SUBMITTAL ID: 2

Project Owner: City of Wichita , Kansas

Project Title: Sanitary Sewer Improvement Lift Station #16

Project Number: 468-2020-019216 S0013

Subject: Sanitary Sewer Improvement Lift Station #16

Manufacturer/Supplier: Atlas Electric

Specification Section: Electric Gear-Generator,

Submitted By: Wildcat Construction Co ., Inc.

SUBMITTAL DATA

- [x] FOR APPROVAL
- [x] REVIEWED
- [ ] REVIEWED AS NOTED
- [ ] REVISE AND RESUBMIT

FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS.

DATE 10.28.2024 BY ____________

WILDCAT CONSTRUCTION CO., INC.

Wildcat Construction Co., Inc.
P.O. Box 9163
Wichita, KS 67277

Office: (316) 945-9408
Fax: (316) 942-4012

Submittals
For
City of Wichita
SS Improvements lift station #16

General Contractor
Wildcat Construction

Engineer
PEC

Electrical Contractor
Atlas Electric, LLC

Generator and Transfer Switch

ATLAS ELECTRIC, L.L.C .
ELECTRICAL SUBMITTALS
___X__ APPROVED
______ APPROVED AS NOTED
______ RESUBMIT AS NOTED

BY Jeff Keys

DATE October, 28, 2024

1607 N. Wabash, 67214 • Wichita, KS
(316) 858-1560 • Fax (316) 858-1564

CENTRAL

POWER SYSTEMS & SERVICES

A Rolls-Royce solution

Engineering Data and Proposal
This proposal has been prepared specifically for:

City of Wichita Sanitary Sewer Improvements Pump 16

It contains all the necessary literature, drawings and component information for the following equipment:

MTU 8V0071 GS50 Generator

Contact:

Mike Echelberry
316-789-7370 Office
316-619-5168 Mobile
mike.echelberry@cpower.com

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BILL OF MATERIALS

Model:	MTU 8V0071 GS50
Quantity:	1
Output:	50kW, 63kVA, 174Amps
Ratings:	Emergency Standby, NFPA 110, UL2200
Voltage:	208V, 3 Phase, 12 Wire
Engine:	Model: PSI 5.7L EPA Certified for Emergency Standby Single Stage Air Cleaner
Cooling System:	Unit Mounted Radiator, 50 °C
Block Heater:	-20° F, 120 Volt Input, 1-Phase, 1500W Output, with isolation valves
Alternator:	105°C with PMG Excitation
Control Panel:	MGC - 1520 Control Panel
Circuit Breaker:	150Amp, 3 Pole, 100% Rated with LI Trip
Battery:	Heavy Duty Lead Acid Battery with Rack and Cables
Battery Charger:	10 Amp**,** 120V Input, Mounted and Wired
Enclosure:	Level 1, Weather Enclosure, Steel
Silencer:	Critical Grade Silencer
Fuel Tank:	Fuel Tank NOT Included
Annunciator:	No Remote Annunciator
Owner's Manual:	1 ea., USB & Printed
Warranty:	5 Year Standard Limited Comprehensive Warranty

CENTRAL
POWER SYSTEMS & SERVICES

A Rolls-Royce solution

Generator Data Sheet

Project Name	City of Wichita Pump 16					Date: 10/9/2024
Model	8V0071 GS50					
Voltage	208	VAC				
Power Output	50	kW				
Number of Phases	3					
Dimensions & Weights	Length	Width	Height	Weight		Notes:
Base / Tank	N/A	N/A	N/A	-	Pounds	Empty Tank Weight
Generator	87.38"	40"	52.2"	2,940		
Enclosure	86"	40"	70.95"	-		
				-		
Total	87.38"	40"	70.95"	2,940		
Remote Radiator	N/A	N/A	N/A	N/A		
Remote Fuel Tank	N/A	N/A	N/A	N/A		
Number of Shipped Pieces:			1			
		Volts	Phase	Ampacity	# of Circuits	
Main Breaker #1	☑	208	3	150		**Pull all Stranded Wire**
Main Breaker #2	☐					
Main Breaker #3	☐					
Load Center	☐					
Convenience Outlet	☐					
A/C Light Package	☐					
Battery Heater	☐					
Block Heater	☑	120	1	12.5	1	
Battery Charger	☑	120	1	6.6	1	
Generator Heater Strip	☐					
Powered Louvers	☐					
Generator Connected to BMS	☐	MODBUS ☐		Ethernet ☐		
Remote Generator Kill Switch	☑	2- Wires; 14 Gauge Stranded				
Generator Start Signal	☑	3- Wires; 14 Gauge Stranded				
Remote Annunciator Panel	☐					
Annunciator cable type / qty of conductors						
Starting Batteries	Group	Quantity		CCA		
	31	1		950 Amps		

Note: If this form does not appear with fillable fields, navigate to *Edit > Preferences > Documents > PDF/A View Mode*. In the **View documents in PDF/A mode** drop-down list, select **Never**. Click **OK**.

Form A - Engine Generator Set Request for Start-Up

Requested Date: ______________________

☐ First Visit ☐ Follow-Up Visit

Instructions

This form must be completed and signed by the customer/client to ensure proper installation of the generator set prior to scheduling a start-up date and to request start-up service from an authorized MTU distributor or regional service center.

Applicant Contact Details

Company: ______________________

Name: ______________________

Telephone: ______________________

Email: ______________________

Project Details

Project Name: ______________________

Project Number: ______________________

Site Address: ______________________

____

Engine Generator Set Nameplate

Model Number: ______________________

Serial Number: ______________________

Rating: ______________________

Hz: __________ kW: __________

kVA: __________ Volts: __________

Phase: __________ Amps: __________

Engine

Model Number: ______________________

Serial Number: ______________________

Power: __________ RPM: __________

Fuel Type

☐ Diesel ☐ NG ☐ LP Vapor ☐ Liquid LP ☐ Other

ATS (☐ Yes ☐ No)

Manufacturer: ______________________

Model Number: ______________________

Serial Number: ______________________

Voltage: __________ Current: __________

Poles: __________

Utility Service

Volts: __________ Phase: __________

Phase Rotation: __________

Load Bank (☐ Yes ☐ No)

Capacity: ______________________

Pre-Start-Up Validation Checklist

	Yes	No	N/A
Unit set in final location	☐	☐	☐
Radiator ducted to air discharge louvers	☐	☐	☐
Intake and discharge air louvers installed and wired	☐	☐	☐
Unit filled with oil to proper level	☐	☐	☐
Unit filled with coolant to proper level	☐	☐	☐
Battery filled and fully charged	☐	☐	☐
Battery charger mounted with AC and DC wiring	☐	☐	☐
Block heater wired to correct AC power supply	☐	☐	☐
Switch gear/transfer switch connections made	☐	☐	☐
All other AC and DC electrical connections made	☐	☐	☐
Fuel inlet and return lines run between the unit and fuel storage system	☐	☐	☐
Fuel storage system filled with sufficient quantity for commissioning	☐	☐	☐
Exhaust system properly installed and supported	☐	☐	☐
Radiator and engine generator set room is free of debris	☐	☐	☐
Permission for use of site load or request load bank	☐	☐	☐
Other: ______________________	☐	☐	☐

NOTE: If the tasks on this checklist are not adequately completed upon arrival of the authorized MTU technician or for reasons beyond the control of MTU, an additional start-up charge may be incurred. Please resubmit this form when items are addressed.

Additional Comments/Notes:

____

____

____

____

Completed by (signature): ______________________

Print Name: ______________________

Company: ______________________

Date: ______________________

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Gas Generator Set

mtu 8V0071 GS50

50 kWe/60 Hz/Standby/208 - 600V

System ratings

Voltage (L-L)	208V †
Phase	3
PF	0.8
Hz	60
Natural Gas (NG)	
Amps	174
kW/kVA	50/62.5

NG and LP	
skVA@30% voltage dip	129
Generator model	361CSL1601
Temp rise	130 °C/40 °C
Connection	12 LEAD WYE

† UL 2200 offered

Certifications and standards

- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- UL 2200 – optional (refer to *System ratings* for availability)
- Performance Assurance Certification (PAC)
  - Generator set tested to ISO 8528-5 for transient response
  - Verified product design, quality and performance integrity
  - All engine systems are prototype and factory tested
- Power rating
  - Accepts rated load in one step per NFPA 110

A Rolls-Royce solution

Standard features*

- Single source supplier
- Global product support

- 5.7L NA engine
  - 5.7 liter displacement
  - 4-cycle
- Optional fuels: LP liquid and dual fuel
- Engine-generator resilient mounted
- Complete range of accessories
- Cooling system
  - Integral set-mounted
  - Engine-driven fan
- Generator
  - Brushless, rotating field generator
  - 2/3 pitch windings
  - 300% short circuit capability with optional Permanent Magnet Generator (PMG)
- Digital control panel(s)
  - UL recognized NFPA 110
  - Complete system metering
  - LCD display

Standard equipment*

Engine
- Air cleaner
- Oil pump
- Oil drain extension and shut-off valve
- Full flow oil filter
- Jacket water pump
- Thermostat
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 12V
- Governor - electronic isochronous
- Base - formed steel
- Industrial flywheel and bell housing
- Charging alternator - 12V
- Battery box and cables
- Flexible fuel connectors
- Flexible exhaust connection
- EPA certified engine

Generator
- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Self-ventilated and drip-proof
- Superior voltage waveform
- Solid state, volts-per-hertz regulator
- ± 1% voltage regulation no load to full load
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 1-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)
- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- SAE J1939 engine ECU communications
- Windows®-based software
- Multilingual capability
- Communications to remote annunciator
- Programmable input and output contacts
- UL recognized
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

* Represents standard product only. Consult the factory/*mtu* Distributor for additional configurations.

Application data

Engine

Manufacturer	PSI
Model	5.7L NA
Type	4-cycle
Arrangement	8-V
Displacement: L (in^3)	5.7 (350)
Bore: cm (in)	10.2 (4)
Stroke: cm (in)	8.8 (3.5)
Compression ratio	9.4:1
Rated rpm	1,800
Engine governor	Bosch
Maximum power (NG): kWm (bhp)	78.1 (104.7)
Maximum power (LP): kWm (bhp)	84.4 (113.2)
Steady state frequency band	± 0.75%
Air cleaner	dry

Liquid capacity

Total oil system: L (gal)	4.73 (1.25)
Engine jacket water capacity: L (gal)	7.8 (2)
System coolant capacity: L (gal)	22.7 (6)

Electrical

Electric volts DC	12
Cold cranking amps under -17.8 °C (0 °F)	925
Batteries: group size	31
Batteries: quantity	1

Fuel inlet - vaporous supply

Fuel supply connection size	**NG**: 1-1/2" NPT
Fuel supply pressure: mm H_2O (in. H_2O)	178–279 (7–11)

Fuel inlet - liquid supply

Fuel supply connection size	#6 (3/8") female JIC 37° flare
Maximum fuel supply pressure: kPa (PSI)	2,150 (312)

Fuel consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG
At 100% of power rating: m^3/hr (ft^3/hr)	23.2 (818)
At 75% of power rating: m^3/hr (ft^3/hr)	19.3 (680)
At 50% of power rating: m^3/hr (ft^3/hr)	15.5 (547)

Cooling - radiator system

	NG and LPG
Ambient capacity of radiator: °C (°F)	50 (122)
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H_2O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	132.5 (35)
Heat rejection to coolant: kW (BTUM)	54.9 (3,120)
Heat radiated to ambient: kW (BTUM)	17.5 (993.2)
Fan power: kW (hp)	3.2 (4.3)

Air requirements

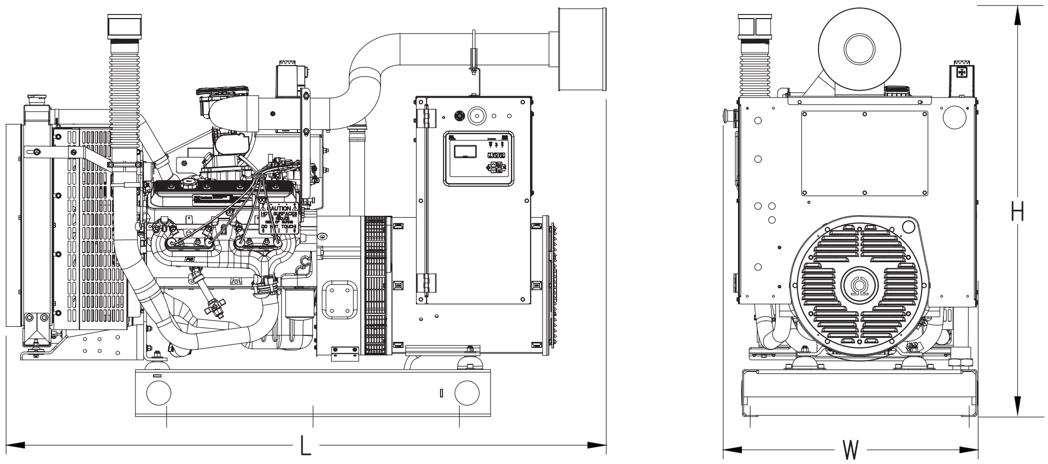
	NG and LPG
Aspirating: *m^3/min (SCFM)	4.9 (173)
Air flow required for radiator cooled unit: *m^3/min (SCFM)	138.4 (4,888)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m^3/min (SCFM)	90 (3,199)

* Air density = 1.184 kg/m^3 (0.0739 lbm/ft^3)

Exhaust system

	NG and LPG
Gas temperature (stack): °C (°F)	745 (1,373)
Gas volume at stack temperature: m^3/min (CFM)	15.8 (552.7)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H_2O)	10 (40)

Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

Emissions data

Fuel type	THC + NO_x	NMHC + NOx	CO
Natural gas	N/A	4.89	19.93

— All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

Rating definitions and conditions

— Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
— Nominal ratings at standard conditions: 25 °C and 300 meters (77 °F and 1,000 feet).
— Deration factor:
  - Consult your local ***mtu*** Distributor for altitude derations.
  - Consult your local ***mtu*** Distributor for temperature derations.

Digital Generator Set Controller Data Sheet

MGC-1500 Series

The MGC-1500 Series controllers include the following models which are described throughout this document.*

— MGC-1520

MGC Series Generator Set Controllers are rugged, reliable, and easy-to-use digital generator set control systems. The MGC-1500 Series is perfectly focused, combining rugged construction and microprocessor technology to offer a product that will hold up to almost any environment and is flexible enough to meet your application's needs.

PRODUCT HIGHLIGHTS

- Three-phase generator metering
- Engine metering
- Generator set control
- Engine and generator protection
- BESTCOMS*Plus*®
  - Windows®-based software for optional remote operation (Software can be downloaded at www.mtu-solutions.com)
  - Programming and setup software
  - Intuitive and powerful
  - Remote control and monitoring
  - Programmable logic
  - USB communications
- Suitable for rental generator sets with high/low sensing, single or three phase override, wye/delta/grounded delta configurable, and alternate frequency override (50/60 Hz)
- Resistive sender inputs for oil pressure and coolant temperature
- Multilingual capability
- SAE J1939 Engine Control Unit (ECU) communications (Refer to *Configuration Options*)
- Remote annunciation with RDP-110
- Event recording (up to 30 events in non-volatile memory)
- Extremely rugged, fully potted design
- Seven programmable contact inputs with Input 1 programmed to recognize an emergency stop
- Start, run, and prestart relays with four programmable outputs
- UL recognized,
- IP56 rating per IEC 60529
- NFPA-110 compatible
- Microprocessor based
- Complete system metering
- Expandable to meet customer needs

* Please refer to the last page of this data sheet for available MGC-1500 series configuration options. The MGC Series Controller Comparison Data Sheet is a available as a reference for all MGC series configuraton options..

DIAGRAM

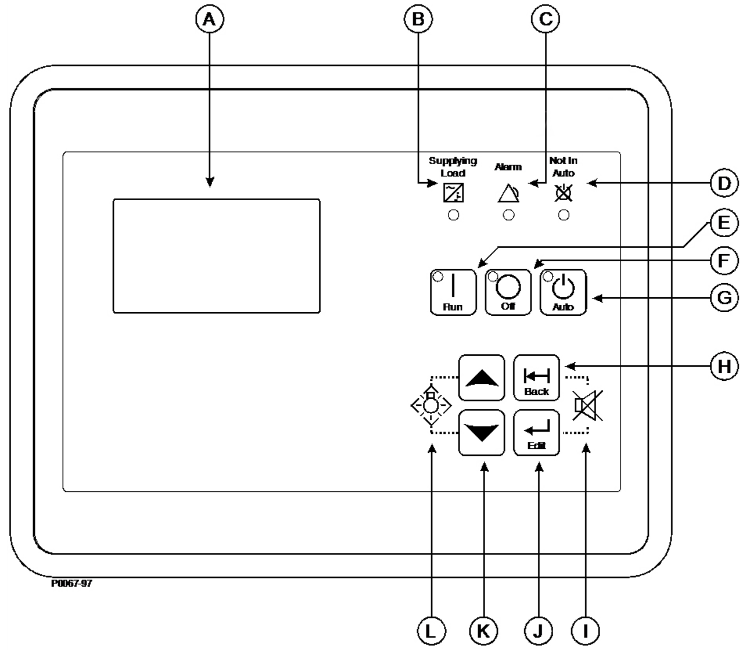


Figure 1: Front Panel Descriptions

A. Liquid crystal display
B. Supplying load indicator
C. Alarm indicator
D. Not in auto indicator
E. Run pushbutton and mode indicator
F. Off pushbutton and mode indicator
G. Auto pushbutton and mode indicator
H. Back pushbutton
I. Alarm silence pushbutton combination
J. Edit pushbutton
K. Arrow pushbuttons
L. Lamp test pushbutton combination

FUNCTIONS

Generator set protection

Generator ANSI codes
— Overvoltage (59)
— Overfrequency (81O)
— Voltage phase imbalance (47)
— Undervoltage (27)
— Underfrequency (81U)
— Overcurrent (50)

All generator set protection features are programmable as alarms, pre-alarms, status, or not used.

Alarms (shutdowns)
— Low oil pressure
— High coolant temperature
— Low coolant temperature
— Overspeed
— Overcrank
— Coolant temp sender fail (non-ECU engines)
— Oil pressure sender fail (non-ECU engines)
— Emergency stop
— Critical low fuel level (refer to *Configuration Options*)

Pre-alarms (warnings)
— Low oil pressure
— Low coolant temperature
— Weak battery voltage
— Low fuel level
— High fuel level
— High coolant temperature
— Battery overvoltage

All alarms and pre-alarms can be enabled or disabled via the BESTCOMSPlus® PC software or the front panel.
Additional custom alarms and pre-alarms are available upon request.

FUNCTIONS, continued

Generator set metering

- Generator parameters include voltage, current, real power (watts), apparent power (VA), and power factor. The view can be programmed to display up to 20 parameters using the scrolling and time delay feature.
- Engine parameters include oil pressure, coolant temperature, RPM, battery voltage, fuel level, engine runtime, and various SAE J1939 supported parameters.

Engine control

- Cranking control: cycle or continuous (quantity and duration fully programmable)
- Engine cooldown: smart cooldown function saves time and fuel
- Successful start counter: counts and records successful engine starts
- Timers:
  - Engine cooldown timer
  - Engine maintenance timer
  - Pre-alarm time delays for weak/low battery voltage
  - Alarm time delay for overspeed
  - Alarm time delay for sender failure
  - Arming time delays after crank disconnect:
    - Low oil pressure
    - High coolant temperature
  - Pre-crank delay
  - Continuous or cycle cranking time delay
  - Programmable logic timers

Event recording

The MGC-1500 Series has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set. Contains up to 30 event records each retaining numerous occurrences in memory. Time, date, and engine hour detail are available for the most current 30 occurrences within each event record.

Transfer switch control (Mains failure)

(Refer to *Configuration Options*)

The MGC-1500 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

- Any phase of bus voltage falls below the dead bus threshold
- Any phase of bus voltage is unstable due to overvoltage or undervoltage
- Any phase of bus voltage is unstable due to overfrequency or underfrequency

When conditions are met, the MGC-1500 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-1500 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-1500 Series will transfer the load back to the mains and stop the engine.

USB port

The USB communication port can be used with BESTCOMS*Plus*® software to quickly configure an MGC-1500 Series with the desired settings or retrieve metering values and event log records.

Programmable logic

The MGC-1500 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic™*Plus,* for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The Programmable logic control includes the selection of logic gates and timers with drag-and-drop technology to make it fast and simple.

Remote display panel annunciation

(Refer to *Configuration Options*)

The MGC-1500 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate many of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

SAE J1939 communications

(Refer to *Configuration Options*)

SAE J1939 CANBus communications allows the MGC-1500 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-1500 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicate these via SAE J1939 to the MGC-1500 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.

