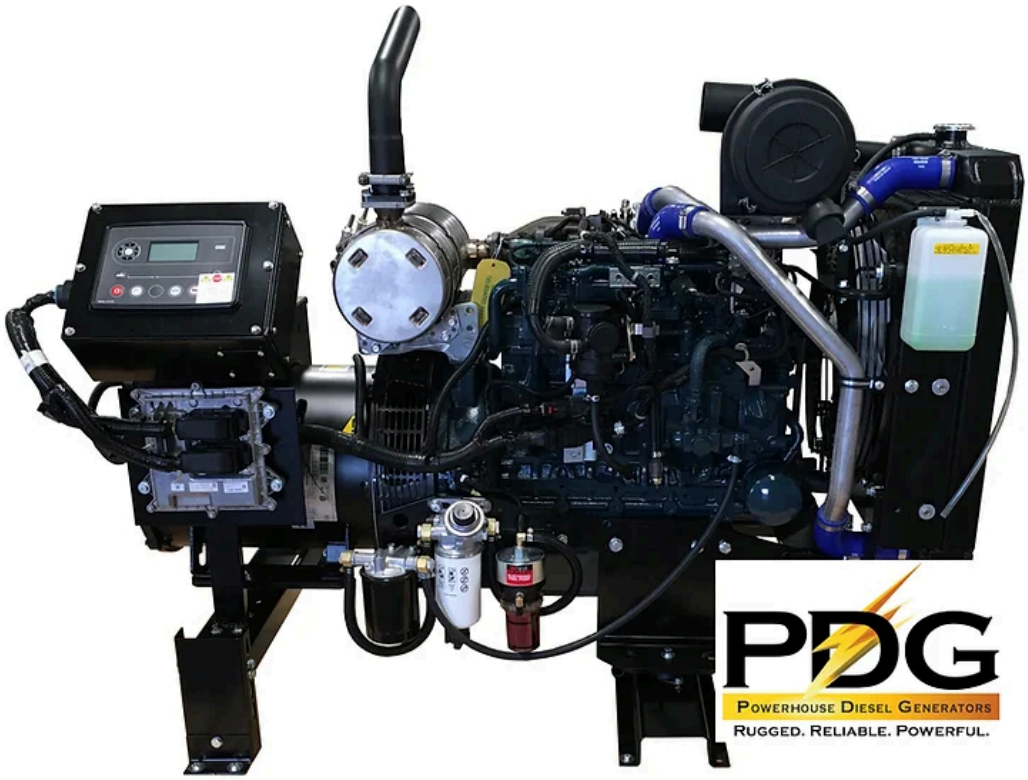
RUGGED. RELIABLE . POWERFUL.

Rugged Series
18-21 kWe Tier 4



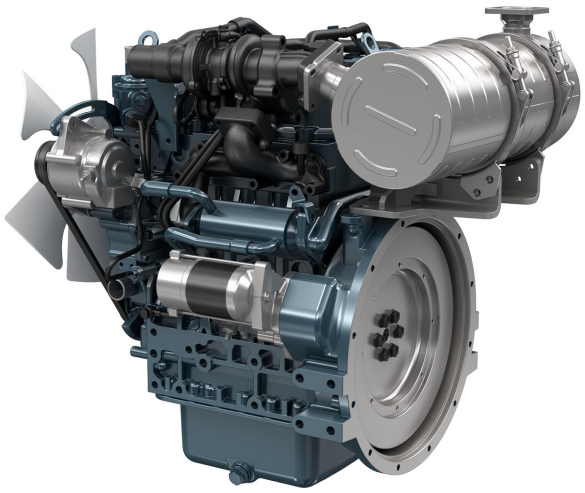
Shown with optional enclosure and base fuel tank

Powerhouse Diesel Generators
Rugged. Reliable. Powerful.

INDUSTRIAL DIESEL ENGINE

Kubota 03 Series (3-Cylinder)

D1803-CR-E4B



Proven Reliability and Technology

The latest technology and strong performance-two things customers expect from Kubota engines. We continue to provide both of these through the pursuit of excellence in three key areas: emissions compliance, progress towards fully electronic-controlled engines, and flexibility in the products and services we provide to customers worldwide.

Clean and Quiet Power

A common rail system has made it possible to optimize combustion and create a more durable and quieter engine with higher fuel efficiency. By meticulously screening and controlling the exhaust gas aftertreatment components (Diesel Oxidation Catalyst [DOC] and Diesel Particulate Filter [DPF]), we are able to offer a clean and high-performance engine.

Emissions Compliance

Meeting rigid emissions regulations can be a challenge for any company. D1803-CR-E4B engine have been designed to comply with stringent regulations: EPA / CARB Tier 4 + EU Stage IIIA. In addition, innovative emissions solutions, such as the use of aftertreatment units, have also been integrated into the 03 Series engines.

