DAGARTECH®
ENERGY SOLUTIONS

400/230V - 50Hz (1500 rpm) | CUMMINS QSG12-G2 | STAMFORD S4L1D-F

BGCS 450 ST

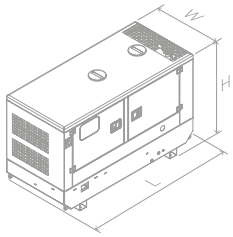
Emergency Balance Range

Ideal for...

INDUSTRY | RESIDENTIAL | EQUIPMENT

Weight with liquids without fuel: **4400 kg**

Dimensions
Plat FK1B:
L: 4600 mm
W: 1603 mm
H: 2233 mm



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Diesel | EU Stage 0 | Water-cooled | Soundproofed | CE Conformity

1. General technical data

General technical data	**Engine**	**CUMMINS QSG12-G2**
	Alternator	**STAMFORD S4L1D-F**
	Type of execution	G2
	Frequency	50Hz
	Voltage	400/230V
	Control panel	DSE 7320 MKII
	Fuel tank (l)	820
	Sound level-Lp(A) (dB(A)@7m)	69
	Sound power-LW(A) (dB(A))	97

Power[1] (m.p. cos φ 0,8)	**PRP (kVA / kW)**	**409 / 328**
	ESP (kVA / kW)	**445 / 356**

[1]PRP: Continuous power ("Prime Power"). ESP: Emergency Standby Power according to ISO8528-1.
Maximum active power tolerance (kW) ±5%

Voltage	PRP (KVA/KW)	ESP (KVA/KW)	Amperage (A)
400/230V	409 / 328	445 / 356	**643**

Directives and Regulations

ENVIRONMENTAL CONDITIONS STANDARD ISO 8528-1:2018: 25ºC, 100kPa and 30% relative humidity:

- **Prime Power (PRP):** Data on electrical power available at variable load without limit of hours per year. An overload of 10% is allowed for 1h out of 12. According to ISO 8528-1:2018.
- **Emergency Standby Power (ESP):** Data on electrical capacity available at variable load in case of emergency according to ISO 8528-1:2018.

The DAGARTECH Generating Set has EC labelling which includes the following directives:

- **2006/42/EC.** Machine Safety Directive.
- **EN ISO 8528-13:2016. Part 13: Safety.** Alternating current generator sets powered by reciprocating internal combustion engines.
- **2014/30/EU. Electromagnetic Compatibility Directive.**
- **2000/14/EC. Noise Emissions Directive.** Sound power levels evaluated in accordance with the procedure laid down in the directive.
- **Directive 2011/65/EU** on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

2. Engine specifications

2.1. General technical data of the engine	**Make and model**	**CUMMINS QSG12-G2**	
	r.p.m.	1500	
	Maximum ESP power (kWm)	389	
	Power PRP (kWm)	351	
	Fuel	Diesel	
	No. of cylinders	6 cylinders	
	Cylinder capacity (c.c.)	11800	
	Compression ratio	N/A	
	Cooling system	Water-cooled	
	Type of regulation	electronic	
	Type of engine/injection/suction	Diesel/direct/turbocharged	
2.2. Fuel	Type of fuel	Diesel	
	Fuel tank capacity	820	

2.3. Consumption and autonomy	**Consumption (l/h)**		**Autonomy (h)**	
	PRP	**ESP**	**PRP**	**ESP**
50%	41	-	20	-
75%	60	-	13,7	-
100%	82	92	10	8,9

2.4. Cooling system	Fan flow (m³/s)	7,15	
	Fan power consumption (kW)	14,08	
	Radiator back pressure (mm H O)	13	
	Total refrigerant capacity (l)	48	
2.5. Lubrication system	Oil capacity (l)	34,1	
2.6. Intake system	Combustion air intake flow (l/s)	424	
2.7. Starter system	No. of batteries	2	
	Battery characteristics	12V 44Ah	
	Start-up voltage (V)	24V	
2.8. Exhaust system	Exhaust gas flow (l/s)	936 [PRP]	1029 [ESP]
	Exhaust gas temperature (ºC)	507º [PRP]	524º [ESP]
	Exhaust outside diameter (mm)	6" - Ø152,4mm	
	Max. exhaust back pressure (kPa)	10,2	

- **6 cylinders 4-stroke diesel engine online** with electronic regulation electronic by means of a fuel pump, original from the manufacturer.

