

POWER FACTOR

Energy Solutions for a brighter future...



(Optional equipment shown)

**CAT 1000 kW Containerized
Generator with Utility-Grade
Switch-Gear
C32 "ACERT" Technology
50 & 60 Hz Capability
Sound Attenuated
ISO 20 ft. CSC Certified Container
Prime Power
400 V, 50 Hz, 1000 KVA (800 eKW)
480 V, 60 Hz, 910 EKW**

FEATURES

EMISSIONS AND NOISE



- Meets most worldwide emissions requirements without after treatment. Low noise to achieve a noise pressure of only **85 dB(A) at 7 meters.**

COMPLETE SOLUTION WITH ATTACHMENTS

- Wide range of rugged features, system attachments, and factory designed, selected and tested at 50 and 60 Hz.
- **Fully Prototype Tested** with certified torsional vibration analysis and actual noise measurements available. The prototype test report is certified by the German TUV, an independent certification agency.
- CSC certification is provided for convenient transport and stackable storage of the module.

ENGINE



- Reliable, Caterpillar C32 Diesel ACERT ® engine.
- V12, 4 stroke, turbocharged - air to air after-cooled.
- Designed for maximum performance and minimum fuel consumption.

GENERATOR



- Exclusive Caterpillar SR4B ® generator, performance and design matched to Caterpillar C32 engine.
- Two bearings, random wound, 693 Frame, 6 lead.
- Permanent magnet excitation with Caterpillar CDVR digital voltage regulator.

WORLDWIDE PRODUCT SUPPORT



- Worldwide parts availability through your Caterpillar dealer, with over 1800 dealer branch stores operating in 166 countries.
- Caterpillar dealer services technicians are trained to service every aspect of your electric power generation system.
- Customer Support Agreements offer back-to-back services from scheduled inspections and preventive maintenance to total maintenance and repair contracts.

GENERATOR SET & CONTAINER



- Cooling system 50°C ambient operating & horizontal discharge radiator.
- ISO high cube (2.896 m), 20 feet long (6 m), 2.438 m wide container. Interior walls and ceiling are insulated with 2 in (50 mm) of acoustic glass and covered with perforated metal sheet for a durable interior wall surface.
- Three lockable personnel (padlock) doors are provided with sound attenuation and double sealed. One door is located on each side of the engine for service and equipped with emergency stop button. One door is located on the container rear side to access the controls. Doors include stainless steel hardware & hinges and panic release.

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GENERATOR SET & CONTAINER (Continued)

- External access door provided for bus bars and auxiliary connections for external power source feeding (jacket water heater, battery charger, and space heater in generator, A/C lighting and sockets).
- Convenient external connections for fuel. (Fuel transfer system by others)
- Manual operated filling pump to radiator for external filling.
- 21 Gals (80 L) lube oil make up tank (gravity) with manual fill from interior, sight glass level indicator.
- 24 VDC interior lights with 60 minutes timer in switchgear room and in engine room.
- Delivered fully tested (50/60 Hz), ready to operate.
- Lloyds CSC (Convention for Safe Containers) certified for convenient transport. Stackable, up to three high for transport and storage.
- Meets or exceeds specifications: ISO 3046, IEC 34, ISO 8528, EGSA101P, NEMA MG1-22
- Meets EU directives Low Voltage Safety, EMI & Machinery.

CONTROL SYSTEM

- Utility paralleling switchgear intended for automatic or manual synchronizing with a utility power source as a load management system, with provisions for standby operation feeding an isolated load network. Modes of operation are field configurable and include:
 - Single Unit Island Mode.
 - Multiple Unit Island Mode (up to 18 units).
 - Includes Load Sense / Load Demand control, ramp loading, bump-less transfer
 - Load sharing (kW and kVAR) capability is provided via network communication
 - Single Unit Utility Parallel Mode.
 - Automatic paralleling.
 - Selectable for Import / Export control. (Requires 4-20 mA customer input).
 - This product is intended for unmanned operation automatic paralleling.
- Convenient operator interface
- Graphical one-line diagrams with LED status indicators.
- Modules can operate in groups up to 18 with all communications synchronizing and load sharing between units by data-link for quick and convenient setup. (Max cumulative distance 450 m)
- Protection includes 1600A motorized generator 3 poles circuit breaker with 55kA interrupt capability, extensive protective relays and internal power distribution.
- Convenient customer connections for power
- Request to run / stop signal (customer input)
- Can also be paralleled to Woodward compatible legacy modules in island operation.

