STORAGEDOCK

12 VOLT BATTERY RANGE

ES0.64K/12V LiFePO$_4$ BATTERY

TECHNICAL DATA SHEET
WITH INSTALLATION INSTRUCTIONS

STORAGEDOCK ES0.64K 12 VOLT	
Product Code	ES12-50Ah/640
Weight	7.6kg
Dimensions	185 x 200 x 175mm

Manufactured by SPECIALIZED SOLAR SYSTEMS
43 Ossie Urban Street, Tamsui Industria, George, South Africa
+27 (0)44 878 1126 | www.specializedsolarsystems.co.za | info@specializedsolarsystems.co.za

To be completed by Distributor:

IMPORTANT INFORMATION

• PROJECT No.	
• CLIENT NAME	
• CLIENT CONTACT DETAILS	
• DATE PURCHASED/INSTALLED	
• SERIAL NUMBER of UNIT	
• SSS REPRESENTATIVE	

Please retain this booklet as proof of your warranty.

If this section has not been completed by a registered SSS Distributor, please submit a copy of the above to the following email address to ensure that your warranty will be valid:

info@specializedsolarsystems.co.za

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STORAGEDOCK ES 0.64K/12V

INTRODUCTION

Each Storagedock battery is composed of prime cell A grade lithium iron phosphate ($LiFePO_4$) cells. The $LiFePO_4$ battery is one of the most stable forms of lithium-iron technologies available for this specific purpose. This battery uses a lithium-iron-derived chemistry and shares many advantages with other lithium-ion battery chemistries. However, there are significant differences. Lithium iron phosphate chemistry offers a longer cycle life than other lithium-ion approaches. Another important advantage over other lithium-ion chemistries is thermal and chemical stability, which improves battery safety, making these batteries ideal for home and business use.

The Storagedock batteries are also modular in design which allows one to increase the capacity of your energy system over time, if so required. Units can be connected in parallel.

With a Specialized Solar Systems' (SSS) custom designed and intelligent BMS (battery monitoring system), the health of the battery is automatically maintained from the charging cycle, right through to the discharging floor level State of Charge (SOC) within the various parameters from the battery cell supplier in order to ensure the optimal lifespan, safety and warranty.

The batteries can be wall mounted (bracket provided) or positioned on the floor for ease of installation.

Please see the technical specifications hereafter and please read the installation and operating instructions carefully before operating this unit.