SPECIFICATIONS

Operating power
— Nominal: 12 or 24 VDC
— Range: 6 to 32 VDC
— Power consumption:
  - Sleep mode: 4.5 W
  - Normal operational mode: 6.5 W - Run mode, LCD heater off, three relays energized
  - Maximum operational mode: 14 W - Run mode, LCD heater on, seven relays energized
  - Battery ride-through: Withstands cranking ride-through down to 0 V for 50 ms (typical)

Current sensing (5 Amp CT inputs)
— Continuous rating: 0.1 to 5.0 Aac
— One second rating: 25 Aac
— Burden: 1 VA

Voltage sensing
— Range: 12 to 576 V rms, line-to-line
— Frequency range: 10 to 72 Hz
— Burden: 1 VA
— One second rating: 720 V rms

Contact sensing/input contacts
Contact sensing inputs include one emergency stop input and seven programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with an optional relay. All programmable inputs accept normally open, dry contacts. The factory may utilize up to three of these inputs.

Engine system inputs
— Fuel level sensing resistance range: 5 to 250 Ω nominal
— Coolant temperature sensing resistance range: 5 to 2,750 Ω nominal
— Oil pressure sensing resistance range: 5 to 250 Ω nominal
— Engine speed sensing:
  - Magnetic pickup or CANBus
    - Magnetic pickup voltage range: 3 to 35 V peak (6 to 70 V peak to peak)
    - Magnetic pickup frequency range: 32 to 10,000 Hz

Output contacts
— (7) total outputs: (3) 5 A @ 28 VDC and (4) 2 A @ 28 VDC
— The factory utilizes the following on each generator set which can be reprogrammed as needed:
  - (3) 5 A @ 28 VDC for Pre-start, Start, and Run
  - (4) 2 A @ 28 VDC for general purpose

Metering
Generator voltage (rms)
— Metering range: 12 to 576 VAC (direct measurement), up to 9,999 VAC (with appropriate voltage transformer)
— Accuracy: ±1% of programmed rated voltage or ±2 VAC (subject to accuracy of voltage transformer when used)

Generator current (rms)
— Generator current is measured at the secondary windings of 5 A CTs.
— Metering range: 0 to 5,000 Aac
— CT primary range: 1-5,000 Aac, in primary increments of 1 Aac
— Accuracy: ±3% of programmed rated current or ±3 Aac (subject to accuracy of CTs)

Generator frequency
— Metering range: 10 to 72 Hz
— Accuracy: ±0.25% or 0.05 Hz

Apparent power
— Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line)
— Accuracy: ±5% of the full-scale indication or ±4 kVA

Power factor
— Metering range: 0.2 leading to 0.2 lagging
— Accuracy: ±0.02

Real power
— Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
— Accuracy: ±5% of the full-scale indication or ±4 kW

Oil pressure
— Metering range: 0 to 150 psi or 0 to 1,034 kPa
— Accuracy: ±3% of actual indication or ±2 psi or ±12 kPa (subject to accuracy of sender)

Coolant temperature
— Metering range: 0 °C to 204 °C (32 °F to 410 °F)
— Accuracy: ±3% or actual indication or ±2° (subject to accuracy of sender).

Fuel level
— Metering range: 0 to 100%
— Accuracy: ±3% (subject to accuracy of sender)

Battery voltage
— Metering range: 6 to 32 VDC
— Accuracy: ±3% of actual indication or ±0.2 VDC

Engine RPM
— Metering range: 0 to 4,500 rpm
— Accuracy: ±2% of actual indication or ±2 rpm

Engine run time
— Engine run time is retained in non-volatile memory
— Metering range: 0 to 99,999 h; update interval: 6 min
— Accuracy: ±1% of actual indication or ±12 min

SPECIFICATIONS, continued

Metering, continued

Maintenance timer

- Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
- Metering range: 0 to 5,000 h; update interval: 6 min
- Accuracy: ±1% or actual indication or ±12 min

Generator protection functions

Overvoltage (59) and undervoltage (27)

- Pickup range: 70 to 576 VAC
- Activation delay range: 0 to 30 s

Overfrequency (81O) and underfrequency (81U)

- Pickup range: 45 to 66 Hz
- Pickup increment: 0.1 Hz
- Activation delay range: 0 to 30 s

Phase imbalance (47)

- Pickup range: 5 to 100 VAC
- Pickup increment: 1 VAC
- Activation delay range: 0 to 30 s
- Activation delay increment: 0.1 s

Overcurrent (51)

- Pickup range: 0.18 to 1.18 Aac (1 A current sensing)
- Time dial range: 0 to 7,200 s (fixed time curve)

Environmental

- Temperature
  - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
  - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt fog: ASTM B 17-73, IEC 68-2-11 (tested while operational)
- Ingress protection: IEC IP54 for front panel
- Shock: 15 G in three perpendicular planes
- Vibration: swept over the following ranges for 12 sweeps in each of three mutually perpendicular planes with each 15-minute sweep.
  - 5 to 29 to 5 Hz at 1.5 G peak for 5 min
  - 29 to 52 to 29 Hz at 0.036” DECS-A for 2.5 min
  - 52 to 500 to 52 Hz at 5 G peak for 7.5 min

Agency approvals

- UL approval: “cURus” approved to UL 6200
- NFPA Compliance: complies with NFPA Standard 110, standard for emergency and standby power

ADDITIONAL SPECIFICATIONS

Battery backup for real time clock

The MGC-1500 Series provides a real-time clock with capacitor backup that is capable of operating the clock for up to 24 hours after power is removed from the controller. As the capacitor nears depletion, an internal backup battery takes over and maintains timekeeping. The battery will maintain the clock for approximately 10 years, depending on conditions. The battery is not replaceable. The clock is used by the events recorder function to timestamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker management

The MGC-1500 Series is capable of controlling the generator breaker and the mains breaker. The status of the breakers is determined by using BESTlogic™Plus programmable logic to set up the GENBRK and MAINSBRK logic blocks. These logic blocks have outputs that can be configured to energize an output contact and control a breaker, as well as inputs for breaker control and status. The MGC-1500 Series will attempt to close a breaker only after verifying that it can be closed. If the breaker cannot be closed, the close request will be ignored. Only one breaker can be closed at a time. Synchronization is required before closing the breaker to a live bus. Closure to a dead bus can be performed after meeting dead bus threshold and timing requirements set by the user.

CONFIGURATION OPTIONS

Generator protection

	MGC-1520
Standard	
Phase Imbalance (47)	X
Overcurrent (50)	X
Overvoltage (59)	X
Undervoltage (27)	X
Underfrequency (81U)	X
Overfrequency (81O)	X
Reverse Power (32)	
Loss of Excitation (40Q)	
Enhanced	
Overcurrent (51)	
Vector Shift (78)	
Rate of Change of Frequency (81R)	
Ground Fault	

Note: Numbers in parentheses above are ANSI standard device numbers denoting which features the controllers support.

Inputs

	MGC-1520
Controller	
Digital	7
Analog (Dedicated)	-
Analog	-

Outputs

	MGC-1520
Controller	
Digital Form A, 30 Amp	-
Digital Form A, 5 Amp	3
Digital Form A, 2 Amp	4
Analog	-

Communication

	MGC-1520
ModBus RTU (RS-485)	
ModBus TCP-IP	
RDP-110	X
CANBus	X
Modem Interface (RS-232)	
Ethernet	

Metering

	MGC-1520
Bus 1 Voltage	
Single Phase	X
Three Phase	X
Bus 2 Voltage	
Single Phase	
Three Phase	
Current Transformers	
Generator	3
Auxiliary	-

Control Station Data Sheet

Break Glass Pushbutton

DESCRIPTION

The break glass pushbutton control station is designed for special applications in the emergency shutdown of electric circuits. The pushbutton is depressed, and the contacts are closed while the glass disc is in place. When the glass is broken with the hammer, the button returns to a normal extended position, opening the contacts. This action prevents the flow of the electric circuit during emergency shutdowns.

This control station with operators includes control station enclosure, emergency break glass pushbutton operator, hammer, and five glass discs.

FEATURES

— Heavy-duty indoor/outdoor constructed enclosure
— One or two snap-action contact blocks
— "STOP" legend

SPECIFICATIONS

— ***mtu*** Part Number: SUA35133
— Enclosure Material: Die cast zinc (painted red)
— Weight: 1.47 kg (3.25 lbs)
— Size: 30 mm (1.18 in)
— Contact Configuration: 1 N.O. / 1 N.C.
— Terminal Type: Screw clamp
— Enclosure Rating: NEMA 3/4/13
— Maximum Voltage Rating: 300 V
— Ampere Rating: 10 Amps
— Ratings: UL Listed,

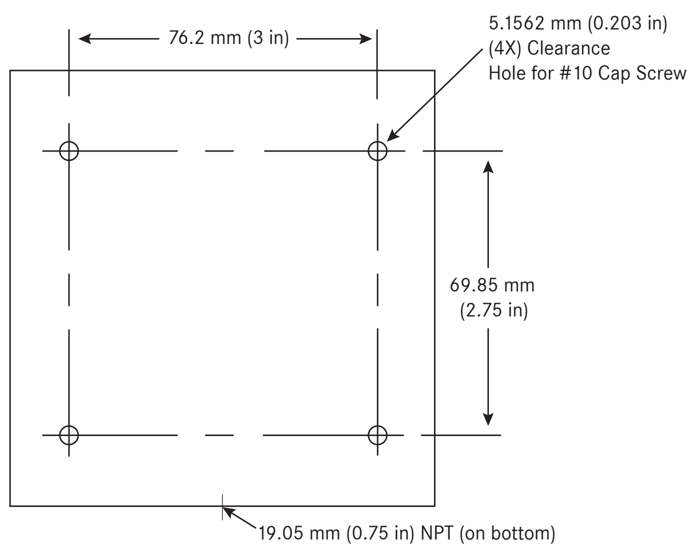
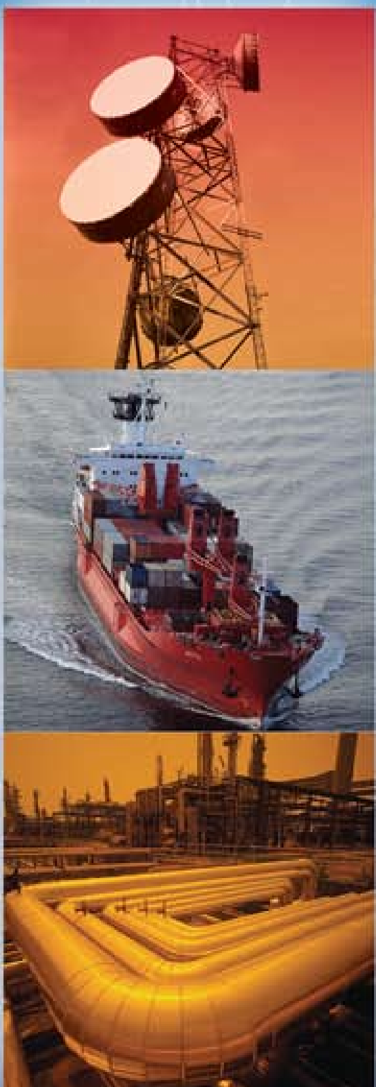


Figure 1: Mounting Dimensions

Subject to change. | WT00032338 | 2021-09

MAGNAPLUS®

Generator Ratings:
kW 5 to 430 (60 Hertz)
kVA 5 to 420 (50 Hertz)



MARATHON ELECTRIC
GENERATORS

ISO 9001:2008 Certified

MAGNAPLUS®

Innovation Performance Reliability

MAGNAPLUS® offers a field-adaptable, permanent magnet generator, coupled with the PM300 or DVR®2000E voltage regulator, for installations requiring fault current support or for applications involving non-linear loads. These regulators enhance generator performance and offer additional features, meeting the needs of the most difficult applications.

What makes the Marathon Electric approach unique?
Proven top performers in every respect, **MAGNAPLUS®** generators offer powerful performance, reliable power generation, and easy installation. With a full range of voltage regulator configurations, **MAGNAPLUS®** provides application flexibility to meet unique installation requirements. Ruggedly constructed with solid state technology, Marathon's SE350 voltage regulator, included with all standard equipment, is a solid performer.

These unique design features make **MAGNAPLUS®** the ideal general purpose generator for standby and prime power markets such as:

- **Agricultural**
- **Commercial**
- **Telecommunications**
- **Marine**
- **Construction**
- **Rental Markets**

Marathon Electric: The experts in your field
As an independent manufacturer with more than fifty years of experience as a leading supplier to the generator market, Marathon Electric is dedicated to designing and manufacturing the highest quality electrical products.

Marathon's commitment to long term customer support and an intensive product development program means you get more:

- **Design & Application Experience**
- **Advanced Testing Facilities**
- **Technical Support Staff**
- **Broad Product Line**

MARATHON ELECTRIC
GENERATORS

Product Features

Choice . . . abounds with more than 34 stock models ranging from 5–430 kW (60 Hz) and 5–420 kVA (50 Hz). All three-phase generators are 12-lead reconnectable, providing voltage and phase flexibility. For applications requiring price-sensible, dedicated single-phase generators, Marathon Electric stocks 26 models. Standard and optional conduit box designs are available to meet all customer requirements and to ease installation of accessories.

Easy Mount SAE Adapters . . . provided with every generator, are designed with easy drive disc access to simplify the mounting to all popular engines. Generator foot mounting location is unaffected by adapter changes. Special adaptations for automotive engines are available.

Class H Insulation System . . . utilizes an unsaturated polyester varnish for optimal insulation life and superior moisture protection. An epoxy overcoat is added for increased environmental protection. Field windings are wet wound with epoxy and designed to withstand overspeeds of 125%. All windings are 100% copper with class H insulation.

Linkboards . . . are standard to simplify voltage reconnection and support lead termination.

SE350 Voltage Regulator . . . is encapsulated for reliable performance in all environments. The SE350 regulator provides 1% regulation, underspeed protection, stability adjustment to optimize transient performance, and EMI filtering to commercial standards.

Optimized Electrical Design . . . with four-pole, brushless features, utilizes a 2/3 pitch winding to minimize harmonic distortion. The main rotor, utilizing Marathon Electric's unirotor construction, provides exceptional waveshape and voltage balance. The unirotor construction method incorporates full amortisseur windings facilitating parallel operation and non-linear loads.

Enhanced Ventilation . . . created by a high efficiency cast aluminum fan and optimized internal air flow patterns, maximizes heat transfer and minimizes hot spot differentials for extended winding life. Durable aluminum alloy fans avoid breakage problems associated with steel weldments or plastic fans.

Fully Guarded . . . for operator safety and generator protection. No rotating or electrically energized parts are exposed. All openings are covered by louvers or screens.

Heavy Duty Bearings . . . are double shielded and pre-lubricated for the life of the bearing. This helps resist contamination and ensures a maximum bearing life.

Design Specs and Agency Approvals . . . are important at Marathon. All MAGNAPLUS® units meet NEMA MG1-32, BS5000, and IEC 34-1 requirements. **MAGNAPLUS®** generators are also CE Certified, CSA Certified and fully UL Listed. Marine versions are available to meet American Bureau of Shipping, Lloyds, Det Norske Veritas, or Nippon Kaiji Kyokai requirements.

MARATHON ELECTRIC GENERATORS

MAGNAPLUS®

TYPICAL SUBMITTAL DATA

Prepared by: Mark R Bartz

MODEL: 361PSL1601 Winding: 1601 Date: 12/06/17

Kilowatt ratings at	1800 RPM	60 Hertz		12 LEADS	
kW (kVA)	3 Phase	0.8 Power Factor		Dripproof or Open Enclosure	
	CONTINUOUS ① ②			STANDBY ① ②	
Voltage*	NEMA B / 80 °C	NEMA F / 105 °C	NEMA H / 125 °C	NEMA F / 130 °C	NEMA H / 150 °C
208/416	45 (56)	50 (63)	55 (69)	55 (69)	58 (73)

① Rise by resistance method, Mil-Std-705, Method 680.1b. ② Machine rated for Max Ambient of 40 °C, Max Altitude 3300 ft

Submittal Data: 208 Volts*, 55 kW, 69 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase — **STD. CONNECTION**

Mil-Std-705B Method	Description	Value	Units	Mil-Std-705B Method	Description	Value	Units
301.1b	Insulation Resistance	>1.5 Meg	Ohms	505.3b	Overspeed	2250	RPM
302.1a	**High Potential Test**			507.1c	Phase Sequence CCW-ODE	ABC	
	Main Stator	1480	Volts	508.1c	Voltage Balance, L-L or L-N	0.2%	
	Main Rotor	1500	Volts	601.4a	L-L Harmonic Max - Total (Distortion Factor)	3.5%	
	Exciter Stator	1500	Volts				
	Exciter Rotor	1500	Volts	601.4a	L-L Harmonic Max - Single	2.5%	
	PMG Stator	1500	Volts	601.1c	Deviation Factor	7.0%	
401.1a	Stator Resistance, Line to Line Low Wye Connection	0.066	Ohms	---	TIF (1960 Weightings)	<50	
				---	THF (IEC, BS & NEMA Weightings)	<2%	
	Rotor Resistance	0.81	Ohms				
	Exciter Stator	23.5	Ohms				
	Exciter Rotor	0.12	Ohms				
	PMG Stator	2.1	Ohms				
410.1a	No Load Exciter Field Amps at 208 Volts Line to Line	0.53	A DC		**Additional Prototype Mil-Std Methods are Available on Request.**		
420.1a	Short Circuit Ratio	0.492					
421.1a	Xd Synchronous Reactance	2.746	PU	--	Generator Frame	361	
		1.728	Ohms	--	Type	MagnaPlus	
422.1a	X2 Negative Sequence React.	0.248	PU	--	Insulation	Class H	
		0.156	Ohms	--	Coupling - Single Bearing	Flexible	
423.1a	X0 Zero Sequence Reactance	0.059	PU	--	Amortisseur Windings	Full	
		0.037	Ohms	--	Excitation	Ext. Voltage Regulated, Brushless	
425.1a	X'd Transient Reactance	0.195	PU	--	Voltage Regulator	SE350E	
		0.123	Ohms	--	Voltage Regulation	1.00%	
426.1a	X''d Subtransient Reactance	0.161	PU				
		0.101	Ohms				
--	Xq Quadrature Synchronous	-	PU	--	Cooling Air Volume	700	CFM
		-	Ohms	--	Heat rejection rate	336	Btu's/min
427.1a	T'd Transient Short Circuit Time Constant	0.048	Sec	--	Full load current	190.8	Amps
				--	Minimum Input hp required	81.7	HP
428.1a	T''d Subtransient Short Circuit Time Constant	0.008	Sec	--	Full load torque	238	Lb-ft
				--			
430.1a	T'do Transient Open Circuit Time Constant	0.68	Sec				
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.01	Sec	--	Weight	569	lbs

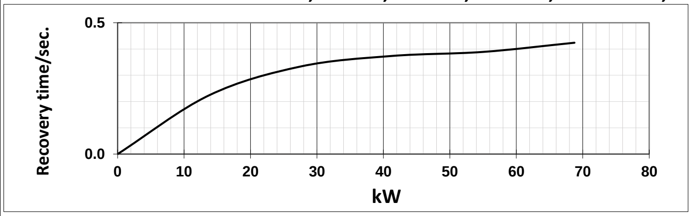
** Voltages refer to wye (star) connection, unless otherwise specified.*

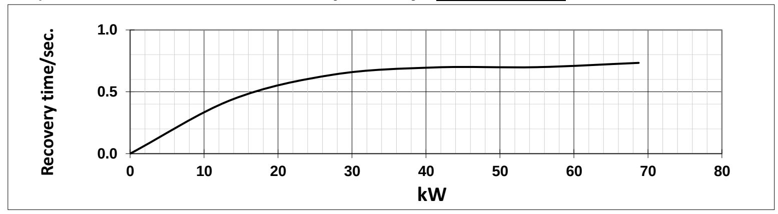
MAGNAPLUS®

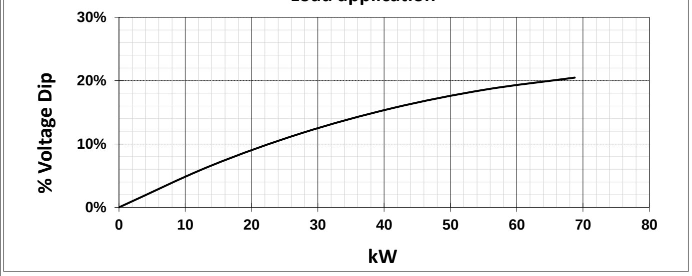
TYPICAL DYNAMIC CHARACTERISTICS

MODEL: 361PSL1601 **Date:** 12/06/17

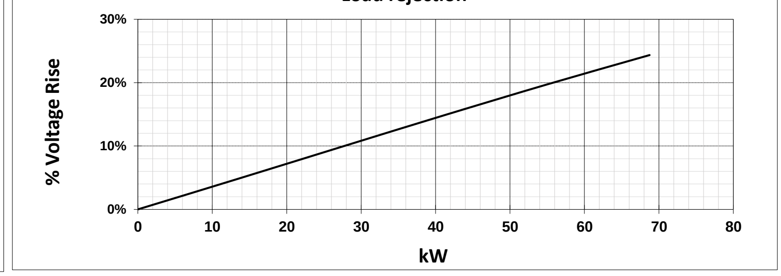
Submittal Data: 208 Volts*, 55 kW, 69 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase **Prepared by:** Mark R Bartz



