

## Technical specifications

### QIS 470

Voltage: 400/230 V

Frequency: 50HZ



Genset Image for illustration purposes only

### TECHNICAL INFORMATION

<b>Standby Power (ESP)</b>	kVA	470
	kW	376
<b>Prime Power (PRP)</b>	kVA	410
	kW	328
<b>Mechanical structure</b>	Soundproofed	
<b>Engine</b>	DOOSAN P158 LE	
<b>Alternator</b>	MECC ALTE ECO40-2S	
<b>Control card</b>	DEEP SEA 7320	
<b>Measures (L x W x H)</b>	mm	4.800 x 1.870 x 2.395
<b>Empty weight</b>	kg	4.508
<b>Fuel tank</b>	L	1.079
<b>Acoustic pressure, LpA</b>	dB(A) a 7	73
<b>Acoustic power LwA</b>	dB(A)	98

Voltages	Prime Power (PRP)		Standby Power (ESP)	
	(kVA)	(kW)	(kVA)	(kW)
380/220	410	328	470	376
400/230	410	328	470	376
415/240	410	328	470	376

#### Notes:

PRIME POWER: Electrical power data available at a variable load without limits of hours per year. An overload of 10 % is allowed for 1 hour of every 12. In accordance with ISO 8528/1 (2005) – PRP

STANDBY POWER: Electrical power data at variable load in an emergency in accordance with standard ISO 8528/1 (2005) – ESP. Overloads of emergency power are not allowed.

The standard reference conditions are: 25 °C, 100 kPa and 30% relative humidity. Gasoil density: 0.85 g/cm3. Gasoline density: 0.68 g/cm3.

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Grupos Electr6genos Europa, S.A. is a certified company with ISO 9001, ISO 14001, OHSAS 18001 and PECAL

We reserves the right to modify any characteristic of their equipment without prior warning.

Photographs representing the product range, while able to include options.

Weight and dimensions of a standard generator set.

Non-contractual document

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## ■ GENERAL DESCRIPTION

Generator set for automatic operation due to a grid failure, including the electrical operations panel and soundproofing. Start-up of the generator set will be carried out when a failure in the grid power supply is detected. Once the generator set has stabilized, a signal is sent to the switching panel to switch the grid position to generator set. When the grid power supply return is detected, a command is sent to the switching to switch to the generator set position of the grid. The generator set shuts-down after the applicable cooling period has elapsed.

## ■ ENGINE

Doosan diesel engine, with turbo, with direct injection and Electronic regulation of the engine.

Engine brand	DOOSAN	Bore (mm)	128
Model	P158 LE	Stroke (mm)	142
R.P.M.	1.500	Compression ratio	15:1
Net power (kWm)	400	Type of regulation	Electronic
Fuel	Diesel	Europe exhaust emission	EU0
No. of cylinders	8 V (90°)	EPA exhaust emission	N/A
Engine Capacity (c.c.)	14.618		

### Cooling System

Cooling of the sleeves using cooling fluid comprised of water and glycol at 50% in a closed circuit driven by the engine pump.

Engine driven exhaust fan, radiator and expansion tank; original from the engine manufacturer.

The circuit is completed with the cooling purge system towards the outside of the bedplate and protections of all running surfaces

Flow of air from fan (m <sup>3</sup> /min)	522	Coolant capacity (l)	80
Cooling type	Water	Design temperature radiator (°C)	45°C

### Lubrication System

Gear pump lubrication system driven by the engine and with original engine manufacturer lubricant filtering system.

It is completed with the oil purge system towards the outside of the baseframe.

Oil capacity (l)	21	Medium oil consumption (% fuel consumption)	0,5
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### Air intake system

Air intake system for combustion with filtering device and filter change indicator; originals from the engine manufacturer. Intake air cooling after the turbo by means of an air/air exchanger.

Intake air flow (m <sup>3</sup> /min)	29	Air inlet filter type	Medium
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## Exhaust System

Interior and exterior aluminized steel exhaust silencer.

<b>Number of exhaust</b>	2	<b>Body diameter (mm)</b>	611
<b>Outlet diameter (")</b>	7,6	<b>Exhaust length (mm)</b>	1.350
<b>Inlet diameter (")</b>	6	<b>Attenuation (dB(A))</b>	26

## Start system

Start system that uses an electrical motor, battery, battery disconnecter and battery charge alternator that is driven by the engine itself. The start motor and the battery charge alternator are originals from the engine manufacturer.

Lead acid battery with Spiralcell® recombining technology, sealed structure to prevent leaks, maintenance free, large start-up capacity maintaining the voltage due to its low internal resistance and small volume thanks to its rolled plates design that guarantees it will withstand many discharges with large temperature changes.

<b>Starter voltage system (V)</b>	24	<b>Battery type</b>	2 x 12V 44Ah - 730A
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## Fuel supply system

Fuel intake system original from engine manufacturer with filter.

<b>Fuel tank capacity (L)</b>	1.079
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## Fuel consumption panel (range according to the standard configuration)

Load	Prime Power (PRP)		Standby Power (ESP)	
	(l/h)	Range (h)	(l/h)	Range (h)
25%	24	46	27	41
50%	44	25	50	22
75%	65	16,6	75	14,4
100%	89	12,1	103	10,5

## ■ ALTERNATOR

Mecc Alte alternator with 4 poles, with a lifetime lasting greased bearing, H class insulation, without brushes, 2/3 coil and AVR (Automatic Voltage Regulator)

Protection of all the windings by means of 2-part high quality polyester resin impregnation. The stator windings receive a double impregnation. Final finish with a coat of EG43 varnish.

Excitation system with MAUX auxiliary winding with overload capacity 3 times the nominal current for 20 s.

Joining of engine and alternator through flexible disc coupling.

Regulations:

- CEI 2-3
- IEC 34-1
- EN 60034-1
- VDE 0530
- BS 4999-5000
- CAN/CSA-C22.2 No14-68-No100-95
- ISO 8528:3

Low wave distribution:

- THC < 4%
- THD < 4%
- THF (IEC) < 2%
- TIF (NEMA) < 40

Incorporates electromagnetic emissions suppressor in accordance with standard VDE 0875, class K.

<b>Brand</b>	MECC ALTE	<b>Voltage Stability</b>	±1%
<b>Model</b>	ECO40-2S	<b>Performance at 75% p.f. 0.8 (%)</b>	95
<b>Alternator Power (kVA)</b>	491 / Standby (SB27)	<b>Performance at 100% p.f. 0.8 (%)</b>	94
<b>Number of wires</b>	12	<b>Direct subtransient reactance X"d (%)</b>	16,9
<b>IP Alternator</b>	IP 21	<b>Subtransient time constant, T"d (ms)</b>	17
<b>Excitation system</b>	MAUX	<b>Zero sequence reactance, Xo (%)</b>	3,2
<b>AVR model</b>	DSR	<b>Short-circuit ratio, Kcc</b>	0,4

## ▪ BEDPLATE

The engine-alternator set is coupled to the bedplate by means of anti-vibration shock mounts that absorb almost all the vibrations.

The fuel tank is integrated and joined to the bedplate using hardware, which allows disassembling it for maintenance or replacement. It has a drainage plug, wide cleaning cover and filler connection with plug.

Includes level sensor with low fuel alarm signal that indicates the amount of fuel available in the tank to the electrical panel.

## ▪ SOUNDPROOFED CANOPY

Soundproof generator set galvanized finish using polyester dust paint.

It is lined inside with a noise-absorbing material made of mineral wool.

It also has an emergency shutdown pushbutton that is accessible from the outside

## ▪ ELECTRIC PANEL

Electrical panel integrated in the generator set with digital control plate.

Has a single-pole circuit breaker, manually actuated, with thermal-magnetic protection against overloads and short-circuits.

<b>Circuit Breaker rated current (A)</b>	4P 800A R	<b>Battery charger</b>	DSE 9255 - 24V 5A
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Has a DEEP SEA battery charge maintainer, designed to be permanently connected to the battery and maintains it charged to its maximum capacity.

Has no moving parts. The charger switches to floating mode when the charge is complete

## Control Card

DEEP SEA control plate, DSE 7320 with grid monitor that starts-up the generator set when it detects a failure in the electrical power supply from the grid and sends a signal to the switching panel to switch from the grid position to the group position. Once the power supply has been re-established, it sends an order to the switching panel to transfer the generator set power to the grid and shuts-down the generator set once it has cooled down. It also starts-up the generator set using an external signal.

Also, control plate DSE 7320 checks a large number of parameters of the generator set which allows it to display information, statuses and alarms. If required, it will shutdown the generator set: Due to high coolant fluid temperature, low oil pressure, low coolant fluid level, etc.

Includes a 132x64 pixel LCD screen with lighting, 5 navigation menubuttons, independent operational mode buttons, and alarms and status indicating LEDs.

Communications via USB, RS232, RS485, as well as DSEnet® for system upgrade. Possibility of Ethernet connection (requires a separate module). MODBUS protocol available for client software. Completely configurable using a PC in Windows environment and free Scada type software in real time.

Includes reading and displaying of parameters with RMS values, real time clock, events history log up to 250 events and programming of alarms, events, start-ups and shutdowns.

Operating modes: START-UP, SHUTDOWN, AUTO, MANUAL AND TEST.