For Earth, For Life

Kubota

D1803-CR-E4B

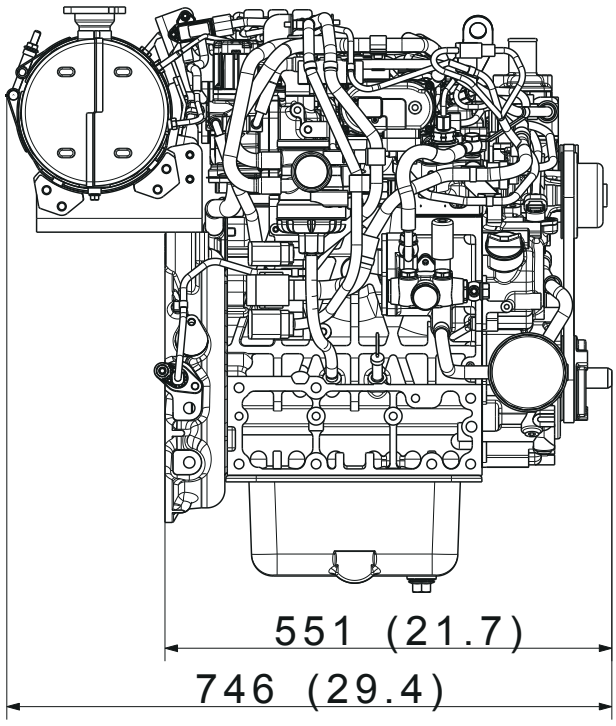
Engine Specifications

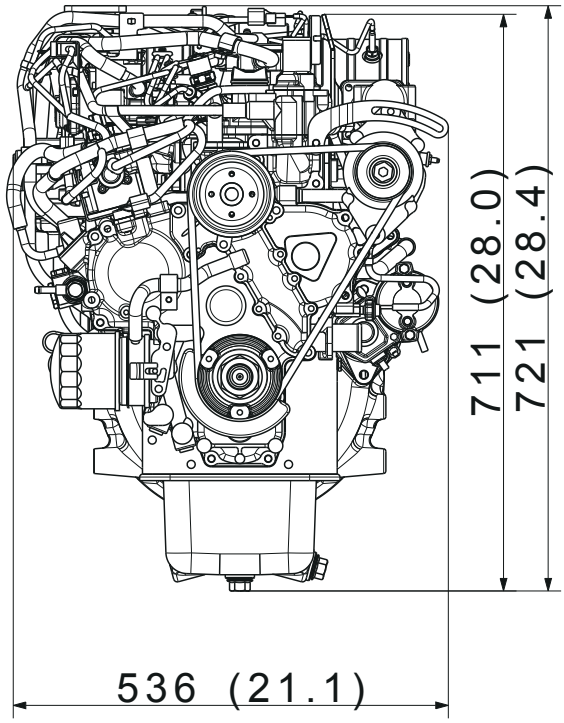
Engine model		D1803-CR-E4B
Emission regulation		EPA/CARB Tier 4 + EU Stage IIIA
Type		Vertical, water cooled 4-cycle diesel engine
Cylinders		3
Bore and stroke	mm (in)	87.0 x 102.4 (3.43 x 4.031)
Displacement	L (cu.in)	1.826 (111.4)
Aspiration		Naturally aspirated
Aftertreatment		DOC + DPF
Rated output / speed *1	kW (HP) / rpm	28.0 (37.5) / 2700
Maximum torque / speed *1	Nm (lb-ft) / rpm	115.8 (85.4) / 1600
Combustion system		Direct injection
Fuel system		Common rail system
Length x Width x Height *2 **(without aftertreatment unit)**	mm (in)	551 x 536 x 711 (21.7 x 21.1 x 28.0)
Length x Width x Height *3 **(with aftertreatment unit)**	mm (in)	746 x 536 x 721 (29.4 x 21.1 x 28.4)
Dry weight *3	kg (lbs)	185 (407)

Specifications are subject to change without notice.
DOC: Diesel Oxidation Catalyst
DPF: Diesel Particulate Filter
Dimensions and dry weight are according to Kubota's standard specification.
Dimensions and weight depend on completed specifications.

*1: SAE J1995 gross intermittent
*2: Exclude cooling fan and exclude aftertreatment unit
*3: Exclude cooling fan and include aftertreatment unit on engine