Emissions compliance
EU Stage 0

- **Direct injection and suction system turbocharged.** Original manufacturer's particle separator filter.

- **Refrigeration through cooling liquid**, fully distributed in the closed circuit run by an engine driven pump, tropicalised radiator, original from the engine manufacturer.
- **Crankshaft-driven pump lubrication system.** The filter is a full-flow insert cartridge, front housing, original from the engine manufacturer.
- **Air intake system for turbo-fed combustion** with two-stage filter, original from the engine manufacturer.
- **Electric motor starting system, battery** (no maintenance) **with disconnector and load alternator driven by the starter** 24V, original elements from the engine manufacturer.

Exhaust attenuation level
-25dB(A)

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3. Alternator specifications

3.1. General technical data for the alternator

Make and model	STAMFORD S4L1D-F
No. of poles	4
Insulation class	H
No. of threads	12
Mechanical protection index	IP23
Voltage Regulator (AVR)	AS440
Voltage regulation	±1%
ESP power 27ºC (kVA)	465
Power PRP 40ºC (kVA)	415
No. of phases	3
Power factor (cos φ)	0,8

Performance η (%)

50%	75%	100%	110%
94,4%	94,2%	93,2%	92,6%

- **Brushless 4-pole alternator.** Robust mechanical structure with easy access to connections and components. Insulation class H, coil pitch 2/3 and self-excited AVR.
- **Protection with premium epoxy resins.** High voltage parts are impregnated under vacuum, which always means very good insulation.

Standard regulations
that the alternator fulfils:

AS 1359 | IEC 34-1 1 | BS EN 60034-1 | VDE 0530 | BS 5000 | CAN/CSA-C22.2-100 | NEMA MG1-32.

Low wave distortion:

- **THD (100% load) = 2%**
- **THF < 2%**

Complies with: EN61000-6-3, EN61000-6-2 regarding radio interference.

4. Frame Specifications

- Unit mounted on **electro-welded high-resistance steel frame**, painted with epoxy-polyester powder paint.
- Connection of the assembly to the frame by means of **anti-vibration dampers.**
- **Fuel tank located on the frame itself**. The engine is equipped with a measuring gauge and fuel system.
- **Tested in a saline mist chamber according to ASTM B-117-09, resistance 500h.**

5. Soundproof canopy Specifications

- Electro-welded **canopy made of high resistance galvanized steel** painted with electrostatic epoxy-polyester powder paint.
- **Interior soundproofing** by means of a lining with soundproofing material.
- **Efficient attenuation silencer -35dB(A)** for the evacuation of gases to the outside with protective cover.
- **Tested in a saline mist chamber chamber according to ASTM B-117-09, resistance 720H. IP44 mechanical protection degree.**

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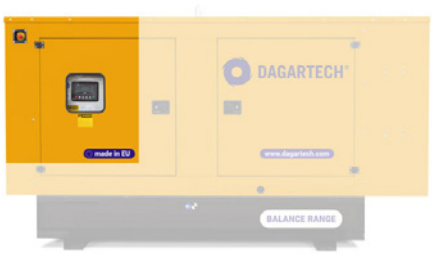
6. Control panel

6.1. Main elements of the control panel

- Protection panel, distribution with **automatic control module** which allows you to work in manual, automatic or signal mode.
- **Emergency stop button**.
- **Deep Sea Electronics battery charger**, designed to be permanently connected to the battery and maintain 100% of the charge. The charger switches to float mode when charging is complete:

Model	DSE 9255 24V, 5A

- **Protections:**
  - **4-pole magnetothermic protection** against overloads and short circuits.
  - **Protection fuses** for the control set.