### Generator

- Generator voltage (L-N)
- Generator voltage (L-L)
- Generator frequency
- Generator current
- kW
- kVA
- kWh
- kVAh
- Power factor

### Grid

- Grid voltage (L-N)
- Grid voltage (L-L)
- Grid frequency

### Engine

- Turn speed
- Cooling fluid temperature
- Oil pressure
- Hour meter
- Battery voltage
- No. of start-ups
- Fuel level

### Protections

- Start-up fault (generator set shutdown)
- High coolant temperature (alarm and generator set shutdown)
- Low oil pressure (alarm and generator set shutdown)
- Low fuel level (alarm)
- Low cooling fluid level (generator set shutdown)
- Overload (alarm and generator set shutdown)
- Battery voltage high (alarm)
- Battery voltage low (alarm)
- Battery charge alternator failure (alarm)
- Generator low frequency (alarm and shutdown)
- Generator high frequency (alarm and shutdown)
- Generator low voltage (alarm and shutdown)
- Generator high voltage (alarm and shutdown)
- External emergency shutdown (shutdown)
- Engine overspeed (shutdown)
- Maintenance interval (alarm)



## ■ ATS

Optional cabinet for switching between the grid and the generator set by means of a Socomec brand motorized switch with an integrated mechanical and electrical interlocking device.

Allows for the padlock locking function. Includes a Manual / Automatic mode selector and emergency manual control.

Safety switching for isolating the loads. High dynamic resistance against short-circuits.

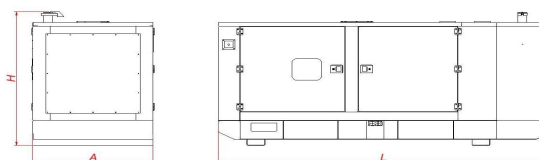
Position indicator with fully visualized cut-off. Stable positions not affected by changes in voltage and mechanical vibrations. External electrical control of the positions and test sequences.

High number of operations. IP54 protection. Connections: Lower/lower.

<b>ATS</b>	4P 800A 160-333V L-N CCM
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## ■ DIMENSIONS AND WEIGHT

<b>Length, L (mm)</b>	4.800
<b>Width, A (mm)</b>	1.870
<b>Height, H (mm)</b>	2.395
<b>Weight (kg)</b>	4.508



## ■ PERFORMANCE CLASS

Execution class in accordance with ISO 8528/5 (2005) taking into account the behaviour of the generator set in a permanent mode of operation with different load levels, as well as in a temporary mode of operation due to shocks in the load.

<b>Performance class</b>	G2
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## ■ REGULATION

The generator set has a CE Marking that includes the following directives:

- 2006/42/CE Machine Safety.
- 2006/95/CEE Low Voltage.
- 2004/108/CE Electromagnetic compatibility.
- 97/68/CE Gases and contaminating particles emissions.
- 2005/88/CE Noise emissions of machines outdoors in soundproof generator sets.

Applicable international regulations:

- ISO 8528
- ISO 3046
- BS 5000
- IEC 60034

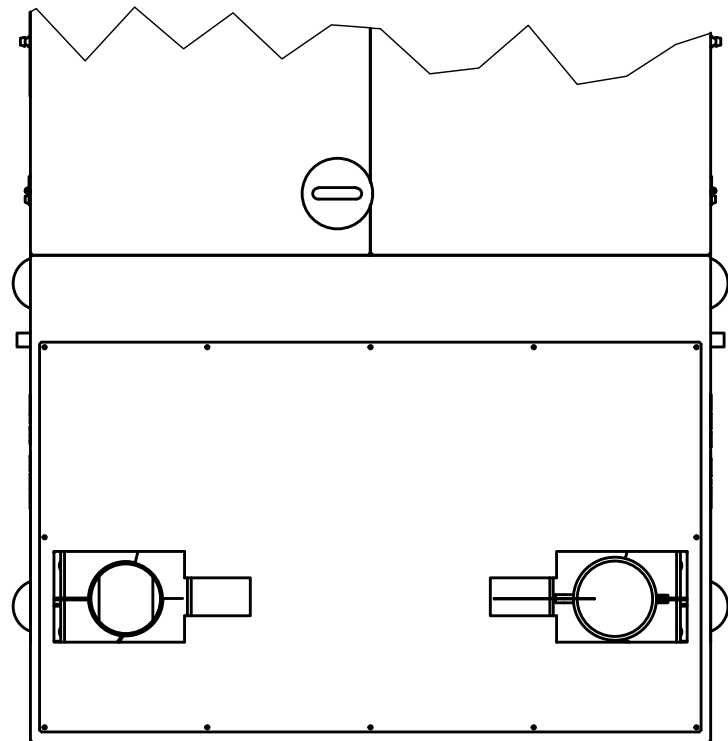


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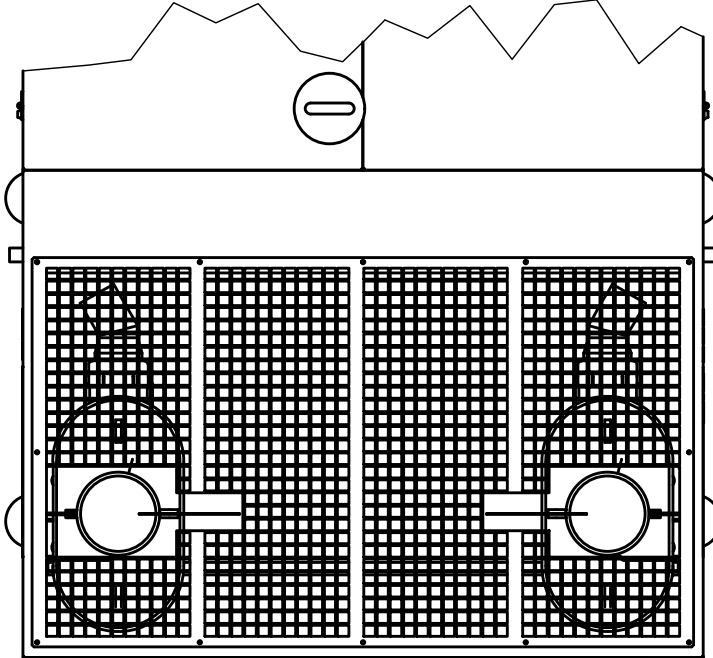
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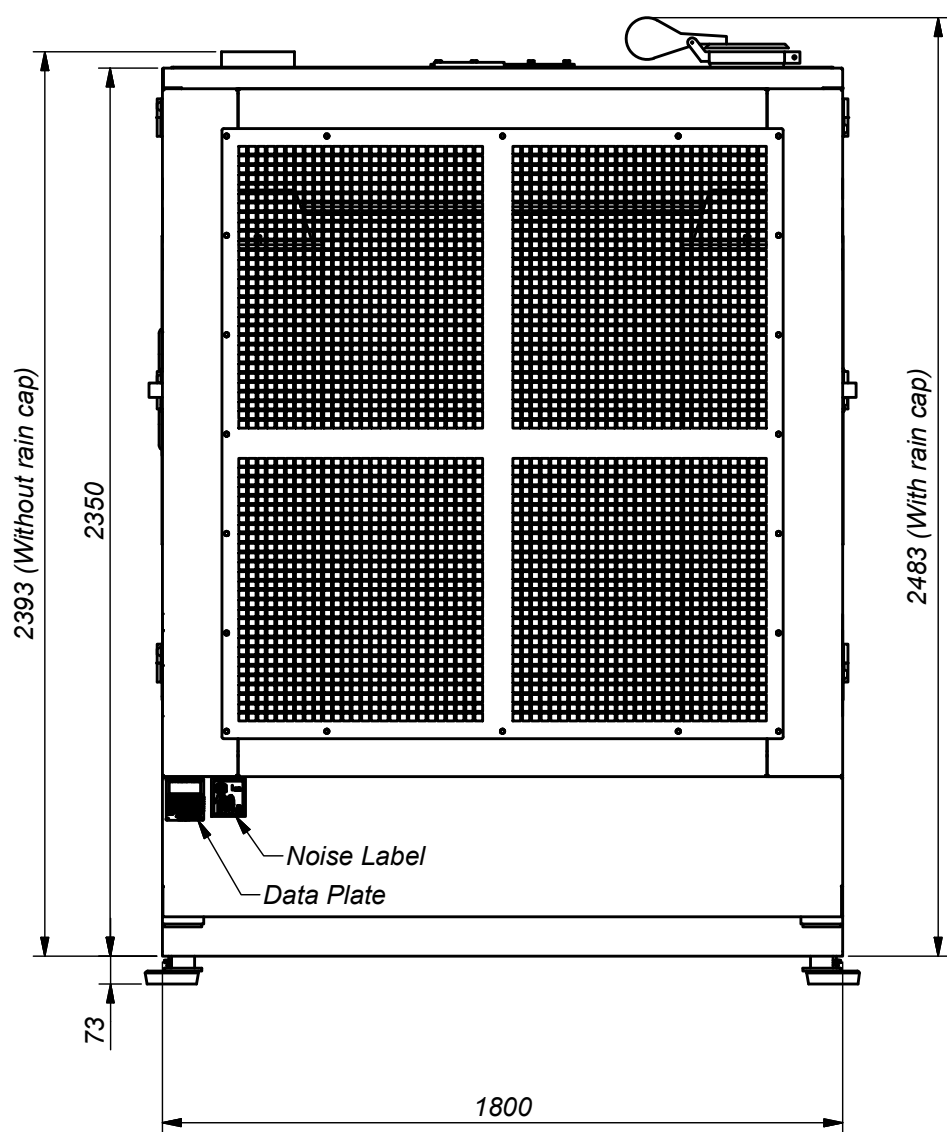
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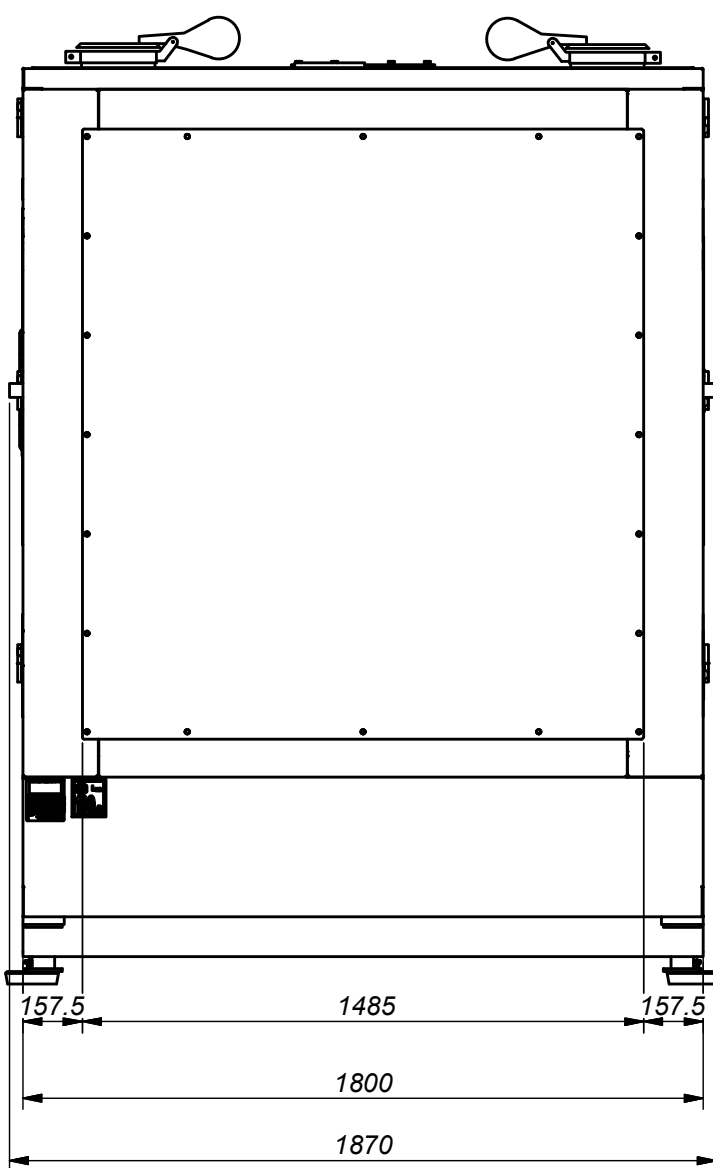
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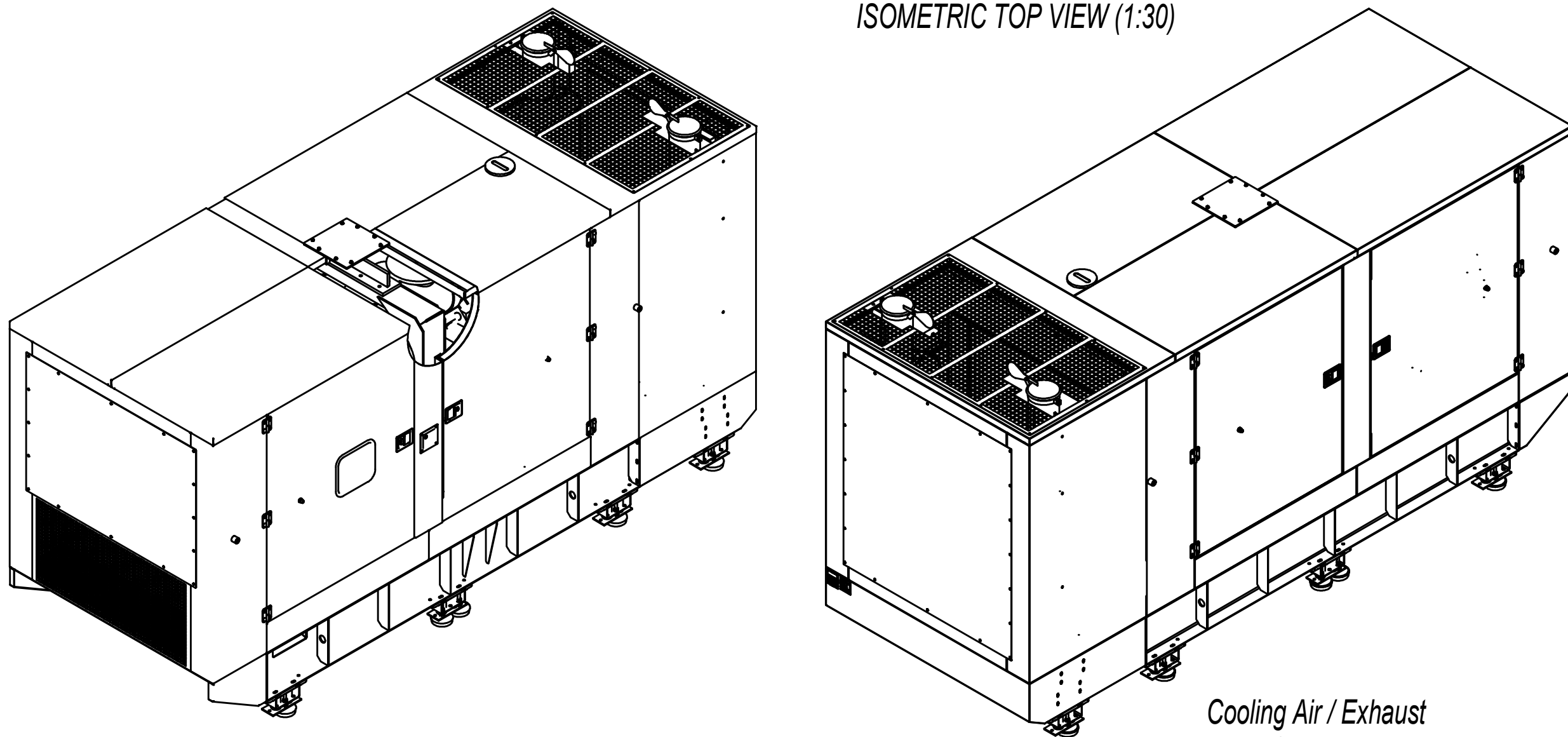
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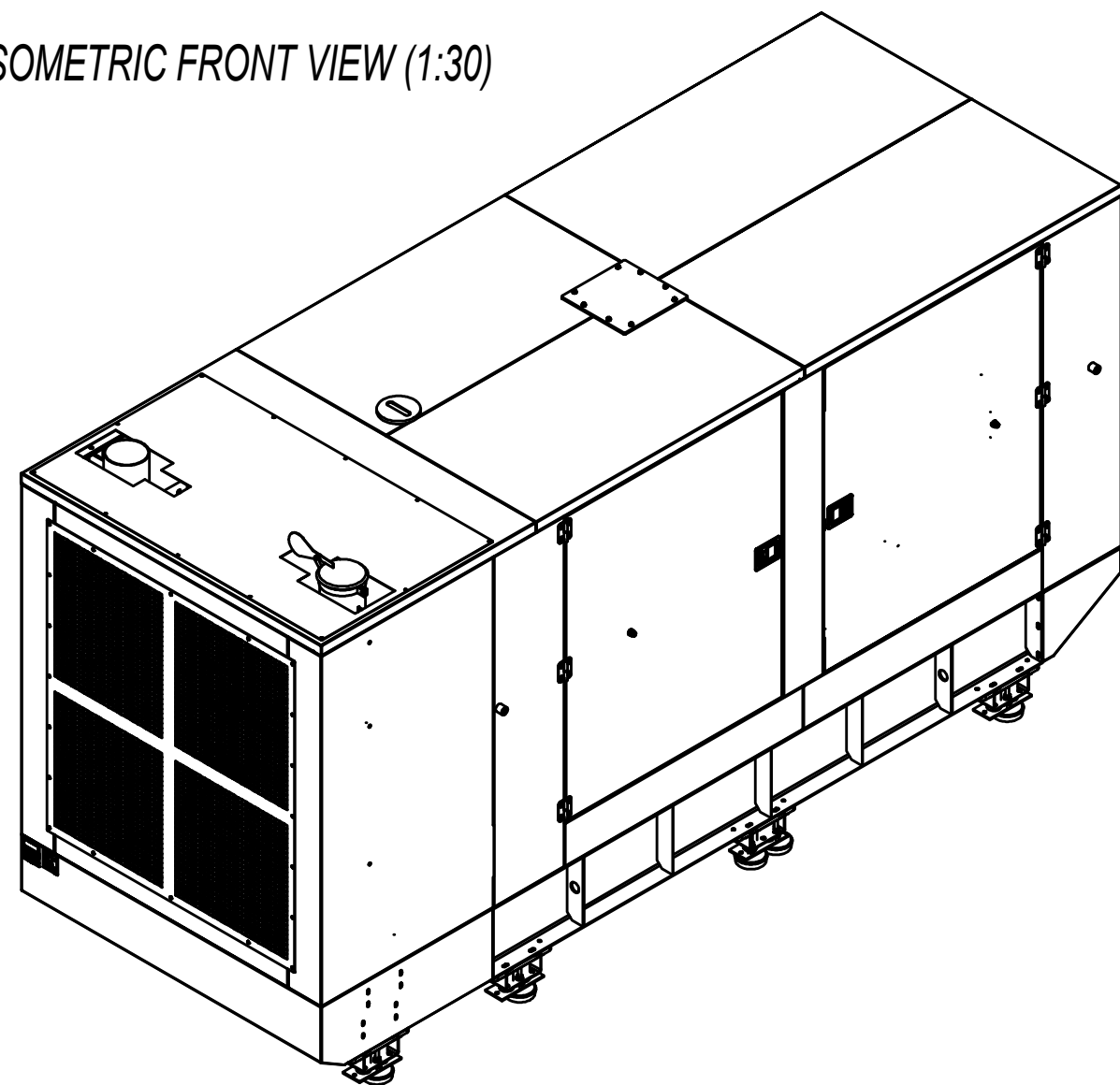
TOP OUTLET