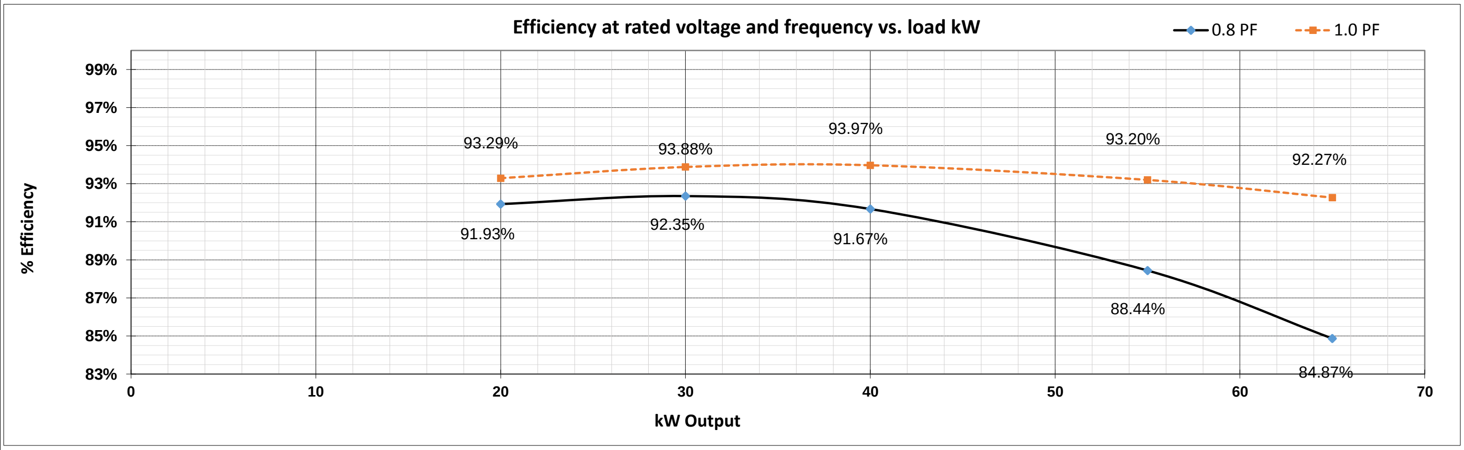




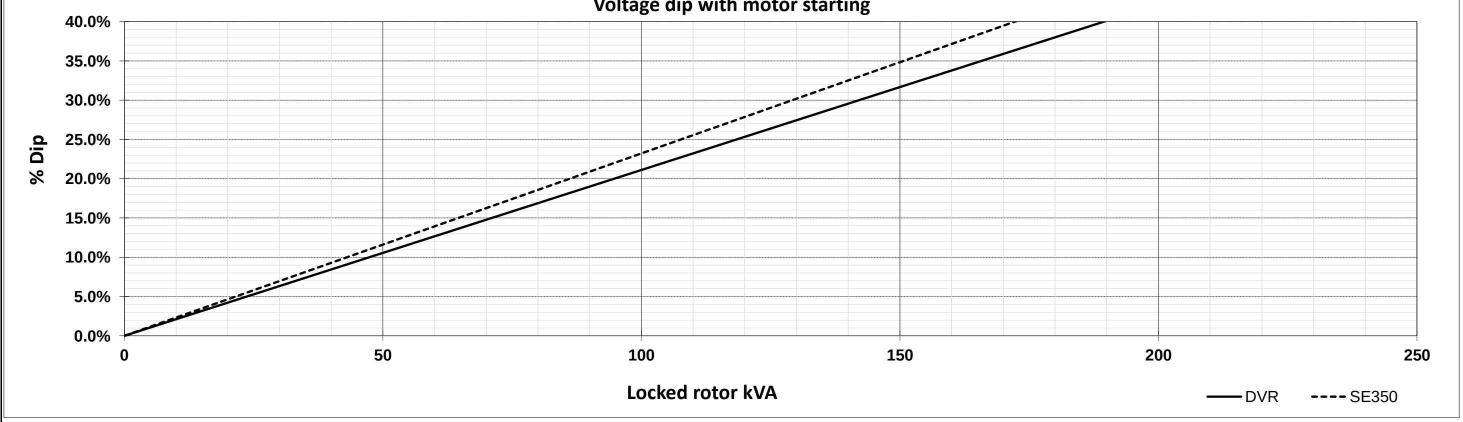
Load application



Load rejection



Efficiency at rated voltage and frequency vs. load kW



Voltage dip with motor starting

marathon® Generators

MAGNAPLUS®

DECREMENT CURVE

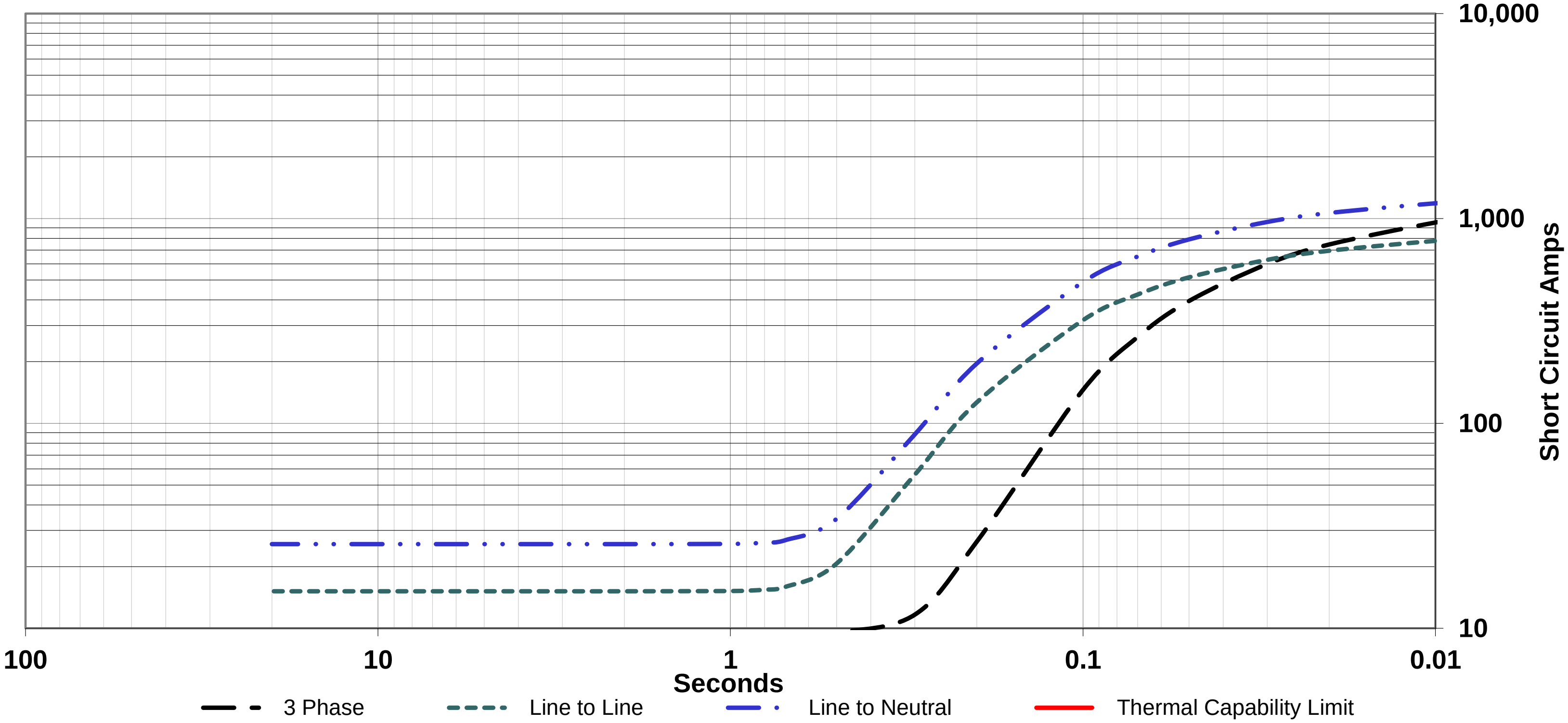
MODEL: 361PSL1601
Submittal Data: 208 Volts*, 55 kW, 69 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Prepared by: Mark R Bartz
Date : 12/06/17

Full Load Current : 190.8 amps
Steady State S.C. Current : 9.54 amps

Max. 3 ph. Symm. S.C. Current : 1184 amps

Symmetrical Component values, Maximum Asymmetrical Values Are 1.732 Times Symmetrical Values

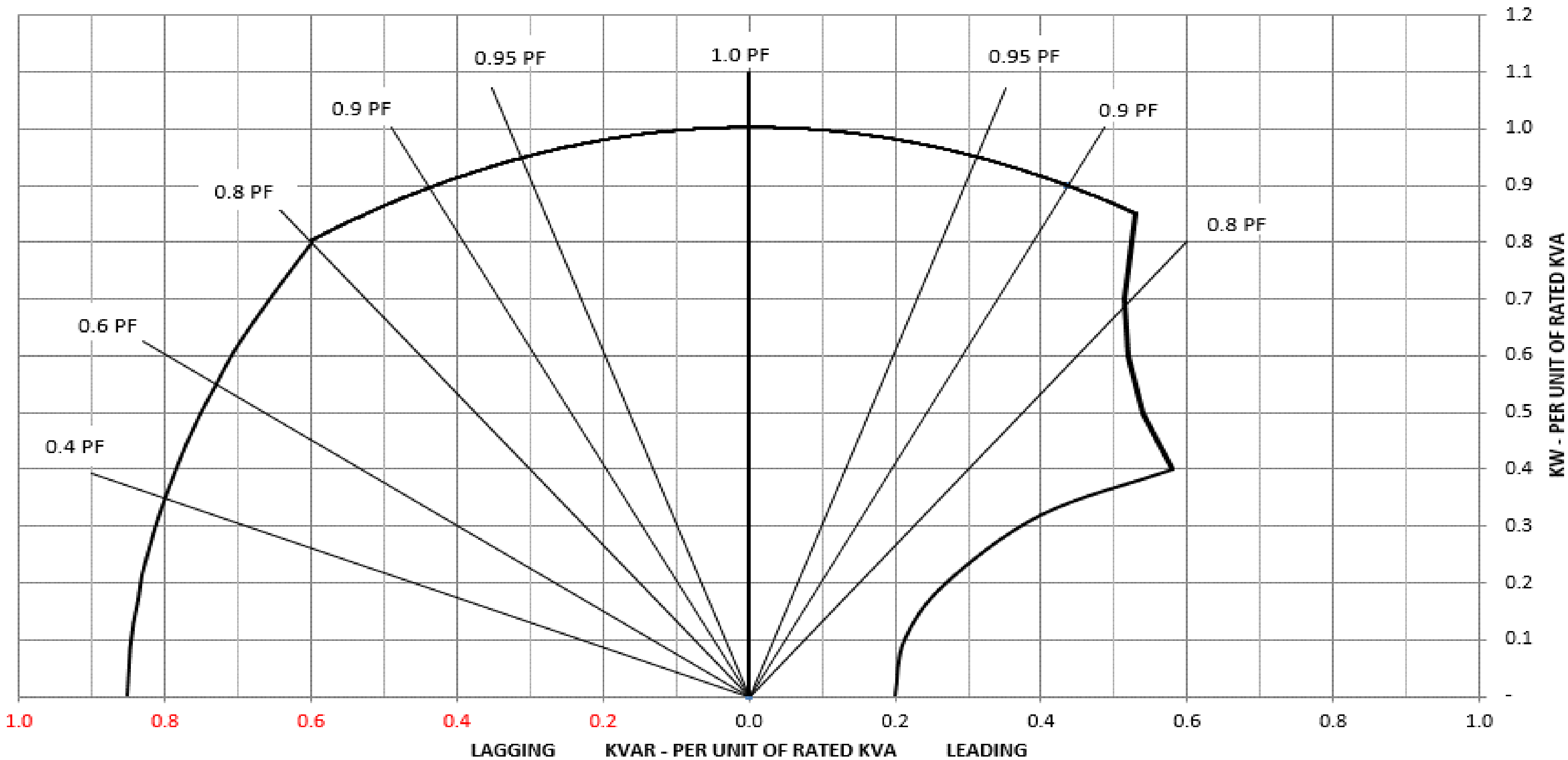


marathon® Generators

Typical Reactive Capability Curve

MODEL: 361PSL1601
Submittal Data: 208 Volts*, 55 kW, 69 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Prepared by: Mark R Bartz
Date : 12/06/17



MAGNAPLUS®

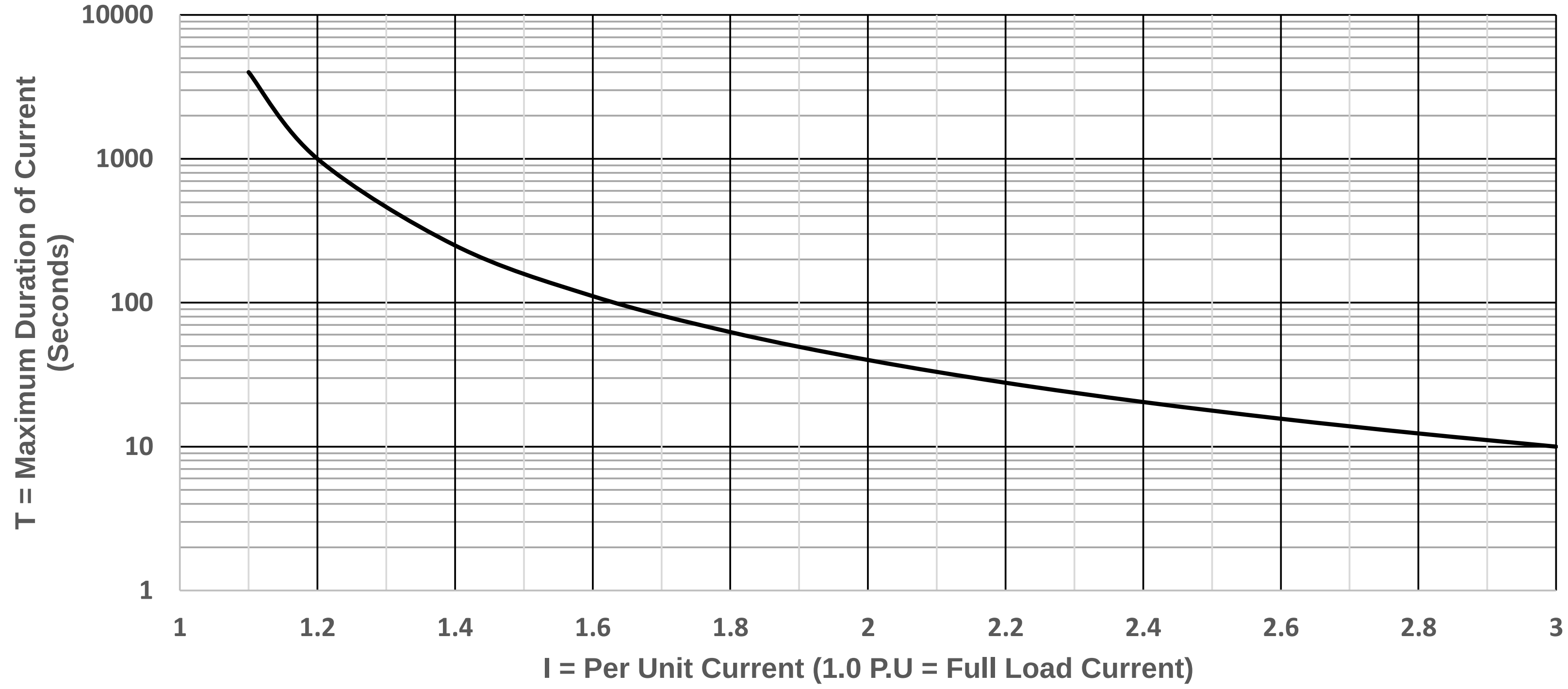
THERMAL DAMAGE CURVE

MODEL: 361PSL1601
Submittal Data: 208 Volts*, 55 kW, 69 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase
Full Load Current : 190.8 amps

Prepared by: Mark R Bartz
Date : 12/06/17

Base is 3.0 P.U. current for 10 seconds from T = 40/(I-1)^2

Windings at operating temperature



marathon® Generators

marathon®
Generators

DVR® 2400
DIGITAL VOLTAGE REGULATOR

NEW FEATURES

- USB 2.0 access through front panel
- Euro style connector for low voltage connections
- Event Logging
- PMG voltage metering
- Polarity configuration for external inputs
- Configurable cut-in and cut-out frequencies
- Retain/reset configuration of remote adjust

FOUR DIGIT HMI DISPLAY

From intial setup to monitoring regulator status, this display provides innovative, fast and easy setup.

REGULATION MODES

Single and Three phase (AVR), Manual Field Current Regulation (FCR), Reactive Power Regulation (VAR) and Power Factor Regulation (PF). All modes compatible with control by external devices.

GENERATOR SOFT START

Controlled increase to rated voltage limits overshoot during voltage build-up in AVR modes.

TRUE RMS VOLTAGE SENSING - SINGLE OR THREE PHASE

Directly sense 100 to 600 Volts at 50/60 Hz. Circuitry senses true RMS voltage for superior regulation.

SINGLE PHASE POWER METERING

FRAME SIZE SPECIFIC PID SELECTION

Simply select the appropriate frame size and your gains are set.

ROBUST GENERATOR PROTECTION FEATURES

9 different Alarm and Shutdown protection features, many are customizable for your application including:

- Field Over & Under Excitation
- Instantaneous Field Over Current
- Generator Over & Under Voltage
- Generator Voltage Imbalance
- Generator Loss of Sensing

REGAL®

DVR®2400 DIGITAL VOLTAGE REGULATOR

SPECIFICATIONS

Voltage Regulation - 0.25% over load range at rated power factor and constant generator frequency.

Output Power - 100 Vdc, 4.0 Adc continuous rating and 190 Vdc, 7.5 Adc forcing capability for one minute.

Exciter Field DC Resistance - 18 to 25Ω Range

Remote Voltage Adjustment - ±30% of nominal via analog input, ±15% via external contacts.

Input Power - 180 to 240 Vac, 250 to 300 Hz PMG power supply

Regulator Sensing - 100 to 600 Vac, 50/60 Hz, 1-phase/3phase

Operating Temperature - From -40°C to +70°C (-40°F to + 158°F)

Storage Temperature - From -40° C to +85°C (-40°F to +185°F)

Ingress Protection - IP52 (front side mounted in conduit box along with swing cover); IP10 (rear side with protective cover)

Shock - 20G in 3 perpendicular planes

Vibration - 2.5G at 5 to 26 Hz; 0.050" double amplitude (27 to 52 Hz); 7G at 53 to 500 Hz

Weight - 3.5 lb. (1361 g)

Humidity Testing - Per MIL-STD-705B, Method 711-D

Salt Fog Testing - Per MIL-STD-810E

EMI Compatibility

Immunity

Meets EN 61000-6-2: 2005 Electromagnetic compatibility (EMC) -Part 6-2: Generic standards- immunity for industrial environments.