6.2. Protection switch

Model	Chint 630A 4P

6.3. Control module

Model	DSE 7320 MKII

1. 4 configurable indicator LEDs
2. Generator on load
3. Transfer to the generator (manual mode)
4. **Start engine (manual mode)**
5. Silence alarm
6. Automatic mode
7. Test mode
8. Manual mode
9. **Genset stop**
10. Main network transfer (manual mode)
11. Network in load
12. Navigation keyboard
13. Main status and instrument display

DSE 7320 MKII DEEP SEA control card with mains grid monitor. The genset will automatically start up when detecting a fault in the electric power network and it will turn off automatically as well, when the electrical supply is re-established. It can also work in manual mode and by signal. It allows you to monitor a wide range of generator parameters and display information alerts, status and alarms.

The module includes communication ports USB , RS232, RS485,and also DSENet® for system expansion. Possibility of Ethernet networking (plug).

The entire module is easily configurable via PC using the DSE specific software configuration.

It has 132x64p illuminated LCD display with 4 lines of text, 5-key navigation through menus, 9 configurable outputs and 8 configurable inputs, programmable clocks and alarms, reading and displaying parameter values, including RMS values.

Different operating modes: AUTOMATIC mode, MANUAL mode, SIGNAL mode and TEST mode.

Other alternative configurations are available upon request to extend the capabilities of the operation modes.

Environmental Tests that the module complies with:

BS EN 61000-6-2 (electromagnetic compatibility) | BS EN 61000-6-4 (electromagnetic compatibility) | BS EN 60950 (electrical safety) | BS EN 61000-6-2 (temperature) | BS EN 60068-2-6 (vibrations) | BS EN 60068-2-27 (shock)

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6. Control panel

6.3. Control module

Model	DSE 7320 MKII
Operating modes	
STOP mode	✔
MANUAL mode	✔
TEST mode	✔
AUTO mode	✔
Module configuration options	
PC	✔
Group readings	
Generator voltage (F-F)	✔
Generator voltage (F-N)	✔
Generator current (A)	✔
Generator frequency	✔
Generator load F-N (kW / kVA / kVAr)	✔
Total generator load (kW / kVA / kVAr)	✔
Average generator power factor	✔
Accumulated generator load (kW, kVAh, kWh, kVAh)	✔
Network readings	
Network voltages (ph-N)	✔
Network voltages (ph-ph)	✔
Network frequency	✔
Network current (A)	■
Network load ph-N (kW / kVA / kVAr)	■
Total network load (kW / kVA / kVAr)	■
Engine readings	
Coolant temperature	✔
Oil pressure	✔
Engine fuel level	✔
Engine battery volts	✔
Engine speed	✔
Engine run time	✔

Ask us for further readings in generating sets equipped with electronically managed engines and DSE 7320MKII control module.

Do you want a superior performance control module?

Contact us and tell us what you need.

✔ Includes ■ Optional

✕ Not available ⓘ Consult

Readings available at control module level.

Confirm the availability of these readings for this generator and engine.

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6. Control panel

6.3. Control module

Model	DSE 7320 MKII
Engine protections	
High water temperature	✔
Low oil pressure	✔
Low water level	✔
Fuel reserve by sensor	✔
Second fuel tank control	✔
Shutdown failure	✔
Battery voltage failure	✔
Battery charge alternator failure	✔
Overspeed	✔
Underfrequency	✔
Failure to start	✔
Emergency stop	✔
Maintenance notice	✔
Maintenance Alert	✔
Alternator protections	
High frequency	✔
Low frequency	✔
High voltage	✔
Low voltage	✔
Short circuit	✔
Asymmetry between phases	■
Incorrect phase sequence	✔
Reverse power	✔
Breaker Trip 4 poles	■
Overpressure alarm	✔
Counters	
Hour meter	✔
Kilowatt meter	✔
Starter counter	✔