ISOMETRIC TOP VIEW (1:30)



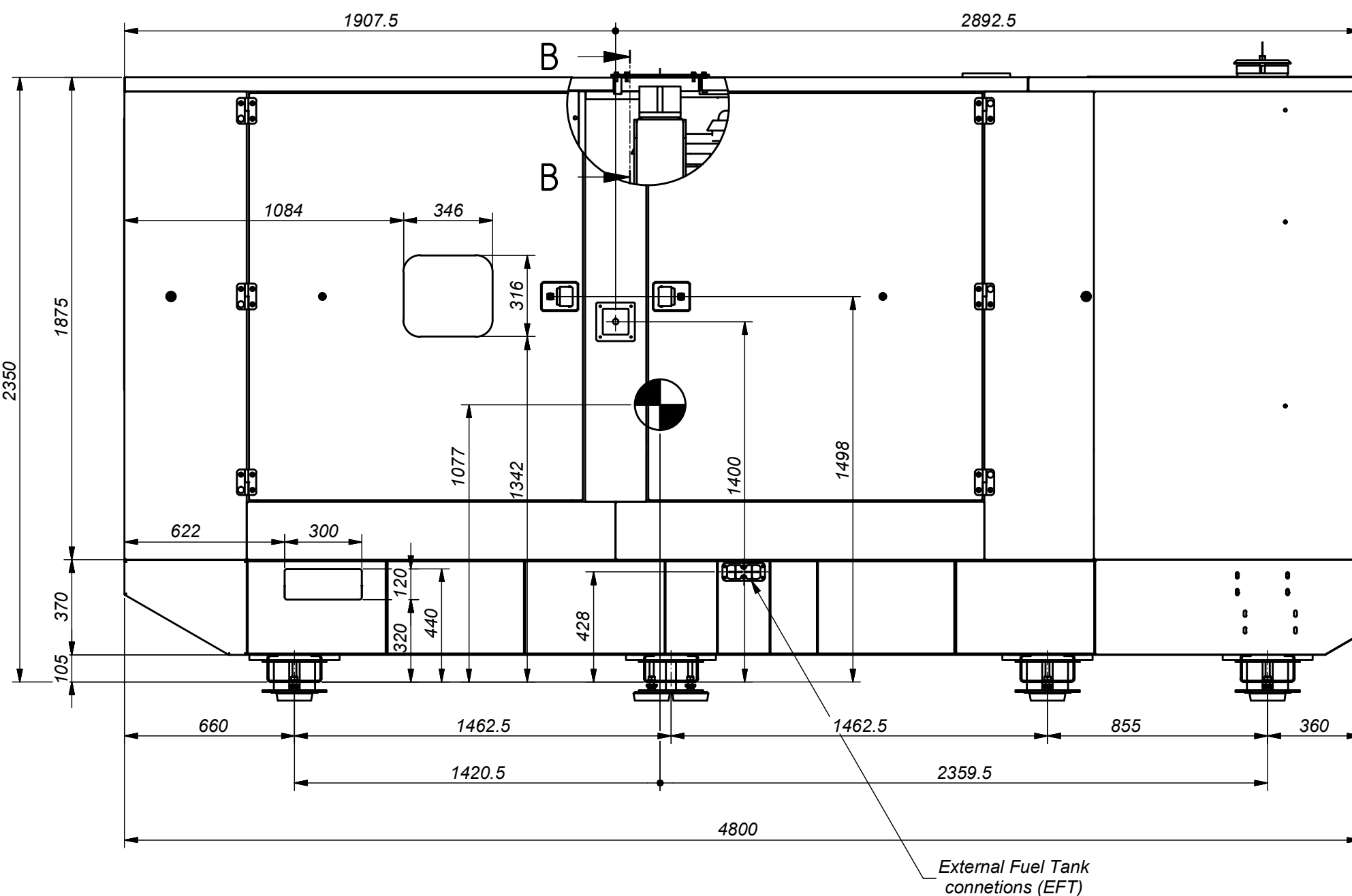
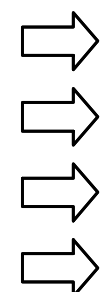
ISOMETRIC FRONT VIEW (1:30)



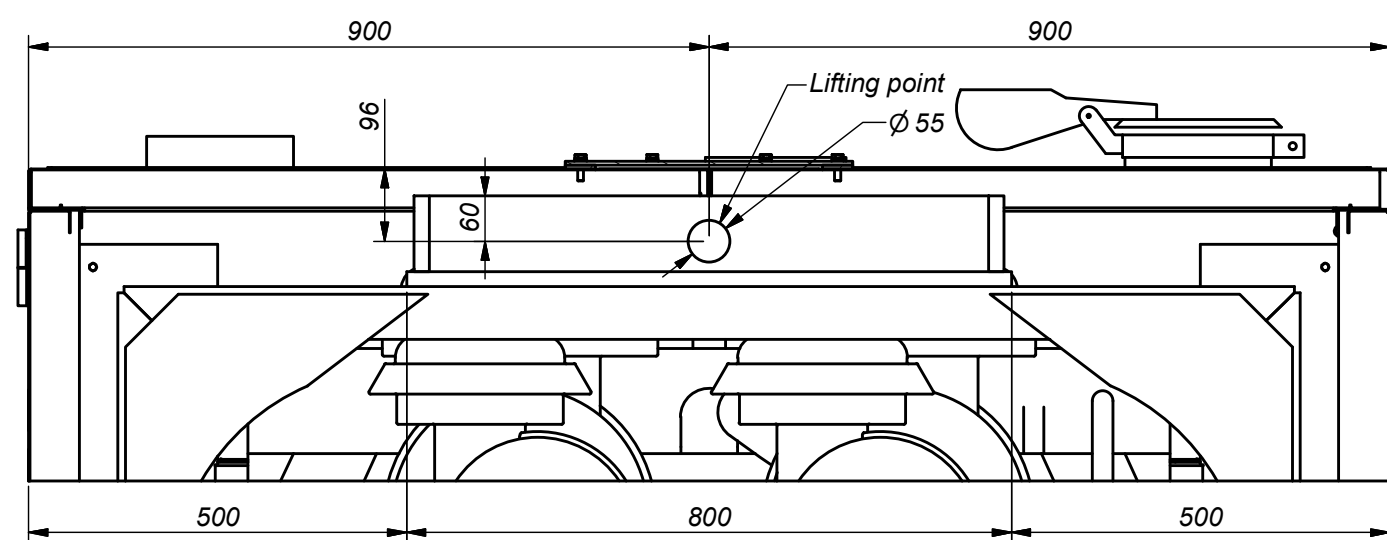
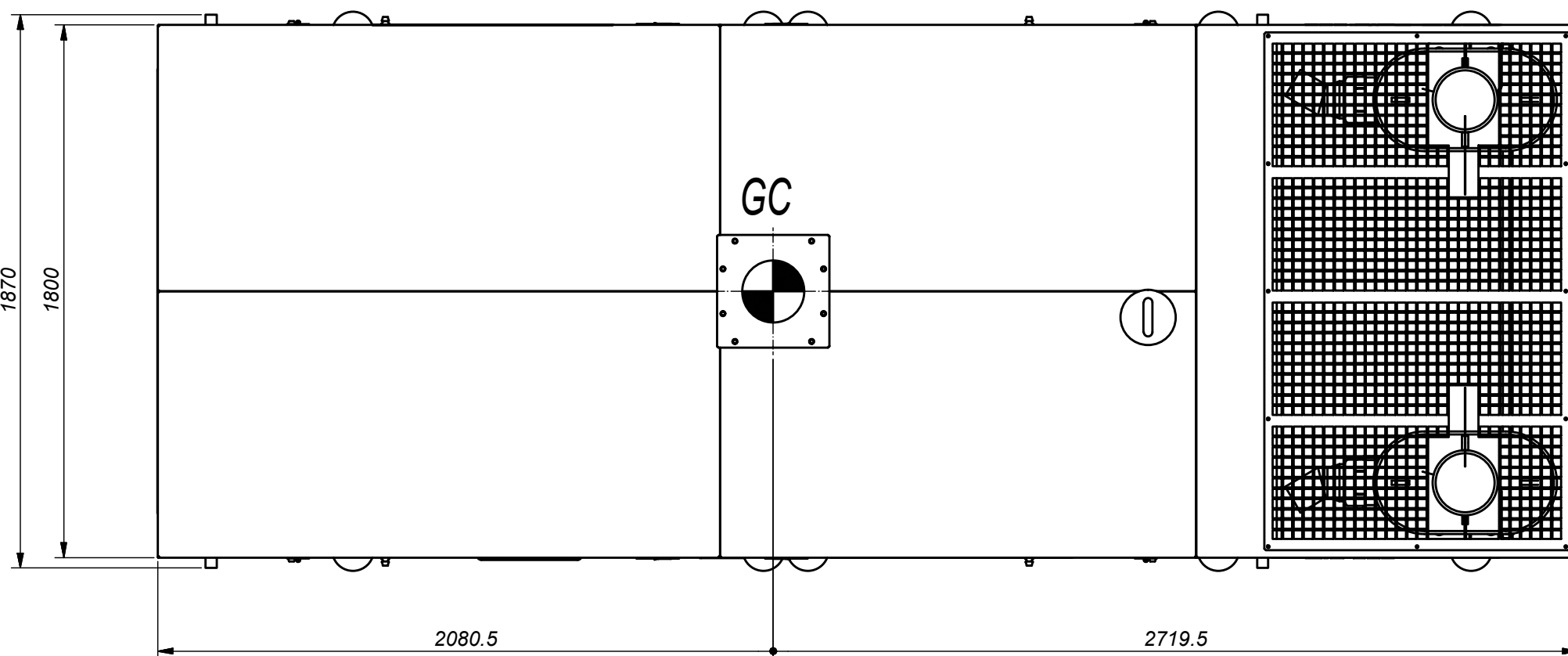
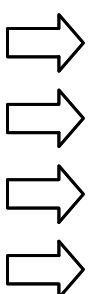
Cooling Air / Exhaust  
OUTLET



