HIPOWER SYSTEMS

Operating Manual

HRIW 25	**ISUZU - 4LE2T**
HRIW 45	**ISUZU - 4LE2X**
60Hz Generator	
Manual Version: 1.0	

Complete this table upon delivery of generator.	
Description	**Details**
Engine Manufacturer & Model Number	Isuzu
Generator Manufacturer & Model Number	Stamford
Parts: Hipower Systems	(913) 495-5557 ext. 645
Service: Hipower Systems	(913) 495-5557 ext. 641

PROPOSITION 65 WARNINGS

Safety and environmental risks that are regulated by California Proposition 65 may be present before, during and after the operation of HRIW 25 and HRIW 45 generators.

WARNING

CALIFORNIA - Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

1/3

WARNING

CALIFORNIA - Proposition 65 Warning

This product may contain a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm.

2/3

PROPOSITION 65 WARNINGS

WARNING

CALIFORNIA - Proposition 65 Warning

Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

WASH HANDS AFTER HANDLING.

3/3

ENVIRONMENTAL HAZARD WARNING

WARNING

Environmental Hazard

Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury.

1/1

Table of Contents

INTRODUCTION: HRIW 25 & HRIW 45

This Hipower Systems operating manual provides information required to safely and suitably operate HRIW 25 and HRIW 45 generators.

PROTECT yourself and your co-workers from injury and prevent damage to equipment by reading and following the operating procedures described in this manual.

COMPLETE any required training **before** attempting to operate the HRIW 25 and HRIW 45 generators and any associated equipment.

KEEP a copy of this manual with the generator.

CONTACT Hipower Systems to request additional copies of this operating manual or to obtain more information about the safe operation of HRIW 25 and HRIW 45 generators.

Hipower Systems
16600 South Theden Street
Olathe, Kansas 66062

Main: (913) 495-5557
Parts: (913) 495-5557 extension 645
Service: (913) 495-5557 extension 641

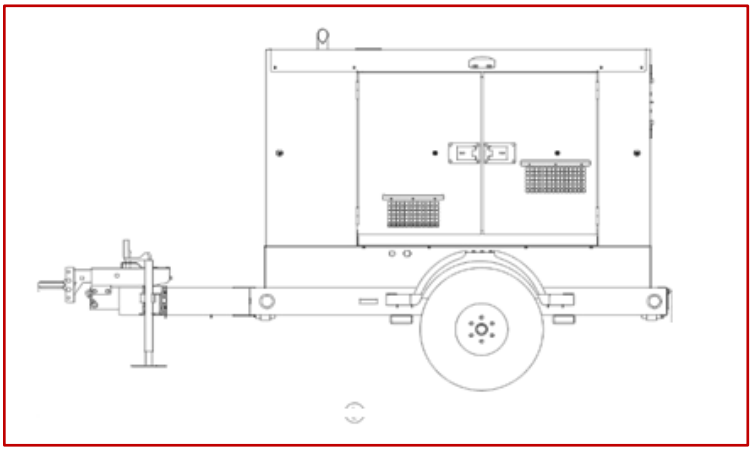
GENERAL DESCRIPTION OF HRIW 25 & HRIW 45 GENSETS

HRIW 25 and HRIW 45 generator sets are powered by 4-stroke, diesel combustion engines with compression ignition, naturally aspirated or turbocharged and/or aftercooled.

Cylinder configuration is either in-line (straight) or V-type, depending on the engine model and temperature management method, i.e., air and/or water.

Electrical power is generated by alternators using horizontal axis, synchronous, 2 or 4 pole with a frequency of **50 Hz** (1500 or 3000 rpm); or **60 Hz** (1800 or 3600 rpm) and class H insulation.

NOTICE: Exceptions to this specification are made when other requirements are requested by a customer.



HRIW 25 & HRIW 45

Engine Mounts

The engine and alternator are coupled and are mounted on a supporting bedplate formed from high strength steel. The coupling between the generator set and the bedplate incorporates elastic supports (anti-vibration elements) that reduce the transmission of engine vibration.

Fuel Tank

The fuel tank may be integrated with the bedplate or be separate from the genset.

Cooling

The cooling system includes a radiator, a high-powered fan, expansion tank, centrifugal pump, thermostatic valve and temperature sensor and other components. The coolant water is mixed with additives that lower the freezing point and protect against corrosion.

Enclosure

The enclosure canopy is constructed of GA14 steel coated with high quality, durable powder coat. For soundproofed static gensets, the interior of the enclosure is lined with fire-retardant, sound-absorbing material.

SAFETY OVERVIEW

This HRIW 25 and HRIW 45 operating manual augments content with safety messages and hazard symbols to increase awareness of hazards and risks associated with diesel-powered gensets and distribution equipment.

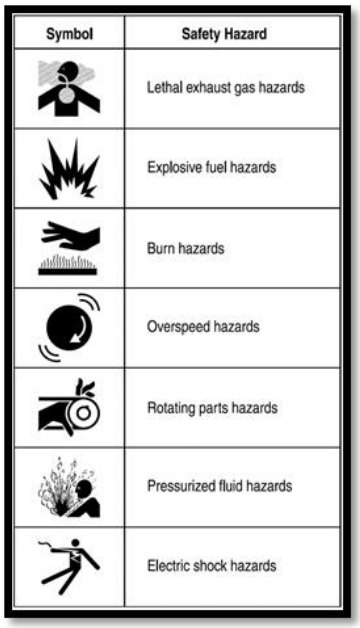
Safety Messages

Safety **messages** inform about potential hazards that could injure you or others. The safety messages are **Danger**, **Warning**, **Caution** and **Notice.**

Safety Symbols

Safety hazard **symbols** are universally-recognized icons that warn of potential hazards associated with the operation of machinery.

Safety Messages



Safety Symbols

Operating Manual

READ all manuals shipped with HRIW 25 and HRIW 45 generators because the manuals present specific information about safe and appropriate set-up, transport, operation and maintenance.

SAFETY GUIDELINES: HRIW 25 & HRIW 45

Overview: Safe Operation

For your safety and the safety of your co-workers, follow the operating guidelines presented in this manual for Hipower Systems' HRIW 25 and HRIW 45 generators.

- The HRIW 25 and HRIW 45 generators should be operated only by trained, qualified personnel who have access to the resources required to safely and correctly operate the generators.

FOLLOW all relevant and applicable safety precautions when operating HRIW 25 and HRIW 45 generators.

POSITION and operate HRIW 25 and HRIW 45 generators on a firm, level surface free of excess dirt and moisture.

⚠ WARNING

ONLY trained, licensed electricians should assess repair, change or modify wiring and connections to the HRIW 25 and HRIW 45. Wiring materials and installation must meet standards published by relevant regulatory and standards agencies, including:

- Occupational Safety and Health Administration (**OSHA**) guidelines
- Canada Occupational Health and Safety (**OH&S**)
- National Electrical Code (**NEC**)
- Applicable state, Province, District, county and municipality regulations

DISPLAY the appropriate and required signs to warn operators, employees and others of hazards that may exist with the HRIW 25 and HRIW 45 generators. Example signs include:

- **Lock-Out / Tag-Out** signs and locks to prevent accessing or starting an engine being serviced, is out-of-service or is unsuitable for use.
- **Hazard Warning Signs** displayed during fueling, lifting, hoisting, loading, maintenance and other activities that present potential hazards.
- **Personal Protective Equipment** (PPE) signs that identify required personal protection for eyes, hearing, face, head, hands and feet

⚠ DANGER

PROHIBIT people with pacemakers from working on or near the HRIW 25 and HRIW 45 generators because electromagnetic fields created by generator(s) may cause pacemaker to stop working.

⚠ WARNING

DO NOT start a HRIW 25 or HRIW 45 generator that is inoperable or is not ready to be started or operated.

Immediately shut down the engine if any of the following conditions exist:

- Noticeable, unplanned change in engine speed
- Unexpected loss of electrical output
- Overheating of HRIW 25, HRIW 45 or equipment connected to the generators
- Sparking and / or engine misfire
- Excessive vibration
- Ambient air temperature above 120^{o} F / 49^{o} C

WARNING

Engine Safety: Ventilation, Fueling, Batteries, Lubricants, Coolant

Diesel engines present specific risks during operation and fueling. To avoid risks, operators of HRIW 25 and HRIW 45 generators must understand and follow guidelines for safe operation.

ASSURE proper ventilation when operating the HRIW 25 and HRIW 45 generators inside tunnels and caves.

- Engine exhaust contains noxious, potentially harmful and fatal elements.
- Accumulation of engine exhaust can result in serious injury or death.
- Route engine exhaust to a ventilated area.

AVOID exposure to diesel fuel fumes and diesel exhaust because:

- **SHORT-TERM** exposure to diesel exhaust can irritate the eyes, throat, and lungs.
- **LONG-TERM** exposure to diesel exhaust can cause chronic respiratory symptoms, including persistent cough, bronchitis and reduced lung capacity.

ALWAYS refuel in a well-ventilated area, away from sparks and open flames because diesel fuel is extremely flammable and its vapors explode when ignited.

DO NOT start the HRIW 25 or HRIW 45 near spilled fuel or combustible fluids.

DO NOT fill the fuel tank while the engine is running or hot.

DO NOT overfill tank, since spilled fuel could ignite if it encounters hot engine parts or sparks from the ignition system.

- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.

DO NOT smoke around or near HRIW 25 and HRIW 45 generators.

- Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.

NEVER use fuel as a cleaning agent.

WARNING

Corrosives

ALWAYS wear safety glasses and gloves when handling batteries because they contain acids that can seriously injure the eyes and skin.

DO NOT drop the battery because impact may cause the battery to explode.

DO NOT expose the battery to open flames, sparks, cigarettes, or other sources of ignition. Batteries contain combustible gases and liquids that may ignite and/or explode when exposed to flame, spark or other ignition source.

DANGER

High Temperatures

DO NOT remove radiator cap while engine of HRIW 25 or HRIW 45 is hot because pressurized, boiling water will gush out of the radiator and can severely burn anyone near the generators.

DO NOT remove the coolant drain plug while the engine is hot because hot, pressurized coolant will gush out of the coolant tank and could severely burn anyone near the generator.

DO NOT remove the engine oil drain plug while the engine is hot because hot, pressurized oil will gush out of the oil tank and could severely burn anyone near the generator.

DO NOT touch the hot exhaust manifold, muffler or cylinder because the extremely hot surface temperatures could cause severe burns.

ALWAYS allow exhaust manifold and surrounding parts to cool before servicing HRIW 25 and HRIW 45 generators.

⚠ CAUTION

Safe Maintenance

The HRIW 25 and HRIW 45 generators should be serviced only by qualified personnel who are familiar with the equipment, are adequately trained and have access to the resources required to safely and appropriately operate the generators.

VERIFY the control power switch and circuit breakers are in the **OFF** position and the negative (-) terminal on the battery is disconnected.

SHUT DOWN electrical components before performing any service.

DO NOT start the HRIW 25 or HRIW 45 under load.

- Circuit breakers must be in the **OFF (O)** position when starting in **Manual** mode.
- Circuit breakers can be in the **ON (I)** position only when started in **Auto** mode.
- A **transfer** switch must be used in the **Auto** mode to deflect load during startup.

MAINTAIN safety labels and decals in **clean** condition so they can be easily read.

- **DO NOT** alter, damage, cover, obscure or modify safety labels and decals.
- Contact **Parts** at **Hipower Systems** to replace safety labels and decals when they no longer meet requirements.

AVOID working on or standing near HRIW 25 and HRIW 45 generators while wearing loose clothing that could be caught by moving machinery components, such as pulleys, belts, arms, gears and shafts.

ALWAYS keep track of tools, parts and equipment used in engine maintenance.

ALWAYS remove tools, parts and equipment used for maintenance before starting or moving the generator.

ALWAYS check the generator for loosened threads or bolts before starting.

NEVER leave or temporarily store objects on a generator or in the generator housing.

NEVER use the generator for anything other than its intended purpose(s) or application(s).

NEVER by-pass, remove, alter or modify safety devices.

NEVER by-pass, remove, alter or modify the operational settings of the HRIW 25 and HRIW 45 generator sets.

⚠ CAUTION

Towing Safety

Trailer-mounted HRIW 25 and HRIW 45 generator sets are transported by a towing vehicle with adequate gross vehicle weight rating (GVWR).

ALWAYS follow federal, state, Province, District, local and company towing rules.

INSPECT trailer before attaching to towing vehicle.

VERIFY hitch and coupling are rated equal to or greater than the trailer gross vehicle weight rating (GVWR).

INSPECT safety chains to identify signs of excessive wear or damage.

DISCARD excessively worn or damaged chains.

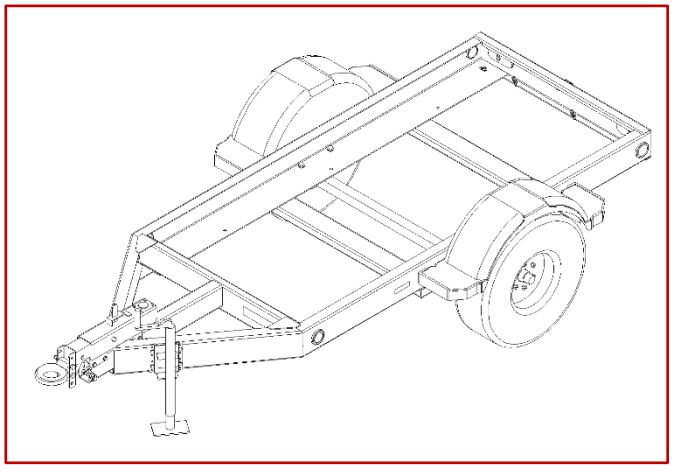
ATTACH safety chains (trailer to towing vehicle).

VERIFY tires on trailer and towing vehicle are inflated to specified pressures.

VERIFY lights on trailer and towing vehicle function as intended and required before towing.

MAINTAIN trailer in level position while towing.

PREVENT rolling of parked trailer by securing chock blocks underneath trailer wheels.



Trailer: HRIW 25 & HRIW 45

⚠ CAUTION

Lifting Safety

Follow all appropriate and required safety and health guidelines pertaining to safe lifting. Relevant regulatory authorities include:

- The United States Occupational Safety and Health Administration (**OSHA**)
- Canada Occupational Health and Safety (**OH&S**)
- Forklift safety guidelines adopted by your company and/or employer
- All other, applicable state, Province, District, county and municipality regulations

If the HRIW 25 and HRIW 45 generator sets are not mounted on a trailer or if the trailer is not needed, the equipment can be hoisted and maneuvered into position in a safe and controlled manner by lifting with:

- Slings
- Forklift trucks

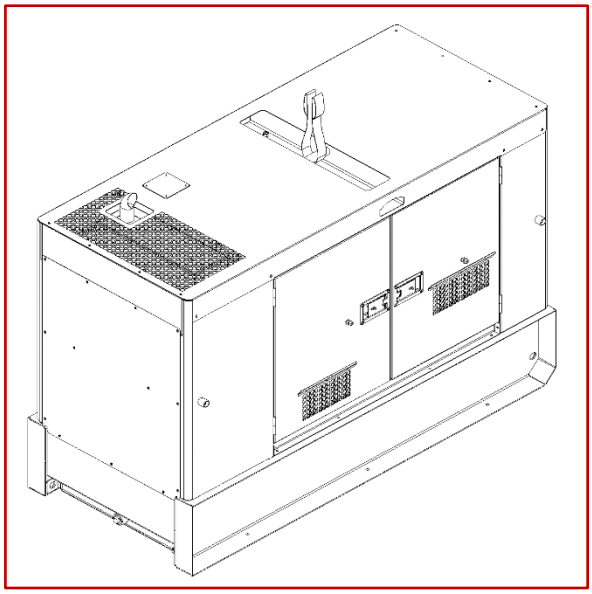
LIFTING should be performed only by trained, qualified personnel.

VERIFY that the machinery and the lifting elements to be used are rated for the weight of the genset(s).

ENSURE the floor / platform can support the weight of the genset before beginning the lift.

ENSURE that the transport route is free of obstacles, overhead wires or unsafe terrain.

KEEP the genset in a level horizontal position.



HRIW 25 & HRIW 45: No Trailer

Safe Use of Slings

LIFTS with slings should only be performed by trained, qualified personnel.

ATTACH lift equipment to the generator at the designated lift points.

TIGHTEN sling(s) to assure stable and safe lift.

MONITOR sling throughout lift.

STOP lift if load shifts or if sling shows signs of tearing or damage.

PREVENT people from walking near or under equipment during lift by using appropriate barriers, danger signs and a designated lift safety monitor.

Safe Use of Forklift Trucks

Follow all appropriate and required safety and health guidelines pertaining to the safe use of forklifts. Relevant regulatory authorities include:

- The United States Occupational Safety and Health Administration (**OSHA**)
- Canada Occupational Health and Safety (**OH&S**)
- Forklift safety guidelines adopted by your company and/or employer
- All other, applicable state, Province, District, county and municipality regulations

LIFTING should be performed only by trained, qualified personnel.

INSPECT forklift (structural integrity, lights, power, etc.) before attempting to lift.

VERIFY that the machinery and the lifting elements to be used are rated for the weight of the genset(s).

LIFT the genset by using the **forkpockets** which are specially constructed fork entry points built into the genset base.

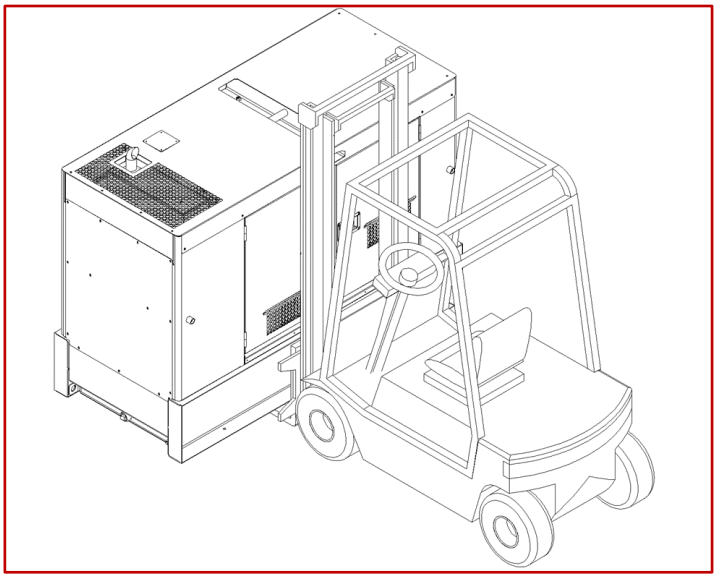
ENSURE the floor / platform can support the weight of the genset before beginning.

ENSURE that the transport route is free of obstacles, overhead wires or unsafe terrain

MAINTAIN clear line of sight; always look in the direction of travel.

USE trained spotters or aids such as rear-view mirrors to boost visibility.

USE headlights if working at night, outdoors or in areas in which additional lighting would improve visibility.



Moving HRIW 25 with Forklift

Safe Decommissioning: HRIW 25 & HRIW 45

When and How To Decommission

Decommission HRIW 25 and HRIW 45 generators when unacceptable safety risk appears and/or when it is no longer cost-effective to maintain. Follow the guidelines presented in this manual to safely decommission a HRIW 25 and HRIW 45 generators:

DO NOT pour oil, coolants or other waste fluids onto the ground, down a drain or into any water source.

USE the appropriate personal protective equipment (PPE) and applicable safety precautions when handling batteries that contain sulfuric acid.

CONTACT appropriate regulatory or government officials to plan proper disposal of any electrical components, waste or oil associated with this HRIW 25 and HRIW 45 generators.

REMOVE battery and transport it to an appropriate facility for lead reclamation when the life cycle of the HRIW 25 and HRIW 45 generators finished.

Emissions Information: HRIW 25 & HRIW 45

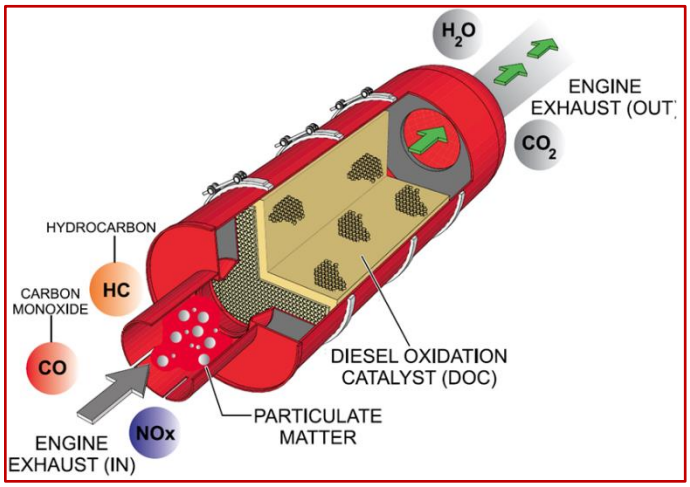
NOTICE

Emission Control

The diesel engines used in HRIW 25 and HRIW 45 generators include emission control components that are designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in diesel exhaust emissions.

The emission control system incorporated with this diesel engine uses a **Diesel Oxidation Catalyst** (**DOC**).

- As installed, this engine is certified to meet **US EPA** evaporative emissions requirements.
- **MAINTAIN** and service the DOC emission safety device on a periodic basis.