Emission

- Meets EN 61000-6-4: 2007 Electromagnetic compatibility (EMC) - Part 6-4: Generic Standards - emmission standard for industrial environments

EMI Compatibility Tests

Immunity

- Electrostatic Discharge (ESD): IEC 61000-4-2
- Radiated RF: IEC 61000-4-3
- Electrical Fast Transient (EFT) /Burst: IEC 61000-4-4
- Conducted RF: IEC 61000-4-6
- Power Frequency and Magnetic Field: IEC 61000-4-8

Emission

- Radiated RF: EN 61000-6-4: 2007, 30 MHz to 1000 MHz

marathon® Generators

Regal Beloit America, Inc.
100 East Randolph Street
Wausau, WI 54402-8003
PH: 715-675-3359

www.marathonelectric.com

REGAL®

Product data sheet
Characteristics

HDL36150C
PowerPact H Circuit Breaker,ThermMagn,150A,3P,600V,14kA

Main

Product or component type	Circuit breaker
Range of product	PowerPact H
Trip unit technology	Thermal-magnetic
Breaking capacity code	D

Complementary

Line Rated Current	150 A
Poles description	3P
Breaking capacity	18 kA at 480 V AC 25 kA at 240 V AC 14 kA at 600 V AC 20 kA at 250 V DC
System Voltage	250 V DC 600 V AC
[Ics] rated service short-circuit breaking capacity	100 %
Mounting mode	Unit mount
Electrical connection	Lugs load Lugs line
AWG gauge	AWG 14...AWG 3/0 (aluminium/copper)
Magnetic hold current	900 A
Magnetic tripping current	1700 A

Environment

Product certifications	IEC UL listed

Ambient air temperature for operation	104 °F (40 °C)

Ordering and shipping details

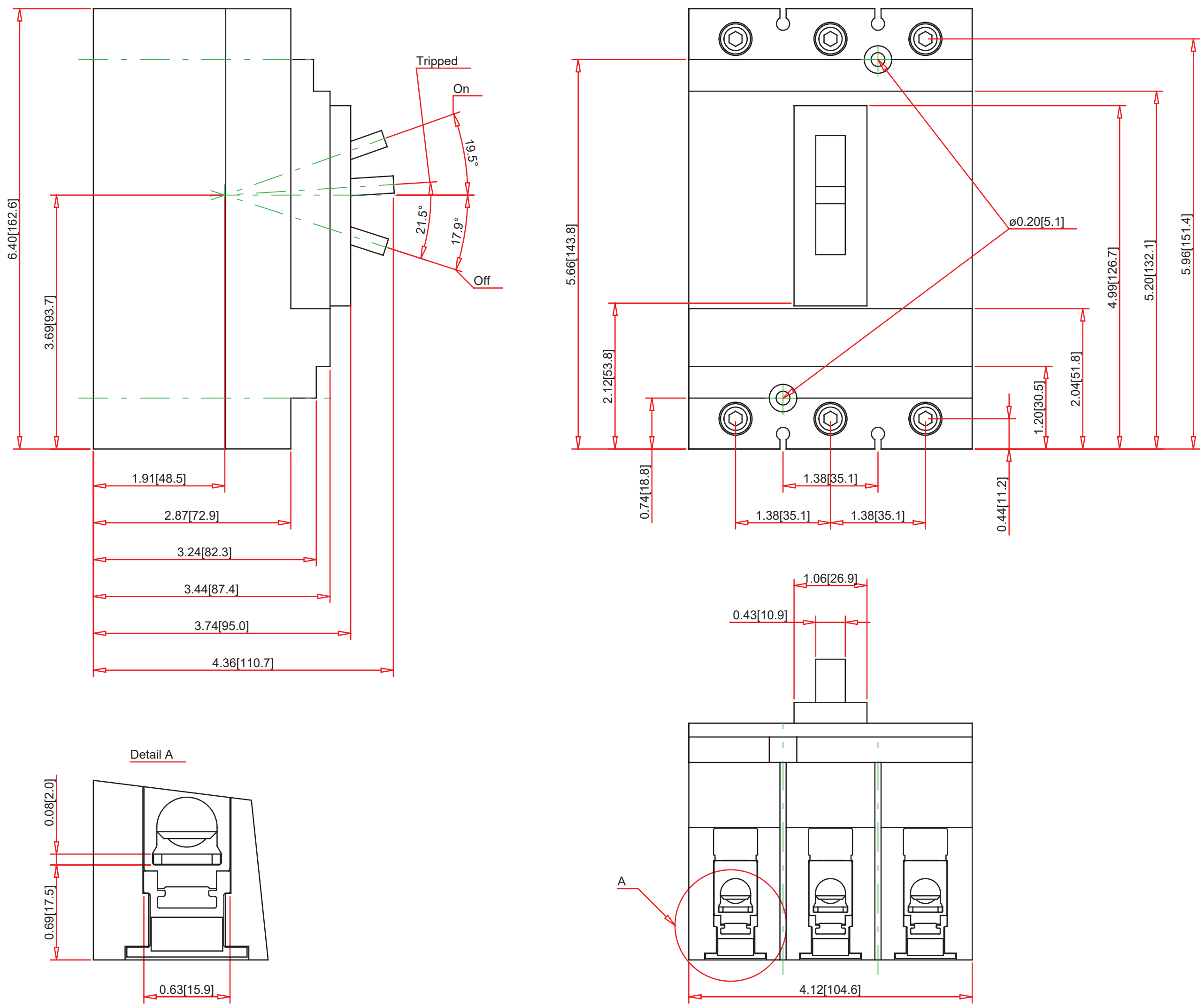
Category	01110 - HD,JD UNIT MT BREAKER/SWITCH
Discount Schedule	DE2
GTIN	00785901590989
Nbr. of units in pkg.	1
Package weight(Lbs)	4.1200000000000001
Returnability	Y
Country of origin	US

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0832 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Need no specific recycling operations

Contractual warranty

Warranty period	18 months



Note:
- Drawings Not To Scale
- Drawings Subject to Change Without Notice
- Dimensions are inches next to [Millimeters]

Part No.:

HDL36150C

SQUARE D by Schneider Electric

Schneider Electric United States
North American Division
Boston One Campus
800 Federal Street
Andover, MA 01810, USA
Phone:+1 8773425173
Email: CCC@us.schneider-electric.com

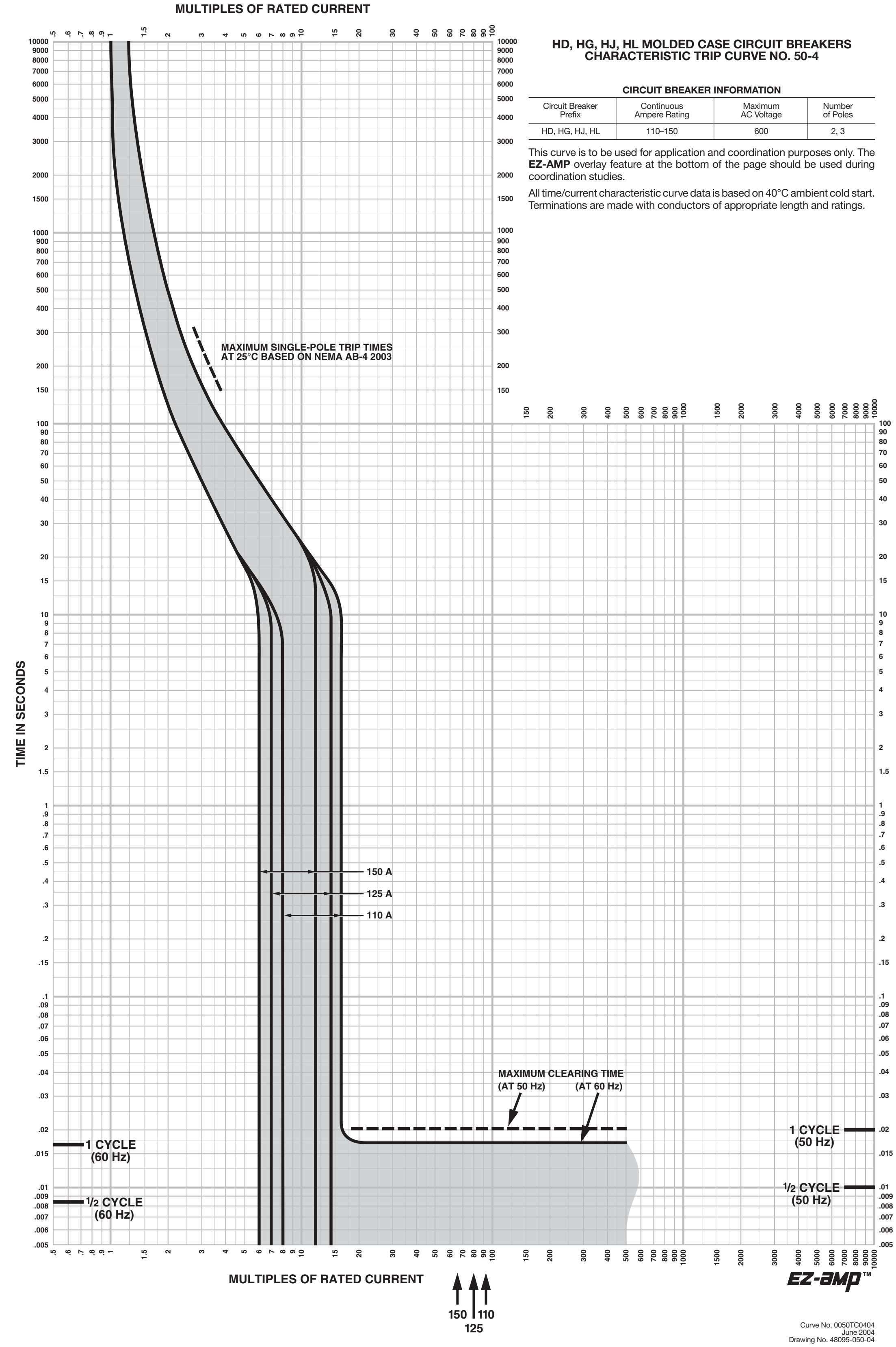
Technical Information:

General Application:	Provides overload and short circuit protection
For Use With:	Industrial Enclosures and Switchboards
Approvals:	UL Listed - IEC Rated
Mounting Type:	Unit Mount
Terminal Type:	Line: Lug - Load: Lug
Wire Size:	#14-3/0 AWG(Al/Cu)
Weight:	5 Pounds
Depth:	4.36 Inches
Height:	6.40 Inches
Width:	4.12 Inches

Specification:

Description:	PowerPact H-frame Thermal Magnetic Circuit Breaker
Number of Poles:	3-Pole
Ampere Rating:	150A
Voltage Rating:	600VAC/250VDC
Interrupting Rating:	25kA at 240VAC - 18kA at 480VAC - 14kA at 600VAC - 20kA at 250VDC
Circuit Breaker Rating:	100% Rated
Fixed AC Magnetic Trip:	Hold: 900A - Trip: 1700A

Figure 73: H-Frame 110–150 A (HD, HG, HJ, and HL) Thermal-Magnetic Trip



HD, HG, HJ, HL MOLDED CASE CIRCUIT BREAKERS
CHARACTERISTIC TRIP CURVE NO. 50-4

CIRCUIT BREAKER INFORMATION

Circuit Breaker Prefix	Continuous Ampere Rating	Maximum AC Voltage	Number of Poles
HD, HG, HJ, HL	110–150	600	2, 3

This curve is to be used for application and coordination purposes only. The **EZ-AMP** overlay feature at the bottom of the page should be used during coordination studies.

All time/current characteristic curve data is based on 40°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.

Curve No. 0050TC0404
June 2004
Drawing No. 48095-050-04

SQUARE D by Schneider Electric

Circuit Breaker Enclosure Data Sheet - Gas

50-60 kW Standby

DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the ***mtu*** 8V0071 GS50 and ***mtu*** 8V0071 GS60 circuit breakers. The dimensional drawings will govern and should be referenced for installation.

360 FRAME ENCLOSURE

— Supplied with all 360 frame alternator applications.
— Right side breakers shown. Left side breakers optional.
— Reference Figure 2 for breaker mounting positions.

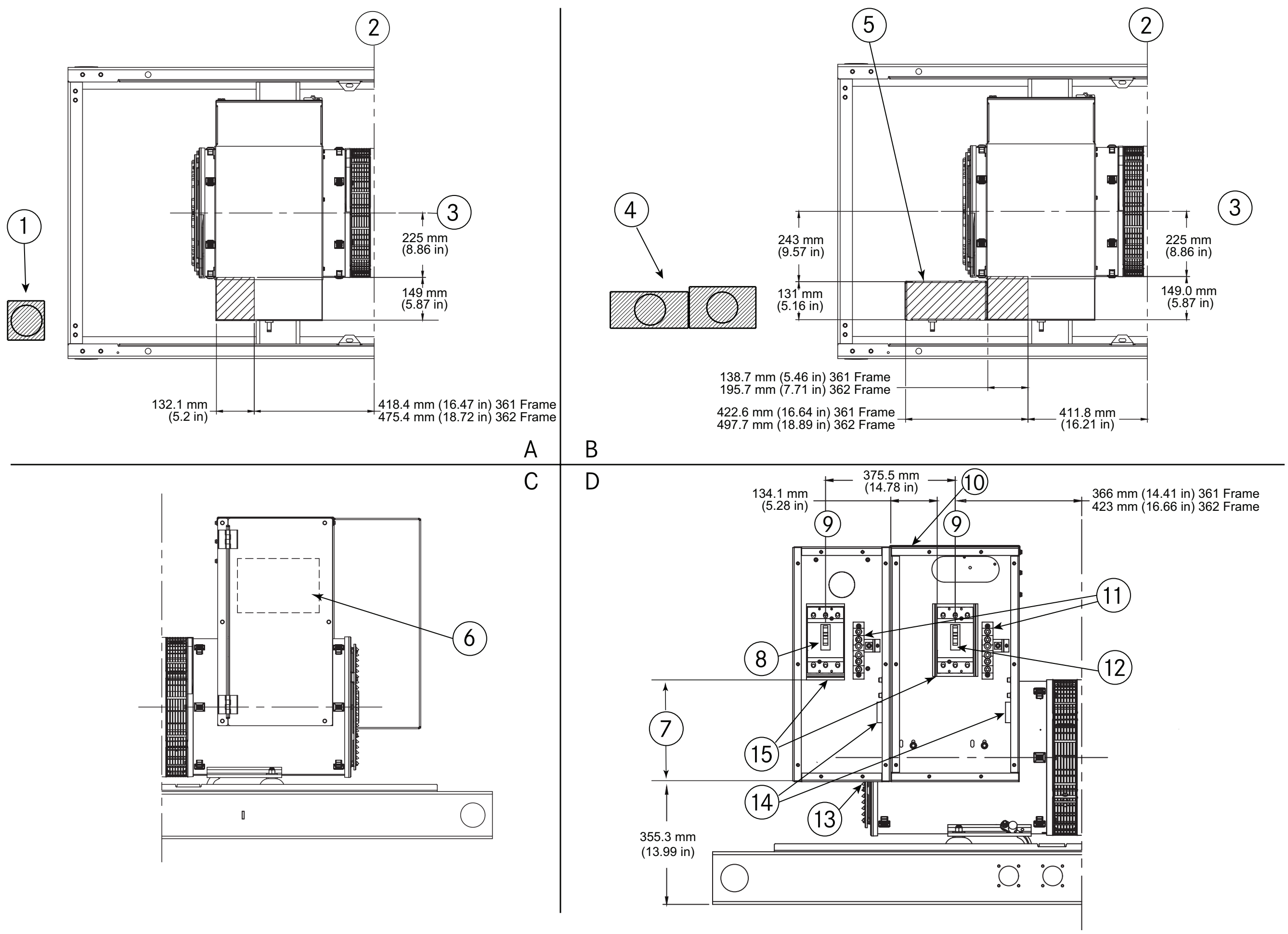


Figure 1: 360 Frame Enclosure

A. Top view, top entry conduit area
B. Top view, bottom entry conduit area
C. Left view, breaker enclosure detail
D. Right view, breaker enclosure detail (enclosure cover not shown)

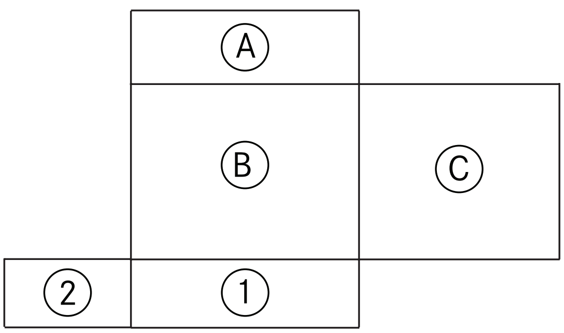
1. Possible top entry conduit locations
2. Rear face of flywheel housing
3. Generator centerline
4. Possible bottom entry conduit locations
5. Optional secondary breaker enclosure
6. Optional control panel location
7. Dimension A
8. Optional second breaker
9. Breaker centerline
10. Top entry conduit area
11. Neutral ASM (torque to 275 in/lbs)
12. Primary breaker
13. Bottom entry conduit area
14. Equipment ground terminal (torque to 275 in/lbs)
15. Customer connect end (recommended torque on label)

Available Circuit Breakers		Enclosure Data				
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space[1] Dimension A mm (in)	Wire Gutter Space [1,2] Dimension B mm (in)	Conduit Quantity	Conduit Size[3] in
H-Frame	20-150	(1) 8-3/0	329 (12.95)	134 (5.27)	1	2.5

[1] Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)
[2] Top entry only available for single breaker applications
[3] Based on flexible metal conduit at 40% fill using THHN wire

NOTE: Equipment grounding terminal wire range: 6 AWG - 3/0 AWG.

Table 1: 360 Frame Enclosure Data



Top View - Right Side Breaker

Figure 2: 360 Frame Enclosure Breaker Mounting Positions

A. Controls
B. Outlet box
C. Alternator

1. Position 1 (Primary)
2. Position 2

Subject to change. | WT00059722 | 2022-06

Starting System Data Sheet

Commercial Battery

Extra ruggedness and resistance to vibration, heat, chemicals, and physical abuse are built into every commercial battery provided with an ***mtu*** generator set. The battery design features the latest in power storage technology for lead-acid batteries, as well as incorporates proven designs developed with the most experience in the business.

PRODUCT FEATURES

- **Case Design:** Tough, high-impact reinforced polypropylene case is heat sealed under extreme pressure to withstand heavy commercial service usage. This helps to prevent electrolyte leakage, improves reliability, and reduces breakage.
- **Internal Design:** Full-frame power path grids avoid sharp wires protruding through separators and directs the power straight to the lug for low resistance and higher cranking amps.
- **Terminals:** Standard terminals are solidly built preventing porosity, corrosion, black post, and harmful acid leaks.
- **Power Density:** Extra heavy-duty batteries deliver more cranking amps per pound.
- **Maintenance:** The battery uses pure de-mineralized electrolytes for reduced water loss, reduced gassing, longer battery life, and low maintenance.
- **Reliability:** Narrow ribs reduce separator corrosion to protect against shorts while deep-pocket envelopes dramatically improve reliability and extend service life.
- **Quality:** Over 250 quality control checks, combined with computer-aided design technology, provide a tough, durable battery in each commercial battery provided with an ***mtu*** generator set.

						Overall Dimension			
BCI Group Size	Terminal Type	*mtu* Part Number	Volt	Cranking Performance CCA (Cold Cranking Amps) -18° C / 0° F	Reserve Capacity	Length mm (in)	Width mm (in)	Height mm (in)	Weight (Wet) kg (lbs)
31	Post	SUA120299	12	950	175	330 (13)	171 (6.75)	241 (9.5)	25.7 (56.5)

Subject to change. | WT0037987 | 2021-09

Battery Charger Data Sheet

MicroGenius Battery Charger

BENEFITS AND FEATURES

Designed for mission-critical applications, the MicroGenius® battery charger packs advanced technology charging into a small, lightweight, and rainproof package. MicroGenius® is the only charger that delivers high-performance charging while prolonging useful life of batteries and significantly reducing risk of sudden battery failure. Rigorous worst-case analysis design processes and extensive abuse testing ensure reliable operation in adverse environments.

- Dynamic Boost™ Charge safely recharges batteries faster than competing products
- HELIX™ technology increases battery life and cuts risk of sudden battery failure
- Field-selectable 12/24 volt output
- Hardened switchmode powertrain delivers first-class abuse resistance and state-of-the-art energy efficiency
- Small, lightweight, water-resistant, and rugged
- Standard J-1939 and Modbus communications

SPECIFICATIONS

AC Input	MicroGenius 2		
VAC, Hz	90-265 VAC, 47-63 Hz When set for 24-volt output, full 15A output of 450W available above 170 VAC input, 12A output current max between 100 VAC and 170 VAC input.		
Protection	Supplementary overcurrent protection fuse, transient protected to EN61000-4-5 level 4		
Power factor and efficiency	PF > 0.95 typical; efficiency to 93%; meets CEC Title 20 Efficiency Regulations; standby AC draw < 3W		

A Rolls-Royce solution

SPECIFICATIONS, continued

DC Output	MicroGenius 2		
Volts	12V / 24V nominal		
Amps	**MicroGenius 180:** 10A/6A		
Charging modes	Multi-stage, including float, boost, and commissioning charge modes		
Current limit	Factory set at 100% of rating. Field adjustable w/optional keypad or from PC.[1]		
Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control		
Line and load regulation	±0.5%		
Output ripple	< 30 mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.		
Output protection	Current limit, supplementary overcurrent protection fuse, transient protected		
Dead battery charge	Starts into and recharges zero volt battery without user intervention		
Parallel operation	Two or more chargers operate with all modes synchronized for increased current or fault tolerance[3]		

Adjustment and Controls	MicroGenius 2		
Charge mode control	Fully automatic patented Dynamic Boost system. Manual boost and battery commissioning available from keypad.		
Adjustments	12 or 24 volt; battery type program; fine voltage setting, alarm setpoints; alarm relay mapping		
Battery type programs	Flooded lead-acid, Ni-Cd, VRLA, ultracapacitor, lithium[4]		
Field voltage adjustment	Three methods: jumper pins, from front panel keypad (requires that digit 12 of the model number be F), or from PC[1]		

Status Display	MicroGenius 2		
LEDs	Two multi-color front panel status LEDs		
Metering and status display	Voltmeter accurate to +2%; ammeter to +5%. 20-character display of status and alarm messages.		