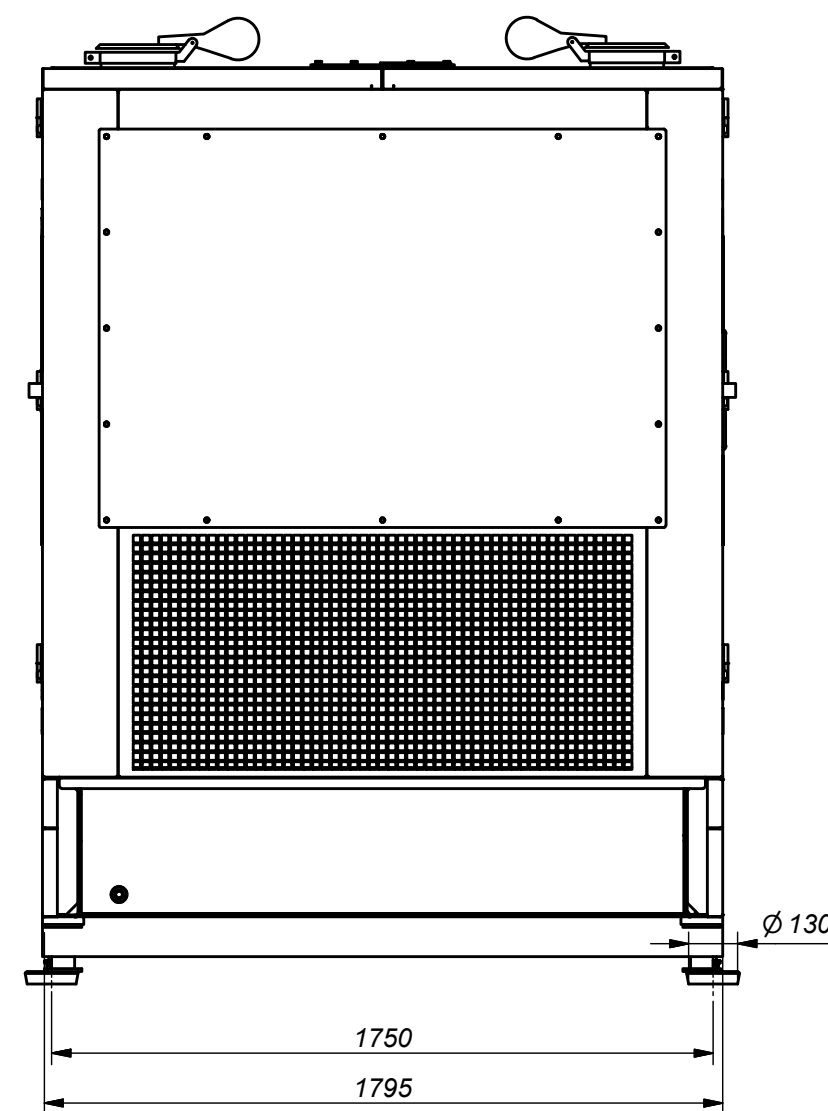
Cooling  
Air Inlet



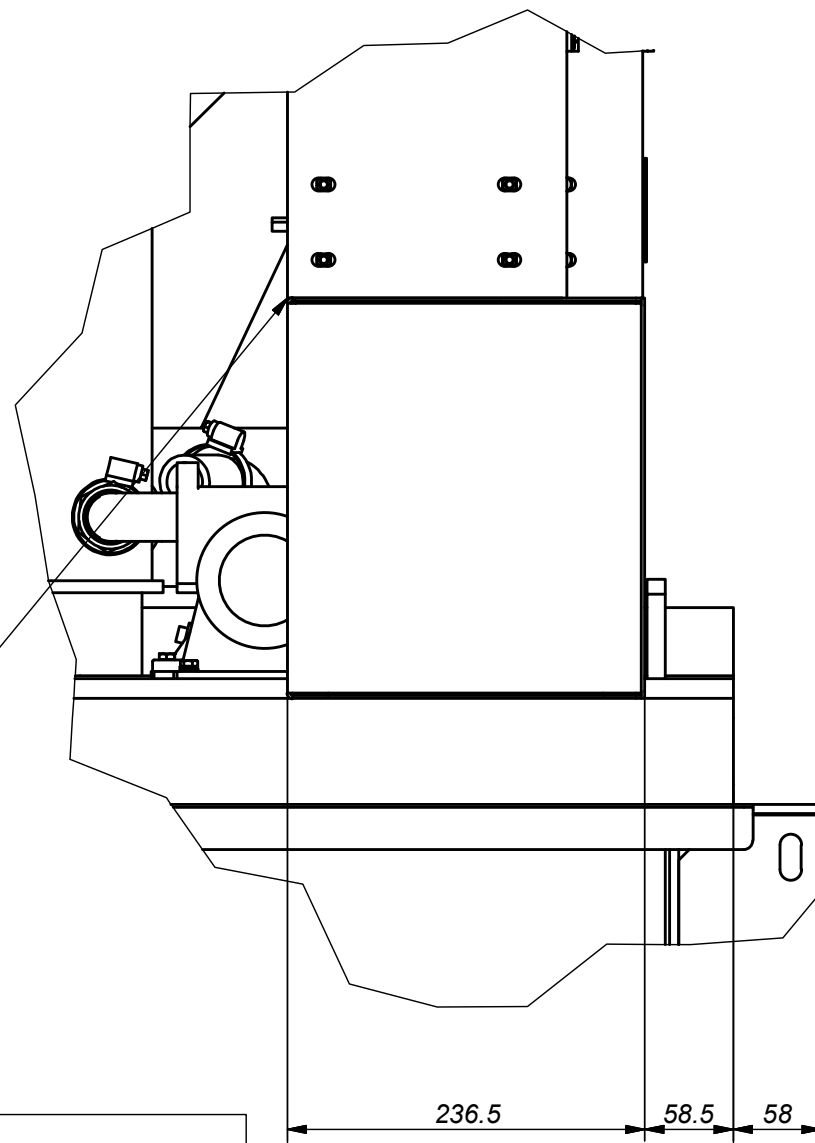
Cooling  
Air Inlet



B-B ( 1 : 10 )



ALIGN CUBICLES WITH CUBICLE SUPPORT



MODEL TABLE			
(50 HZ) KVA	(60 HZ) KVA	(50 HZ) KW	(60 HZ) KW
470	400	410	360
510	450	460	420
580	500	525	455
630	540	570	510
700	610	635	550

Tolerances, if not indicated, according to:

General tolerances

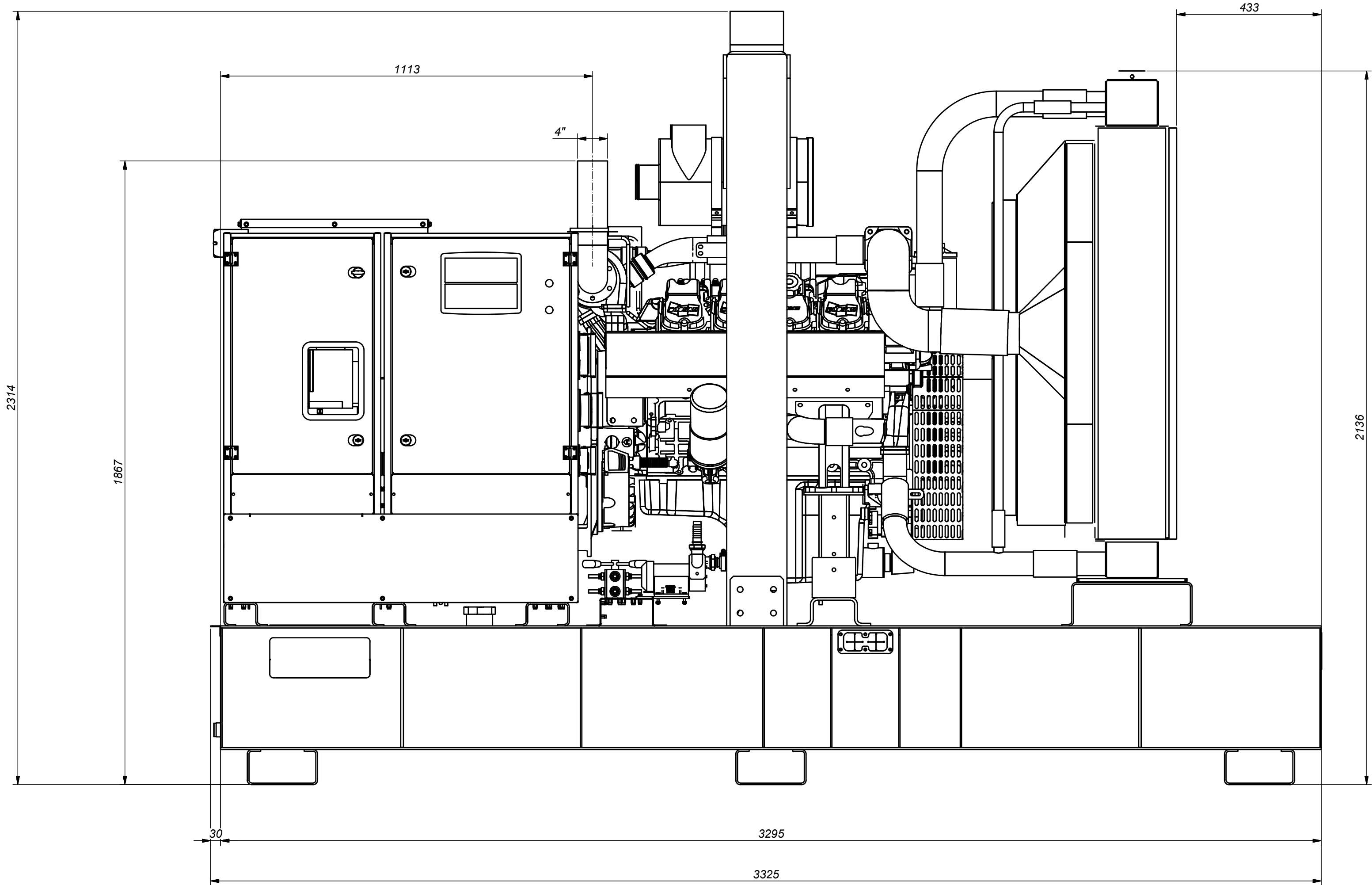
1350K - mK

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Treatment					INV
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Parent 3D model	Ed - Version 3D				