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FACTORY INSTALLED STANDARD EQUIPMENT

Feature	Benefits
Caterpillar C32 Engine	ENGINE CONFIGURATION Air cleaner with service indicator Batteries Primary & secondary fuel filters with service indicators; lubricating oil pump, fuel priming pump Lube oil make-up system Critical Grade silencers recessed in roof of module and insulated Radiator; jacket water heater Service meter; standard eight-gauge instrument panel Electronic ADEM® IV governing system <ul style="list-style-type: none"> • The ADEM® A4 is an integral part of the innovative ACERT® Technology that provides higher degree of control over a large number of combustion variables than ever before • The ADEM A4 engine system is composed of the Adem A4 ECM, control software, sensors, actuators, fuel injectors and interface to the generator system. The prime benefit of an Adem A4 engine system is to better control and maintain the particulate emissions, both steady state and transient, improving engine performance.
	ADVANCED FEATURES Isochronous or droop speed control. Enhanced performance from fuel injection timing and limiting. Adjustable monitoring of vital engine parameters: <ul style="list-style-type: none"> • Idle / rated speed setting • Programmable speed acceleration ramp rate • Adjustable cool-down duration
	SIMPLE SERVICING Each Adem IV system works in combination with the Caterpillar ET service tool software to keep the engine operating at peak performance: <ul style="list-style-type: none"> • Displays measured parameters. • Retrieves active and logged event codes documenting abnormal system operation. • Performs calibrations and diagnostic tests.
	SELF DIAGNOSTICS Each ADEM IV ECM has a full complement of self diagnostic equipment. The ECM can detect faults in the electrical system and report those faults to the service technician for quick repair.

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FACTORY INSTALLED STANDARD EQUIPMENT (Continued)

Features	Benefits
Caterpillar SR4B Generator	400/480 Volt SR4B brushless, 693 frame, random wound. <ul style="list-style-type: none"> • Permanent magnet excited, three-phase with digital voltage regulator Class H insulation, operating at class F for extended life. • Two bearing, 6 lead star connected • Three phase voltage sensing • Space heater
Caterpillar CDVR Voltage Regulator	Ten generator protective functions <ul style="list-style-type: none"> • Generator Over-voltage • Generator Under-voltage • Loss of Excitation • Instantaneous Field Over-current / Over Excitation • Loss of Sensing • Diode Fault Monitor • Internal Watchdog Failure • Internal Memory Failure • Fault Reset Closed Too Long
Generator Set EMCP®3.3 Local control panel	Generator mounted EMCP®3.3 local panel <ul style="list-style-type: none"> • Provides MODBUS data link to engine and generator • Convenient service access for Caterpillar service tools (not included) • The Caterpillar EMCP®3.3 places fully featured power metering, protective relaying and engine and generator control and monitoring at your fingertips. • Integration with the CDVR provides enhanced system performance. • Fully featured power metering, protective relaying, engine and generator parameter viewing, and expanded AC metering are all integrated into this controller. • Real-time clock allows for date and time stamping of diagnostics and events. Languages: French, English, German, Dutch, Spanish
	OPERATOR INTERFACE Graphical display with positive image, trans-reflective LCD, adjustable white backlight/contrast. <ul style="list-style-type: none"> • Two LED status indicators (1 red, 1 amber). • Three Engine Control Keys and Status Indicators (Run/Auto/Stop). • Lamp Test Key. • Alarm Acknowledgement Key. • Display Navigation Keys • Two Shortcut Keys: Engine Operating Parameters and Generator Operating Parameters.