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6. Control panel

6.3. Control module

Model	DSE 7320 MKII
Communications	
RS232	✔
RS485	✔
USB communication port	✔
Modbus IP	■ DSE 855/890/891
Modbus RS 485	✔
PC Software (Mimic)	✔
GSM/GRPS MODEM	■ DSE 890
Remote display < 1km	■ DSE 2520
Remote monitoring	■ DSE 855/890
Input expansion	■ DSE 2130 8 inputs
Output expansion	■ DSE 2157 8 inputs
SNMP protocol	■ DSE 892
Services	
Configurable alarm history	250
External start	✔
Start-up inhibition	■
Network Failure Start	✔
Activation of group counter	✔
Activation of grid and group counter	✔
Control of fuel transfer	✔
Motor temperature control	✔
Forced group operation	✔
Free programmable alarms	✔
Group start function in test mode	✔
Free programmable outputs	✔
Multilingual	✔
Special applications	
GPS localisation	■ DSE 890
Calendar scheduler	✔
DSE configuration suite via PC	✔
Front panel module configuration with PIN	✔
Alternative work	✔
Programmable PLC	✔
Power save mode	✔
Alternative configurations	✔
Dummy load control / load shedding	✔ 5 Stage dummy load

Do you want a superior performance control module?

Contact us and tell us what you need.

Ask us for further readings in generating sets equipped with electronically managed engines and DSE 7320MKII control module.

✔ Includes ■ Optional
✕ Not available ⓘ Consult

Readings available at control module level.

CONFIRM THE AVAILABILITY OF THESE READINGS FOR THIS GENERATOR AND ENGINE.

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7. Standard Scope of Delivery

Engine

- **CUMMINS QSG12-G2Diesel Engine,** 1500 rpm water cooled.
- With **electronic regulation.**
- **Protection from moving parts.**
- Electric motor starting system, **battery (maintenance-free) with switch** and load alternator driven by **starter motor of 24V**.
- **Efficient high-attenuation exhaust silencer of -25d(BA)** for the evacuation of gases to the outside with protective cover.

Alternator

- **12-Wire, 4-pole brushless STAMFORD S4L1D-F alternator** with electronic voltage regulation type AVR (AS440).
- With IP23 protection level.
- **Insulation class H**.

Frame

- **Electro-welded frame** made of **high-strength steel**.
- Painted with electrostatic epoxy-polyester powder paint.
- **Anti-vibration dampers** from the engine block to the frame.
- **Fuel tank with capacity of 820 litres,** located on the frame itself. Equipped with **cleaning record** to facilitate maintenance work (models > 75kVA).
- **With measuring gauge** and installation of fuel to the engine.
- **Liquid** drainage connection **to** the outside (models > 75kVA).
- **Bedplate tested in a salt spray chamber according to ASTM B-117-09 (500h resistance).**

Soundproof canopy

- **Electro-welded canopy** of high-strength **galvanized steel**.
- Painted with electrostatic epoxy-polyester powder paint.
- **Interior soundproofing** by means of **a rigid panel composed of polyurethane foam with** an xterior textile covering.
- With IP44 mechanical protection level**.**
- **Cab tested in salt spray chamber according to ASTM B-117-09 (resistance 720h).**

Control panel

- **DeepSea Electronics automatic control module DSE 7320 MKII** which allows you to work in manual, automatic or signal mode.
  - It offers multiple event logging and is fully configurable through DeepSea Electronics' free-access specific configuration software.
  - Three-phase network and group detection with measurement for configurations upon network failure.
- DeepSea Electronics battery charger **DSE 9255 24V, 5A**. Designed to be permanently connected to the battery and maintain 100% of the charge. The charger switches to float mode when charging is complete.
- **Protections:**
  - 4-pole magnetothermic protection against overloads and short circuits.
  - Protection fuses for the control set.

Other equipment

- **Emergency stop button.**
- **Reinforced pole** centrally-mounted (models > 75kVA).

