ARF-1025 **Item #: 28. A.**

REGULAR SESSION AGENDA **Purchasing**

Date: 07/27/2010

R10-091 agreement

Submitted By:	Debbie Kaminski, Purchasing
Department:	Purchasing
Type of Item:	Discussion Item
Renewal Agreement/ Appointment:	No
Reviewed by County Attorney's Office:	Yes
Multiple Originals Y/N?:	y

Information

SUMMARY OF ITEM

Take all appropriate action on agreement with McDonald Electric for trailer mounted generators pursuant to RFP 10-091. (Funding: OEM 08SHSP grant)

SPECIAL HANDLING

Attachments

Link: R10-091 agreement

8/2/10 3 originals returned to Cheryl at Purchasing

TRAILER MOUNTED GENERATOR AGREEMENT

THIS AGREEMENT is made and entered into by and between Fort Bend County, (hereinafter "County"), a body corporate and politic under the laws of the State of Texas, and C.F. McDonald Electric, Inc., (hereinafter "Contractor"), a corporation authorized to conduct business in the State of Texas.

W I T N E S S E T H

WHEREAS, County desires to obtain services related to the provision and installation of two trailer mounted generators and the materials necessary to manually transfer power from the grid to the generators at four county facilities (hereinafter "Services"); and

WHEREAS, Contractor represents that it is qualified and desires to perform such Services.

NOW, THEREFORE, in consideration of the mutual covenants and conditions set forth below, the parties agree as follows:

AGREEMENT

Article I. Scope of Services

Contractor shall render Services to County as defined in the Scope of Services (attached hereto as Exhibit A).

Article II. Personnel

2.1 Contractor represents that it presently has, or is able to obtain, adequate qualified personnel in its employment for the timely performance of the Scope of Services required under this Agreement and that Contractor shall furnish and maintain, at its own expense, adequate and sufficient personnel, in the opinion of County, to perform the Scope of Services when and as required and without delays.

2.2 All employees of Contractor shall have such knowledge and experience as will enable them to perform the duties assigned to them. Any employee of Contractor who, in the opinion of County, is incompetent or by his conduct becomes detrimental to the Project shall, upon request of County, immediately be removed from association with the Project.

Article III. Compensation and Payment

3.1 The Maximum Compensation for the performance of Services within the Scope of Services described in Exhibit A is one hundred and ninety-eight thousand four hundred and sixty-nine dollars and no/100 ($198,469.00). In no case shall the amount paid under this Agreement exceed the Maximum Compensation without an approved change order.

3.2 All performance of the Scope of Services including any changes in the Scope of Services and revision of work satisfactorily performed will be performed only when approved in

advance and authorized by County. Payment will be made in accordance with those payment procedures set forth in Section 3.3 below.

3.3 It is understood and agreed that payment will be made to Contractor by County based on the following procedures: Upon completion of the tasks identified in the Scope of Services, Contractor shall submit to County two (2) original copies of invoices showing the amounts due for services performed in a form acceptable to County. County shall review such invoices and approve them within 30 calendar days with such modifications as are consistent with this Agreement and forward same to the Auditor for processing. County shall pay each such approved invoice within thirty (30) calendar days. County reserves the right to withhold payment pending verification of satisfactory work performed.

Article IV. Time of Performance

It is understood and agreed that the time for performance of the Scope of Services under this Agreement shall begin with receipt of the Notice to Proceed and end no later than one hundred and twenty (120) days after receipt of the Notice to Proceed. Tasks described in the Scope of Services shall be completed within this time or within such additional time as may be extended by the County.

Article V. Modifications

Any modifications to this Agreement must be in writing and must be signed by both parties.

Article VI. Termination

6.1 Termination for Convenience

6.1.1 County may terminate this Agreement at any time upon thirty (30) days written notice.

6.2 Termination for Default

6.2.1 County may terminate the whole or any part of this Agreement for cause in the following circumstances:

6.2.1.1 If Contractor fails to perform services within the time specified in the Scope of Services or any extension thereof granted by the County in writing;

6.2.1.2 If Contractor materially breaches any of the covenants or terms and conditions set forth in this Agreement or fails to perform any of the other provisions of this Agreement or so fails to make progress as to endanger performance of this Agreement in accordance with its terms, and in any of these circumstances does not cure such breach or failure to County's reasonable satisfaction within a period of ten (10) calendar days after receipt of notice from County specifying such breach or failure.

6.2.2 If, after termination, it is determined for any reason whatsoever that Contractor was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the County in accordance with Section 6.1 above.

6.3 Upon termination of this Agreement, County shall compensate Contractor in accordance with Section 3, above, for those services which were provided under this Agreement prior to its termination and which have not been previously invoiced to County. Contractor's final invoice for said services will be presented to and paid by County in the same manner set forth in Section 3 above.

6.4 If County terminates this Agreement as provided in this Section, no fees of any type, other than fees due and payable at the Termination Date, shall thereafter be paid to Contractor.

Article VII. Ownership and Reuse of Documents

All documents, data, reports, research, graphic presentation materials, etc., developed by Contractor as a part of its work under this Agreement, shall become the property of County upon completion of this Agreement, or in the event of termination or cancellation thereof, at the time of payment under Section 3 for work performed. All such data and material shall be promptly furnished to County on request.

Article VIII. Inspection of Books and Records

Contractor will permit County, or any duly authorized agent of County, to inspect and examine the books and records of Contractor for the purpose of verifying the amount of work performed under the Scope of Services. County's right to inspect survives the termination of this Agreement for as long as Contractor maintains such records. Contractor shall maintain records related to this Agreement for the greater of three years from the completion of performance under this Agreement or the period of time required by other applicable laws.

Article IX. Insurance

9.1 Prior to commencement of the Services, Contractor shall furnish County with properly executed certificates of insurance which shall evidence all insurance required and provide that such insurance shall not be canceled, except on 30 days' prior written notice to County. Contractor shall provide certified copies of insurance endorsements and/or policies if requested by County. Contractor shall maintain such insurance coverage from the time Services commence until Services are completed and provide replacement certificates, policies and/or endorsements for any such insurance expiring prior to completion of Services. Contractor shall obtain such insurance written on an Occurrence form from such companies having Bests rating of A/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

9.1.1 Workers' Compensation insurance in accordance with the laws of the State of Texas. Substitutes to genuine Workers' Compensation Insurance will not be allowed.

9.1.2 Commercial general liability insurance with a limit of not less than $1,000,000 each occurrence and $2,000,000 in the annual aggregate. Policy shall cover liability for bodily injury, personal injury, and property damage and products/completed operations arising out of the business operations of the policyholder.

9.1.3 Business Automobile Liability insurance with a combined Bodily Injury/Property Damage limit of not less than $1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.

9.1.4 Professional Liability insurance with limits not less than $1,000,000.

9.1.5 Employers' Liability insurance with limits of not less than $1,000,000 per injury by accident, $1,000,000 per injury by disease, and $1,000,000 per bodily injury by disease.

9.2 County and the members of Commissioners Court shall be named as additional insured to all required coverage except for Workers' Compensation and Professional Liability. All Liability policies (except Workers Compensation) written on behalf of Contractor shall contain a waiver of subrogation in favor of County and the members of Commissioners Court.

9.3 If required coverage is written on a claims-made basis, Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of the contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of 2 years beginning from the time that work under the Agreement is completed.

Article X. Indemnity

CONTRACTOR SHALL SAVE HARMLESS COUNTY FROM AND AGAINST ALL CLAIMS, LIABILITY, AND EXPENSES, INCLUDING REASONABLE ATTORNEYS FEES, ARISING FROM ACTIVITIES OF CONTRACTOR, ITS AGENTS, SERVANTS OR EMPLOYEES, PERFORMED UNDER THIS AGREEMENT THAT RESULT FROM THE NEGLIGENT ACT, ERROR, OR OMISSION OF CONTRACTOR OR ANY OF CONTRACTOR'S AGENTS, SERVANTS OR EMPLOYEES.

Article XI. Confidential and Proprietary Information

11.1 Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Agreement, be exposed to or acquire information that is confidential to County. Any and all information of any form obtained by Contractor or its employees or agents in the performance of this Agreement shall be deemed to be confidential information of County ("Confidential Information"). Any reports or other documents or items (including software) that result from the use of the Confidential Information by Contractor shall be treated with respect to confidentiality in the same manner as the Confidential Information. Confidential Information shall be deemed not to include information that (a) is or becomes (other than by disclosure by Contractor) publicly known or

is contained in a publicly available document; (b) is furnished by County to others without restrictions similar to those imposed by this Agreement; (c) is rightfully in Contractor's possession without the obligation of nondisclosure prior to the time of its disclosure under this Agreement; or (d) is independently developed by employees or agents of Contractor who can be shown to have had no access to the Confidential Information.

11.2 Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purposes whatsoever other than the provision of Services to County hereunder, and to advise each of its employees and agents of their obligations to keep Confidential Information confidential. Contractor shall use its best efforts to assist County in identifying and preventing any unauthorized use or disclosure of any Confidential Information. Without limitation of the foregoing, Contractor shall advise County immediately in the event Contractor learns or has reason to believe that any person who has had access to Confidential Information has violated or intends to violate the terms of this Agreement and Contractor will at its expense cooperate with County in seeking injunctive or other equitable relief in the name of County or Contractor against any such person. Contractor agrees that, except as directed by County, Contractor will not at any time during or after the term of this Agreement disclose, directly or indirectly, any Confidential Information to any person, and that upon termination of this Agreement or at County's request, Contractor will turn over to County all documents, papers, and other matter in Contractor's possession which embody Confidential Information.

11.3 Contractor acknowledges that a breach of this Section, including disclosure of any Confidential Information, or disclosure of other information that, at law or in equity, ought to remain confidential, will give rise to irreparable injury to County that is inadequately compensable in damages. Accordingly, County may seek and obtain injunctive relief against the breach or threatened breach of the foregoing undertakings, in addition to any other legal remedies that may be available. Contractor acknowledges and agrees that the covenants contained herein are necessary for the protection of the legitimate business interest of County and are reasonable in scope and content.

11.4 Contractor in providing all services hereunder agrees to abide by the provisions of any applicable Federal or State Data Privacy Act.

11.5 County is subject to various open government laws and does not agree with to pay any fee related to the release of information related to this Agreement in accordance with state or federal law.

Article XII. Independent Contractor

12.1 In the performance of work or services hereunder, Contractor shall be deemed an independent Contractor, and any of its agents, employees, officers, or volunteers performing work required hereunder shall be deemed solely as employees of Contractor or, where permitted, of its subcontractors.

12.2 Contractor and its agents, employees, officers, or volunteers shall not, by performing work pursuant to this Agreement, be deemed to be employees, agents, or servants of County and shall not be entitled to any of the privileges or benefits of County employment.

Article XIII. Contract Administration

13.1 All written notices, demands, and other papers or documents to be delivered to County under this Agreement shall be delivered to the Fort Bend County Purchasing Department, 4520 Reading Road, Suite A, Rosenberg, Texas 77471, Attention: Purchasing Agent, or at such other place or places as it may from time to time designate by written notice delivered to Contractor. For purposes of notice under this Agreement, a copy of any notice or communication hereunder shall also be forwarded to the following address: Fort Bend County, 301 Jackson Street, Suite 719, Richmond, Texas 77469, Attention: County Judge.

13.2 All written notices, demands, and other papers or documents to be delivered to Contractor under this Agreement shall be delivered to C.F. McDonald Electric, Inc., 5044 Timber Creek, Houston, Texas 77017, or such other place or places as Contractor may designate by written notice delivered to County.

Article XIV. Compliance with Laws

Contractor shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of this Agreement, including, without limitation, Worker's Compensation laws, minimum and maximum salary and wage statutes and regulations, licensing laws and regulations, and any other law applicable to SAA Grant Award No. 08-SR 48157-01. When required, Contractor shall furnish County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

Article XV. Debarment/Suspension Certification

Contractor certifies that it is not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded by any federal department or agency and does not appear in the Excluded Parties List System at http://www.epls.gov.

Article XVI. Prohibited Interests

Contractor shall ensure that no employee, officer, or agent of Contractor; any member of his or her immediate family; his or her partner; or, any organization that employs or is about to employee any of the aforementioned, shall participate in the selection, award, or administration of a subcontract under this Agreement with a firm or person in which the employee, officer, or agent has or will obtain during the term of this Agreement or for one year thereafter a financial or other interest.

Article XVII. Assignment

Neither party may assign or transfer its rights or obligations under this Agreement without the prior written consent of the other party.

Article XVIII. Applicable Law

This Agreement shall be construed under and in accordance with the laws of the State of Texas. The parties hereto acknowledge that venue is proper in Fort Bend County, Texas, for all disputes arising hereunder and waive the right to sue or be sued elsewhere.

Article XIX. Successors and Assigns

County and Contractor bind themselves and their successors, executors, administrators and assigns to the other party of this Agreement and to the successors, executors, administrators and assigns of the other party, in respect to all covenants of this Agreement.

Article XX. Publicity

Contractor shall not make news releases, publicize or issue advertising pertaining to this Agreement without first obtaining the written approval of County.

Article XXI. Conflict

In the event there is a conflict between this Agreement and the attached exhibit, this Agreement shall control.

IN WITNESS WHEREOF, the parties hereto have signed or have caused their respective names to be signed to multiple counterparts to be effective on the _____ day of _____, 2010.

FORT BEND COUNTY

Robert E. Hebert, County Judge — Date: 7-27-2010

ATTEST:

Dianne Wilson, County Clerk — Date: 7-27-10

C.F. MCDONALD ELECTRIC, INC.

Authorized Representative — Date: 07-22-10

Harry Keller, V. President

AUDITOR'S CERTIFICATE

I hereby certify that funds are available in the amount of $ 198,469.00 to accomplish and pay the obligation of Fort Bend County under this contract.

Robert Edward Sturdivant, County Auditor

McDONALD
ELECTRIC
CONTRACTORS • ENGINEERS
5044 TIMBER CREEK
HOUSTON, TX 77017
(713) 921-1368 PH.
(713) 928-2569 FAX

ATTACHMENT "C"

May 19, 2010

Fort Bend County, Rosenberg Annex
4520 Reading Road, Suite A
Rosenberg, TX 77471

Attn: Gilbert Jalomo

RE: Fort Bend County RFP – Trailer Mounted Generators (RFP 10-091)

We are pleased to provide a quote on the above referenced project for the sum of $198,469.00. This price includes the following items included under section 6.0 (Scope of Work) of the RFP:

6.1 Furnish (1) 150KW and (1) 80KW portable Kohler diesel generator with all components as indicated in the RFP.

6.2 Furnish and install all materials needed to manually transfer the power from the grid to a portable generator at the buildings as indicated in the RFP.

6.3 Please refer to "Attachment 150KW" and "Attachment 80KW" for the information requested on items 6.3.1, 6.3.2, and 6.3.3 in the RFP.

6.3.4 We propose to install non automatic transfer switches at each of the four facilities listed in 6.3.4 so that the portable generator can easily, safely, and quickly be connected to the building.

We appreciate the opportunity to provide this quote. If you need anything else please give me a call at (713) 921-1368.

Sincerely,

Wayne Berkenmeier
Estimator/Project Manager

LOFTIN

LOFTIN EQUIPMENT CO.

KOHLER POWER SYSTEMS

DIESEL GENERATOR SET

PROJECT SUBMITTAL

Ft. Bend County Trailer 80kW

Electrical Contractor

McDonald Electric

Dale Grimes

LOFTIN EQUIPMENT CO.

6113 BRITTMOORE / HOUSTON, TX 77041
P: 281-310-6858 F: 602-352-4842

GENERATOR SET

Model: 80REOZJE
This generator set equipped with a 4S7 alternator operating at 120/208 volts is rated for 80 kW/ 100 kVA.
Output amperage: 278

Configuration

Qty	Description
1	80REOZJE Generator Set
1	Covers, 4S J-Box L-Frame With H/J LCB
1	MTG, LCB2, H-FR to L, 100-150A, 4S/4UA
1	LCB, 125A, HDL, Therm Mag, 80%
1	Skid, 44", Enclosure, 12V
1	Warranty, 1 Year Standby
1	Lit Kit, Production, 80REOZJE
1	Flexible Fuel Lines
1	Neutral, 600A 4S
1	Mtg, LCB, L-Frame, 300-400A. 4S
1	LCB, 300A, LAP, Therm Mag, 80%
1	Batt Chgr, Float, 90-120V, 12V-6A
1	Battery,1/12V,650CCA,Wet
1	Block Heater, 1500W, 120V
1	Enclosure, Sound, Crit Sil,Cap
1	Control & Harness
1	Controller, DEC3000, 800A
1	Air Intake, Standard Duty
1	Cooling, Unit Mounted Radiator
1	Alternator, 4S7
1	Voltage,60Hz,120/208V,3Ph,4W,0.8PF
1	Nameplate Rating, Standby 130 Degree
1	80REOZJE, 12V, 60HZ
1	Three Position Voltage Selector Switch for 277/480V & 120/240V 3 phase & 120/208V 3 phase

KOHLER POWER SYSTEMS

Warranty

Stationary Standby and Prime Power One-Year or Two Thousand (2000)-Hour Limited Warranty

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original consumer, Kohler Co. warrants, for the period indicated below, each product to be free from defects in materials and workmanship. Repair, replacement, or appropriate adjustment at Kohler Co.'s option will be furnished if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized representative must perform startup. This warranty does not apply to malfunctions caused by damage, unreasonable use, misuse, repair or service by unauthorized persons, or normal wear and tear.

Kohler Product	**Warranty Coverage***
Generator Set & Accessories	One (1) year or 2000 hours (whichever occurs first) from date of initial startup†
Prime Power Generator Set 20 kW or Larger	One (1) year or 2000 hours (whichever occurs first) from date of initial startup†

*Some restrictions may apply. Contact your Kohler distributor/dealer for full details.

†Startup must occur within 24 months of original shipment by Kohler Co.

The following will **not** be covered by the warranty:

1. Normal engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized service representative, or improper storage.
3. Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
4. Damage caused by negligent maintenance such as:
   a. Failure to provide the specified type and sufficient quantity of lubricating oil.
   b. Failure to keep the air intake and cooling fin areas clean.
   c. Failure to service the air cleaner.
   d. Failure to provide sufficient coolant and/or cooling air.
   e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
   f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Original installation charges and startup costs.
6. Starting batteries and the following related expenses:
   a. Labor charges related to battery service.
   b. Travel expense related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year.
8. Rental of equipment during performance of warranty repairs.
9. Parts purchased from sources other than Kohler Co. Replacement of a failed Kohler part with a non-Kohler part voids warranty on that part.
10. Radiators replaced rather than repaired.
11. Fuel injection pumps not repaired locally by an authorized servicing dealer.
12. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
13. Engine fluids such as fuel, oil, or coolant/antifreeze.
14. Shop supplies such as adhesives, cleaning solvents, and rags.
15. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
16. Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.

A Startup Notification form must be on file at Kohler Co. A Startup Notification form must be completed by Seller and received at Kohler Co. within 60 days after the date of initial startup. Standby systems not registered within 60 days of startup will automatically be registered by Kohler Co. using the Kohler Co. ship date as the startup date.

To obtain warranty service, call 1-800-544-2444 for your nearest authorized Kohler service representative or write Kohler Co., Generator Service Department, Kohler, WI 53044 USA.

KOHLER CO. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND including, but not limited to, incidental consequential labor costs, installation charges, telephone charges, or transportation charges in connection with the replacement or repair of defective parts.

This is our exclusive written warranty. We make no other express warranty nor is anyone authorized to make any on our behalf.

ANY IMPLIED OR STATUTORY WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF PURPOSE, is expressly limited to the duration of this warranty. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

KOHLER.
POWER SYSTEMS

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444
KohlerPowerSystems.com

TP-5374 12/99c

KOHLER POWER SYSTEMS

Prototype Test Certifications

Kohler Standby/Prime Generator Set Test Program

Testing is an integral part of quality assurance. In keeping with our uncompromising commitment to quality, safety, and reliability, every Kohler Standby/Prime power generator set undergoes an extensive series of prototype and production testing.

Prototype Testing

Prototype testing includes the potentially destructive tests necessary to verify design, proper function of protective devices and safety features, and reliability expectations. Kohler's prototype testing includes the following:

- Alternator temperature rise test per NEMA MG1-32.6. Standby and prime ratings of the alternator are established during this test.
- Maximum power test to assure that the prime mover and alternator have sufficient capacity to operate within specifications.
- Alternator overload test per NEMA MG1-32.8.
- Steady-state load test to ensure voltage regulation meets or exceeds ANSI C84.1, NEMA MG1-32.17 requirements and to verify compliance with steady-state speed control specifications.
- Transient test to verify speed controls meets or exceeds specifications.
- Transient load tests per NEMA MG1-32.18, and ISO 8528 to verify specifications of transient voltage regulation, voltage dip, voltage overshoot, recovery voltage, and recovery time.
- Motor starting tests per NEMA MG1-32.18.5 to evaluate capabilities of generator, exciter, and regulator system.
- Three-phase symmetrical short-circuit test per NEMA MG1-32.13 to demonstrate short circuit performance, mechanical integrity, ability to sustain short-circuit current.
- Harmonic analysis, voltage waveform deviation per NEMA MG1-32.10 to confirm that the generator set is producing clean voltage within acceptable limits.
- Generator set cooling and air flow tests to verify maximum operating ambient temperature.
- Reliability tests to demonstrate product durability, followed by root cause analysis of discovered failures and defects. Corrective action is taken to improve the design, workmanship, or components.
- Acoustical noise intensity and sound attenuation effects tests.

Production Testing

In production, Kohler Standby/Prime generator sets are built to the stringent standards established by the prototype program. Every Kohler Generator set is fully tested prior to leaving the factory. Production testing includes the following:

- Stator and exciter winding high-potential test on all generators. Surge transient tests on stators for generators 180 kW or larger. Continuity and balance tests on all rotors.
- One-step, full-load pickup tests to verify that the performance of each generator set, regulator, and governor meets published specifications.
- Regulation and stability of voltage and frequency are tested and verified at no load, 1/4 load, 1/2 load, 3/4 load, and full-rated load.
- Voltage, amperage, frequency and power output ratings verified by full-load test.
- The proper operation of controller logic circuitry, prealarm warnings, and shutdown functions is tested and verified.
- Any defect or variation from specification discovered during testing is corrected and retested prior to approval for shipment to the customer.

Torsional analysis data, to verify torsional effects are not detrimental and that the generator set will provide dependable service as specified, is available upon request.

Kohler offers other testing at the customer's request at an additional charge. These optional tests include power factor testing, customized load testing for specific application, witness testing, and a broad range of MIL-STD-705c testing. A certified test report is also available at an additional charge.

KOHLER.
POWER SYSTEMS

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444
KohlerPowerSystems.com

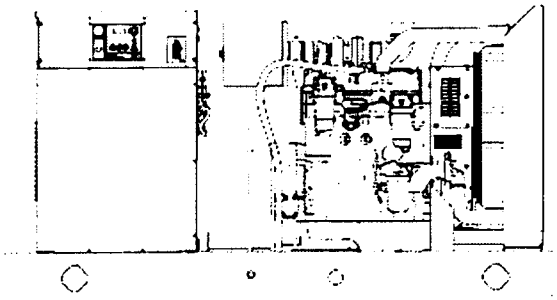
G18-56 12/05a

80REOZJE

Diesel

KOHLER POWER SYSTEMS

ISO 9001 KOHLER



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 3 nonroad emissions regulations.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator Features:
  - o The unique Fast-Response™ II excitation system delivers excellent voltage response and short circuit capability using a permanent magnet (PM)-excited alternator.
  - o The brushless, rotating-field alternator has broad range reconnectability.
- Other Features:
  - o Controllers are available for all applications. See controller features inside.
  - o The low coolant level shutdown prevents overheating (standard on radiator models only).
  - o Integral vibration isolation eliminates the need for under-unit vibration spring isolators.

Generator Set Ratings

				Standby130C Ratings	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**
4S7	120/208	3	60	80/100	278

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Ratings: 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. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. GENERAL GUIDELINES FOR DERATION: Altitude: Derate 1.3% per 100 m (328 ft.) elevation above 2500 m (8200 ft.). Temperature: Derate 1.0% per 10°C (18°F) temperature above 25°C (77°F).

Model: 80REOZJE, continued

Iternator Specifications

Specifications	Alternator
Alternator manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless,Permanent-Magnet
Leads, quantity	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: Temperature Rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load Decision-Maker 3000 controller	3-Phase Sensing, ±0.5%
550 controller (with 0.5% drift due to temperature variation)	3-Phase Sensing, ±0.25%
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of Rated Standby Current

- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling down stream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Fast-Response™ II brushless alternator with brushless exciter for excellent load response.

Model: 80REOZJE, continued

Engine

Engine Specifications	
Engine Manufacturer	John Deere
Engine Model	4045HF285H
Engine: type	4-Cycle, Turbocharged, Charge Air Cooled
Cylinder arrangement	4 Inline
Displacement, L (cu. in.)	4.5 (276)
Bore and stroke, mm (in.)	106 x 127 (4.19 x 5.00)
Compression ratio	19:01
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	5, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	118 (158)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve (exhaust) material Intake	Chromium-Silicon Steel
Valve (exhaust) material Exhaust	Stainless Steel
Governor: type, make/model	JDEC Electronic L16 Denso HP3
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System	
Exhaust Manifold Type	Dry
Exhaust flow at rated kW, m^3/min. (cfm)	19.2 (679)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	579 (1074)
Maximum allowable back pressure, kPa (in. Hg)	7.5 (2.2)
Exh. outlet size at eng. hookup, mm (in.)	98 (3.86)

Engine Electrical

Engine Electrical System	
Battery charging alternator	12 Volt/24 Volt
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	12/24
Ampere rating	65/45
Starter motor rated voltage (DC)	12/24
Battery, recommended cold cranking amps (CCA):	
Qty., CCA rating each	12 Volt/24 Volt One, 640/Two, 570
Battery voltage (DC)	12

Model: 80REOZJE, continued

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	11.0 (0.44)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Engine-Driven, 1.8 (6.0)
Max. fuel flow, Lph (gph)	62.5 (16.5)
Fuel prime pump	Manual
Fuel Filter Secondary	2 Microns@ 98% Efficiency
Fuel Filter Primary	30 Microns
Fuel Filter Water Separator	Yes
Recommended fuel	#2 Diesel

Lubrication

Lubrication System	
Type	Full Pressure
Oil pan capacity, L (qt.)	14.7 (15.5)
Oil pan capacity with filter, L (qt.)	15.6 (16.5)
Oil filter: quantity, type	1, Cartridge
Oil cooler	Water-Cooled

Cooling

Radiator System	
Ambient temperature, °C (°F)	50 (122)
Engine jacket water capacity, L (gal.)	8.5 (2.25)
Radiator system capacity, including engine, L (gal.)	20.1 (5.3)
Engine jacket water flow, Lpm (gpm)	155 (41)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	54.4 (3096)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	13.5 (768)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	600 (23.6)
Fan, kWm (HP)	6.6 (8.8)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H20)	0.125 (0.5)

Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m^3/min. (scfm) *	142 (5000)
Combustion air, m^3/min. (cfm)	6.9 (244)
Heat rejected to ambient air: Engine, kW (Btu/min.)	22.9 (1300)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	9.8 (560)

*Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

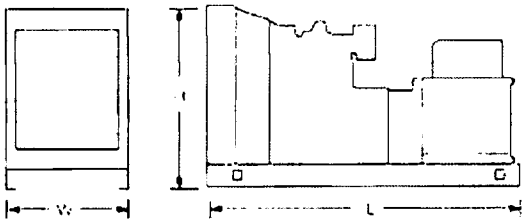
Model: 80REOZJE, continued

Fuel Consumption

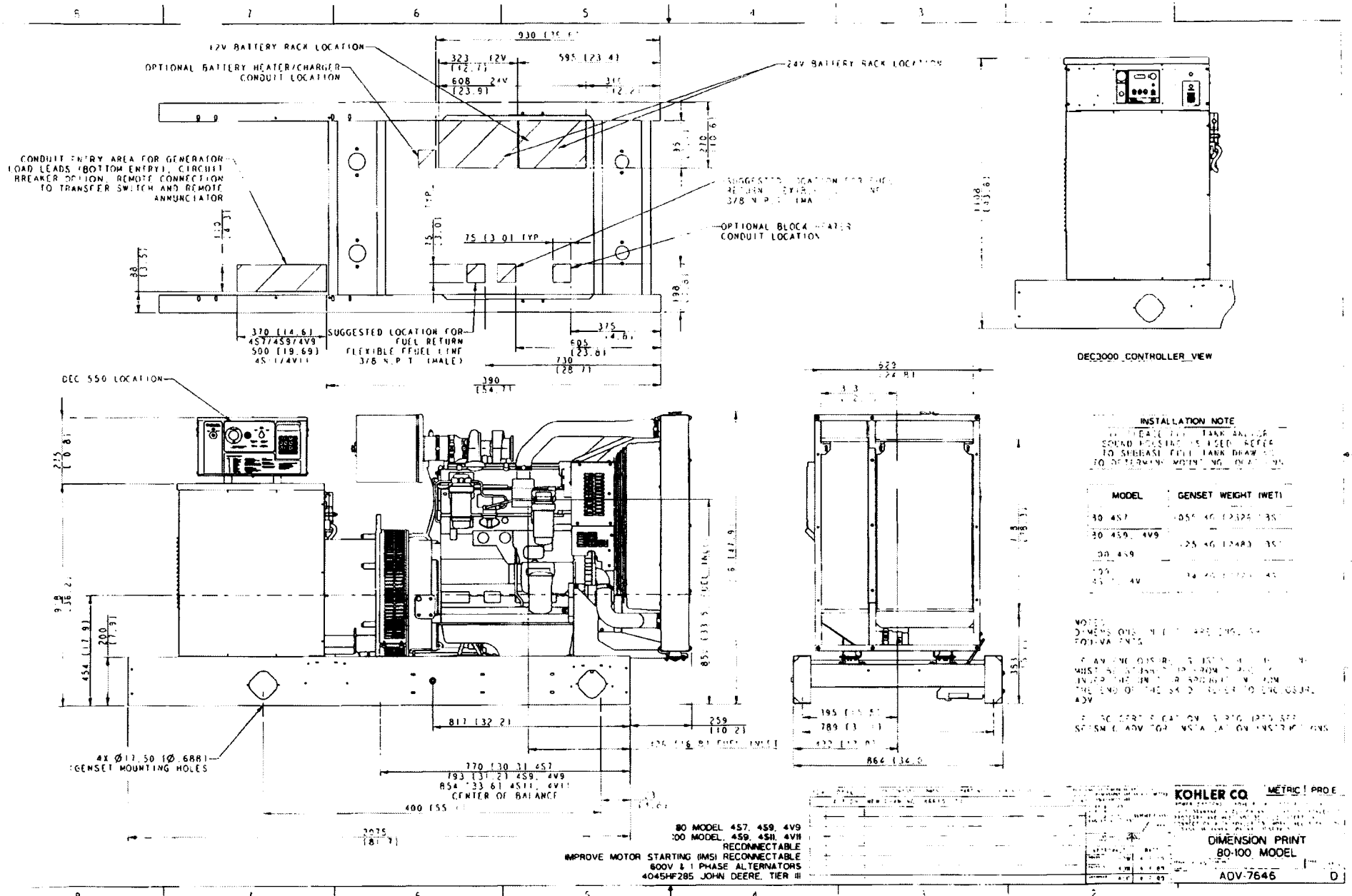
Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	26.1 Lph (6.9 gph)
Standby Fuel Consumption at 75% load	21.2 Lph (5.6 gph)
Standby Fuel Consumption at 50% load	15.5 Lph (4.1 gph)
Standby Fuel Consumption at 25% load	8.3 Lph (2.2 gph)
Prime Fuel Consumption at 100% load	23.8 Lph (6.3 gph)
Prime Fuel Consumption at 75% load	19.3 Lph (5.1 gph)
Prime Fuel Consumption at 50% load	14.4 Lph (3.8 gph)
Prime Fuel Consumption at 25% load	7.9 Lph (2.1 gph)

Dimensions and Weights

Overall Size, L x W x H, mm (in.): Wide Skid	See Enclosure ADV Drawing
Overall Size, L x W x H, mm (in.): Narrow Skid	2334 x 864 x 1216 (91.89 x 34.02 x 47.90)
Weight (radiator model), wet, kg (lb.):	1125 (2480)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.