Dimensions





Kubota

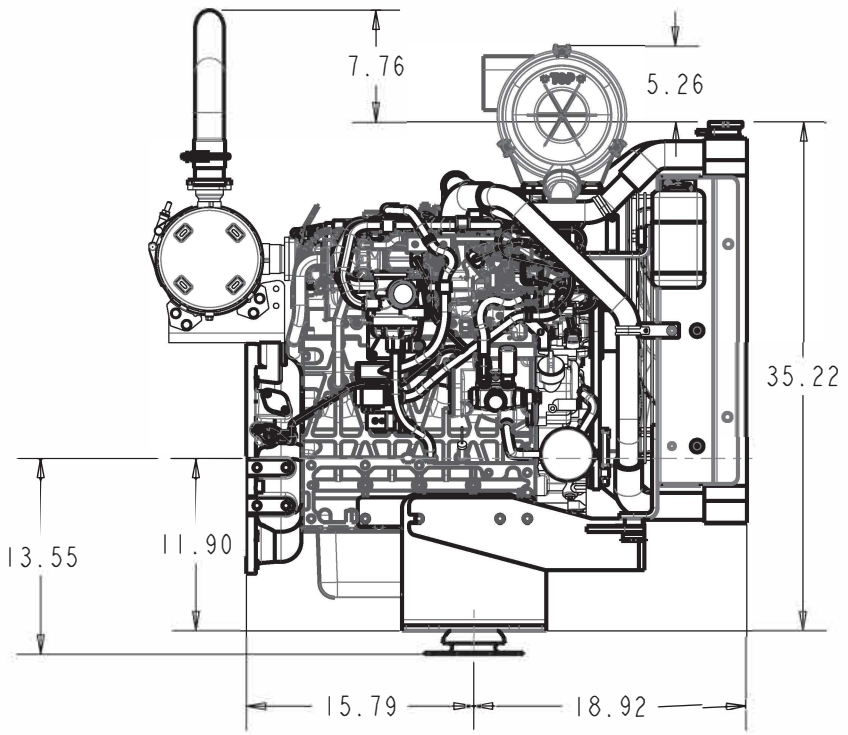
D1803TI-BG

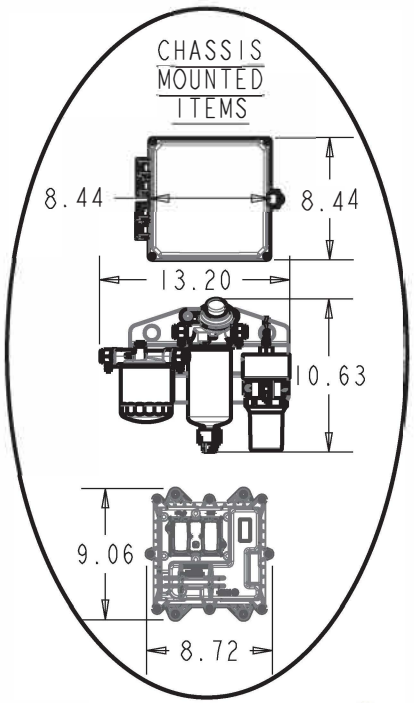
SCALE: 0.075

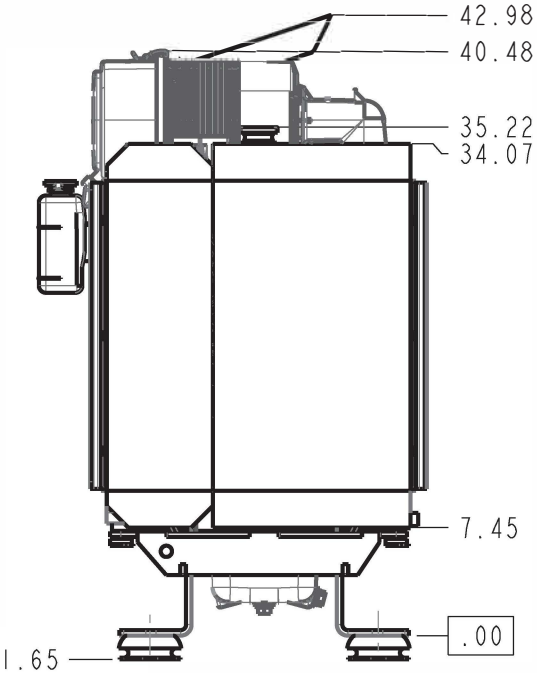
Sheet 1 of 2

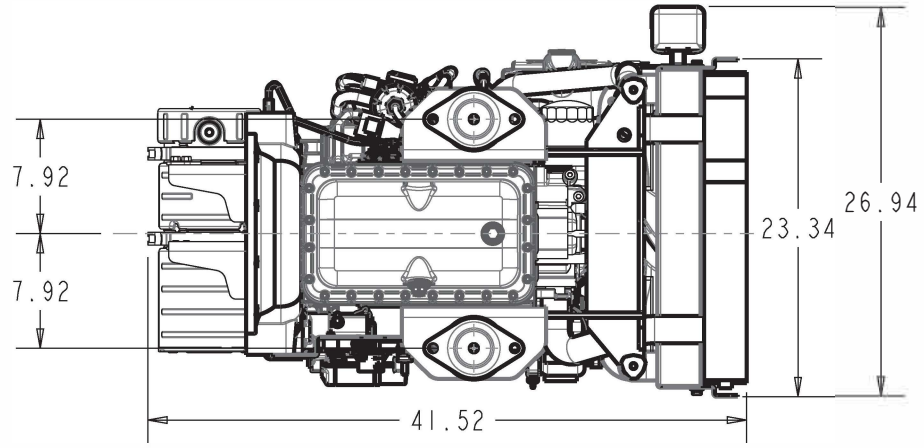
BECAUSE WE ARE CONTINUOUSLY IMPROVING OUR PRODUCTS AND SERVICES, EPS RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT PRIOR NOTICE

