importance that you know that **YOU are primarily responsible for YOUR OWN health and safety**. Wear appropriate Personal Protective Equipment and make sure that you have had all the necessary training to operate the equipment. The following basic safety precautions must be adhered to at all times:
1. OCU switches must never be mechanically blocked ON or OFF for any motion. When not in use the OCU must be turned off. A safe and secure storage space should be provided for the OCU unit and the unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane. MCUs must be removed from the equipment when it is unlikely that it will be used for a period of time, and properly stored.
2. All defective or missing safety equipment, mechanical or electrical defects must be reported to the supervisor without delay. Operation must not continue until all required repairs are completed. Any changes to the condition of the remote or equipment must be recorded and communicated to or made accessible by the following operators on shift.
3. Ensure that there is nobody in the path of the travel of the equipment. If there is, stop and sound the alarm before proceeding.
4. When leaving the equipment area for any reason, switch off the OCU, remove the USB Key and store it in a safe and secure place to prevent unauthorized operation.
5. Do not allow any unauthorized person to operate the OCU at any point.
6. Do not operate the OCU at a distance where the equipment and all surrounding objects are not visible. Make sure that your view is not obstructed.
7. Do not attempt to override any of the safety features built into the Radio Remote Control.
8. Put rechargeable batteries on charge at the end of each shift.
9. Use protective gloves when surface temperature of unit exceeds 58°C (136°F) as per IEC 62368-1:2014.

B.2 Safety Checklist

The following checklist provides general safety guidelines for radio control operation of equipment by fully qualified and trained operators. These recommendations do not take precedence over any of the following requirements relating to cranes, hoists, lifting devices or other equipment which use or include Hetronic products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where Hetronic products are used,
- Plant safety rules and procedures of the employers and the owners of the facilities where the Hetronic products are being used,
- Occupational Health and Safety Administration (OSHA) regulations,
- Safety standards and practices for the industries in which Hetronic products are used.

OCU Start-up and Safety Checklist		
1	Are batteries fully charged?	
2	Are all switch labels clear and legible?	
3	Is the OCU free from cracks and damages?	
4	Are the battery enclosures free from cracks and damages?	
5	Is the STOP function working as it should be?	
6	Is the correct USB Key being used?	
7	Has each function of the OCU been tested independently to ensure the equipment is responding correctly?	
8	Is the TFT free from cracks, deep scratches and damages?	
9	Is there any debris inside the USB port which will prevent the USB Key from being inserted /functioning properly?	
10	Are the Status LEDs on the OCU clearly visible?	
11	Are the charger and plug in good working condition?	
12	Is the cable control cable (where applicable) free from kinks and damages?	

Appendix C

C.1 Spare Parts

Keep the safety instructions for future reference. Always download the User Manual instructions from our website for the latest version available.
Refer to the online web shop for respective part numbers of any parts that may need replacement:
https://shop.hetronic.com.mt/en/home

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.