INSTALLATION NOTE

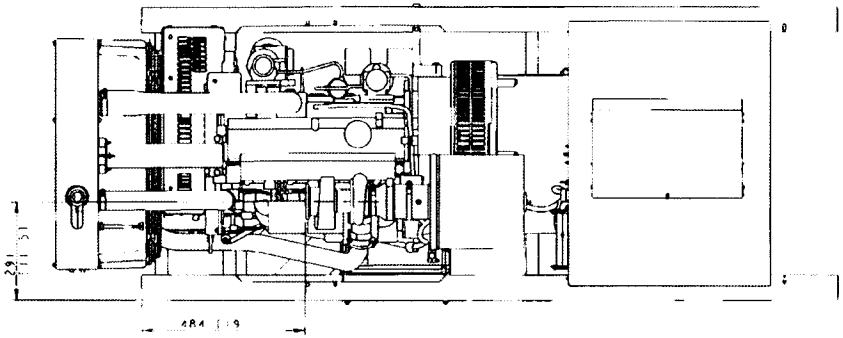
MODEL	GENSET WEIGHT (WET)
80 4S7	
80 4S9, 4V9	
80 4S9	
4V	

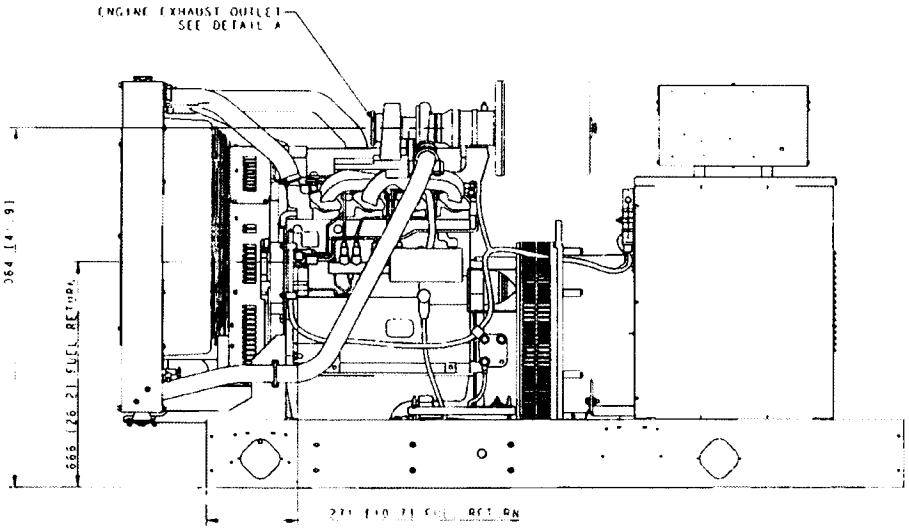
80 MODEL 4S7, 4S9, 4V9
100 MODEL, 4S9, 4S11, 4V11
RECONNECTABLE
IMPROVE MOTOR STARTING (IMS) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE, TIER III

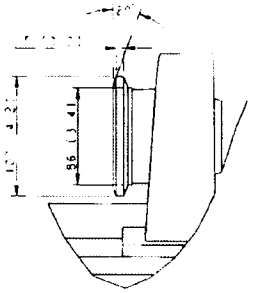
KOHLER CO. METRIC PROE

DIMENSION PRINT
80-100 MODEL

ADV-7646 D





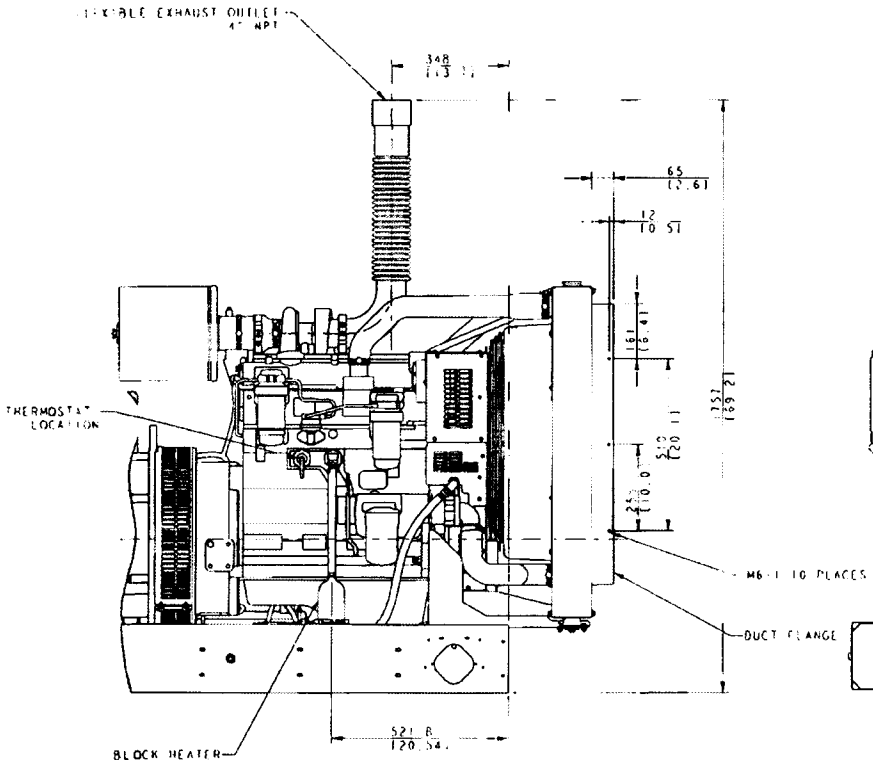


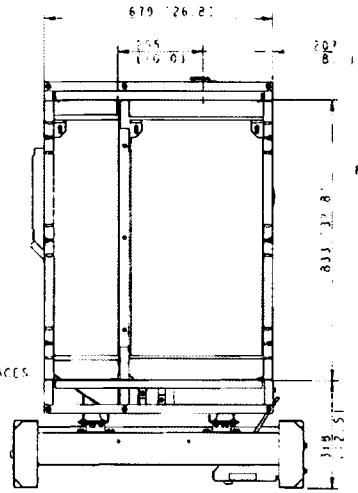
DETAIL A
EXHAUST OUTLET

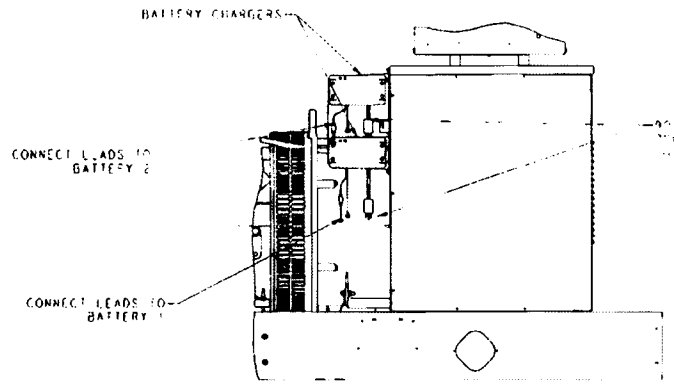
KOHLER CO. METRIC PRO-E

DIMENSION PRINT
80-100 MODEL

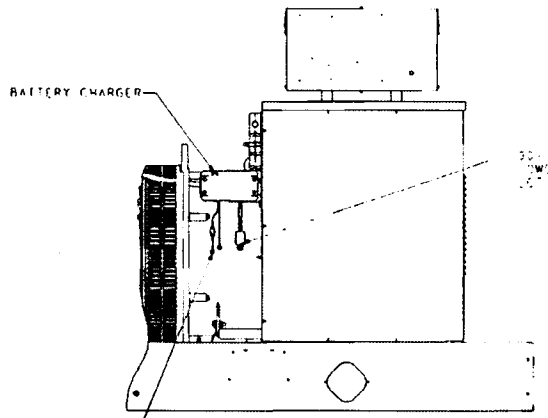
ADV-7646 D







BATTERY CHARGER 24V



BATTERY CHARGER 12V

80 MODEL 4S7, 4S9, 4V9
100 MODEL, 4S9, 4S11, 4V11
RECONNECTABLE
IMPROVE MOTOR STARTING (IMSI) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE, TIER III

KOHLER CO. METRIC PRO-E

DIMENSION PRINT
80-100 MODEL

ADV-7648

D

KOHLER POWER SYSTEMS

Alternator Data

KOHLER.
POWER SYSTEMS

TIB-102

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 4S7
Frequency: 60 Hz
Speed: 1800 RPM
Leads: 12 (6 Lead, 600 Volt)

Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)						
				Class B	Class F				Class H	
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby
139/240 277/480	3	0.8	Wye	74.0 (92.5)	77.5 (96.9)	79.0 (98.8)	82.0 (102.5)	87.5 (109.4)	86.5 (108.1)	88.0 (110.0)
127/220 254/440	3	0.8	Wye	69.0 (86.3)	71.0 (88.8)	72.5 (90.6)	75.0 (93.8)	81.5 (101.9)	80.0 (100.0)	83.0 (103.8)
120/208 240/416	3	0.8	Wye	69.0 (86.3)	71.0 (88.8)	72.5 (90.6)	75.0 (93.8)	81.5 (101.9)	80.0 (100.0)	83.0 (103.8)
110/190 220/380	3	0.8	Wye	62.0 (77.5)	64.5 (80.6)	66.0 (82.5)	69.0 (86.3)	75.0 (93.8)	73.5 (91.9)	78.0 (97.5)
120/240	3	0.8	Delta	65.5 (81.9)	68.0 (85.0)	69.5 (86.9)	72.5 (90.6)	80.0 (100.0)	78.5 (98.1)	81.0 (101.3)
120/240	1	1.0	Dogleg	52.0 (52.0)	53.5 (53.5)	54.0 (54.0)	56.0 (56.0)	61.0 (61.0)	60.0 (60.0)	61.0 (61.0)
120/240	1	0.8	Dogleg	39.0 (48.8)	40.5 (50.6)	41.5 (51.9)	43.5 (54.4)	47.0 (58.8)	46.0 (57.5)	47.0 (58.8)
347/600	3	0.8	Wye	74.0 (92.5)	77.5 (96.9)	79.0 (98.8)	82.0 (102.5)	87.5 (109.4)	86.5 (108.1)	88.0 (110.0)

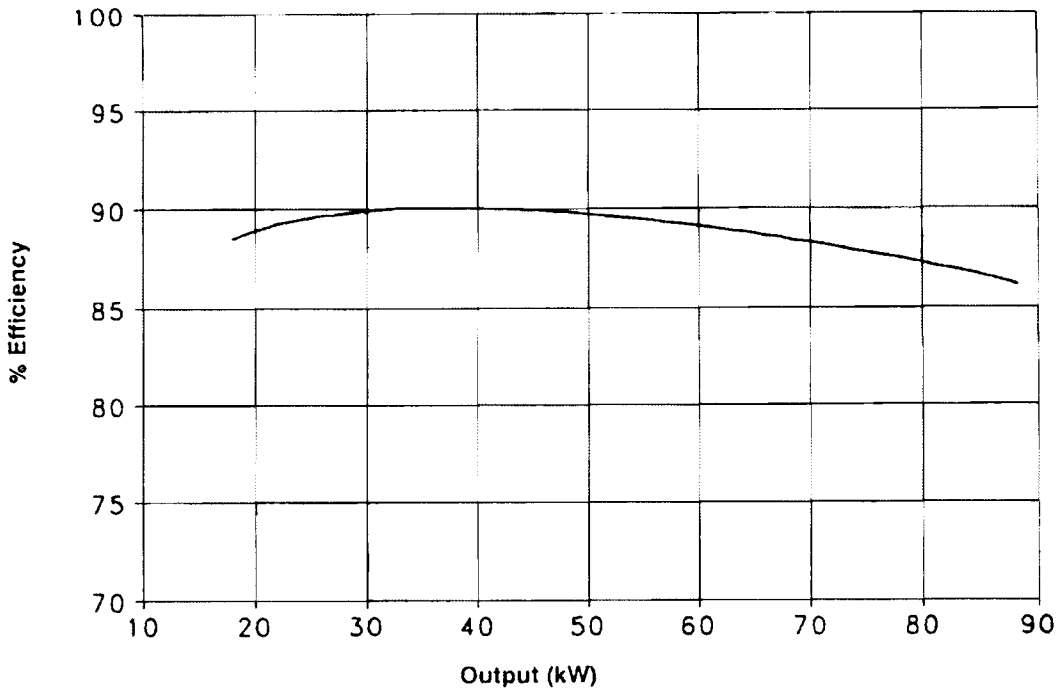
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Submittal Data: 139/240 Volts, 0.8 PF, 1800 RPM, 60 Hz, 3-Phase, 130°C Rise

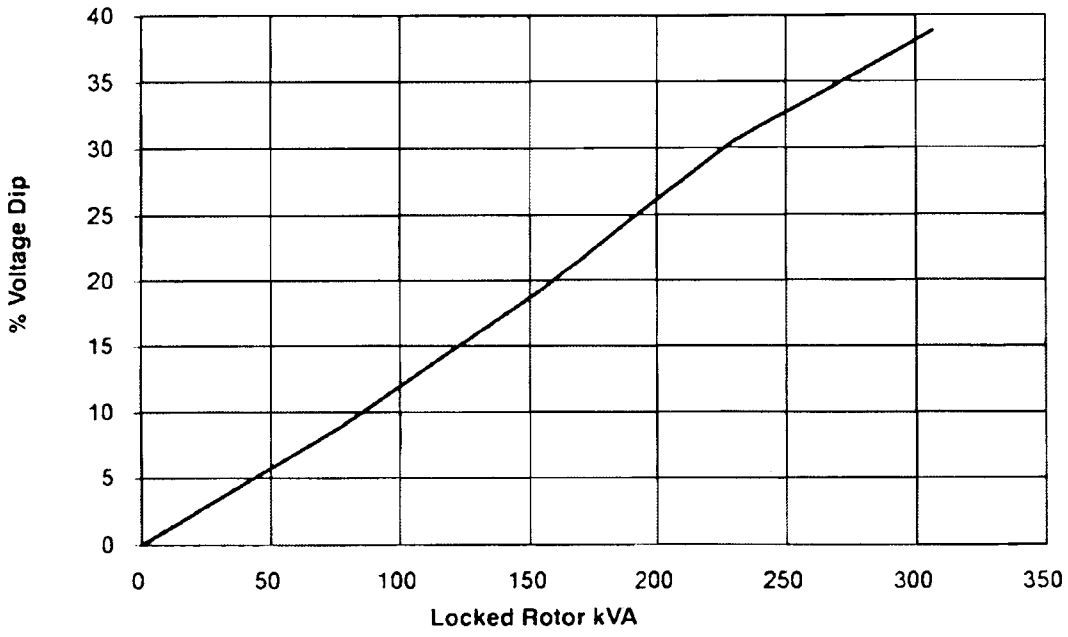
	Symbol	Per Unit	Ohms
Typical Resistances			
Phase Resistance		0.046	0.024
Rotor Resistance		3.646	1.920
Typical Reactances			
Synchronous			
Direct	X_d	4.042	2.129
Quadrature	X_q	2.009	1.058
Transient			
Unsaturated	X'_{du}	0.437	0.230
Saturated	X'_d	0.385	0.203
Subtransient			
Direct	X''_d	0.151	0.079
Quadrature	X''_q	0.144	0.076
Negative Sequence	X_2	0.151	0.078
Zero Sequence	X_0	0.014	0.007

	Symbol	Value
Typical Time Constants		
Armature Short Circuit	T_a	0.009 sec.
Transient Short Circuit	T'_d	0.113 sec.
Transient Open Circuit	T'_{do}	1.191 sec.
Typical Field Current		
Full Load	If_{FL}	28.75 amps
No Load	If_{NL}	5.26 amps
Typical Short Circuit Ratio		0.304
Harmonic Distortion		
RMS Total Harmonic Distortion		2.5%
Max. Single Harmonic		5th
Deviation Factor (No Load, L-L)		3.7%
Telephone Influence Factor		<50
Insulation Material Class per NEMA MG1-1.66		H
Phase Rotation		ABC

4S7, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL ALTERNATOR EFFICIENCY*

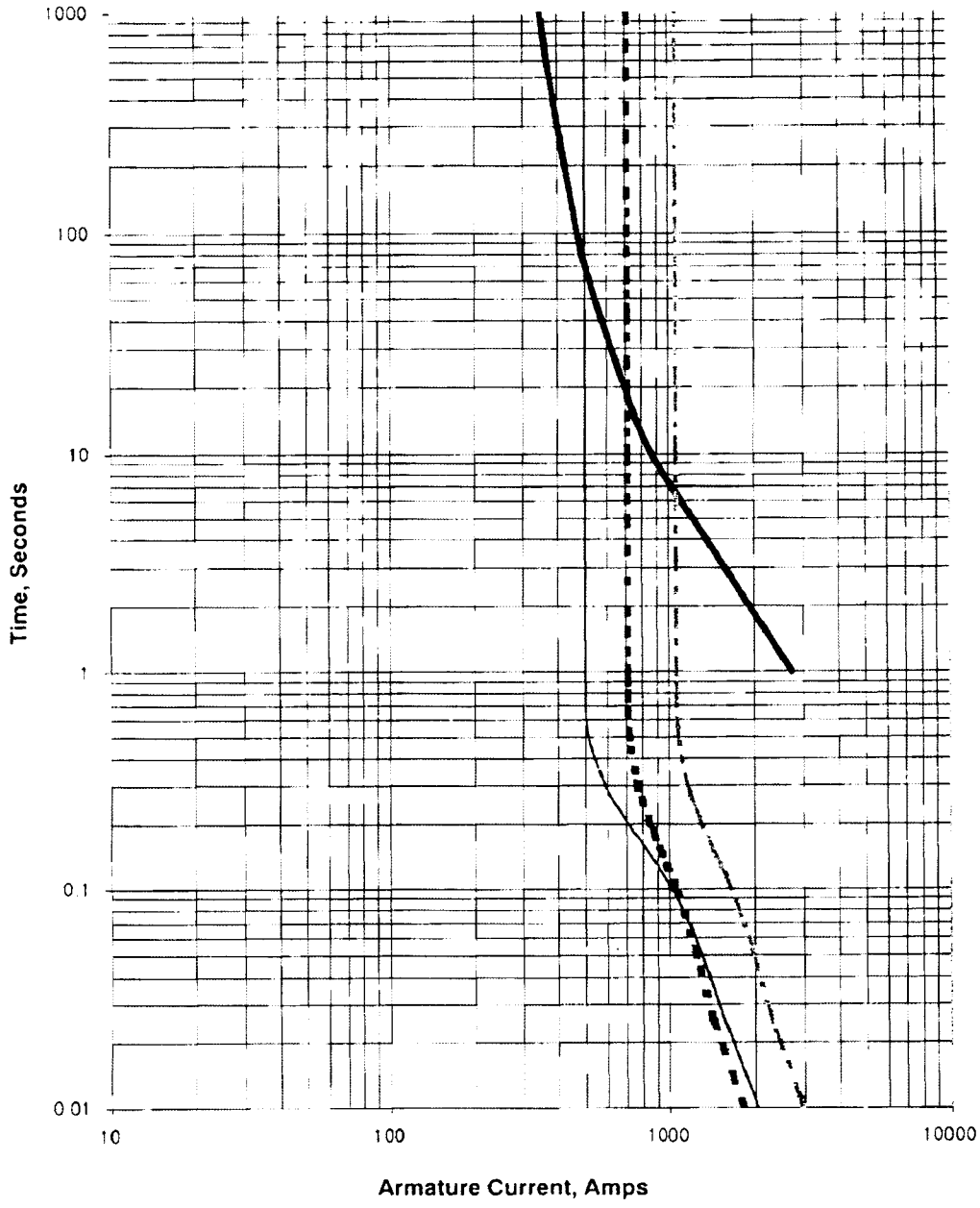


4S7, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL MOTOR STARTING CHARACTERISTICS*

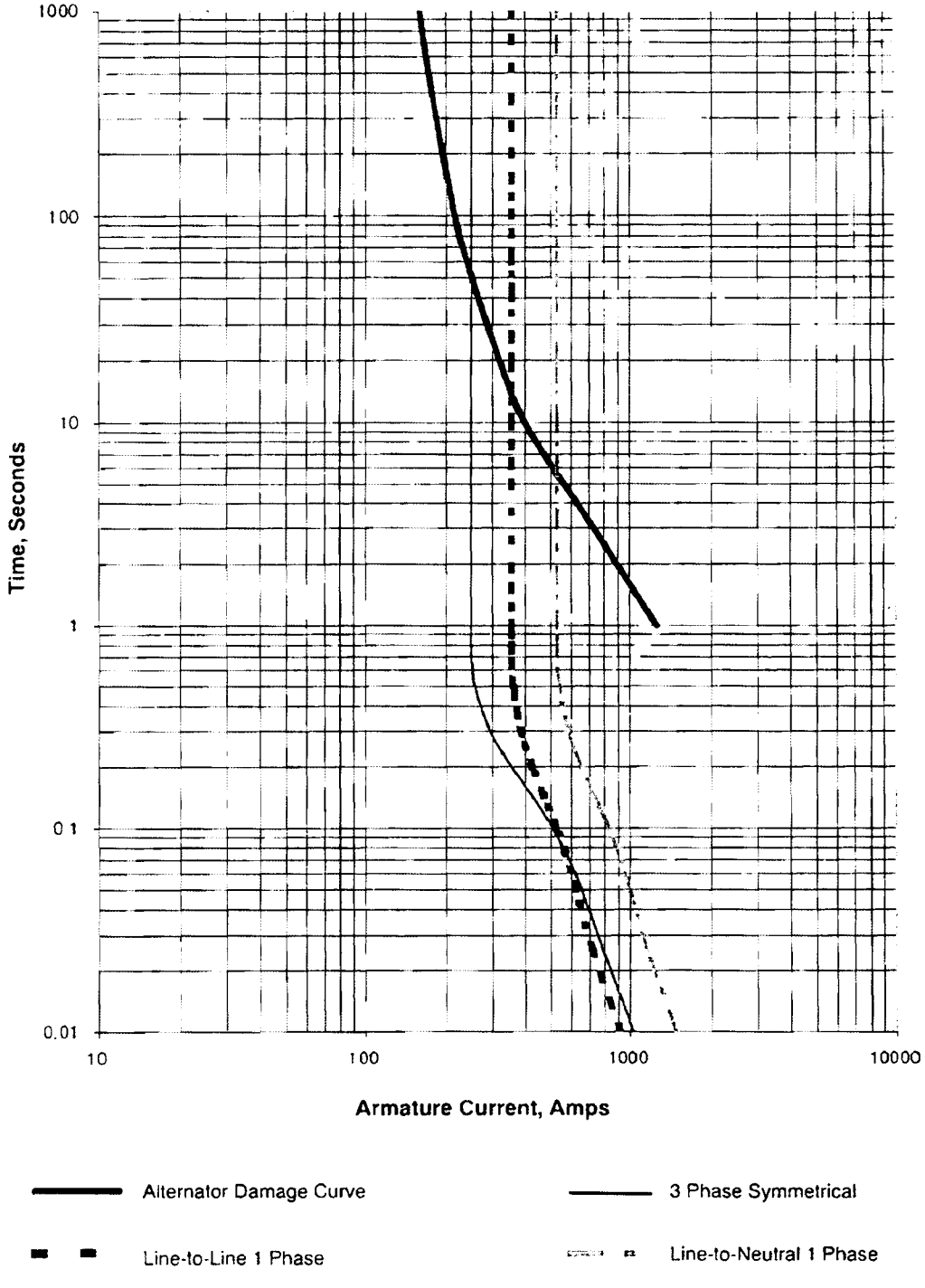


* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

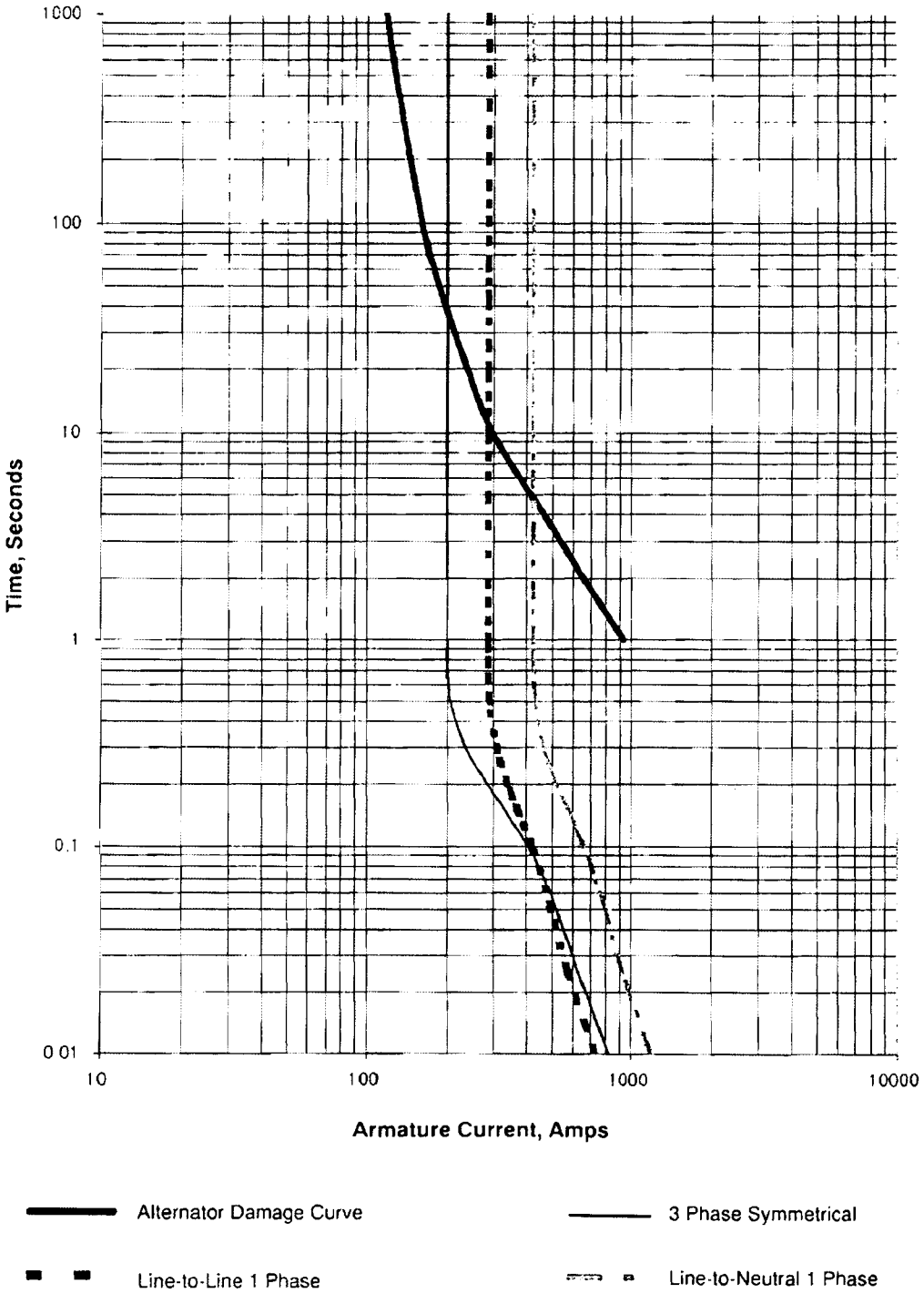
4S7, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE



4S7, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE



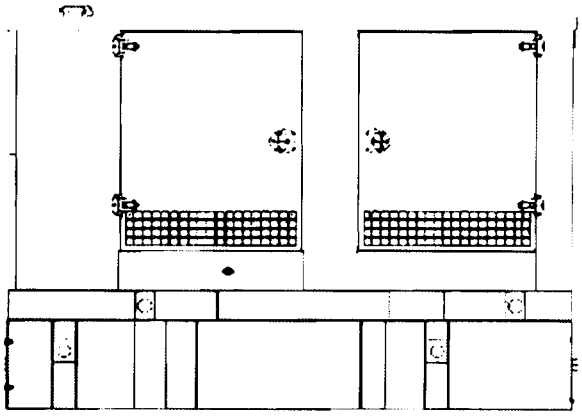
4S7, 60 Hz, 600 V Connection
SHORT CIRCUIT DECREMENT CURVE



KOHLER POWER SYSTEMS

Sound Enclosure with Lift Base Package

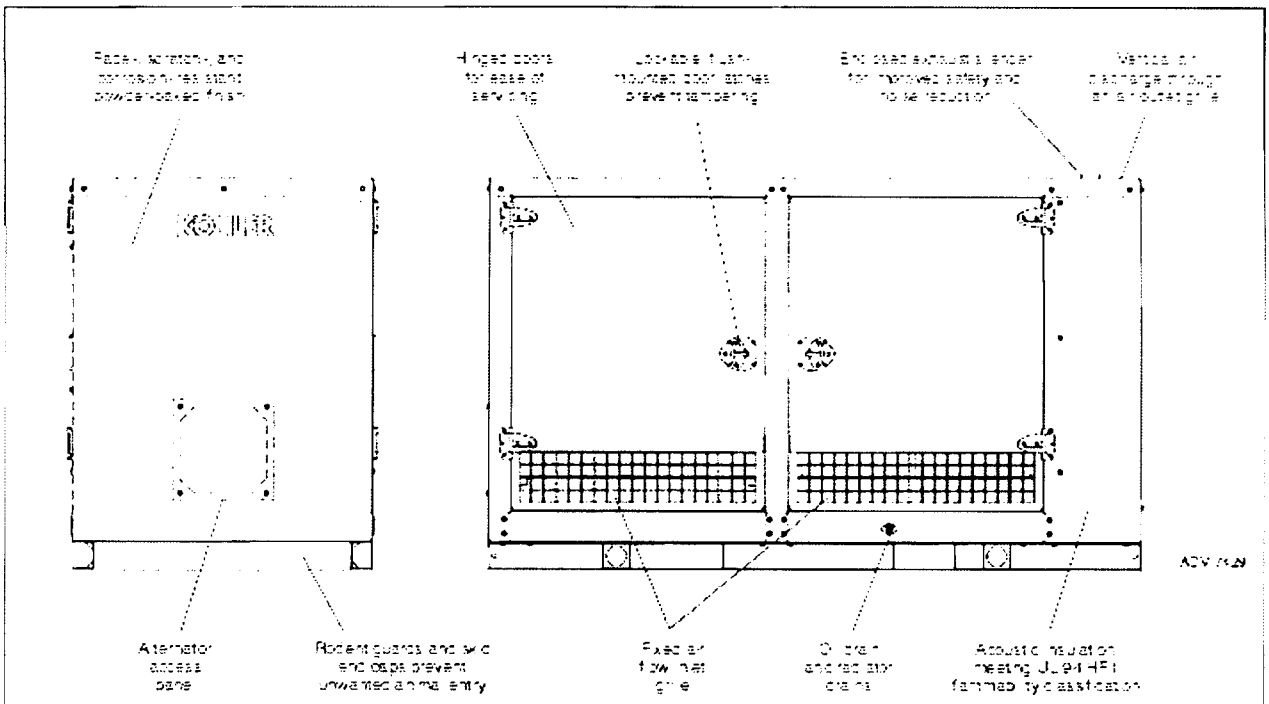
ISO 9001
KOHLER



Sound Enclosure Standard Features

- Internal-mounted critical silencer and flexible exhaust connector.
- Lift base-mounted or tank mounted steel construction with hinged doors.
- Fade-, scratch-, and corrosion-resistant Kohler® cream beige and black powder-baked finish.
- Lockable, flush-mounted door latches.
- Vertical air inlet and outlet hoods with 90 degree angles to redirect air and reduce noise.
- Lift base or tank-mounted, steel construction with hinged doors.
- Accoustic insulation that meets UL 94 HF1 flammability classification and repels moisture absorption.
- Sound attenuated enclosure that uses up to 25 mm (1 in.) of acoustic insulation, acoustic-lined air inlet hoods, and acoustic-lined air discharge hood.

Sound Enclosure with Lift Base Package, continued

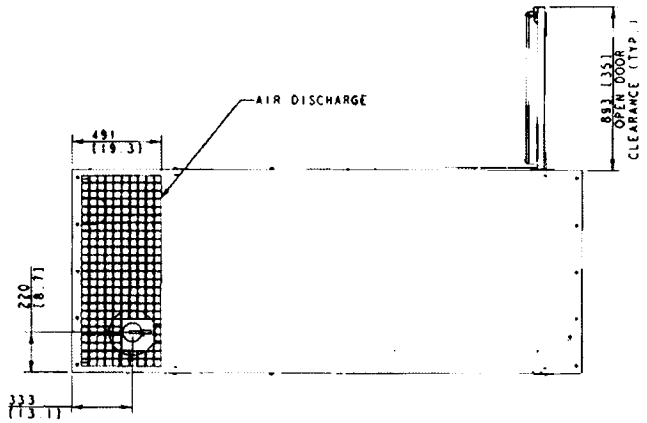


Note: 20-80REOZJC models shown, other models are similar. Refer to the respective ADV drawings for details.

Sound Enclosure Features

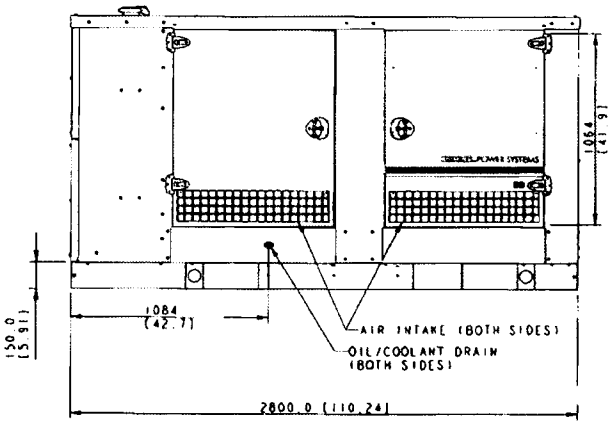
- Available in steel (14 gauge) formed panel, solid construction. Preassembled package offering dent resilient structure mounting directly to lift base or fuel tank.
- Powder-baked paint. Superior finish, durability, and appearance.
- Internal critical exhaust silencer offering maximum component life and operator safety.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill and battery.
- Cooling air discharge. Weather protective design featuring vertical air discharge. Exhausts air through a punched air outlet grille.
- Attenuated design. Acoustic insulation UL 94 HF1 listed for flame resistance offering up to 25 mm (1 in.) mechanically restrained acoustic insulation.
- Cooling air discharge. The sound enclosures include acoustic insulation with urethane film.