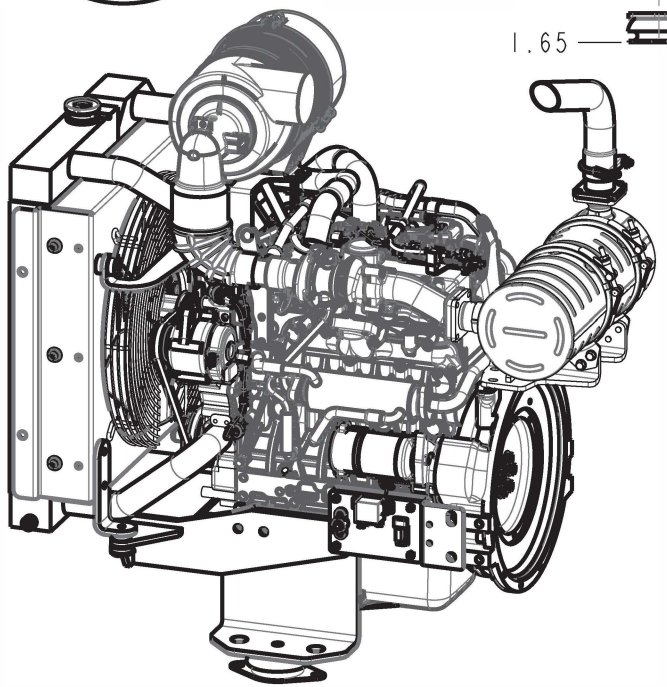
V1803TI CONSTANT SPEED
1800 RPM, 60 Hz ONLY
EMISSION TIER: TIER 4 FINAL FUEL
REF. SAE J1349:











S0L2-M - Technical Data Sheet

Standards

Stamford industrial alternators meet the requirements of IEC EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100 and AS1359. Other standards and certifications can be considered on request.

Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Excitation and Voltage Regulators

Excitation System	
AVR Type	**AVR Power**
VITA01	Self-Excited / Aux winding
Voltage Regulation	± 0.5%
No Load Excitation Voltage (V)	13 V
Full Load Excitation Voltage (V)	51 V

STAMFORD

S0L2-M Winding 311 / 711

Electrical Data								
Insulation System	Class H							
Stator Winding	Double Layer Concentric							
Winding Pitch	Two Thirds							
Winding Leads	12							
Winding Number	311/711							
Number of Poles	4							
IP Rating	IP23							
RFI Suppression	EN 61000-6-2 & EN 61000-6-4, refer to factory for others							
Waveform Distortion	NO LOAD < 2.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
Short Circuit Ratio	1/Xd							
Steady State X/R Ratio	6.0							
	50 Hz				**60 Hz**			
Telephone Interference	THF<2%				TIF<75			
Voltage Series Star	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
Voltage Parallel Star	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
Voltage Series Delta	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA Base Rating (Class H)	22.9	25	25	N/A	26.4	28	N/A	30
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.318	2.284	2.122		2.676	2.537		2.284
X'd Dir. Axis Transient	0.154	0.152	0.141		0.178	0.169		0.152
X"d Dir. Axis Subtransient	0.129	0.127	0.118		0.149	0.141		0.127
Xq Quad. Axis Reactance	1.439	1.418	1.317		1.661	1.575		1.418
X"q Quad. Axis Subtransient	0.162	0.159	0.148		0.187	0.177		0.159
XL Stator Leakage Reactance	0.083	0.082	0.076		0.096	0.091		0.082
X2 Negative Sequence Reactance	0.236	0.233	0.216		0.272	0.258		0.233
X0 Zero Sequence Reactance	0.050	0.050	0.046		0.058	0.055		0.050
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.153	3.106	2.886		3.639	3.450		3.106
X'd Dir. Axis Transient	0.177	0.175	0.162		0.204	0.194		0.175
X"d Dir. Axis Subtransient	0.151	0.149	0.138		0.174	0.165		0.149
Xq Quad. Axis Reactance	1.482	1.460	1.357		1.711	1.622		1.460
X"q Quad. Axis Subtransient	0.194	0.191	0.178		0.224	0.212		0.191
XL Stator Leakage Reactance	0.094	0.092	0.086		0.108	0.103		0.092
X2 Negative Sequence Reactance	0.283	0.279	0.259		0.327	0.310		0.279
X0 Zero Sequence Reactance	0.059	0.058	0.054		0.068	0.064		0.058
Time Constants (Seconds)								
T'd TRANSIENT TIME CONST.	0.021							
T''d SUB-TRANSTIME CONST.	0.002							
T'do O.C. FIELD TIME CONST.	0.552							
Ta ARMATURE TIME CONST.	0.006							

STAMFORD

S0L2-M Winding 311 / 711

Resistances in Ohms (Ω) at 22°C	
Stator Winding Resistance (Ra)	0.290 Ω per phase series star connected
Rotor Winding Resistance (Rf)	0.747 Ω
Exciter Stator Winding Resistance	15.42 Ω
Exciter Rotor Winding Resistance	0.106 Ω per phase
Positive Sequence Resistance (R1)	0.362 Ω
Negative Sequence Resistance (R2)	0.417 Ω
Zero Sequence Resistance (R0)	0.362 Ω
Aux Winding Resistance (with winding 711 only)	5.160 Ω