Alarms	MicroGenius 2		
Alarms	Factory set and field reconfigurable. Standard genset configuration includes summary, AC fail, charger fail, high DC volts, low DC volts, low cranking volts.		
Alarms: Form C contacts	**MicroGenius 180:** N/A		

SPECIFICATIONS, continued

Networking	MicroGenius 2		
J-1939 communications	CAN 2.0 extended ID on RJ-45 port		
Modbus communications	Modbus RS-485 on RJ-45 port or Modbus TCP/IP on RJ-45 port.		
SENSbus	Proprietary bus for connection of paralleled chargers and SENS accessories		
Environmental	**MicroGenius 2**		
Operating temp[5] (convection cooled)	-40 °C to +70 °C (-40 °F to +158 °F)		
	MicroGenius 180: Meets full specification from -40 °C to +60 °C (-40 °F to +140 °F)		
Humidity	5% to 95%, non-condensing		
Ingress protection	IP 22; NEMA 3R; UL Listed "Rainproof"		
Vibration	Swept Sine (EN60068-2-6); 4G, 18-500 Hz, 3 axes. Random: 20-500 Hz, 0.01G2/Hz		
Shock	EN 60068-2-27 (15G)		
Electrical transient	ANSI/IEEE C62.41 and EN 61000-4-12 on power terminals		
Abuse Protection	**MicroGenius 2**		
Reverse polarity	Charger self-protects without fuse clearing. Indication via LED and optional LCD.		
Wrong voltage battery	Charger-battery voltage mismatch shuts down charger. Indication via LED and LCD		
Overvoltage shutdown	Selective: Shutdown only operates if charger causes the overvoltage condition		
Overtemp protection	Gradual output power reduction if heatsink temperature becomes excessive		
Regulatory Compliance	**MicroGenius 2**		
North America	UL Listed for US: UL 1236 categories BBGQ, BBHH, BBJY and QWIR[6]. Certified to UL 1236 supplements SB (marine), SC (fire pump) and SE (emergency generator)		
	NFPA-70, NFPA-110[7] **Note:** X00A42500005 meets NFPA-70 only.		
	FCC Part 15, Class B		
	American Bureau of Shipping, type approved		

SPECIFICATIONS, continued

Construction	MicroGenius 2		
Housing/Configuration	Die-cast aluminum heatsink base with stainless steel co-vers and fasteners		
Connections	AC and DC terminal blocks: 20 to 10 AWG. J-1939 and Modbus-485: RJ-45. Form C alarms: 28 to 16 AWG		

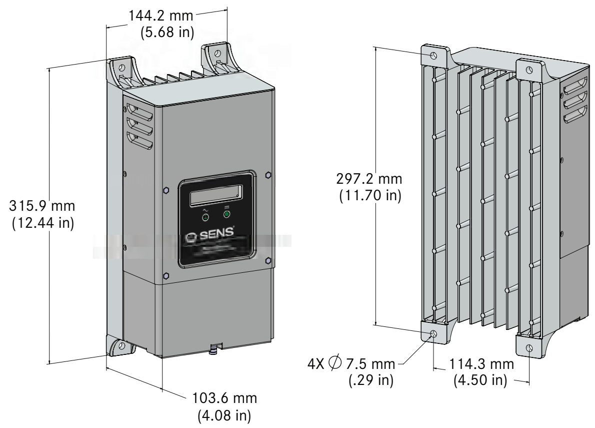
[1] Requires optional computer-to-charger adapter. To order, contact ***mtu*** Parts Department.
[2] Remote battery temp sensor is optional. To order, contact ***mtu*** Parts Department.
[3] Requires standard RJ-45 network cable to connect paralleling bus. To order, contact ***mtu*** Parts Department.
[4] Contact factory to determine compatibility with the battery management system (BMS) of your lithium battery.
[5] At 65 **°C (149 °F)** and above, the LCD display may be unreadable and display life will be reduced.
[6] Except 180 W unit in 24 V configuration, which is not listed to QWIR
[7] All chargers equipped with an alarm/display board meet NFPA-110 requirements. For chargers without an alarm/display board to meet NFPA-110, charger performance and alarm data available on the J-1939 port must be annunciated by the generator set control panel.

MICROGENIUS ORDERING INFORMATION

Battery Charger	*mtu* Part #	Output Volts	Output Amps
MicroGenius 2 180**	XG3042500013	12 Volts	10 Amps

*Meets NFPA-70 only.
Includes ***mtu*-specific programming

DIAGRAMS AND DIMENSIONS



MicroGenius 2 Dimensions

Subject to change. | WT00038096 | 2021-03

Water Heater Data Sheet

TPS Series

DESCRIPTION

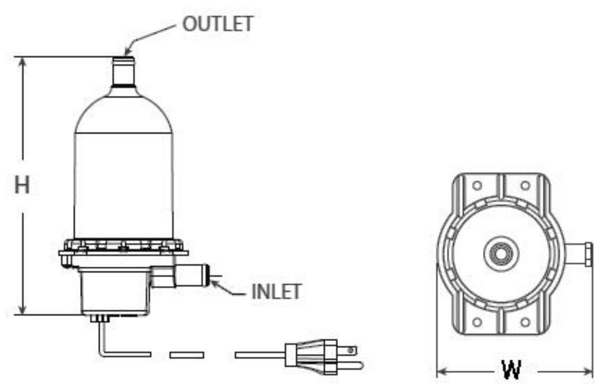
The TPS engine preheater is designed to preheat diesel and gas engines in generator set applications. Simple to install and very lightweight, the TPS engine preheater features a built-in thermostat and heats engines with up to 12 L displacement. Thermosiphon circulation of the coolant delivers heat throughout the entire engine.

CERTIFICATIONS AND STANDARDS

— c-UL-us Listed

SPECIFICATIONS

Height:	200 mm (7.9 in)
Width:	117 mm (4.6 in)
Weight:	771 g (1.7 lb)
Heating fluid:	Engine coolant (50% glycol/50% water)
Power:	0.5, 1, 1.5, 1.8, and 2 kW
Voltage range:	120 to 240 V
Tank material:	Polyphenylene sulfide (PPS)
Heating element:	Incoloy 800
Enclosure:	IP41
Fluid capacity:	416 cm³ (0.11 gal)
Max pressure:	6.2 bar (90 psi)
Inlet / outlet:	15.9 mm (0.625 in)
Thermostat range:	
On	38 °C (100 °F)
Off	49 °C (120 °F)



Model Number	*mtu* Part Number	Watts	Volts	Phase	Hz	Amps
TPS151GT10-000	SUA52748	1,500	120	1	60	12.5

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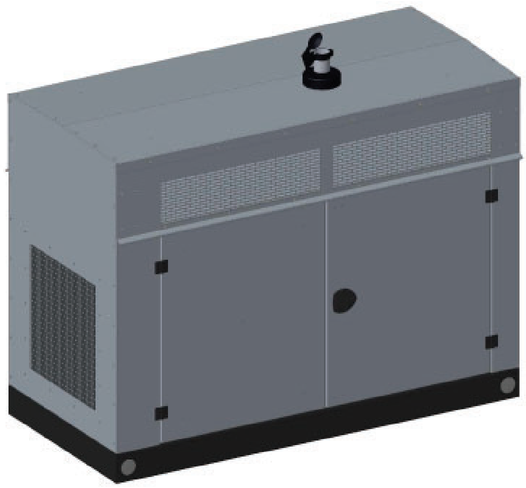
Enclosure and Sound Data Sheet - Gas, Open Field

60 Hz: 50-60 kW Standby



Level 1 Enclosure (pictured)

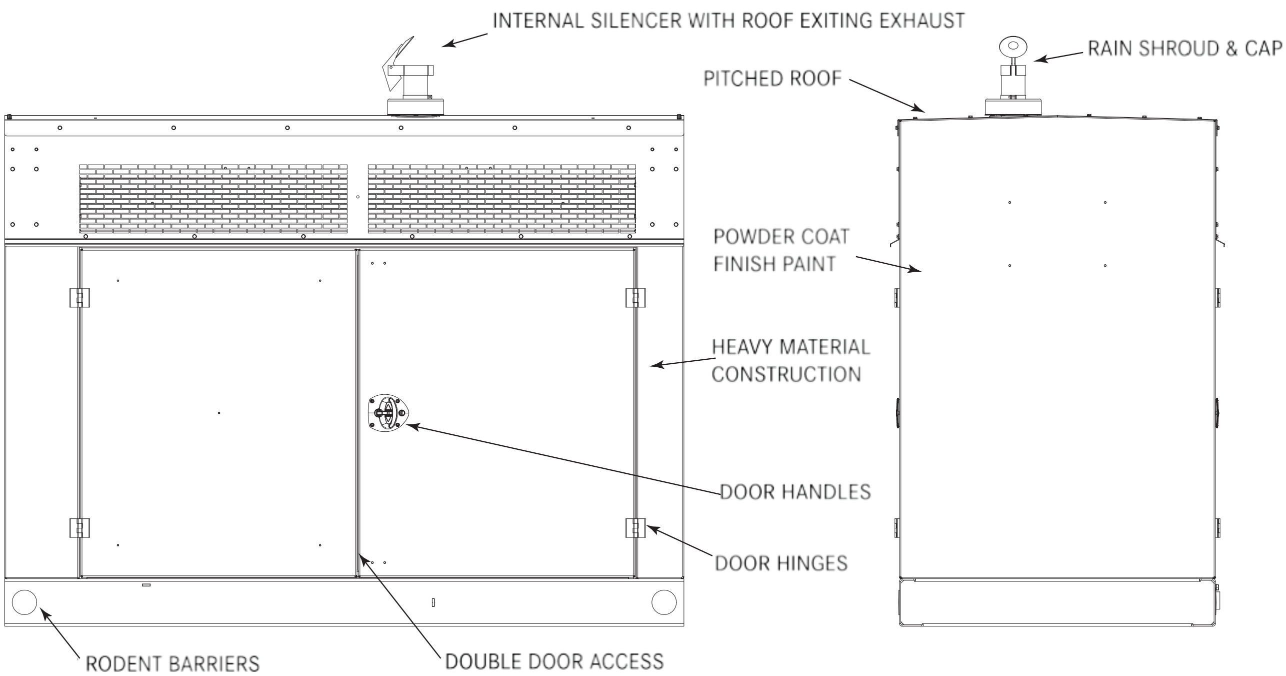
Enclosure Level Identification	
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.

CERTIFICATIONS AND STANDARDS

— UL 2200

STANDARD FEATURES FOR ALL LEVELS

- Heavy material construction
  - Steel enclosure: 1.9 mm (0.075 in) - 14 gauge or greater thickness
  - Aluminum enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
  - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud
- Rain cap
- Rodent barriers
- Exhaust scoop access panel and drain
- Hardware
  - Powder coated hinges with stainless steel pins
  - Key-lockable and pad-lockable powder coated door handles
- Powder coat finish paint: RAL 7001 Silver Grey standard
  - Custom colors available upon request
- Internal silencer (Hospital Grade)
  - Wrapped exhaust pipe



Level 1 Enclosure (pictured)

ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

				7 Meters
Application	Model	Power Node		Level 1
60 Hz (Natural Gas)	***mtu*** 8V0071 GS50	50 kW		74.3

(1) Undampened engine exhaust noise
(2) Measurement with infinite exhaust connection

NOTE:
— Measurements include exhaust noise.
— Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures.
— For installation within 50 miles of the coast, aluminum enclosures are recommended to prevent accelerated corrosion.
— Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability.
— Generator set is tested on level ground without spring isolators installed.
— Sound power levels per ISO 8528-10 and ANSI S1.13-2005
— Sound data measured with:
- Full-rated load
- Standard radiator package

Power Generation

PERFORMANCE ASSURANCE CERTIFICATION

A Rolls-Royce solution

TESTING PROCEDURES

Prototype

We have been producing superior generator sets for more than six decades. Understanding the importance of reliable, cost-effective products, we have developed industry-leading test procedures to ensure we exceed this criteria. Our testing program confirms that our customers will receive products of the highest quality.

Our Performance Assurance Certification (PAC) certifies that every MTU generator set undergoes rigorous prototype testing including the following:

Prototype Test Procedures

- **Rated Load (NFPA 110)**
  All generator set models will produce the nameplate-rated load within the design tolerance of the generator set.
- **Extended-run Testing**
  All generator set prototypes have been subjected to extended run-time testing.
- **Transient Response Analysis (ISO 8528-5)**
  All new generator set models have undergone transient response analysis per ISO 8528-5.
- **Torsional Analysis**
  All generator set models have undergone torsional stress analysis.
- **Engine Cooling System**
  All generator set models will cool sufficiently within the ambient design conditions per each model.
- **Anticipatory Alarms and Shutdowns**
  The pre-alarms and alarms function appropriately to protect the generator set from any foreseen unnecessary failures.
- **Vibrational Analysis (ISO 8528-9)**
  All new generator set models have undergone vibration analysis to ensure that each engine-generator coupling is balanced and that there is no destructive resonant vibration.
- **Noise Analysis (ISO 8528-10)**
  All generator sets undergo airborne noise analysis using the enveloping surface method.

Prototype Test Standards

MTU generator sets are compliant with many different codes and standards. Our validation philosophy and performance are regularly reviewed to ensure continuity with these codes and standards: *UL2200, CSA, EPA, NFPA 99—Health Care Facilities, NFPA 70—National Electrical Code, NFPA 110—Standard for Emergency and Standby Power Systems, Department of Labor and Industry, NEMA MG 1—Motors and Generators, and MIL-STD-705-c.*

Factory Acceptance

Our factory testing is performed with the same extreme diligence and attention to detail that is given to the prototype testing process. Every MTU generator set receives a complete factory acceptance test that certifies and ensures the system will function in accordance to every specific application.

Test metering has an accuracy of 1.3% or better. This metering is calibrated a minimum of once per year and is directly traceable to the Bureau of Standards.

Factory acceptance testing procedures

- **Insulation Resistance Inspection** (301.1c)*
- **High Potential Test** (302.1b)*
- **Alternator Overspeed** (1 min.)*
- **Engine Inspection**
- **Generator Inspection**
- **Resistances Inspection** (401.1b)
  - Exciter Field Stator
  - Alternator Armatures
- **Mounting and Coupling Inspection**
- **Engine Fuel Oil System Inspection**
- **Engine Lube Oil System Inspection**
- **Engine Cooling System Inspection**
- **DC Charging System Inspection**
- **Circuit Breaker Inspection**
- **Anticipatory Alarms and Shutdowns Inspection** (505.2b, 515.1b, 515.2b)
- **Optional Equipment Inspection** (513.2a)
- **Load Test Inspection**
  - Full Nameplate-Rated Load
  - No-Load Inspection
  - MAX Load @ 1.0 P.F. (640.1d)
  - MAX Load @ 0.8 P.F.
  - Block Loads @ 0–25%, 0–50%, 0–75%, 0–100%
- **Phase Balance and Sequence Inspection** (507.1d, 508.1d, 516.1a)

** Performed by Alternator OEM*

Prototype Test Summary (PTS)

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Prototype testing is administered to validate the electrical and mechanical design integrity of the generator set. The results indicated below summarize testing performed on the prototype of the specified generator set model. This form of testing is only conducted on standard factory prototype generator sets. *Results may vary.*

GENERATOR SET MODEL(S):	MTU 8V0071 GS50	MTU 8V0071 GS60

Rep. Prototype Model:	MTU 8V0071 GS60	**Test Date:**	8/10/2021
kW:	60	**kVA:**	60
Voltage:	240	**Hz:**	60

ENGINE/GENERATOR

Engine Manufacturer:	PSI	**Engine Model:**	PSI 5.7L NA
Engine Fuel:	LPG		
Generator Manufacturer:	Marathon	**Generator Model:**	361PSL1613
Voltage Regulator Model:	SE350	**PMG Equipped:**	☐ Yes ☒ No

OPTIONS

Enclosure Level:	Level 3 plus	**Silencer:**	Unit Mounted – L3 system
Air Filtration:	Standard		

TEST SUMMARY

TEST	TEST RESULT	
Transient Performance *Certifies that the engine generator-set model has undergone transient response analysis per ISO 8528-5*	**NFPA-110 One Step:** ☒ 100% **Full Load Acceptance:** Voltage Dip: 30.5 % Frequency Dip: 10.8 %	☐ Other. Specify:_____% Recovery Time: 1.2 seconds Recovery Time: 1.5 seconds
Steady State Performance *Certifies that voltage deviation and harmonics are within acceptance tolerance range per ISO-8528-5 at full load*	**Frequency Regulation:** 0.61 +/- % Regulation Overall 60.45 Maximum Hz 59.72 Minimum Hz	**Voltage Regulation:** 0.85 +/- % Regulation Overall 243.38 Maximum AC Volts 239.31 Minimum AC Volts
Torsional Analysis *Certifies that the generator set has undergone torsional stress analysis and is not subjected to torsional stresses that could be harmful to the unit*	☒ Complete	
Cooling System *Certifies that all generator set models will cool sufficiently within the ambient design conditions per each model at referenced enclosure level*	50 °C (122 °F) Maximum Ambient Temperature 138 m^3/min (4,888 SCFM) Radiator Air Flow	
Sound Data *Certifies that sound data is within the acceptable tolerance range per ISO 8528-10 at referenced enclosure level*	67.3 dBA @ 7 m (23 ft) at full rated load *The sound value is representative of the specified prototype at the time of testing and is subject to alteration due to technological advances. Please contact your MTU representative for the most recent enclosure and sound data.*	
Vibrational Analysis *Certifies that new generator set models have undergone vibration analysis to ensure that each generator coupling is balanced and there is no destructive resonant vibration per ISO 8528-9*	☒ Complete	

Subject to change. 2021-12

Power Solutions International, Inc.
201 Mittel Drive
Wood Dale, IL 60191
www.psiengines.com

0 Hour Non-Deteriorated Emissions Data for Permitting Customers

PSI EPA Engine Family XPSIB5.702ED **"X" denotes generic model year**

PSI Engine Model Description PSI-GM 5.0L & 5.7L Emergency Stationary

	5.0L LPG	5.0L NG	5.7L LPG	5.7L NG
Displacement	5.0L	5.0L	5.7L	5.7L
Test Speed (rpm)	1800	1800	1800	1800
	g/KW-hr	g/KW-hr	g/KW-hr	g/KW-hr
BSCO	39.68	31.57	29.61	26.73
BSCO2	876.22	785.48	871.91	779.14
BSCH4	NA	1.66	NA	1.17
BSTHC	1.26	NA	1.33	NA
BSNMHC	NA	0.46	NA	0.42
BSNOx	7.42	5.60	8.33	6.14
BSTHC+NOx	8.68	NA	9.66	NA
BSNMHC+NOx	NA	6.06	NA	6.56
BSFC (kg/kw-hr)	0.314	0.314	0.307	0.309

Weighted compositie emissions from ISO 8178 G2 test cycle
BSFC is the weighted composite fuel consumption over the emission test cycle
All Emission Data Units in g/KW-hr

SK36229A

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2024 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION** **AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Power Solutions International, Inc. (U.S. Manufacturer or Importer) **Certificate Number: RPSIB5.70NGP-010**	**Effective Date:** **05/12/2023** **Expiration Date:** **12/31/2024**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **05/12/2023** **Revision Date:** **N/A**

Manufacturer: Power Solutions International, Inc.
Engine Family: RPSIB5.70NGP
Mobile/Stationary Certification Type: Mobile and Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Gasoline (up to and including 10% Ethanol)
Emission Standards :
Part 60 Subpart JJJJ Table 1
CO (g/Hp-hr) : 2.0
VOC (g/Hp-hr) : 0.7
NOx (g/Hp-hr) : 1.0
Stationary Part 1048
CO (g/kW-hr) : 4.4
NMHC + NOx (g/kW-hr) : 2.7
HC + NOx (g/kW-hr) : 2.7
Mobile Part 1048
HC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
NMHC + NOx (g/kW-hr) : 2.7
Emergency Use Only : N

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 1048, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 1048. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 1048. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 1048.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

MTU AMERICA INC.

Five (5) Year / 3,000 Hour
Comprehensive Extended Standby Limited Warranty

MTU America Inc. issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU America Inc. warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU America Inc. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU America Inc. after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is sixty (60) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than seventy-two (72) months from the date of shipment from MTU's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU America Inc. Mankato, MN facility.

MTU America Inc. warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

(a) The MTU warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU within sixty (60) days of the start-up date; and
(b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU America Inc. Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU America Inc. will, during normal working hours, through an MTU authorized distributor, dealer, or service outlet, perform some or all of the following:

(a) Repair or replace, at the sole election of MTU America Inc., the defective part with a new or remanufactured replacement part;
(b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
(c) Provide technician travel time of 400 miles to and from the closest MTU authorized distributor, dealer, or service outlet to the Product location;
(d) Part removal and re-installation, if necessary and as solely determined by MTU America Inc.

The obligation to repair or replace defective parts by MTU America Inc. does not include responsibility for reimbursement of incidental or consequential costs. If MTU America Inc. repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU America Inc.

Failure of MTU America Inc. to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and MTU America Inc. will not reimburse for the following:

(a) Battery;
(b) Premium or overtime labor costs;
(c) Labor and material costs for Product removal and reinstallation;
(d) Any special access fees required to gain access to MTU equipment, without limitation, training or safety policy requirement to gain access;
(e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
(f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
(g) Non-Product repairs, vehicle damage, “downtime” expenses, cargo damage, fines, lost income, any business costs of any kind, Owner’s travel expenses, and other losses resulting from a Warrantable Defect;
(h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
(i) Local taxes, if applicable.