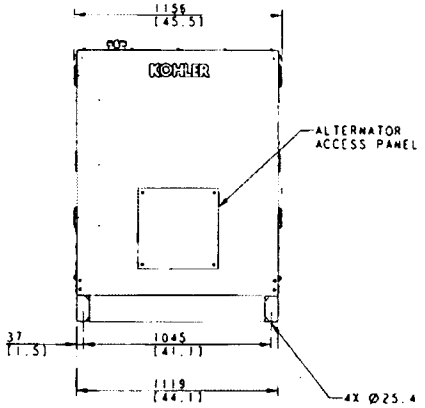
Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	Length (B), mm (in.)	Max. Width, mm (in.)	Enclosure and Fuel Tank Length, mm (in.)	Enclosure and Fuel Tank Width, mm (in.)	Enclosure and Fuel Tank Weight, kg (lb.)	Enclosure and Fuel Tank Height, mm (in.)	Fuel Tank Height (H), mm (in.)	Sound Pressure at 7m (23ft.), dB(A)	Max. Height, mm (in.)	Weight, kg (lb.)
Lift base	0			2821 (111.1)	1156 (45.5)	1483 (3269)	1525 (60)	102 (4)			

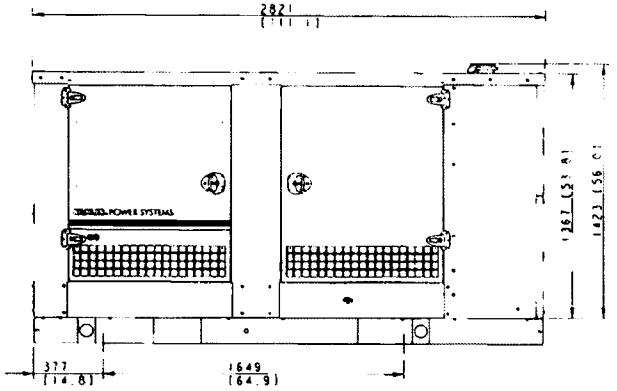


MODEL	ENCLOSURE WEIGHT KG (LBS)
STEEL WEATHER	318 [700]
STEEL SOUND	329 [725]
ALUMINIUM SOUND	204 [450]

NOTE:
1. IF TANK IS ORDERED, ENCLOSURE MOUNTS DIRECTLY TO TANK
2. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)







80 MODEL 4S7, 4S9, 4V9
100 MODEL 4S9, 4S11, 4V11
RECONNECTABLE
IMPROVE MOTOR STARTING (IMS) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE TIER III

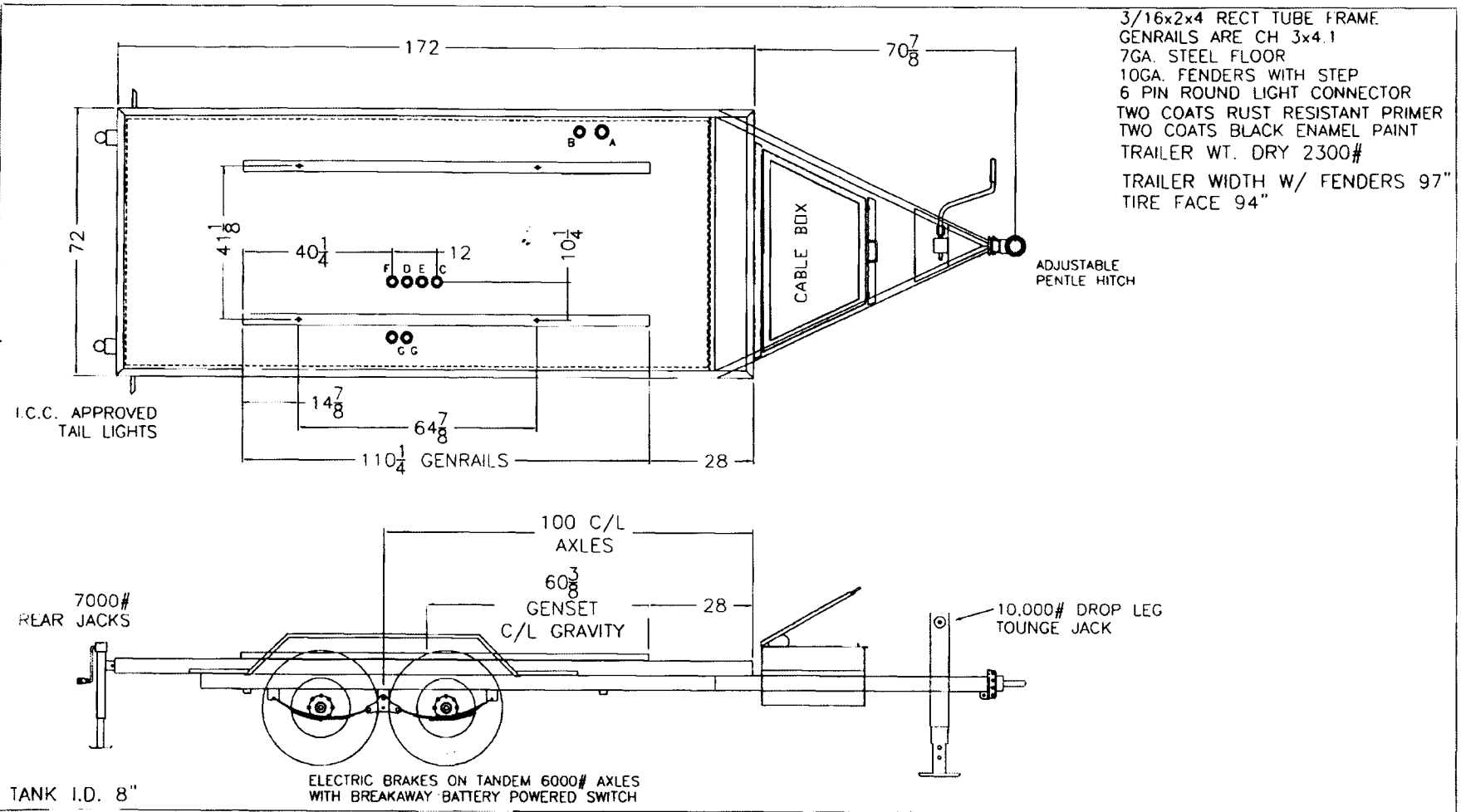
REV	DATE	
-	7-9-09	NEW DRAWING (86619-10)
A	7-9-10	- 81150 WAS 'A' (A-3) 2800 WAS 'B' (D-4) TABLE REMOVED, (B-3) NEW TABLE ADDED, (B-4) DIMENSIONS FOR ACCESS PANEL REMOVED (86619)

KOHLER CO. METRIC | PRO E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
THIS DRAWING IS DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED (EXCEPT IN CONNECTION WITH KOHLER CO. WORK). ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

APPROVALS	DATE
KDW	7-9-09
KDW	7-9-09
ALC	7-9-09

DIMENSION PRINT

ADV-7647 D



3/16x2x4 RECT TUBE FRAME
GENRAILS ARE CH 3x4.1
7GA. STEEL FLOOR
10GA. FENDERS WITH STEP
6 PIN ROUND LIGHT CONNECTOR
TWO COATS RUST RESISTANT PRIMER
TWO COATS BLACK ENAMEL PAINT
TRAILER WT. DRY 2300#
TRAILER WIDTH W/ FENDERS 97"
TIRE FACE 94"

TANK I.D. 8"

FITTING LEGEND
A = 2" VELVAC CAP ON FILL NECK
B = 1 1/2" MECHANICAL GAUGE
C = 1 1/2" MUSHROOM STYLE TANK VENT (ON STAND PIPE)
D = 1 1/2" SUPPLY WITH 1/2" x 7 1/2" TUBE
E = 1 1/2" RETURN WITH 1/2" x 7 1/2" TUBE
F = 1 1/2" LOW FUEL ALARM WITH 1/2" x 5 1/4 TUBE
G = 1 1/2" SPARE PLUGGED (2)

* NOTICE *
THIS DRAWING MUST BE SIGNED AND DATED BEFORE FABRICATION CAN BEGIN.

THIS DRAWING HAS BEEN REVIEWED AND
☐ APPROVED AS IS
☐ APPROVED WITH NOTED CHANGES

SIGNED BY _____ DATE

WEDLAKE FABRICATING INC.
6041 N. YORKTOWN TULSA, OK. 74130-1575
PHONE: (918) 428 - 1641
FAX: (918) 428 - 1620

CHECKED BY:
DATE:
APPROVED BY:
DATE:

CUSTOMER: LOFTIN EQUIPMENT

DESCRIPTION: 12000# TANDEM AXLE TRAILER WITH 350 GALLON INTEGRAL SW FUEL TANK

APPLICATION: 80 REOZJE (ADV-7647) ENCLOSURE

DRAWN BY:	DATE:	DRAWING NO:	PAGE NO:
RB	6/30/10	050610LDG-2-1	1 OF 2

3/16x2x4 RECT TUBE FRAME
GENRAILS ARE CH 3x4.1
7GA. STEEL FLOOR
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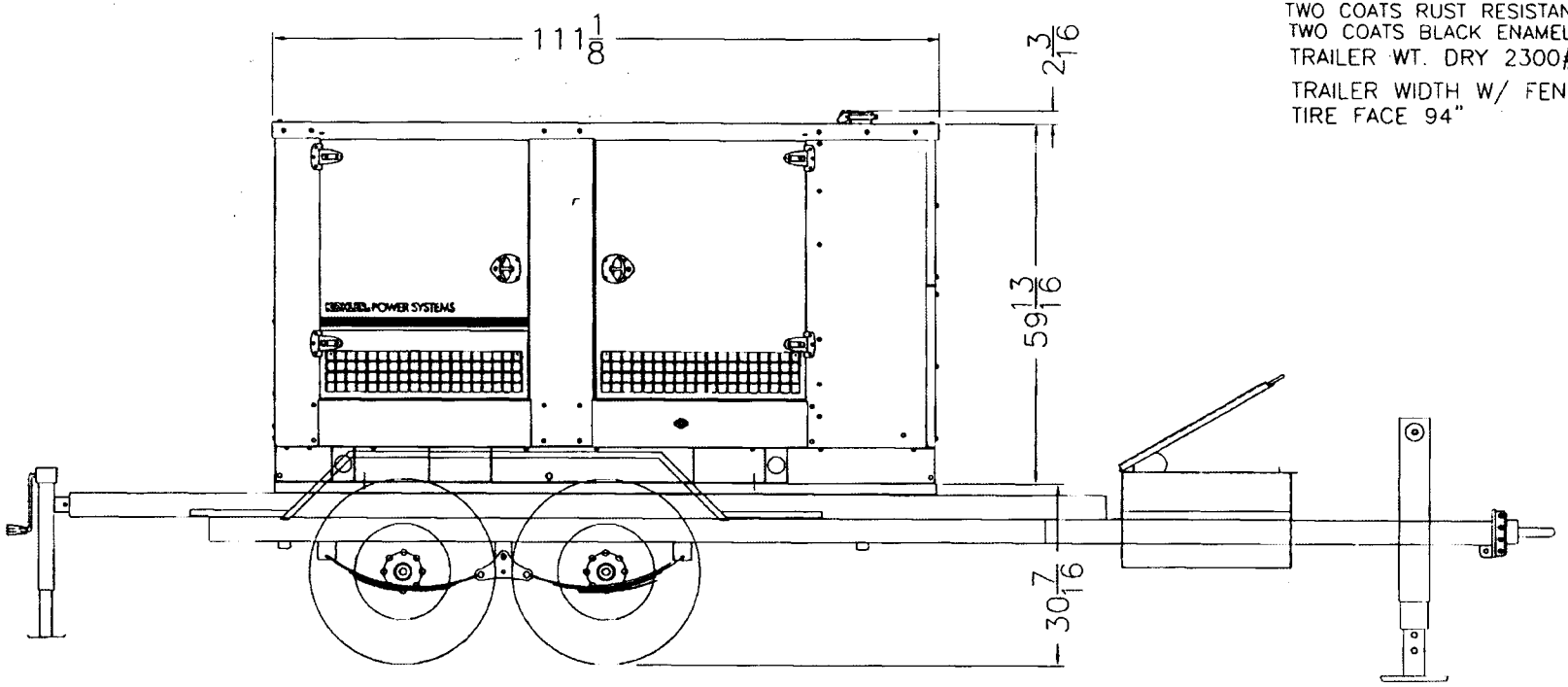


ELECTRIC BRAKES ON TANDEM 6000# AXLES
WITH BREAKAWAY BATTERY POWERED SWITCH

TANK I.D. 8"

FITTING LEGEND
A = 2" VELVAC CAP ON FILL NECK
B = 1 1/2" MECHANICAL GAUGE
C = 1 1/2" MUSHROOM STYLE TANK VENT (ON STAND PIPE)
D = 1 1/2" SUPPLY WITH 1/2" x 7 1/2" TUBE
E = 1 1/2" RETURN WITH 1/2" x 7 1/2" TUBE
F = 1 1/2" LOW FUEL ALARM WITH 1/2" x 5 1/4 TUBE
G = 1 1/2" SPARE PLUGGED (2)

* NOTICE *
THIS DRAWING MUST BE SIGNED AND DATED BEFORE FABRICATION CAN BEGIN.

THIS DRAWING HAS BEEN REVIEWED AND
☐ APPROVED AS IS
☐ APPROVED WITH NOTED CHANGES

SIGNED BY _____ DATE _____

WEDLAKE FABRICATING INC.
6041 N. YORKTOWN TULSA, OK. 74130-1575
PHONE: (918) 428 - 1641
FAX: (918) 428 - 1620

CHECKED BY:
DATE:
APPROVED BY:
DATE:

CUSTOMER: LOFTIN EQUIPMENT

DESCRIPTION: 12000# TANDEM AXLE TRAILER WITH 350 GALLON INTEGRAL SW FUEL TANK

APPLICATION: 80 REOZJE (ADV-7647) ENCLOSURE

DRAWN BY:	DATE:	DRAWING NO:	PAGE NO.
RB	6/30/10	050610LDG-2-2	2 OF 2

KOHLER POWER SYSTEMS

Emissions Data

Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Rating Data

Rating		4045HF285H
Certified Power (kW)		99
Rated Speed		1800
Vehicle Model Number		OEM (Gen Set)
Units	g/kW-hr	g/hp-hr
NOx	3.7	2.7
HC	0.1	0.1
NOx + HC	3.8	2.8
Pm	0.21	0.15
CO	2.2	1.6

Certificate Data

Engine Model Year	2010
EPA Family Name	AJDXL06.8117
EPA JD Name	350HAH
EPA Certificate Number	JDX-NRCI-10-15.1
CARB Executive Order	U-R-004-0391
Parent of Family	4045HPRNT6

Units	g/kW-hr
NOx	3.3
HC	0.2
NOx + HC	3.5
Pm	0.20
CO	1.6

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

Emissions Query V1.4.xls run on Jan-05-2010

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF TRANSPORTATION AND AIR QUALITY
WASHINGTON, DC 20460

CERTIFICATE OF CONFORMITY
2010 MODEL YEAR

Manufacturer:	**JOHN DEERE POWER SYSTEMS**
Engine Family:	**AJDXL06.8117**
Certificate Number:	**JDX-NRC1-10-15.1**
Intended Service Class:	**NR 5 (75-130)**
Fuel Type:	**DIESEL**
FELs: g/kW-hr	NMHC +NOx: **3.8** NOx: **NA** PM: **NA**
Effective Date:	**12/16/2009**
Date Issued:	**12/16/2009**

Karl J. Simon, Director
Compliance and Innovative Strategies Division
Office of Transportation and Air Quality

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60 and Part 89, 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 stationary and nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and 89, and produced in the stated model year.

This certificate of conformity covers only those new stationary and nonroad compression-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 and 89 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60 and 89.

This certificate of conformity is conditional upon compliance of said manufacturer with the averaging, banking and trading provisions of 40 CFR Part 89, Subpart C. Failure to comply with these provisions may render this certificate void ab initio.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 89.129-96 and 89.506-96 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to a revocation or suspension of this certificate for reasons specified in 40 CFR Part 89. 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 89.

This certificate does not cover stationary and 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.

California Environmental Protection Agency AIR RESOURCES BOARD	JOHN DEERE POWER SYSTEMS	EXECUTIVE ORDER U-R-004-0391 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2010	AJDXL06.8117	4.5, 6.8	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Control Module, Direct Diesel Injection, Turbocharger, Charge Air Cooler, Smoke Puff Limiter	Loaders, Tractor, Dozer, Pump, Generator Set, Other Industrial Equipment

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
75 ≤ kW < 130	Tier 3	STD	N/A	N/A	4.0	5.0	0.30	20	15	50
		FEL	--	--	3.8	--	--	--	--	--
		CERT	--	--	3.5	1.6	0.20	6	2	12

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 23RD day of December 2009.

M. Fuentes FOR AGM

Annette Hebert, Chief
Mobile Source Operations Division

Date: 12/10/09 EOH: U-R-004-0391

Engine Model Summary Form

Manufacturer: John Deere Power Systems
Engine category: Nonroad CI
Engine Family: AJDXL06.8117
Mfr Family Name: 350HAH
Process Code: New Submission

Attachment 1 of 1

1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm³/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm³/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
4045HF285G	4045H	138.47@2400	102.10@2400	55.14@2400	387.17@1600	120.2@1600	43.33@1600	EM EC SPL
4045HF285F	4045H	124.72@2400	91.80@2400	49.56@2400	354.72@1600	111.9@1600	40.33@1600	EM EC SPL
4045HF285C	4045H	115.33@2400	84.80@2400	45.77@2400	317.11@1600	101.1@1600	36.45@1600	EM EC SPL
4045HF285D	4045H	115.33@2200	90.40@2200	44.71@2200	354.72@1600	113.7@1600	40.97@1600	EM EC SPL
4045HF285E	4045H	124.72@2200	97.00@2200	47.98@2200	387.17@1600	124.3@1600	44.78@1600	EM EC SPL
6068HF285E	6068H	173.00@2400	82.40@2400	66.69@2400	491.89@1500	101.22@1500	51.22@1500	EM EC SPL
6068HF285F	6068H	173.00@2200	86.80@2200	64.19@2200	526.55@1500	108.48@1500	54.83@1500	EM EC SPL
6068HF285G	6068H	155.56@2400	75.70@2400	61.31@2400	441.01@1500	93.6@1500	47.43@1500	EM EC SPL
6068HF285H	6068H	155.56@2200	79.20@2200	58.78@2200	491.89@1500	102.8@1500	52.01@1500	EM EC SPL
6068HF285I	6068H	139.47@2400	68.90@2400	55.80@2400	396.76@1500	87.3@1500	44.23@1500	EM EC SPL
6068HF285J	6068H	139.47@2200	72.30@2200	53.84@2200	441.01@1500	96.4@1500	48.88@1500	EM EC SPL
4045HF285J	4045H	126.06@1800	115.80@1800	46.90@1800				EM EC SPL
4045HF285I	4045H	158.25@1800	144.10@1800	59.52@1800				EM EC SPL
4045HF285H	4045H	132.77@1800	121.70@1800	49.26@1800				EM EC SPL
6068HT068	6068H	123.38@2100	68.20@2100	48.29@2100	401.38@1500	90.4@1500	45.84@1500	EM EC SPL
6068HT069	6068H	173.00@2000	93.80@2000	63.28@2000	544.25@1500	120.7@1500	61.07@1500	EM EC SPL
4045HT058	4045H	127.40@2200	85.60@2200	49.81@2200	387.17@1600	108.56@1600	45.11@1600	EM EC SPL
6068HT063A	6068H	167.63@2100	87.50@2100	62.00@2100	550.89@1500	118.2@1500	59.79@1500	EM EC SPL
6068HT063B	6068H	173.00@2100	90.00@2100	63.74@2100	573.75@1500	119.1@1500	60.26@1500	EM EC SPL
4045HL281	4045H	118.87@2300	90.10@2300	46.61@2300	353.40@1600	117.2@1600	42.16@1600	EM EC SPL
6068HL280	6068H	140.81@2300	73.10@2300	54.28@2300	429.21@1600	97.95@1600	50.42@1600	EM EC SPL
6068HRW72	6068H	140.81@2300	73.10@2300	54.28@2300	429.21@1600	97.95@1600	50.42@1600	EM EC SPL
6068HL281	6068H	173.00@2100	93.30@2100	63.32@2100	575.23@1500	125.1@1500	60.72@1500	EM EC SPL
J68HRW74	6068H	173.00@2100	93.30@2100	63.32@2100	575.23@1500	125.1@1500	60.72@1500	EM EC SPL
6068HL280A	6068H	118.36@2300	84.20@2300	47.82@2300	364.51@1600	97@1600	44.98@1600	EM EC SPL
4045HL283B	4045H	115.33@2300	93.80@2300	46.74@2300	351.77@1600	121.9@1600	42.11@1600	EM EC SPL
4045HL283A	4045H	123.38@2300	98.10@2300	48.73@2300	378.11@1600	127.6@1600	44.10@1600	EM EC SPL
4045HL283C	4045H	104.80@2300	85.90@2300	42.77@2300	319.33@1600	113@1600	38.81@1600	EM EC SPL
6068HDW74A	6068H	152.88@2350	76.10@2350	60.37@2350	511.97@1500	107.3@1500	58.10@1500	EM EC SPL
6068HT067	6068H	138.47@2200	72.30@2200	53.84@2200	441.01@1500	96.4@1500	48.88@1500	EM EC SPL
4045HT057A	4045H	108.63@2200	89.20@2200	44.14@2200	337.03@1500	114.4@1500	38.61@1500	EM EC SPL
4045HT057B	4045H	115.33@2200	93.50@2200	46.28@2200	370.95@1500	118.9@1500	40.11@1500	EM EC SPL
4045HP052C	4045H	118.87@2100	96.90@2100	46.75@2100	353.84@1575	113.9@1575	40.33@1575	EM EC SPL
4045HP052A	4045H	135.45@2100	111.50@2100	52.65@2100	383.93@1575	122.4@1575	43.35@1575	EM EC SPL
4045HP052B	4045H	128.97@2100	106.50@2100	49.81@2100	366.73@1575	122.5@1575	43.39@1575	EM EC SPL
4045HDW54	4045H	128.74@2200	100.90@2200	49.94@2200	389.39@1600	122.6@1600	44.21@1600	EM EC SPL
6068HT072	6068H	173.00@2000	93.80@2000	63.28@2000	544.25@1500	120.7@1500	61.07@1500	EM EC SPL
6068HL280C	6068H	140.81@2300	73.10@2300	54.28@2300	429.21@1600	97.95@1600	50.42@1600	EM EC SPL
6068HL281B	6068H	173.00@2100	93.30@2100	63.32@2100	575.23@1500	125.1@1500	60.72@1500	EM EC SPL
4045HL283D	4045H	123.38@2300	98.10@2300	48.73@2300	378.11@1600	127.6@1600	44.10@1600	EM EC SPL
4045HPRNT6	4045H	148.18@2400	111.50@2400	60.17@2400	413.65@1600	131.5@1600	47.40@1600	EM EC SPL

DAI, TC, C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive, Diamond Bar, CA 91765

Application No.
462962
Page 1

CERTIFIED EQUIPMENT PERMIT
(NOT A PERMIT TO CONSTRUCT OR OPERATE)

Granted as of November 21, 2006
Expires December 31, 2010
ID 92796

Legal Owner or Operator:
DEERE POWER SYSTEMS GROUP
P.O. BOX 5100
WATERLOO, IA 50704-8000
ATTN: RICHARD A. BISHOP

Equipment Location: SAME AS ABOVE

The equipment described below and as shown on the approved plans and specifications are subject to the special conditions or conditions listed.

Equipment Description

INTERNAL COMBUSTION ENGINE, JOHN DEERE, 6 CYLINDER, TURBOCHARGED/AFTERCOOLED, MODEL 4045HF285H, 133 BHP, DIESEL FUELED, DRIVING AN EMERGENCY ELECTRICAL GENERATOR.

Manufacturer Condition

1. **THIS CERTIFIED EQUIPMENT PERMIT (CEP) IS NOT A PERMIT TO CONSTRUCT OR OPERATE.** THE PERSON CONSTRUCTING, INSTALLING OR OPERATING THE EQUIPMENT AT EACH SPECIFIC SITE SHALL OBTAIN ALL NECESSARY PERMIT(S) TO CONSTRUCT AND PERMIT(S) TO OPERATE AND COMPLY WITH ANY OTHER DISTRICT RULES AND REGULATIONS INCLUDING THE REQUIREMENTS OF REGULATION XIII

End User Conditions

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITIONS AT ALL TIMES.

3. A NON-RESETTABLE TOTALIZING TIMER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.

4. AN ENGINE OPERATING LOG SHALL BE KEPT AND MAINTAINED ON FILE TO RECORD WHEN THIS ENGINE IS STARTED MANUALLY. THE LOG SHALL LIST THE DATE OF OPERATION, THE TIMER READING IN HOURS AT THE BEGINNING AND END OF OPERATION, AND THE REASON FOR OPERATION FOR A MINIMUM OF THREE YEARS FROM THE DATE OF ENTRY AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST. THE TOTAL HOURS OF OPERATION (INCLUDING HOURS FOR MANUAL AND AUTOMATIC OPERATION)

ORIGINAL (copy)

CERTIFIED EQUIPMENT PERMIT
(NOT A PERMIT TO CONSTRUCT OR OPERATE)

SHALL BE RECORDED SOMETIME DURING THE FIRST 15 DAYS OF JANUARY OF EACH YEAR.

5. THIS ENGINE SHALL NOT OPERATE MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING PURPOSES.

6. THE OPERATOR SHALL NOT PURCHASE ANY DIESEL FUEL UNLESS THE FUEL IS LOW-SULFUR DIESEL FOR WHICH THE SULFUR CONTENT DOES NOT EXCEED 15 PPM BY WEIGHT. EFFECTIVE JANUARY 1, 2006, THE OPERATOR SHALL ONLY USE DIESEL FUEL WITH A SULFUR CONTENT THAT DOES NOT EXCEED 15 PPM BY WEIGHT, UNLESS THE OPERATOR DEMONSTRATES IN WRITING TO THE EXECUTIVE OFFICER THAT SPECIFIC ADDITIONAL TIME IS NECESSARY.

7. OPERATION BEYOND THE 50 HOURS PER YEAR ALLOTTED FOR ENGINE MAINTENANCE AND TESTING SHALL BE ALLOWED ONLY IN THE EVENT OF A LOSS OF GRID POWER OR UP TO 30 MINUTES PRIOR TO A ROTATING OUTAGE, PROVIDED THAT: (A) THE UTILITY DISTRIBUTION COMPANY HAS ORDERED ROTATING OUTAGES IN THE CONTROL AREA WHERE THE ENGINE IS LOCATED OR HAS INDICATED THAT IT EXPECTS TO ISSUE SUCH AN ORDER AT A CERTAIN TIME; AND (B) THE ENGINE IS LOCATED IN A UTILITY SERVICE BLOCK THAT IS SUBJECT TO THE ROTATING OUTAGE. ENGINE OPERATION SHALL BE TERMINATED IMMEDIATELY AFTER THE UTILITY DISTRIBUTION COMPANY ADVISES THAT A ROTATING OUTAGE IS NO LONGER IMMINENT OR IN EFFECT.

8. THIS ENGINE SHALL BE A US EPA CERTIFIED, NON-ROAD COMPRESSION-IGNITION ENGINE, AS EVIDENCED BY THE MANUFACTURER'S ENGINE TAG.

Please notify RAMAN PATEL at 909/396-2466 when SCAQMD information packets are needed or if you have any questions concerning the Certification/Registration Program.

This Certified Equipment Permit is based on the plans, specifications, and data submitted as it pertains to the release of air contaminants and control measures to reduce air contaminants. No approval or opinion concerning safety and other factors in design, construction or operation of the equipment is expressed. or implied.

This Certified Equipment Permit will become invalid if this application is cancelled. THIS PERMIT SHALL EXPIRE ONE YEAR FROM THE DATE OF ISSUANCE unless an extension is granted by the Executive Officer.

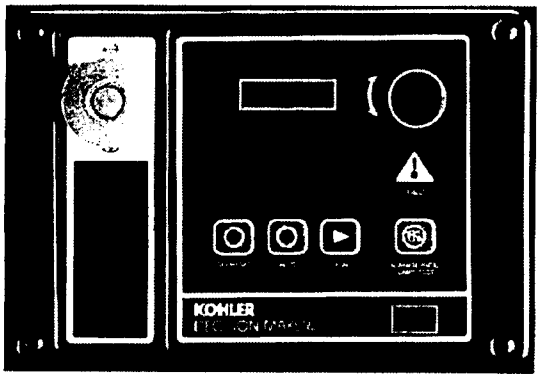
By Raman C. Patel
RAMAN C. PATEL, P.E.
Senior Air Quality Engineer

ORIGINAL (copy)

KOHLER.POWER SYSTEMS

Generator Set Controller

ISO 9001 KOHLER



Decision-Maker® 3000

Kohler® Decision-Maker® 3000 Controller

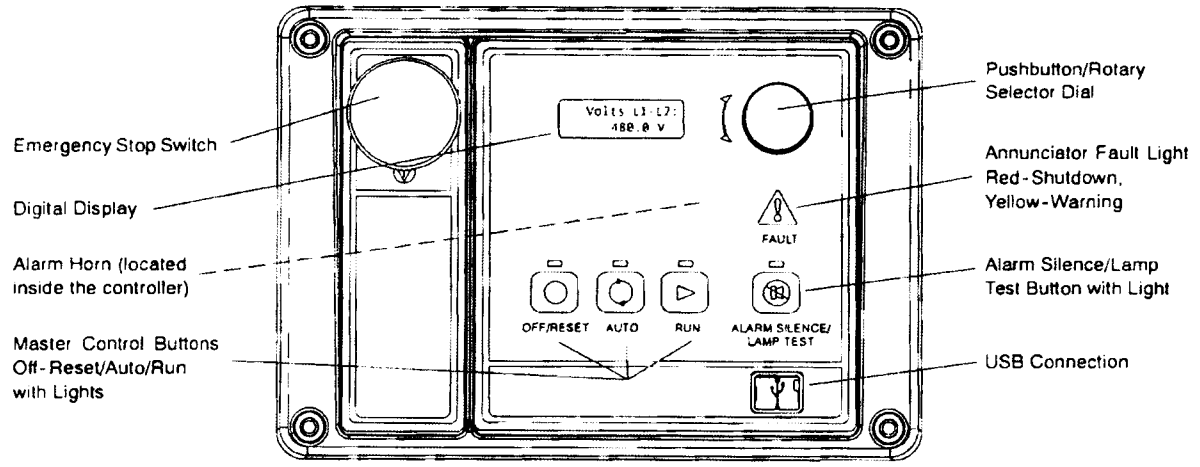
General Description and Function

The Decision-Maker® 3000 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

The Decision-Maker® 3000 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

The Decision-Maker® 3000 controller uses patented software logic to manage sophisticated functions, such as voltage regulation and alternator thermal overload protection, normally requiring additional hardware. Additional features include:

- A digital display and pushbutton/rotary selector dial provide easy local access to data.
- Measurements selectable in metric or English units.
- Scrolling display shows critical data at a glance.
- Digital display of power metering (kW and kVA).
- Integrated hybrid voltage regulator providing ±0.5% regulation.
- Built-in alternator thermal overload protection.



User Interface Controls and Components

- Emergency stop switch
- Backlit LCD digital display with two lines of 12 characters *(see User Interface Displays for menus)*
- Alarm horn indicates generator set shutdown and warning faults
- Environmentally sealed membrane keypad with three master control buttons with lights
  - o Off/Reset (red)
  - o Auto (green)
  - o Run (yellow)
- Pushbutton/rotary selector dial for menu navigation
  - o Rotate dial to access main menus
  - o Push dial and rotate to access sub menus
  - o Press dial for 3 seconds to return to top of main menu
- Annunciator fault light
  - o System shutdown (red)
  - o System warning (yellow)
- Alarm silence/lamp test button
  - o Alarm silence
  - o Lamp test
- USB connection
  - o Allows software upgrades
  - o Provides access for diagnostics
- Dedicated user inputs
  - o Remote emergency stop switch
  - o Remote 2-wire start for transfer switch
  - o Auxiliary shutdown
- Integrated hybrid voltage regulator
- Auto-resettable circuit protection mounted on circuit board
- One relay output standard. Optional five relay output available.
- One analog and three digital inputs standard. Optional two inputs available.

NFPA 110 Requirements

In order to meet NFPA 110, Level 1 requirements, the generator set controller monitors the engine/generator functions and faults shown below.

- Engine functions:
  - o Overcrank
  - o Low coolant temperature warning
  - o High coolant temperature warning
  - o High coolant temperature shutdown
  - o Low oil pressure shutdown
  - o Low oil pressure warning
  - o High engine speed
  - o Low fuel (level or pressure) *
  - o Low coolant level
  - o EPS supplying load
  - o High battery voltage
  - o Low battery voltage
- General functions:
  - o Master switch not in auto
  - o Battery charger fault *
  - o Lamp test
  - o Contacts for local and remote common alarm
  - o Audible alarm silence button
  - o Remote emergency stop *

* Functions require optional input sensors or kits

User Interface Displays

The listing below has • denoting main menus and o denoting sub-menus.

- Overview
  - o Active shutdowns and warnings (if any are present)
  - o Engine run time, total hours
  - o Average voltage line-to-line
  - o Frequency
  - o Average current
  - o Coolant temperature
  - o Fuel level or pressure *
  - o Oil pressure
  - o Battery voltage
  - o Software version
- Engine Metering
  - o Engine speed
  - o Oil pressure
  - o Coolant temperature
  - o Battery voltage
- Generator Metering
  - o Total power, VA
  - o Total power, W
  - o Rated power, %
  - o Voltage, L-L and L-N for all phases
  - o Current, L1, L2, L3
  - o Frequency
- GenSet Information
  - o Generator set model number
  - o Generator set serial number
  - o Controller serial number
- GenSet Run Time
  - o Engine run time, total hours
  - o Engine loaded, hours
  - o Number of engine starts
  - o Total energy, kWh
- GenSet System
  - o System voltage
  - o System frequency, 50 or 60 Hz
  - o System phase, single or three (wye or delta)
  - o Power rating, kW
  - o Amp rating
  - o Power type, standby or prime
  - o Measurement units, metric or English (user selectable)
  - o Alarm silence, always or auto only
- GenSet Calibration
  - o Voltage, L-L and L-N for all phases
  - o Current, L1, L2, L3
  - o Reset calibration
- Voltage Regulation
  - o Adjust voltage, ±10%
- Digital Inputs
  - o Input settings and status
- Digital Outputs
  - o Output settings and status
- Analog Inputs
  - o Input settings and status
- Event Log
  - o Event history (stores up to 1000 system events)

* Function requires optional input sensors or kits

Controller Features

- **AC Output Voltage Regulator Adjustment**. The voltage adjustment provides a maximum of ±10% of the system voltage.
- **Alternator Protection** The controller provides generator set overload and short circuit protection matched to each alternator for the particular voltage/phase configuration
- **Automatic Restart**. The controller automatic restart feature initiates the start routine and recrank after a failed start attempt.
- **Cyclic Cranking**. The controller has programmable cyclic cranking.
- **Engine Start Aid**. The starting aid feature provides control for an optional engine starting aid.
- **Event Logging**. The controller keeps a record (up to 1000 entries) for warning and shutdown faults. This fault information becomes a stored record of system events and can be reset.
- **Historical Data Logging**. Total number of generator set successful starts is recorded and displayed.
- **Integrated Hybrid Voltage Regulator**. The voltage regulator provides ±0.5% no-load to full-load regulation with three-phase sensing.
- **Lamp Test**. Press the alarm silence/lamp test button to verify functionality of the indicator lights.
- **Power Metering**. Controller digital display provides kW and kVA.
- **Programming Access (USB)**. Provides software upgrades and diagnostics.
- **Remote Reset**. The remote reset function resets faults and allows restarting of the generator set without going to the master switch off/reset position.
- **RSA II Remote Monitoring Panel.** The controller is compatible with the Kohler® Remote Serial Annunciator (RSA II).
- **Run Time Hourmeter**. The generator set run time is displayed.
- **Time Delay Engine Cooldown (TDEC)**. The TDEC provides a time delay before the generator set shuts down.
- **Time Delay Engine Start (TDES)**. The TDES provides a time delay before the generator set starts.