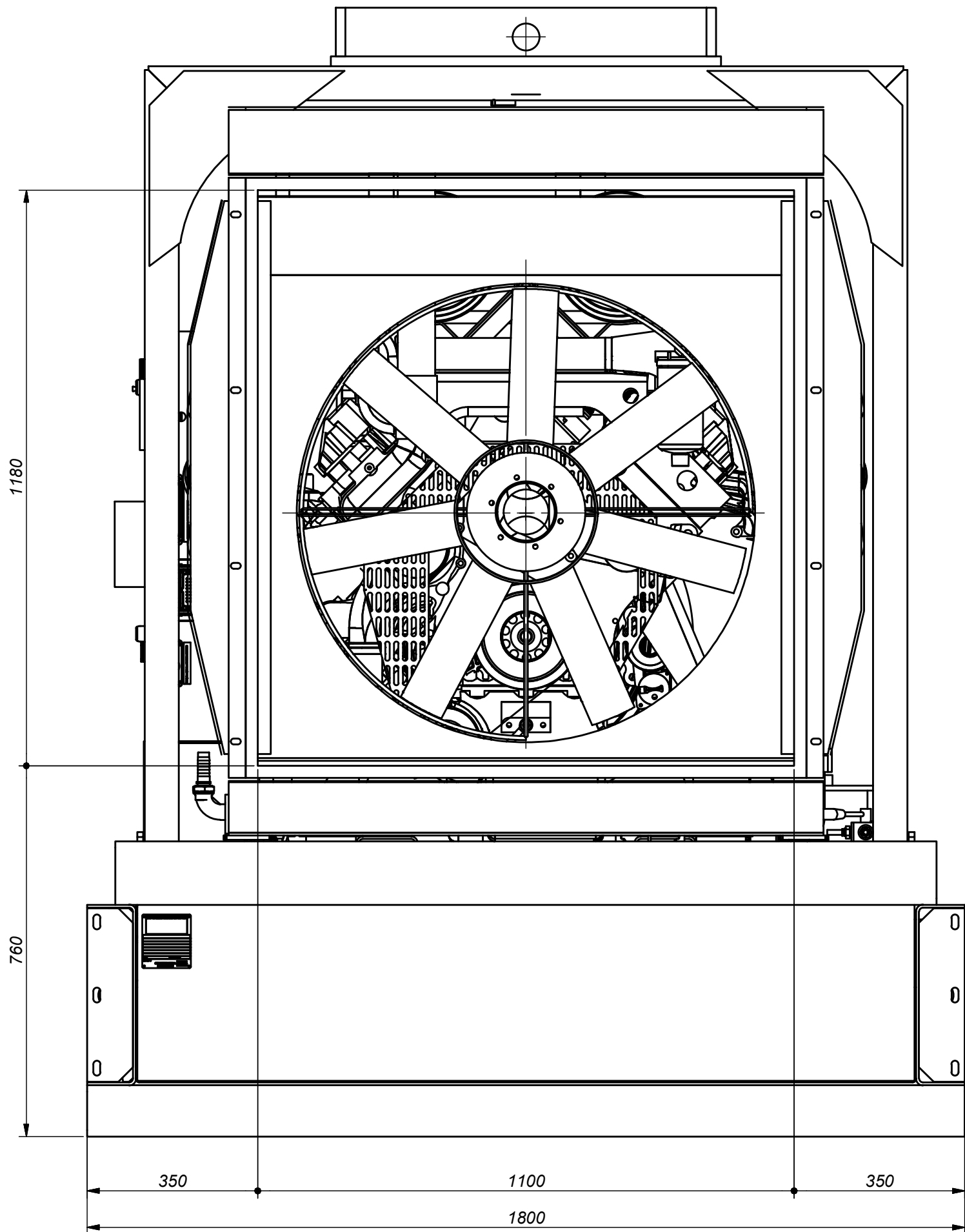
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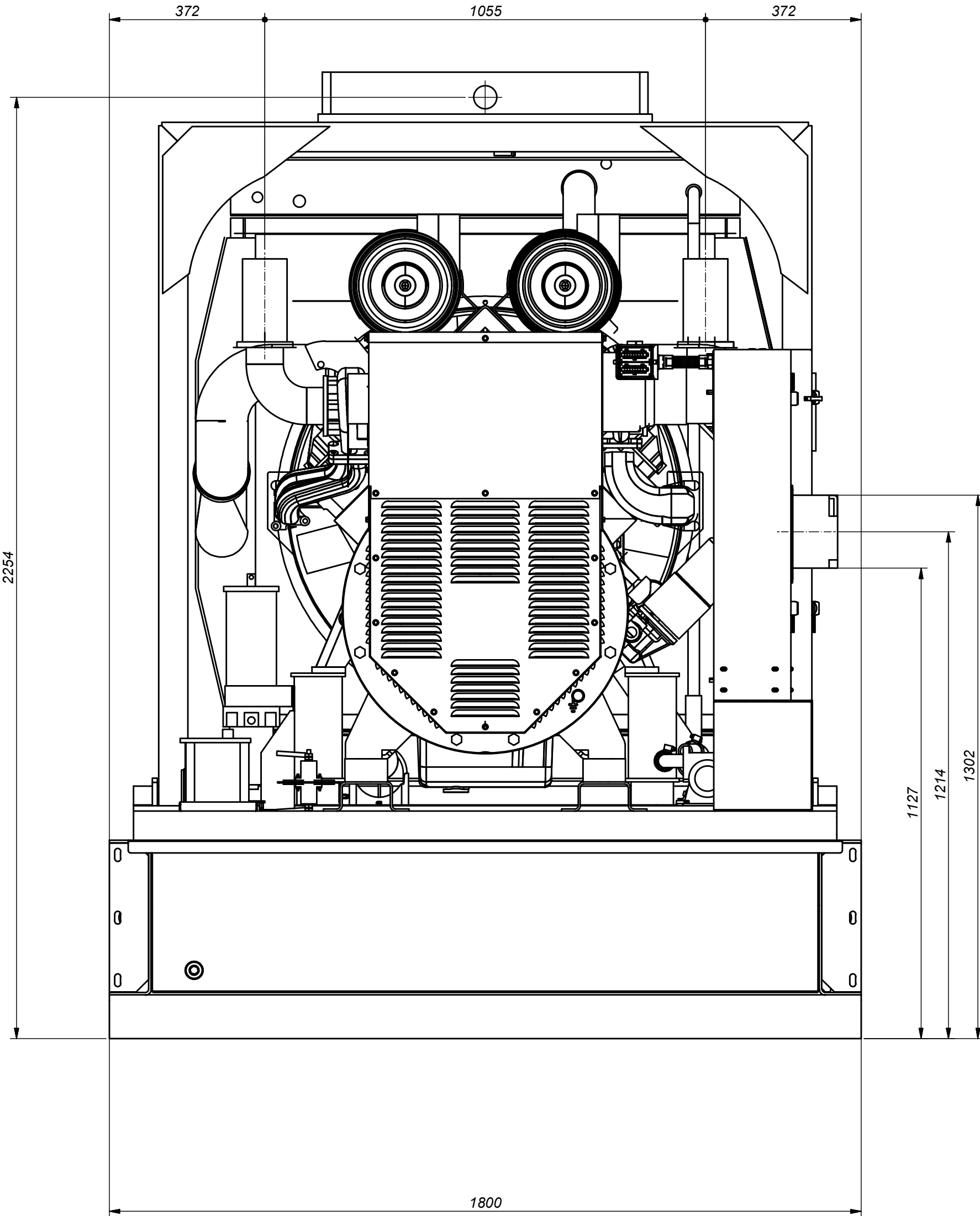
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ENGINE P158 ( 1 : 10 )



A ( 1 : 10 )