In addition, Owner must:

(a) Operate, use, and maintain the Product in accordance with the applicable Owner’s manual and/or any other manuals specified by MTU America Inc., including without limitation handling, inspection, servicing, or operating instructions;
(b) Promptly notify MTU America Inc. or its authorized representative of a Warrantable Defect and make the Product available for repair;
(c) Comply with MTU America Inc. or its authorized representative’s reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
(d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
(e) Use MTU specified parts, components, and consumables;
(f) Promptly return to MTU America Inc. all parts replaced under this Limited Warranty;
(g) Comply with MTU America Inc. long term storage guidelines, if applicable, and maintain and provide proof of compliance;
(h) Routinely exercise the Product in accordance with operating instructions;
(i) Install the Product in accordance with the installation guide provided; and
(j) Reimburse MTU America Inc. for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU America Inc. is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

(a) Failure of Owner to fulfill its obligations under Section 3;
(b) Failure of Owner to follow MTU America Inc. instructions for Product stored by Owner longer than 180 days from date of shipment from the MTU America Inc. Mankato, MN facility;
(c) Defects caused by adjustments made by Owner to the fuel system or governor system;
(d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU America Inc. within a reasonable time;

(e) Rental equipment used during warranty work;
(f) Defects caused or potentially caused by service work performed by non-MTU authorized service providers and/or the use of non-genuine MTU parts;
(g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
(h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
(i) Repair or any use or installation which MTU America Inc., in its sole discretion, determines to be improper;
(j) Defects caused by incorrect maintenance;
(k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
(l) Damage caused by shipping;
(m) Repair of parts sold by MTU America Inc. that are warranted directly to the Owner by the respective part's manufacturer;
(n) Misapplication of the Product;
(o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
(p) Acts of nature or acts of God;
(q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
(r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to MTU America Inc. in writing at the time of the order; or
(s) Material provided by or a design specified by the Owner.

5. **Software Warranty.** Where software is included in the Product, MTU America Inc. warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship, and that 2) it shall function substantially in accordance with MTU America Inc. specification at the time of dispatch from the MTU America Inc. manufacturing facility. MTU America Inc. does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU America Inc. shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU America Inc. MTU America Inc., at its option, may elect to provide the most current software at no cost, and in such case MTU America Inc. will not cover the cost to install the applicable updated software. MTU America Inc. shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.

6. **Emissions Warranty.** The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: https://www.mtu-solutions.com/eu/en/technical-information/emissions-warranty.html. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region-specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective MTU America Inc. defined technical specifications. IT IS THE OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

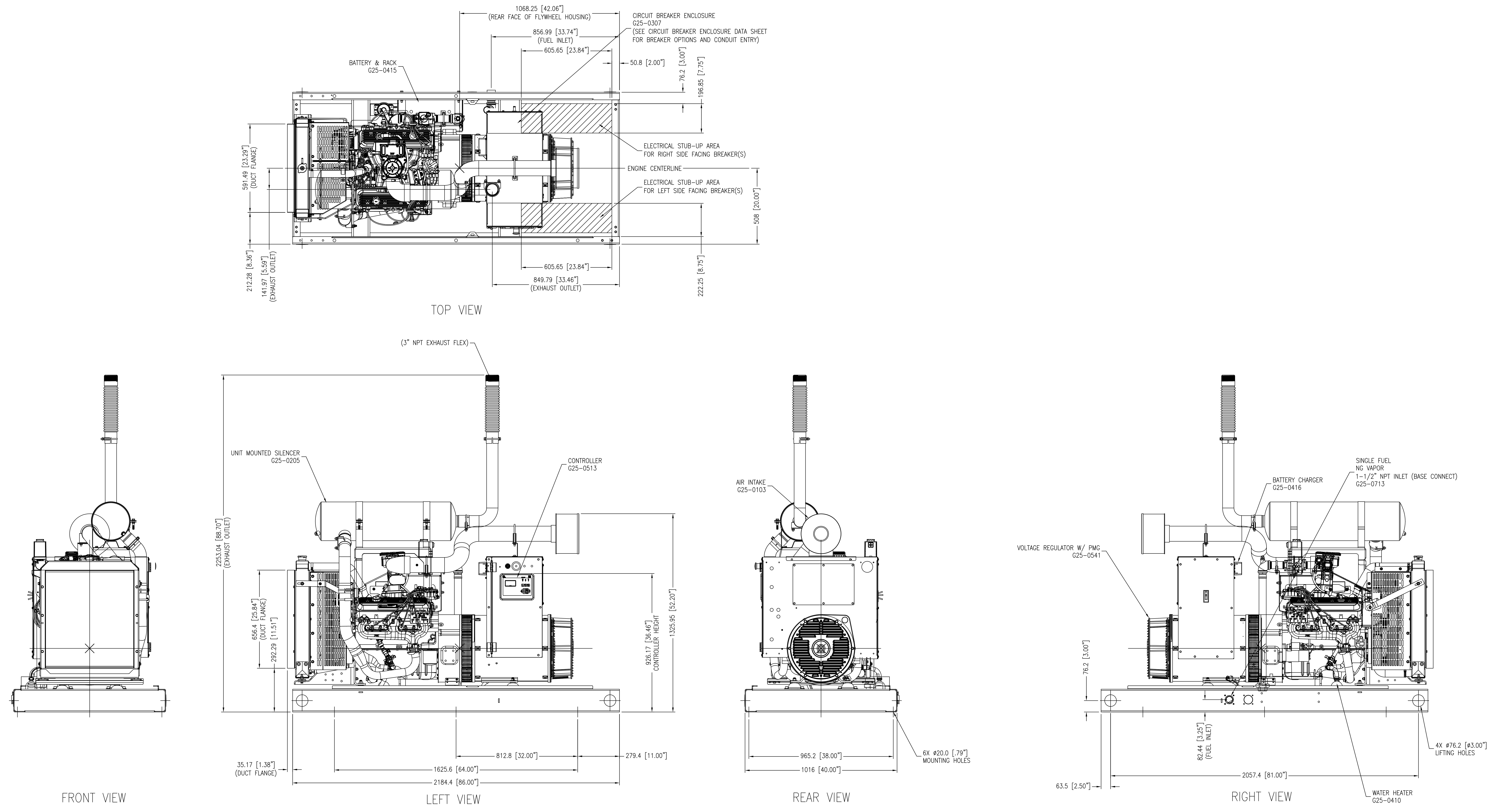
MTU AMERICA INC. SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU America Inc. and obtained prior written consent from MTU America Inc. In such cases, MTU America Inc. shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU America Inc. would have incurred had it remedied the defect itself.

9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.

10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.

11. In order to obtain performance of an MTU America Inc. warranty obligation, the Owner should contact the nearest MTU authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU America Inc. Warranty Department, 100 Power Drive, Mankato, MN 56001.



REVISION	DATE	DESCRIPTION
A	2023-05-25	ADDED FUEL INLET DIMENSIONS FOR NON-BASE CONNECT FUEL SYSTEMS

mtu A Rolls-Royce solution

APPLICABLE MODELS:
mtu 8V0071 GS50
mtu 8V0071 GS60

THIRD ANGLE PROJECTION

DRAWN TO SCALE
DIMENSIONS: MM [INCH]

DATE CREATED: 2021-09-13

DIMENSIONAL LAYOUT

DESCRIPTION: 50-60 kW Genset, Housed Base

ENGINE: PSI (GM), 5.7L

WEIGHT (MIN-MAX): 867-1101 KG 1912-2428 LB

DRAWING NUMBER: XZG2500100039

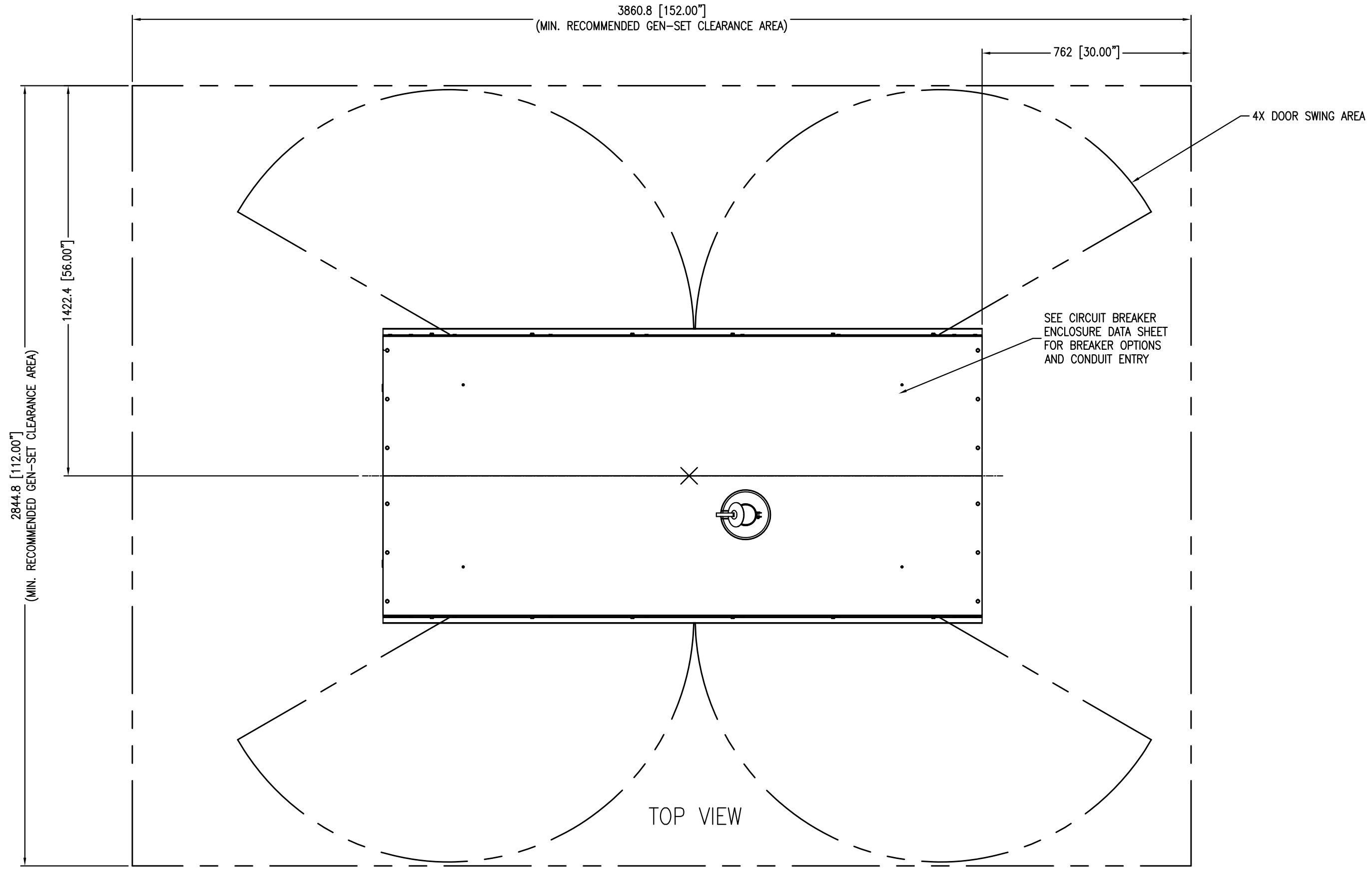
SHEET: 1 of 2

DRAWING CODE CONFIGURATION 5.7L PSI		
GENERATOR FRAME	BREAKER SIDE	LOCATION
361	RIGHT	1
	LEFT	2
362	RIGHT	3
	LEFT	4

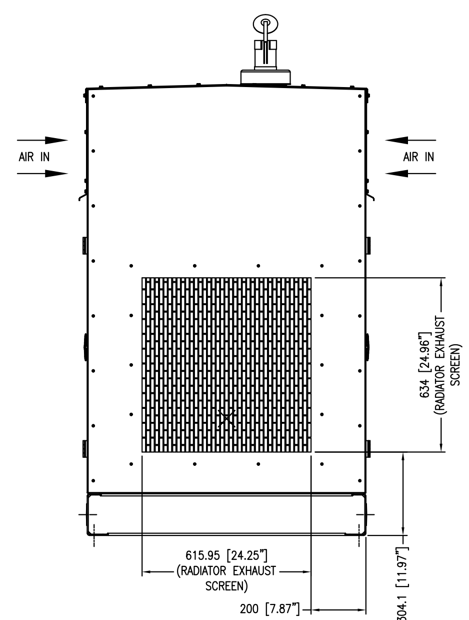
Reference the Drawing Options table and within the Layer Properties turn on/off the Drawing Codes that may or may not apply to your configuration.

Note: Some options may not be referenced. Only options which visibly change the drawing are selectable

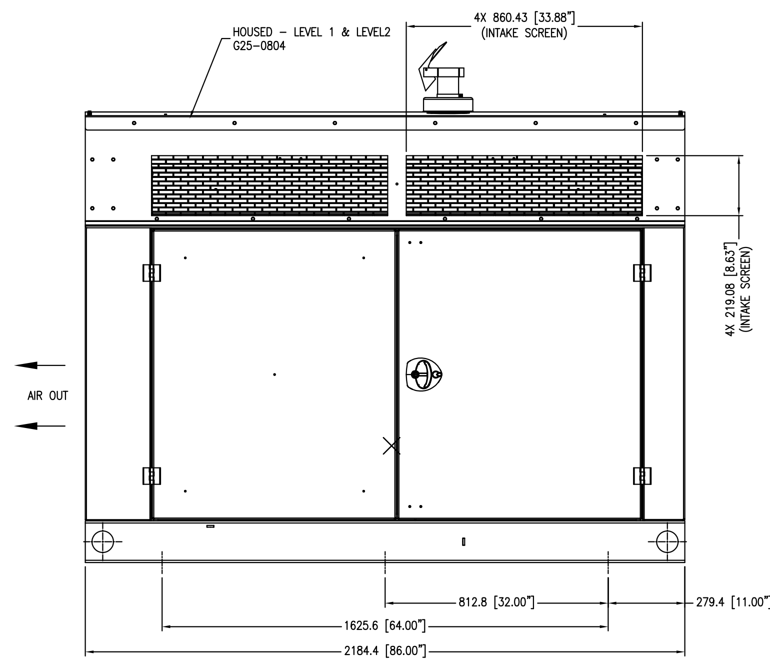
DRAWING OPTIONS 5.7L PSI			LOCATION				SELECTED OPTIONS
GROUP	DRAWING CODE	DESCRIPTION	1	2	3	4	
Standard Unit	G25–0004	Standard Unit w/ Housed Base	X	X	X	X	✓
Housing Options, Exterior	G25–0804	Housed – Level 1 & Level 2	X	X	X	X	✓
	G25–0805	Housed – Level 3	X	X	X	X	
	G25–0806	Louvers – Motorized Intake	X	X	X	X	
	G25–0807	Louvers – Gravity Exhaust	X	X	X	X	
Housing Options, Interior	G25–0904	Space Heater	X	X	X	X	
	G25–0905	Interior Housing Light Assembly (Right Side Facing Breaker) (361 Frame Generator)	X				
	G25–0906	Interior Housing Light Assembly (Left Side Facing Breaker) (361 Frame Generator)		X			
	G25–0907	Interior Housing Light Assembly (Right Side Facing Breaker) (362 Frame Generator)			X		
	G25–0908	Interior Housing Light Assembly (Left Side Facing Breaker) (362 Frame Generator)				X	



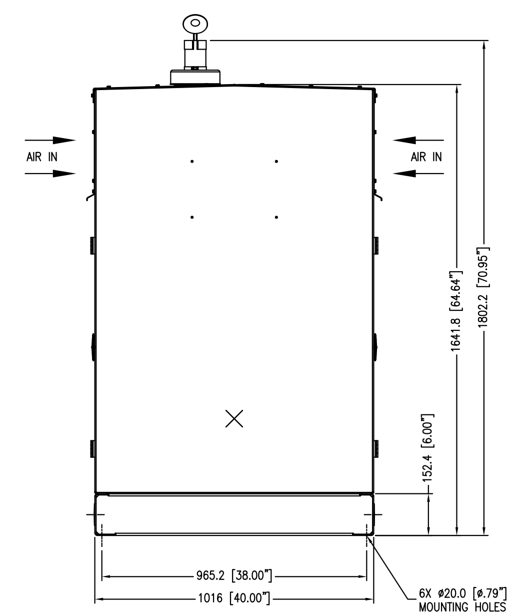
TOP VIEW



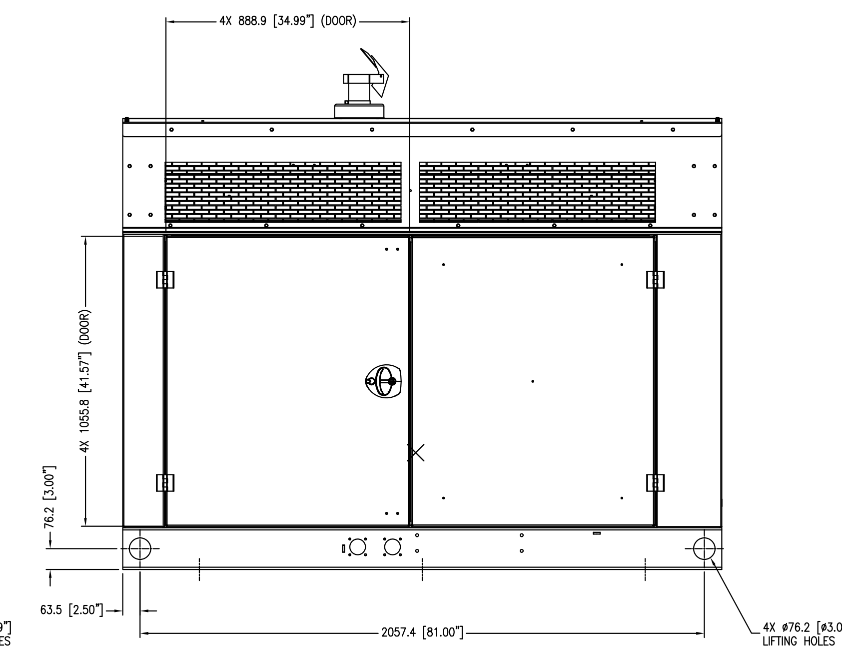
FRONT VIEW



LEFT VIEW



REAR VIEW



RIGHT VIEW

REVISION	DATE	DESCRIPTION

mtu A Rolls–Royce solution

APPLICABLE MODELS:
mtu 8V0071 GS50
mtu 8V0071 GS60

THIRD ANGLE PROJECTION

DRAWN TO SCALE
DIMENSIONS: MM [INCH]

DATE CREATED: 2021–09–03

DIMENSIONAL LAYOUT

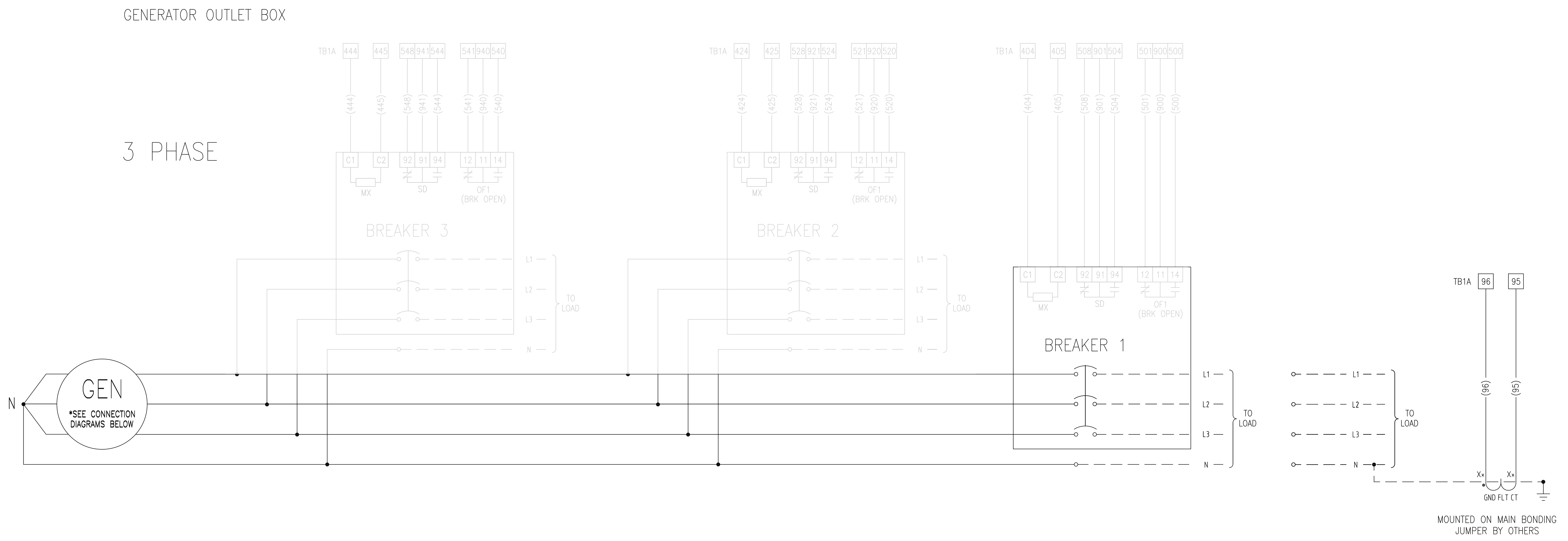
DESCRIPTION: 50–60 kW Genset, Housing

ENGINE: PSI (GM), 5.7L

WEIGHT (MIN–MAX): 1047–1492 KG 2308–3290 LB

DRAWING NUMBER: XZG2500100040

SHEET: 1 of 1



NOTE:

1. WIRE NUMBERS ARE IN PARENTHESIS
2. SHORT DASHED LINES (------) INDICATE CUSTOMER CONNECTION
3. BREAKER ACCESSORIES ARE SHOWN IN THE TRIPPED OR OPEN POSITION