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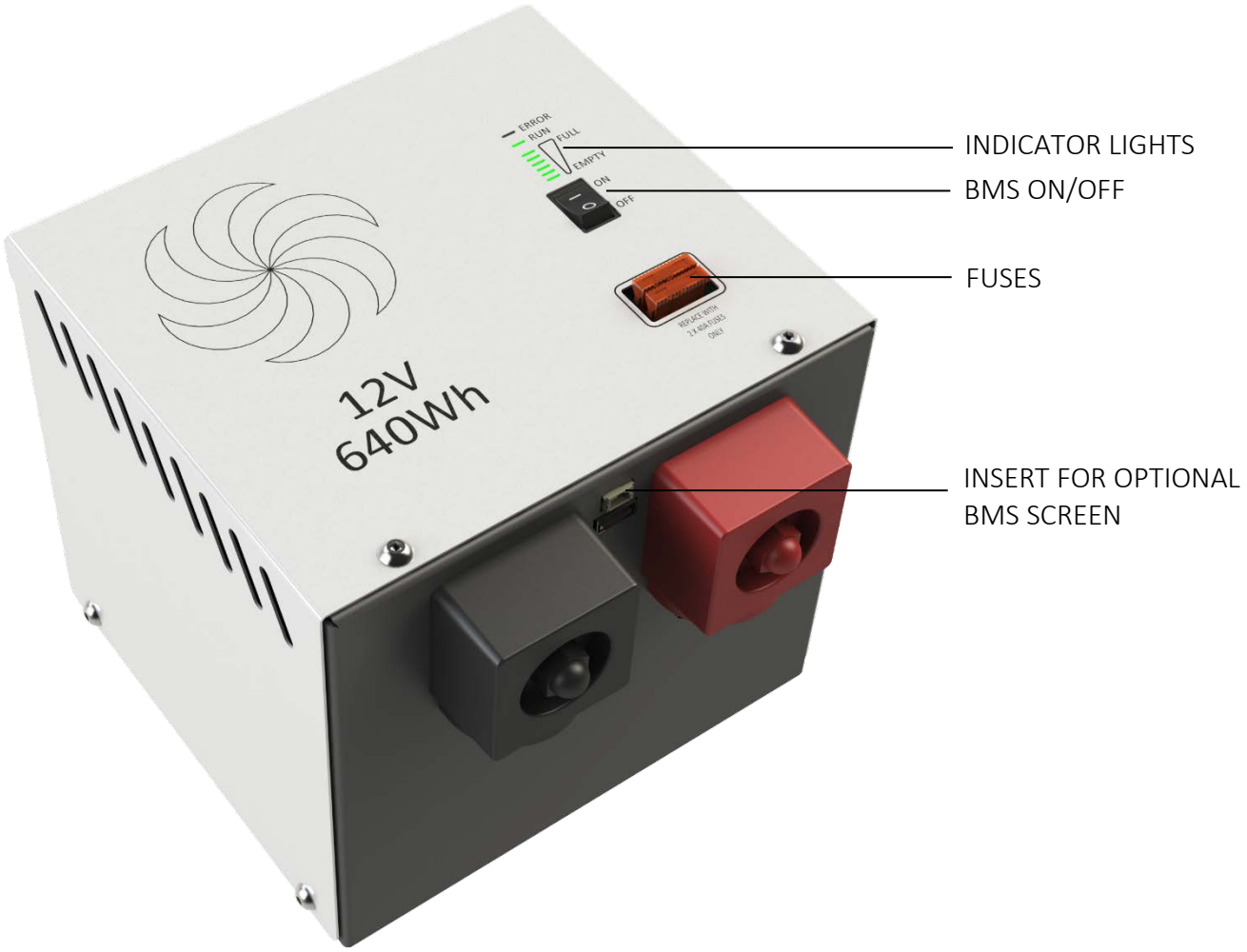
STORAGEDOCK ES0.64K/12V

COMPONENTS



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2. TECHNICAL SPECIFICATIONS

Technical Specifications ES0.64K	
Battery type	Grade A $LiFePO_4$ Prismatic Cells
Nominal Voltage	12.8 VDC
Nominal capacity	50 Ah
Total Energy Capacity	0.64 kWh
Energy Capacity at 80% DoD	0.512 kWh
Standard charge current	25 A
Max charge current	35 A
Charge voltage Bulk/Absorb	14.1 VDC
Float voltage	14.0 VDC
Cycle life	4000 cycles @ 0.5C 80% DOD
Standard discharge current	30 A
Max discharge current	50 A
Discharge cut-off voltage	12 V @ 0.005C
BMS	Charge: 80A / Discharge: 80A
Protection	2 x 40 Amp fuses
Parallel connection ports	No
CAN-bus communication	No
Operating temperature - Charge:	0 to 45° C
Discharge:	0 to 55° C

General Specifications

Unit Installation type	Indoor wall or floor mounted
Inverter size support	0.5kVA maximum
Enclosure material	Aluminum; 409 Stainless steel
Dimensions (length x width x depth)	185mm x 200mm x 175mm
Weight	7.5kg
Ventilation distance	150mm clear on all sides with no obstructions
Installation	Indoors/inside only

In the event the conditions of the battery exceed the pre-programmed settings, a beeping alarm will be raised and if not rectified, the unit will disconnect either the charge or discharge mosfet.

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The following battery protection settings are relevant to this battery:

100% state of charge	Pack	13.68 V
	Cell	3.42 V
Under voltage alarm		12 V
Under voltage cut-off		11.6 V
Over voltage alarm	Pack	14.2 V
	Cell	3.55 V
Over voltage cut-off	Pack	14.5 V
	Cell	3.625 V
Over current discharge alarm	50 Amps for 30 seconds	
Over current disconnect	60 Amps for 5 seconds	
Over current charge alarm	40 Amps for 30 seconds	
Over current discharge alarm	50 Amps for 5 seconds	
Over temperature alarm	60˚ C for 5 seconds	
Inverter cut-off settings	11.8 V	

3. SAFETY INSTRUCTIONS

3.1 General safety instructions

Please read all documentation supplied with this product first so that you are familiar with the safety indicators and instructions before using this product. This equipment should be used for the designated application only.