Controller Functions

The following chart shows which functions cause a warning or shutdown. All functions are available as relay outputs.

Warning causes the fault light to show yellow and sounds the alarm horn signaling an impending problem.

Shutdown causes the fault light to show red, sounds the alarm horn, and stops the generator set.

	Warning Function	Shutdown Function
Engine Functions		
Critically high fuel level *	o	
ECM communication loss		•
ECM diagnostics	•	•
Engine over speed		•†
Engine start aid active		
Engine under speed		•
Fuel tank leak *	o	o
High battery voltage	•	
High coolant temperature	•	•†
High fuel level *	o	
Low battery voltage	•	
Low coolant level		•
Low coolant temperature	•	
Low cranking voltage	•	
Low engine oil level *	o	o
Low fuel level (diesel models) *	o	o
Low fuel pressure (gas models) *	o	
Low oil pressure	•	•†
No coolant temperature signal		•
No oil pressure signal		•
Overcrank		•†
Speed sensor fault	•	
General Functions		
Alarm horn silenced		
Analog inputs	o	o
Battery charger fault *	•	
Chicago code active *		
Common fault (includes †)		•
Common warning	•	
Digital inputs	o	o
Emergency stop		•†
Engine cooldown (delay) active		
Engine start delay active		
Engine started		
Engine stopped		
EPS supplying load		
Generator running		
Input/output communication loss	•	
Internal failure		•
Master switch not in auto	•	
NFPA 110 alarm active		
Remote start		
System ready		
Generator Functions		
AC sensing loss	•	•
Alternator protection		•
Ground fault input *	•	
kW overload		•
Locked rotor		•
Overfrequency		•
Overvoltage (each phase)		•
Underfrequency		•
Undervoltage (each phase)		•

• Standard functions
o Available user functions
* Functions require optional input sensors or kits
† Items included with common fault shutdown

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales and service outlet in the
US and Canada, phone 1-800-544-2444
KohlerPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Controller Specifications

Decision-Maker® 3000—Software Version 1.00 or higher

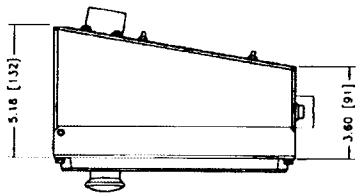
- Power source with circuit protection: 12- or 24-volt DC
- Power drain: 200 milliamps
- Humidity range: 5% to 95% noncondensing
- Operating temperature range: -40°C to +70°C (-40°F to +158°F)
- Storage temperature range: -40°C to +85°C (-40°F to +185°F)
- Standards:
  - CE Directive
  - NFPA 99
  - NFPA 110, Level 1
  - UL 508
  - ASTM B117 (salt spray test)
- Panel dimensions—W x H, 229 x 160 mm (9.0 x 6.3 in.)

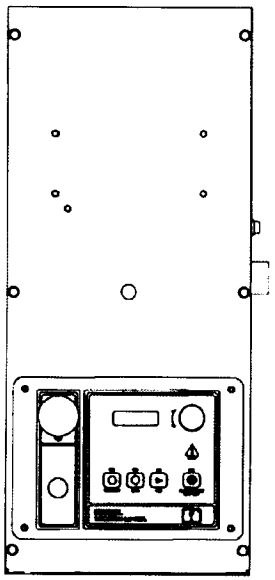
Decision-Maker® 3000 Available Options

- ❑ **Common Fault Relay** provides a relay output to trip a circuit breaker or to signal the common fault shutdowns.
- ❑ **2 Input/5 Output Module** provides a generator set mounted panel with two inputs and five relay outputs.
- ❑ **Float/Equalize Battery Charger** available with 6 or 10 amp DC volt output. The 10 amp models are available with and without NFPA alarm to signal a battery charger fault.
- ❑ **Prime Power Switch** prevents battery drain during generator set non-operation periods and when the generator set battery cannot be maintained by an AC battery charger.
- ❑ **Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.
- ❑ **Remote Monitoring Panel**. The Kohler® Remote Serial Annunciator (RSA II) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations.
- ❑ **Run Relay** provides a relay indicating that the generator set is running.

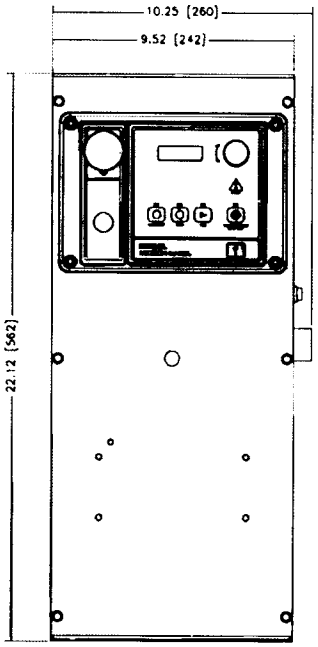
DISTRIBUTED BY:

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

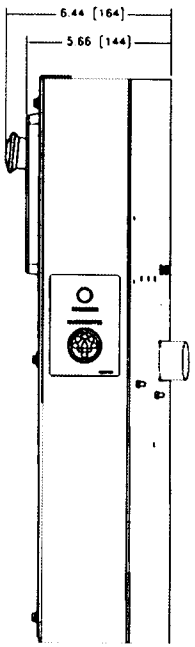




LOWER MOUNT CONTROLLER



UPPER MOUNT CONTROLLER



DECISION-MAKER 3000
20-275 KW SIDE MOUNTED CONTROL BOX

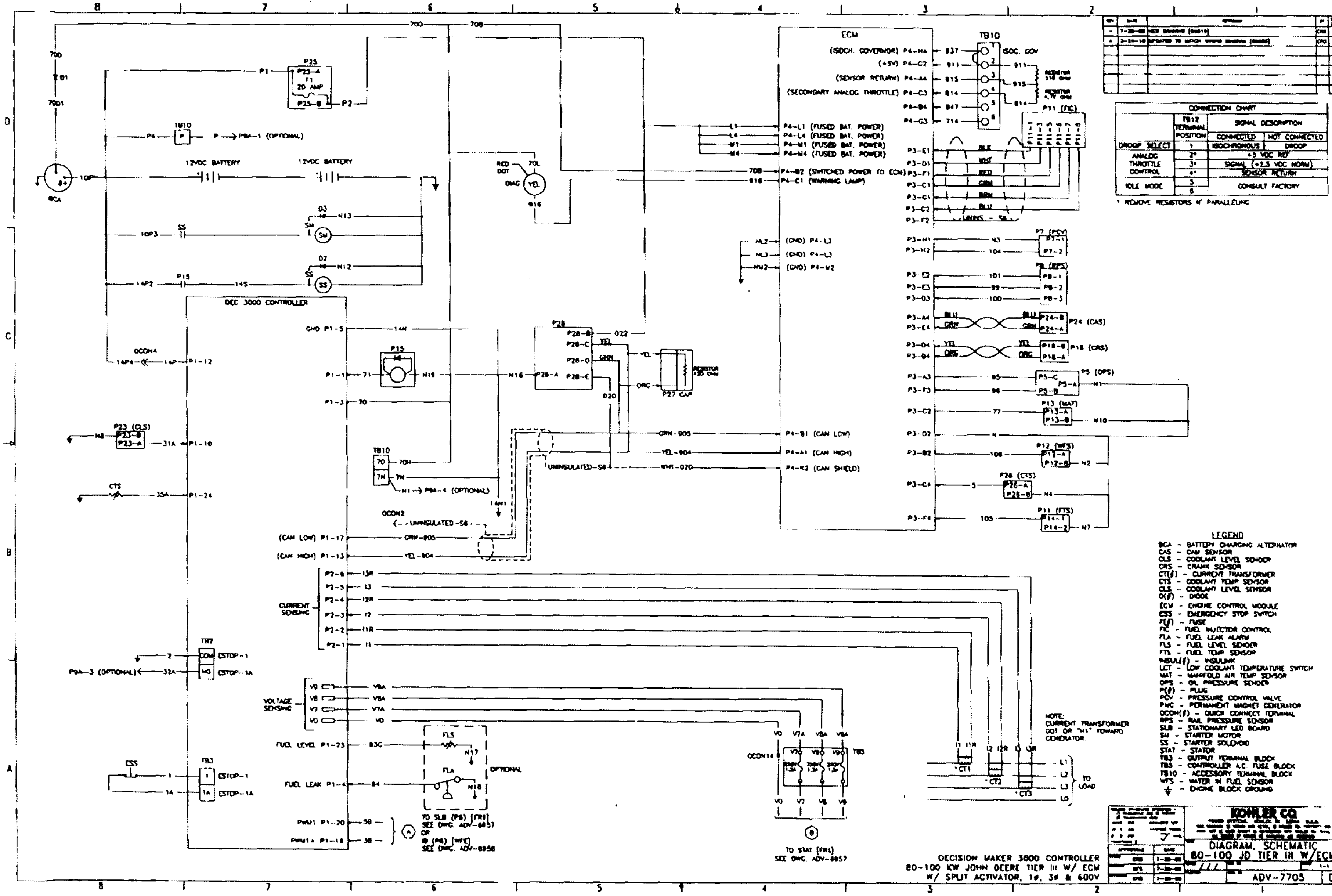
KOHLER CO.

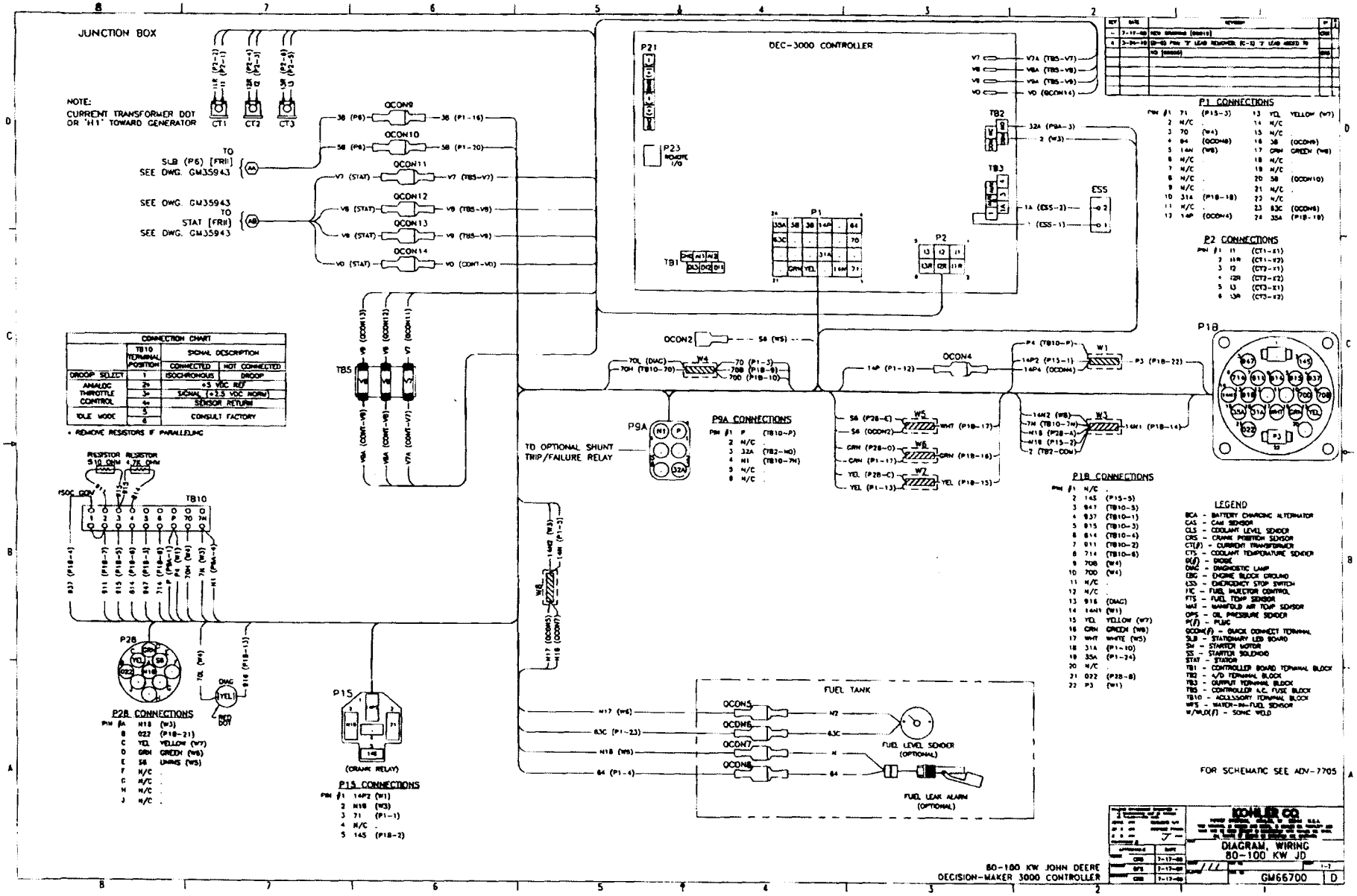
DIMENSION PRINT

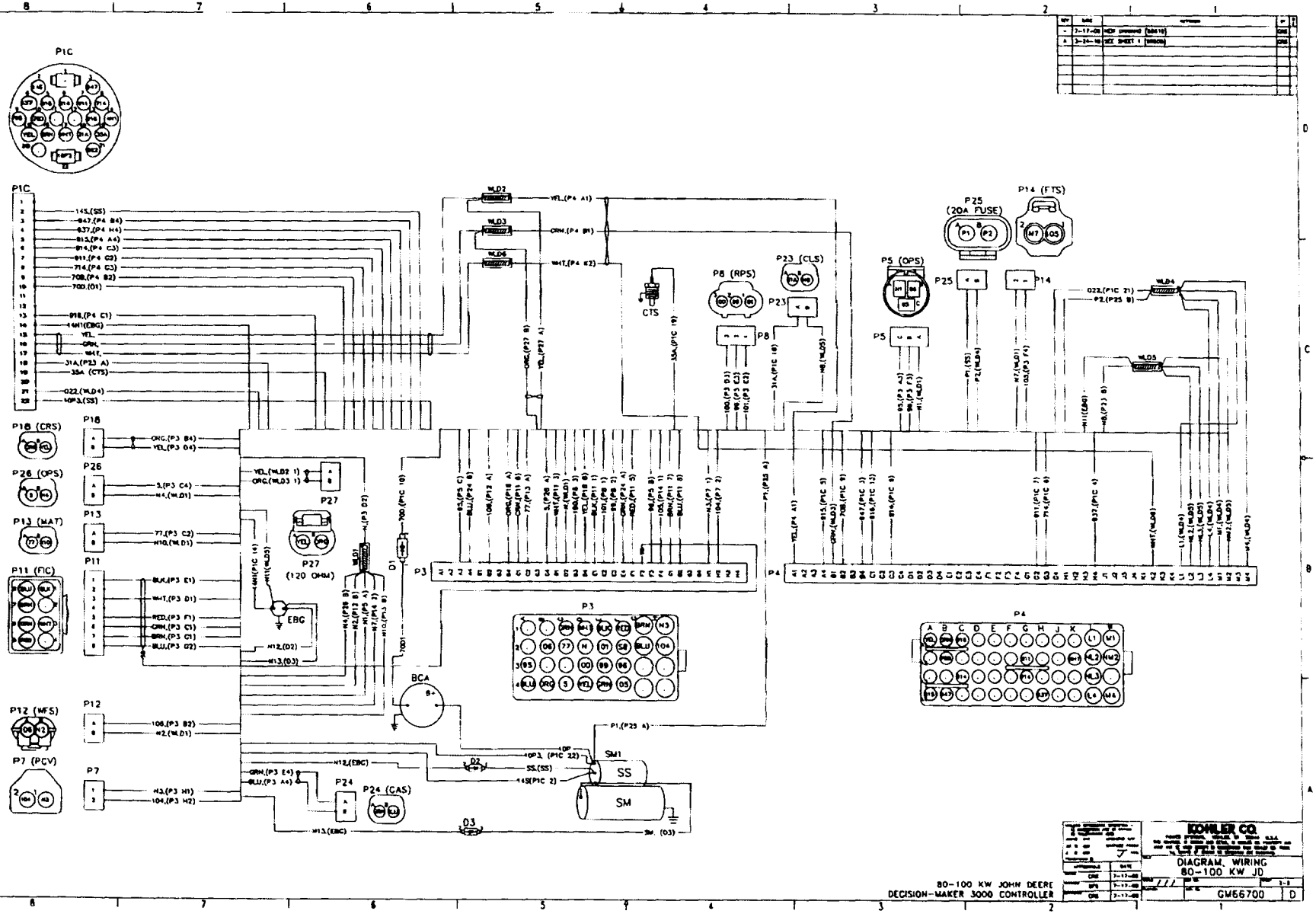
ADV-5849 D

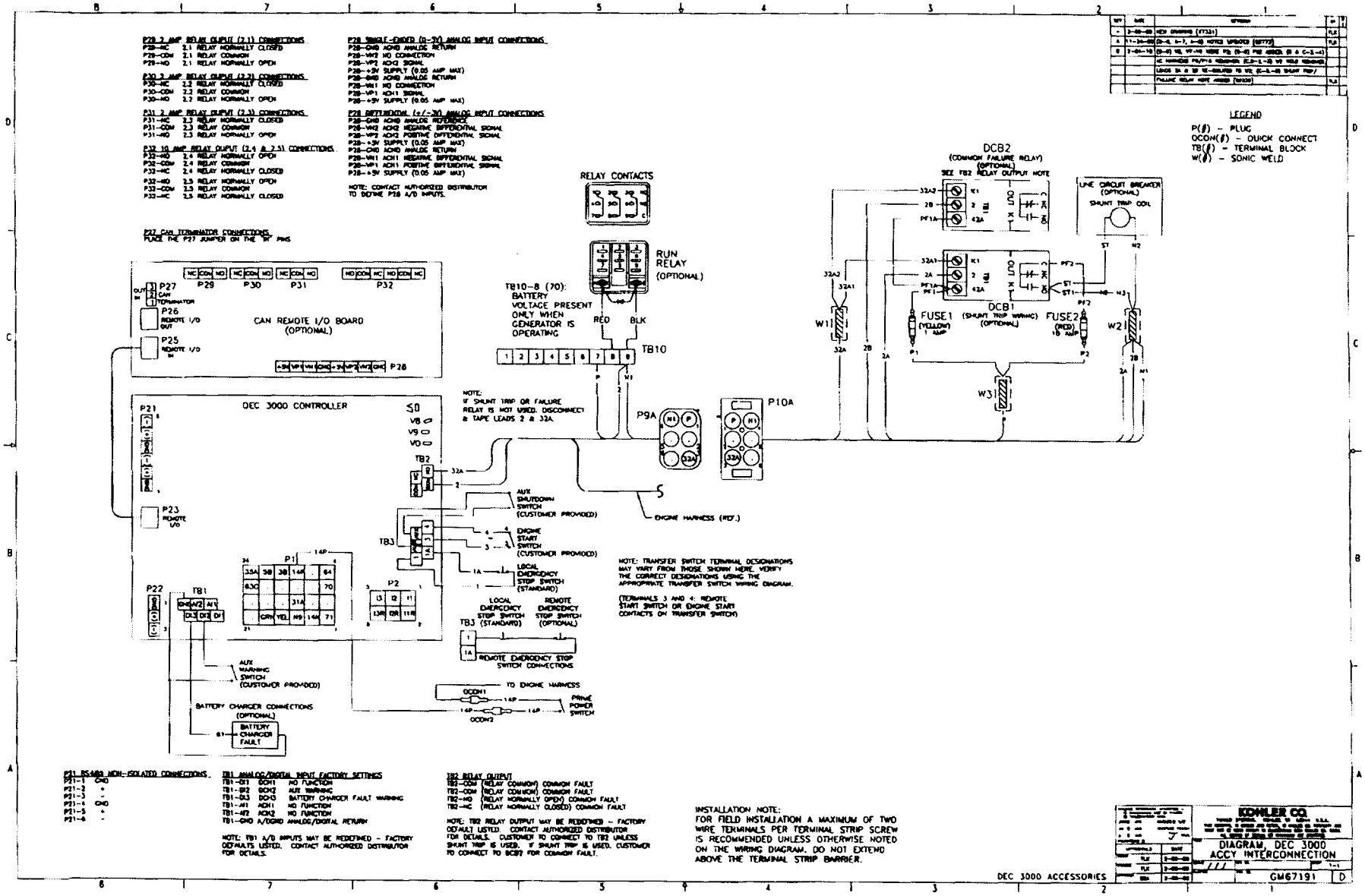
KOHLER POWER SYSTEMS

Wiring Schematics


ECM
OCC 3000 CONTROLLER
TB10
P25
F1 20 AMP
12VDC BATTERY
BCA
P28
P27 CAP
P24 (CAS)
P18 (CRS)
P5 (OPS)
P13 (MAT)
P12 (WFS)
P26 (CTS)
P14 (FTS)
P7 (PCV)
P8 (RPS)
P11 (FIC)
P23 (CLS)
CTS
ESS
TB2
TB3
TB5
CURRENT SENSING
VOLTAGE SENSING
FUEL LEVEL P1-23
FUEL LEAK P1-4
OPTIONAL
TO SLB (P6) [FRE] SEE DWG. ADV-6857 OR (P6) [WFE] SEE DWG. ADV-6856
TO STAT (FRE) SEE DWG. ADV-6857
TO LOAD
NOTE: CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR.
CONNECTION CHART
DROOP SELECT
ANALOG THROTTLE CONTROL
IDLE MODE
ISOCHRONOUS
DROOP
+5 VDC REF
SIGNAL (+2.5 VDC NORM)
SENSOR RETURN
CONSULT FACTORY
* REMOVE RESISTORS IF PARALLELING
LEGEND
BCA - BATTERY CHARGING ALTERNATOR
CAS - CAM SENSOR
CLS - COOLANT LEVEL SENSOR
CRS - CRANK SENSOR
CT(#) - CURRENT TRANSFORMER
CTS - COOLANT TEMP SENSOR
CLS - COOLANT LEVEL SENSOR
D(#) - DIODE
ECM - ENGINE CONTROL MODULE
ESS - EMERGENCY STOP SWITCH
F(#) - FUSE
FIC - FUEL INJECTOR CONTROL
FLA - FUEL LEAK ALARM
FLS - FUEL LEVEL SENSOR
FTS - FUEL TEMP SENSOR
INSUL(#) - INSULINK
LCT - LOW COOLANT TEMPERATURE SWITCH
MAT - MANIFOLD AIR TEMP SENSOR
OPS - OIL PRESSURE SENDER
P(#) - PLUG
PCV - PRESSURE CONTROL VALVE
PMG - PERMANENT MAGNET GENERATOR
QCON(#) - QUICK CONNECT TERMINAL
RPS - RAIL PRESSURE SENSOR
SLB - STATIONARY LED BOARD
SM - STARTER MOTOR
SS - STARTER SOLENOID
STAT - STATOR
TB3 - OUTPUT TERMINAL BLOCK
TB5 - CONTROLLER A.C. FUSE BLOCK
TB10 - ACCESSORY TERMINAL BLOCK
WFS - WATER IN FUEL SENSOR
ENGINE BLOCK GROUND
DECISION MAKER 3000 CONTROLLER
80-100 KW JOHN DEERE TIER III W/ ECM
W/ SPLIT ACTIVATOR, 1Ø, 3Ø & 600V
KOHLER CO.
DIAGRAM, SCHEMATIC
80-100 JD TIER III W/ECM
ADV-7705
D


JUNCTION BOX
NOTE:
CURRENT TRANSFORMER DOT OR 'H1' TOWARD GENERATOR
CT1
CT2
CT3
TO SLB (P6) [FRII] SEE DWG. GM35943
SEE DWG. GM35943 TO STAT [FRII] SEE DWG. GM35943
DEC-3000 CONTROLLER
P21
P23
TB1
TB2
TB3
ESS
P1
P2
OCON2
OCON4
OCON9
OCON10
OCON11
OCON12
OCON13
OCON14
TB5
P9A
TO OPTIONAL SHUNT TRIP/FAILURE RELAY
P18
TB10
P28
P15
(CRANK RELAY)
FUEL TANK
OCON5
OCON6
OCON7
OCON8
FUEL LEVEL SENDER (OPTIONAL)
FUEL LEAK ALARM (OPTIONAL)
W1
W2
W3
W4
W5
W6
W7
W8
P1 CONNECTIONS
P2 CONNECTIONS
P9A CONNECTIONS
P18 CONNECTIONS
P28 CONNECTIONS
P15 CONNECTIONS
CONNECTION CHART
* REMOVE RESISTORS IF PARALLELING
LEGEND
FOR SCHEMATIC SEE ADV-7705
80-100 KW JOHN DEERE
DECISION-MAKER 3000 CONTROLLER
KOHLER CO.
DIAGRAM, WIRING
80-100 KW JD
GM66700
D


P1C
P18 (CRS)
P26 (OPS)
P13 (MAT)
P11 (FIC)
P12 (MFS)
P7 (PCV)
P27 (120 OHM)
EBG
BCA
P24 (CAS)
SM1
SS
SM
CTS
P8 (RPS)
P23 (CLS)
P5 (OPS)
P25 (20A FUSE)
P14 (FTS)
P3
P4
80-100 KW JOHN DEERE
DECISION-MAKER 3000 CONTROLLER
KOHLER CO.
DIAGRAM, WIRING
80-100 KW JD
GM66700
D

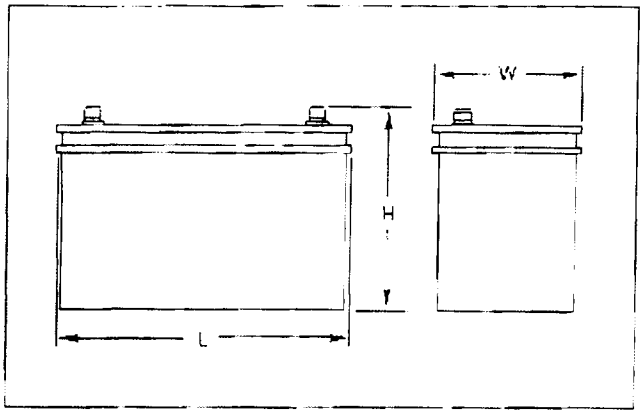

P29 3 AMP RELAY OUTPUT (2.1) CONNECTIONS
P29-NC 2.1 RELAY NORMALLY CLOSED
P29-COM 2.1 RELAY COMMON
P29-NO 2.1 RELAY NORMALLY OPEN
P30 3 AMP RELAY OUTPUT (2.2) CONNECTIONS
P30-NC 2.2 RELAY NORMALLY CLOSED
P30-COM 2.2 RELAY COMMON
P30-NO 2.2 RELAY NORMALLY OPEN
P31 3 AMP RELAY OUTPUT (2.3) CONNECTIONS
P31-NC 2.3 RELAY NORMALLY CLOSED
P31-COM 2.3 RELAY COMMON
P31-NO 2.3 RELAY NORMALLY OPEN
P32 10 AMP RELAY OUTPUT (2.4 & 2.5) CONNECTIONS
P32-NO 2.4 RELAY NORMALLY OPEN
P32-COM 2.4 RELAY COMMON
P32-NC 2.4 RELAY NORMALLY CLOSED
P32-NO 2.5 RELAY NORMALLY OPEN
P32-COM 2.5 RELAY COMMON
P32-NC 2.5 RELAY NORMALLY CLOSED
P28 SINGLE-ENDED (0-5V) ANALOG INPUT CONNECTIONS
P28-GND ADC0 ANALOG RETURN
P28-VR7 NO CONNECTION
P28-VP2 ADC2 SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28-GND ADC0 ANALOG RETURN
P28-VR1 NO CONNECTION
P28-VP1 ADC1 SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28 DIFFERENTIAL (+/-5V) ANALOG INPUT CONNECTIONS
P28-GND ADC0 ANALOG REFERENCE
P28-VR2 ADC2 NEGATIVE DIFFERENTIAL SIGNAL
P28-VP2 ADC2 POSITIVE DIFFERENTIAL SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28-GND ADC0 ANALOG RETURN
P28-VR1 ADC1 NEGATIVE DIFFERENTIAL SIGNAL
P28-VP1 ADC1 POSITIVE DIFFERENTIAL SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
NOTE: CONTACT AUTHORIZED DISTRIBUTOR TO DEFINE P28 A/D INPUTS.
P27 CAN TERMINATOR CONNECTIONS
PLACE THE P27 JUMPER ON THE "IN" PINS
P27 CAN TERMINATOR
P26 REMOTE I/O OUT
P25 REMOTE I/O IN
CAN REMOTE I/O BOARD (OPTIONAL)
P28
DEC 3000 CONTROLLER
P21
P23 REMOTE I/O
P22
TB1
P1
P2
TB2
TB3
TB4
RELAY CONTACTS
RUN RELAY (OPTIONAL)
TB10-8 (70): BATTERY VOLTAGE PRESENT ONLY WHEN GENERATOR IS OPERATING
RED
BLK
TB10
NOTE: IF SHUNT TRIP OR FAILURE RELAY IS NOT USED, DISCONNECT & TAPE LEADS 2 & 32A.
P9A
P10A
ENGINE HARNESS (REF.)
AUX SHUTDOWN SWITCH (CUSTOMER PROVIDED)
ENGINE START SWITCH (CUSTOMER PROVIDED)
LOCAL EMERGENCY STOP SWITCH (STANDARD)
LOCAL EMERGENCY STOP SWITCH (STANDARD)
REMOTE EMERGENCY STOP SWITCH (OPTIONAL)
REMOTE EMERGENCY STOP SWITCH CONNECTIONS
AUX WARNING SWITCH (CUSTOMER PROVIDED)
BATTERY CHARGER CONNECTIONS (OPTIONAL)
BATTERY CHARGER FAULT
TO ENGINE HARNESS
OCDM1
OCDM2
PRIME POWER SWITCH
NOTE: TRANSFER SWITCH TERMINAL DESIGNATIONS MAY VARY FROM THOSE SHOWN HERE. VERIFY THE CORRECT DESIGNATIONS USING THE APPROPRIATE TRANSFER SWITCH WIRING DIAGRAM.
(TERMINALS 3 AND 4: REMOTE START SWITCH OR ENGINE START CONTACTS ON TRANSFER SWITCH)
DCB2 (COMMON FAILURE RELAY) (OPTIONAL)
SEE TB2 RELAY OUTPUT NOTE
LINE CIRCUIT BREAKER (OPTIONAL)
SHUNT TRIP COIL
DCB1
FUSE1 (YELLOW) 1 AMP
(SHUNT TRIP WIRING) (OPTIONAL)
FUSE2 (RED) 10 AMP
W1
W2
W3
LEGEND
P(#) - PLUG
QCON(#) - QUICK CONNECT
TB(#) - TERMINAL BLOCK
W(#) - SONIC WELD
P21 RS-485 NON-ISOLATED CONNECTIONS
P21-1 GND
P21-2 +
P21-3 -
P21-4 GND
P21-5 +
P21-6 -
TB1 ANALOG/DIGITAL INPUT FACTORY SETTINGS
TB1-DI1 DCH1 NO FUNCTION
TB1-DI2 DCH2 AUX WARNING
TB1-DI3 DCH3 BATTERY CHARGER FAULT WARNING
TB1-AI1 ADC1 NO FUNCTION
TB1-AI2 ADC2 NO FUNCTION
TB1-GND A/DGND ANALOG/DIGITAL RETURN
NOTE: TB1 A/D INPUTS MAY BE REDEFINED - FACTORY DEFAULTS LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS.
TB2 RELAY OUTPUT
TB2-COM (RELAY COMMON) COMMON FAULT
TB2-COM (RELAY COMMON) COMMON FAULT
TB2-NO (RELAY NORMALLY OPEN) COMMON FAULT
TB2-NC (RELAY NORMALLY CLOSED) COMMON FAULT
NOTE: TB2 RELAY OUTPUT MAY BE REDEFINED - FACTORY DEFAULT LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS. CUSTOMER TO CONNECT TO TB2 UNLESS SHUNT TRIP IS USED. IF SHUNT TRIP IS USED, CUSTOMER TO CONNECT TO DCB2 FOR COMMON FAULT.
INSTALLATION NOTE:
FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.
DEC 3000 ACCESSORIES
KOHLER CO.
DIAGRAM, DEC 3000 ACCY INTERCONNECTION
GM67191
D

KOHLER POWER SYSTEMS

System Batteries

ISO 9001 KOHLER

Typical Overall Dimensions



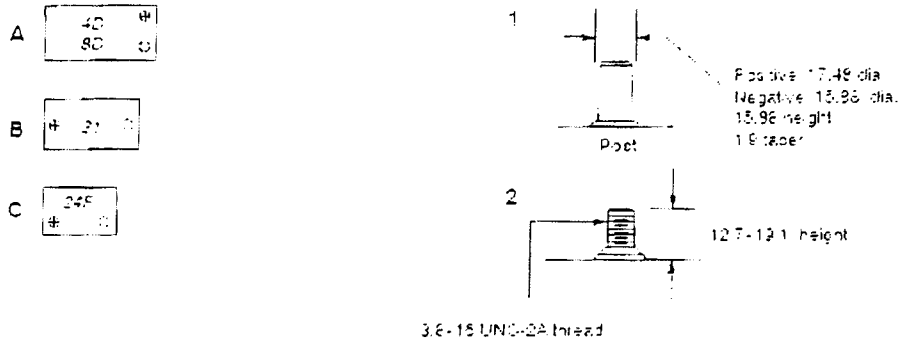
Standard Features

- Kohler Co. selects batteries to meet the engine manufacturer's specifications and to comply with NFPA requirements for engine-cranking cycles.
- Heavy-duty starting batteries are the most cost-effective means of engine cranking and provide excellent reliability in generator set applications.
- Batteries are rated according to SAE standard J-537. All batteries are 12-volt and have lead-calcium or lead-antimony plates with sulfuric acid electrolyte.
- Most generator set battery kits offer dry-charged or wet-charged batteries.
- Tough polypropylene cases protect against life-shortening vibration and impact damage.
- Removable cell covers allow checking of electrolyte specific gravity.