LEGEND

A	AMMETER
AEM	ANALOG EXPANSION MODULE
CP	CONTROL PANEL
MGC	MTU GENERATOR CONTROLLER
DVR	DIGITAL VOLTAGE REGULATOR
F1-3	KTK-10 OR JX-10 10A
GFM	GROUND FAULT MONITOR
GGS	GENERATOR GROUND STUD
Hz	FREQUENCY METER
K6	LOUVER MOTOR RELAY
M	LOUVER MOTOR
MN	UNDERVOLTAGE TRIP
MX	SHUNT TRIP
OF1	AUXILIARY SWITCH 1
SD	ALARM SWITCH
TB1	TERMINAL BLOCK 1 (PANEL BACK)
TB1A	TERMINAL BLOCK 1A (PANEL BACK)
TB3	TERMINAL BLOCK 3 (GEN OUTLET BOX)
TB4	TERMINAL BLOCK 4 (HANDY BOX)
V	VOLTMETER

GROUND FAULT CT WIRING CONNECTIONS

CB RATING	CT RATIO	*CT CONNECTIONS
30-230A	50:5	X2-X3
250-450A	100:5	X1-X2
500-700A	150:5	X1-X3
750-900A	200:5	X4-X5

Aenderungsbeschreibung/Description of revision: REVISE TITLE BLOCK			kommt vor/Frequency: KOMMT_VOR
Buchst./Rev.Ltr.: c.3	Erh-Antrags-Nr./Promotion Request No.: PR080178	Aenderungs-Nr./Change Notice No.: CN030319	Bearbeitungsstatus/Lifecycle: Released

Passmass Fit | Abmass in Deviation µm

Allgemeintoleranzen / General Tolerances ISO 2768-mK
Bauart/Type: 30-60kW GAS
Ausfuehrung u. Lieferung / Tech. Characteristics: ----
Oberflaechenschutz /Surface Protection: ----
Verwendbar fuer Typ / Applicable to Model: ----
Projekt-/Auftrags-Nr. / Project/Order No.: ----
Referenz-Nr./Ref.No.: ---- Emission ID: ----
Oberflaechenangaben nach MTN5033 Surface Specification per MTN5033
Allgemeine Fertigungs- vorschriften nach MMN 332 Production Specification per MMN 332
Fert.Ber. Man. Adv.: shaik farh 23.11.2021
Mont.Ber. Inst.Adv.: ---- ----

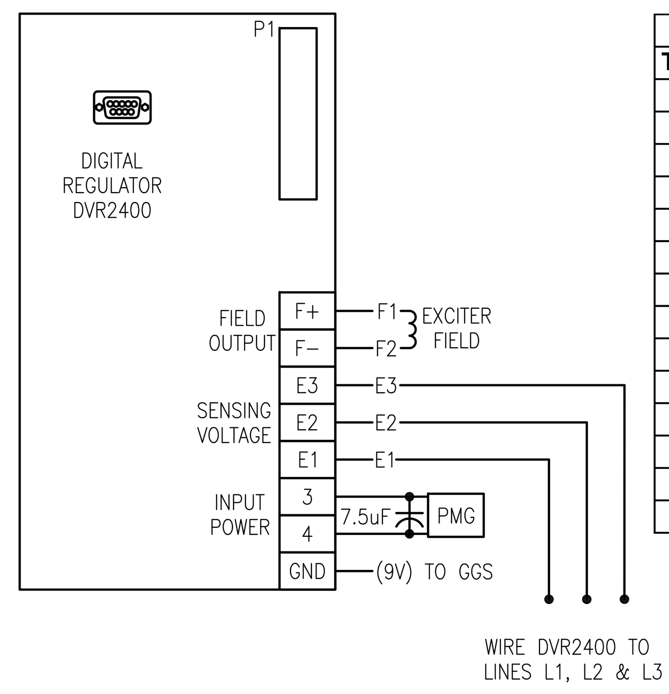
ACAD	Datum/Date	Name
Ersteller Drawn	----	----
Bearb. Change	22.11.2021	groenke do
Norm. Std.	23.11.2021	ramireddy
Gepr. Checked	23.11.2021	ramireddy

A Rolls-Royce solution
Rolls-Royce Solutions GmbH

Masse / Size ISO 14405 (E)
Massstab/Scale: MAßSTAB | Masse/Mass kg: 0.000000 | Format/Size: A2
Werkstoff / Material: ####----
Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----
Material-Nr./Material-No.: XZG3164400001
Benennung/Title: AO Arrangement
BREAKERS

ELEC SYSTEM DRAWING
30-60KW 2.5 FORD
Zeichnungs-Nr./Drawing No.: FDH00000000001229030
Beschreibung/Description: BREAKER OPTIONS
Blatt Sheet: 1/1

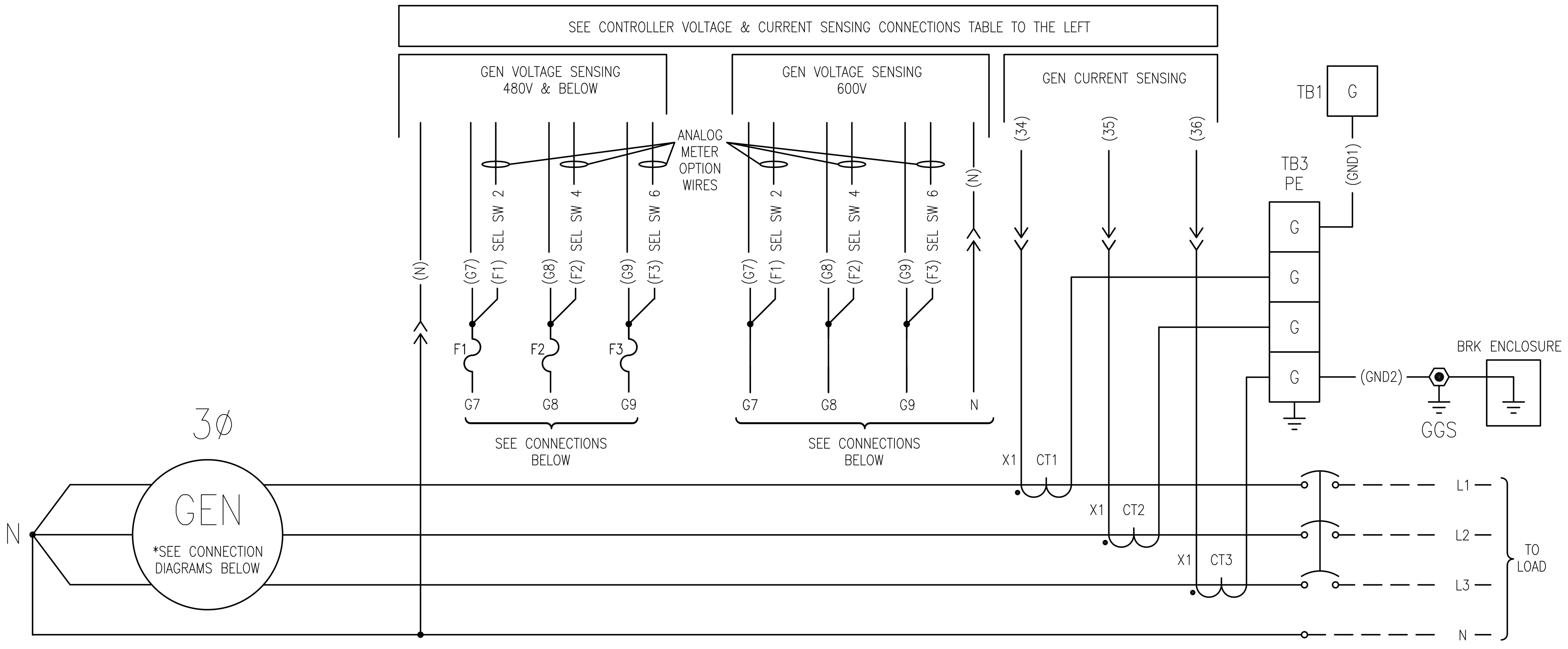
DVR2400
3Ø



DVR2400 P1 CONNECTOR		
Terminal	Name	Description
P1-1	IB1	Generator Phase B CT - terminal 1
P1-2	IB2	Generator Phase B CT - terminal 2
P1-3	A_L	Auxiliary current loop (DVR2500 only)
P1-4	AU+	Auxiliary input positive
P1-5	AU-	Auxiliary input negative
P1-6	EXC	Excitation disable contact input (active closed)
P1-7	UP	UP contact input (active closed)
P1-8	DN	DOWN contact input (active closed)
P1-9	DRP	Droop disable contact input (active closed)
P1-10	QRP	VAR/PF mode disable (active closed)
P1-11	DG	Digital ground
P1-12	NO	Contact output normally open
P1-13	COM	Contact output common
P1-14	NC	Contact output normally closed

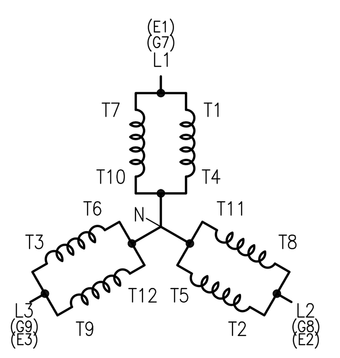
CONTROLLER VOLTAGE &
CURRENT SENSING
CONNECTIONS

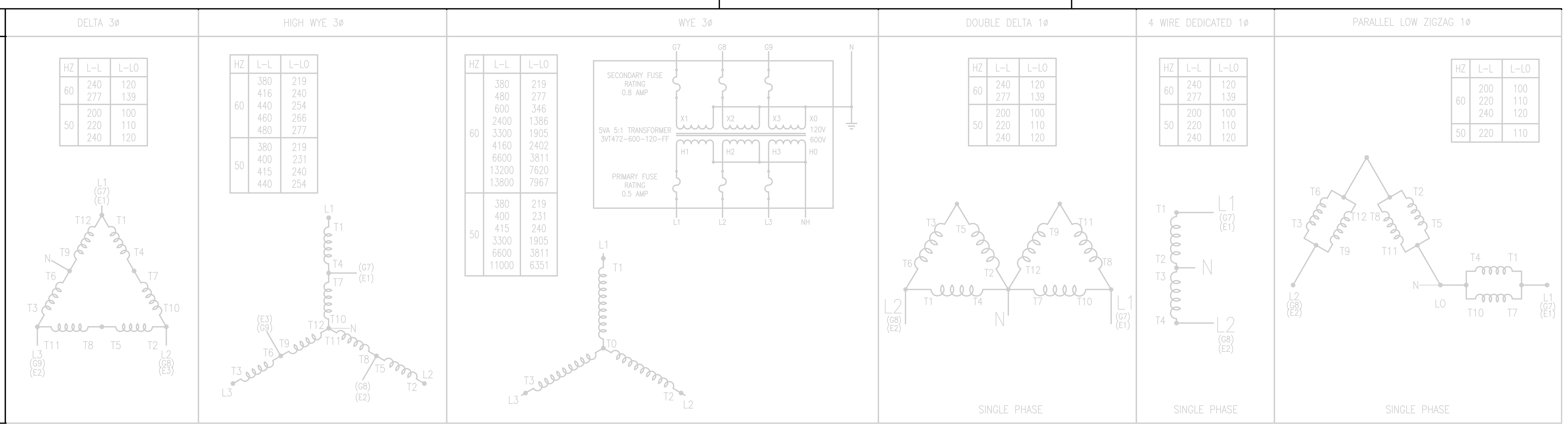
		MGC & PIN #		
		1500	2000	3000
WIRE #	G7	45	41	86
	G8	43	39	88
	G9	41	37	90
	N	40	35	91
	34	38	69	1
	35	36	72	3
	36	34	75	5



LOW WYE 3Ø

HZ	L-L	L-LO
60	190 208 220 230	110 120 127 133
50	190 200 208 220	110 115 120 127





Aenderungsbeschreibung/Description of revision	kommt vor/Frequency
REVISE TITLE BLOCK	KOMMT_VOR

Buchst./Rev.Ltr.	Erh-Antrags-Nr./Promotion Request No.	Aenderungs-Nr./Change Notice No.	Bearbeitungsstatus/Lifecycle
a.3	PR080178	CN030319	Released

Allgemeintoleranzen / General Tolerances ISO 2768-mK	Masse / Size ISO 14405 (E)
Bauart/Type: 50-60kW GAS	Oberflaechenangaben nach MTN5033 / Surface Specification per MTN5033
Ausfuehrung u. Lieferung / Tech. Characteristics: ----	Allgemeine Fertigungs- vorschriften nach MMN 332 / Production Specification per MMN 332
Oberflaechenschutz /Surface Protection: ----	Massstab/Scale: MAßSTAB
Verwendbar fuer Typ / Applicable to Model: ----	Masse/Mass kg: ----
Projekt-/Auftrags-Nr. / Project/Order No.: ----	Werkstoff / Material: ---------
Referenz-Nr./Ref.No.: ----	Emission ID: ----
Fert.Ber. Man. Adv.: shaik farh 23.11.2021	Mont.Ber. Inst.Adv.: ---- ----
Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----	Material-Nr./Material-No.: XZG31K0000012

ACAD	Datum/Date	Name
Ersteller Drawn	15.03.2019	jayanath v
Bearb. Change	22.11.2021	groenke do
Norm. Std.	23.11.2021	ramireddy
Gepr. Checked	23.11.2021	ramireddy

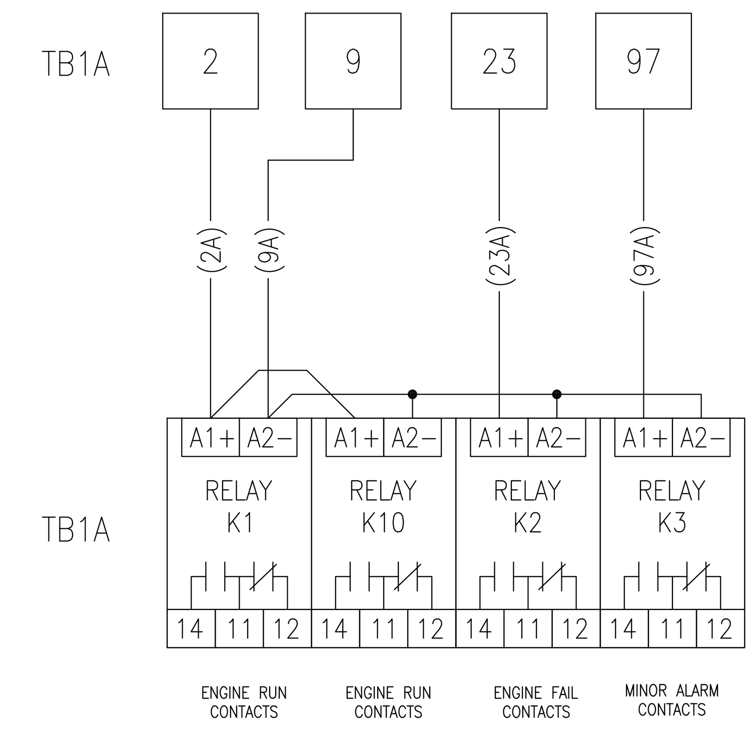
Benennung/Title ---------
GENERATOR

ELEC SYSTEM DRAWING

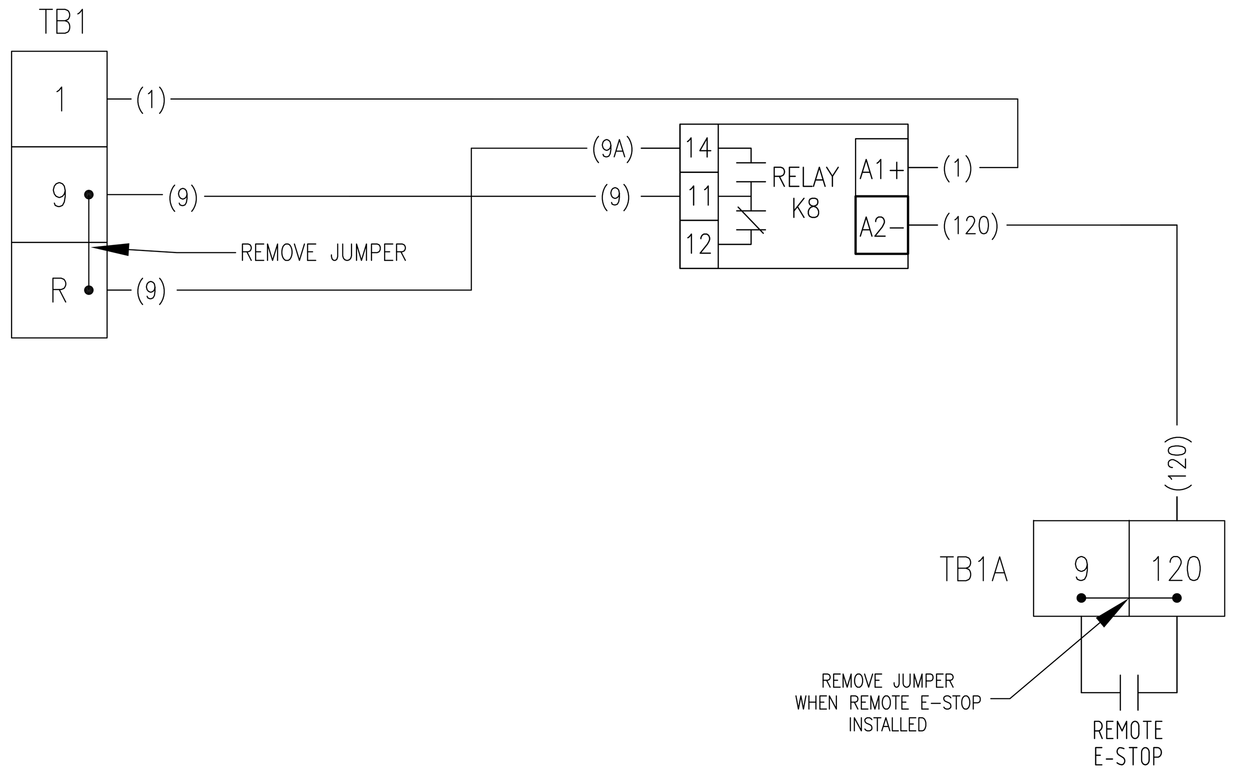
A Rolls-Royce solution
Rolls-Royce Solutions GmbH

Zeichnungs-Nr./Drawing No. CAD03858532
Beschreibung/Description GENERATOR ARRANGEMENT DRAWING
Blatt Sheet 1/1

4 RELAY OPTION



REMOTE E-STOP OPTION



Aenderungsbeschreibung/Description of revision: REVISE TITLE BLOCK			kommt vor/Frequency: KOMMT_VOR
Buchst./Rev.Ltr.: c.3	Erh-Antrags-Nr./Promotion Request No.: PR080178	Aenderungs-Nr./Change Notice No.: CN030319	Bearbeitungsstatus/Lifecycle: Released

Passmass Fit | Abmass in Deviation µm

Allgemeintoleranzen / General Tolerances ISO 2768-mK

Masse / Size ISO 14405 (E)

Bauart/Type: 30-60kW GAS	Oberflaechenangaben nach MTN5033 Surface Specification per MTN5033	Massstab/Scale: MAßSTAB; Masse/Mass kg: 0.000000; Format/Size: A2
Ausfuehrung u. Lieferung / Tech. Characteristics: ----	Allgemeine Fertigungs- vorschriften nach MMN 332 Production Specification per MMN 332	Werkstoff / Material: ####----
Oberflaechenschutz /Surface Protection: ----		Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----
Verwendbar fuer Typ / Applicable to Model: ----	Fert.Ber. Man. Adv.: shaik farh 23.11.2021; Mont.Ber. Inst.Adv.: ---- ----	
Projekt-/Auftrags-Nr. / Project/Order No.: ----		Material-Nr./Material-No.: XZG3164400008
Referenz-Nr./Ref.No.: ----; Emission ID: ----		

ACAD	Datum/Date	Name
Ersteller Drawn	----	----
Bearb. Change	22.11.2021	groenke do
Norm. Std.	23.11.2021	ramireddy
Gepr. Checked	23.11.2021	ramireddy