FACTORY INSTALLED STANDARD EQUIPMENT (Continued)

Feature	Benefits
Switchgear Controls	MODES of OPERATION Utility paralleling switchgear is included for automatic paralleling with a utility power source as a load management system, with provisions for standby operation feeding in an isolated load network. Modes of operation are field configurable and include: Single Unit Island Mode Multiple Unit Island Mode (up to 18 modules per site) with ramp loading <ul style="list-style-type: none"> • Includes Load Sense / Load Demand control • Each module displays system summary power level and summary alarms. • Load sharing capability is provided via CAN network communication • Single Unit Utility Parallel Mode. • Automatic paralleling • Selectable for Import / Export control • If Import control is selected a 4-20mA or 0 - 10 V signal is required and will be provided by others that is scalable to the utility contribution. • Provision for Manual Paralleling Selectable 50 - 60 Hz controls
	AUTOMATIC LOAD DEMAND: <ul style="list-style-type: none"> • Load demand operation includes sequencing of multiple units; with configurable start stops levels and timers. • Although the modules are intended for prime power rental applications, they can also be configured for various stand-by scenarios as well. • This includes strategies where the first module up to speed becomes the master and can close on a dead bus with the remaining packaging automatically paralleling to it.
	AUTOMATIC SYNCHRONIZING: The control system provides soft loading and unloading for bump-less transfer in parallel operation. The control system also works together with EMCP 3.3 to provide automatic cool-down feature. The control system provides data communication for 1 to 18 modules in a network: <ul style="list-style-type: none"> • Communication is provided with a robust high speed CAN network. • The CAN data link was selected for robust high speed deterministic data transfer. Modules are connected in series with a 15 m long, high speed CAN cables (provided with each module). • Parallel operation includes both real kW and reactive KVAR load sharing and control.

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FACTORY INSTALLED STANDARD EQUIPMENT (Continued)

Feature	Benefits																																		
Switchgear Monitoring	<p>The monitoring system includes a mimic one line that shows the generator with its respective circuit breaker in a one-line representation of the system. The graphic COLOR LED indicators display the following information:</p> <ul style="list-style-type: none"> • Generator circuit breaker open/closed/tripped • Engine running • System summary alarm <p>The monitoring system also includes an additional display conveniently mounted in the EMCP 3.3 panel. This display is a 4 line text display with pushbuttons for various controls. This display provides quick module set up with all parameters stored in non-volatile memory. In addition to individual module information, each module also provides overall plant information including: overall power production; and alarm / shutdown status of each MODULE.</p> <p>The control system monitors and manages various module functions. This includes the automatic lube oil make up system, alarms and emergency stop functions.</p> <p>The 693 frame generator is provided with winding temperature sensors as standard.</p> <p>The control system monitors and displays these values, providing alarm and shutdown. Various diagnostic features are provided including breaker synchronizing time out and reclose alarms, circuit breaker position feedback, phase rotation mismatch, network communication error alarms, sensor diagnostics, and multiple unit configuration checks.</p>																																		
Switchgear Protection	<p>MONITOR AND PROTECTION FUNCTIONS</p> <table> <tbody> <tr> <td>- Generator over current</td><td>ANSI 50 / 51</td></tr> <tr> <td>- Neutral earth current</td><td>ANSI 50 / 51 (requires optional CT)</td></tr> <tr> <td>- Generator current imbalance</td><td>ANSI 46G</td></tr> <tr> <td>- Generator under voltage</td><td>ANSI 27G</td></tr> <tr> <td>- Generator over voltage</td><td>ANSI 59 G</td></tr> <tr> <td>- Generator voltage imbalance</td><td>ANSI 18 G</td></tr> <tr> <td>- Generator leading power factor</td><td></td></tr> <tr> <td>- Generator lagging power factor</td><td></td></tr> <tr> <td>- Generator under frequency</td><td>ANSI 81 U/G</td></tr> <tr> <td>- Generator over frequency</td><td>ANSI 81 O/G</td></tr> <tr> <td>- Generator reverse power</td><td>ANSI 32 G</td></tr> <tr> <td>- Generator overload</td><td>ANSI 32 O / G</td></tr> <tr> <td>- Bus bar under voltage</td><td>ANSI 27G</td></tr> <tr> <td>- Bus bar over voltage</td><td>ANSI 59 G</td></tr> <tr> <td>- Bus bar voltage imbalance</td><td>ANSI 18</td></tr> <tr> <td>- Bus bar under frequency</td><td>ANSI 81 U</td></tr> <tr> <td>- Bus bar over frequency</td><td>ANSI 81 O</td></tr> </tbody> </table>	- Generator over current	ANSI 50 / 51	- Neutral earth current	ANSI 50 / 51 (requires optional CT)	- Generator current imbalance	ANSI 46G	- Generator under voltage	ANSI 27G	- Generator over voltage	ANSI 59 G	- Generator voltage imbalance	ANSI 18 G	- Generator leading power factor		- Generator lagging power factor		- Generator under frequency	ANSI 81 U/G	- Generator over frequency	ANSI 81 O/G	- Generator reverse power	ANSI 32 G	- Generator overload	ANSI 32 O / G	- Bus bar under voltage	ANSI 27G	- Bus bar over voltage	ANSI 59 G	- Bus bar voltage imbalance	ANSI 18	- Bus bar under frequency	ANSI 81 U	- Bus bar over frequency	ANSI 81 O
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FACTORY INSTALLED STANDARD EQUIPMENT (Continued)