						Battery SAE Dimension, mm (in.)					
Charge Type*	Voltage	Fuel	Battery Part Number	Battery Qty. per Kit	BCI Group Size	L	W	H	Cold Cranking Amps at -18°C (0°F) Min.	Reserve Capacity Minutes at 27°C (80°F) Min.	Battery Post Layout and Style
Wet			256984	1	24	273.0 (10.8)	173.0 (6.8)	228.6 (9.0)	650	130	C/1

Battery Specifications

Battery Post Layouts A–C and Styles 1-2



Notes: Dimensions are in mm; 25.4 mm equals 1 inch. BCI group numbers shown in italics
Order stud kit 254427 to convert from Style 2 to Style 1

PART NO.	REV	SAE DIMENSION L	SAE DIMENSION W	SAE DIMENSION H	VOLTAGE	COLD CRANKING AMPS AT 0°F MINIMUM	RESERVE CAP MINUTES AT 80°F MINIMUM	POST LAYOUT /STYLE	CHARGE TYPE	BATTERY CONSTRUCTION	BCI GROUP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
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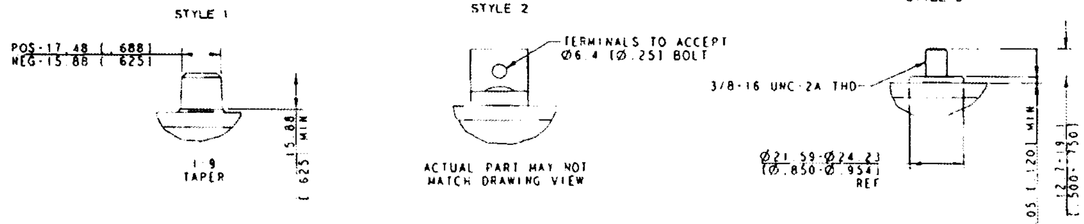
324368	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
324586	BR	330.2 (13.00)	173.0 (6.81)	239.8 (9.44)	12	950	185	C/3	WET	SEE NOTE 2	31
324587	BR	330.2 (13.00)	173.0 (6.81)	239.8 (9.44)	12	950	200	C/3	DRY	SEE NOTE 2	31
256984	BR	273.0 (10.75)	173.0 (6.81)	228.6 (9.00)	12	650	120	D/1	WET	SEE NOTE 1	24
225289	BR	273.0 (10.75)	173.0 (6.81)	228.6 (9.00)	12	650	130	D/1	DRY	SEE NOTE 1	24
345197	BS	273.0 (10.75)	173.0 (6.81)	228.6 (9.00)	12	510	80	[illegible]	WET	SEE NOTE 2	24
354147	BR	330.2 (13.00)	173.0 (6.81)	239.8 (9.44)	12	700	170	C/3	WET	SEE NOTE 2	31
354148	BR	330.2 (13.00)	173.0 (6.81)	239.8 (9.44)	12	700	150	C/3	DRY	SEE NOTE 2	31
345309	BR	219.2 (8.63)	153.9 (6.06)	212.9 (8.38)	12	525	-	E/1	WET	SEE NOTE 1	55
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
GM22349	BR	527.1 (20.75)	282.4 (11.12)	276.4 (10.88)	12	1150	400	A/1	DRY	SEE NOTE 1	8D
GM34399	BR	527.1 (20.75)	282.4 (11.12)	276.4 (10.88)	12	1150	430	A/1	WET	SEE NOTE 1	8D
GM40784	BR	208.0 (8.19)	173.0 (6.81)	196.9 (7.75)	12	525	70	D/1	WET	-	26
GM75512	BS	238.0 (9.38)	129.0 (5.06)	223.0 (8.81)	12	500	85	D/1	WET	-	51

NOTE: DIMENSIONS IN ( ) ARE ENGLISH EQUIVALENTS.

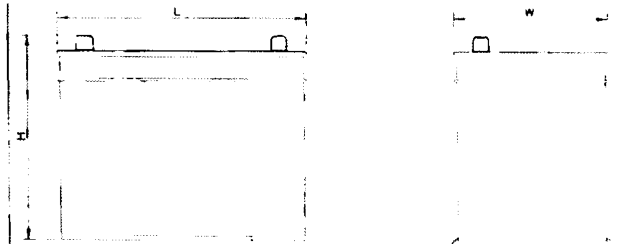


NOTES:
1) STYLE 3 CAN BE CONVERTED TO STYLE 1 BY INSTALLATION OF 254427 STUD CONVERTION KIT.
2) BATTERIES USING "STYLE 3" STUDS MUST HAVE EITHER THE "POS" OR "NEG" STUD CLEARLY IDENTIFIED.
3) STYLE 3 TERMINAL TORQUE 10 Nm (15 FT LBS)

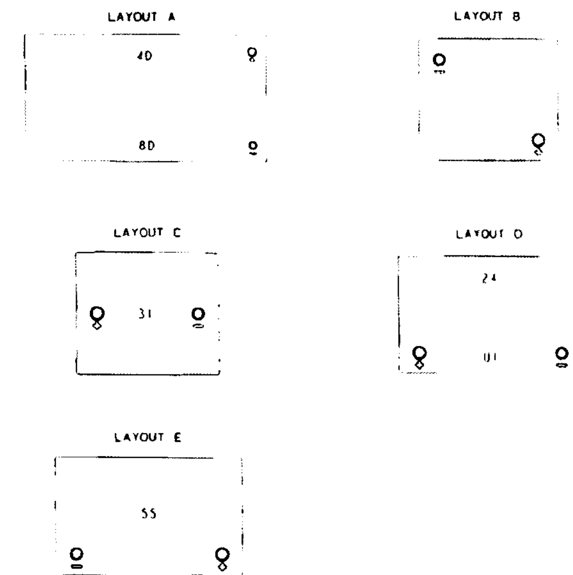
NOTES: (APPLIES TO ALL BATTERIES)
SAE J537 DIMENSIONS ARE MAX ALLOWABLE DIMENSIONS.
COLD CRANKING AMPS ARE MINIMUM ACCEPTABLE VALUES.
HOLD DOWN DESIGN IN COMPLIANCE WITH SAE STANDARDS.
BATTERY WARNING LABEL TO BE LOCATED ON TOP OF BATTERY. (BETWEEN TERMINALS ON LAYOUT D)
MANUFACTURER MUST PROVIDE A CERTIFICATE CONTAINING MFGRS. NAME, MFGRS. PART NUMBER,
AND KOHLER PART NUMBER CERTIFYING THAT THE BATTERY WAS BUIT TO INDUSTRY STANDARDS.
SEE N.F.P.A.-110 FOR SPECIFIC DETAILS. CERTIFICATE REQUIRED ONLY ONCE PER BATTERY PART NUMBER.
MAY NOT BE CALCIUM-CALCIUTYPE

NOTES: (CHARGE TYPE)
ALL DRY CHARGED BATTERIES MUST BE SUPPLIED WITH ACTIVATION INSTRUCTIONS ADHERED TO BATTERY AND LOOSE. BATTERY MUST ALSO BE IDENTIFED ON TOP AS: "DRY CHARGED, MUST ADD BATTERY GRADE ELECTROLYTE. SEE ACTIVATION INSTRUCTIONS".
BATTERIES SHOULD BE RECEIVED APPROPRIATELY MARKED AS DRYCHARGED OR WET STORAGE.
ONE OF THE BATTERY POSTS MUST BE SHIELDED WHEN BATTERIES ARE WET CHARGED.
BATTERIES WHEN SHIPPED DRY - DO NOT REQUIRE POST PROTECTORS.

NOTES: (BATTERY CONSTRUCTION)
1) MUST BE LEAD-CALCIUM HYBRID OR LEAD-ANTIMONY TYPE.
2) LEAD-CALCIUM GRID



ALTERNATE CONSTUCTION ON BOTTOM OF BATTERIES ACCEPTABLE



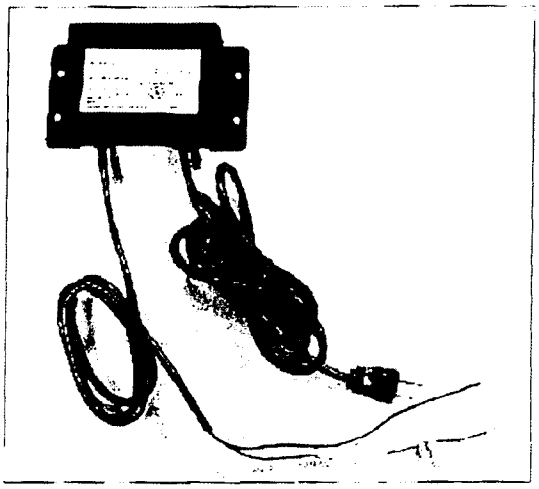
REV	DATE	REVISION
BR	10-22-07	(C-4) BCI COLUMN ADDED (B-7) 15.88 DIM LOCATIONS CORRECTED (D C-8) 324586, 330.0 WAS 328.4, 173.0 WAS 171.2, 239.8 WAS 217.8, 324587: 330.2 WAS 333.2, 256984 & 225289: 273.0 WAS 270.0, 173.0 WAS 171.5, 228.6 WAS 225.6, 345197 ...
BS	4-7-10	(C-8) 345197 VOIDED PER 87080, GM75512 ADDED (89560)

KOHLER CO. METRIC PRO-E
BATTERY
244578
D

KOHLER POWER SYSTEMS

Float/Equalize Battery Charger

ISO 9001 KOHLER



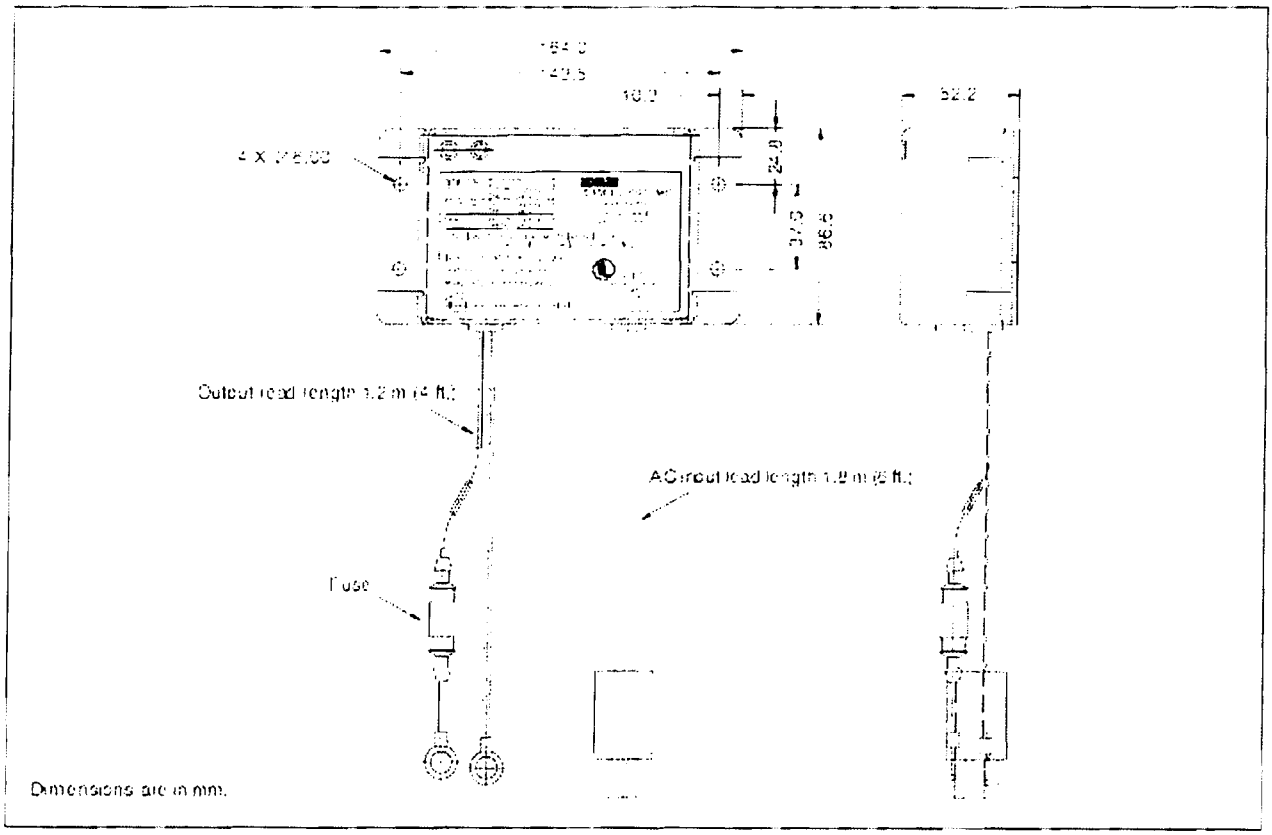
Standard Features

- 12 VDC output. * Use two battery chargers for 24-volt electrical systems
- Automatic 3-stage float/equalize battery charger
- Charges both lead-acid and gel-cell type batteries
- Indicator lamps: red and green LEDs indicate bulk charge, absorption, and float charge stages
- Durable potted assembly for full waterproofing and shockproofing
- Reverse-polarity protection
- Short-circuit protection
- UL 1236 listed
- UL 2200 compliant
- UL 991 compliant for vibration and shock
- UL listed to Canadian safety standards
- UL rated inline fuse
- FCC Class B-compliant for EMI/RFI (Date code 8/26/04 or later)
- 1-year warranty
- Easy installation:
- Integral mounting flanges
- Ring terminals for battery connection
- Standard US style 3-prong AC plug

Specifications

Battery Charger Kit	GM28569-KA1
Input Voltage	90-135 VAC
Input Frequency	50/60 Hz
DC Output: Bulk	11.8-14.0 VDC @ 5.0-6.0 amps
DC Output: Absorption	14.0-14.5 VDC @ 1.5-5.0 amps
DC Output: Float	13.3-14.5 VDC @ 0.1-1.5 amps
Steady Full-Load Output Current	6 amps
Current Limit	7 amps
Output Power Limit	70 +2/-5 watts
Line Regulation Across Input Voltage Range	0.01
Isolation, Input to Output	2500 V
Dimensions (L x W x D)	164 x 87 x 53 mm (6.4 x 3.5 x 2.1 in)
Weight	1.6 kg (3.5 lb.)
Temperature Range, Operating and Storage	--40°C to 70°C (--40°F to 158°F)
Humidity	0 to 100% (condensing)

Float/Equalize Battery Charger, continued



Battery Connections

Lead Length	1.2 m (4 ft.)
Battery Connections	9.5 mm (3/8 in.) ring terminals

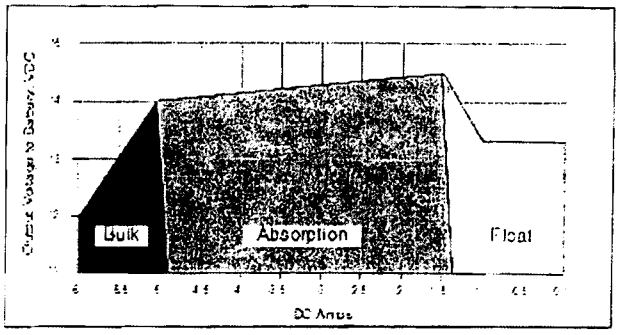
AC Power Connections

Lead Length	1.8 m (6 ft.)
Connection	Standard US style 3-prong AC plug

Shipping Information

Carton Size	254 x 152 x 89 mm (10 x 6 x 3.5 in.)
Shipping Weight	1.8 kg (4 lb.)

Charging Curves



OVERVIEW:
THE AUTOMATIC MULTI-LEVEL FLOAT/ EQUALIZE CHARGER SPECIFIED BELOW IS INTENDED TO CHARGE ENGINE STARTING BATTERIES EITHER INDEPENDENT OR IN CONJUNCTION WITH AN ENGINE DRIVEN CHARGING SYSTEM

BATTERY TYPES TO BE CHARGED:
LEAD ACID
GEL CELL

INPUT:
INPUT VOLTAGE: 90-135 VOLTS AC
INPUT FREQUENCY: 50/60 Hz

INPUT LEAD:
APPROXIMATELY 1.8M (72") (REF) TYPE SJTOW -40°C TO 105°C UL RATED WIRE TERMINATED IN PRE-MOLDED US STYLE 120 V 3 PRONG AC PLUG

DC OUTPUT:
AUTOMATIC FLOAT EQUALIZE
STEADY FULL LOAD CURRENT: 6 AMPS
BULK 11.8-14.0 VOLTS @ 5.0-6.0 AMPS
ABSORPTION VOLTAGE: 14.0-14.5 VOLTS @ 1.5-5.0 AMPS
FLOAT VOLTAGE: 13.3-14.5 VOLTS @ 0.1-1.5 AMPS
BULK TO ABSORPTION TRANSITION: 14.0 VOLTS
ABSORPTION TO FLOAT TRANSITION: 1.5 AMPS
CURRENT LIMIT 7 AMPS
OUTPUT POWER LIMITS: 70 +2/-5 WATTS
FLOAT TO ABSORPTION TRANSITION: 2.06 VOLTS PER CELL
LINE REGULATION ACROSS INPUT VOLTAGE RANGE: 1%
SPARK PROTECTION CONNECTION AND OPERATION

OUTPUT LEAD:
APPROX. 1.2M (48") (REF) TYPE SJTOOW -50°C TO 105°C UL RATED WIRE WITH RED AND BLACK WIRE INSULATION TERMINATED IN 9.5 mm (REF) RING STYLE TERMINALS.

FUSES:
THE FUSE MUST BE LOCATED APPROXIMATELY 5" FROM RING TERMINAL ON RED OUTPUT LEAD.
DC OUTPUT: RATED PER UL (125% RATED OUTPUT)

ISOLATION:
INPUT TO OUTPUT: 2500V

ENVIRONMENTAL:
STORAGE TEMPERATURE RANGE: -40 TO +70°C (-40 TO +158°F)
OPERATING TEMPERATURE RANGE: -40 TO +70°C (-40 TO +158°F)
HUMIDITY: 0 TO 100% (CONDENSING)
VIBRATION AND SHOCK: UL991

REVERSE POLARITY PROTECTION:
THE CHARGER SHALL SUSTAIN NO DAMAGE WHEN INCORRECTLY CONNECTED TO THE BATTERY IN REVERSE ORIENTATION

MOUNTING: SHALL HAVE INTERGRAL MTG. FLANGES

ENCLOSURE:
SHALL PROTECT THE CHARGER COMPONETS FROM RAIN, SNOW, DUST AND DRIPPING WATER. ALL INTERNAL COMPONENTS PROTECTED FROM WATER DROPLETS.

INDICATORS:
SHALL HAVE CHARGE INDICATOR LAMP TO INDICATE BULK CHARGE AND FLOAT CHARGE CYCLES.

OPERATIONAL:
CAPABLE OF WITHSTANDING AN INDEFINITE OUTPUT SHORT CIRCUIT WITHOUT DAMAGE TO THE CHARGER.
SHALL OPERATE PROPERLY AND SUSTAIN NO DAMAGE WHEN CONNECTED TO INPUT POWER WHILE CONNECTED TO THE BATTERY AND CHARGING SYSTEM OF ENGINE WHILE ENGINE IS CRANKED, RUNNING OR SHUTDOWN

DOCUMENTATION:
THERE SHALL BE AN INSTALLATION / OPERATIONAL MANUAL SUPPLIED WITH EACH CHARGER PER KOHLER SUPPLIED ARTWORK.

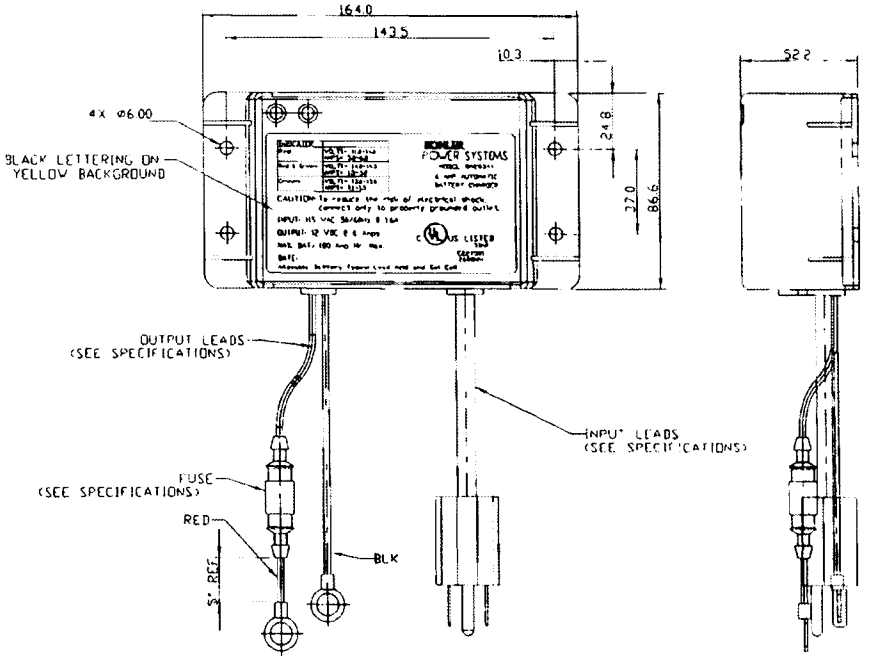
CERTIFICATIONS (US AND CANADA):
MUST COMPLY WITH UL2200
UL1236
MUST MEET CSA REQUIREMENTS
EMI / RFI FCC CLASS B COMPLIANT AFTER CHARGER DATE CODE 8/26/04

PRODUCT LABELING:
THE LABEL ATTACHED TO THE CHARGER SHALL HAVE THE FOLLOWING INFORMATION:
UL LISTING
KOHLER PART NUMBER
DESCRIPTION OF ALL INDICATOR
ALLOWABLE RANGE OF BATTERY UNIT CAPACITY
ALLOWABLE BATTERY TYPES
OUTPUT CURRENT AND VOLTAGE
INPUT VOLTAGE AND FREQUENCY

PACKAGING:
EACH CHARGER TO BE SHIPPED IN 254mm x 152mm x 89mm (10" x 6" x 3.5") (REF.) CARTON WITH AN APPROPRIATE LABEL ATTACHED. AN OPERATIONAL / INSTALLATION MANUAL SHALL BE SUPPLIED WITH EACH INDIVIDUAL PACKAGE

PACKAGING LABEL:
THE PACKAGING LABEL SHALL CONTAIN THE FOLLOWING INFORMATION:
KOHLER P/N
DESCRIPTION - BATTERY CHARGER
MFG. MODEL NO.
MFG. PART NUMBER
DATE CODE

WARRANTY:
2 YEAR FROM DATE OF PURCHASE FROM MANUFACTURE



REV	DATE	REVISION	BY	APPROVALS	DATE
A	5-1-03	(B-0) UPDATED INPUT LEAD NOTE(C-0)UPDATED OUTPUT LEAD & FUSES NOTES; (B-3) ADDED COLOR, FUSE & LENGHT NOTES TO OUTPUT LEADS; (C-3) "BATTERY CHARGER" REMOVED FROM DECAL (69512)	BTV		
B	10-7-04	(A-8) CLASS B COMPLIANT AFTER CHARGER DATE CODE 8/26/04 WAS CLASS A COMPLIANT(73350)	BTV	BTV	11-1-02
C	2-12-07	(C-3) UPDATE DRAWING TO MATCH LABEL ON PART, ADD UL FILE#E227501 (80682)	BTV	JS	11-1-02
				DB	11-1-02

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POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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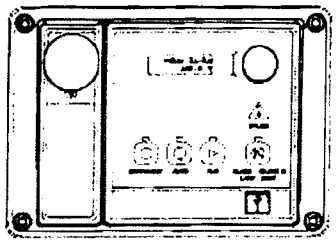
BATTERY CHARGER,
12V 6A FLOAT EQUALIZES

SIZE D | DWG NO. GM28341 | REV D

KOHLER POWER SYSTEMS

ISO 9001 KOHLER

Integral Voltage Regulator with Kohler® Decision-Maker® 3000 Controller (20-300 kW Generator Set Models)



Decision-Maker® 3000 Controller with integral Voltage Regulator

The voltage regulator is integral to the controller and uses microprocessor logic providing ±0.5% no-load to full-load regulation using root-mean-square (RMS) voltage sensing.

The voltage regulator features three-phase sensing and is available for 12- or 24-volt engine electrical systems.

Voltage Regulators

The following information provides general features, specifications, and functions of available voltage regulators.

This information generally applies to a single generator set and multiple generator sets with paralleling applications. Refer to the respective generator set specification sheet and see your authorized distributor for information regarding specific voltage regulator applications and availability.

Integral Voltage Regulator with Decision-Maker® 3000 Controller

Adjustment	Digital Display	Range Setting	Default Selection
Voltage Adjustment	Volt Adj	±10% of System Voltage	System Voltage
Underfrequency Unload or Frequency Setpoint	Frequency Setpoint	42 to 62 Hz	2.5 Hz Below System Frequency
Underfrequency Unload Slope	Slope	0-10% of System Voltage (Volts per Cycle)	3 Volts per Cycle

Voltage Regulators, continued

pecification	Integral with DEC 3000 Controller
Generator Set Availability	20-300 kW Models
Type	Microprocessor based
Status and Shutdown Indicators	LEDs and Digital Display
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5-95% Non-Condensing
Circuit Protection	Solid-State, Redundant Softward and Fuses
Sensing, Nominal	100-240 Volts (L-N), 50-60 Hz
Sensing Mode	RMS, Single- or 3-Phase
Input Requirements	8-36 VDC
Continuous Output	100 mA at 12 VDC
Maximum Output	100 mA at 12 VDC
Transition Frequency	50-70 Hz
Exciter Field Resistance	NA
No-Load to Full-Load Voltage Regulation	±0.5%
hermal Drift	less than 0.5% (-40 C to 70 C) [-40 F to 158 F] Range
Response Time	Less Than 5µS
Voltage Adjustment (of system voltage)	±10%
Voltage Adjustment	Controller Menu Knob
Remote Voltage Adjustment	NA
Paralleling Capability	NA
VAR/PF Control Input	NA

DVR® is a registered trademark of Marathon Electric Mfg. Corp.

NA - Data not available at time of print.

Integral Voltage Regulators with Decision-Maker® 3000 Controller

- A digital display and pushbutton/rotary dial provide access to data. A two-line LCD display provides complete and concise information.
- The controller provides ISO 8528-5, Class G3, compliance for transient response on some 20-300 kW generator set models. See the respective generator set spec sheet for specific applications
- See G6-100 Decision-Maker® 3000 for more information.

Generator Set Calibration Menu

- L1-L2 Volts
- L2-L3 Volts (3-phase)
- L3-L1 Volts (3-phase)
- L1-N Volts
- L2-N Volts
- L3-N Volts (3-phase)

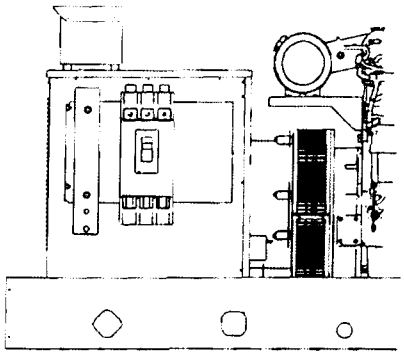
Voltage Regulation Menu

- Adjust voltage, ±10%

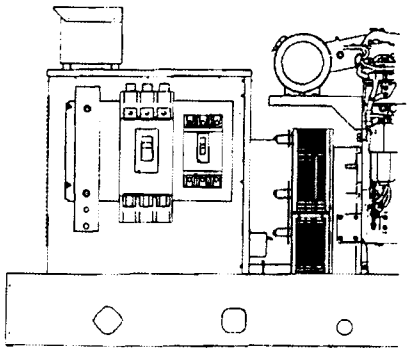
KOHLER.POWER SYSTEMS

Line Circuit Breakers 20-2250 kW

ISO 9001
KOHLER POWER SYSTEMS
NATIONALLY REGISTERED



Single Circuit Breaker Kit with Neutral Bus Bar
20-300 kW Model Shown



Dual Circuit Breaker Kit with Neutral Bus Bar
20-300 kW Model Shown

Standard Features

- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and are available standard with load-side lugs or bus bars and neutral bus bar.
- Konler Co. offers a wide selection of molded-case line circuit breaker kits including single and dual configurations for each generator set.
- Four types of line circuit breakers are available:
  - Magnetic trip
  - Thermal magnetic trip
  - Electronic trip
  - Electronic with Ground Fault Circuit Interruption (GFCI) trip
- In addition, line circuit breakers are offered with 80% and 100% ratings (thermal magnetic available only in 80% rating).
- Single line circuit breaker kits allow circuit protection of the entire electrical system load.
- Dual line circuit breaker kits allow circuit protection of selected priority loads from the remaining electrical system load.
- Line circuit breakers comply with the following codes and standards unless otherwise stated.
  - UL 489 Molded Case Circuit Breakers
  - UL 1077 Supplementary Protectors
  - UL 2200 Stationary Engine Generator Assemblies

Line Circuit Breaker Types

Magnetic Trip

The magnetic trip features an electromagnet in series with the load contacts and a moveable armature to activate the trip mechanism. When a sudden and excessive current such as a short circuit occurs, the electromagnet attracts the armature resulting in an instantaneous trip (UL 1077 circuit breakers).

Thermal Magnetic Trip

Thermal magnetic trip contains a thermal portion with a bimetallic strip that reacts to the heat produced from the load current. Excessive current causes it to bend sufficiently to trip the mechanism. The trip delay is dependant on the duration and excess of the overload current. Elements are factory-calibrated. A combination of both thermal and magnetic features allows a delayed trip on an overload and an instantaneous trip on a short circuit condition.

Electronic Trip

These line circuit breakers use electronic controls and miniature current transformers to monitor electrical currents and trip when preset limits are exceeded.

Electronic with Ground Fault Trip

The ground fault trip feature is commonly referred to as Ground Fault Circuit Interruption (GFCI). Models with GFCI compare current flow in phase and neutral lines, and trip when current unbalance exists.

Ground fault trip units are an integral part of the circuit breaker and are not available as field-installable kits. The ground fault pickup switch sets the current level at which the circuit breaker will trip after the ground fault delay. Ground fault pickup values are based on circuit breaker sensor plug only and not on the rating plug multiplier. Changing the rating plug multiplier has no effect on the ground fault pickup values.

80% Rated Circuit Breaker

Most molded-case circuit breakers are 80% rated devices. An 80% rated circuit breaker can only be applied at 80% of its rating for continuous loads as defined by NFPA 70. Circuit conductors used with 80% rated circuit breakers are required to be rated for 100% of the circuit breaker's rating.

The 80% rated circuit breakers are typically at a lower cost than the 100% rated circuit breaker but load growth is limited.

100% Rated Circuit Breaker

Applications where all UL and NEC restrictions are met can use 100% rated circuit breakers where 100% rated circuits can carry 100% of the circuit breaker and conductor current rating.

The 100% rated circuit breakers are typically at a higher cost than the 80% rated circuit breaker but have load growth possibilities.

When applying 100% rated circuit breakers, comply with the various restrictions including UL Standard 489 and NEC Section 210. If any of the 100% rated circuit breaker restrictions are not met, the circuit breaker becomes an 80% rated circuit breaker.

Accessories

☐ Alarm Switch

The alarm switch indicates that the circuit breaker is in a tripped position caused by an overload, short circuit, ground fault, the operation of the shunt trip, an undervoltage trip, or the push-to-trip pushbutton. The alarm resets when the circuit breaker is reset.

☐ Auxiliary Contacts

These switches send a signal indicating whether the main circuit breaker contacts are in the open or closed position.

☐ Bus Bars (units without circuit breakers installed)

Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered. Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present.

☐ Ground Fault Annunciation

A relay contact for customer connection indicates a ground fault condition and is part of a ground fault alarm.

☐ Lockout Device (padlock attachment)

This field-installable handle padlock attachment is available for manually operated circuit breakers. The attachment can accommodate three padlocks and will lock the circuit breaker in the OFF position only.

☐ Neutral Lugs

Various neutral lug sizes are available to accommodate multiple cable sizes for connection to the bus bar only.

☐ Overcurrent Trip Switch

The overcurrent trip switch indicates that the circuit breaker has tripped due to overload, ground fault, or short circuit and returns to the deenergized state when the circuit breaker is reset.

☐ Undervoltage Trip, 12 VDC or 24 VDC

The undervoltage trips the circuit breaker when the control voltage drops below the preset threshold of 35%-70% of the rated voltage.

☐ Shunt Trip, 12 VDC or 24 VDC

A shunt trip option provides a solenoid within the circuit breaker case that, when momentarily energized from a remote source, activates the trip mechanism. This feature allows the circuit breaker to be tripped by customer-selected faults such as alternator overload or overspeed. The circuit breaker must be reset locally after being tripped. Tripping has priority over manual or motor operator closing.

☐ Shunt Trip Wiring

Connects the shunt trip to the generator set controller.

Line Circuit Breaker Specifications

80% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Style
20-60	4P/4Q	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
60-180	4S/4V	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
		300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		800	Electronic	P
		800	Electronic GFCI	
200-300	4UA	15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
		300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		1000-1200	Thermal magnetic	P
		800-1200	Electronic	P
		800-1200	Electronic GFCI	
350-900 (small ext. box) (no 5M4044)	4M/5M w/leads	300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		1000-1200	Thermal magnetic	P
		800-1200	Electronic	P
		800-1200	Electronic GFCI	
350-900 (large ext. box) (no 5M4044) *†	4M/5M w/leads	1600-2500	Thermal magnetic	R
			Electronic	
			Electronic GFCI	
1000- 2250 and 900 kW with 5M4044 (large ext. box) *‡	5M/7M w/bus bars	1200-2500	Thermal magnetic	R
			Electronic	
			Electronic GFCI	

100% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Style
20-60	4P/4Q	150-400	Electronic	D
			Electronic GFCI	
60-180	4S/4V	150-400	Electronic	D
			Electronic GFCI	
		600-800	Electronic	P
			Electronic GFCI	
200-300	4UA	150-400	Electronic	D
			Electronic GFCI	
		600-1200	Electronic	P
			Electronic GFCI	
350-900 (small ext. box) (no 5M4044)	4M/5M w/leads	150-400	Electronic	D
			Electronic GFCI	
		600-1200	Electronic	P
			Electronic GFCI	
350-900 (large ext. box) (no 5M4044) *†	4M/5M w/leads	1600-2500	Electronic	R
			Electronic GFCI	
		3000	Electronic	NW
			Electronic GFCI	
1000- 2250 and 900 kW with 5M4044 (large ext. box) *‡	5M/7M w/bus bars	1200-2500	Electronic	R
			Electronic GFCI	
		3000	Electronic	NW
			Electronic GFCI	

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
E (480 V max.)	30-100	Up to two wire terminals fitting 10-32 or 1/4-20 stud
H	15-150	One #14 to 3/0
J	175	One 1/0 to 4/0
	200-250	One 3/0 to 350 kcmil
L	300-400	One #1 to 600 kcmil Al
D	150-400	One #2 to 500 kcmil Al
		One #2 to 600 kcmil Cu
	600	Two 2/0 to 500 kcmil Al
		Two 2/0 to 350 kcmil Cu
M	700-800	Three 3/0 to 500 kcmil
P	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
R	1600-2500	(8) lugs per phase rated for (1) #4-600 kcmil or (2) 1/0-250 kcmil
NW	3000	

* Available as front or rear facing circuit breaker on junction box.
Front facing circuit breakers are not available on the 600-2000REOZM, 600-2000REOZMB, and 400-800RZW models
† Front facing circuit breakers for 450/500REOZVB models are available for units with standard air cleaner and not with heavy-duty air cleaner.
‡ The 5M4044 is a 4-bus alternator and has bus-type mounting.