Diesel Oxidation Catalyst (DOC)

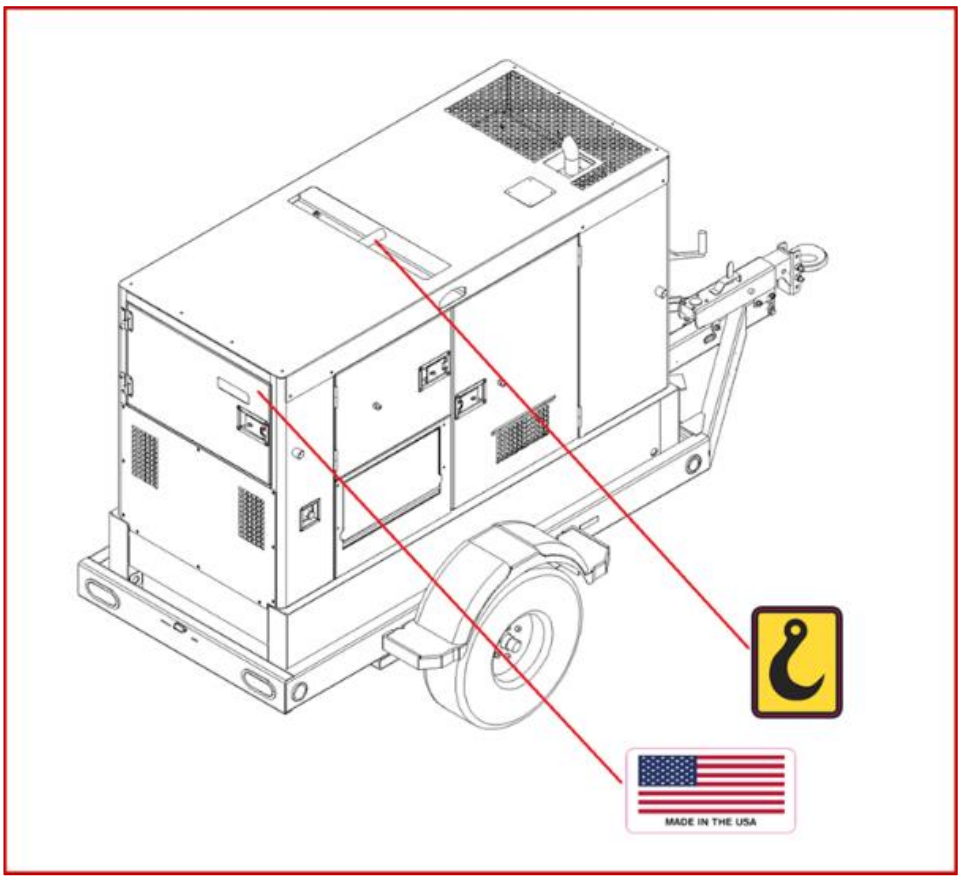
NOTICE

Placement of Safety Labels: HRIW 25 & HRIW 45 Generators

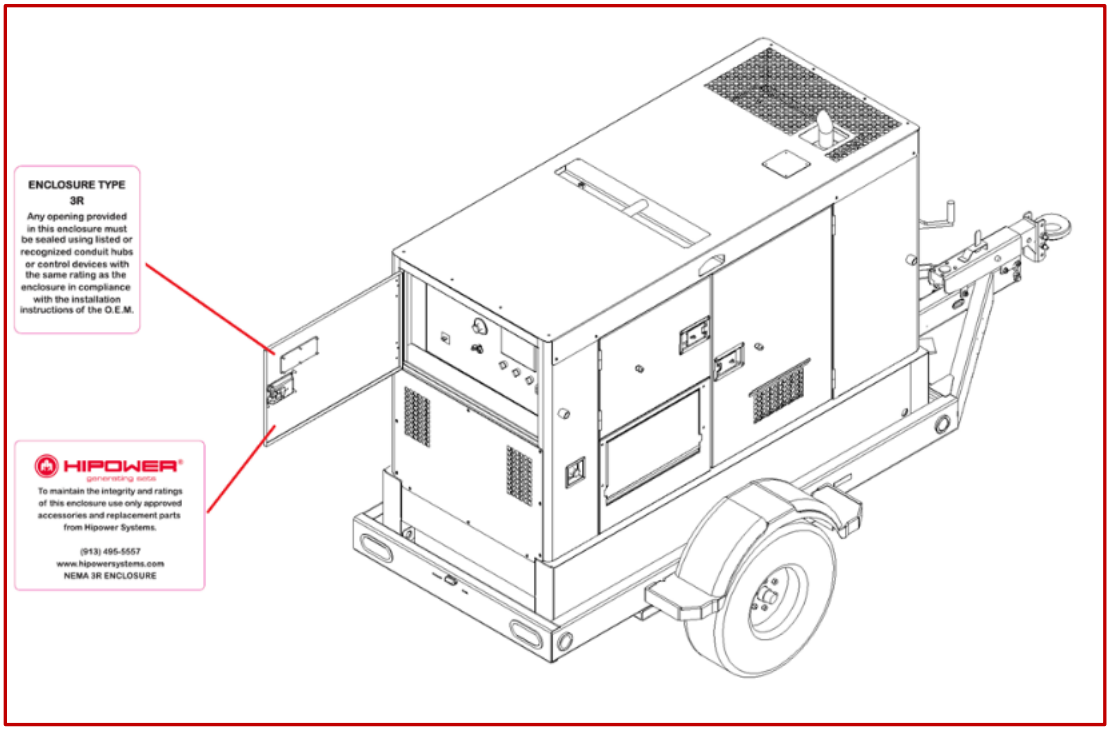
Hipower Systems applies safety labels and decals on HRIW 25 and HRIW 45 generators to prevent injury or death to operators and damage to equipment.

MAINTAIN safety labels and decals in **clean** condition so they can be easily read.

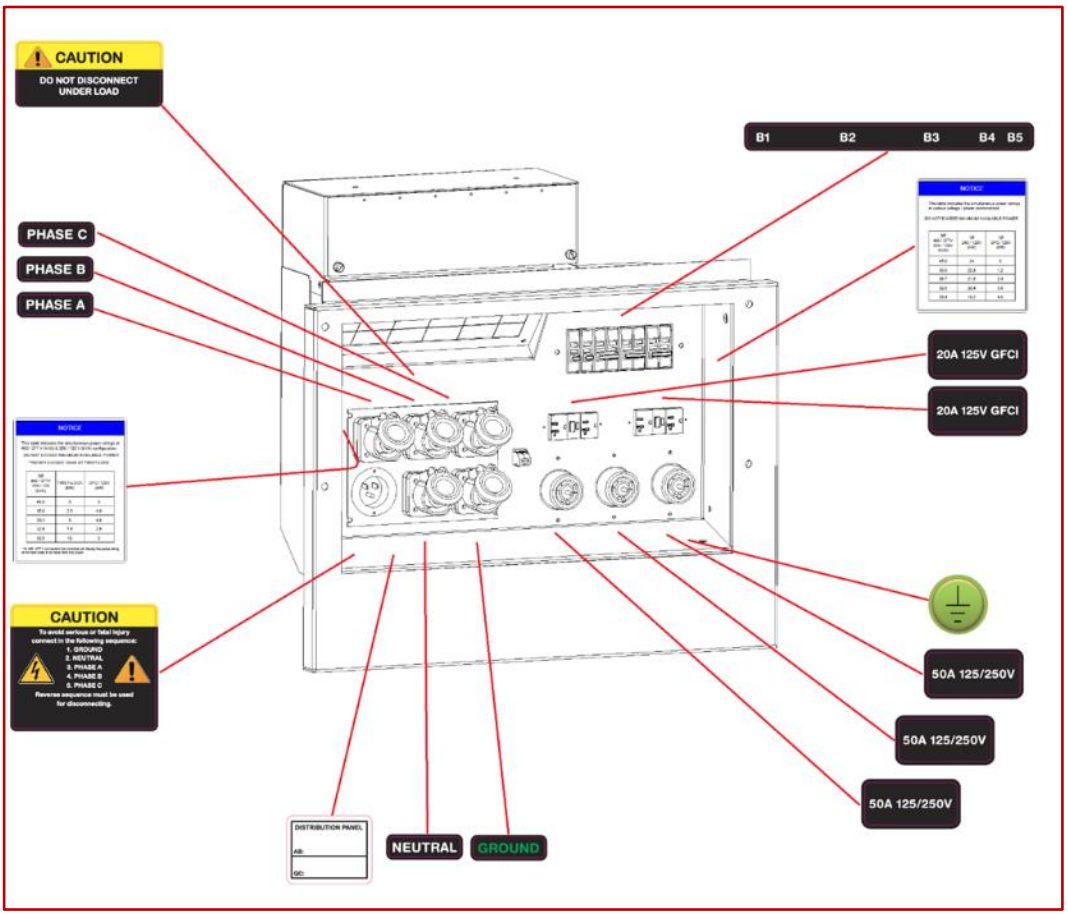
- **DO NOT** alter, damage, cover, obscure or modify safety labels and decals.
- **REPLACE** safety labels and decals that are damaged, altered or modified in any way that obscures text or symbols.
- Contact **Parts** at **Hipower Systems** to replace safety labels and decals when they no longer meet requirements.



Safety Label Placement:
HRIW 25 & HRIW 45



Safety Label Placement:
HRIW 25 & HRIW 45



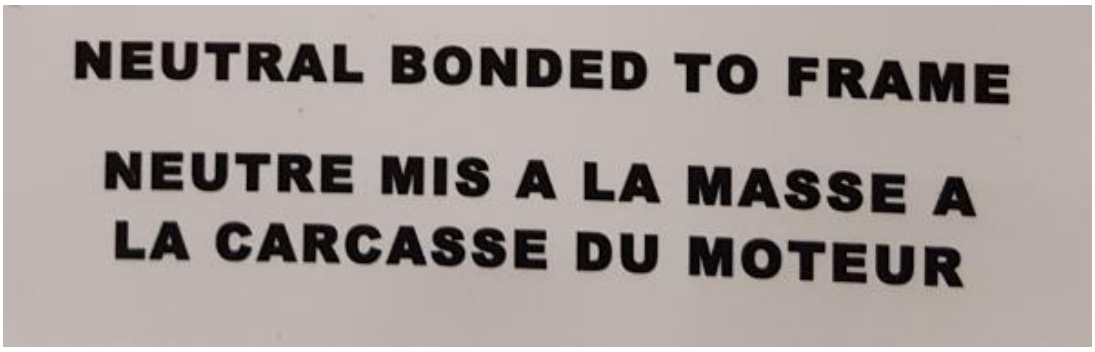
Safety Label Placement:
HRIW 25 & HRIW 45

SAFETY AND WARNING LABELS: LOCATIONS OVERVIEW

Distribution

Distribution

Distribution



Distribution

Distribution

Distribution

Distribution

Distribution

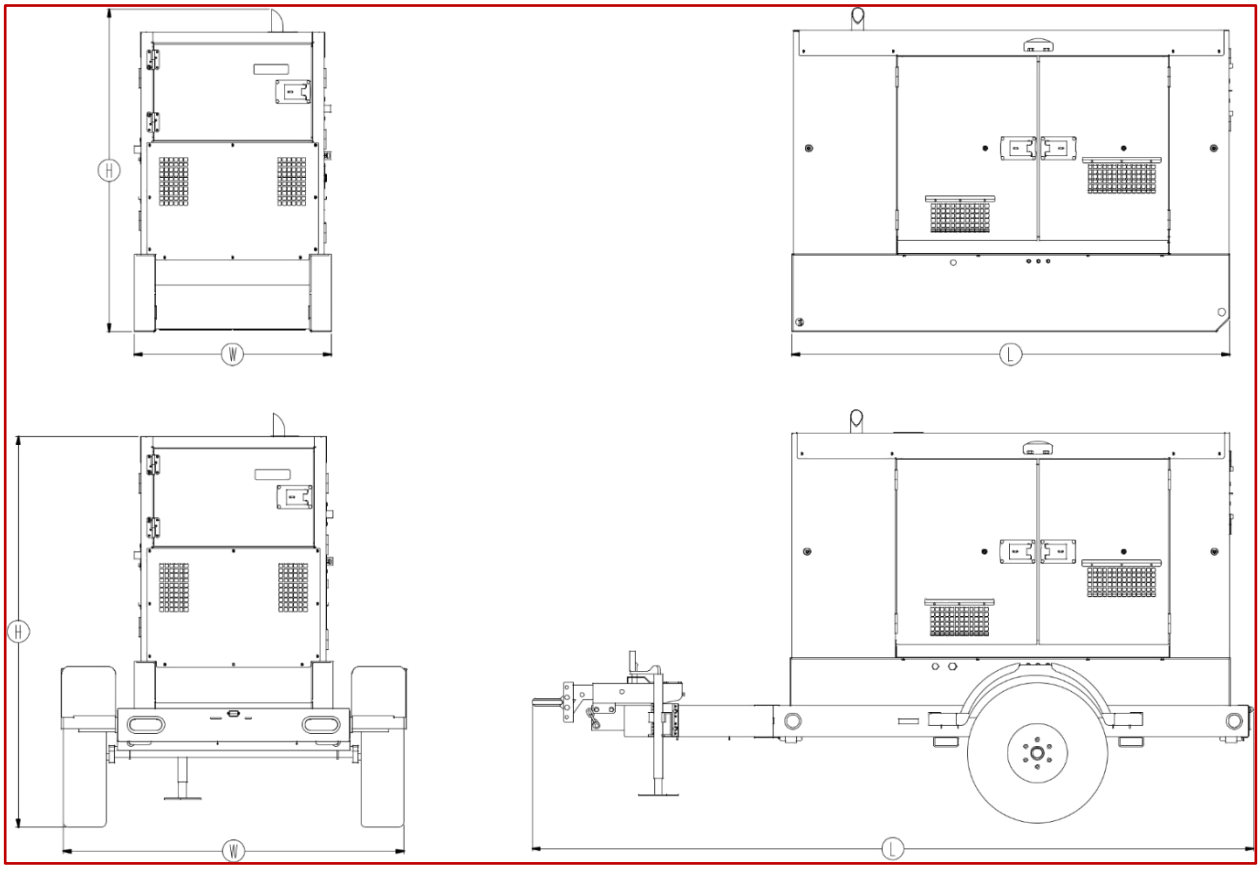
Front (Exterior)

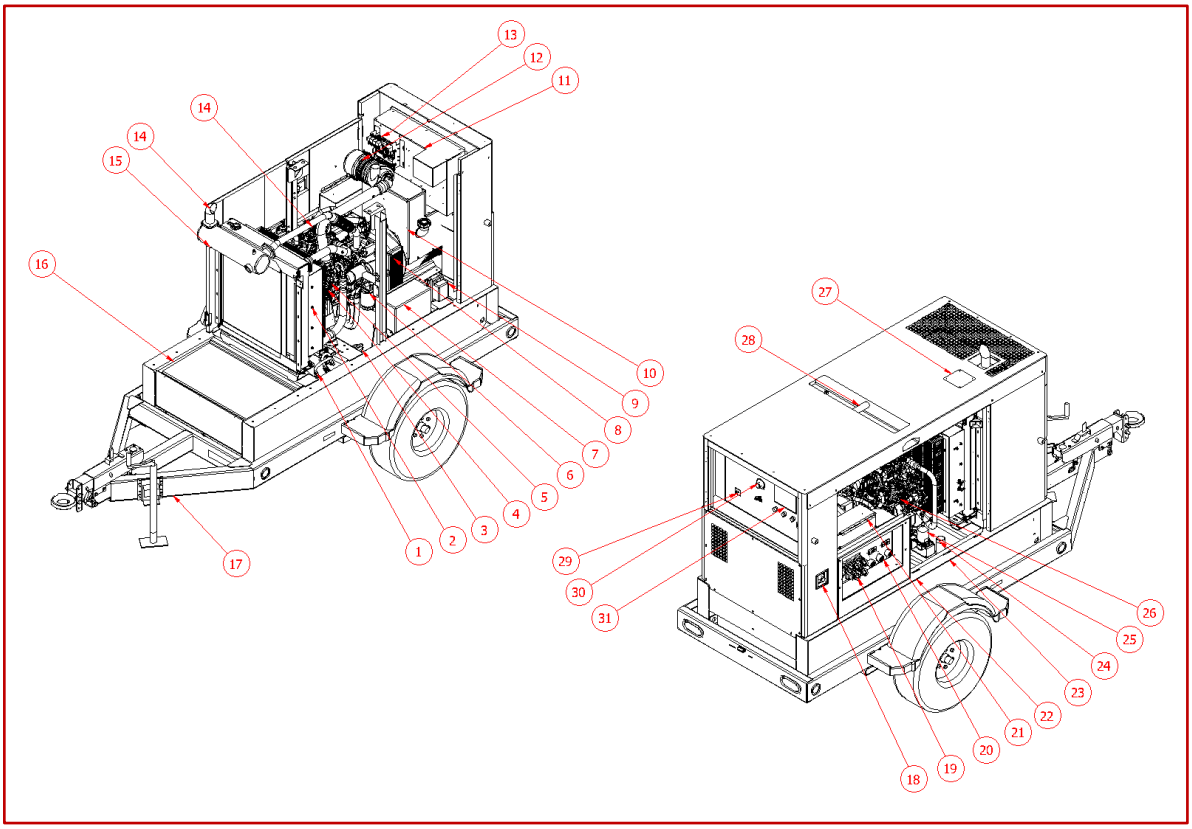
SPECIFICATIONS: HRIW 25 & HRIW 45

Performance	Unit	HRIW-25 T4F		HRIW-45 T4F	
Frequency	Hz	60		60	
Rated prime power 3ø	kW/kVA	20	25	36	45
Rated standby power 3ø	kW/kVA	22	27.5	40	50
3ø Power factor		0.8		0.8	
3ø Voltage in 480V switch position (High wye w/neutral)	V	480	277	480	277
Amp capacity @480V	A	30		54	
3ø Voltage in 240-208V switch position (Low wye w/neutral)	V	240	208	240	208
Amp capacity @139/240V	A	48		100	
Amp capacity @120/208V	A	56		115	
Rated prime power 1ø	kW/kVA	11.6	11.6	24	24
1ø Power factor		1.0		1.0	
1ø Voltage in 120-240V switch position (Zig-Zag)	V	240	120	240	120
Starting KVA Capacity	SKVA	77		183	
Main breaker - Shunt trip	A	90		150	
Max. sound pressure level (LPA) @23' @75% Load	dB(A)	62		64	
Fuel consumption					
Fuel tank capacity	Gal (L)	82.5 (312.3)		82.5 (312.3)	
Fuel consumption at full load (PRP)	gal / h (L/h)	1.62 (6.12)		2.93 (11.1)	
Fuel consumption at 75% load (PRP)	gal / h (L/h)	1.26 (4.77)		2.20 (8.31)	
Fuel consumption at 50% load (PRP)	gal / h (L/h)	0.94 (3.57)		1.60 (6.04)	
Fuel consumption at 25% load (PRP)	gal / h (L/h)	0.67 (2.52)		1.04 (3.92)	
Fuel autonomy considering 90% of fuel capacity	h	45.8		25.4	
Alternator					
Model		STAMFORD PI 144 F		STAMFORD UCI 224 D	
Excitation		EBS		PMG	
Automatic voltage regulator (+/-0.5%)		STAMFORD AS480		STAMFORD MX341	
Insulation		Class H		Class H	
Temperature Rise		Class F (105 /40 ºC)		Class F (105 /40 ºC)	
Engine					
Manufacturer		ISUZU		ISUZU	
Model		4LE2T		4LE2X	
EPA certified		Tier 4 Final		Tier 4 Final	
Crankshaft speed	RPM	1800		1800	
Type		Industrial, four-stroke		Industrial, four-stroke	
Aspiration		Turbocharged & Air-to Air Aftercooled		Turbocharged & Air-to-Air Aftercooled	
Number of Cylinders		4		4	
Displacement	CID (liters)	133 (2.17)		133 (2.17)	
Bore and Stroke	ins (mm)	3.34 x 3.77 (85 x 96)		3.34 x 3.77 (85 x 96)	
Nominal power	HP	40		66	
Cooling		Liquid		Liquid	
Starting motor & alternator		12 VDC		12 VDC	
Total cooling capacity	US. Gallons (liters)	3.8 (14.4)		3.8 (14.4)	
Oil pan capacity with filter	US gallons (liters)	2.25 (8.39)		3.96 (14.94)	
Type of Lubrication Oil		API CC or CD		API CC or CD	
Type of Fuel		Diesel fuel (SAE 2D Type)		Diesel fuel (SAE 2D Type)	

DIMENSIONS AND WEIGHT: HRIW 25 & HRIW 45

Dimensions and weight			
Dimensions skid L x W x H	Inches	88.8 x 40.2 x 65.7	88.8 x 40.2 x 65.7
Weight - Skid wet	Lbs (kg)	2150 (975.2)	2400 (1088.6)
Dimensions w/ Trailer L x W x H	Inches	151 x 76.8 x 82	151 x 76.8 x 82
Weight - w/ Trailer wet	Lbs (kg)	3050 (1383.4)	3300 (1496.8)



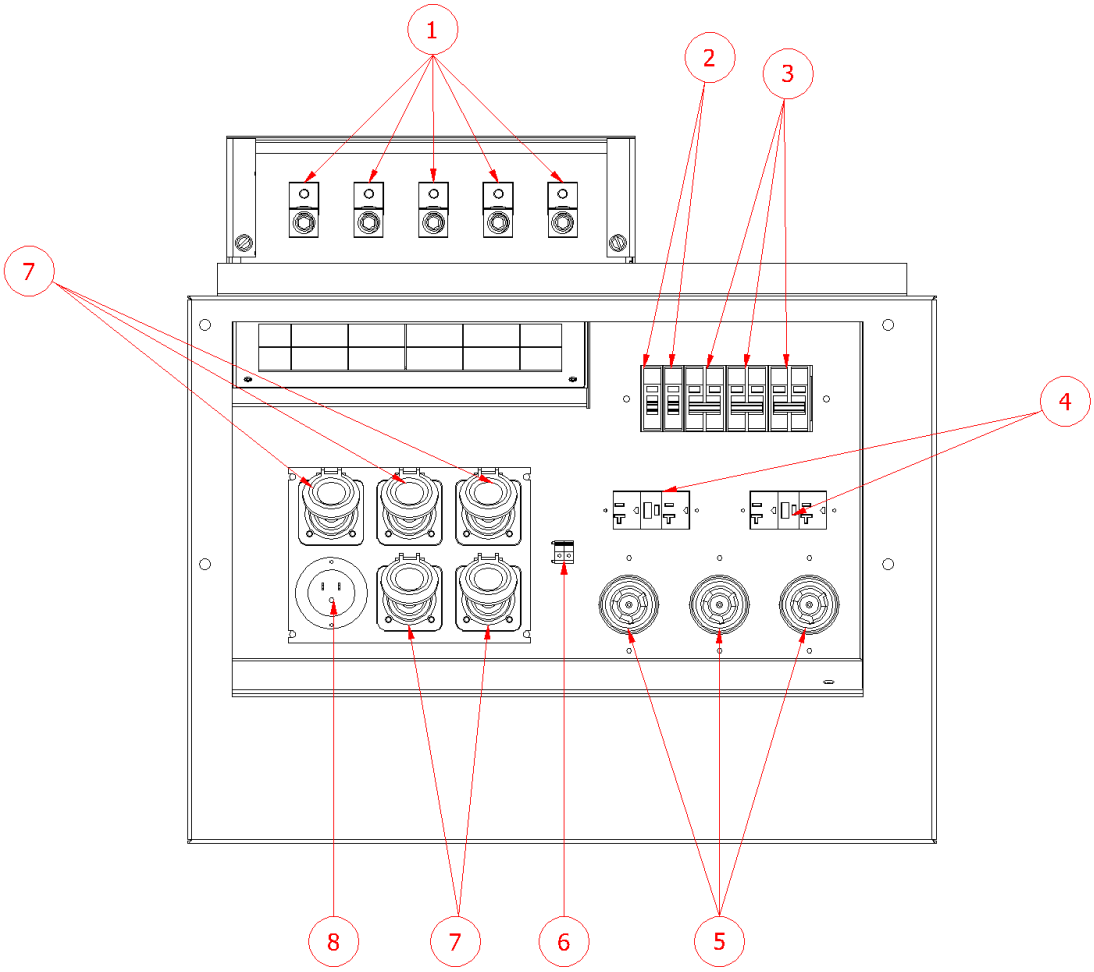


Component Locations: HRIW 25 & HRIW 45

COMPONENT LOCATIONS: HRIW 25 & HRIW 45

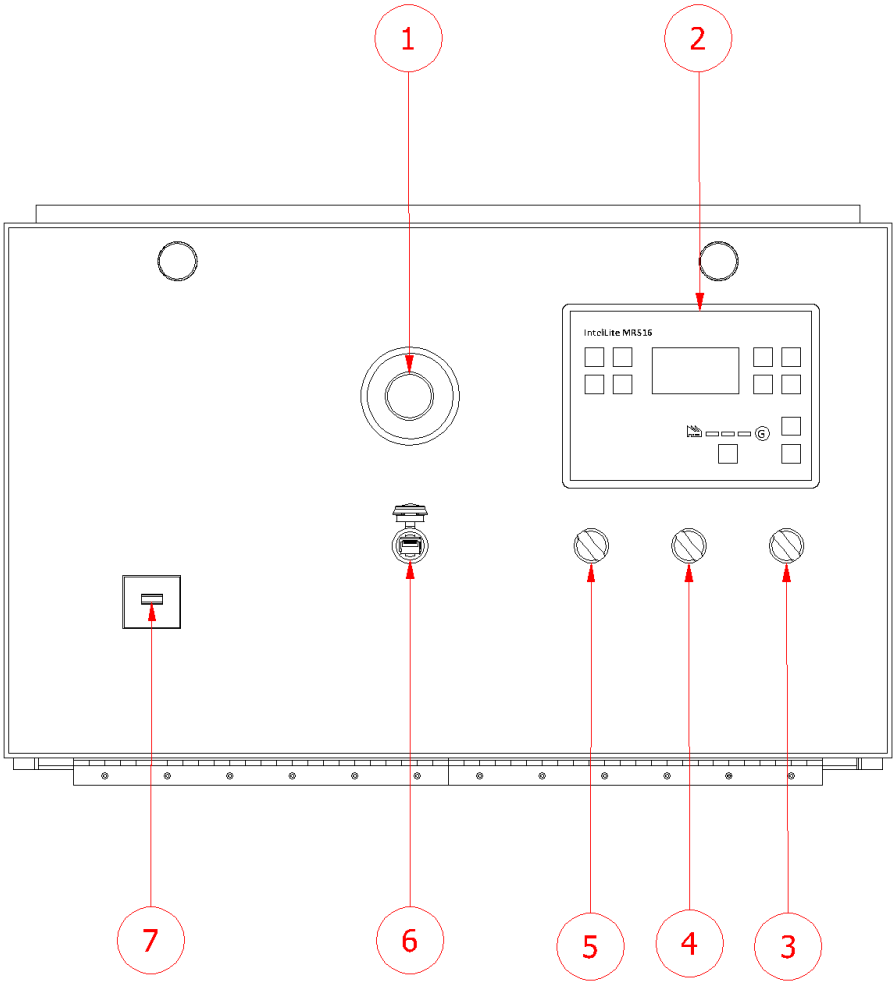
NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION
1	External Fuel Fill	12	Air Filter	22	Oil Drain
2	Radiator	13	ECM	23	Coolant Drain
3	Internal Fuel Fill	14	Exhaust Pipe	24	Vent Pipe
4	Engine Alternator	15	DOC	25	Block Heater
5	Engine	16	Chassis	26	Oil Dipstick
6	Oil Filter	17	Trailer	27	Coolant Fill
7	Battery	18	Emergency Stop Switch	28	Lift Point
8	Generator	19	Camlocks	29	Main Circuit Breaker
9	Battery Charger	20	Receptacles	30	Emergency Stop Switch
10	Generator Box	21	Mechanical Lugs	31	Controller
11	Control Panel				