Feature	Benefits
Electrical Connections	SHORE POWER CONNECTION The module is provided with shore power connection for lighting, generator space heater, and battery charger. The control system provides a 20 Amp internal transfer switch that automatically transfers internal loads to the gen set for autonomous operation.
	POWER OUTPUT CONNECTION The electrical power output connections are provided through a convenient door on the right hand side of the module. The paralleling circuit breaker is rated for 65 kA interrupt capability. The module features robust well braced bus bars with easy customer access. These bus bars are three phase plus full rated neutral, with an IEC standard hole pattern and lugs fully rated at an 0.8 power factor.

AVAILABLE OPTIONAL CONTROL EQUIPMENT

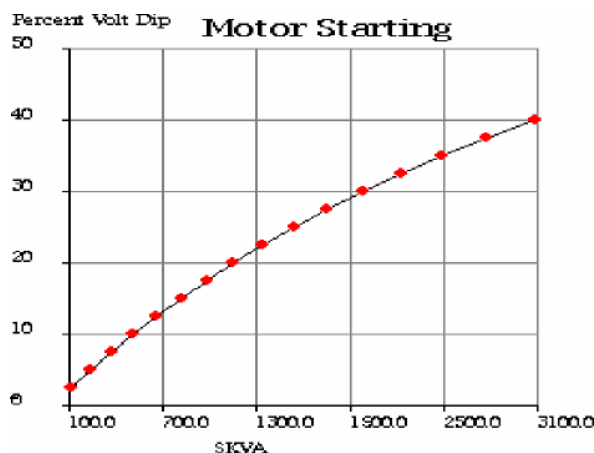
Feature	Benefits
Remote Software	Provides modem and software for off-site monitoring of installations C32 EAME power modules installations can be accessed via telephone connection. Operator can contact local installation from remote via telephone line, and monitor it as if in front of the local control panel. Depending on a password, operator has access to control functions. Local communications, via Internet Explorer located on customer PC, provided to interface with touch-screen. Server software and Windows compatible touch-screen provided.
Site Controller	Includes industrial PC and site software for EAME modules. Local communications, via internet Explorer located on PC, with touch-screen. Server software and Windows compatible: This option is browser based with ability to view 1 to 18 individual units with Internet Explorer. From the customer PC you can launch a browser and look at each individual unit with same views displayed at each local unit. "Plant Controller" includes Overview Screen.