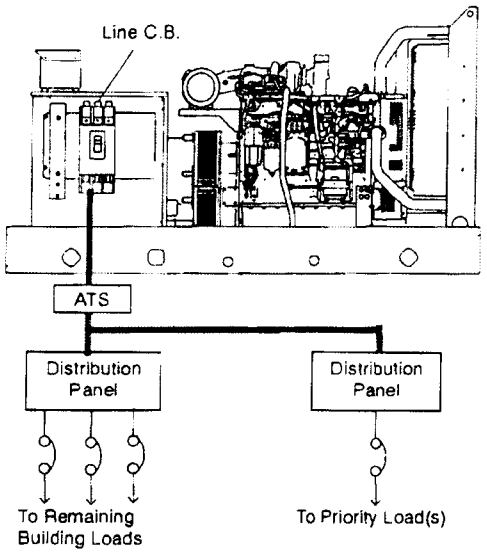
KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KohlerPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Line Circuit Breaker Applications

Single Circuit Breaker Installations

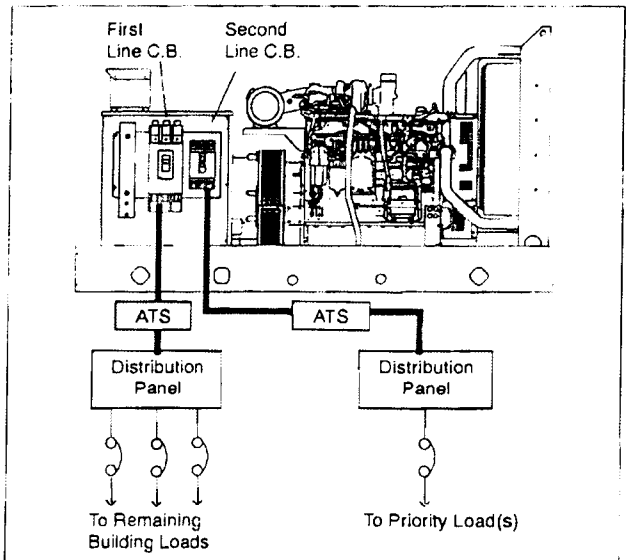
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



Single line circuit breaker configuration where circuit breaker trip can trip causing all power to building loads including priority load to be disrupted.

Dual Circuit Breaker Installations

A generator set with dual circuit breakers installed is used to segregate critical loads. Typically, one circuit breaker will feed a main transfer switch with noncritical loads and the other circuit breaker will feed a second transfer switch that feeds critical loads.



Dual line circuit breaker configuration where first circuit breaker can trip allowing second circuit breaker to continue supplying power to priority load(s).

Dual Circuit Breaker Combinations

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
4P/4Q/4S/4V/4UA	H	—	
	J	—	
4S/4V/4UA	L	—	
4P/4Q/4S/4V/4UA	D	—	100% rating, standard or GFCI
4S/4V/4UA	M	—	
	P	—	100% rating, standard or GFCI
4P/4Q/4S/4V/4UA	H	H	
	J	H or J	
4S/4V/4UA	L	H, J, or L	
4P/4Q/4S/4V	D	H, J, L, or D	100% rating, no GFCI
4UA	D	H, J, L, or D	Primary or sec. available as 100% rating, std. or GFCI

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
4S/4V	M	H, J, L, or D	100% rating, no GFCI
4UA	M	H, J, L, or D	D available as GFCI
4S/4V	P	H, J, L, or D	100% rating, no GFCI
4UA	P	H, J, L, or D	P and/or D available as GFCI
	P	P	100% rating, no GFCI
4M/5M/7M	All	—	Dual circuit breaker configurations available as Engineered Specials

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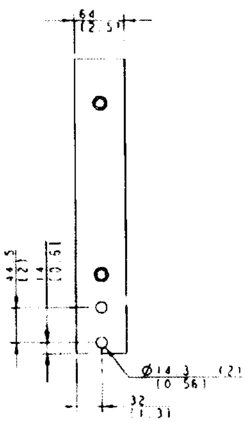
AL/CU MECHANICAL LUGS PER PHASE			A
BREAKER FRAME	AMPS	WIRE RANGE	WIRE BENDING
H	15-50	ONE #14 TO 3/0	427 (16.8)
J	75	ONE 1/0 TO 4/0	413 (16.3)
J	200-250	ONE 3/0 TO 350 KCMIL	413 (16.3)
L	300-400	ONE #1 TO 600 KCMIL	369 (14.5)
D	150-400	ONE #2 TO 500 KCMIL AL	362 (14.2)
D	150-400	ONE #2 TO 600 KCMIL CU	362 (14.2)
D	600	TWO 2/0 TO 350 KCMIL AL	362 (14.2)
D	600	TWO 2/0 TO 500 KCMIL CU	362 (14.2)
M	700-800	THREE 3/0 TO 500 KCMIL	341 (13.4)
P	600-800	THREE 3/0 TO 500 KCMIL	341 (13.4)

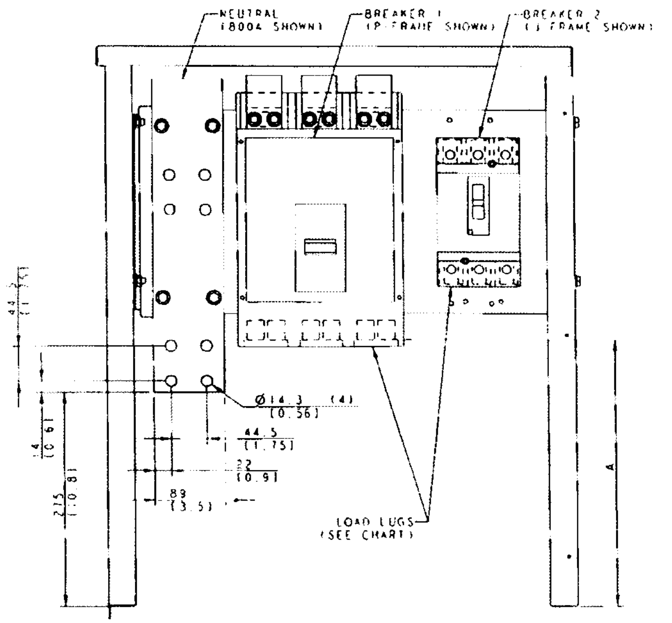
STANDARD BREAKER COMBINATIONS		
BREAKER 1	BREAKER 2	COMMENT
H	-	
J	-	
L	-	
D	-	STD OR GFI
M	-	
P	-	STD OR GFI
H	H	
J	H OR J	
L	H, J OR L	
D	H, J, L OR D	NO GFI
M OR P	H, J, L OR D	NO GFI

NOTES:

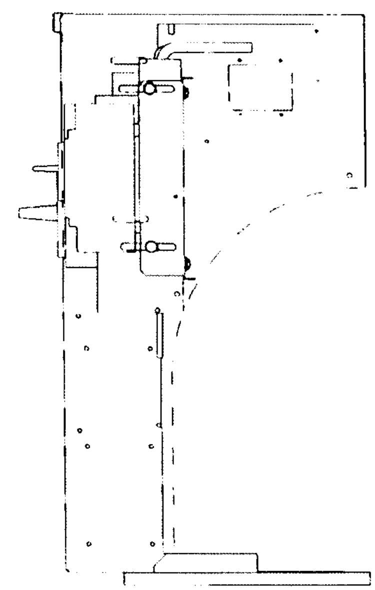
1) SEE UNIT DIMENSION PRINT (ADV-XXXX) FOR ADDITIONAL DIMENSIONS JUNCTION BOX AND STUB-UP LOCATION
2) ADD SKID DEPTH TO WIRE BENDING HEIGHTS ON THIS PRINT TO ARRIVE AT FULL WIRE-BENDING SPACE
3) CONSULT FACTORY FOR BREAKER COMBINATIONS NOT SHOWN ON THIS PRINT
4) MECHANICAL LUGS ARE AVAILABLE FOR NEUTRAL SEE ADV-7376
5) NEUTRALS ARE BONDED TO GROUND AS STANDARD CONSULT LOCAL CODES OR SYSTEM REQUIREMENTS
6) CIRCUIT BREAKER FRAMES REFER TO STANDARD SQUARE D PRODUCT
7) STANDARD NEUTRALS PROVIDED ARE SIZED FOR MAXIMUM UNIT AMPS GFI NEUTRALS ARE MATCHED TO CIRCUIT BREAKER AMPS
8) DIMENSIONS IN ( ) ARE INCHES



600A NEUTRAL



SHOWN WITH COVERS REMOVED
(ALL VIEWS)



VIEW FROM ENGINE END
(HALF VIEW SHOWN)

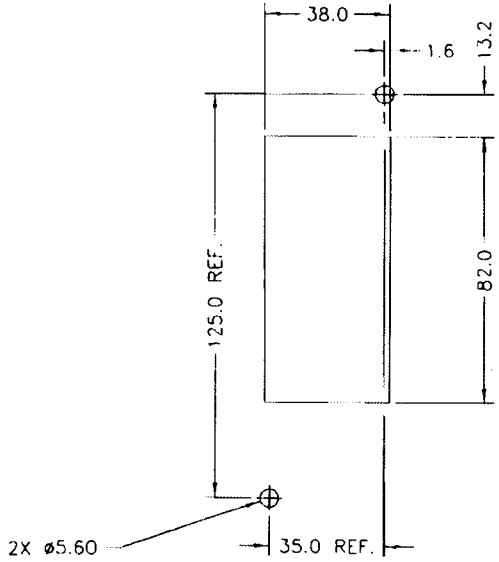
LINE CIRCUIT BREAKER (LCB) KITS
4S/4SW/4V/4W ALTERNATOR FRAME STYLES

KOHLER CO.
METRIC | PRO-E
DIMENSION PRINT
ADV-7371 D

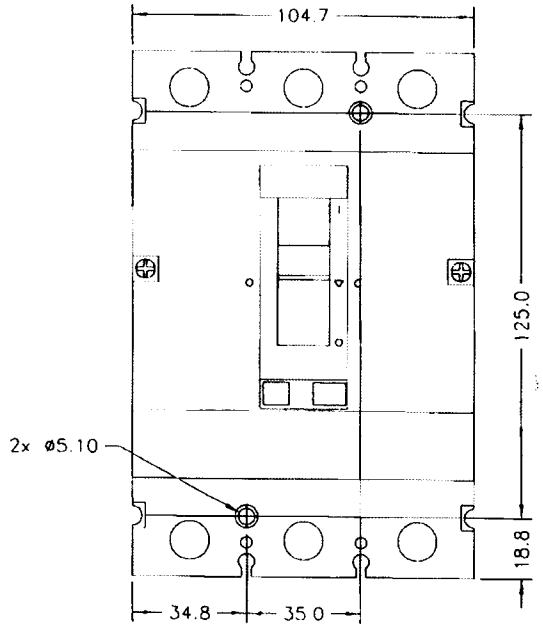
PART NO.	F	MPS	VENDOR NO.
GM47475-1	-	40	HDL36040
GM47475-2	-	60	HDL36060
GM47475-3	-	70	HDL36070
GM47475-4	-	80	HDL36080
GM47475-5	-	90	HDL36090
GM47475-6	-	100	HDL36100
GM47475-7	-	125	HDL36125
GM47475-8	-	150	HDL36150

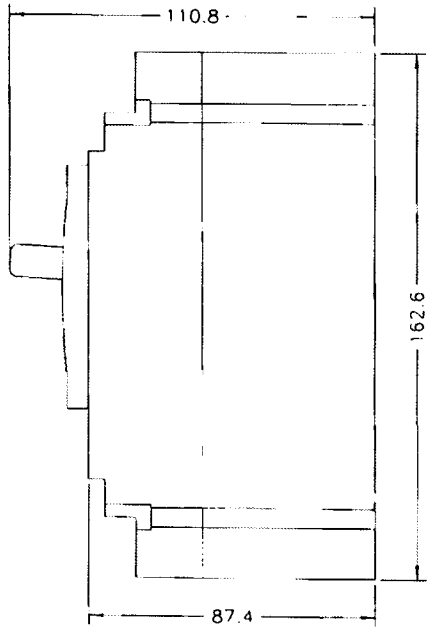
REV	DATE	REVISION	BY
-	10-21-05	NEW DRAWING (76459)	RAC

REVISION BLOCK INDICATES REVISION LEVEL OF DRAWING NOT PART REVISION. SEE PART REVISION LEVEL BEHIND PART NUMBER FOR CURRENT PART REVISION LEVEL.



SUGGESTED PANEL
CUTOUT & MOUNTING





METRIC CAD FILE

MODELLED IN PRO/E

NOTES:

AL150HD LUGS EACH END (REF)
(1) #14-#10 AWG, TORQUE 5 Nm [50 IN-LBS]
OR (1) #8-3/0 AWG, TORQUE 14 Nm [120 IN-LB]

HARDWARE INCLUDED: (2) #8-32 SCREWS

SQUARE D HD-FRAME CIRCUIT BREAKER
THERMAL MAGNETIC 3 POLE TOGGLE LUG-LUG

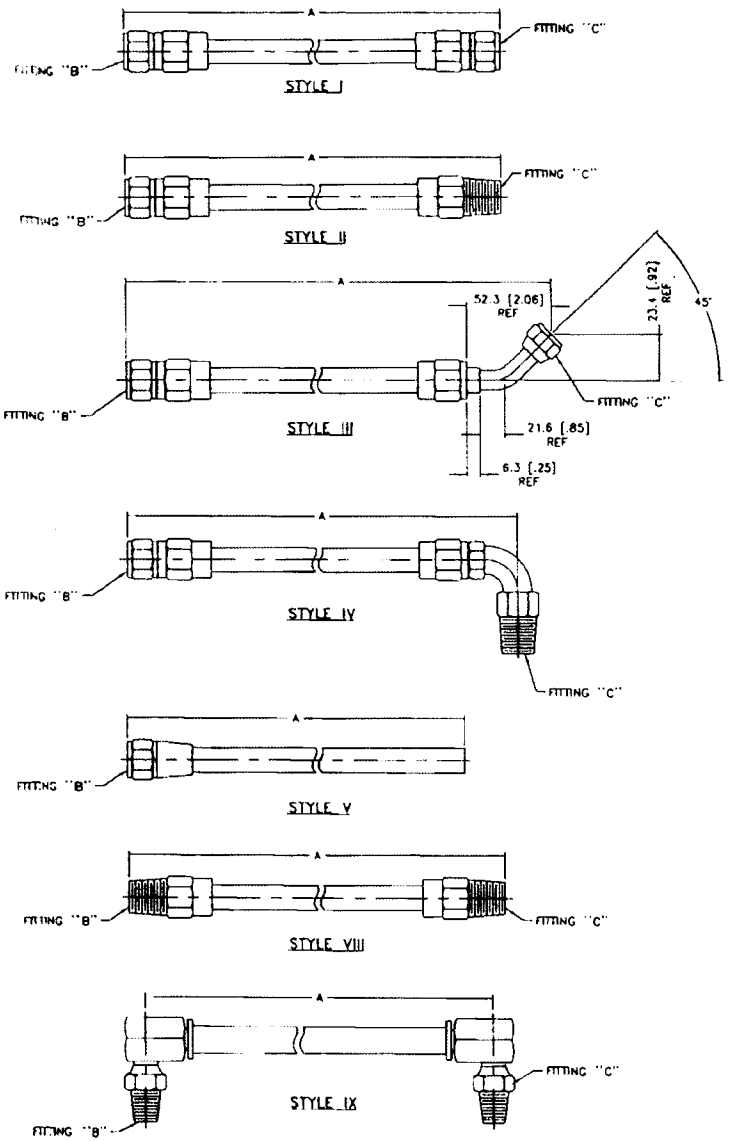
UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0.30
SURFACE FINISH 3.2 MAX.
THIRD ANGLE PROJECTION

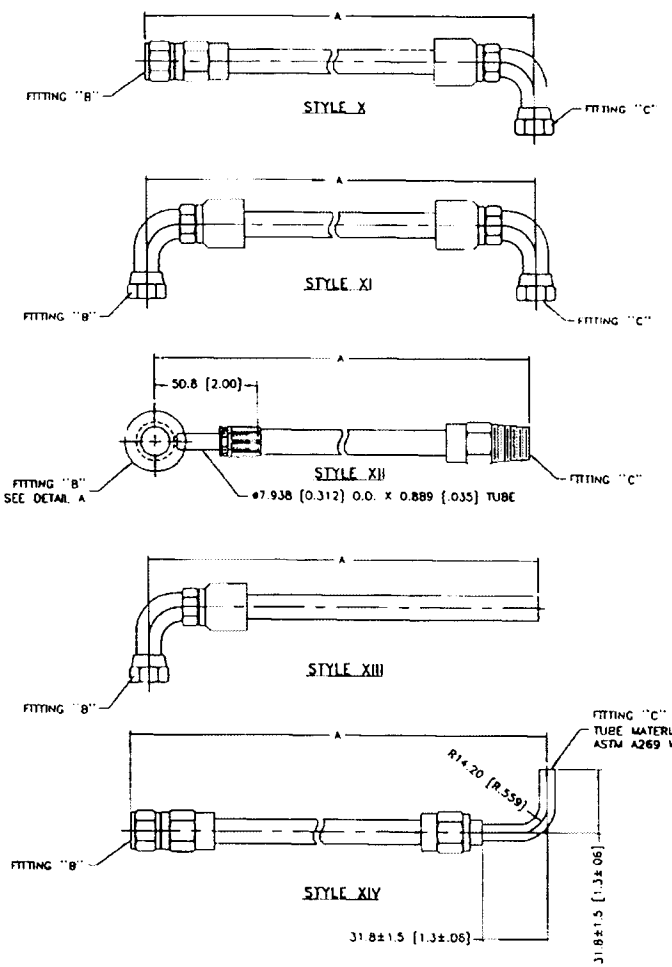
APPROVALS		DATE
DRAWN	RAC	10-21-05
CHECKED	JMS	6-13-06
APPROVED	SU	6-15-06

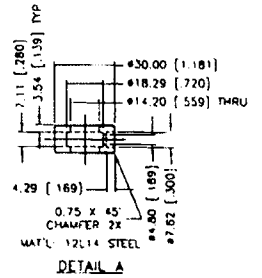
KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: DWG, CIRCUIT BREAKER

SCALE	NONE	CAD NO.	GM47475.DWG	SHEET	1 - 1
DWG NO.		GM47475			C
PLOTTED DATE					







NOTES:
- REFER TO SAE STANDARD J30R3, MINIMUMS OF EXCEPTIONS ARE LISTED BELOW.
- FITTINGS: APPROPRIATE FOR APPLICATION, BURST PRESSURE AND OPERATING PRESSURE, CONNECTION TYPE TO BE AS SPECIFIED. FITTINGS MAY NOT APPEAR EXACTLY AS SHOWN.
- MATERIAL CERTIFICATION REQUIRED FOR TYPES, I, II, III, V AND VI.

HOSE TOLERANCE							
ENGLISH LENGTH				METRIC LENGTH			
0"-24"	24.01"-60"	60.01"-75"	75.01"-UP	0-610	610.1-1524	1524.1-1905	1905.2-UP
±.25	±.50	±.75	±1%	±6.4	±12.7	±19.1	±1%

METRIC CAD FILE

NOTE: DIMENSIONS IN [ ] ARE INCH. EQUIVALENTS.

KOHLER CO.

FUEL LINE, FLEXIBLE

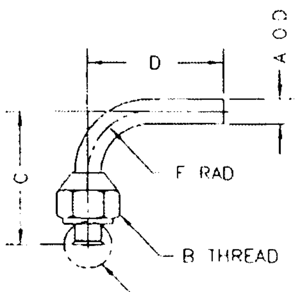
273614 D

PART NO.	REV.	D	B UNION NUT	C ±.06 [±1.5]	D ±.06 [±1.5]	E	F [1.5]	G	H UNION NUT	TYPE
324101	K	.2[illegible] [[illegible].4]	7/16-20 UNF	1.25 [31.8]	1.25 [31.8]	.360/.345 [9.14/8.76]	.56 [[illegible]2]	–	–	1
324102	K	.31 [7.9]	1/2-20 UNF	1.63 [41.4]	1.63 [41.4]	.410/.425 [10.41/10.80]	.75 [19.1]	–	–	1
~~324378~~	~~L~~	~~.31 [7.9]~~	~~1/2-20 UNF~~	~~1.63 [41.4]~~	~~3.50 [88.9]~~	~~.410/.425 [10.41/10.80]~~	~~.75 [19.1]~~	–	–	1
~~324175~~	~~L~~	~~.31 [7.9]~~	~~1/2-20 UNF~~	~~1.60 [40.6]~~	~~.97 [24.6]~~	~~.410/.425 [10.41/10.80]~~	~~.75 [19.1]~~	~~2.57 [65.3]~~	–	2
273616	K	.25 [6.4]	7/16-20 UNF	7.0 [178]	2.3 [58]	.360/.345 [9.14/8.76]	1.0 [25.4]	–	–	1
273631	K	.25 [6.4]	7/16-20 UNF	4.8 [122]	4.8 [122]	.360/.345 [9.14/8.76]	1.0 [25.4]	–	–	1
CM16938	K	.25 [6.4]	7/16-20 UNF	4.8 [122]	3.4 [86]	.360/.345 [9.14/8.76]	1.0 [25.4]	–	–	1
GM48024	N	.25 [6.4]	7/16-20 UNF	4.8 [122]	2.5 [64]	.360/.345 [9.14/8.76]	1.0 [25.4]		11/16-16 UN-2B	3
CM48028	P	.25 [6.4]	7/16-20 UNF	4.8 [122]	4.4 [112]	.360/.345 [9.14/8.76]	1.0 [25.4]	–	1/2-24 UNS-2B	4

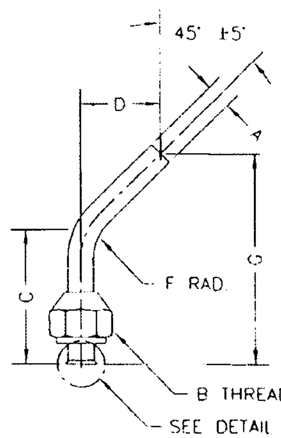
NOTE:
DIMENSIONS IN [ ] ARE MILLIMETER EQUIVALENTS.

REV	DATE	REVISION	BY
J	9-20-00	(D-4) GM16938 ADDED [62707]	RSH
K	11-21-01	METRIC EQUIVALENTS ADDED TO DIMENSIONS [66097]	RTW
L	6-24-03	(D-4) 324378 & 324175 VOIDED [69833]	JMS
M	2-14-06	(D-4) GM48024 & GM48028 ADDED, TYPE 3, 4 & DETAIL B ADDED [77054]	RD
N	3-29-06	(D-4) GM48024 "D" 2.5 WAS 3.8 [77578]	SAM
P	3-15-07	(B-3) TYPE 4 RUBBER SLEEVE ADDED, VIEW UPDATED [80067]	DJG

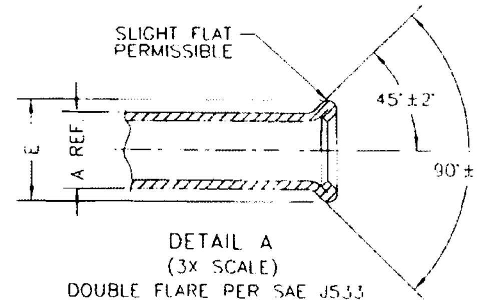
REVISION BLOCK INDICATES REVISION LEVEL OF DRAWING NOT PART REVISION. SEE PART REVISION LEVEL BEHIND PART NUMBER FOR CURRENT PART REVISION LEVEL.



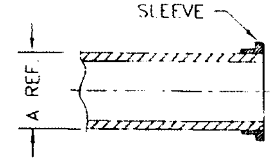
TYPE 1



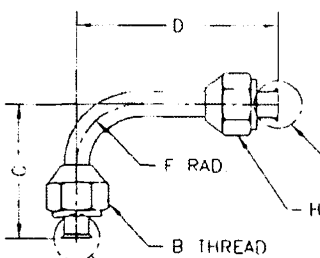
TYPE 2



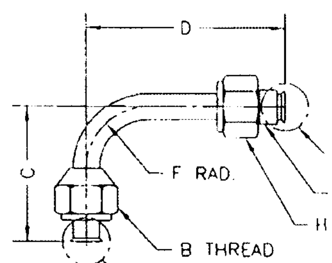
DETAIL A
(3X SCALE)
DOUBLE FLARE PER SAE J533



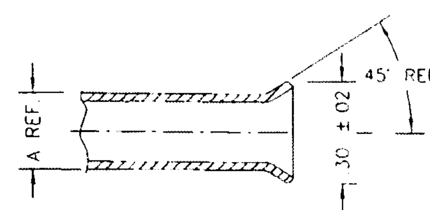
DETAIL B
(3X SCALE)
O-RING FACE SEAL PER SAE J1453



TYPE 3



TYPE 4



DETAIL C
(3X SCALE)
FLARE PER SAE J533

TUBING MATERIAL: .028 inch WALL ASTM A269 WELDED 304 S.S. TUBING

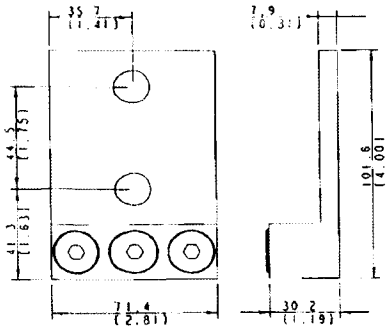
NOTE:
TUBING MUST BE ANNEALED, AND FREE FROM CRACKS, OBSTRUCTIONS AND SMOOTH INSIDE AND OUTSIDE.

APPROVALS		DATE
DRAWN	PWH	4-29-93
CHECKED	JS	5-13-93
APPROVED	CF	5-13-93

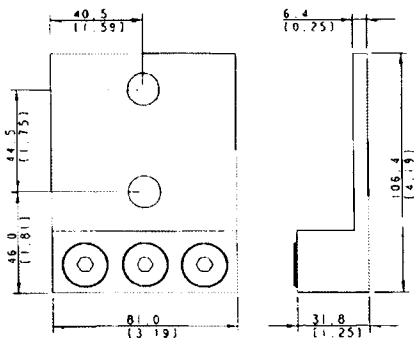
KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: LINE, FUEL

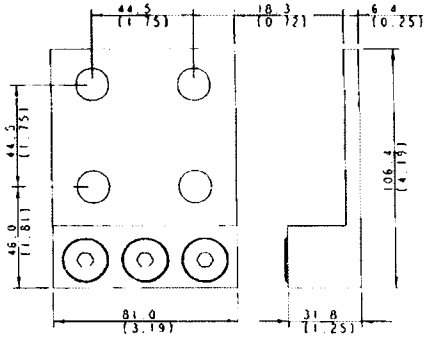
SCALE: FULL | CAD NO. 324101.DWG | SHEET 1-1
DWG NO. 324101 | C



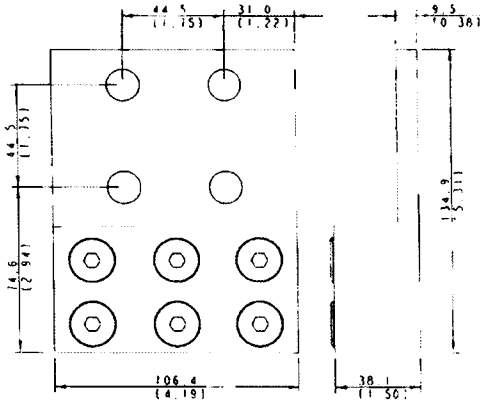
GM53097-KP1
LUG, #6 AWG-3/0 AWG X3
(USE WITH NEUTRAL WITH 2-HOLE MTG)



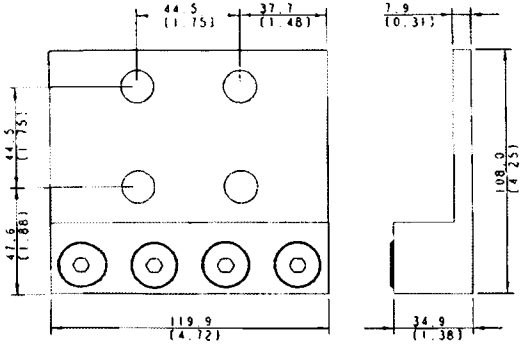
GM53097-KP2
LUG, #6 AWG-350 KCMIL X3
(USE WITH NEUTRAL WITH 2-HOLE MTG)



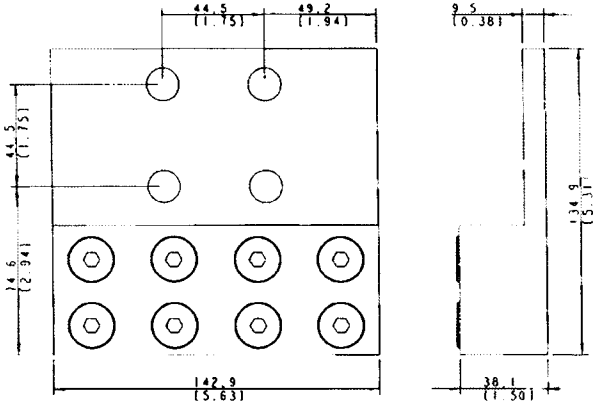
GM53097-KP3
LUG, #6 AWG-350 KCMIL X3
(USE WITH NEUTRAL WITH 4-HOLE MTG)



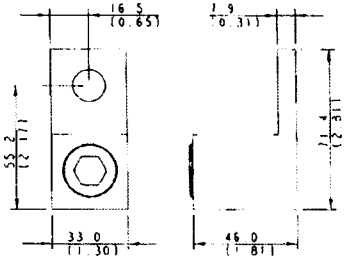
GM53097-KP4
LUG, #2 AWG-600 KCMIL X3
(USE WITH NEUTRAL WITH 4-HOLE MTG)



GM53097-KP5
LUG, #6 AWG-350 KCMIL X4
(USE WITH NEUTRAL WITH 4-HOLE MTG)



GM53097-KP8
LUG, #2 AWG-600 KCMIL X4
(USE ONLY WITH 4UA NEUTRAL WITH 4-HOLE MTG)



GM53097-KP7
LUG, 1/0 AWG-750 KCMIL X1

NOTES:

1) ALL LUGS ARE SIZED FOR 1/2" MOUNTING HARDWARE.

2) ALL KITS ARE SUPPLIED WITH 1/2" HARDWARE FOR MOUNTING TO BUS UP TO 3/8" THICK.

3) REFER TO CIRCUIT BREAKER ADV'S FOR NEUTRAL TYPE.

4) DIMENSIONS IN [ ] ARE INCHES.

REV	DATE	REVISION	BY
-	7-12-07	NEW DRAWING (73677)	WSD

KOHLER CO. METRIC | PRO E

DIMENSION PRINT
LUG KITS

ADV-7378

LOFTIN

LOFTIN EQUIPMENT CO.

KOHLER POWER SYSTEMS

DIESEL GENERATOR SET

PROJECT SUBMITTAL

Ft. Bend County Trailer 150kW

Electrical Contractor

McDonald Electric

Dale Grimes

LOFTIN EQUIPMENT CO.

6113 BRITTMOORE / HOUSTON, TX 77041
P: 281-310-6858 F: 602-352-4842

GENERATOR SET

Model: 150REOZJE
This generator set equipped with a 4S13 alternator operating at 120/208 volts is rated for 155 kW/194 kVA.
Output amperage: 538

Configuration

Qty	Description
1	150REOZJE Generator Set
1	Skid, Extension
1	Block Heater, 1800w, 120V, 1Ph
1	Enclosure, Sound Steel
1	Control & Harness,DEC3000, Upper Mnt
1	Controller, DEC3000, 800A
1	Standard Duty Air Intake
1	Alternator, 4S13
1	Voltage,60Hz,120/208V,3Ph,4W,0.8PF
1	Nameplate Rating, Standby 130 Degree
1	150REOZJE, 12V, 60Hz
1	Unit, Mtd. Radiator Cooling
1	Skid & Plant Mtg.
1	LCB, 225A, JDL, Therm Mag, 80%
1	MTG, LCB2, J-FR to D, 200-250A, 4S/4UA
1	Covers, 4S J-Box D-Frame With H/J LCB
1	Battery,1/12V,950CCA,Wet
1	Batt Chgr, Float, 90-120V, 12V-6A
1	LCB, 600A, DGP, EL, 80%
1	Mtg, LCB,D-Frame, 600A. 4S
1	Neutral, 600A 4S
1	Coolant in Genset 6 gals.
1	Lit Kit, Production, 150REOZJE
1	Warranty, 1 Year Standby
1	Three Position Voltage Selector Switch for 277/480V & 120/240V 3 phase & 120/208V 3 phase

KOHLER POWER SYSTEMS

Warranty

Stationary Standby and Prime Power One-Year or Two Thousand (2000)-Hour Limited Warranty

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original consumer, Kohler Co. warrants, for the period indicated below, each product to be free from defects in materials and workmanship. Repair, replacement, or appropriate adjustment at Kohler Co.'s option will be furnished if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized representative must perform startup. This warranty does not apply to malfunctions caused by damage, unreasonable use, misuse, repair or service by unauthorized persons, or normal wear and tear.

Kohler Product	Warranty Coverage*
Generator Set & Accessories	One (1) year or 2000 hours (whichever occurs first) from date of initial startup†
Prime Power Generator Set 20 kW or Larger	One (1) year or 2000 hours (whichever occurs first) from date of initial startup†

*Some restrictions may apply. Contact your Kohler distributor/dealer for full details.

†Startup must occur within 24 months of original shipment by Kohler Co.