DISTRIBUTION PANEL: HRIW 25 & HRIW 45



NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION
1	Mechanical Lugs	4	120V GFCI Receptacles	7	CamLocks
2	20A Circuit Breakers	5	120/240V TwistLock Receptacles	8	Auxiliary Supply Plug
3	50A Circuit Breakers	6	AutoStart Contact		

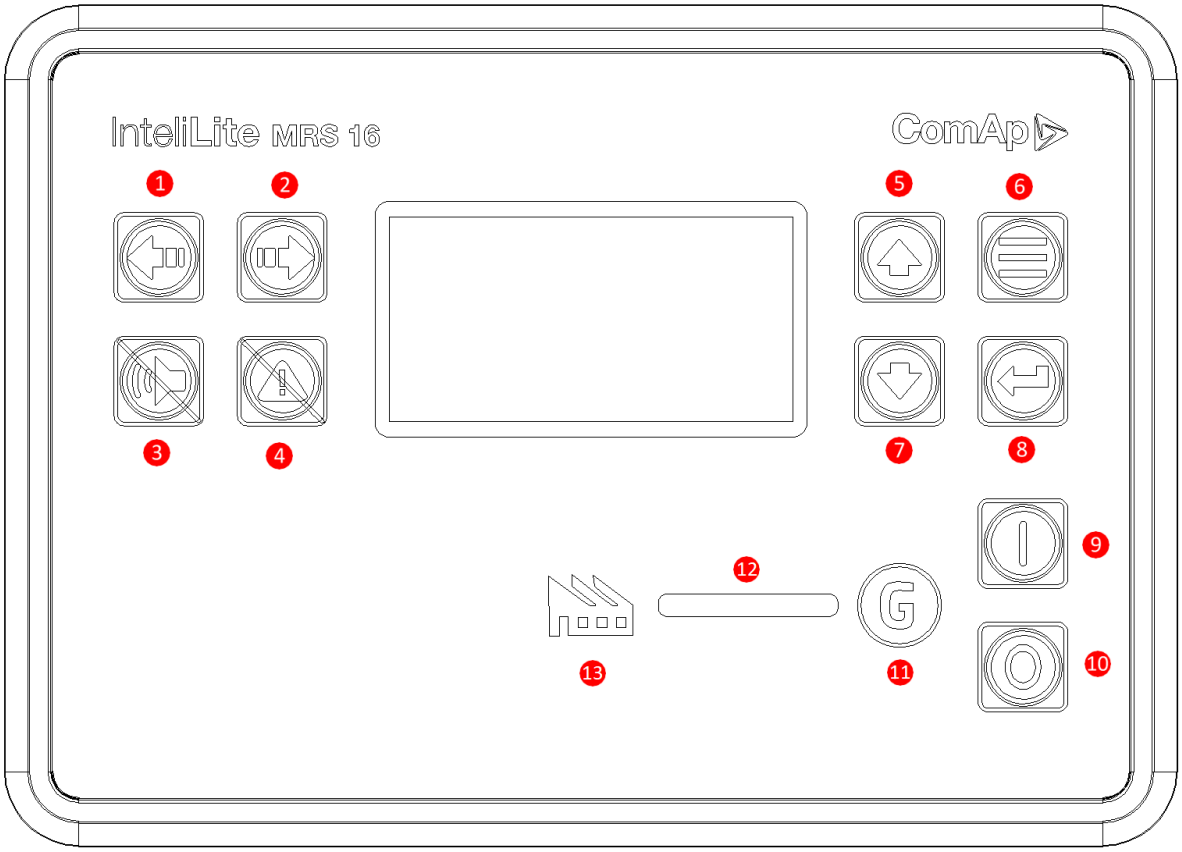
CONTROL PANEL: HRIW 25 & HRIW 45



NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION	NUMBER	SHORT DESCRIPTION
1	Emergency Stop Switch	4	Hydronic Heater (Optional)	7	Main Circuit Breaker
2	Controller	5	Power Control Switch		
3	AVR Regulator	6	USB Connector		

CONTROLLER

Front Panel Elements



Control Buttons

Control buttons		
Position	**Picture**	**Description**
1		**LEFT** button. Use this button to move left or to change the mode. The button can change the mode only if the main screen with the indicator of currently selected mode is displayed. ***Note:*** *This button will not change the mode if the controller mode is forced by one of binary inputs listed in the Reference Guide – "Operating modes" chapter.*
2		**RIGHT** button. Use this button to move right or to change the mode. The button can change the mode only if the main screen with the indicator of currently selected mode is displayed. ***Note:*** *This button will not change the mode if the controller mode is forced by one of binary inputs listed in the Reference Guide – "Operating modes" chapter.*
3		**HORN RESET** button. Use this button to deactivate the horn output without acknowledging the alarms. ****POWER** the ECM in "OFF" mode
4		**FAULT RESET** button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.
5		**UP** button. Use this button to move up or increase value.
6		**PAGE** button. Use this button to switch over display pages.
7		**DOWN** button. Use this button to move down or decrease value.
8		**ENTER** button. Use this button to finish editing a setpoint or moving right in the history page.
9		**START** button. Works in MAN mode only. Press this button to initiate the start sequence of the engine.

10		**STOP** button. Works in MAN mode only. Press this button to initiate the stop sequence of the gen-set. Repeated pressing or holding the button for more than 2 s will cancel current phase of stop sequence (like ramping the power down or cooling) and next phase will continue.

Indicators and others

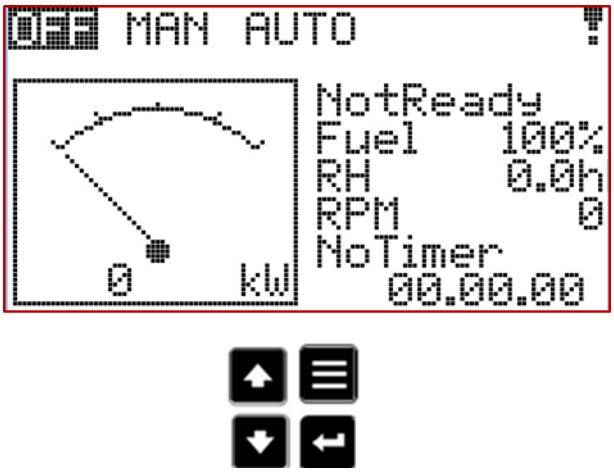
Position	
11	**GENERATOR** status indicator. There are two states - Gen-set OK (indicator is green) and Gen-set failure (indicator is red). Green LED is on if the generator voltage is present and within limits. Red LED starts flashing when gen-set failure occurs. After FAULT RESET button is pressed, goes to steady light (if an alarm is still active) or is off (if no alarm is active).
12	**GCB ON**. Green LEDs are on if GCB is closed and Gen-set is healthy. If Gen-set is not healthy and GCB is closed than middle LED is on. It is driven by GCB CLOSE/OPEN output or by GCB feedback signal.
13	**LOAD**. Green LED is ON if load is supplied by mains or by generator. It means, that Gen-set or mains is OK and proper circuit breaker is closed.

Display Screens and Page Structures

Displayed information is structured into "screens" and “pages".

- **PAGE** button switches display **pages**.
- **MEASUREMENT** presents **screens** that display measured values like voltages, current, oil pressure etc., computed values like i.e. Genset power, statistic data and the alarm list on the last screen.
- **SETPOINTS** presents setpoints organized in groups and a special group for entering password.
- **HISTORY** displays history beginning with last record first.

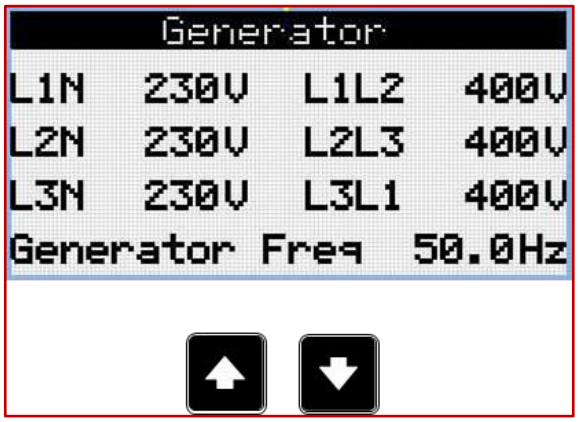
Measurement Screens



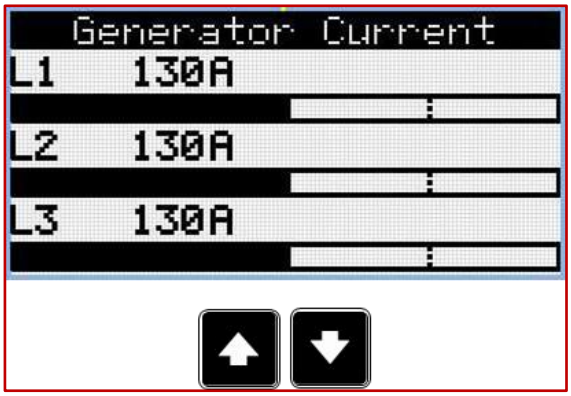
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.

Generator Voltage



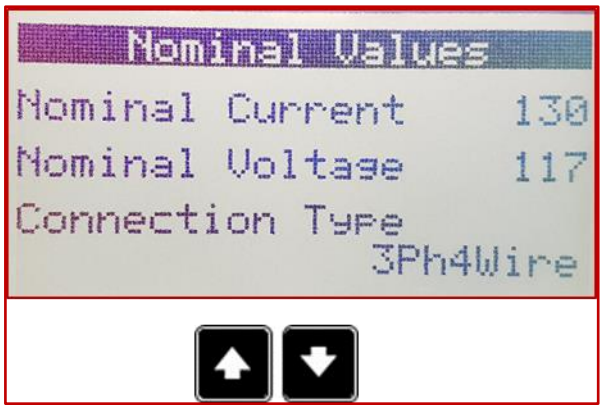
Generator Current



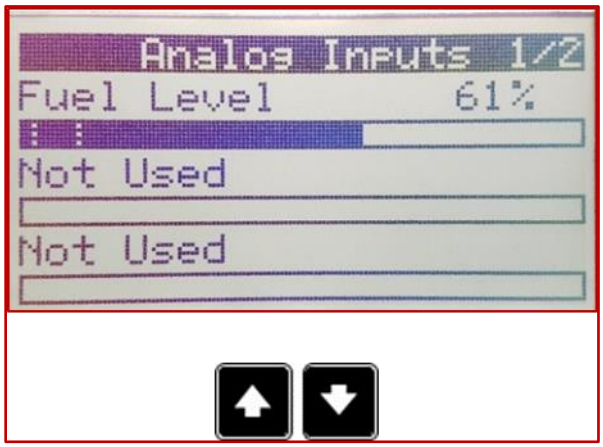
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.

Nominal Values



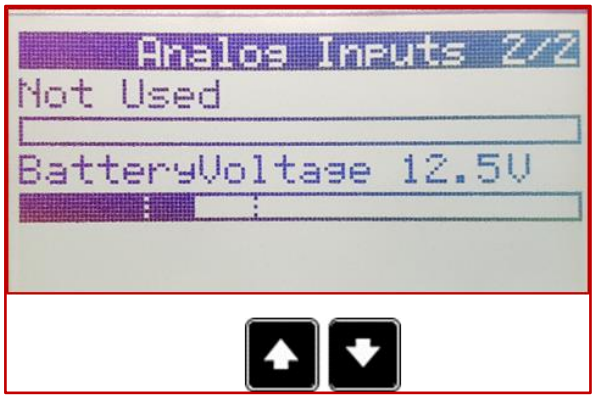
Analog Inputs (Screen 1 of 2)



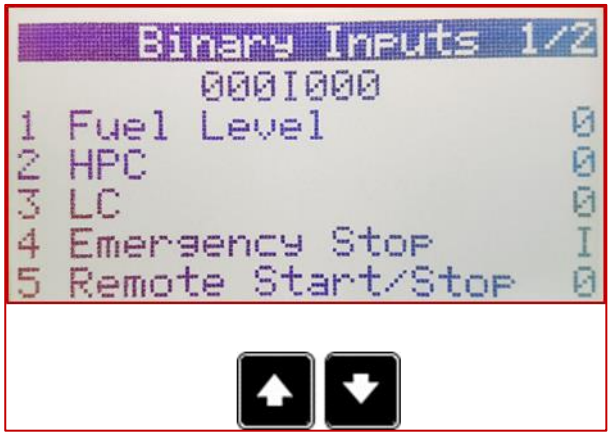
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.

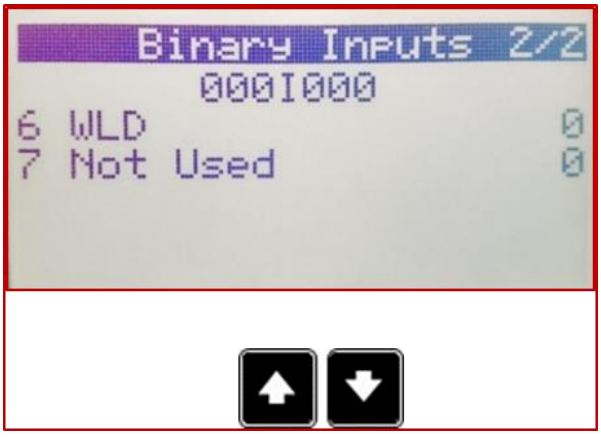
Analog Inputs (Screen 2 of 2)



Binary Inputs (1 / 2)



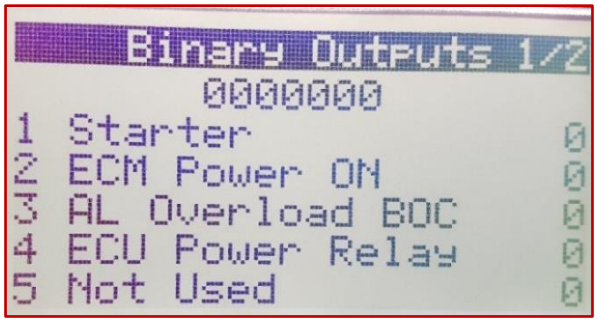
Binary Inputs (2 / 2)



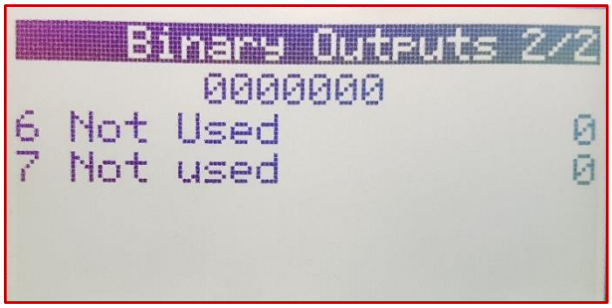
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.

Binary Outputs (1 / 2)



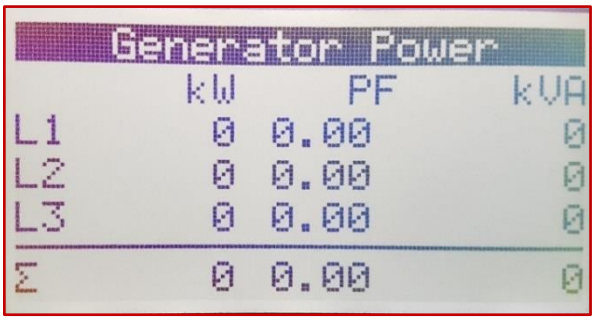
Binary Outputs (2 / 2)



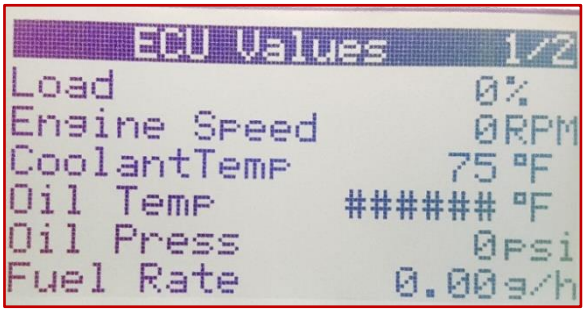
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.

Generator Power



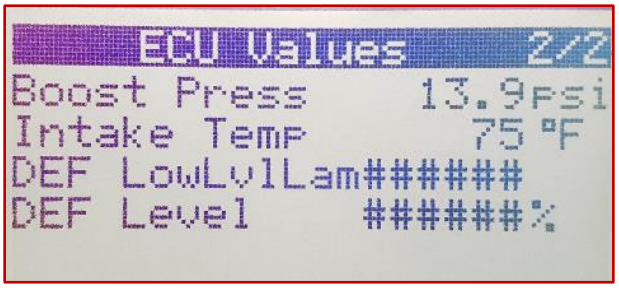
ECU Values (1 / 2)



HIPOWER NOTES:

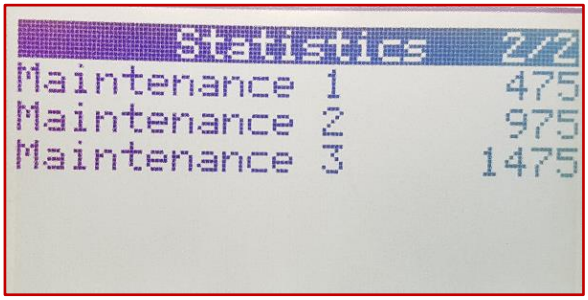
- Use **Up** and **Down** buttons to move between measurement pages.

ECU Values (2 / 2)



Statistics (1 / 2)

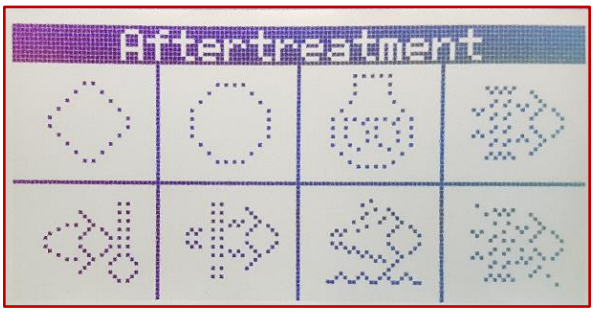
Statistics (2 / 2)



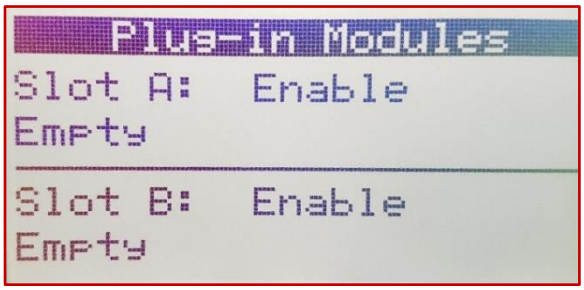
HIPOWER NOTES:

- Use **Up** and **Down** button to move between measurement pages.

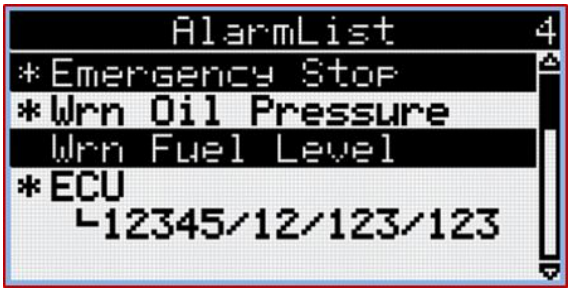
Aftertreatment



Plug-In Modules



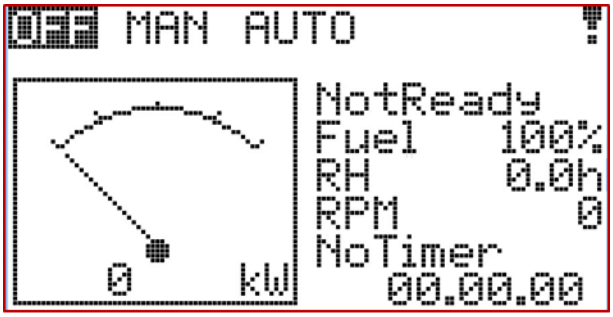
Alarm List



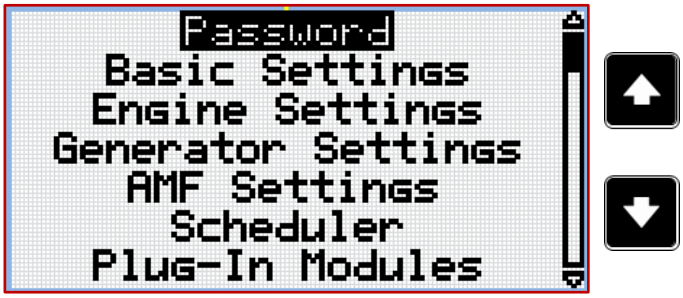
HIPOWER NOTES:

- Use **Up** and **Down** buttons to move between measurement pages.
- From all pages, return to the **Setpoint** group page by pressing **Page** button.
- There may be additional screens if controller, communication modules or ECU is configured to provide.