*CHECK THE SPECIFICATION ACCORDING TO THE MODEL.

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8. Featured options available

Do you need to include some options to the standard equipment of this generator set to make it the perfect generator for you? We offer you two complete Kits with which to customize your Balance generator set quickly and easily.

KIT 1: Network failure

Adding an engine heater to your equipment **will ensure that your generator set starts without problems** in the event of any failure in the electrical network, and without the cold or humidity becoming a problem.

KIT 2: Readings and alarm[1]

Your generator set can provide you with very useful information before any breakdown, maintenance work or, simply, during its operation.

If this is an important aspect for you, do not hesitate to include this Kit in your equipment, which has:

- **Radiator level alarm.**
- **Oil pressure reading.**
- **Temperature reading.**

THE READINGS AND ALARM KIT IS INCLUDED IN THE STANDARD SCOPE OF SUPPLY OF THE EQUIPMENT FROM 275KVA OF POWER.

Check the availability of these options according to the model and, if you do not find what you are looking for, please contact us. We have many more options to offer you.

[1] **Radiator level sensor not available for Baudouin 4M06 series engines.**

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9. Even more options

If you're looking for other features to complete your machine, don't worry.

Below we detail many of the options from the Industrial range that we make available to you to turn your unit into a unique machine.

24 hour tank

AUTONOMY OPTIONS

Increase the autonomy of your generator up to 48 hours, including special tanks

You can choose between **different integrated tanks to increase the autonomy of the unit up to 48 hours** of operation.

You can also incorporate automatic fuel transfer systems for supply from external tanks.

	Capacity (l):		24h tank - 2790 l		48h tank - Consultar l	
% load	Consumption (l/h)		Autonomy (h)		Autonomy (h)	
Power	PRP	ESP	PRP	ESP	PRP	ESP
50%	41	-	68	-	N/A	-
75%	60	-	46,5	-	N/A	-
100%	82	92	34	30,3	N/A	N/A

Fuel particle separator filter

ENGINE - ALTERNATOR OPTIONS

- Electronic engine regulation/management (for models with mechanical regulation)
- Fuel particle separator filter.
- Manual oil drainage pump.
- 6-way fuel valve kit.
- Alternator anti-condensation resistors.
- Alternator superior impregnation systems.
- AVR MX341 + PMG ± 1% STAMFORD.
- AVR MX321 + PMG ± 0.5% STAMFORD.

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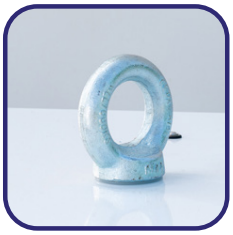
9. Even more options



Central lifting beam

MECHANICAL OPTIONS

- Retention tray (see change of dimensions).
- Liquid leakage probe (requires retention tray).
- SilentBlocks for levelling.
- Damping - anti-vibration springs.
- Central lifting beam (models < 75kVA)
- Non-standard RAL colour.

DSE 2157

DSE 334 network surveillance

COMMUNICATION OPTIONS

- Supplement to the DSE 7320 MKII control board (for models with the DSE 6020 MKII control board in the standard scope of supply).
- DSE 2157 8 potential free output (requires DSE 7320MKII).
- DSE 2130 8 inputs (requires DSE 7320MKII).
- DSE 2548 8 LED diodes (requires DSE 7320MKII).
- GSM modem (RS232) (requires DSE 7320MKII).
- DSE 855.
- DSE 890 webnet.
- DSE 7420 module.
- DSE 334 network surveillance.

Socomec
motorised switchboard

POWER OPTIONS

- Differential protection.
- As an option, you can include a switch cabinet attached to the generating set.
  - Switching with Schneider contactors. 25 to 125 A.
  - Socomec motorised switches: ≥ 125A.