Benennung/Title: AO Arrangement
OPTIONS

ELEC SYSTEM DRAWING

A Rolls-Royce solution
Rolls-Royce Solutions GmbH

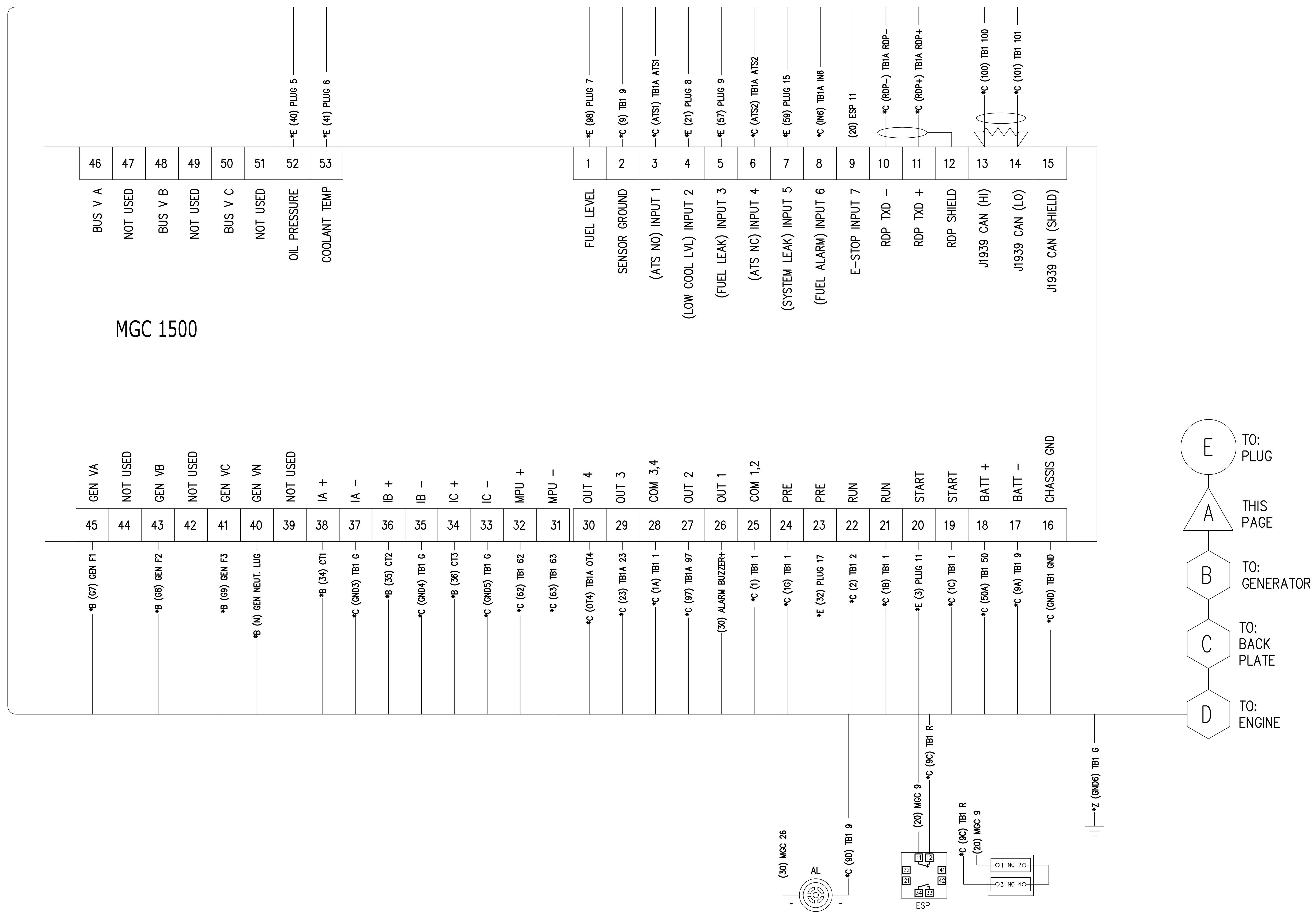
Zeichnungs-Nr./Drawing No.: FDH000000000001229051

Beschreibung/Description: OPTIONS

Blatt Sheet: 1/2

Passmass Fit	Abmass in Deviation µm	
Aenderungsbeschreibung/Description of revision	REVISE TITLE BLOCK	kommt vor/Frequency KOMMT_VOR
Buchst./Rev.Ltr.	a.8	
Erh–Antrags–Nr./Promotion Request No.	----	
Aenderungs–Nr./Change Notice No.	CN030319	
Bearbeitungsstatus/Lifecycle	In Work	

Allgemeintoleranzen / General Tolerances ISO 2768–mK		Masse / Size ISO 14405 (E)
Bauart/Type: 50–60kW GAS	Oberflaechenangaben nach MTN5033 Surface Specification per MTN5033	Massstab/Scale: MAßSTAB; Masse/Mass kg: ----; Format/Size: .
Ausfuehrung u. Lieferung / Tech. Characteristics: ----	Allgemeine Fertigungs– vorschriften nach MMN 332 Production Specification per MMN 332	Werkstoff / Material: --------
Oberflaechenschutz /Surface Protection: ----	Fert.Ber. Man. Adv.: ---- ----	Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----
Verwendbar fuer Typ / Applicable to Model: ----	Mont.Ber. Inst.Adv.: ---- ----	
Projekt–/Auftrags–Nr. / Project/Order No.: ----		Material–Nr./Material–No.: XZG2564400001
Referenz–Nr./Ref.No.: ---- ; Emission ID: ----	ACAD / Datum/Date / Name	Benennung/Title: A0 Arrangement
	Ersteller Drawn: 27.05.2021 groenke do	PSI 5.7L GAS ENGINE
	Bearb. Change: 22.11.2021 groenke do	
	Norm. Std.: ---- ----	ELEC SYSTEM DRAWING
	Gepr. Checked: ---- ----	
Rolls–Royce Solutions GmbH, A Rolls–Royce solution	Zeichnungs–Nr./Drawing No.: CAD08020068	Blatt Sheet 1/4
	Beschreibung/Description: ----	



NOTES:

1. WIRE NUMBERS ARE IN PARENTHESIS.
2. SHORT DASHED LINES (------) INDICATE CUSTOMER CONNECTION OR OPTIONAL EQUIPMENT.

LEGEND

AL	ALARM BUZZER
AEM	ANALOG EXPANSION MODULE
ATS	AUTOMATIC TRANSFER SWITCH
BPS	BACK PLATE STUD
CEM	CONTACT EXPANSION MODULE
DGS	DOOR GROUND STUD
ESP	EMERGENCY STOP BUTTON
F1	PANEL FUSE ATO 5A
F2	PANEL FUSE ATO 10A
F3	PANEL FUSE ATO 15A
FLGS	FUEL LEVEL GAUGE SENDER
FLS	FUEL LEAK SWITCH
GGS	GENERATOR GROUND STUD
GSA	GOVERNOR SPEED ADJUST
K6	LOUVER MOTOR RELAY
K8	REMOTE EMERGENCY STOP RELAY
LWL	LOW WATER LEVEL PROBE
MGC	MTU GENERATOR CONTROLLER
MEC	MODBUS/ETHERNET CONVERTER
R1	120 OHM ⅛ 1% RESISTOR
TB1	TERMINAL BLOCK 1 (PANEL BACK)
TB1A	TERMINAL BLOCK 1A (PANEL BACK)
VAR	VOLTAGE ADJUST RHEOSTAT
VAT	VOLTAGE ADJUST TOGGLE

*X (X) XXX X

*X	DESTINATION
(X)	WIRE NUMBER
XXX	DESTINATION
X	DESTINATION TERMINAL

Aenderungsbeschreibung/Description of revision
ESTOP DIAGRAM UPDATE TO NEW STYLE. PRIOR DESIGN STILL SHOWN FOR LEGACY PRODUCT.

kommt vor/Frequency KOMMT_VOR

Passmass Fit	Abmass in Deviation µm	Buchst./Rev.Ltr.	Erh-Antrags-Nr./Promotion Request No.	Aenderungs-Nr./Change Notice No.	Bearbeitungsstatus/Lifecycle
		b.3	PR110783	CN045877	Released

Allgemeintoleranzen / General Tolerances ISO 2768-mK

Masse / Size ISO 14405 (E)

Bauart/Type: 30-60kW GAS

Oberflaechenangaben nach MTN5033 / Surface Specification per MTN5033

Massstab/Scale: MAßSTAB

Masse/Mass kg: ----

Format/Size: .

Ausfuehrung u. Lieferung / Tech. Characteristics: ----

Allgemeine Fertigungs- vorschriften nach MMN 332 / Production Specification per MMN 332

Werkstoff / Material: --------

Oberflaechenschutz /Surface Protection: ----

Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----

Verwendbar fuer Typ / Applicable to Model: ----

Fert.Ber. Man. Adv.: kansakar d31.03.2023

Mont.Ber. Inst.Adv.: ---- ----

Projekt-/Auftrags-Nr. / Project/Order No.: ----

Material-Nr./Material-No.: XZG3164400011

Referenz-Nr./Ref.No.: ----

Emission ID: ----

ACAD	Datum/Date	Name
Ersteller Drawn	02.10.2020	witte dohn
Bearb. Change	29.03.2023	witte dohn
Norm. Std.	31.03.2023	siebert jo
Gepr. Checked	31.03.2023	siebert jo

Benennung/Title --------
MGC 1500 CONTROL PANEL

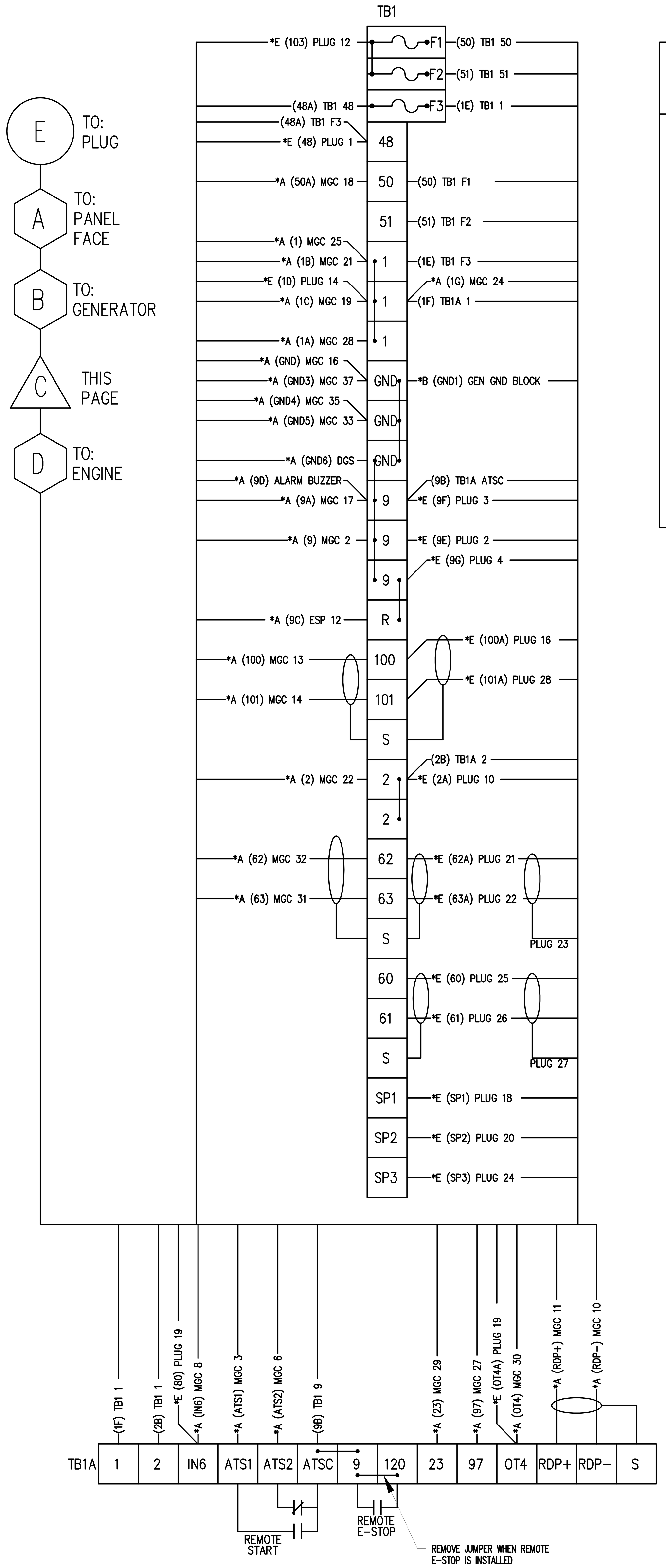
ELEC SYSTEM DRAWING
----

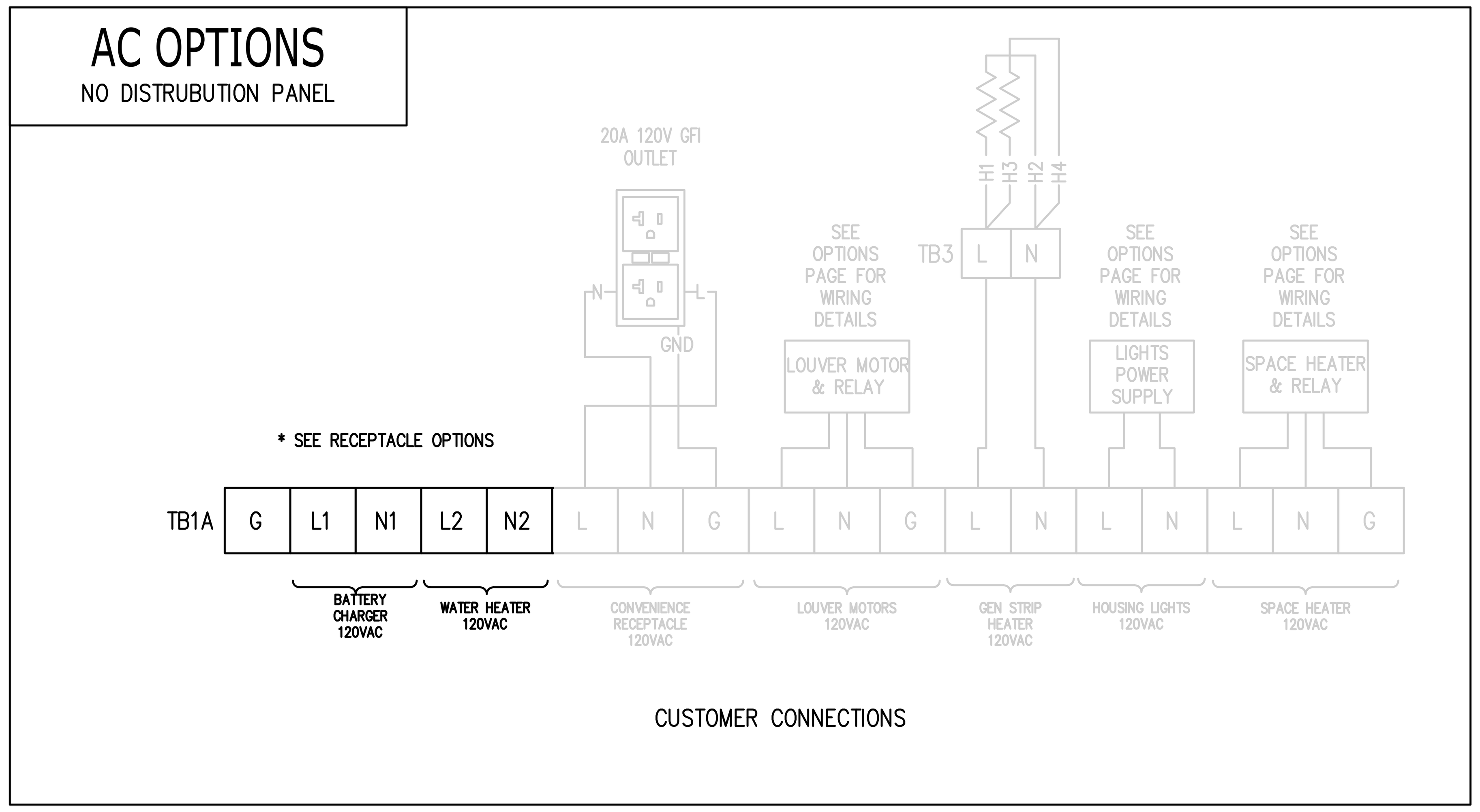
mtu A Rolls-Royce solution
Rolls-Royce Solutions GmbH

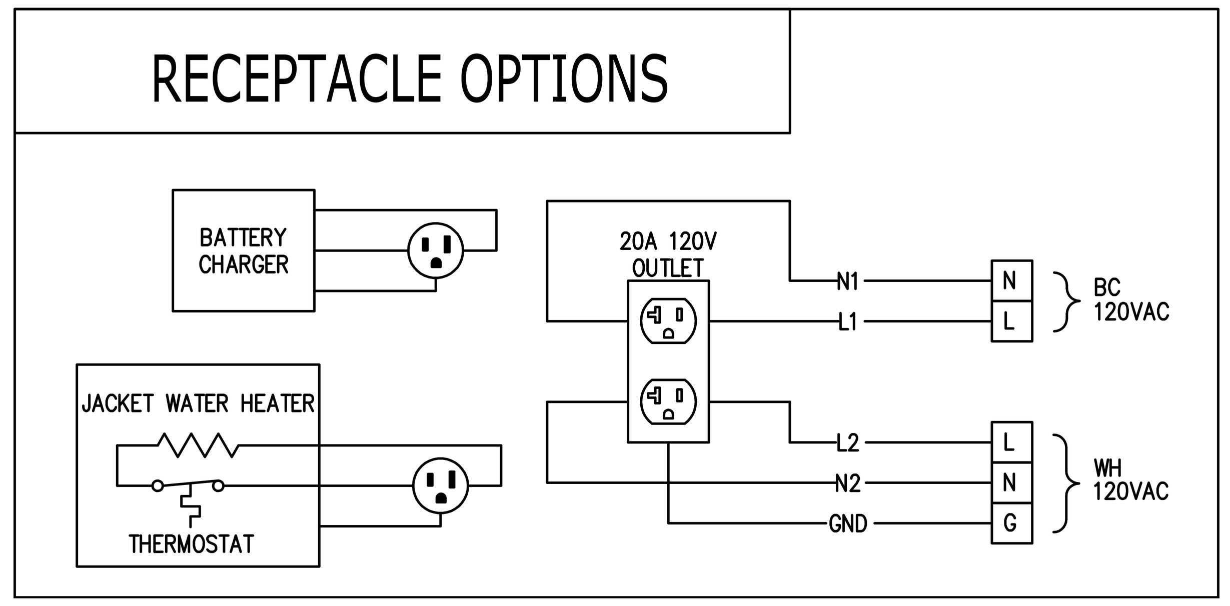
Zeichnungs-Nr./Drawing No.: CAD06762852

Beschreibung/Description: CONTROLLER

Blatt Sheet: 1/2







NOTES:

1. WIRE NUMBERS ARE IN PARENTHESIS.
2. SHORT DASHED LINES (------) INDICATE CUSTOMER CONNECTION OR OPTIONAL EQUIPMENT.

LEGEND:

AEM	ANALOG EXPANSION MODULE
ATS	AUTOMATIC TRANSFER SWITCH
BPS	BACK PLATE STUD
CEM	CONTACT EXPANSION MODULE
MGC	MTU GENERATOR CONTROLLER
DGS	DOOR GROUND STUD
F1	PANEL FUSE ATO 5A
F2	PANEL FUSE ATO 10A
F3	PANEL FUSE ATO 15A
K1	ENGINE RUN RELAY
K2	ENGINE FAIL RELAY
K3	MINOR ALARM RELAY
K6	LOUVER MOTOR RELAY
K8	REMOTE ESTOP RELAY
K10	ENGINE RUN RELAY
LVR	LOUVER MOTOR RELAY
MEC	MODBUS/ETHERNET CONVERTER
R1	RESISTOR 120 OHM ½ W
TB1	TERMINAL BLOCK 1 (PANEL BACK)
TB1A	TERMINAL BLOCK 1 (PANEL BACK)
TB3	TERMINAL BLOCK 3 (GENERATOR OUTLET BOX)

*X (X) XXX X

*X	DESTINATION
(X)	WIRE NUMBER
XXX	DESTINATION
X	DESTINATION TERMINAL

Aenderungsbeschreibung/Description of revision
ESTOP DIAGRAM UPDATE TO NEW STYLE. PRIOR DESIGN STILL SHOWN FOR LEGACY PRODUCT.
kommt vor/Frequency KOMMT_VOR

Passmass Fit	Abmass in Deviation µm	Buchst./Rev.Ltr.	Erh-Antrags-Nr./Promotion Request No.	Aenderungs-Nr./Change Notice No.	Bearbeitungsstatus/Lifecycle
		b.3	PR110783	CN045877	Released

Allgemeintoleranzen / General Tolerances ISO 2768-mK
Masse / Size ISO 14405 (E)
Bauart/Type: 30-60kW GAS
Oberflaechenangaben nach MTN5033 / Surface Specification per MTN5033
Massstab/Scale: MAßSTAB
Masse/Mass kg: ----
Format/Size: .
Ausfuehrung u. Lieferung / Tech. Characteristics: ----
Allgemeine Fertigungs- vorschriften nach MMN 332 / Production Specification per MMN 332
Werkstoff / Material: --------
Oberflaechenschutz /Surface Protection: ----
Halbzeug,Modell,Gesenk / Semifinished Product,Pattern,Die: ----
Verwendbar fuer Typ / Applicable to Model: ----
Fert.Ber. Man. Adv.: kansakar d31.03.2023
Mont.Ber. Inst.Adv.: ---- ----
Projekt-/Auftrags-Nr. / Project/Order No.: ----
Material-Nr./Material-No.: XZG3164400011
Referenz-Nr./Ref.No.: ----
Emission ID: ----

ACAD	Datum/Date	Name
Ersteller Drawn	02.10.2020	witte dohn
Bearb. Change	29.03.2023	witte dohn
Norm. Std.	31.03.2023	siebert jo
Gepr. Checked	31.03.2023	siebert jo

Benennung/Title
MCG 1500 CONTROL PANEL
ELEC SYSTEM DRAWING

mtu A Rolls-Royce solution
Rolls-Royce Solutions GmbH

Zeichnungs-Nr./Drawing No.: CAD06762853
Beschreibung/Description: BACK PANEL
Blatt Sheet: 2/2