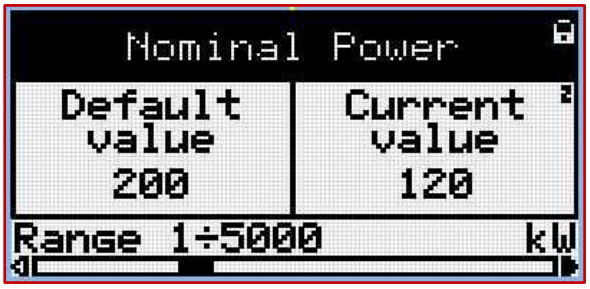
Setpoint Screens



Password



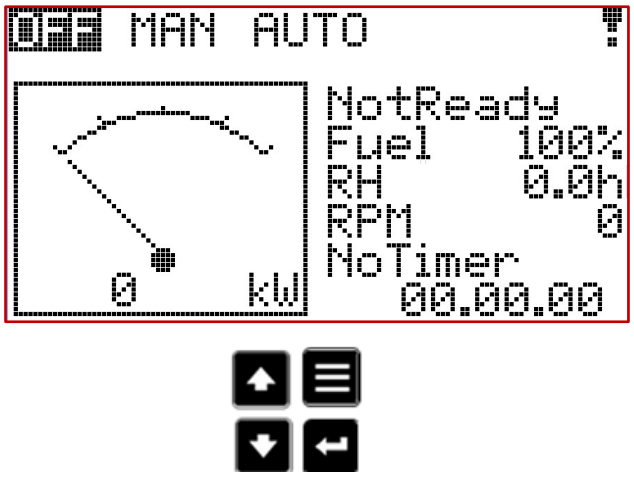
Nominal Power

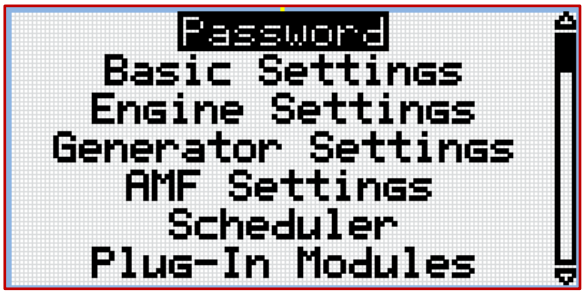


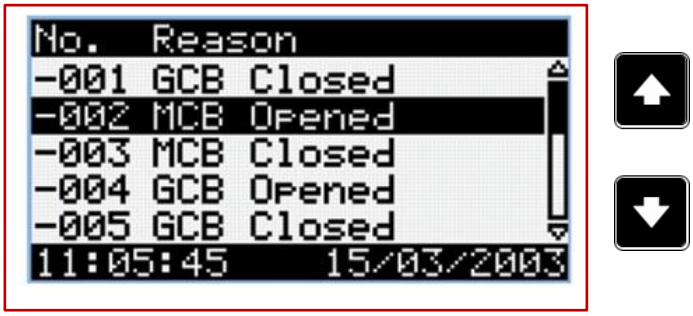
HIPOWER NOTES:

- Use **Left** and **Right** buttons to select required **Setpoint**
- Use **Enter** button to select setpoint group.
- Use **Up** and **Down** buttons to select required setpoint group.
- Use **Enter** button to confirm adjusted value of **Setpoint**.
- Use **Page** button to discard changes, to set setpoint to previous value and to return to the list of setpoints for the selected group.
- Cannot **change Setpoint**? Setpoints marked with padlock are password protected. Enter **password** to change.

History Log



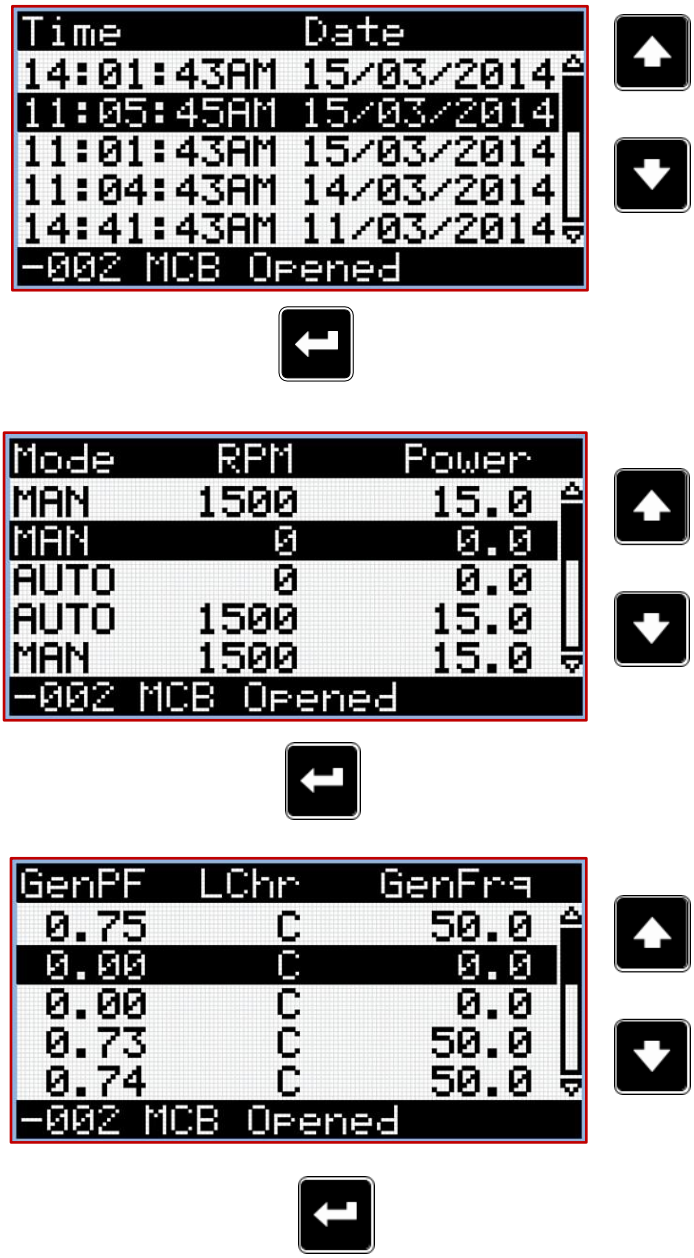




HIPOWER NOTES:

- From all measurement pages, return to the **Setpoint** group page by pressing **Page** button.
- From **Setpoint** group page, return to **History Log** by pressing **Page** button.
- Use **Up** and **Down** button to **select** required alarm reason.
- Press **Enter** to move to the next page of history log.

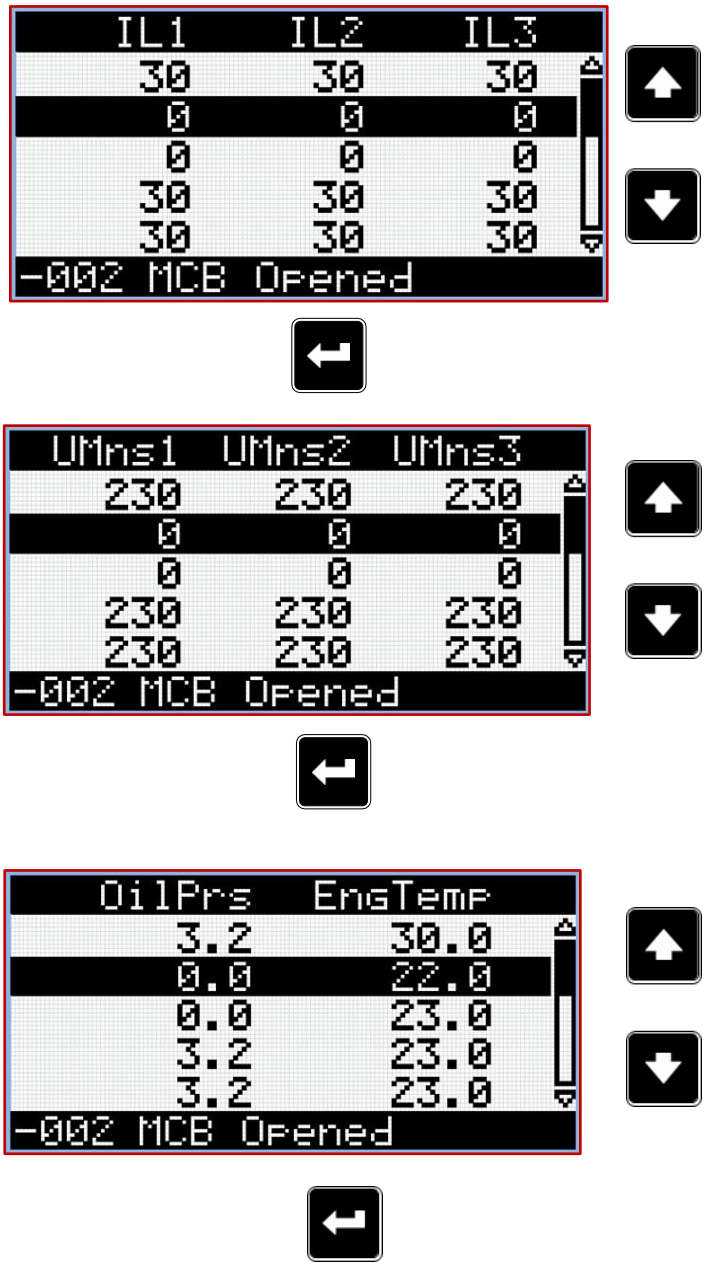
History Log



HIPOWER NOTES:

- Use **Enter** button to move to next page of **History Log**
- Use **Up** and **Down** buttons to select required alarm reason

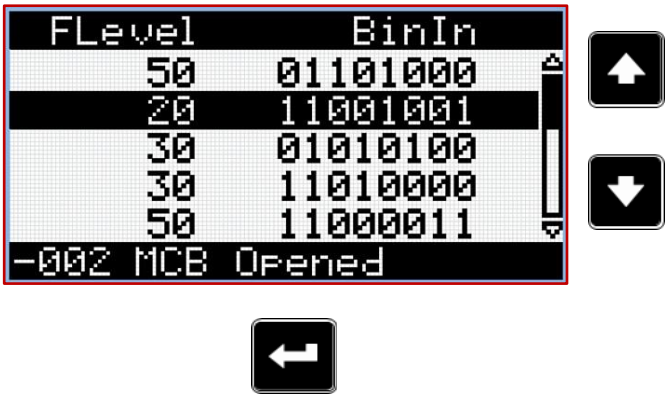
History Log



HIPOWER NOTES:

- Use **Up** and **Down** buttons to select required alarm reason
- Use **Enter** button to move to next page of **History Log**

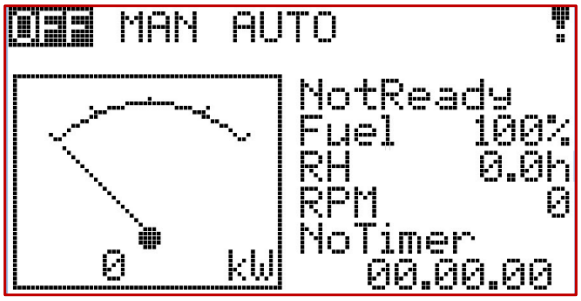
History Log

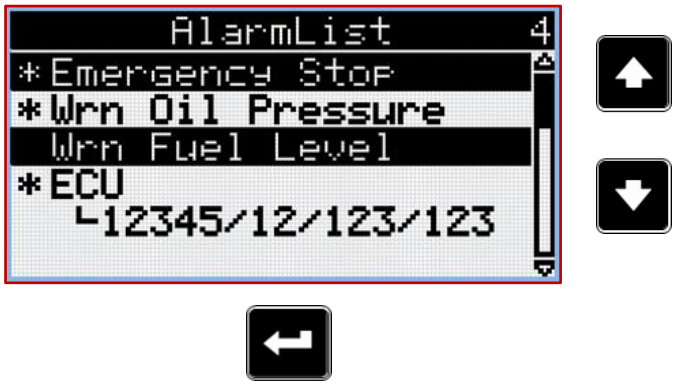


HIPOWER NOTES:

- Use **Up** and **Down** buttons to select required alarm reason
- Use **Enter** button to move to **next** page of **History Log**
- Use **Enter** button to move to **first** page of **History Log**
- Records are numbered in **reverse** order; the latest record = "**0**"…older records = **1,2,3**…
- **History Log** presents only basic history record; additional screens can be made available if controller is extension module or ECU is configured; it also depends on connection type

Front Panel





HIPOWER NOTES:

- Use **Up** button to move to **alarm list** from main measurement screen.
- Use **Up** and **Down** buttons to select required alarm reason
- **Active** alarms are displayed as **white** text on **black** background.
  - Signifies that alarm is still **active**, i.e. the appropriate alarm conditions are still present.
- **Inactive** alarms are displayed as **black** text on **white** background.
  - Signifies that alarm is **not active**, i.e. the appropriate alarm conditions are gone
- **Not Confirmed** alarms are displayed with an asterisk to indicate the alarm is not acknowledged (confirmed).

ECU Alarms

- **SPN** - Suspect parameter number
- **FMI** - Type of protection
- **OC** - Number of errors
- **SC** - Source of error

Alarm List

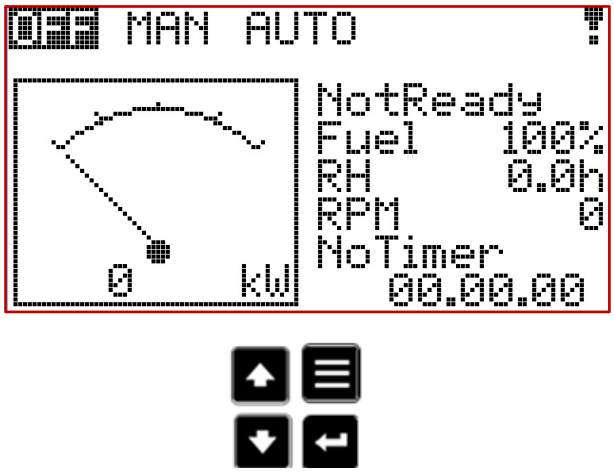
HIPOWER NOTES:

- Use **Up** button to move to **alarm list** from main measurement screen.
- Use **Up** and **Down** buttons to select required alarm reason
- **Active** alarms are displayed as **white** text on **black** background.
    - Signifies that alarm is still **active**, i.e. the appropriate alarm conditions are still present.
- **Inactive** alarms are displayed as **black** text on **white** background.
    - Signifies that alarm is **not active**, i.e. the appropriate alarm conditions are gone
- **Not Confirmed** alarms are displayed with an asterisk to indicate the alarm is not acknowledged (confirmed).

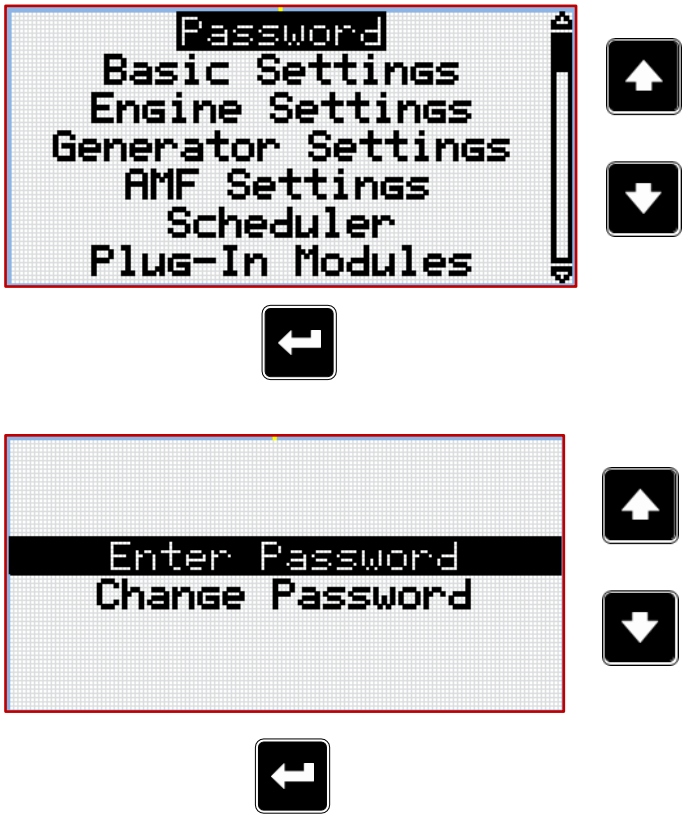
ECU Alarms

- **SPN** - Suspect parameter number
- **FMI** - Type of protection
- **OC** - Number of errors
- **SC** - Source of error

Password



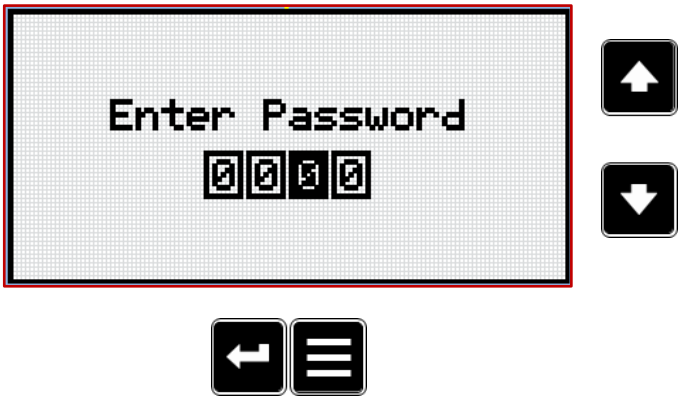
Enter Password



HIPOWER NOTES:

- From all pages, return to the **Setpoint** group page by pressing **Page** button.
- Use **Up** and **Down** buttons to select **Setpoint** group **Password**
- Use **Up** and **Down** buttons to select **Enter Password**.
- Use **Enter** button to select.

Enter Password

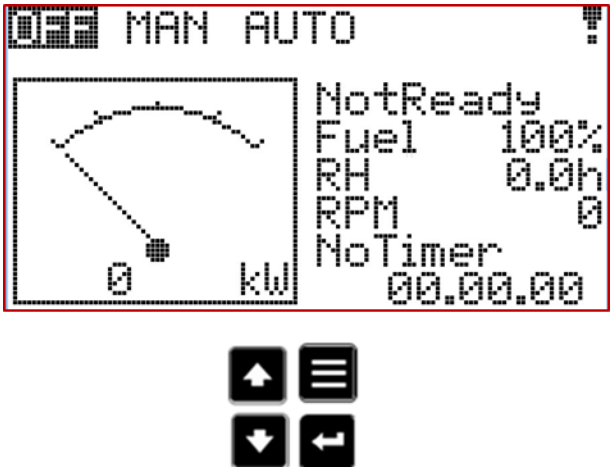


HIPOWER NOTES:

- Use **Enter** button to enter setpoint group **Password**
- Use **Up** and **Down** button to select **Enter Password**.
- Use **Enter** button to enter selected setpoint
- Use **Up** and **Down** button to **set** required value of selected setpoint.
- Use **Left** and **Right** button to move between digits.
- Use **Enter** button to confirm Password or **Page** button to cancel

Invalid Password

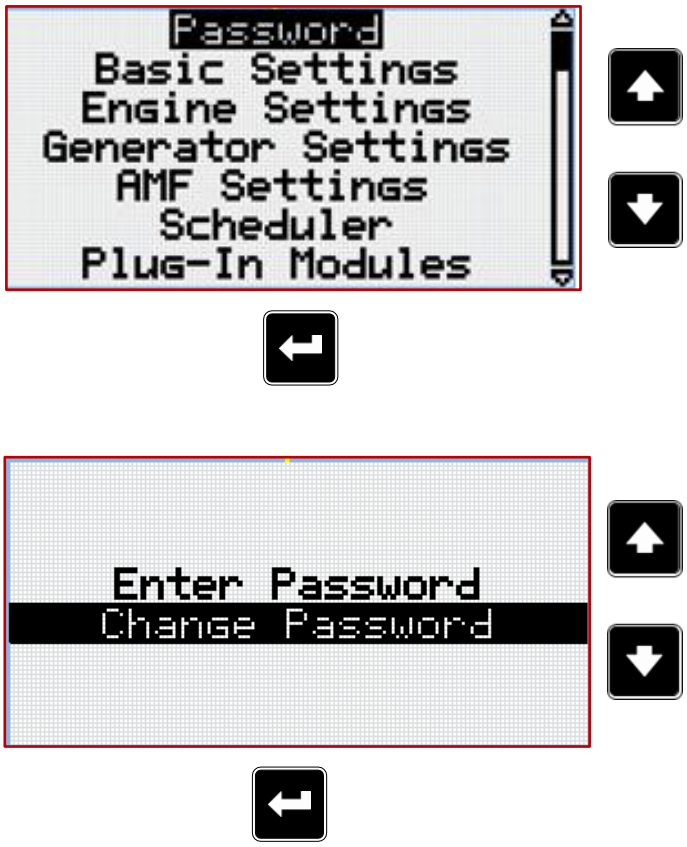
Change Password



HIPOWER NOTES:

- **Invalid Password** screen appears when **incorrect** password is entered
- From all measurement pages, return to the **Setpoint** group page by pressing **Page** button.
- Use **Up** and **Down** button to select Setpoint group **Password**.
- Use **Enter** button to **confirm Password** or **Page** button to **cancel**.
- Use **Up** and **Down** button to set required value of selected setpoint.

Change Password



HIPOWER NOTES:

- From all measurement pages, return to the **Setpoint** group page by pressing **Page** button.
- Use **Up** and **Down** button to select group **Change Password**.
- Use **Enter** button to **confirm Password** or **Page** button to **cancel**.
- Use **Up** and **Down** button to set required value of selected setpoint.

Change Password

HIPOWER NOTES:

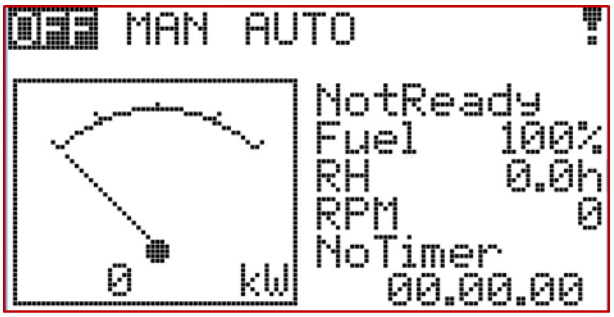
- Use **Up** and **Down** button to select **Change Password**.
- Use **Up** and **Down** button to select required level of **Password**.
- Press **Enter** button to select.