WARNING: ***Danger and electrical shock***

- This product is used in combination with a permanent energy source (battery). Even if the equipment is switched off, a dangerous electrical voltage can occur at the input or output terminals. Always switch the AC power OFF and disconnect the battery before any maintenance is carried out.
- Never use the product at sites where a gas or a dust explosion could occur. The product is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or with a lack of experience or knowledge.
- An approved service agent must take responsibility of the installation of this product.

3.2 Transport and storage safety instructions

- When transporting or storing the product, ensure that the main supply and the battery leads are disconnected.
- Transport the product in the original packaging only.
- Store all products in a dry environment and preferably at a temperature of 25ºC.

WARNING: ***Do not lift heavy objects without assistance.***

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4. INSTALLATION INSTRUCTIONS

- For electrical work, always follow the National Wiring Standards and Regulations of South Africa.
- Never replace a protective device with a component of a different kind.
- Before switching the energy system on, first check that the input voltage is correct.
- Ensure that the equipment is used in the correct operating conditions.
- Never operate in wet or dusty conditions
- Ensure that there is sufficient free space for ventilation around the installed equipment.
- Install the product in a heat proof environment.
- Ensure that there are no chemicals, plastic pots or curtains in the immediate vicinity of the installation.
- Always ensure that you follow the correct installation video/manual procedures when attempting to install this unit.
- If mounting the system on a wall, ensure that the supporting structure (wall) is able to carry weight accordingly as per section 2 in this document.
- 8-10mm size bolt must be used to secure the unit to the supporting structure.

NB: ***Battery to be installed by qualified Specialized Solar Systems approved installers only.***

4.1 The Initialising Procedure

1. Turn ON the power button on the side of the unit. Without a screen, the unit will beep and go into a test protocol and indicate the SOC of the battery via the indicator lights.
2. If no alarm has been raised, the unit is now ON.
3. If a screen is connected to the battery, the screen will indicate state of charge of battery.
4. Using the touch screen, browse through the pages for information.
5. The battery will now be operational.

Once the switch is in the "*ON*" position check the following:

- That there is available DC power on the output leads.
- On the display of the battery check that there are NO Alarm lights, SOC Green LED are indicating correctly

In the event of over-charging the battery, the charge circuit will disconnect separately. In the event of an over-discharge the battery supply will disconnect separately (please familiarize yourself with the FAQ section).