The following will not be covered by the warranty:

1. Normal engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized service representative, or improper storage.
3. Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
4. Damage caused by negligent maintenance such as:
   a. Failure to provide the specified type and sufficient quantity of lubricating oil.
   b. Failure to keep the air intake and cooling fin areas clean.
   c. Failure to service the air cleaner.
   d. Failure to provide sufficient coolant and/or cooling air.
   e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
   f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Original installation charges and startup costs.
6. Starting batteries and the following related expenses:
   a. Labor charges related to battery service.
   b. Travel expense related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year.
8. Rental of equipment during performance of warranty repairs.
9. Parts purchased from sources other than Kohler Co. Replacement of a failed Kohler part with a non-Kohler part voids warranty on that part.
10. Radiators replaced rather than repaired.
11. Fuel injection pumps not repaired locally by an authorized servicing dealer.
12. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
13. Engine fluids such as fuel, oil, or coolant/antifreeze.
14. Shop supplies such as adhesives, cleaning solvents, and rags.
15. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
16. Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.

A Startup Notification form must be on file at Kohler Co. A Startup Notification form must be completed by Seller and received at Kohler Co. within 60 days after the date of initial startup. Standby systems not registered within 60 days of startup will automatically be registered by Kohler Co. using the Kohler Co. ship date as the startup date.

To obtain warranty service, call 1-800-544-2444 for your nearest authorized Kohler service representative or write Kohler Co., Generator Service Department, Kohler, WI 53044 USA.

KOHLER CO. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND including, but not limited to, incidental consequential labor costs, installation charges, telephone charges, or transportation charges in connection with the replacement or repair of defective parts.

This is our exclusive written warranty. We make no other express warranty nor is anyone authorized to make any on our behalf.

ANY IMPLIED OR STATUTORY WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF PURPOSE, is expressly limited to the duration of this warranty. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

KOHLER.
POWER SYSTEMS

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444
KohlerPowerSystems.com

TP-5374 12/99c

KOHLER POWER SYSTEMS

Prototype Test Certifications

Kohler Standby/Prime Generator Set Test Program

Testing is an integral part of quality assurance. In keeping with our uncompromising commitment to quality, safety, and reliability, every Kohler Standby/Prime power generator set undergoes an extensive series of prototype and production testing.

Prototype Testing

Prototype testing includes the potentially destructive tests necessary to verify design, proper function of protective devices and safety features, and reliability expectations. Kohler's prototype testing includes the following:

- Alternator temperature rise test per NEMA MG1-32.6. Standby and prime ratings of the alternator are established during this test.
- Maximum power test to assure that the prime mover and alternator have sufficient capacity to operate within specifications.
- Alternator overload test per NEMA MG1-32.8.
- Steady-state load test to ensure voltage regulation meets or exceeds ANSI C84.1, NEMA MG1-32.17 requirements and to verify compliance with steady-state speed control specifications.
- Transient test to verify speed controls meets or exceeds specifications.
- Transient load tests per NEMA MG1-32.18, and ISO 8528 to verify specifications of transient voltage regulation, voltage dip, voltage overshoot, recovery voltage, and recovery time.
- Motor starting tests per NEMA MG1-32.18.5 to evaluate capabilities of generator, exciter, and regulator system.
- Three-phase symmetrical short-circuit test per NEMA MG1-32.13 to demonstrate short circuit performance, mechanical integrity, ability to sustain short-circuit current.
- Harmonic analysis, voltage waveform deviation per NEMA MG1-32.10 to confirm that the generator set is producing clean voltage within acceptable limits.
- Generator set cooling and air flow tests to verify maximum operating ambient temperature.
- Reliability tests to demonstrate product durability, followed by root cause analysis of discovered failures and defects. Corrective action is taken to improve the design, workmansnip, or components.
- Acoustical noise intensity and sound attenuation effects tests.

Production Testing

In production, Kohler Standby/Prime generator sets are built to the stringent standards established by the prototype program. Every Kohler Generator set is fully tested prior to leaving the factory. Production testing includes the following:

- Stator and exciter winding high-potential test on all generators. Surge transient tests on stators for generators 180 kW or larger. Continuity and balance tests on all rotors.
- One-step, full-load pickup tests to verify that the performance of each generator set, regulator, and governor meets published specifications.
- Regulation and stability of voltage and frequency are tested and verified at no load, 1/4 load, 1/2 load, 3/4 load, and full-rated load.
- Voltage, amperage, frequency and power output ratings verified by full-load test.
- The proper operation of controller logic circuitry, prealarm warnings, and shutdown functions is tested and verified.
- Any defect or variation from specification discovered during testing is corrected and retested prior to approval for shipment to the customer.

Torsional analysis data, to verify torsional effects are not detrimental and that the generator set will provide dependable service as specified, is available upon request.

Kohler offers other testing at the customer's request at an additional charge. These optional tests include power factor testing, customized load testing for specific application, witness testing, and a broad range of MIL-STD-705c testing. A certified test report is also available at an additional charge.

KOHLER.
POWER SYSTEMS

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444
KohlerPowerSystemscom

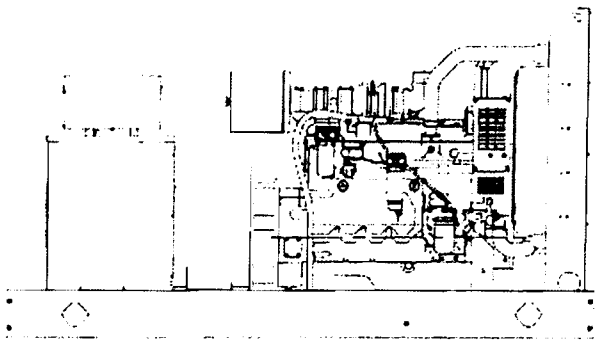
G18-56 12/05a

150REOZJE

Diesel

KOHLER POWER SYSTEMS

ISO 9001 KOHLER



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The generator set complies with ISO 8528-5, Class G2, requirements for transient performance in all generator set configurations. Select the Decision-Maker™ 550 controller for improved voltage regulation and ISO 8528-5, Class G3, compliance.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 3 nonroad emissions regulations.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator Features:
  - o The unique Fast-Response™ II excitation system delivers excellent voltage response and short circuit capability using a permanent magnet (PM)-excited alternator.
  - o The brushless, rotating-field alternator has broad range reconnectability.
- Other Features:
  - o Controllers are available for all applications. See controller features inside.
  - o The low coolant level shutdown prevents overheating (standard on radiator models only).
  - o Integral vibration isolation eliminates the need for under-unit vibration spring isolators.

Generator Set Ratings

				Standby130C Ratings	
Alternator	Voltage	Ph	Hz	kW/kVA	Amps
4S13	120/208	3	60	155/194	538

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Ratings: 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. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. GENERAL GUIDELINES FOR DERATION: Altitude: Derate 0.5% per 100 m (328 ft.) elevation above 1600 m (5250 ft.). Temperature: Derate 1.0% per 10°C (18°F) temperature above 25°C (77°F).

Model: 150REOZJE, continued

`Iternator Specifications

Specifications	Alternator
Alternator manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless,Permanent-Magnet
Leads, quantity	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: Temperature Rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load Decision-Maker 3000 controller	3-Phase Sensing, ±0.5%
550 controller (with 0.5% drift due to temperature variation)	3-Phase Sensing, ±0.25%
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of Rated Standby Current

- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling down stream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Fast-Response™ II brushless alternator with brushless exciter for excellent load response.

Model: 150REOZJE, continued

Engine

Engine Specifications	
Engine Manufacturer	John Deere
Engine Model	6068HF285
Engine: type	4-Cycle, Turbocharged
Cylinder arrangement	6 Inline
Displacement, L (cu. in.)	6.79(414)
Bore and stroke, mm (in.)	106 x 127 (4.19 x 5.00)
Compression ratio	17.0:1
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	7, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	177 (237)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve (exhaust) material Intake	Chromium-Silicon Steel
Valve (exhaust) material Exhaust	Stainless Steel
Governor: type, make/model	JDEC Electronic L16 Denso HP3
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System	
Exhaust Manifold Type	Dry
Exhaust flow at rated kW, m^3/min. (cfm)	33.9 (1197)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	510 (950)
Maximum allowable back pressure, kPa (in. Hg)	7.5 (2.2)
Exh. outlet size at eng. hookup, mm (in.)	98 (3.86)

Engine Electrical

Engine Electrical System	
Battery charging alternator	12 Volt/24 Volt
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	12/24
Ampere rating	65/45
Starter motor rated voltage (DC)	12/24
Battery, recommended cold cranking amps (CCA):	
Qty., CCA rating each	12 Volt/24 Volt One, 640/Two, 570
Battery voltage (DC)	12

Model: 150REOZJE, continued

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	11.0 (0.44)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Electronic, 1.8 (6.0)
Max. fuel flow, Lph (gph)	96.9 (25.6)
Fuel prime pump	Manual
Fuel Filter Secondary	2 Microns@ 98% Efficiency
Fuel Filter Primary	30 Microns
Fuel Filter Water Separator	Yes
Recommended fuel	#2 Diesel

Lubrication

Lubrication System	
Type	Full Pressure
Oil pan capacity, L (qt.)	27.0 (28.5)
Oil pan capacity with filter, L (qt.)	27.9 (29.5)
Oil filter: quantity, type	1, Cartridge
Oil cooler	Water-Cooled

Cooling

Radiator System	
Ambient temperature, °C (°F)	50 (122)
Engine jacket water capacity, L (gal.)	11.3 (3.0)
Radiator system capacity, including engine, L (gal.)	25.7 (6.8)
Engine jacket water flow, Lpm (gpm)	174 (46)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	76.3 (4340)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	31.8 (1810)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	660 (26)
Fan, kWm (HP)	7.7 (10.3)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H20)	0.125 (0.5)

Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m^3/min. (scfm) *	226.5 (8000)
Combustion air, m^3/min. (cfm)	13.6 (480)
Heat rejected to ambient air: Engine, kW (Btu/min.)	35.9 (2040)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	12.3 (700)

*Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

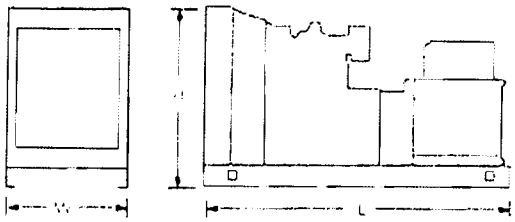
Model: 150REOZJE, continued

Fuel Consumption

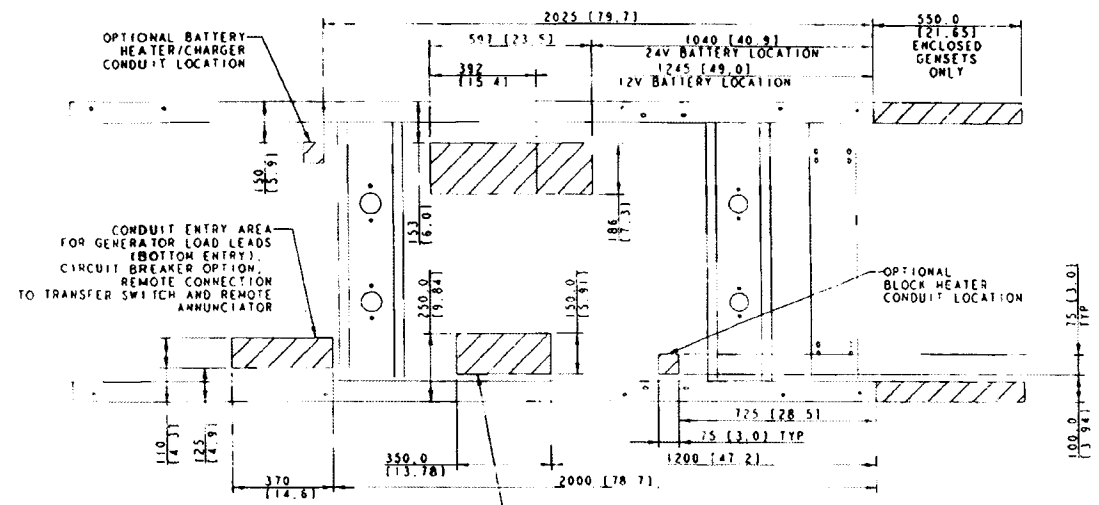
Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	44.3 Lph (11.7 gph)
Standby Fuel Consumption at 75% load	35.1 Lph (9.3 gph)
Standby Fuel Consumption at 50% load	26.3 Lph (6.9 gph)
Standby Fuel Consumption at 25% load	16.2 Lph (4.3 gph)
Prime Fuel Consumption at 100% load	40.6 Lph (10.7 gph)
Prime Fuel Consumption at 75% load	32.3 Lph (8.5 gph)
Prime Fuel Consumption at 50% load	24.0 Lph (6.3 gph)
Prime Fuel Consumption at 25% load	14.4 Lph (3.8 gph)

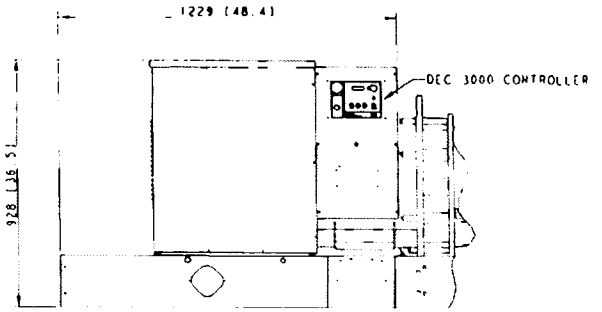
Dimensions and Weights

Overall Size, L x W x H, mm (in.):	2950 x 1120 x 1527 (116.1 x 44.1 x 60.1)
Weight (radiator model), wet, kg (lb.):	1429-1497 (3150-3300)

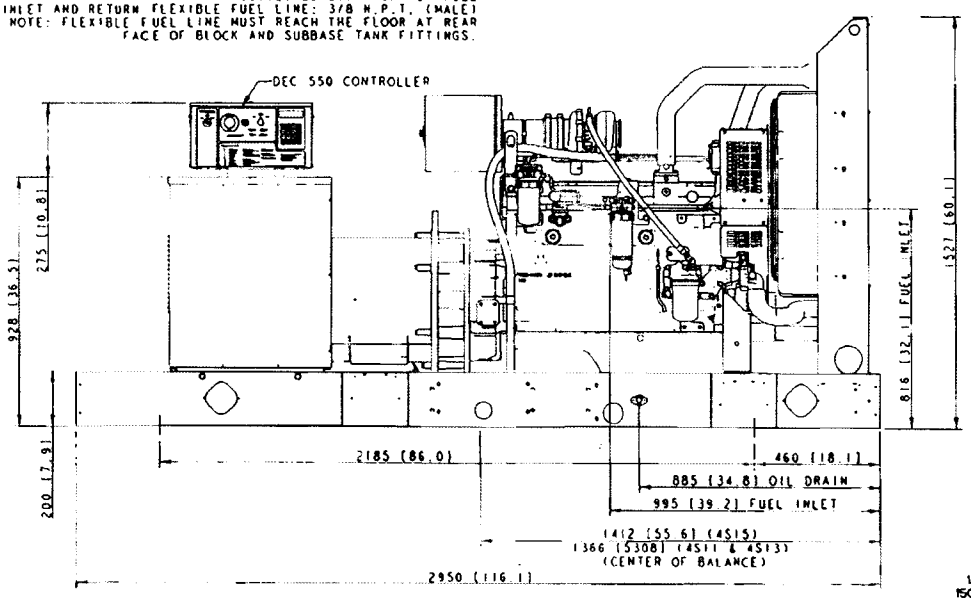


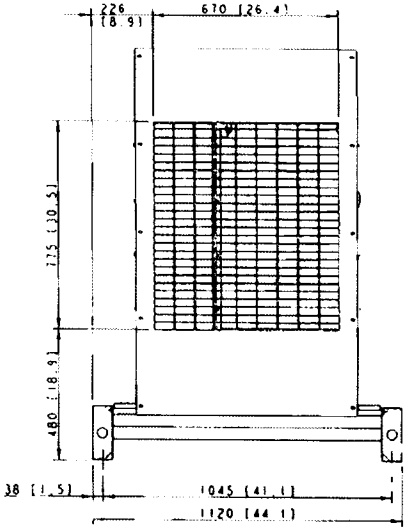
NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.





DEC3000 CONTROLLER VIEW





INSTALLATION NOTE

IF SUBASE FUEL TANK AND/OR SOUND HOUSING IS USED, REFER TO SUBBASE FUEL TANK DRAWING TO DETERMINE MOUNTING LOCATIONS

MODEL	GENSET WEIGHT (WET)
125/150 4S11 4S13	1430 KG [3150 LBS]
150 4S15	1500 KG [3300 LBS]

NOTES
DIMENSIONS IN [ ] ARE INCH EQUIVALENTS

IF AN ENCLOUSURE IS USED THE FUEL LINE MUST BE STUBBED UP FROM DIRECTLY UNDER THE UNIT OR BROUGHT IN FROM THE END OF THE SKID. REFER TO ENCLOSURE ADV.

IF IBC CERTIFICATION IS REQUIRED SEE SEISMIC ADV FOR INSTALLATION INSTRUCTIONS

125 MODEL 4S11, 4S13
150 MODEL 4S13, 4S15
RECONNECTABLE,
IMPROVED MOTOR STARTING (IMS), RECONNECTABLE
& 600V ALTERNATOR
JOHN DEERE

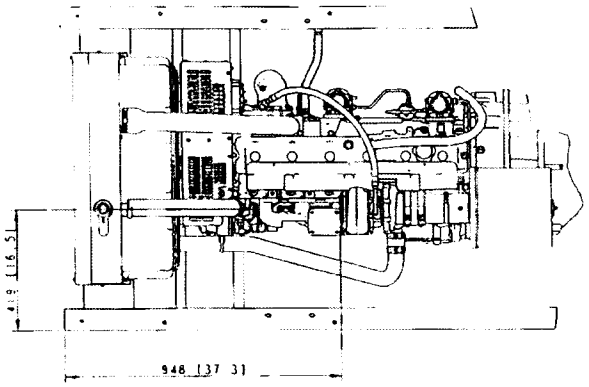
REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
	11-6-09	NEW DRAWING [87805-9]	MRS
B	3-30-10	(C-63) FUEL RETURN LOCATION COMBINED WITH FUEL INLET LOCATION. FLEXIBLE FUEL LINE LOCATION INCREASED IN SIZE AND RELOCATED. (D-43) 550.0 ENCLOSED GEN ADDED. (A-41) DESCRIPTION UPDATED. [886951	GFR

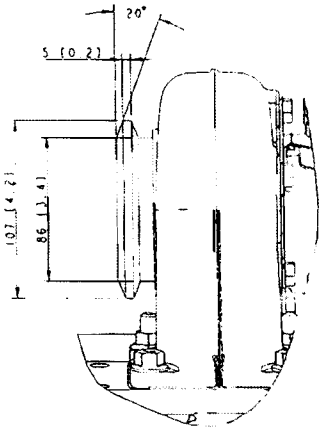
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

DIMENSION PRINT, 125-150 MODEL

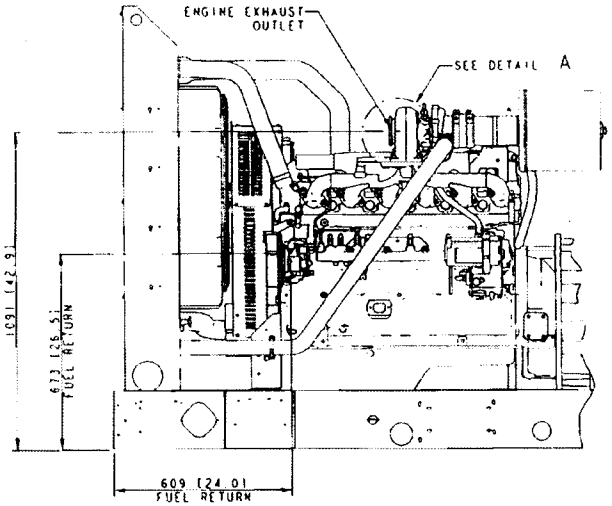
ADV-7734

D





DETAIL A
SCALE 0.750



125 MODEL 4SIR, 4SI3
150 MODEL 4SI3, 4SI5,
RECONNECTABLE,
IMPROVED MOTOR STARTING (IMSI), RECONNECTABLE
& 600V ALTERNATOR
JOHN DEERE

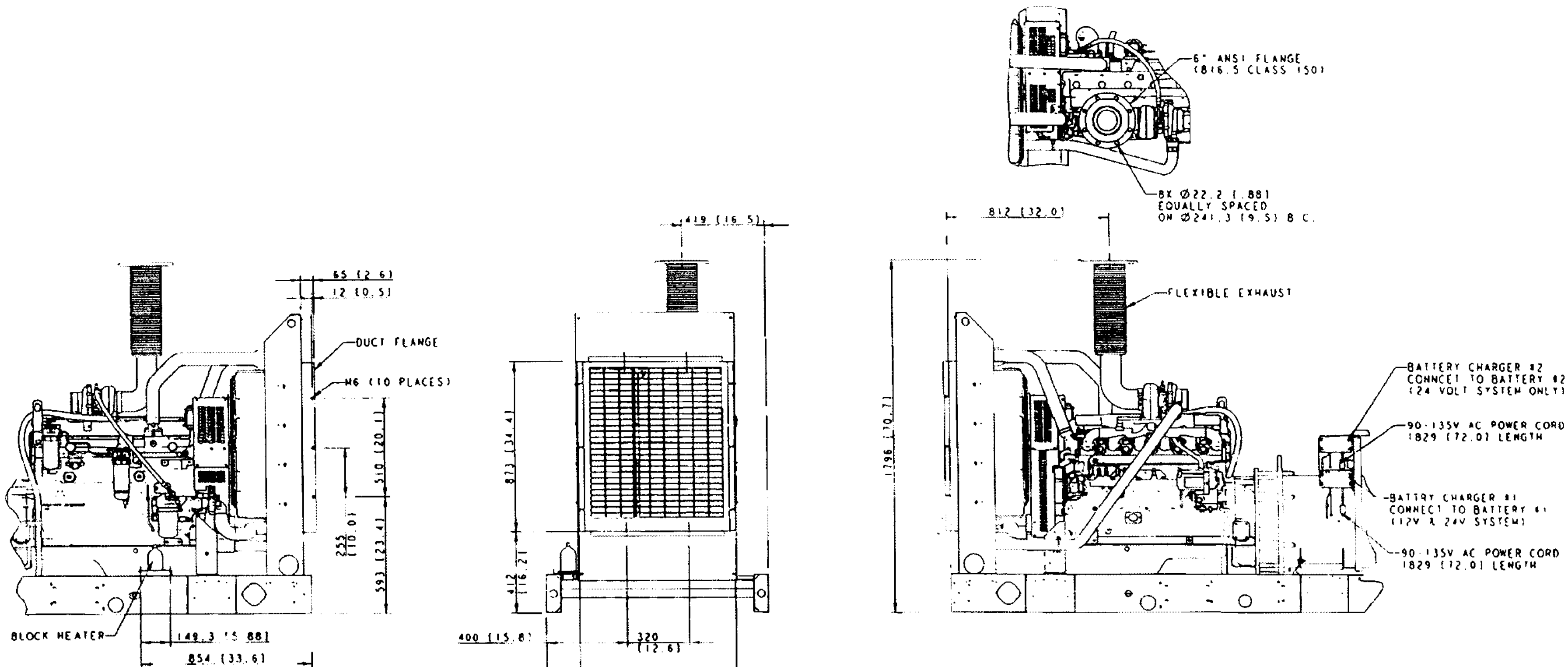
REV	DATE	ON COMPOSITE MADE, SEE PART NO. FOR REVISION LEVEL
	11-6-99	NEW DRAWING (87805 9)
B	3-30-10	SEE SHEET 1 OF 2 (889899)

KOHLER CO. METRIC PRO E

DIMENSION PRINT, 125-150 MODEL

ADV-7734

D



DIMENSIONS IN [ ] ARE INCH EQUIVALENTS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	11-6-09	NEW DRAWING (87885-9)	MRS
A	3-30-10	(C,D-2,3) FLEXIBLE EXHAUST; 6" ANSI FLANGE WAS 6" NPT, AND TOP VIEW ADDED. (C-4) 1796 WAS 1853 (89099)	GFR

APPROVALS		DATE
	MRS	11-6-09
	MRS	11-6-09
	JZ	11-6-09

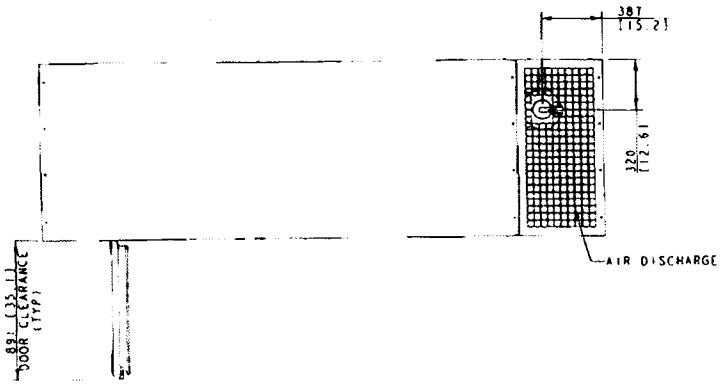
KOHLER CO. METRIC | PRO-E

POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

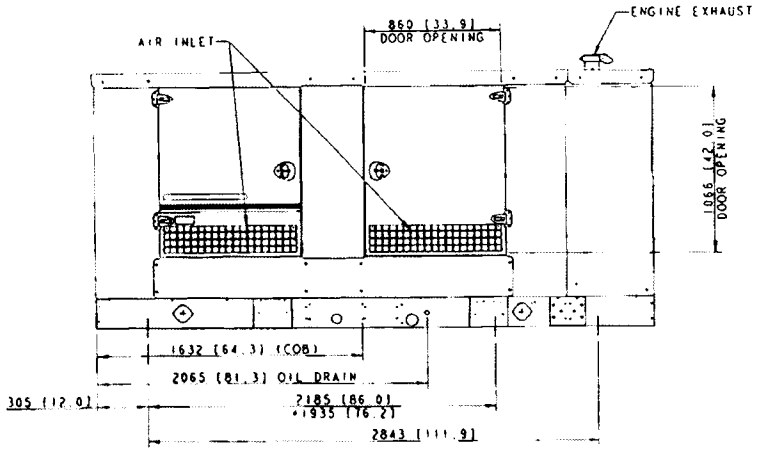
DIMENSION PRINT, ACCESSORIES

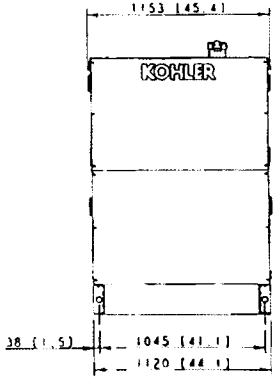
125-150 JOHN DEERE

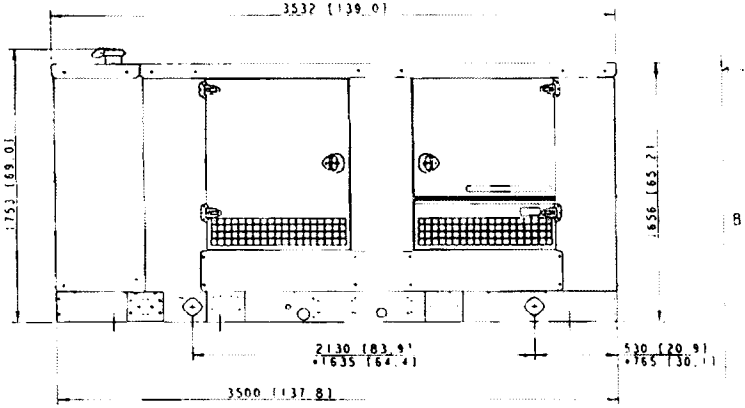
ADV-7841 D



MODEL	ENCLOSURE WEIGHT KG [LBS]
STEEL WEATHER	340 [750]
STEEL SOUND	363 [800]
ALUMINUM SOUND	227 [500]







DIMENSIONS IN [ ] ARE INCH EQUIVALENTS

(*) DESIGNATES 125KW 404SHF ENGINE

REV	DATE	DO COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY
	11-5-09	NEW DRAWING (87805-9)	MRS

APPROVALS	DATE
MRS	11-5-09
MRS	11-5-09
ALC	11-5-09

KOHLER CO. METRIC | PRO-E

POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

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DIMENSION PRINT

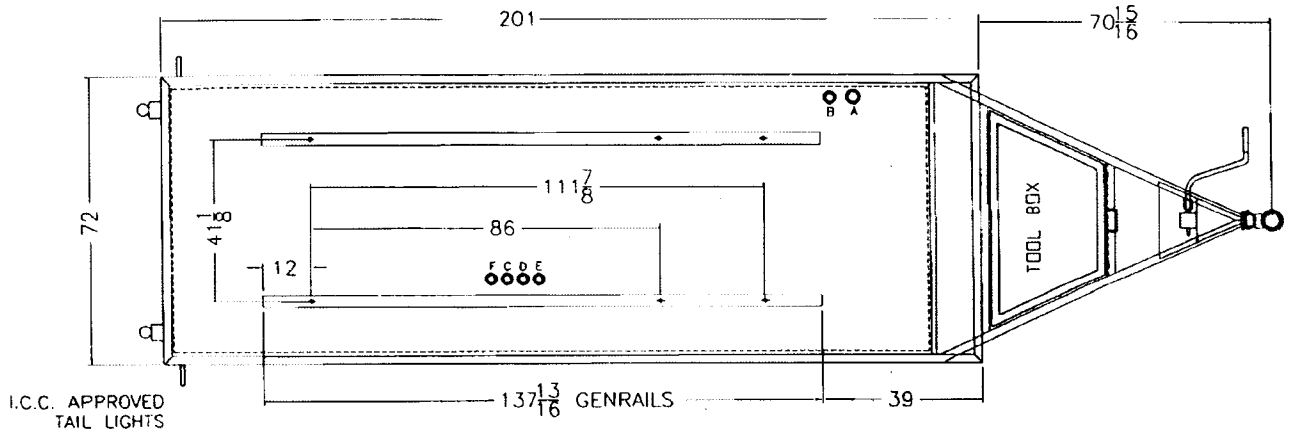
125-150 JOHN DEERE

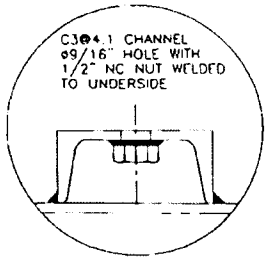
ADV-7825

D

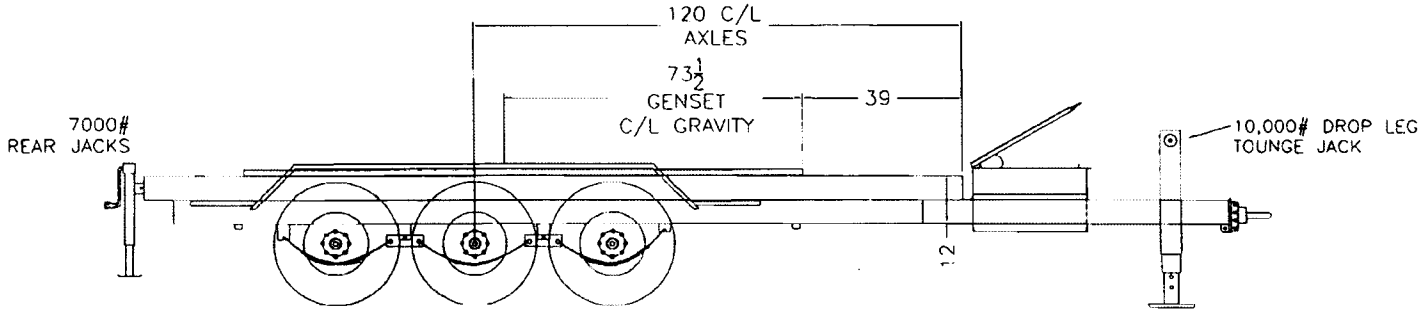
3/16x2x6 RECT TUBE FRAME
3/16x2x6 RECT TONGUE
GENRAILS ARE CH 3x4.1
7GA. STEEL FLOOR
10GA. FENDERS WITH STEP
6 PIN ROUND LIGHT CONNECTOR
TWO COATS RUST RESISTANT PRIMER
TWO COATS BLACK ENAMEL PAINT

TRAILER WT. DRY 3400#





GENRAIL DETAIL



TANK I.D. 11"

ELECTRIC BRAKES ON TRIPLE #6,000 AXLES WITH BREAKAWAY BATTERY POWERED SWITCH

TRAILER WIDTH WITH FENDERS 97"
94 1/2" TO OUTSIDE FACE OF TIRES

FITTING LEGEND
A = 2" VELVAC CAP ON FILL NECK
B = 1 1/2" MECHANICAL GAUGE
C = 1 1/2" MUSHROOM STYLE TANK VENT (ON STAND PIPE)
D = 1 1/2" SUPPLY WITH 1/2" x 10 1/2" TUBE
E = 1 1/2" RETURN WITH 1/2" x 10 1/2" TUBE
F = 1 1/2" LOW FUEL ALARM WITH 1/2" x 7" TUBE

• NOTICE •
THIS DRAWING MUST BE SIGNED AND DATED BEFORE FABRICATION CAN BEGIN.