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SPECIFICATIONS for CATERPILLAR SR4B GENERATOR (2628094)

Voltage regulation	< $\pm 0.5\%$
Voltage gain	Adjustable
Wave form	< 5% deviation
TIF	< 50
THD	< 3%
Enclosure	IP 22
Amperage	1443.4

kW Rating:	800	Frequency	50
Power Factor:	0.80	Insulation	H
kVA Rating:	1000	Poles	4
Duty (C):	105	Excitation	PM
Frame:	693	Winding Type	random
RPM:	1500	Leads	6
Volts:	400	Pitch	0.7222
Bearings:	2	Phases	3
Conn. STAR		Amperage	1443.4
Regulation (V)	< 0.5 %	TIF	< 50
Enclosure	IP 22	THF	< 3 %



CATERPILLAR C32 ENGINE

V-1 2, 4-stroke-cycle Diesel

Bore – mm (in) 145 (5.7)
 Stroke – mm (in) 162 (6.4)
 Displacement – L (cu in) 32.1 (1958)
 Aspiration Turbocharged – Air to Air After-Cooled

Fuel consumption (PF=0.8)

@ 100 %	1000 kVA	210.5 L/h
@ 75 %	750 kVA	163.2 L/h
@ 50 %	500 kVA	117.0 L/h
@ 25 %	250 kVA	71.5 L/h

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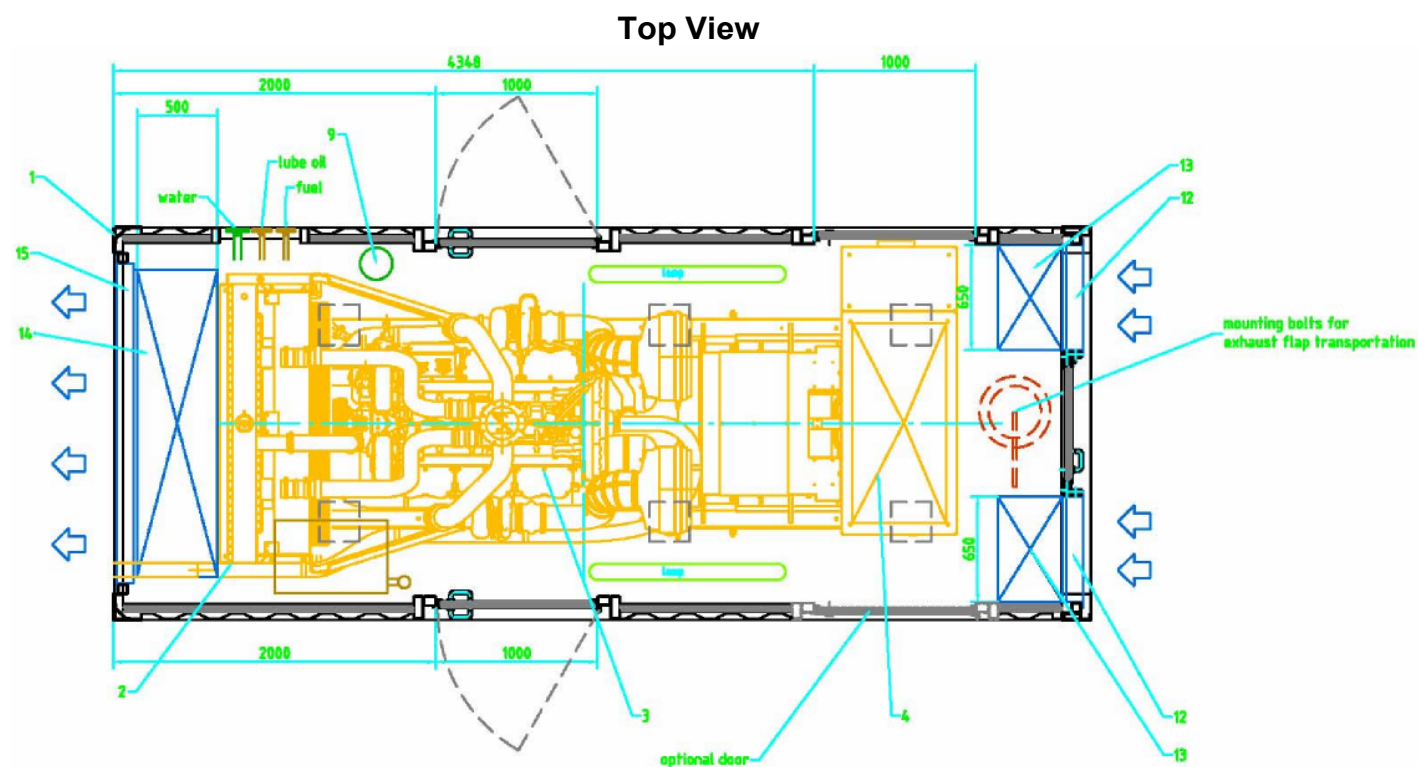
DIMENSIONS & WEIGHTS