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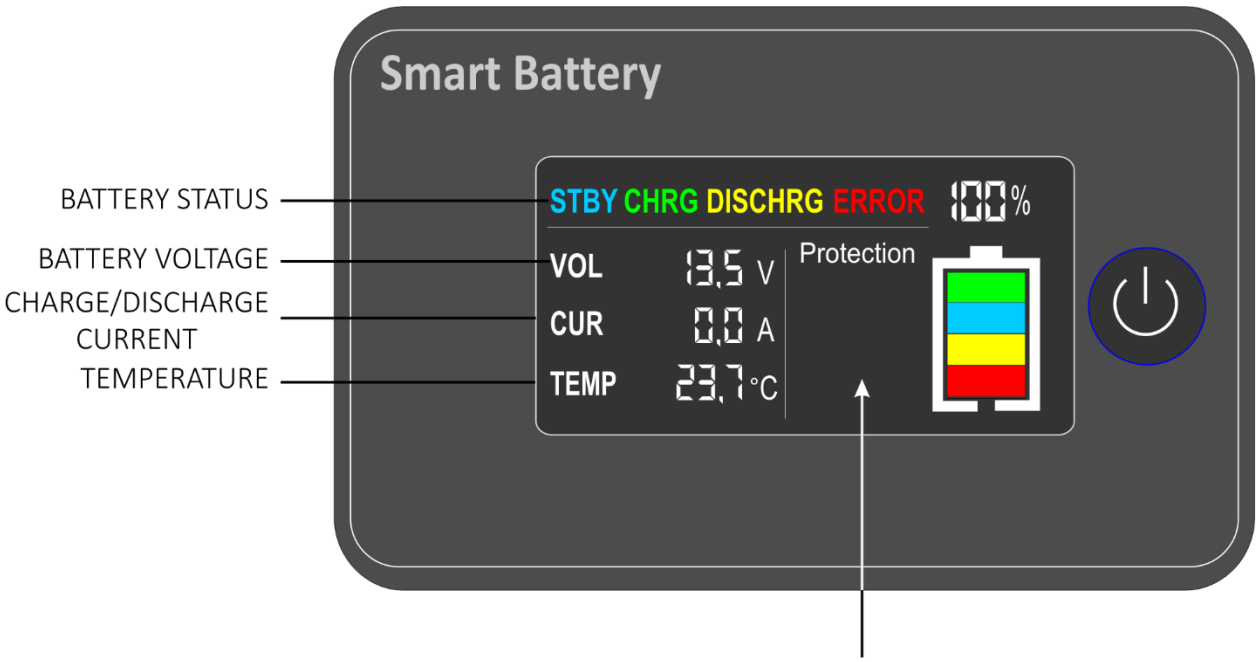
5. BMS SCREEN OPTIONS (EXTRA ADD-ON)

This battery does not include a BMS screen. However, one does have the option to select a BMS screen for this unit. There are two types of screens that are available for this unit:

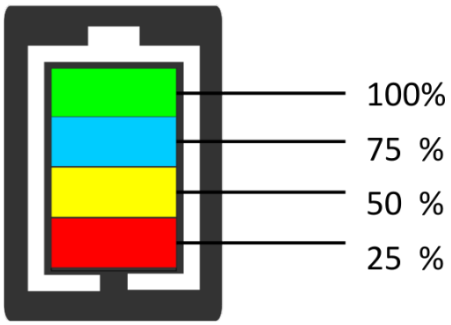
1. Standard indicator screen (colour)
2. Touch screen (colour)

5.1 Standard Indicator Screen



If a fault is detected and the BMS applies protection to the battery, it will be indicated here. The fault/protection could be: OC (over current)
CH (over charge)
DISCHRG (over discharge)
TEMP (temperature high)