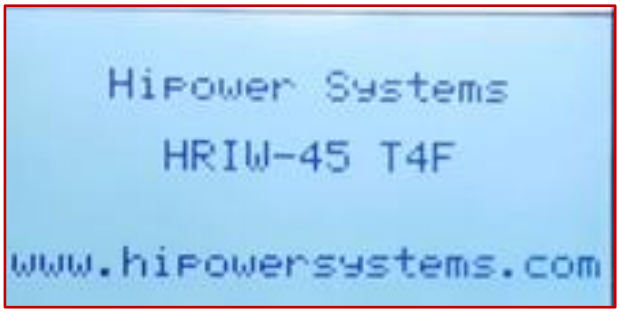
Change Password

HIPOWER NOTES:

- Use **Up** and **Down** button to set required value of password.
- Use **Left** and **Right** buttons to move between digits.
- After creating new password, use **Enter** button to confirm adjusted password.
- Use **Up** and **Down** button to set required value of password **again**.
- After setting new password again use **Enter** button to confirm adjusted password or **Page** button to discard changes and to **cancel** changing password.
- **Unlock Controller** before attempting to change **Password**; Controller will prompt for Password required; Password must be entered before Password can be changed
- **LOST PASSWORD?** Access information screen with serial number and password decode number; contact dealer.

Information Screen

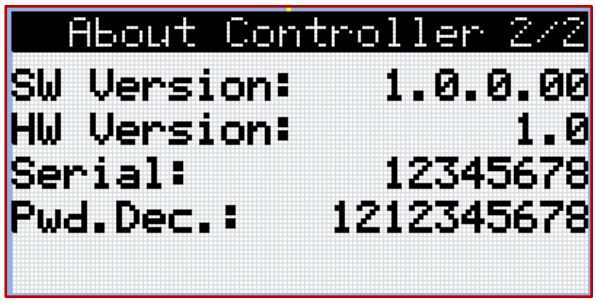


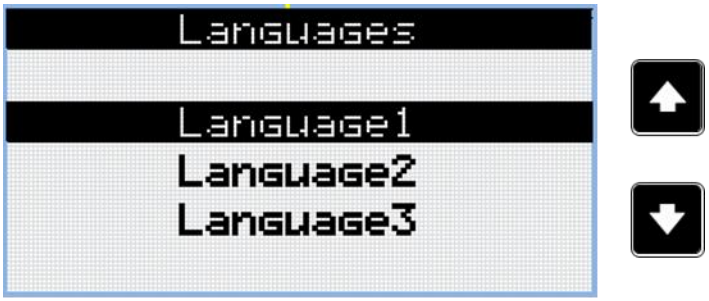


HIPOWER NOTES:

- On **Main** measurement screen, press the **Enter** and the **Page** buttons together; **Enter** button must be pressed **first**.
- Press **Page** button to move to the next page.

Configuration

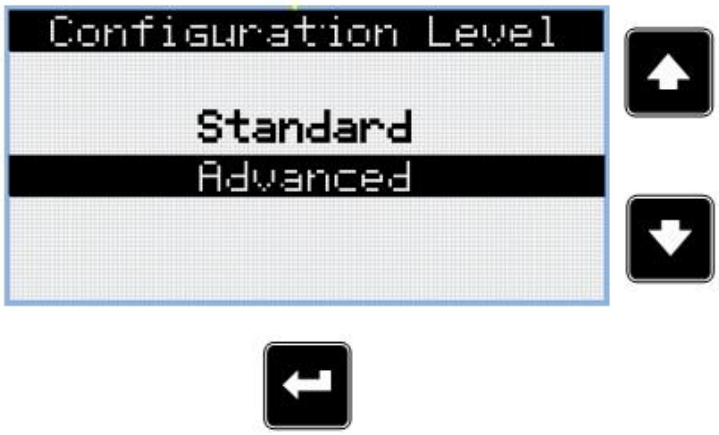




HIPOWER NOTES:

- Use **Page** button to move to the next page.
- Use **Up** button to return to **Main** measurement screen.
- Use **Up** and **Down** buttons to select language.
- Use **Enter** to confirm language selection

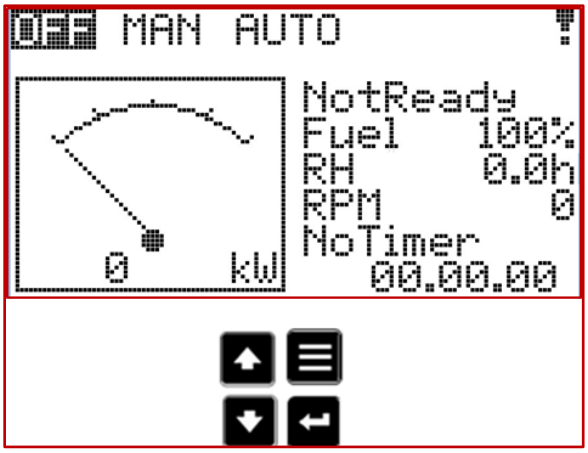
Configuration

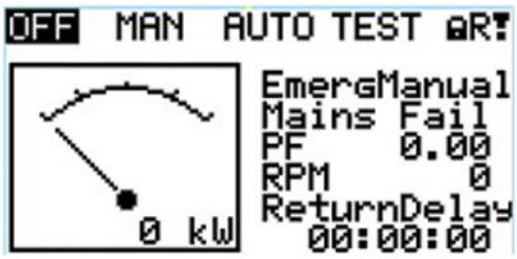


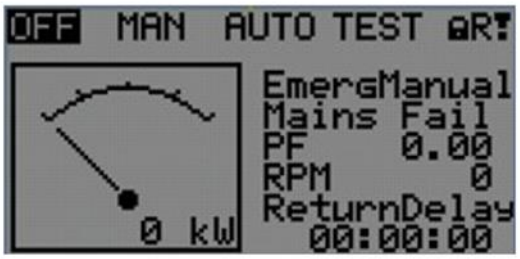
HIPOWER NOTES:

- Use **Up** and **Down** buttons to select required level of **Configuration**.
- Use **Enter** to confirm selected level of **Configuration**

Display Contrast Adjustment







HIPOWER NOTES:

- On any measurement screen, press **Enter** and **Down** button together to **lower** screen contrast.
- On any measurement screen, press **Enter** and **Up** button together for **higher** screen contrast.
- After setting contrast, no additional action is required.

⚠ CAUTION

MOUNTING GUIDELINES: HRIW 25 & HRIW 45

Install Generators on Solid, Level Foundation

Install HRIW 25 and HRIW 45 generators on a solid, level foundation (such as concrete).

- Isolate vibration by securing generator securely to the foundation.

Comply With National Fire Protection Association (NFPA) Codes

ALWAYS install the HRIW 25 and HRIW 45 generators at least 6 inches above the floor or grade level, in compliance with **NFPA 110, Chapter 54.1**.

Metal Skids Protect HRIW 25 & HRIW 45 Generators

DO NOT remove the metal skids on the bottom of the generator.

- Skids prevent damage to the generator and maintain alignment.

Outdoor Installation: HRIW 25 & HRIW 45

FOLLOW these guidelines when installing HRIW 25 and HRIW 45 generators:

- Choose area with very low levels of moisture and dust.
- Area must be free of debris, bystanders, and overhead obstructions.
- Set unit securely on level ground so it cannot slide or shift position.
- Position so exhaust is discharged away from nearby homes, offices, dwellings.

PROTECT all electrical equipment from excessive moisture and dust.

- Failure to protect electrical equipment can result in deterioration of the insulation which may lead to short circuits and grounding.

⚠ DANGER

Outdoor Exhaust Gas Ventilation Requirements

Exhaust gases from diesel engines are extremely dangerous and exposure can cause serious injury or death.

ASSURE proper ventilation when operating the HRIW 25 and HRIW 45 generators inside tunnels and caves.

- Engine exhaust contains noxious, potentially harmful and fatal elements.

- Accumulation of engine exhaust can result in serious injury or death.
- Direct engine exhaust to a ventilated area.

Indoor Installation: HRIW 25 & HRIW 45

INSTALL HRIW 25 and HRIW 45 generators:

- In area free of debris, pedestrians, obstructions and excessive moisture.
- Securely on level surface so it cannot slide or shift position.
- In location that allows exhaust to be discharged away from occupied areas.

PROTECT all electrical equipment from excessive moisture. Failure to protect equipment will result in deterioration of the insulation and will result in short circuits and grounding. Foreign materials such as dust, sand, lint and abrasive materials cause excessive wear to engine and alternator parts.

Indoor Exhaust Gas Ventilation Requirements

Exhaust gases from diesel engines are extremely poisonous and exposure can cause serious injury or death.

- **VENT** engine exhaust fumes to the outside.
- **INSTALL** the engine a minimum of two feet from any outside wall.

ALWAYS use correctly-sized exhaust pipe because using exhaust pipe that is too long or too small causes excessive back pressure.

Grounding Guidelines for HRIW 25 & HRIW 45

Regulatory Requirements

Regulatory agencies governing the design, build, maintenance and operation of the HRIW 25 and HRIW 45 generator sets include:

- The Occupational Safety and Health Administration (OSHA)
- The National Electrical Code (NEC)
- The Canada Occupational Health and Safety (OH&S)

Before operating a generator, assure that you **PROVIDE** a good **EARTH** ground.

WARNING

Licensed Electrician

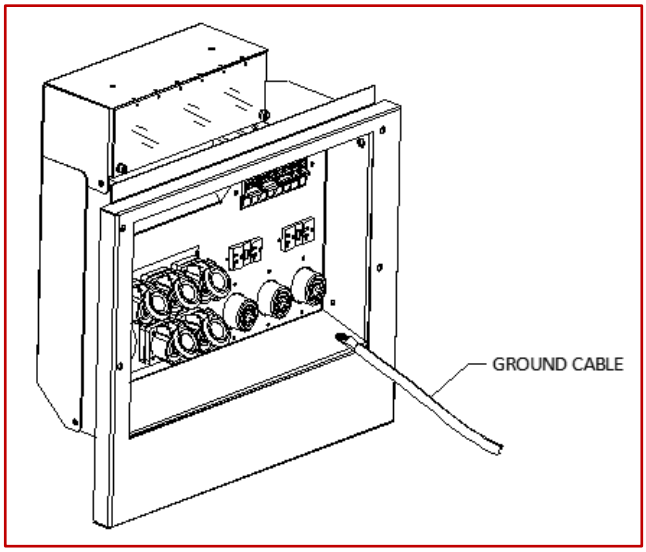
Always consult with a licensed electrician before connecting HRIW 25 and HRIW 45 generators to any electrical system.

FOLLOW federal, state, Province, District, regional and municipalities electrical grounding requirements before using HRIW 25 and HRIW 45 generators.

NEC Article 250 (Grounding) of the NEC handbook provides guidelines for proper grounding.

NEC Article 250 specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical. NEC article 250 specifies the following grounding requirements:

1. Use one of the following wire types to connect the HRIW 25 and HRIW 45 generators to earth ground.
    a) Copper 10 AWG (5.3 mm2) or larger.
    b) Aluminum 8 AWG (8.4 mm2) or larger.
2. To ground the HRIW 25 and HRIW 45 generators:
    c) Connect one end the ground cable to the ground lug on the HRIW 25 and HRIW 45 generators
    d) Connect the other end of the ground cable to the ground rod (earth ground)
3. NEC article 250 specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.



Ground: HRIW 25 & HRIW 45

NOTICE

OPERATION GUIDELINE: HRIW 25 & HRIW 45

Equipment Operator Requirements

HRIW 25 and HRIW 45 generators should only be operated by trained and qualified personnel **18 years of age and older.**

Curb-Side Output Terminal Panel: HRIW 25 & HRIW 45

The Output Terminal Panel is located on the curb-side of the HRIW 25 and HRIW 45 generators. Lift the cover to gain access to receptacles and terminal lugs.

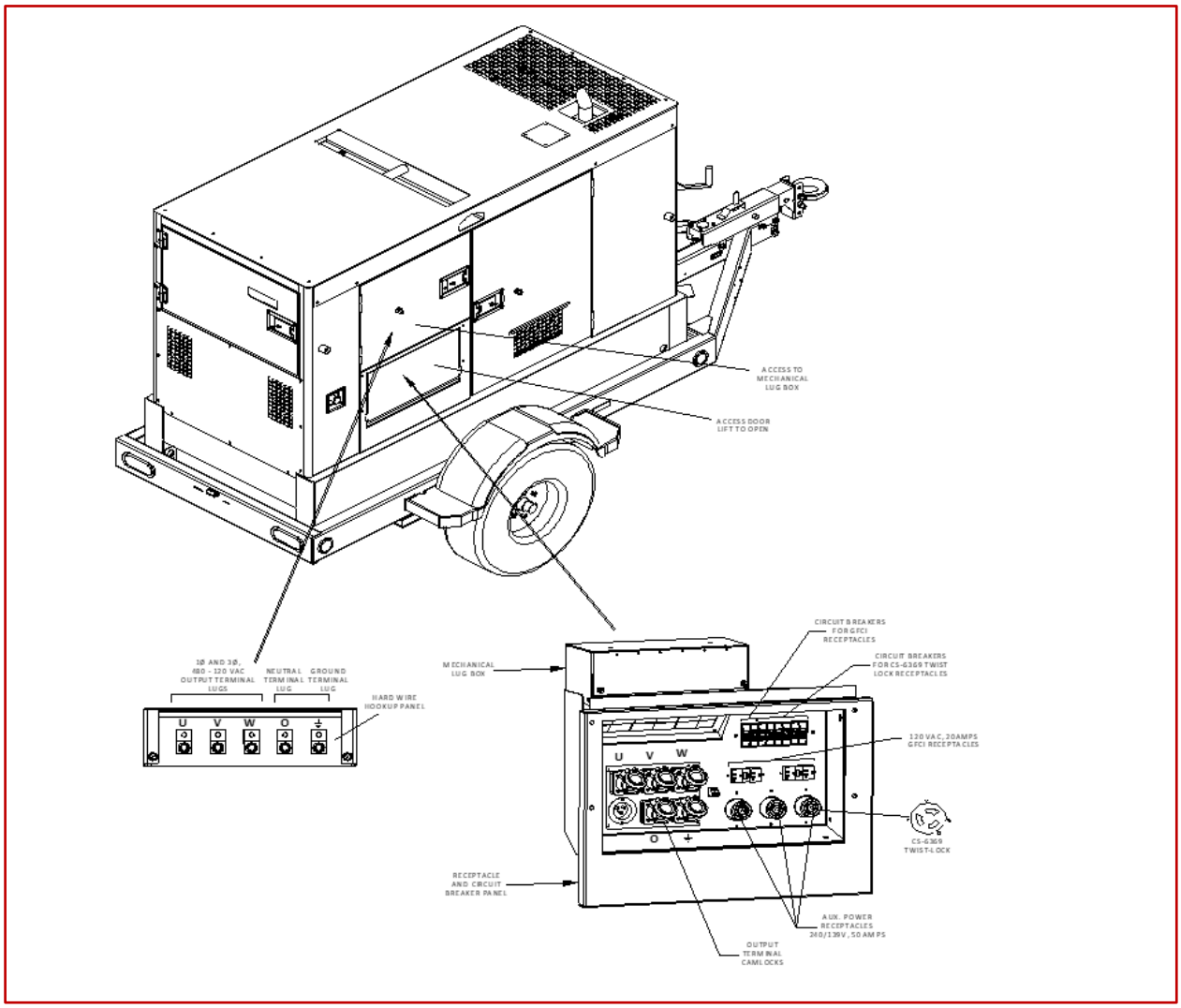
- Terminal legs “O” and “Ground” are considered **bonded grounds**.

Output Terminal Panel

The output terminal panel provides the following power management options:

- Three 240/139V output receptacles @ 50 amps
- Three auxiliary circuit breakers @ 50 amps
- Two 120V GFCI receptacles @ 20 amps
- Two GFCI circuit breakers @ 20 amps
- Five output terminal lugs (U,V,W,O,Ground)
- Five output camlocks (U,V,W,O,Ground)

Output Terminal



NOTICE

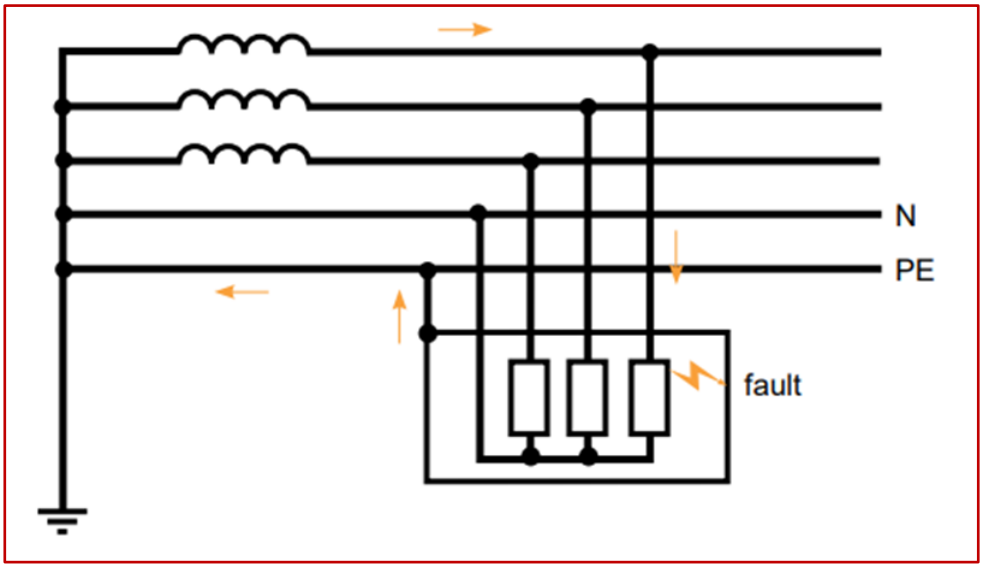
Grounding Systems

Two grounding systems (also known as earthing systems) are approved for use with HRIW 25 and HRIW 45 generators:

- **TN-S**
- **TT**

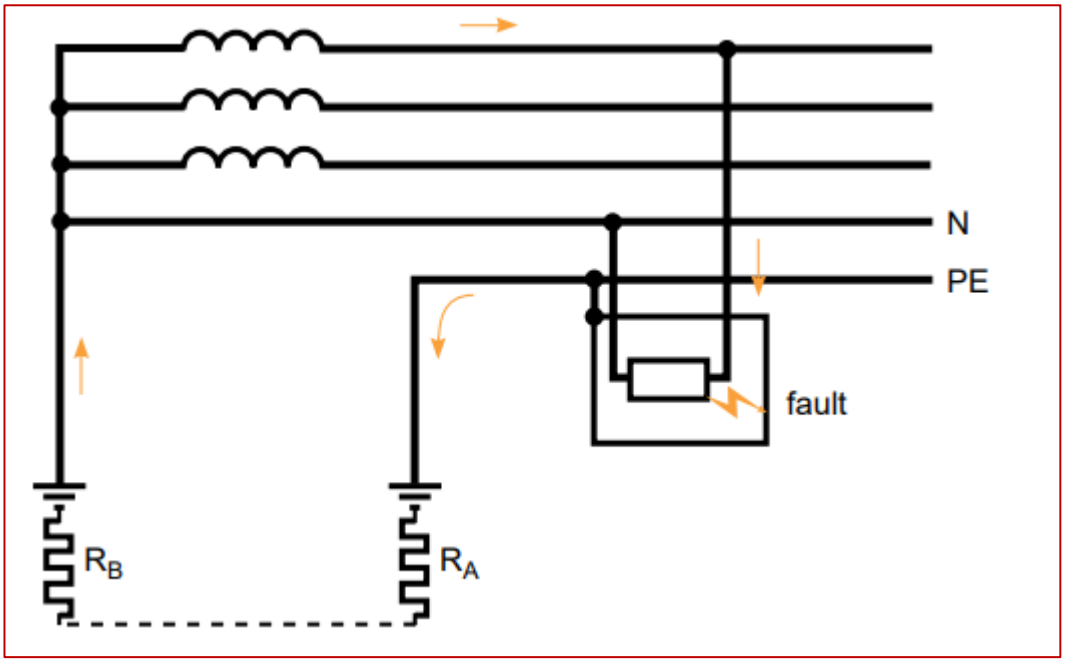
TN-S Grounding System

HRIW 25 and HRIW 45 generators are configured to use the **TN-S** grounding system.



TN-S Grounding System: HRIW 25 & HRIW 45

TT Grounding System

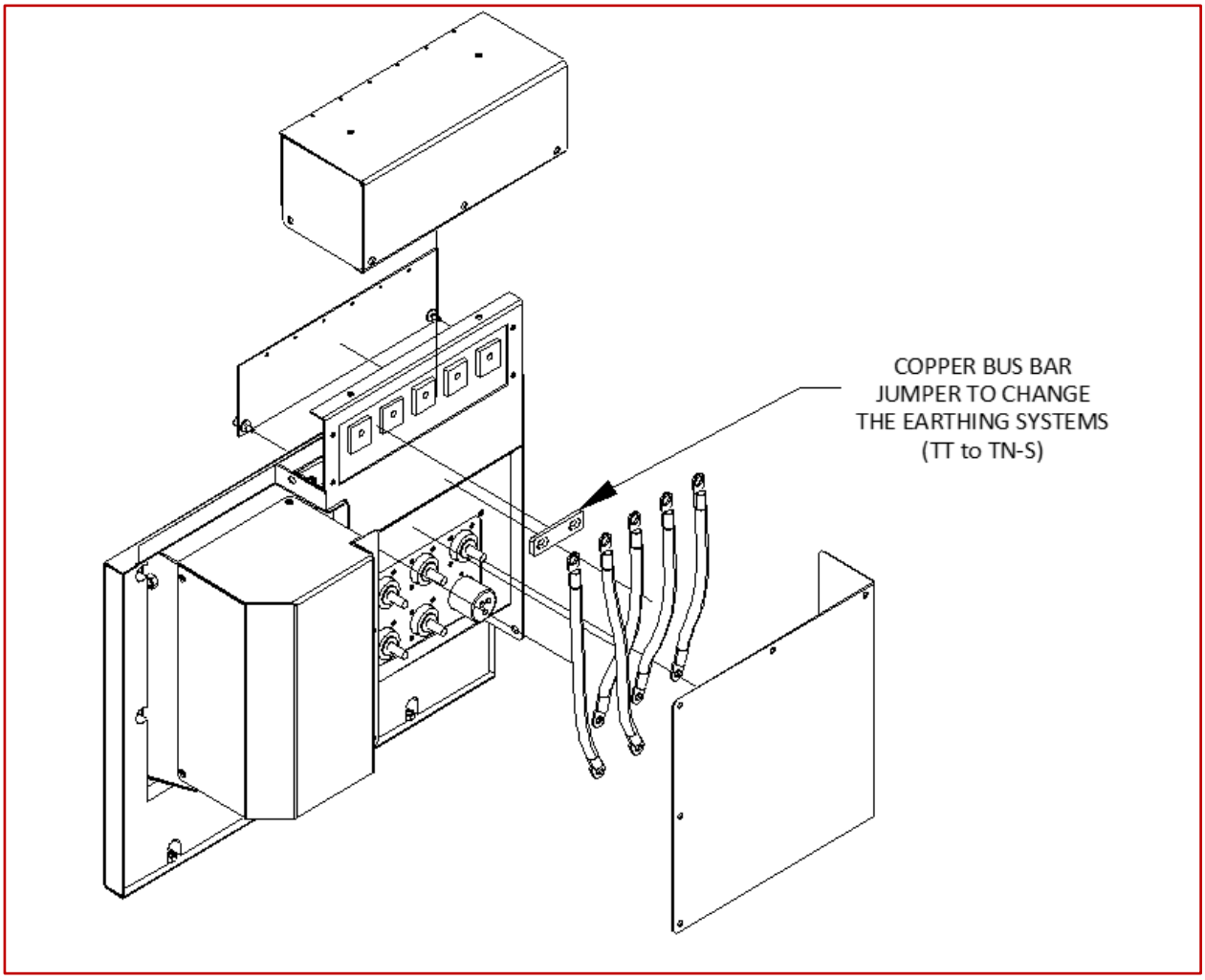


TT Grounding System: HRIW 25 & HRIW 45

⚠ CAUTION

NEVER change the grounding system while the engine is running.