TOTAL APROX. WEIGHT with empty tank = 3625 kg  
Capacity tank : 896 ltrs

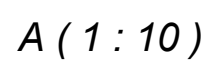
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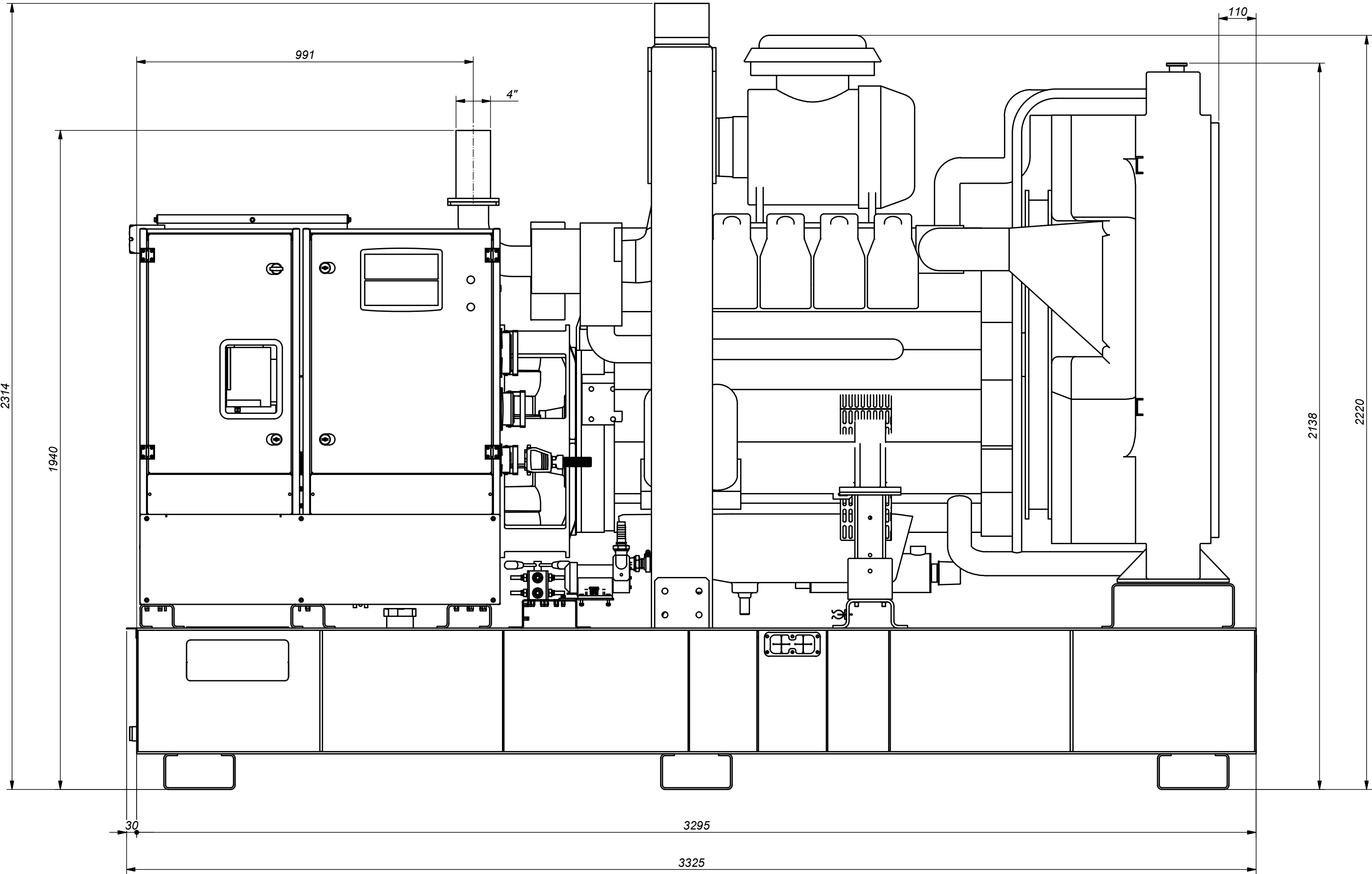
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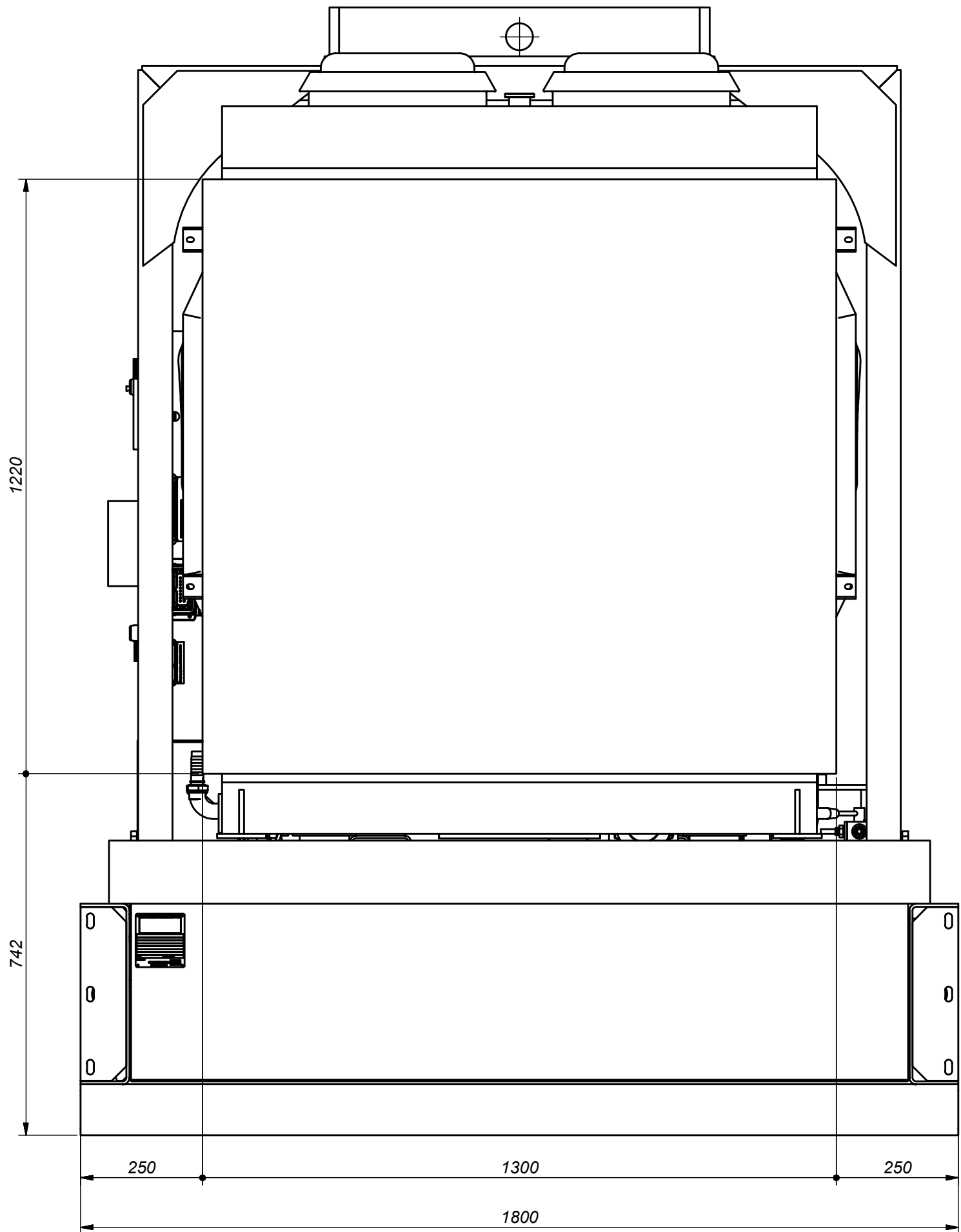
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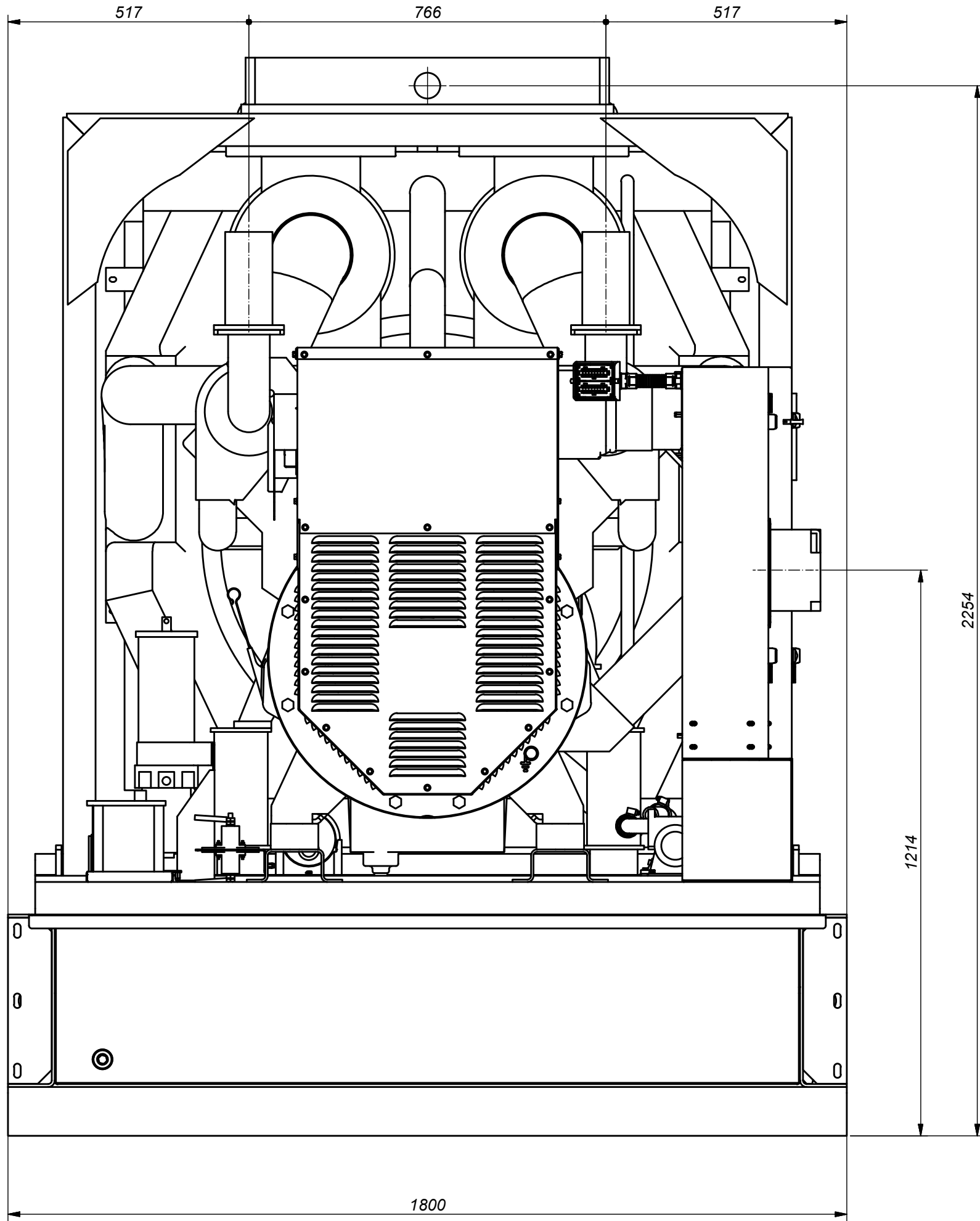
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ENGINE DP180 ( 1 : 10 )