Mechanical data		
Cooling Air	0.105 m³/sec (50Hz)	0.126 m³/sec (60Hz)
Shaft and Keys	All alternator rotors are dynamically balanced to better than BS6861: Part 1 Grade 2.5 for minimum vibration in operation.	
Bearing	1 Bearing	2 Bearing
Weight Complete Alternator	124 kg	135 kg
Weight Wound Stator	49.0 kg	49.0 kg
Weight Wound Rotor	42.947 kg	43.945 kg
Moment of Inertia	0.1588 kgm2	0.1591 kgm2
Shipping weight in a Crate	159 kg	174 kg
Packing Crate Size	930X590X760 mm	930X590X760 mm
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	BALL. 6309-2RS (ISO)
Bearing Non-Drive End	Ball Bearing, 6305-2RS1	Ball Bearing, 6305-2RS1

STAMFORD

S0L2-M Winding 311 / 711

RATINGS AT 0.8 POWER FACTOR

	Class - Temp Rise	Standby - 163/27℃				Standby - 150/40℃				Cont. H - 125/40℃				Cont. F - 105/40℃			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	25.2	27.5	27.5	N/A	24.4	26.7	26.7	N/A	22.9	25.0	25.0	N/A	20.8	22.8	22.8	N/A
	kW	20.2	22.0	22.0	N/A	19.5	21.4	21.4	N/A	18.3	20.0	20.0	N/A	16.6	18.2	18.2	N/A
	Efficiency (%)	86.3	85.8	86.0	N/A	86.7	86.2	86.4	N/A	87.5	87.2	87.3	N/A	88.4	88.0	88.1	N/A
	kW Input	23.4	25.6	25.6	N/A	22.5	24.8	24.7	N/A	20.9	22.9	22.9	N/A	18.8	20.7	20.7	N/A

60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	29.0	30.8	N/A	33.0	28.2	29.9	N/A	32.0	26.4	28.0	N/A	30.0	24.0	25.5	N/A	27.3
	kW	23.2	24.6	N/A	26.4	22.6	23.9	N/A	25.6	21.1	22.4	N/A	24.0	19.2	20.4	N/A	21.8
	Efficiency (%)	87.5	87.4	N/A	87.3	87.8	87.7	N/A	87.7	88.6	88.5	N/A	88.5	89.4	89.3	N/A	89.3
	kW Input	26.5	28.2	N/A	30.2	25.7	27.3	N/A	29.2	23.8	25.3	N/A	27.1	21.5	22.8	N/A	24.5

De-Rates

All values tabulated above are subject to the following reductions:

- 3% for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- 3% for every 5℃ by which the operational ambient temperature exceeds 40℃
- For any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60℃ and altitude exceeding 4000 meters must be referred to applications.

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (http://stamford-avk.com/)

Note: Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

PDG
Powerhouse Diesel Generators
Rugged. Reliable. Powerful.
www.pdgpower.com

PwrNano AMF 5

Controller for single gen-set applications

Datasheet

Product description

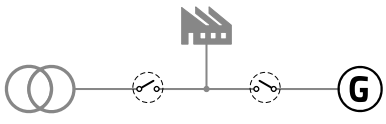
- Single Gen-set controller for stand-by and prime-power applications
- All-in-one intuitive and powerful PC tool for configuration, monitoring and control, locally or remotely
- Easy to install, configure, use and monitor

Key features

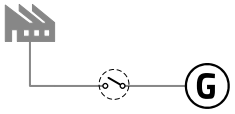
- Stand-by and prime-power application in one unit
- Auto Mains Failure application functionality
- Manual (or) Remote Start/Stop application functionality
- Large graphic monochromatic backlighted LCD display with contrast adjustment
- Full 3-phase current and voltage measurement
- 6 binary outputs, 4 + 1 binary inputs, 3 analog inputs (2x R + 1x R/U/I)
- +5V output reference for analog inputs
- Emergency Stop functionality (E-Stop)
- Slot for extension plug-in module (Modbus, Internet)
- ECU support (Tier 4 Final, Stage V)
- Real Time Clock with battery backup (full calendar)
- Power over USB-C for controller configuration and firmware update
- Low power mode
- True RMS measurement
- Remote monitoring support (AirGate 2.0, WSV, InteliScada)
- Individually calibrated and checked
- Internet access using Ethernet/4G-GPS plug-in module, Modbus RTU
- Geo-fencing using 4G-GPS plug-in module
- Detailed history log with up to 100 records
- User setpoints and protections
- Two languages in the controller
- Translator functionality
- User Access Management
- Cyber security improvement
- Multi-purpose schedulers and timer
- Maintenance timer
- Modbus register mapping possibility
- Cut-out: 118 × 92 mm
- Low Noise EMC design