CONTAINER SHIPPING DIMENSIONS

Length	6 058.0 mm	20 ft
Width	2 476.5 mm	97.5 in
Height	2 896.0mm	114.1 in

CONTAINER WEIGHT (WET): 15,240 Kilograms / 33,640 Pounds

CONTAINER VIEWS:



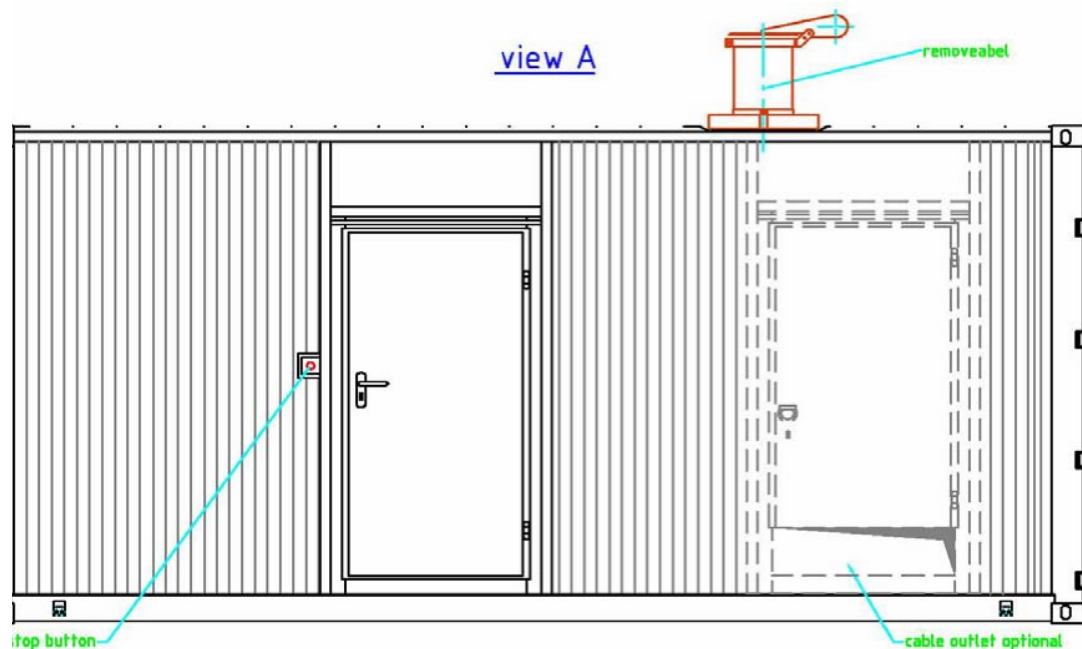
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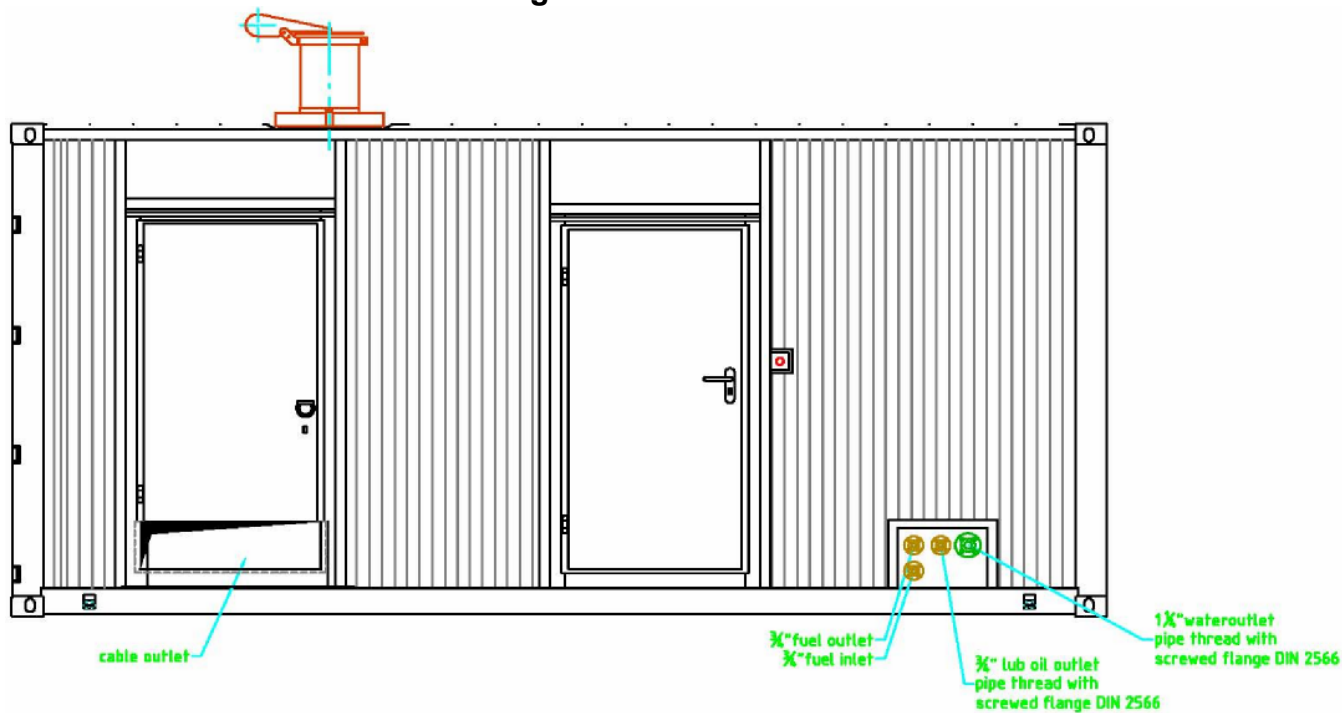
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Left Side View