BATTERY STATUS INDICATOR



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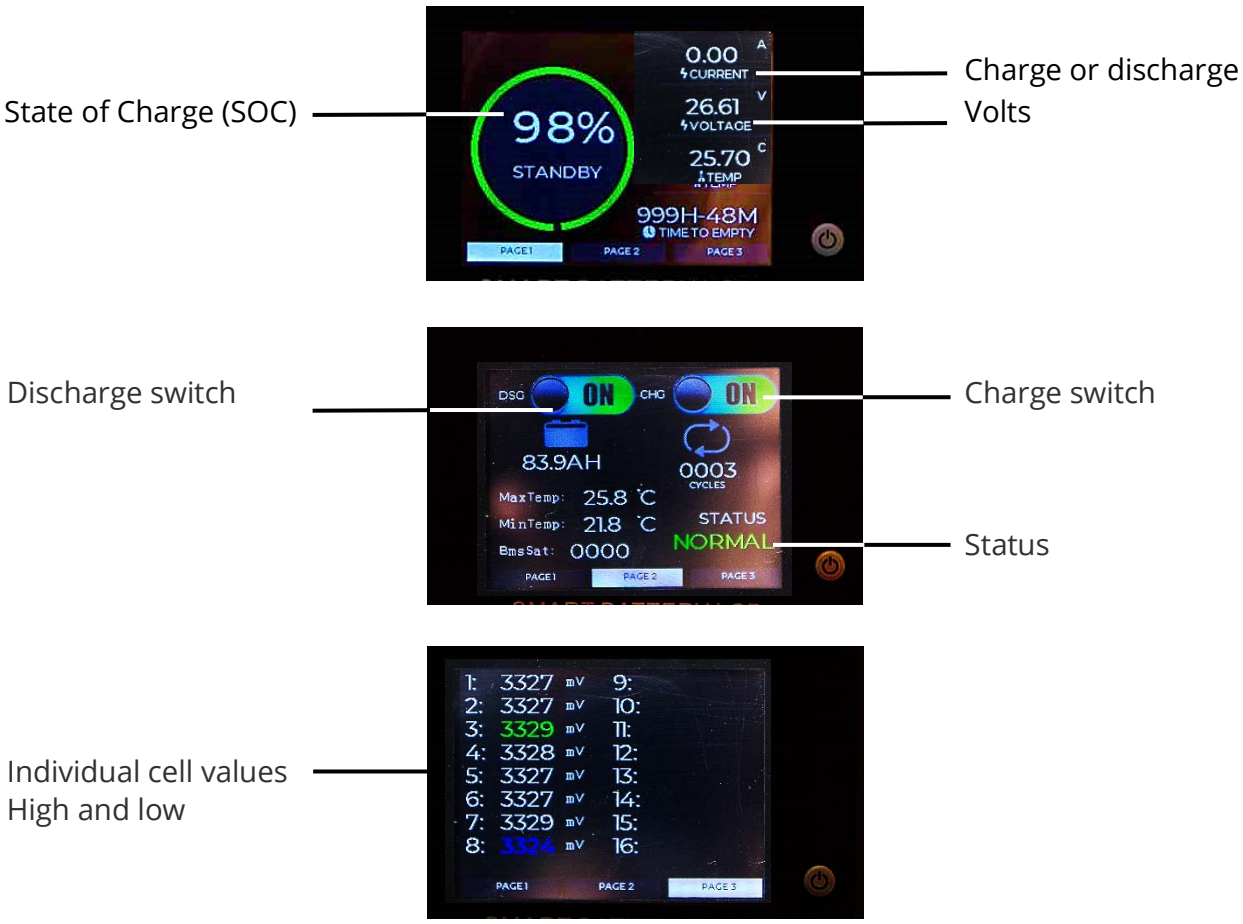
5.2 Touch screen



6. CONNECTION BETWEEN BATTERY AND INVERTER

Please ensure that inverter connected does not exceed the maximum Amp draw, as per the technical specifications above. Please ensure that the cables are a minimum of 16mm² Cu.

7. HOW TO CONNECT A SECOND BATTERY

When installing the second 640 Wh battery, please follow the following procedure:

- Disconnect all PV input (if applicable).
- Disconnect the main isolator fuse.
- It is always advisable to only add the second battery when the first battery is at 90% to 100% SOC. The second battery should be at the same SOC.
- Install the second battery externally, ensure this is secure and safe.
- Using the interconnecting cable supplied (red/black) interconnect the positive and negative cable between the batteries. Ensure that you have a secure connection. 16mm² Cu cable recommended.
- Now close the main isolating fuse and the system will power on.

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- Connect the PV (if applicable) and verify that the unit is now charging, Check the SOC setting on the main screen of the BMS if a screen is connected, or check the indicator lights on the top of the battery if no screen is connected.

8. TROUBLESHOOTING AND FREQUENTLY ASKED QUESTIONS (FAQ)

The battery screen is ON and the charge/discharge mosfets also indicate that they are ON and no alarm is active on the screen but there is no power on the loads.

1. Please ensure that the battery isolator is in the "ON" position.
2. Please check the status on page 2 of the touch screen, and see if the battery is in the "NORMAL" mode. If not, then…
3. Switch the battery ON/OFF and see if the unit reboots the software.
4. Phone your supplier if it does not reboot.

Can a battery cause a fire?

When it comes to households, $LiFePO_4$ batteries provide an added layer of safety due to their inherent stability. However, it is essential to note that improper handling, storage or charging could still pose a risk. Any electrical devices incorrectly used could pose a risk of fire.

What happens if the individual battery cells become unbalanced?

Lithium batteries need to be charged to 100% state of charge in regular intervals. If the cells are unbalanced, recharge the battery and allow it to be charged to 100% for as long as possible. At this time, the cell balance should improve.