Application overview

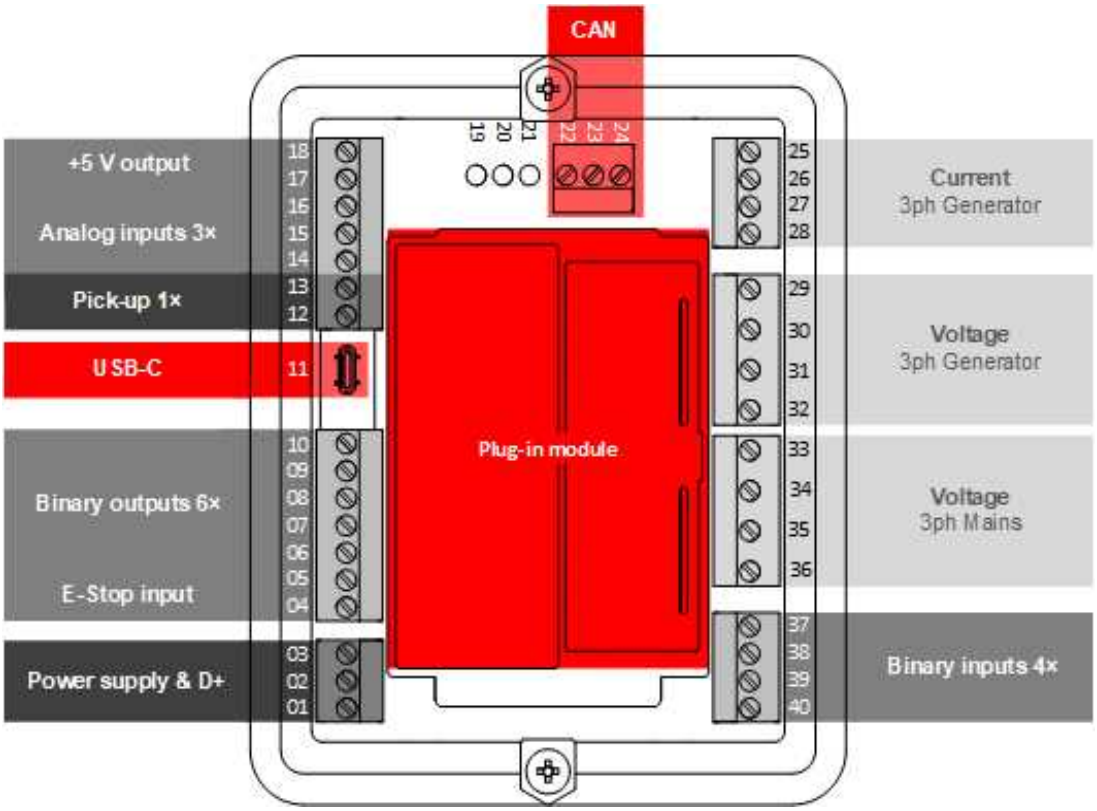
AMF
Mains & Generator Circuit Breaker

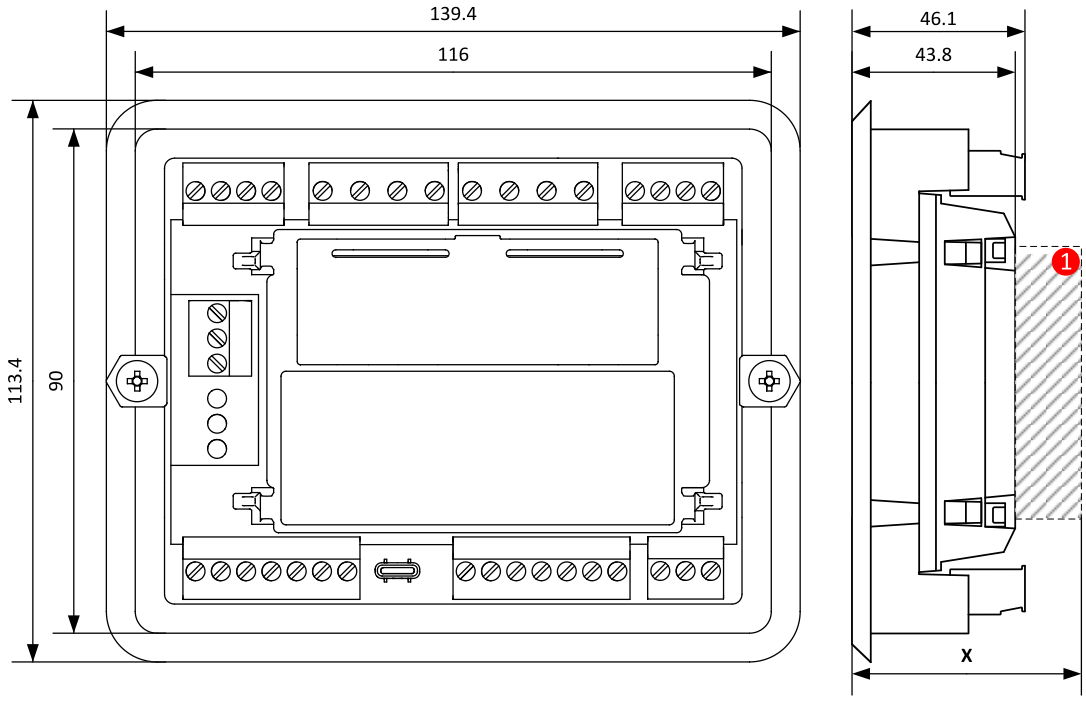


MRS
Generator Circuit Breaker



Dimensions, terminals and mounting





Note: ❶ *The final depth "X" of the controller depends on the selected plug-in module – it can vary between 43.8 mm and 62 mm. Mind also the size of connectors and cables (e.g. in case of RS232 connector, add about 60 mm more for standard RS232 connector and cable).*