ALWAYS place circuit breaker in the **OFF** position before selecting grounding system.



120 VAC Ground Fault Current Interrupter (GFCI) Receptacles

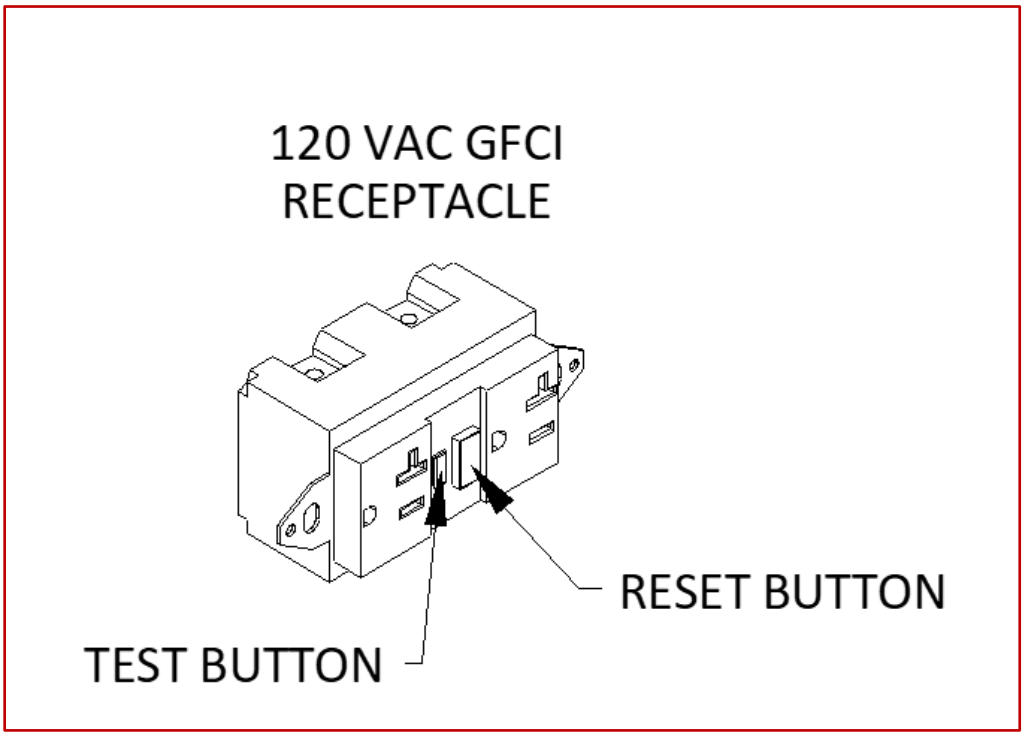
Two 120 VAC, 20 amp GFCI (Duplex Nema 5-20R) receptacles are accessible on the output terminal panel.

Receptacles are protected by 20 amp circuit breakers located above the GFCI receptacles. They are accessible in all **voltage selector switch** configurations.

- **Load output** (current) of GFCI receptacles is determined by the load requirements of the U,V and W output terminal lugs.

If GFCI receptacle trips offline, press the **reset** button.

- **TEST** GFCI function each month by pressing test button (in the center of the receptacle).



Ground Fault Current Interrupter: HRIW 25 & HRIW 45

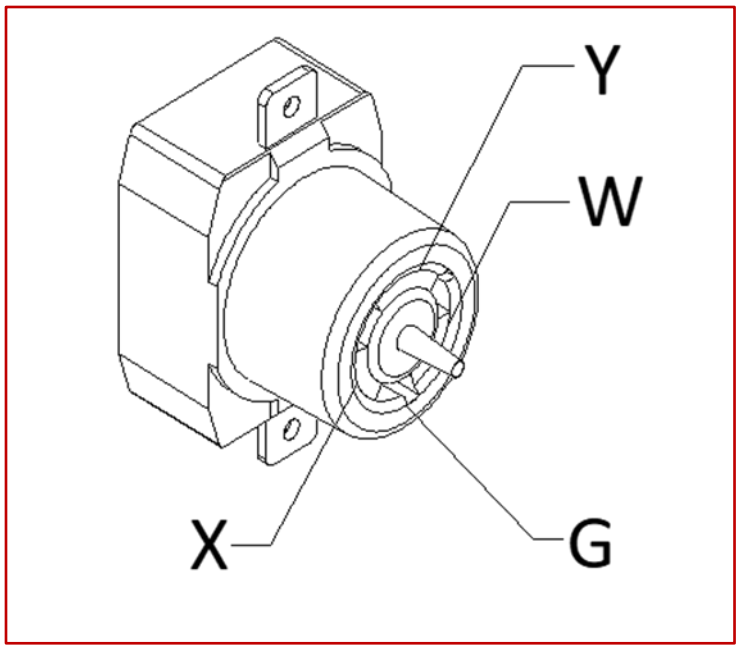
Twist-Lock Dual Voltage 240/139 VAC Receptacles

Three 240/139V, 50 amps auxiliary twist-lock (CS-6369) receptacles provide an output terminal.

ACCESS receptacles when voltage selector switch is configured for **single-phase** 240/120 application.

NOTICE

Hipower Systems' HRIW 25 and HRIW 45 generators provide the ability to connect camlocks, mechanical lugs, twist locks and GFCI receptacles at the same time at 480/277V and 208/120V configurations.



Twist-Lock Dual Voltage 240 / 139 VAC Receptacles:
HRIW 25 & HRIW 45

Available Watts at 480/277V and 208/120V: HRIW 45

NOTICE

This table indicates the simultaneous power ratings at 480 / 277 V (kVA) & 208 / 120 V (kVA) configuration

DO NOT EXCEED MAXIMUM AVAILABLE POWER

**NEVER EXCEED 10 kW AT TWIST LOCK

3Ø 480 / 277V 208 / 120 (kVA)	TWIST-LOCK (kW)	GFCI 120V (kW)
45.0	0	0
35.9	2.5	4.8
33.1	5	4.8
32.5	7.5	2.5
32.5	10	0

**At 480 / 277 V connection the controller will display the power rating of the twist locks to be twice their real power

Power Ratings at Various Voltage / Phase Combinations: HRIW 45

NOTICE

This table indicates the simultaneous power ratings at various voltage / phase combinations

DO NOT EXCEED MAXIMUM AVAILABLE POWER

3Ø 480 / 277V 208 / 120V (kVA)	1Ø 240 / 120V (kW)	1Ø GFCI 120V (kW)
45.0	24	0
40.9	22.8	1.2
36.7	21.6	2.4
32.6	20.4	3.6
28.4	19.2	4.8

NOTICE

A 50 amp circuit breaker protects each Twist-Lock receptacle.

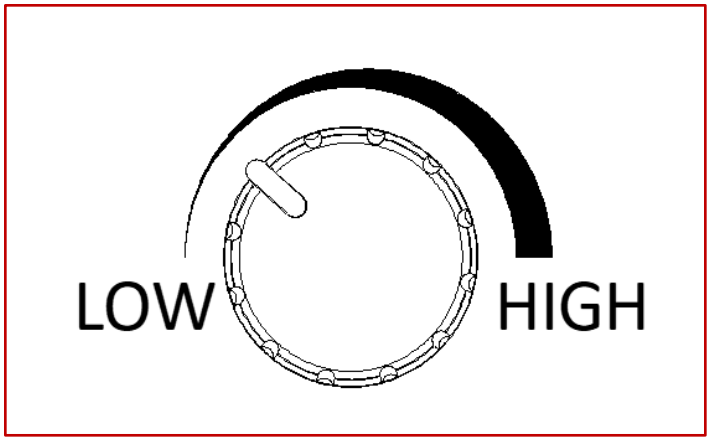
- Circuit breakers are located above GFCI receptacles.

Load output (current) on receptacles is determined by load requirements of output terminal lugs.

Voltage Regulator

The voltage regulator control knob allows the operator to increase or decrease voltage.

- **INCREASE** voltage = clockwise rotation
- **DECREASE** voltage = counter-clockwise rotation

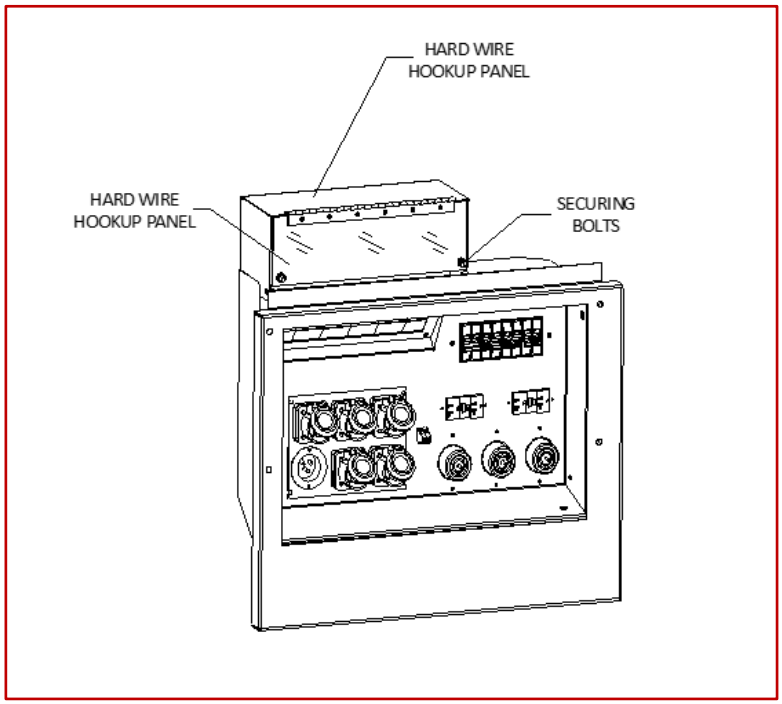


Voltage Regulator Control Knob

Removing Plastic Faceplate: HRIW 25 & HRIW 45:

Output terminal lugs are protected by a faceplate cover.

- **REMOVE** threaded fasteners and lift cover to access terminal enclosure
- **ATTACH** load wires to terminal lugs
- **REINSTALL** faceplate cover



Faceplate: HRIW 25 & HRIW 45

⚠ CAUTION

Load Application: HRIW 25 & HRIW 45

Single-Phase Load

COMPARE information on HRIW 25 and HRIW 45 generator nameplate to assure wattage, amperage, frequency, and voltage requirements are satisfactorily supplied by the HRIW 25 and HRIW 45 generators for operating the equipment.

- The wattage listed on the nameplate of the equipment is its rated output.

NOTE: Equipment may require 130-150% more wattage than the rating on the nameplate, because wattage is influenced by efficiency, power factor and starting system of the equipment.

How to Calculate Wattage

If wattage is not given on the equipment's name plate, approximate wattage may be determined by multiplying nameplate voltage by the nameplate amperage.

- **Watts = Voltage x Amperage**

Generally, the power factor of HRIW 25 and HRIW 45 generators is **0.8.**

Refer to the following table for calculating power factor by load for HRIW 25 and HRIW 45 generators.

Power Factor by Load: HRIW 25 & HRIW 45

Power Factor by Load: HRIW 25 & HRIW 45	
Type of Load	**Power Factor**
Single-phase induction motors	0.4-0.75
Electric heaters, incandescent lamps	1.0
Fluorescent lamps, mercury lamps	0.4-0.9
Electronic devices, communication equipment	1.0
Common power tools	0.8

Cable Selection for 60 Hz, Single-Phase Operation

Cable Selection (60 Hz, Single Phase Operation) HRIW 25 & HRIW 45						
Current in Amperes	Load in Watts		Maximum Allowable Cable Length			
	At 100 Volts	At 200 Volts	#10 Wire (ft.)	#12 Wire (ft.)	#14 Wire (ft.)	#16 Wire (ft.)
2.5	300	600	1000	600	375	250
5	600	1200	500	300	200	125
7.5	900	1800	350	200	125	100
10	1200	2400	250	150	100	
15	1800	3600	150	100	65	
20	2400	4800	125	75	50	

NOTICE

Three-Phase Load

Use the following equation to calculate power requirements for 3-phase power:

kVA = Voltage x Amperage x 1.732 / 1000

- If 3Ø load (kVA) is not given on the equipment nameplate, approximate 3Ø load may be determined by multiplying voltage by amperage by 1.732.
- Motors and motor-driven equipment draw much greater current for starting than during operation.
- Inadequately sized connecting cable that cannot carry the required load can cause a voltage drop.
- Voltage drops can damage tools and appliances and overheat the cable.

Capacity Calculations: Tools and Appliances

- **Resistance Loads** (incandescent lamp, electric heater): When connecting a resistance load, a capacity of up to the generating set's rated output (kW) can be used.
- **Lamps:** When connecting a fluorescent or mercury lamp, a capacity of up to the generating set's rated output (kW) multiplied by 0.6 can be used.
- **Power Tools:** Calculate required starting current capacity.

- **STANDARD TOOLS**: A capacity of up to the generating set's rated output (kW) multiplied by 0.8.

Isolation Transfer Switch

WARNING: A licensed electrician must install an **isolation** (**transfer**) **switch** before connecting this HRIW 25 and HRIW 45 generators to any building's electrical system.

WARNING: Serious damage to the building's electrical system can occur if no isolation transfer switch is installed.

WARNING

Output Voltages: HRIW 25 & HRIW 45

A wide range of voltages are available to supply voltage for many different applications. Voltages are selected by using the voltage selector switch.

Voltage Selection Guide for HRIW 25 & HRIW 45

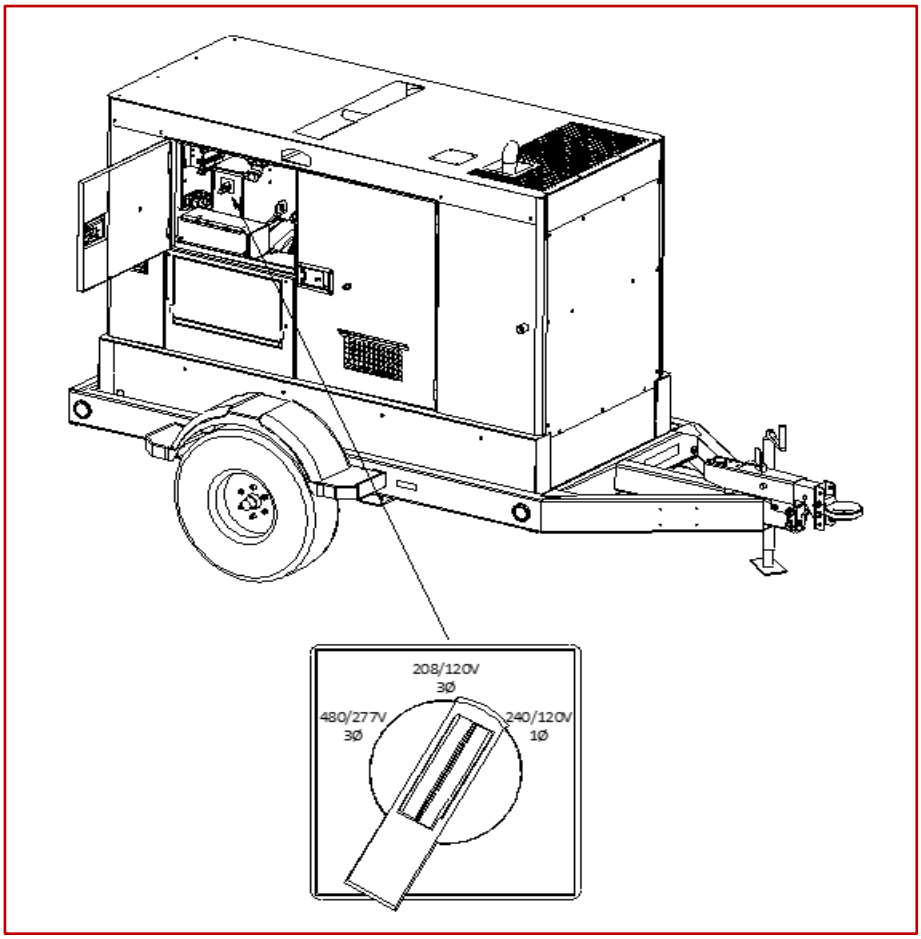
Voltage selector switch is in alternator box.

NEVER change the position of the voltage selector switch while the engine is running.

ALWAYS place circuit breaker in the **OFF** position before selecting voltage.

Voltages Available: HRIW 25 & HRIW 45						
Output Terminal Lugs	**Voltage Selector Switch 3-Phase 208/120V Position**			**Voltage Selector Switch 3-Phase 480/277V Position**		
3Ø Line-Line	208V	220V	240V	416V	440V	480V
1Ø Line-Neutral	120V	127V	139V	240V	254V	277V
Voltage Selector Switch Single-Phase 240/120V Position						
1Ø Line-Neutral/ Line-Line	120V Line-Neutral	N/A	N/A	240V Line-Neutral	N/A	N/A

ADJUST the voltage regulator control knob for variable output voltages.



Location of Voltage Regulator Control Knob: HRIW 25 & HRIW 45

U,V,W,O TERMINAL OUTPUT VOLTAGES

Output voltages can be obtained using the UVWO output mechanical lugs.

Voltages at the terminals are dependent on the position of the Voltage Selector Switch and the adjustment of the Voltage Regulator Control Knob.

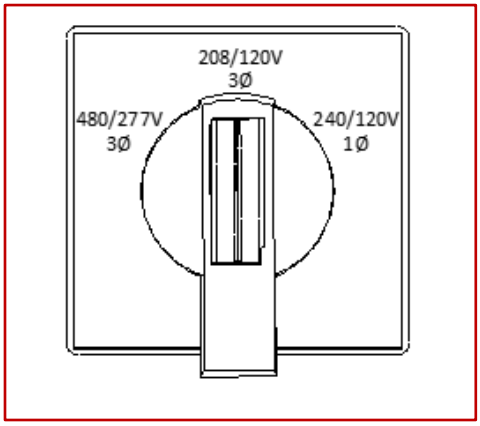
RANGE of output voltage is controlled by the voltage selector switch.

- The voltage regulator (VR) allows the user to increase or decrease the selected voltage.

⚠ CAUTION

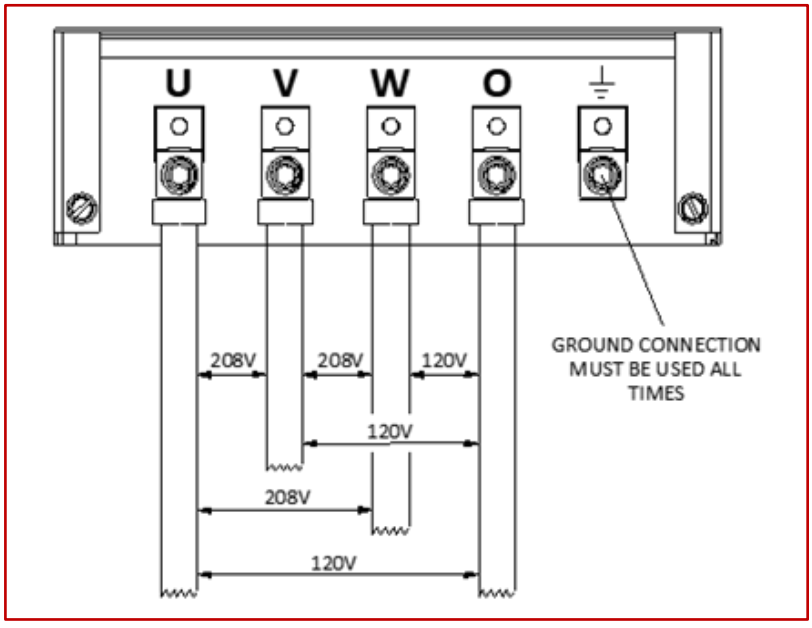
3Φ-208V/1Φ-120V UVWO Terminal Output Voltages

TURN voltage selector switch to 3Φ 208/120V position.



3 Voltage Selector Switch in 3Φ 208/120V Position

CONNECT load wires to UVWO terminals.



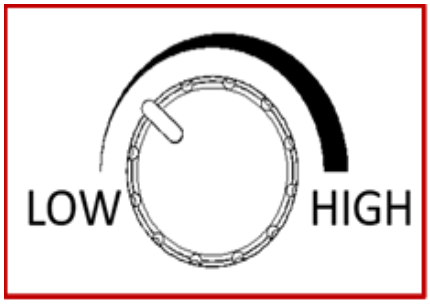
UVWO Terminals

⚠ CAUTION

TURN voltage regulator knob clockwise to increase voltage output,

TURN voltage regulator knob counterclockwise to decrease voltage output.

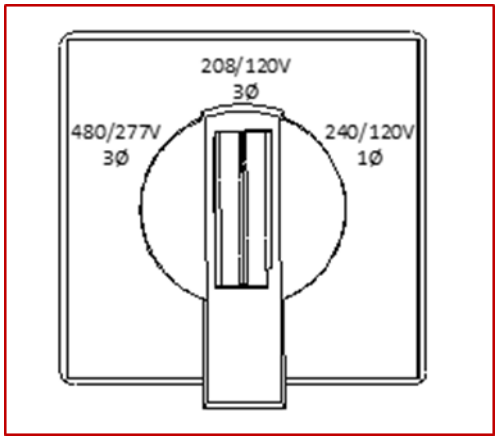
Use voltage regulator adjustment knob to fine tune output voltage.



Voltage Regulator Control Knob

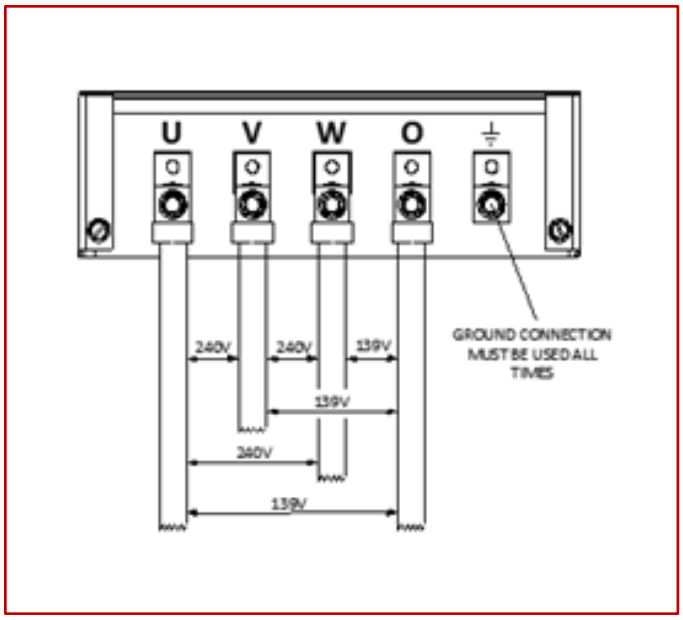
3Φ-240V UVWO Terminal Output Voltages

Place the voltage selector switch in the 3Φ 208/120V position as shown, below:



3 Voltage Selector Switch in 3Φ 208/120V Position

CONNECT load wires to the UVWO terminals as shown, below.