CHECK THE AVAILABILITY OF THESE OPTIONS DEPENDING ON THE MODEL

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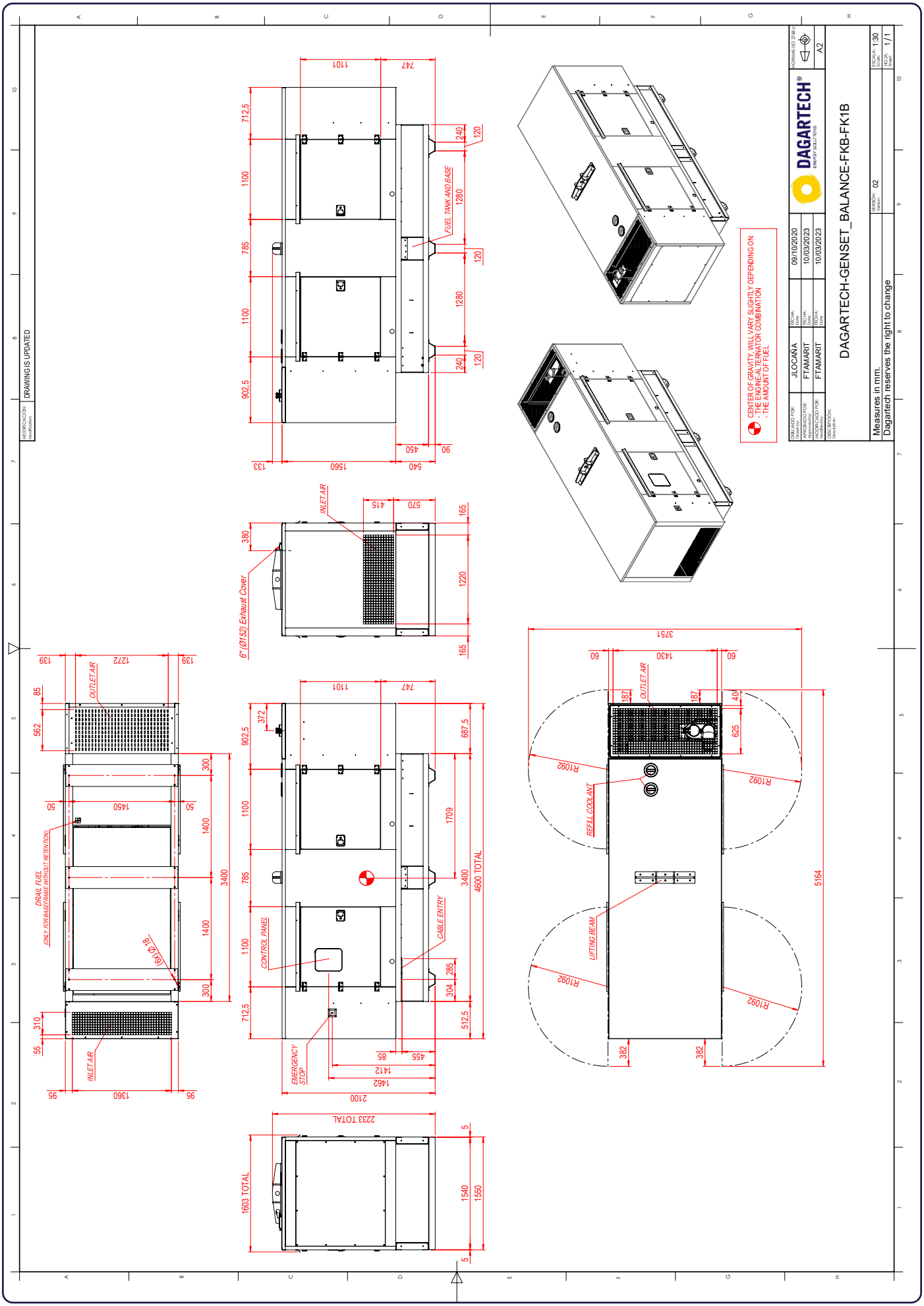
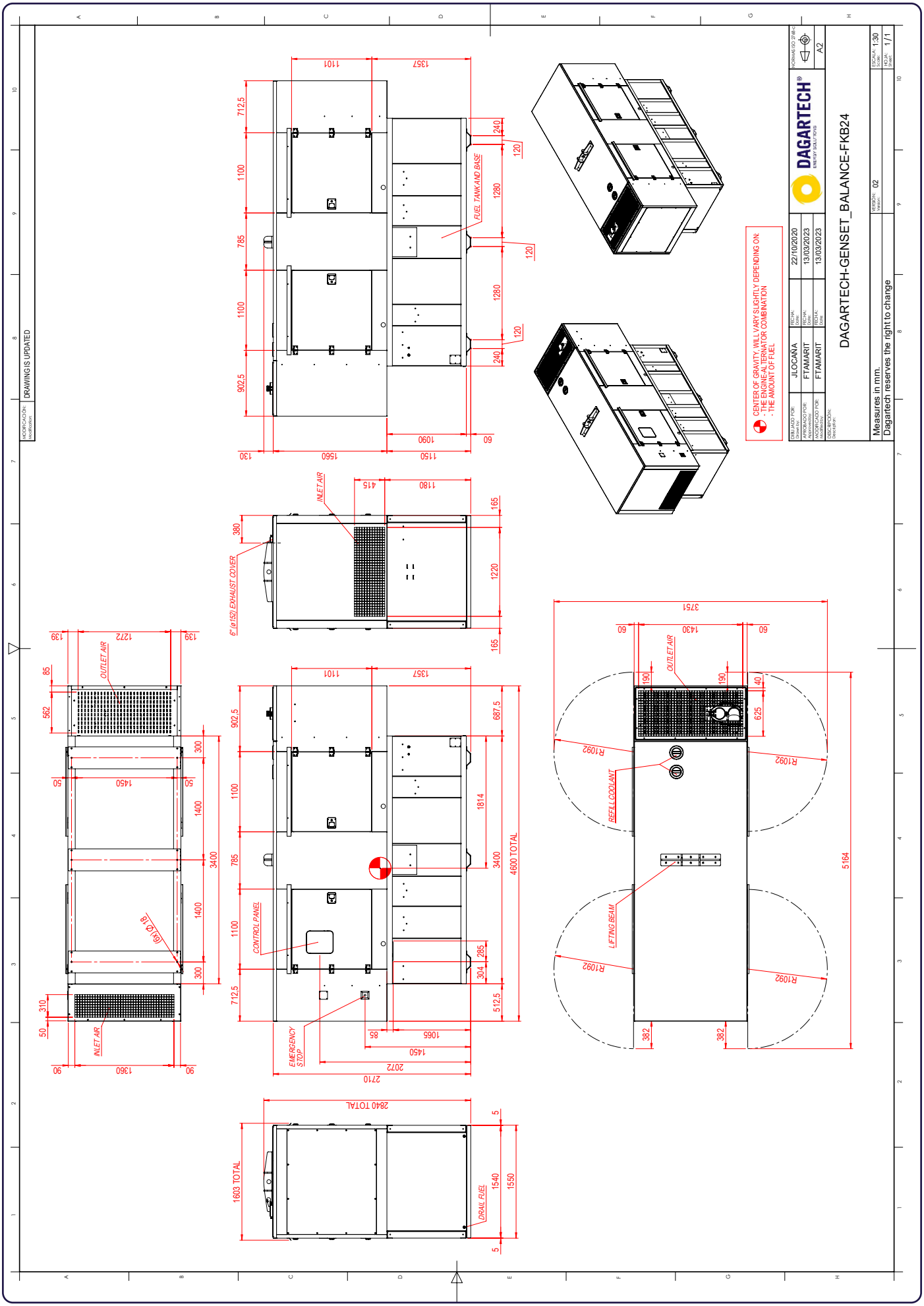


Technical plan for orientation purposes. Dagartech reserves the right to modify the data in this technical sheet without prior notice.



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