Note: *The controller is to be mounted into panel doors as a standalone unit using provided holders. The requested cutout size is 118 × 92 mm. Use the screw holders delivered with the controller to fix the controller into the door.*

Technical data

Power supply

Power supply range	8-36 VDC
Power consumption (without modules)	2 W
RTC battery	Replaceable (3 V)
Fusing power	2 A w/o BOUT consumption
E-Stop fusing	10 A
Max. power dissipation	5.5 W

Operating conditions

Protection degree (front panel)	IP50 , IP65 with optional gasket seal
Operating temperature	-20 ˚C to +70 ˚C
Max. operating altitude	2000 m above sea level
Storage temperature	-30 ˚C to +80 ˚C
Operating humidity	95 % non-condensing (EN 60068-2-30)
Vibration	5-25 Hz, ± 1.6 mm 25-100 Hz, a = 400 m/s^2
Shocks	a = 500 m/s^2
Surrounding air temperature rating 70 °C Suitable for pollution degree 2	

D+

Max. output current	250 mA

Linear measurement and protection range

Measurement inputs	3ph-n Gen, 3ph-n Mains
Measurement range	10-277 V AC* / 10-480 V AC (EU) 10-346 V AC* / 10-600 V AC (US/Canada)
Max measured voltage	350 V AC Ph-N 660 V AC Ph-Ph
Accuracy	2 %
Frequency range	5-80 Hz guaranteed meas range 30-70 Hz (accuracy 0.1 Hz)
Input impedance	0.72 MΩ ph-ph , 0.36 MΩ ph-n

Note: **) Maximum effective voltage on the voltage terminals must be lower than 300 V against minus battery voltage and for overvoltage CAT III or lower.*

Display

Type	Graphical backlighted monochromatic 3.2"
Resolution	132 × 64 px

Communications

USB Device	USB-C
CAN	Non-isolated, 250 / 50 kbps, Terminator impedance 120 Ω Fixed Internal Terminator

Current measurement

Measurement inputs	3ph Gen current
Measurement range	/1A or /5A
Max. allowed current	10 A
Accuracy	±30 mA for 0-2 A; 2 % of value for 2-5 A
Input impedance	<0.1 Ω

E-Stop

Dedicated terminal for safe E-Stop input.
Physical supply for binary outputs 1 & 2.

Binary inputs

Number	4
Close/Open indication	0-2 VDC close contact 6-36 VDC open contact

Binary outputs

Number	6
Max. current	BO1,2=5 A (60 °C); BO3-6=0.5 A
Switching to	positive supply terminal

Analog inputs

Number	1x switchable (R/U/I) 2x R
Range	R = 0-2500 Ω; U = 0-10 V; I = 0-20 mA
Accuracy	R: ±3 % ± 7 Ω in range 0-250 Ω R: ±6 % in range 250-2500 Ω U: ±1.5 % ±150 mV I: ±1.5 % ±0.3 mA

+5 V Power supply output

Max. current	25 mA

Magnetic pickup

Voltage input range	4 Vpk-pk to 50 Vpk-pk in range 4 Hz to 1 kHz 6 Vpk-pk to 50 Vpk-pk in range 1 to 5 kHz 10 Vpk-pk to 50 Vpk-pk in range 5 to 10 kHz
Frequency input range	4 Hz to 10 kHz
Frequency measurement tolerance	0.2 % from measured value

Available accessories

Product	Description	
Gasket IN2	Additional gasket for InteliNano AMF controllers, protection degree IP65 (front panel)	

Available plug-in modules

Product	Description	Order code
CM-RS232-485	Dual port (RS232 & RS485) plug-in communication module	
CM2-4G-GPS	4G & GPS plug-in communication module	
CM3-Ethernet	Internet / Ethernet plug-in communication module for AirGate connection only	

Note: *Controller has one slot for plug-in modules.*

Note: *Plug-in module is supported on controller hardware version HW 2.0 or higher.*

Functions and protections

Support of functions and protections as defined by ANSI (American National Standards Institute):

Description	ANSI code	Description	ANSI code
Master unit	1	**Current unbalance**	46
Stopping device	5	**Negative sequence voltage**	47
Multifunction device	11	**Incomplete sequence relay**	48
Underspeed	14	**Overcurrent**	50/50TD
Overspeed	12	**Breaker failure**	50BF
Starting-to-running transition contactor	19	**Overvoltage**	59
Thermal relay	26	**Aux Over Voltage**	59X
Undervoltage	27	**Pressure switch**	63
Aux Battery Under Voltage	27X	**Liquid level switch**	71
Annunciator	30	**Reclosing relay**	79
Overload (real power)	32P	**Overfrequency**	81O
Reverse Power	32R	**Underfrequency**	81U
Master sequence device	34	**Auto selective control/transfer**	83