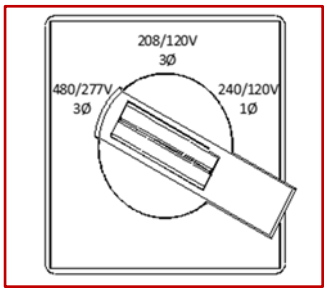


Mechanical Lug: HRIW 25 & HRIW 45

For 3Φ 240V output, move voltage selector switch to 3Φ-208/120V position. The voltage regulator must be adjusted to 240V for the controller to recognize generator voltage.

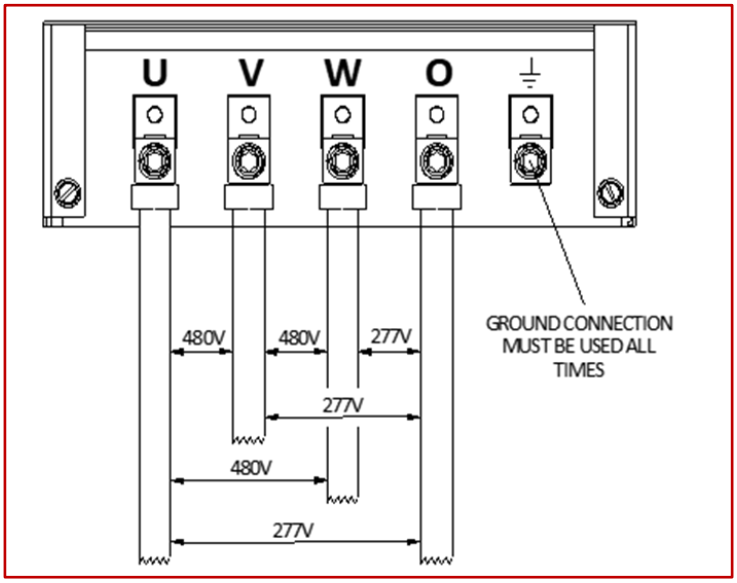
3Φ-480V/277Φ UVWO Terminal Output Voltages

Place the voltage selector switch in the 3Φ 480/277V position as shown, below.



3 Voltage Selector Switch:
3 Φ 480/277V

CONNECT load wires to the UVWO terminals as shown, below.

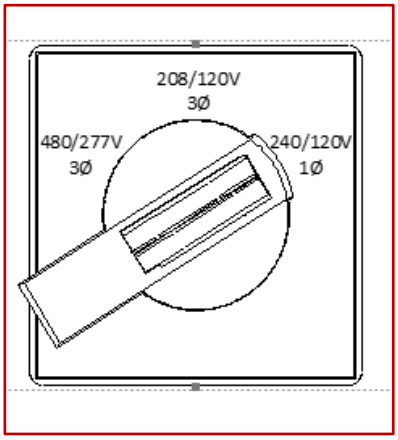


Mechanical Lug: HRIW 25 & HRIW 45

VERIFY that connections to the UVWO terminals are secure and tight to prevent arcing, which could cause a fire.

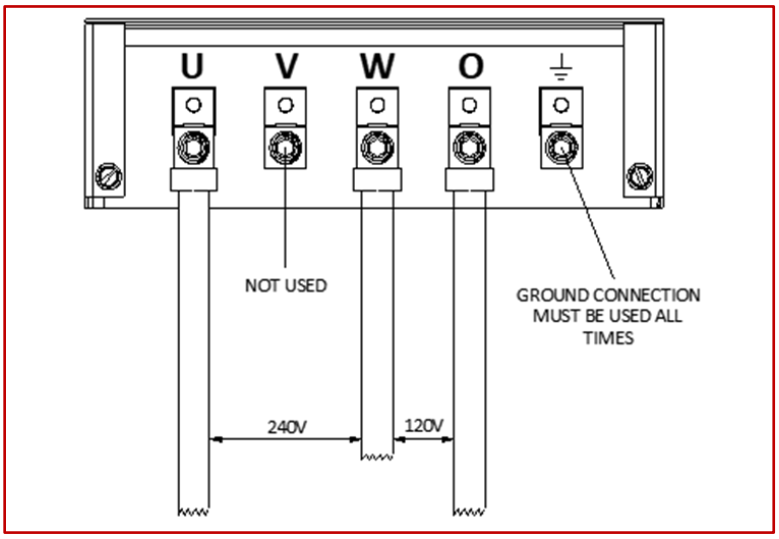
1Φ-240V/120Φ UVWO Terminal Output Voltages

TURN voltage selector switch to 1Φ 240/120V position as shown, below.

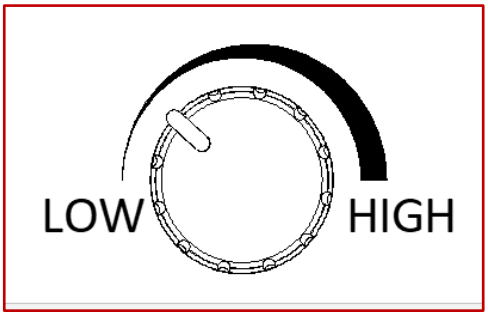


3 Voltage Selector Switch:
1Φ-240V/120Φ

Connect the load wires to the **UVWO** terminals as shown, below.



Mechanical Lug: HRIW 25 & HRIW 45



Voltage Regulator Control Knob

- **TURN** voltage regulator knob clockwise to **increase** voltage output.
- **TURN** voltage regulator knob counterclockwise to **decrease** voltage output.

Use voltage regulator adjustment knob whenever fine tuning of the output voltage is required.

NOTICE

Circuit Breakers

HRIW 25: To protect the HRIW 25 generator from overload, a 3-pole, 90 amps (ABB-XT1 90) main circuit breaker is provided to prevent overload of U, V, and W Output Terminals.

HRIW 45: To protect the HRIW 45 generator from overload, a 3-pole, 150 amps (ABB-XT3 150), main circuit breaker is prevent overload of U, V, and W Output Terminals.

- Two single-pole, 20-amp duplex circuit breakers are provided to protect the GFCI receptacles from overload.
- Three 50-amp load circuit breakers have also been provided to protect the auxiliary receptacles from overload.

The main circuit breaker only protect the loads connected to **Camlocks** and **Mechanical Lugs**.

ALWAYS switch **ALL** circuit breakers to the **OFF** position before starting the engine.

LUBRICATION GUIDELINES

Replace Lubrication Oil

POSITION HRIW 25 and HRIW 45 generators on level ground.

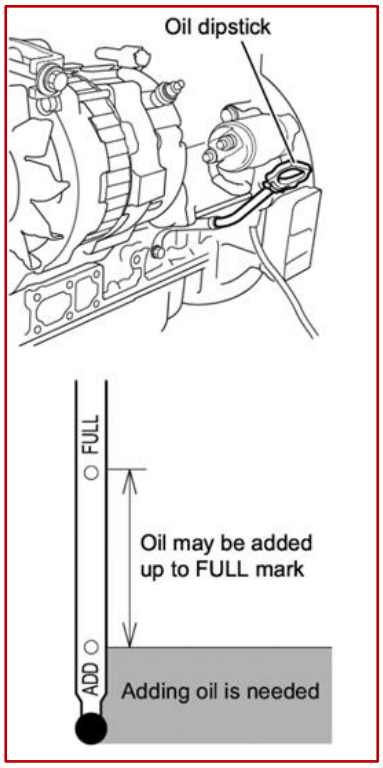
- Turn off engine.
- Check oil level.
- Verify oil is clean.
  - If the oil is not clean, drain oil by removing the oil drain plug.

Fill the engine crankcase with lubricating oil through the filler hole.

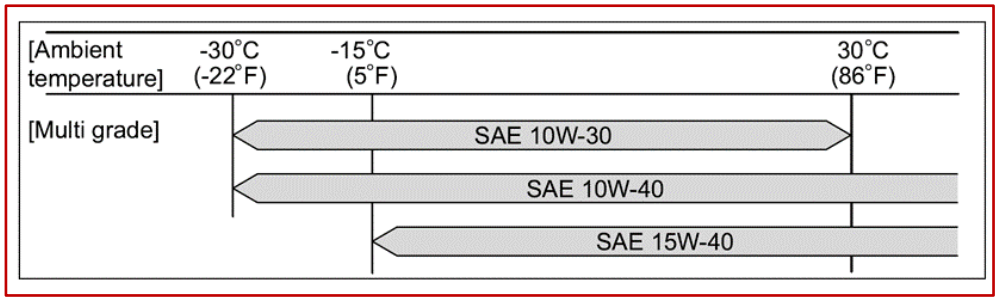
- Refill with the specified amount of oil as outlined in the Isuzu Owner's Manual.

DO NOT overfill crankcase with lubricating oil.

- **ENSURE** oil level is maintained between the two notches in the dipstick.



Oil Level Check: HRIW 25 & HRIW 45



Recommended Oil Weights: HRIW 25 & HRIW 45

DANGER

Fuel Check

Fuel spilled onto a hot engine will likely cause a fire or explosion.

- Spilled fuel must be cleaned up to prevent fire or explosion.
- **NEVER** smoke around or near the HRIW 25 and HRIW 45 generators.
- Turn engine **OFF** before refueling.

WARNING

Tank Refueling Procedure

Only properly trained personnel who have read and understand this section should refill the fuel tank system.

HRIW 25 and HRIW 45 generators have internal fuel tanks located inside the trailer frame; they may also be equipped with an environmental fuel tank.

ALWAYS fill the fuel tanks with clean, fresh No. 2 diesel fuel**.**

DO NOT fill the fuel tanks beyond their capacities.

Be attentive when replenishing fuel.

- Store and transport fuel in an approved safety container.
- Prevent spills; if the container does not have a spout, use a funnel.
- The fuel tank cap must be closed tightly after filling.
- Immediately clean up any spilled fuel.

DO NOT add fuel while engine is running. Stop engine and let cool before adding fuel.

Diesel fuel and its vapors are dangerous to your health and the surrounding environment.

- Avoid skin contact and/or inhaling fumes.
- Wear appropriate PPE if there is a risk of contact with fuel.

ALWAYS place trailer on firm level ground before refueling to prevent spilling and maximize the amount of fuel that can be pumped into the tank.

- Failure to do so will cause fuel to spill from the tank before reaching full capacity.

ONLY use diesel fuel (ultra-low sulfur diesel fuel) when refueling.

NEVER overfill fuel tank.

- **MONITOR** fill rate by reading the digital fuel gauge when filling the fuel tank.
- The ECU controller must be powered **ON** to read the fuel gauge in the controller.

⚠ CAUTION

Coolant (Antifreeze/Summer Coolant/Water)

Isuzu recommends antifreeze/summer coolant for use in their engines, which can be purchased in concentrate (and mixed with 50% demineralized water) or pre- diluted.

- Refer to **Isuzu Engine Owner's Manual** for further details.

DO NOT remove the radiator cap until the unit has completely cooled.

- Day-to-day addition of coolant is done from the recovery tank.

CONSULT the coolant capacity table (presented below) to identify engine, radiator, and recovery tank coolant capacities.

VERIFY coolant level in the recovery tank is always between the "H" and the "L" markings.

Coolant Capacity for HRIW 25 & HRIW 45

HRIW 25		
	Liters	**Gallons**
Engine	4.1	1.08
Radiator	14	3.70
Pipes	1.81	0.48
Total	20 liters	5.28 gallons

HRIW-45		
	Liters	**Gallons**
Engine	4.1	1.08
Radiator	12.75	3.37
Pipes	1.81	0.48
Total	18.66 liters	4.93 gallons

Operation in Freezing Temperatures

When operating in freezing temperatures, maintain required antifreeze levels at the appropriate coolant / water mix ratios.

- When operating in freezing weather, be certain to add the correct amount of antifreeze.

Coolant / Water Mix Ratios for HRIW 25 & HRIW 45

Coolant / Water Mix Ratios		
Climate	**Outside Temperature**	**Coolant Concentration**
Warm	10°F (-12°C) or Above	30%
Cold	-22°F (30°C) or Above	50%

Cleaning the Radiator

CLEAN radiator fins with compressed air to prevent overheating due to dust or debris overload.

TURN OFF engine and **DISCONNECT** negative battery terminal before cleaning inside the machine.

Air Cleaner Maintenance

Periodic cleaning/replacement is necessary.

INSPECT air cleaner in accordance with the **Isuzu Engine Owner's Manual**.

⚠ CAUTION

Fan Belt Tension

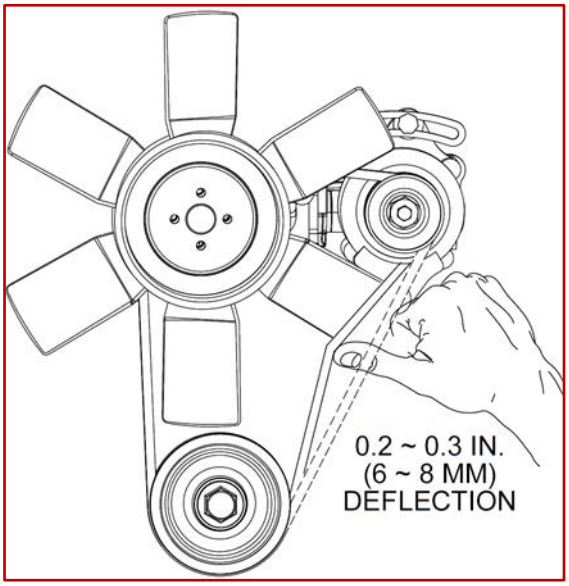
A slack fan belt may contribute to overheating, or to insufficient charging of the battery. Inspect the fan belt for damage and wear and adjust it in accordance with the Isuzu Engine Owner's Manual.

How to Assess Fan Belt Tension

Fan belt tension is proper if the fan belt bends when depressed with the thumb as shown below.

NEVER place hands near the belts or fan while the HRIW 25 and HRIW 45 generators set is running.

- Adjust fan belt tension as required.



Fan Belt Deflection Test

Fan Belt Deflection

Fan Belt Deflection		
Belt	**Standard Value Amount of Deflection**	**Standard Value Vibration Frequency**
New	0.2 ~ 0.3 in. (6 ~ 8 mm)	210 Hz

⚠ CAUTION

Battery Maintenance

ALWAYS correctly connect battery.

- **DO NOT** connect in reverse because it will shorten battery life and poses risk of sparking and explosion.

ALWAYS maintain battery fluid level because inadequate water level shortens battery life.

ONLY use distilled water when replenishment is necessary.

- **DO NOT** over fill.

VERIFY that battery cables are secure because non-secure contact may result in poor starting and malfunctions.

- Coat battery terminals with approved battery terminal treatment compound to assure adequate connection and prevent corrosion.

Assess Battery Condition (Charge)

Battery is sufficiently charged if specific gravity of the battery fluid is 1.28 (at 68° F).

If specific gravity is 1.245 or lower, the battery should be considered dead.

- **Recharge** or **replace** a dead battery.
- **DISCONNECT** battery cables before charging the battery with an external electric source.

Battery Replacement

ONLY replace battery with recommended battery type.

- Recommended battery type for this HRIW 25 and HRIW 45 generators is **BCI Group 4D**.

⚠ CAUTION

Battery Cable Installation

ALWAYS verify the battery cables are properly connected to the battery terminals.

- **RED cable** is connected to the positive terminal of the battery.
- **BLACK cable** is connected to the negative terminal of the battery.

ALWAYS disconnect the negative terminal **FIRST**. Reconnect negative terminal **LAST**.

When installing battery cable, **NEVER** connect the battery cables to the battery terminals when the Auto-Off/Reset-Manual Switch is in either the **AUTO** or **MANUAL** position.

ALWAYS make sure that the switch is in the **OFF / RESET** position when connecting the battery.

- Coat battery terminals with approved battery terminal treatment compound to assure adequate connection and prevent corrosion.
- Incorrectly connected battery cable can cause electrical damage.
- Pay close attention to the polarity of the battery when connecting the battery.
- Inadequate battery connections may cause poor starting of the HRIW 25 and HRIW 45 generators and cause malfunctions.

Alternator

Polarity of the alternator is negative grounding type. When an inverted circuit connection takes place, the circuit will be in short circuit instantaneously resulting alternator failure.

- **DO NOT** direct a water stream directly on the alternator because water in the alternator causes corrosion and damages the alternator.

Wiring Maintenance

INSPECT the HRIW 25 and HRIW 45 generators for bad or worn electrical wiring or connections.

- **REPLACE** if wiring or connections are exposed (insulation missing).

Piping and Hose Connection

Inspect all piping, oil hose, and fuel hose connections for wear and secure fit.

- Check for leaks.
- Tighten all hose clamps.
- Replace defective hose (fuel or oil) lines.

ENERGIZE ECM PROCEDURE: HRIW 25 & HRIW 45

Connect to the OBDII connector to view the sensor signal of the engine powering the ECM before we run the generator. See below the procedure:

Switch on the Power Control.

ACCESS the **MAN** (manual) mode on the screen before starting the engine.

CONNECT any scanner device to OBDII connector to view the engine state.

OBDII connector is located on the back of the control panel (next to ECM).

- **OBDII** also provides views of other engine signals.

PUSH start to begin pre-start sequence – approximately 2 seconds.

AFTER pre-start sequence, engine cranks for maximum of 5 seconds.

3		**HORN RESET** button. Use this button to deactivate the horn output without acknowledging the alarms. ****POWER** the ECM in “OFF” mode

NEED CONTENT

GENERAL MAINTENANCE GUIDELINES

Maintenance Requirements: HRIW 25 & HRIW 45 Generators

Maintenance Guidelines		10 Hrs. Daily	250 Hrs.	500 Hrs. or Every 12 Months	3000 Hrs. or Every 36 Months	Other
Engine	Check Engine Oil and Coolant Levels	●				
	Check Fuel Filter	●				
	Check Air Cleaner/Element	●				
	Clean or Replace Air Cleaner/Element X		●			
	Check for Leaks/Hoses/Clamps	●				
	Check for Loosening of Parts X	●				
	Change Engine Oil and Oil Filter *1		●			
	Clean Unit, Inside and Outside		●			
	Replace Fuel Filter Elements			●		
	Check Engine Mounts			●		
	Service Battery			●		
	Check Air Intake Hoses			●		
	Check Fan Belt Condition			●		
	Check Automatic Belt Tensioner			●		
	Check Electrical Ground Connection			●		
	Clean Radiator, Check Cooling System			●		
	Coolant Solution Analysis, Add SCA's As Required			●		
	Pressure Test Cooling System			●		
	Check Engine Speed			●		
	Test Thermostats				●	
	Check and Adjust Engine Valve Clearance					1000 hrs.
	Test Glow Plugs				●	
	Flush and Refill Cooling System *3					1 yr / 2000 hrs.
	Clean Inside of Fuel Tank					1000 hrs.
	Replace Air Cleaner Elements *4					As Required
Generator	Measure Insulation Resistance Over 3M ohms		●			
	Check Rotor Rear Support Bearing			●		

*1.During initial operation of a new engine, change oil and filter between a minimum of 100 hrs. and a maximum of 250 hrs. Service interval depends on type of oil.

*2.Use fully formulated antifreeze/coolant.

*3.Replace primary air filter element when restriction indicator shows a vacuum of 25" H_2O/ 6.2 kPa.

General Maintenance Inspection

Before each use, inspect and clean the HRIW 25 and HRIW 45 generators.

- **LOOK** for deficiencies and any loose, missing or damaged nuts, bolts or other fasteners.
- **LOOK** for fuel, oil, and coolant leaks.

Air Filter Dust Indicator

DO NOT change the air filter until indicator reads "**RED**".

DISPOSE of old air filter.

DO NOT clean or reuse air filter because air filters cannot be cleaned or reused.

- When the air filter element is clogged, air intake restriction becomes greater and the air filter indicator signal shows **RED**.
- When indicator is red, replace filter immediately. After changing the air filter, press the air filter indicator button to reset.

PPE

Wear protective equipment including approved safety glasses or face shields and dust masks or respirators when cleaning air filters with compressed air.

Maintenance: Primary and Secondary Air Cleaner - Every 250 Hours

- Remove air cleaner element and clean the heavy-duty paper element with light spray of compressed air.
- Replace the air cleaner as needed.

This diesel engine is equipped with a replaceable, high-density paper air cleaner element. It also contains an inner (secondary) element that serves as a backup filter if the primary element is damaged.

Inspection of Primary and Secondary Air Cleaner Elements

CHECK air cleaner daily or before starting the engine.

- Release latches that secure the cover to the air cleaner body.
- Remove air cleaner cover and set aside.
- Remove both the primary and secondary air cleaner elements.

CHECK for and correct heavy buildup of dirt and debris along with loose or damaged components.

OPERATING the engine with loose or damaged air cleaner components could allow unfiltered air into the engine causing premature wear and failure.

Maintenance: Air Cleaner - Every 250 Hours

This diesel engine is equipped with a replaceable, high-density paper air cleaner element. It also contains an inner element that serves as a backup filter if the primary element is damaged.

- Remove air cleaner element and clean the heavy-duty paper element with light spray of compressed air.
- Replace the air cleaner as needed.

Inspection of Air Cleaner Elements

CHECK air cleaner daily or before starting the engine.

- Release latches that secure the cover to the air cleaner body.
- Remove air cleaner cover and set aside.
- Remove air cleaner elements.

How to Clean the Air Cleaner Elements

To clean the primary element (paper air filter) as referenced in the drawing (below):

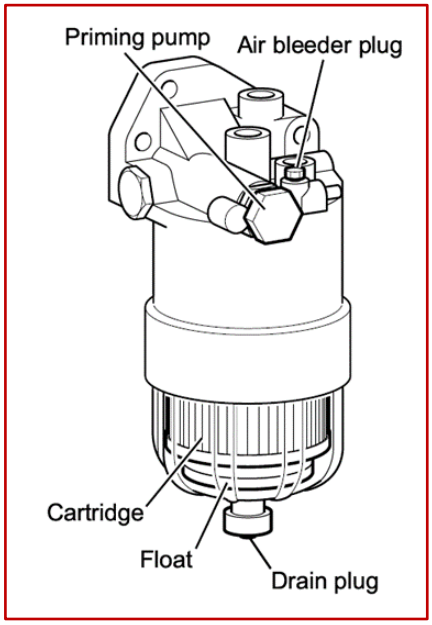
- Tap the filter element several times on a hard surface to remove dirt, or blow compressed air (not to exceed 30 psi (207 kPa, 2.1 kgf / cm2) through the filter element from the inside out.
- **CLEAN** the element (paper air filter).
- **REPLACE** both elements if they are damaged or excessively dirty.
- **CLEAN** the inside of the air cleaner body.
- **REINSTALL** the air filter elements back into air cleaner body.
- **REINSTALL** the air cleaner cover, and secure with latches.