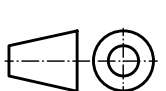


A ( 1 : 10 )



Tolerances, if not indicated, according to:									
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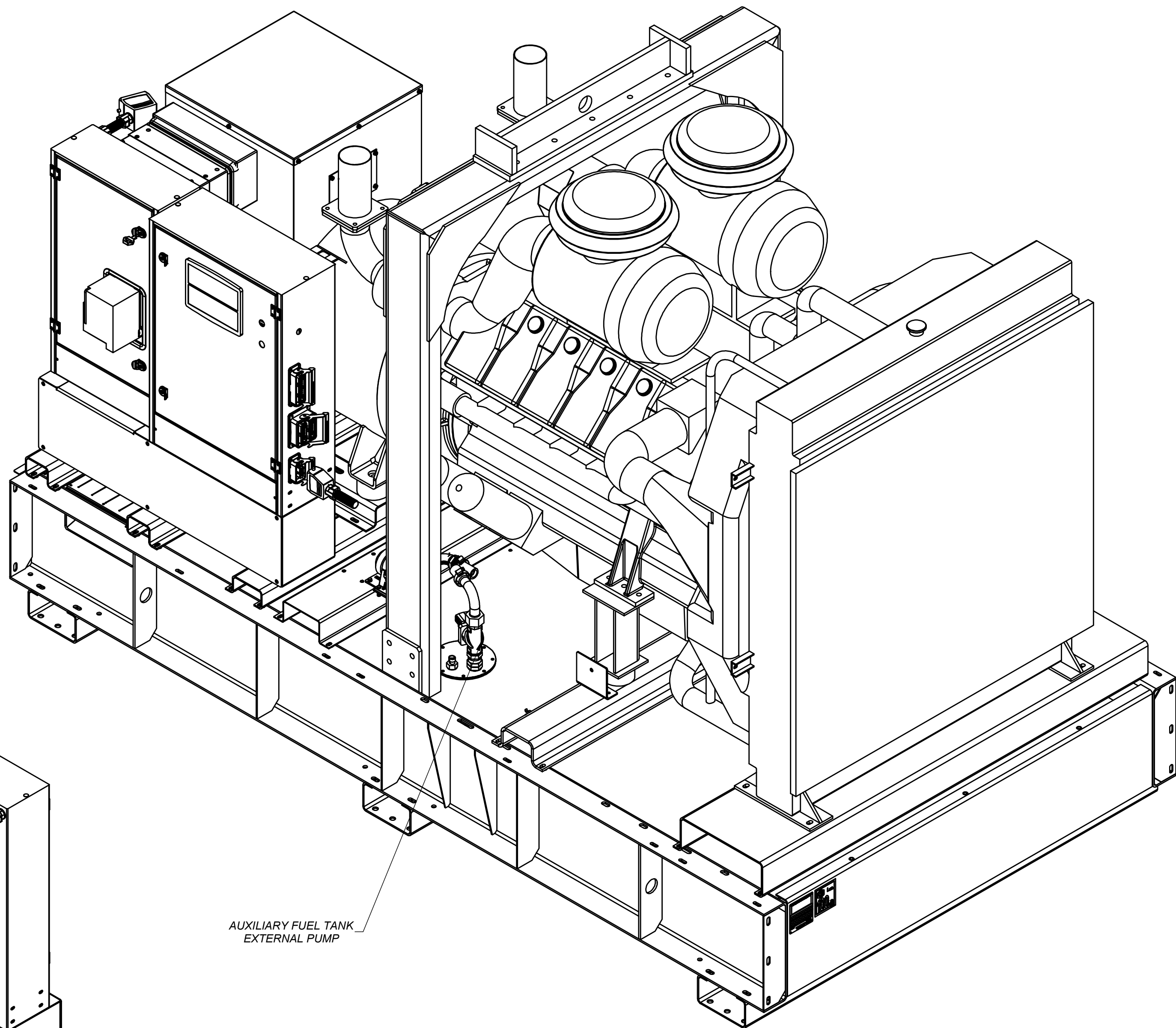
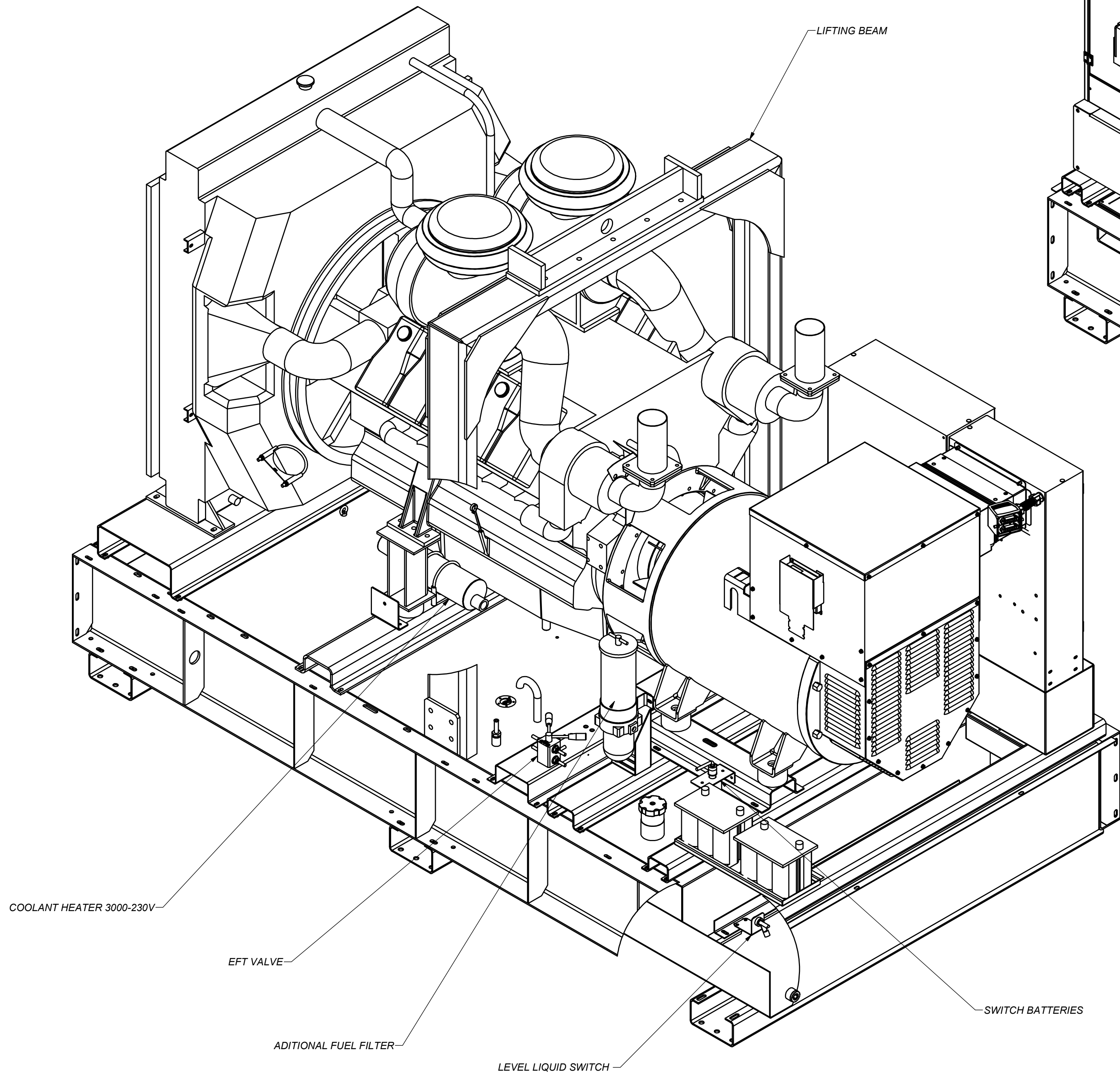
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Sheet 4 / 5

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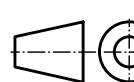
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## ASSEMBLY OF OPTIONS

All materials supplied are in compliance with the requirements of the List of Prohibited Substances

Tolerances, if not indicated, according to:		General tolerances									
		1350K - mK									
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