Right Side View

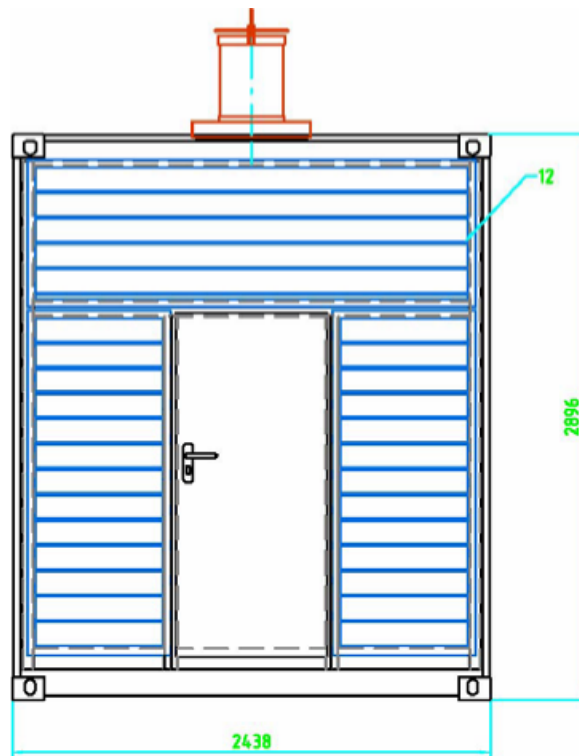


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Rear View



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