Maintenance: Draining the Fuel Filter Element

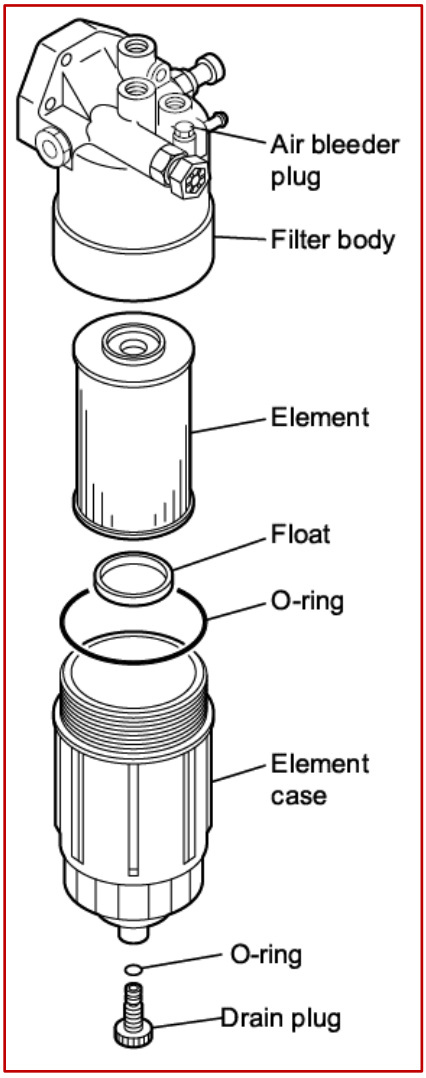
INSPECT the fuel filter daily.

DRAIN the fuel filter if it water and sediment have accumulated at the bottom of the cup.

- Loosen the air bleeder plug on the fuel filter body.
- To **DISCHARGE** fuel from the fuel filter, **OPEN** the drain valve on the fuel filter by turning the knob counterclockwise approximately 3-1/2 turns until the valve drops down 1-inch (25.4 mm) and draining begins.
- **ALLOW** residue or foreign substances inside the case to flow into a suitable container.
- Use a filter wrench to remove the element case from the fuel filter body.



Fuel Filter: HRIW 25 & HRIW 45



Fuel Filter Elements

REMOVE foreign matter or debris that may have accumulated by wiping the inside of the filter body with a clean cloth.

- **INSERT** the new fuel filter element into the element case.
- **REPLACE** both O-rings; coat O-rings with clean 15W-40 engine oil.
- **REINSTALL element** case by hand until it contacts the fuel filter body surface.
- **TORQUE element** case to 22.4 lb-ft (30 N.m).
- **TORQUE drain** plug to 1.4 lb-ft (2.0 N.m).
- **BLEED** air from the fuel system.

To **CLEAN** or **REPLACE** fuel pump filter:

- Disconnect any electrical connections that are attached to the fuel pump.
- Prepare a fuel collector to drain the fuel.
- Prevent fuel spill by securing fuel lines.
- Remove fuel pump from HRIW 25 and HRIW 45 generators enclosure.
- Remove the filter and gasket from the fuel pump housing.
- After fuel pump filter is removed, replace both gaskets and clean the magnet portion inside the cover.

- Clean or replace fuel pump filter.
- Reassemble fuel pump and mount back onto HRIW 25 and HRIW 45 generators enclosure.
- Reconnect all fuel lines and electrical components.
- Check for fuel leaks.

Prevent Water Condensation

Regular inspection and maintenance will prevent accumulation of water and impurities in the fuel tank.

PREVENT water condensation inside the tank during cold weather by maintaining a full tank of diesel fuel.

Clean Inside the Fuel Tank

If necessary, drain the fuel inside the fuel tank completely. Using a spray washer to clear out accumulated deposits or debris.

Inspect the Fuel Tank

In addition to cleaning the fuel tank, the following components should be inspected for wear:

- **Rubber Suspension**: Look for signs of wear or deformity due to contact with oil. Replace the rubber suspension if necessary.
- **Fuel Hoses**: Inspect nylon and rubber hoses for signs of wear, deterioration and hardening.
- **Fuel Tank Lining**: Inspect the fuel tank lining for signs of excessive amounts of oil or other foreign matter.

Assess Drive Belt Tension

Slack drive belt contributes to overheating and insufficient battery charging.

Adjust drive belt according to **Isuzu operator's manual**.

Daily Drive Belt Inspection

Inspect the drive belt for damage and wear. **Horizontal** cracks (across the belt) are acceptable. **Vertical** (direction of belt ribs) cracks that intersect with horizontal cracks are not acceptable.

Inspect the belt to determine if it is oil soaked or "glazed " (hard shiny appearance on the sides of the belt).

- Both conditions cause belt to weaken, increase risk of breaking.
- If the drive belt exhibits breaks or glaze, replace it immediately.

Daily Engine Oil Check

ASSURE HRIW 25 and HRIW 45 generators are level before checking or replacing oil.

REMOVE (pull) the engine oil dipstick from its holder.

ASSESS engine oil level.

- Oil level should be between the upper and lower limit on the dipstick.
- If oil level is low, **ADD** correct amount of engine oil to bring oil level to a normal safe level.
- **ALLOW** enough time for added oil to flow into oil pan before rechecking.

Maintenance: Drain Engine Oil

- **RUN** the engine until the engine coolant reaches a temperature of 140° (60°C).
- Turn the engine off.
- **REMOVE** oil dipstick from its holder.
- **REMOVE** oil drain cap.
- **OPEN** oil drain valve.
- **DRAIN** oil into approved container.

AFTER engine oil is completely drained, reinstall oil drain cap and tighten securely.

- **TURN** oil drain valve to **CLOSED** position.

Maintenance: Engine Oil Filter Replacement

- **CLEAN** area around the lubricating oil filter head.
- **REMOVE** engine oil filter with oil filter wrench.
- **COAT** rubber filter seal with oil recommended by manufacturer.
- **INSTALL** new oil filter first by hand until it makes contacts with the filter head surface. Tighten it another **3/4** turn using filter wrench.

Replace Engine Oil

Fill engine crankcase with high quality detergent oil. Fill to **UPPER** limit of dipstick. **DO NOT** overfill.

1. **RUN** engine for several minutes.
2. **WATCH** for oil leaks.
3. **SHUT DOWN** engine and allow it to sit for several minutes.
4. **ADD** oil to upper limit on dipstick.

Maintenance: Replacing Radiator Coolant

DO NOT remove the pressure cap from the radiator when the engine is hot.

1. **WAIT** for coolant temperature to fall below 120°F (50°C) **before** removing pressure cap.
2. **TURN** coolant drain valve to **OPEN** position.
3. **ALLOW** coolant to drain into a suitable container.
4. **INSPECT** hoses for softening and kinks.
5. **INSPECT** clamps for signs of leakage.
6. **REMOVE** and **INSPECT** radiator cap.
7. **FLUSH** radiator by running clean water through radiator until debris is removed.
8. **TIGHTEN** coolant drain valve to **CLOSED** position.
9. **REPLACE** with coolant as recommended by the engine manufacturer.
10. **REINSTALL** radiator cap. **TIGHTEN** securely.

Maintenance: Cleaning Radiator Cooling Fins and Tubes

CLEAN radiator when inspection reveals accumulation of dirt and debris on cooling fins or tubes.

PREVENT damage to fins and tube from high-pressure washer by maintaining a minimum distance of 5 feet (1.5 meters) from the radiator.

Long Term Storage: HRIW 25 and HRIW 45

For long term storage of the HRIW 25 and HRIW 45, Hipower Systems recommends the following:

DRAIN fuel tank.

- If draining the fuel tank is impracticable, add appropriate amount of fuel stabilizer to maintain integrity of the fuel.

DRAIN all oil from the crankcase.

REFILL crankcase with high quality detergent oil.

CLEAN entire generator, internal and external.

COVER generating set and store in a clean, dry place.

DISCONNECT battery.

MEASURE engine coolant to ensure proper level. Add engine coolant if necessary.

For trailer-mounted HRIW 25 and HRIW 45 generators, **EXTEND** the life of tires by lifting the trailer off the ground and placing on blocks.

- Trailer should be elevated high enough to prevent tires from touching the ground.
- Alternatively, remove tires after lifting trailer off ground.

Jacket Water Heater and Internal Battery Charger: 120 VAC Input Receptacles

HRIW 25 and HRIW 45 generators are equipped engine block heating elements and internal battery chargers. The elements and chargers are installed with electric cords to connect to a commercial power source.

The engine block heating element and internal battery charger both require 120 VAC to operate. A receptacle has been provided on the output terminal panel to allow commercial power to be applied.

The engine block heating element and internal battery charger **ONLY** function when commercial power is supplied to them.

The battery charger should always be connected to a commercial power source to ensure that the battery does not get discharged.

⚠ CAUTION

Do not use jacket water heater when operating HRIW 25 and HRIW 45 generators in **HOT** climates.

When operating HRIW 25 and HRIW 45 generators in **COLD** climates, use jacket water heater.

- If the generator is used daily, the battery should not require charging.
- If the generator remains idle (not used) for extended periods of time, apply power to the battery charger receptacle via commercial power using a power cord of adequate size.

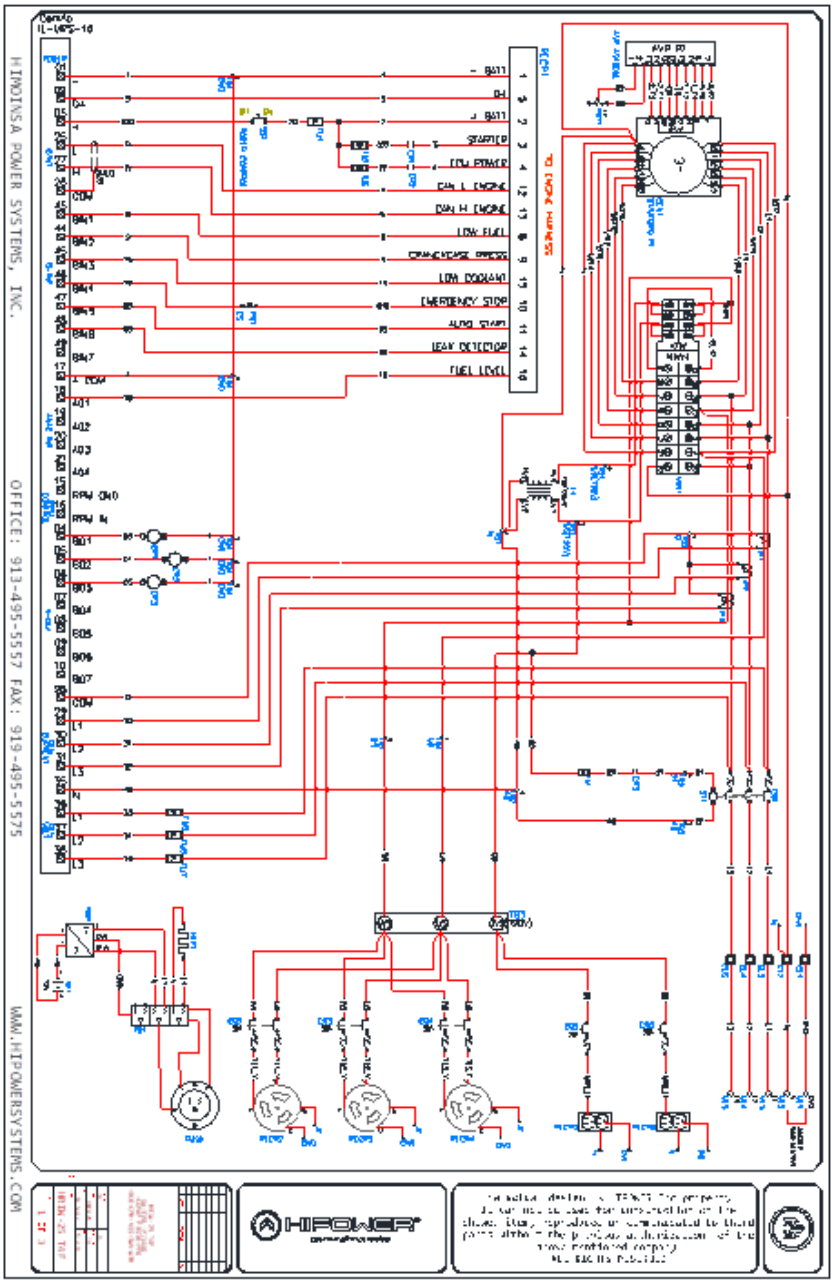
ENSURE adequate starting capacity by maintaining power supply to the internal battery charger.

Hipower Systems

16600 South Theden Street
Olathe, Kansas 66062

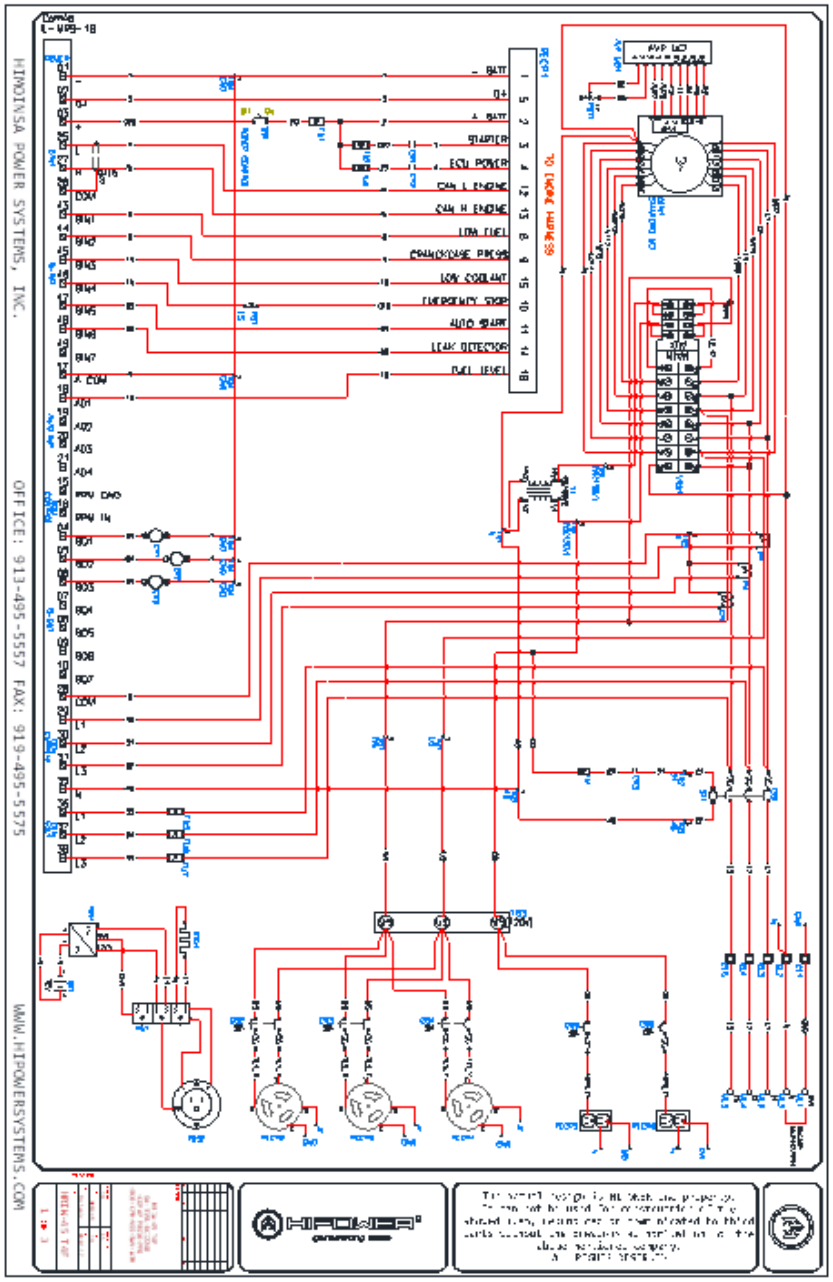
Main: (913) 495-5557
Parts: (913) 495-5557 extension 645
Service: (913) 495-5557 extension 641

WIRING DIAGRAM: HRIW 25



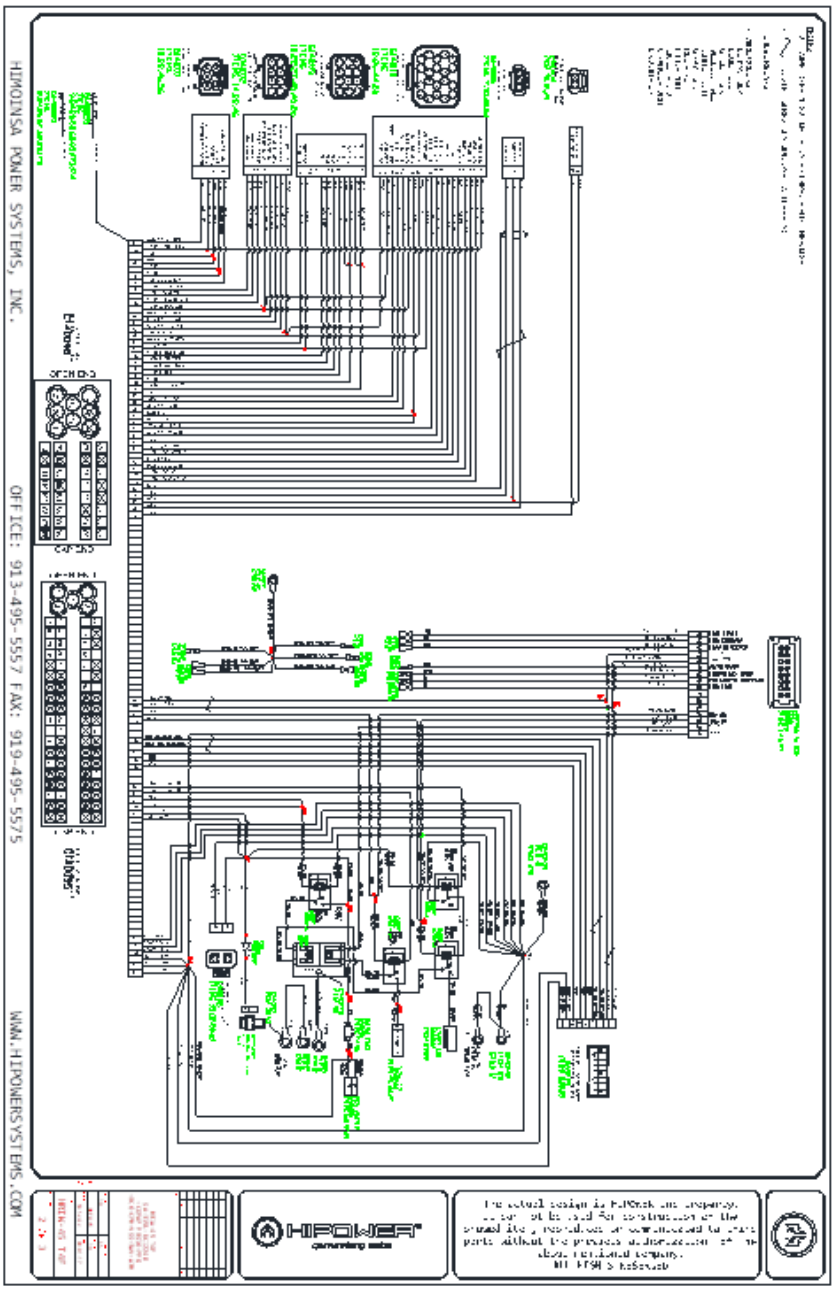
HRIW 25 Generator Wiring Diagram

WIRING DIAGRAM: HRIW 45



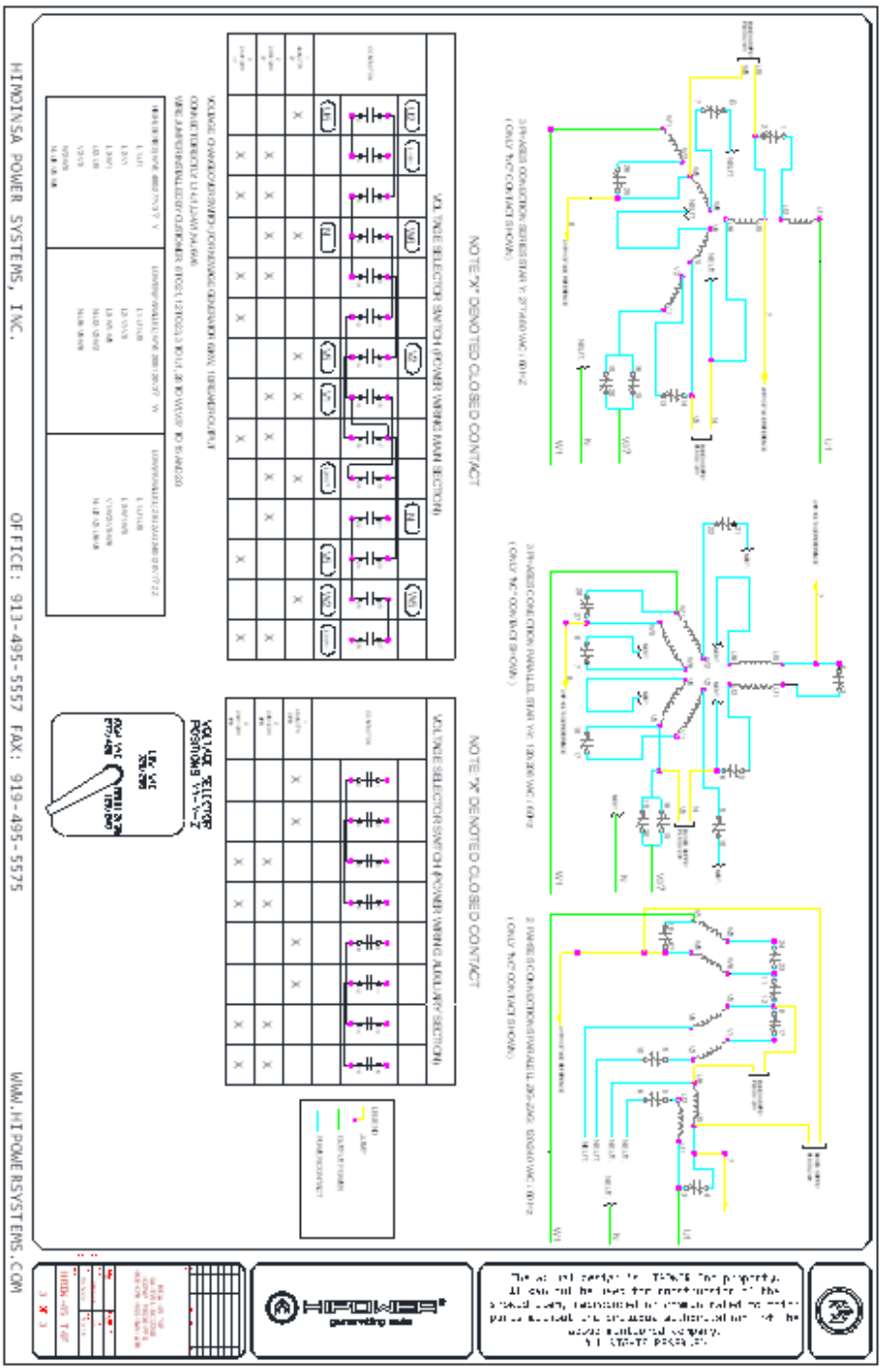
HRIW 45 Generator Wiring Diagram

ENGINE WIRING DIAGRAM: HRIW 25/45



HRIW 25 & HRIW 45 Engine Wiring Diagram

GENERATOR CONNECTIONS: HRIW 25/45



Generator Connections: HRIW 25/45

Hipower Systems

16600 South Theden Street
Olathe, Kansas 66062

Main: (913) 495-5557
Parts: (913) 495-5557 extension 645
Service: (913) 495-5557 extension 641