What happens when the discharge mosfet switches off (page 2 of the BMS touch screen)?

The common reason for this is that the amperage delivery has been exceeded. Reduce the load and reset the discharge mosfet to "ON". If this does not work, switch the BMS ON and OFF and let it reboot. The same will apply if the charge mosfet switches off.

When a fault SCP is indicated on the screen, what do I do?

This fault means that the BMS has gone into Short Circuit Protect (SCP) mode. There are times that a surge, potentially caused by lightning for example, goes through to the battery before the circuit breaker trips. At these times the BMS will protect the battery, and shut down.
Turn the main circuit breaker OFF and reboot the BMS. If this does not restore the BMS, your service technician will need to complete a "hard reboot" on this unit.

For any additional faults, please contact your registered service technician (as per page 1 of this document).

For more information and videos, please scan the following QR code:

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SPECIALIZED SOLAR SYSTEMS QUALITY CONTROL & SIGN-OFF

PRODUCT NAME:	***STORAGEDOCK ES0.64K***	ASSEMBLER NAME:	
SERIAL NUMBER:		QUALITY CONTROLLER NAME:	

CHECKLIST			
PASS	**FIT & FINISH**	**QUALITY CONTROLLER INSPECTION**	**COMMENTS**
	MAIN ASSEMBLY (Paint Finish, Structure, Rivets)		
	BATTERY COMPARTMENT LID		
	CIRCUIT BREAKER DIN RAIL & SSS COVER		
	$LiFePO_4$ BATTERY MOUNT SECURE		
	ALIGNMENTS		
SIGN OFF:		*DATE:*	
PASS	**FIT & FINISH**	**QUALITY CONTROLLER INSPECTION**	**COMMENTS**
	$LiFePO_4$ BREAKER, SIZE, TEST		
	$LiFePO_4$ VOLTAGE SENSING CABLES		
	BMS MAIN ON/OFF		
	BATTERY MAINS ON/OFF		
	TORQUE VALUE:		
	RJ45 CABLE (CAN-bus Colour Coded)		
	FUSE HOLDER - ALIGNMENT LEVEL		
SIGN OFF:		*DATE:*	
PASS	**PROGRAMMING & COMMISSIONING Memory Setup & Connectivity**	**QUALITY CONTROLLER INSPECTION**	**COMMENTS**
	BREAKER ON/OFF, OC AMP TRIP		
	BMS ON/OFF		
	BMS CONFIG UPLOAD		
	BMS UPDATE WITH PRODUCT SERIAL NUMBER		
	CELL MONITOR- CELL VOLTAGES: HIGH:.....		
	LOW:.....		
	PACK:.....		
	CELL TEMPERATURE: A: ..... B:		
SIGN OFF:		*DATE:*	

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PASS	PERFORMANCE - DISCHARGE & CHARGE	QUALITY CONTROLLER INSPECTION	COMMENTS
	UPS MORE - AC DISCONNECT (NON ESS/VS)		
	RESISTIVE LOAD 1700W DISCHARGE TO LVD		
	DISCHARGE SOC 80%		
	RE-CHARGE TO 100% (AC Source 35A)		
SIGN OFF:		*DATE:*	
PASS	**SAFETY & LEGAL**	**QUALITY CONTROLLER INSPECTION**	**COMMENTS**
	BREAKER TEST		
	LABELS - AC, PV DC (if applicable & align)		
	QR CODE		
SIGN OFF:		*DATE:*	
PASS	**PACKAGING**	**QUALITY CONTROLLER INSPECTION**	**COMMENTS**
	PACKAGING MATERIAL AND MOUNT		
	SHIPPING LIST		
	PRODUCT SPECIFICATION BROCHURE		
	HANGER BRACKET KIT		
	QC LABEL		
	SERIAL NUMBER TAG		
SIGN OFF:		*DATE:*	
FINAL SIGN-OFF AND APPROVAL			
	NAME OF COMMISSIONER:		
	DATE:		
	SIGN OFF:		

NOTE: PLEASE RETAIN THIS BOOKLET AS PROOF OF YOUR WARRANTY

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