Certifications and standards

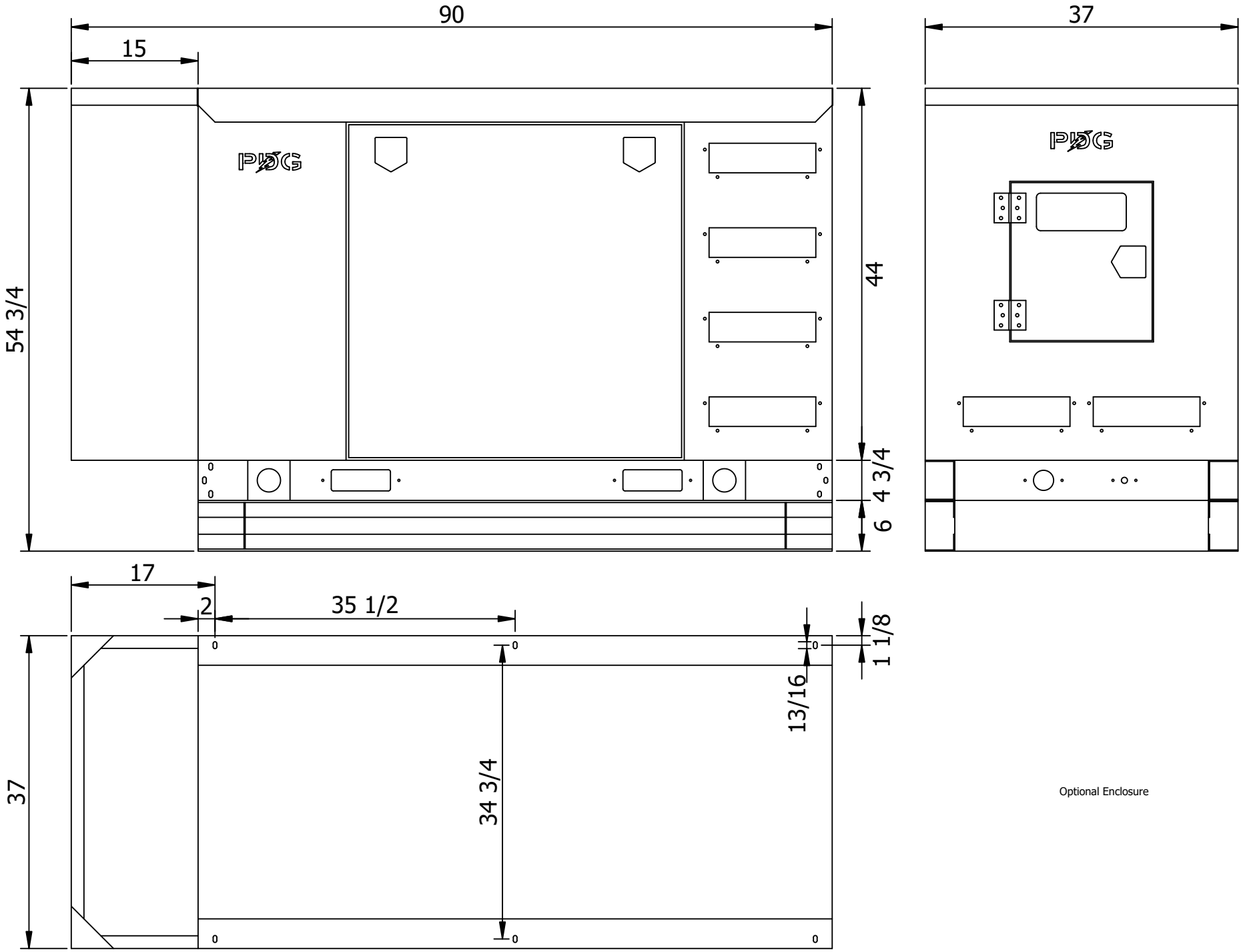
- EN 61000-6-2
- EN 61000-6-4
- EN 61010-1
- EN 60068-2-1 (-20 °C/16 h)
- EN 60068-2-2 (70 °C/16 h)
- EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 40 m/s^2)
- EN 60068-2-27 (a=500 m/s^2; T=6 ms)
- EN 60068-2-30:2005 25/55°C, RH 95%, 48hours
- EN 60529 (front panel IP50, front panel IP65 with gasket, back side IP20)
- UL 6200

c UL us LISTED

CE

UK CA

Optional Enclosure



Optional Enclosure

PDG
POWERHOUSE DIESEL GENERATORS
RUGGED. RELIABLE. POWERFUL.

Fuel Tank Options Available

Custom D.O.T. and UL Tanks For all Applications

Enclosures Available

PDG Enclosures are made with Aluminum and are coated with industrial grade synthetic powder coat for maximum durability. Fasteners, hinges, latches are stainless steel..

Standard Enclosure Color is PDG Tan. Additional Colors are Available Upon Request

POWERHOUSE DIESEL GENERATORS
RUGGED. RELIABLE. POWERFUL.

PDG
POWERHOUSE DIESEL GENERATORS
RUGGED. RELIABLE. POWERFUL.

Lug and Camlock Connections Available

Various Optional D.O.T. Trailer Configurations Available

Various Optional D.O.T. Trailer Configurations Available

POWERHOUSE DIESEL GENERATORS
RUGGED. RELIABLE. POWERFUL.

1616 James P Rodgers Dr. Valdosta, GA. 31601
(229)671-9171 Fax:(229)244-5326
WWW.PDGPOWER.COM