THIS DRAWING HAS BEEN REVIEWED AND
☐ APPROVED AS IS
☐ APPROVED WITH NOTED CHANGES

SIGNED BY _____ DATE

WEDLAKE FABRICATING INC.
6041 N. YORKTOWN TULSA, OK. 74130-1575
PHONE: (918) 428 - 1641
FAX: (918) 428 - 1620

CHECKED BY:
DATE:
APPROVED BY:
DATE:

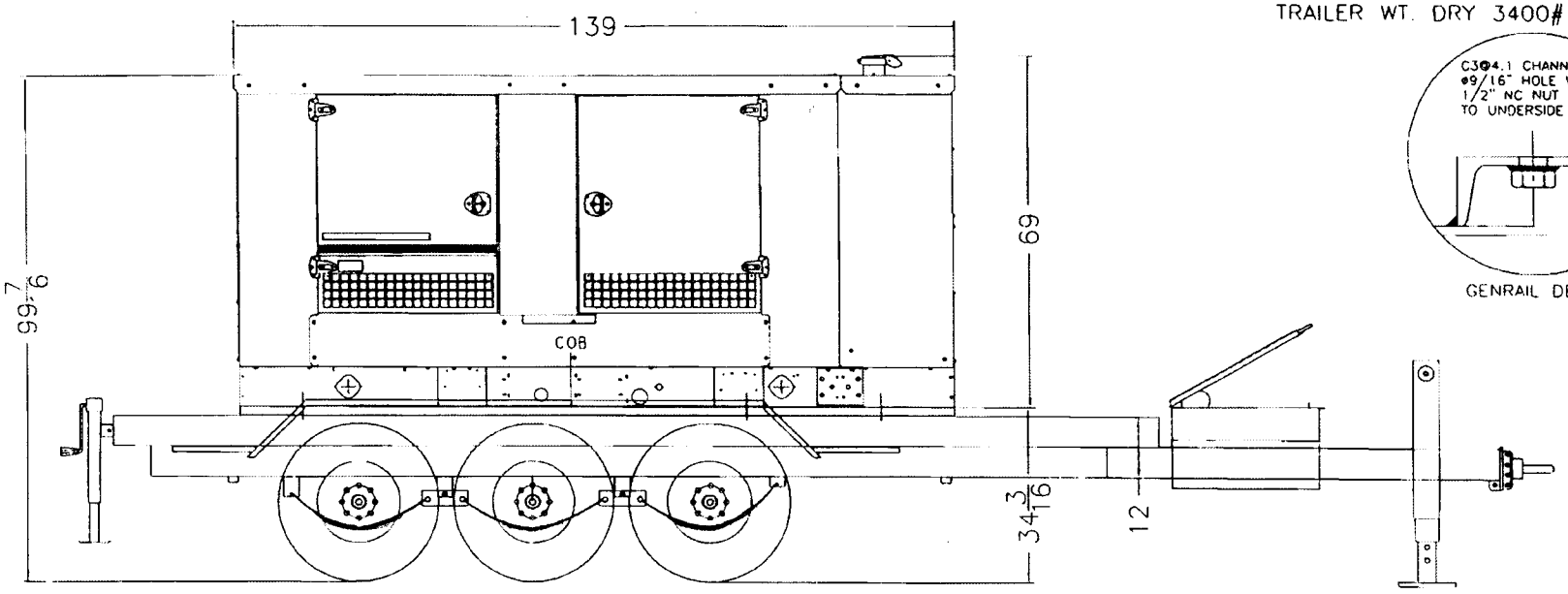
CUSTOMER: LOFTIN

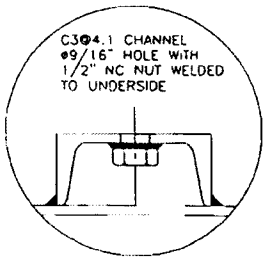
DESCRIPTION: 18,000# TRIPLE AXLE TRAILER WITH 575 GALLON INTEGRAL SW FUEL TANK

APPLICATION: 150 REOZJD (ADV-7825) SOUND HOUSE

DRAWN BY:	DATE:	DRAWING NO.	PAGE NO.
RB	6/29/10	050610LDG-1-1	1 OF 2

3/16x2x6 RECT TUBE FRAME
3/16x2x6 RECT TONGUE
GENRAILS ARE CH 3x4.1
7GA. STEEL FLOOR
10GA. FENDERS WITH STEP
6 PIN ROUND LIGHT CONNECTOR
TWO COATS RUST RESISTANT PRIMER
TWO COATS BLACK ENAMEL PAINT
TRAILER WT. DRY 3400#





GENRAIL DETAIL

TANK I.D. 11"

ELECTRIC BRAKES ON TRIPLE #6,000 AXLES
WITH BREAKAWAY BATTERY POWERED SWITCH

TRAILER WIDTH WITH FENDERS 97"
94 1/2" TO OUTSIDE FACE OF TIRES

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WITH 1/2" x 7" TUBE

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PHONE: (918) 428 - 1641
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CHECKED BY:
DATE:
APPROVED BY:
DATE:

CUSTOMER: LOFTIN

DESCRIPTION:
18,000# TRIPLE AXLE TRAILER WITH
575 GALLON INTEGRAL SW FUEL TANK

APPLICATION:
150 REOZJD (ADV-7825) SOUND HOUSE

DRAWN BY:	DATE:	DRAWING NO.	PAGE NO.
RB	6/29/10	050610LDG--1--2	2 OF 2

KOHLER POWER SYSTEMS

Alternator Data

KOHLER. POWER SYSTEMS

TIB-102

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 4S13
Frequency: 60 Hz
Speed: 1800 RPM
Leads: 12 (6 Lead, 600 Volt)

Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)						
				Class B	Class F				Class H	
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby
139/240 277/480	3	0.8	Wye	142.0 (177.5)	149.0 (186.3)	152.0 (190.0)	159.0 (198.8)	175 0 (218.8)	172.0 (215.0)	180.0 (225.0)
127/220 254/440	3	0.8	Wye	136.5 (170.6)	144.0 (180.0)	147.5 (184.4)	154.0 (192.5)	169.0 (211 3)	166.0 (207.5)	172.5 (215.6)
120/208 240/416	3	0.8	Wye	131.0 (163.8)	139.0 (173.8)	143.0 (178.8)	149.0 (186.3)	163.0 (203.8)	160.0 (200.0)	165.0 (206.3)
110/190 220/380	3	0.8	Wye	126.0 (157.5)	132.0 (165.0)	136.0 (170.0)	140.0 (175.0)	148.0 (185.0)	147.0 (183.8)	150.0 (187.5)
120/240	3	0.8	Delta	128.0 (160.0)	136.0 (170.0)	140.0 (175 0)	146.0 (182.5)	160.0 (200.0)	157.0 (196.3)	160.0 (200.0)
120/240	1	1.0	Dogleg	78.0 (78.0)	83.0 (83.0)	86.0 (86.0)	91.0 (91.0)	101.0 (101.0)	100.0 (100.0)	101.0 (101.0)
120/240	1	0.8	Dogleg	58.0 (72.5)	62.0 (77.5)	64.0 (80.0)	68.0 (85.0)	76.0 (95.0)	75.0 (93.8)	76.0 (95.0)
347/600	3	0.8	Wye	142.0 (177.5)	149.0 (186.3)	152.0 (190.0)	159.0 (198.8)	175.0 (218.8)	172.0 (215.0)	180.0 (225.0)

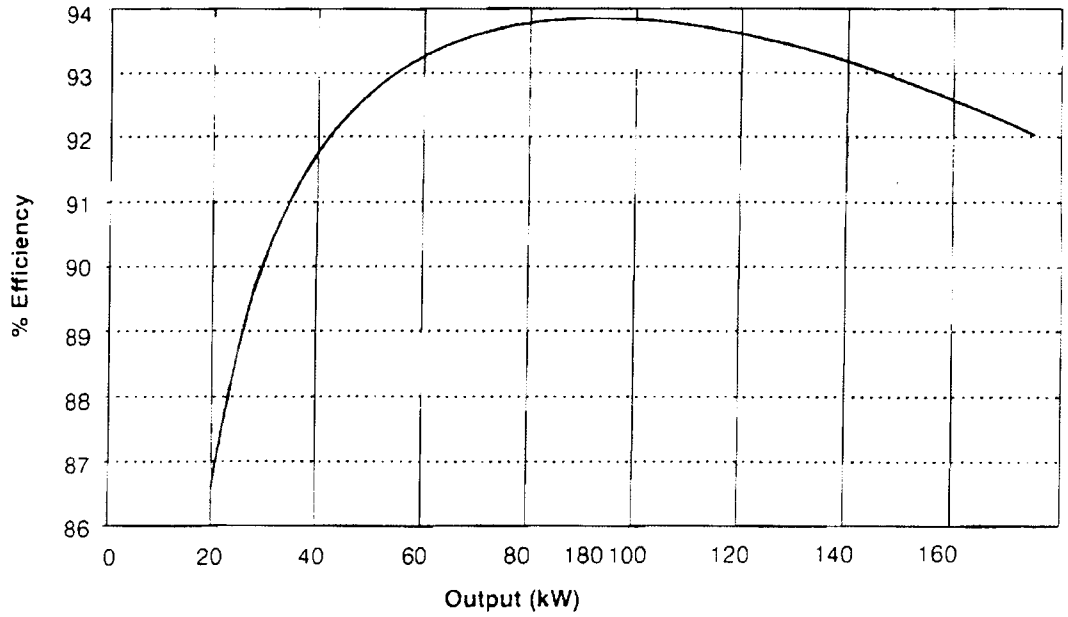
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Submittal Data: 139/240 Volts, 0.8 PF, 1800 RPM, 60 Hz, 3-Phase, 130°C Rise

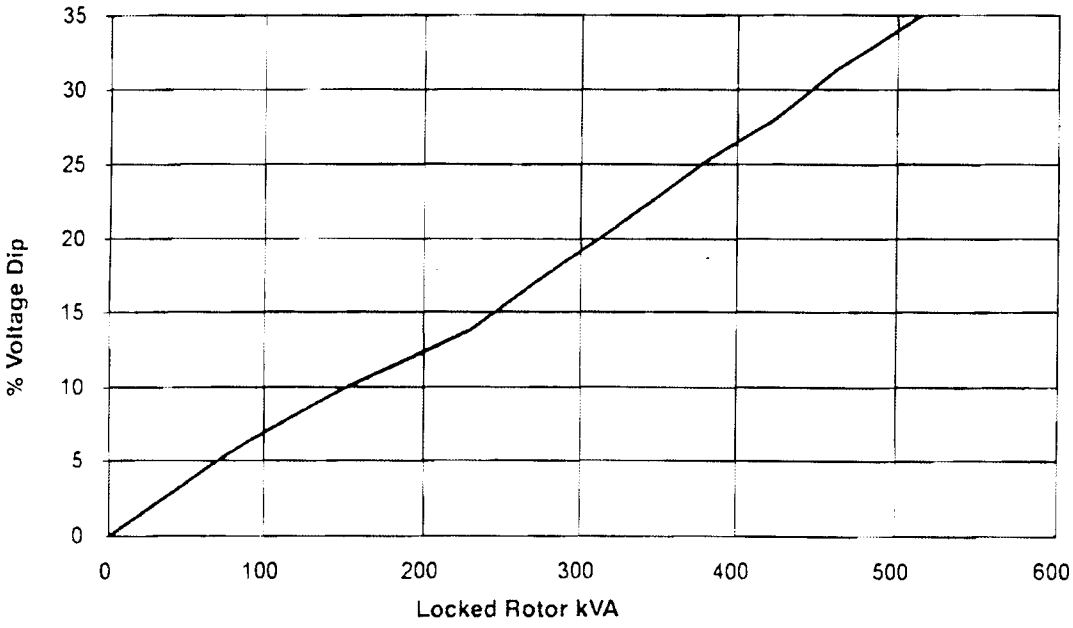
	Symbol	Per Unit	Ohms
Typical Resistances			
Phase Resistance		0.030	0.008
Rotor Resistance		7.671	2.020
Typical Reactances			
Synchronous			
Direct	X_d	3.936	1.036
Quadrature	X_q	1.940	0.511
Transient			
Unsaturated	X'_{du}	0.384	0.101
Saturated	X'_d	0.338	0.089
Subtransient			
Direct	X''_d	0.110	0.029
Quadrature	X''_q	0.111	0.029
Negative Sequence	X_2	0.010	0.029
Zero Sequence	X_0	0.010	0.003

	Symbol	Value
Typical Time Constants		
Armature Short Circuit	T_a	0.010 sec.
Transient Short Circuit	T'_d	0.140 sec.
Transient Open Circuit	T'_{do}	1.640 sec.
Typical Field Current		
Full Load	If_{FL}	30.5 amps
No Load	If_{NL}	7.51 amps
Typical Short Circuit Ratio		0.334
Harmonic Distortion		
RMS Total Harmonic Distortion		2.5%
Max. Single Harmonic		5^{th}
Deviation Factor (No Load, L-L)		3.7%
Telephone Influence Factor		<50
Insulation Material Class per NEMA MG1-1.66		H
Phase Rotation		ABC

4S13, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL ALTERNATOR EFFICIENCY*

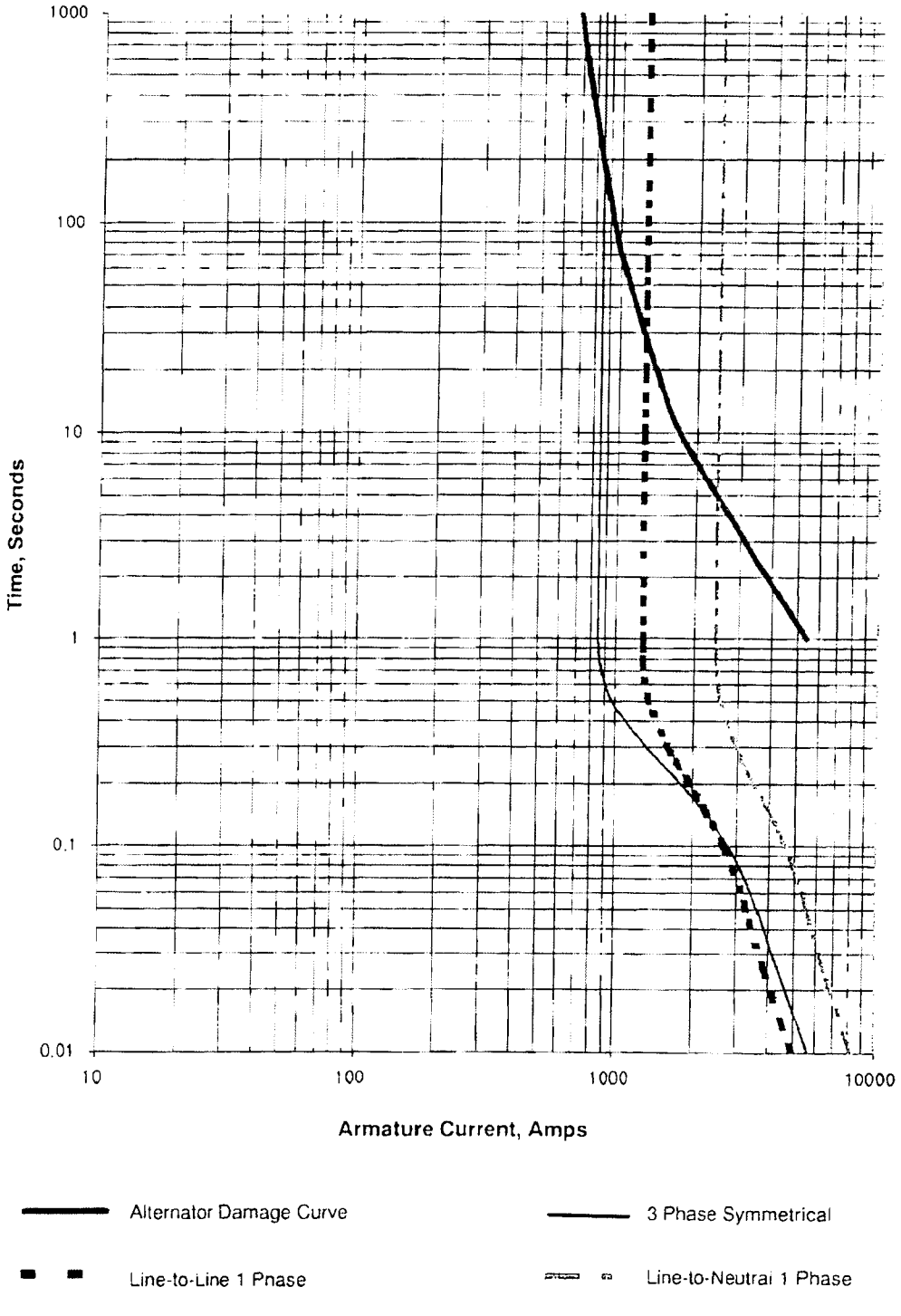


4S13, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL MOTOR STARTING CHARACTERISTICS*

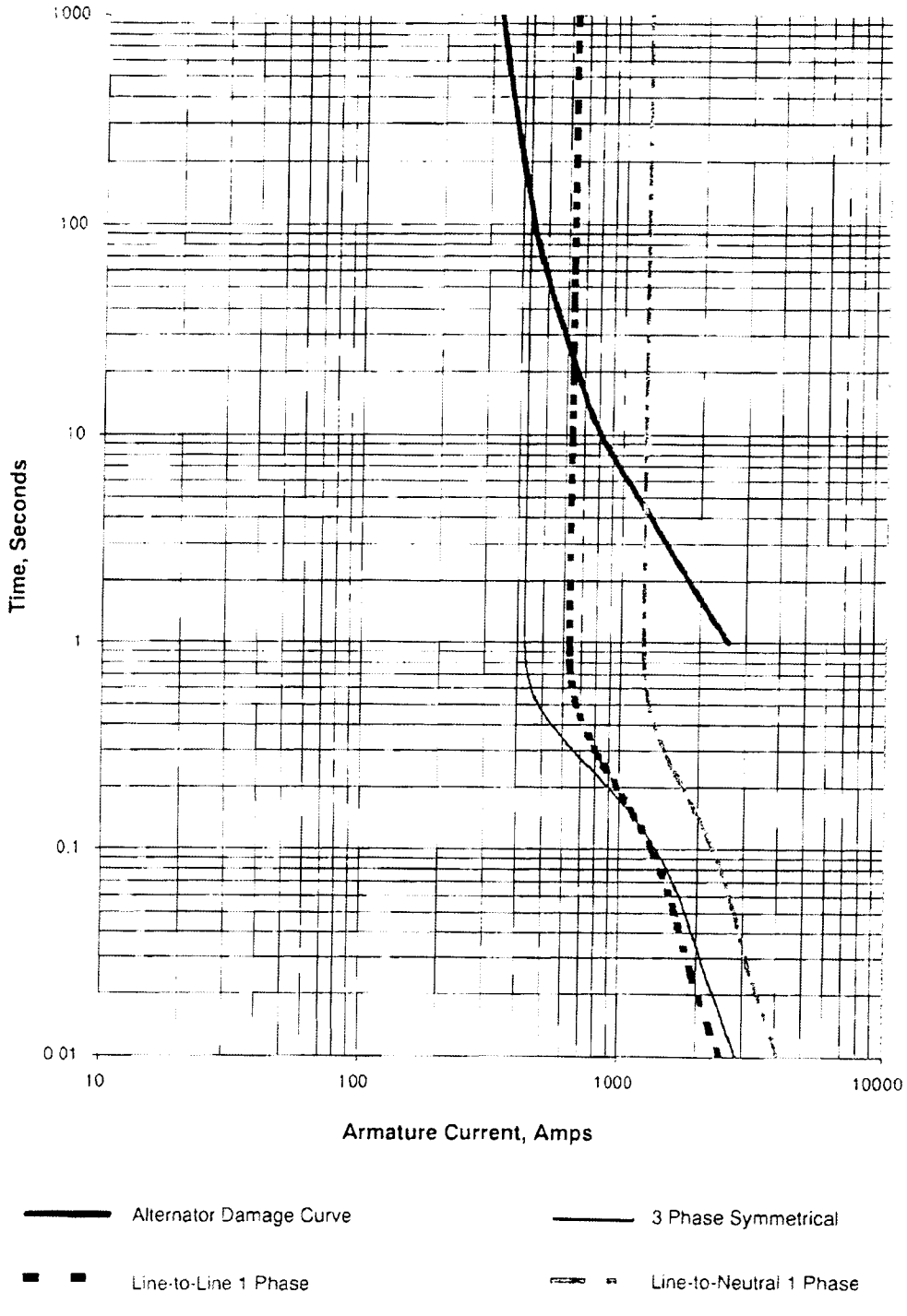


* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

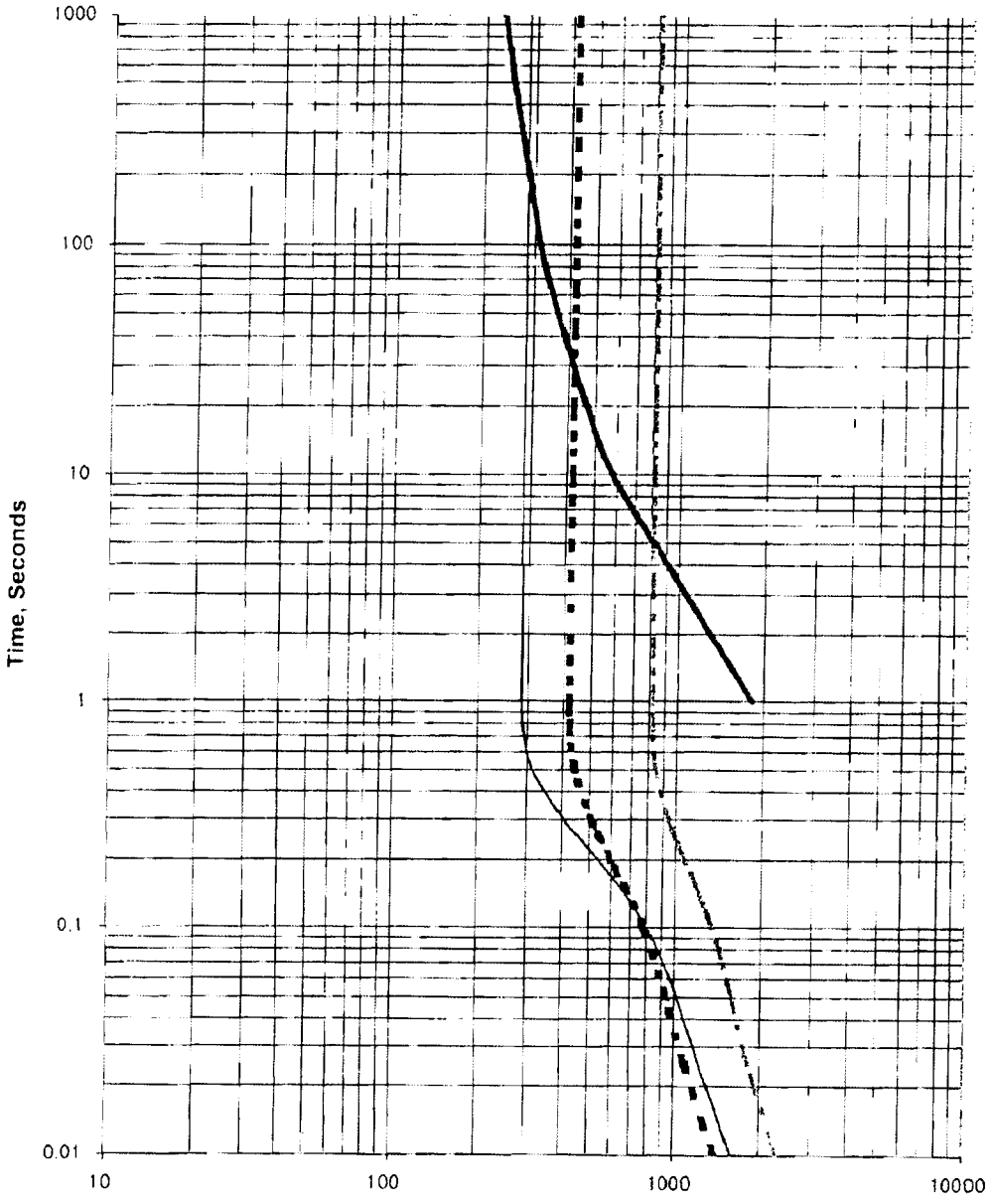
4S13, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE



4S13, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE



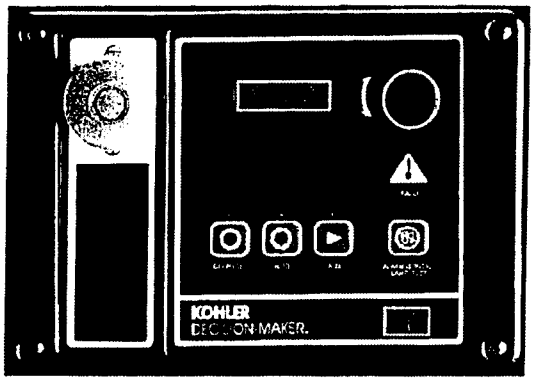
4S13, 60 Hz, 600 V Connection
SHORT CIRCUIT DECREMENT CURVE



KOHLER.POWER SYSTEMS

Generator Set Controller

ISO 9001 KOHLER



Decision-Maker® 3000

Kohler® Decision-Maker® 3000 Controller

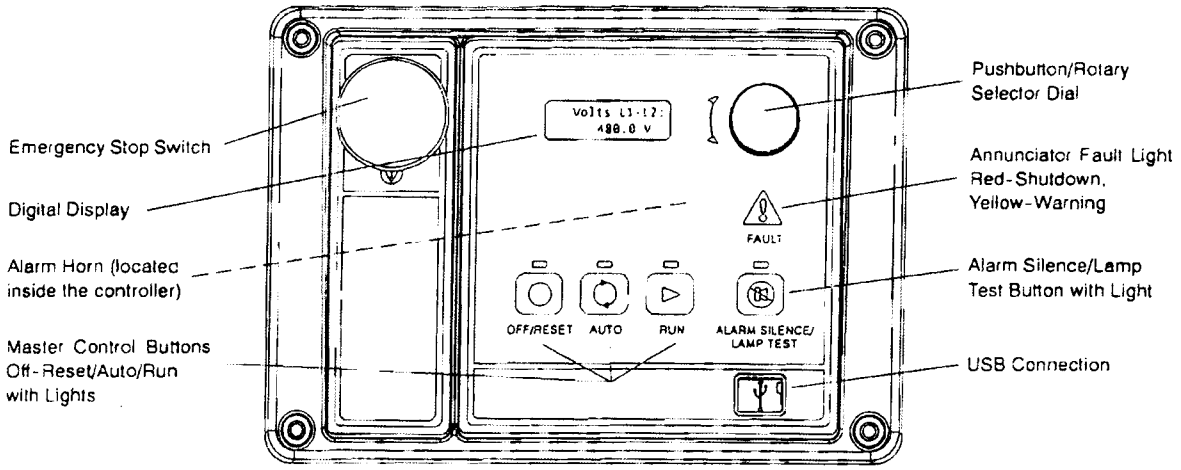
General Description and Function

The Decision-Maker® 3000 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

The Decision-Maker® 3000 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

The Decision-Maker® 3000 controller uses patented software logic to manage sophisticated functions, such as voltage regulation and alternator thermal overload protection, normally requiring additional hardware. Additional features include:

- A digital display and pushbutton/rotary selector dial provide easy local access to data.
- Measurements selectable in metric or English units.
- Scrolling display shows critical data at a glance.
- Digital display of power metering (kW and kVA).
- Integrated hybrid voltage regulator providing ±0.5% regulation.
- Built-in alternator thermal overload protection.



User Interface Controls and Components

- Emergency stop switch
- Backlit LCD digital display with two lines of 12 characters *(see User Interface Displays for menus)*
- Alarm horn indicates generator set shutdown and warning faults
- Environmentally sealed membrane keypad with three master control buttons with lights
  - o Off/Reset (red)
  - o Auto (green)
  - o Run (yellow)
- Pushbutton/rotary selector dial for menu navigation
  - o Rotate dial to access main menus
  - o Push dial and rotate to access sub menus
  - o Press dial for 3 seconds to return to top of main menu
- Annunciator fault light
  - o System shutdown (red)
  - o System warning (yellow)
- Alarm silence/lamp test button
  - o Alarm silence
  - o Lamp test
- USB connection
  - o Allows software upgrades
  - o Provides access for diagnostics
- Dedicated user inputs
  - o Remote emergency stop switch
  - o Remote 2-wire start for transfer switch
  - o Auxiliary shutdown
- Integrated hybrid voltage regulator
- Auto-resettable circuit protection mounted on circuit board
- One relay output standard. Optional five relay output available.
- One analog and three digital inputs standard. Optional two inputs available.

NFPA 110 Requirements

In order to meet NFPA 110, Level 1 requirements, the generator set controller monitors the engine/generator functions and faults shown below.

- Engine functions:
  - o Overcrank
  - o Low coolant temperature warning
  - o High coolant temperature warning
  - o High coolant temperature shutdown
  - o Low oil pressure shutdown
  - o Low oil pressure warning
  - o High engine speed
  - o Low fuel (level or pressure) *
  - o Low coolant level
  - o EPS supplying load
  - o High battery voltage
  - o Low battery voltage
- General functions:
  - o Master switch not in auto
  - o Battery charger fault *
  - o Lamp test
  - o Contacts for local and remote common alarm
  - o Audible alarm silence button
  - o Remote emergency stop *

* Functions require optional input sensors or kits

User Interface Displays

The listing below has • denoting main menus and o denoting sub-menus.

- Overview
  - o Active shutdowns and warnings (if any are present)
  - o Engine run time, total hours
  - o Average voltage line-to-line
  - o Frequency
  - o Average current
  - o Coolant temperature
  - o Fuel level or pressure *
  - o Oil pressure
  - o Battery voltage
  - o Software version
- Engine Metering
  - o Engine speed
  - o Oil pressure
  - o Coolant temperature
  - o Battery voltage
- Generator Metering
  - o Total power, VA
  - o Total power, W
  - o Rated power, %
  - o Voltage, L-L and L-N for all phases
  - o Current, L1, L2, L3
  - o Frequency
- GenSet Information
  - o Generator set model number
  - o Generator set serial number
  - o Controller serial number
- GenSet Run Time
  - o Engine run time, total hours
  - o Engine loaded, hours
  - o Number of engine starts
  - o Total energy, kWh
- GenSet System
  - o System voltage
  - o System frequency, 50 or 60 Hz
  - o System phase, single or three (wye or delta)
  - o Power rating, kW
  - o Amp rating
  - o Power type, standby or prime
  - o Measurement units, metric or English (user selectable)
  - o Alarm silence, always or auto only
- GenSet Calibration
  - o Voltage, L-L and L-N for all phases
  - o Current, L1, L2, L3
  - o Reset calibration
- Voltage Regulation
  - o Adjust voltage, ±10%
- Digital Inputs
  - o Input settings and status
- Digital Outputs
  - o Output settings and status
- Analog Inputs
  - o Input settings and status
- Event Log
  - o Event history (stores up to 1000 system events)

* Function requires optional input sensors or kits

Controller Features

- **AC Output Voltage Regulator Adjustment.** The voltage adjustment provides a maximum of ±10% of the system voltage.
- **Alternator Protection.** The controller provides generator set overload and short circuit protection matched to each alternator for the particular voltage/phase configuration.
- **Automatic Restart.** The controller automatic restart feature initiates the start routine and recrank after a failed start attempt.
- **Cyclic Cranking.** The controller has programmable cyclic cranking.
- **Engine Start Aid.** The starting aid feature provides control for an optional engine starting aid.
- **Event Logging.** The controller keeps a record (up to 1000 entries) for warning and shutdown faults. This fault information becomes a stored record of system events and can be reset.
- **Historical Data Logging.** Total number of generator set successful starts is recorded and displayed.
- **Integrated Hybrid Voltage Regulator.** The voltage regulator provides ±0.5% no-load to full-load regulation with three-phase sensing.
- **Lamp Test.** Press the alarm silence/lamp test button to verify functionality of the indicator lights.
- **Power Metering.** Controller digital display provides kW and kVA.
- **Programming Access (USB).** Provides software upgrades and diagnostics.
- **Remote Reset.** The remote reset function resets faults and allows restarting of the generator set without going to the master switch off/reset position.
- **RSA II Remote Monitoring Panel.** The controller is compatible with the Kohler® Remote Serial Annunciator (RSA II).
- **Run Time Hourmeter.** The generator set run time is displayed.
- **Time Delay Engine Cooldown (TDEC).** The TDEC provides a time delay before the generator set shuts down.
- **Time Delay Engine Start (TDES).** The TDES provides a time delay before the generator set starts.

Controller Functions

The following chart shows which functions cause a warning or shutdown. All functions are available as relay outputs.

Warning causes the fault light to show yellow and sounds the alarm horn signaling an impending problem.

Shutdown causes the fault light to show red, sounds the alarm horn, and stops the generator set.

	Warning Function	Shutdown Function
Engine Functions		
Critically high fuel level *	o	
ECM communication loss		•
ECM diagnostics	•	•
Engine over speed		•†
Engine start aid active		
Engine under speed		•
Fuel tank leak *	o	o
High battery voltage	•	
High coolant temperature	•	•†
High fuel level *	o	
Low battery voltage	•	
Low coolant level		•
Low coolant temperature	•	
Low cranking voltage	•	
Low engine oil level *	o	o
Low fuel level (diesel models) *	o	o
Low fuel pressure (gas models) *	o	
Low oil pressure	•	•†
No coolant temperature signal		•
No oil pressure signal		•
Overcrank		•†
Speed sensor fault	•	
General Functions		
Alarm horn silenced		
Analog inputs	o	o
Battery charger fault *	•	
Chicago code active *		
Common fault (includes †)		•
Common warning	•	
Digital inputs	o	o
Emergency stop		•†
Engine cooldown (delay) active		
Engine start delay active		
Engine started		
Engine stopped		
EPS supplying load		
Generator running		
Input/output communication loss	•	
Internal failure		•
Master switch not in auto	•	
NFPA 110 alarm active		
Remote start		
System ready		
Generator Functions		
AC sensing loss	•	•
Alternator protection		•
Ground fault input *	•	
kW overload		•
Locked rotor		•
Overfrequency		•
Overvoltage (each phase)		•
Underfrequency		•
Undervoltage (each phase)		•

• Standard functions
o Available user functions
* Functions require optional input sensors or kits
† Items included with common fault shutdown

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Phone 920-565-3381, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KohlerPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Controller Specifications

Decision-Maker® 3000—Software Version 1.00 or higher

- Power source with circuit protection: 12- or 24-volt DC
- Power drain: 200 milliamps
- Humidity range: 5% to 95% noncondensing
- Operating temperature range: -40°C to +70°C (-40°F to +158°F)
- Storage temperature range -40°C to +85°C (-40°F to +185°F)
- Standards:
  - CE Directive
  - NFPA 99
  - NFPA 110, Level 1
  - UL 508
  - ASTM B117 (salt spray test)
- Panel dimensions—W x H, 229 x 160 mm (9.0 x 6.3 in.)

Decision-Maker® 3000 Available Options

- ☐ **Common Fault Relay** provides a relay output to trip a circuit breaker or to signal the common fault shutdowns.
- ☐ **2 Input/5 Output Module** provides a generator set mounted panel with two inputs and five relay outputs.
- ☐ **Float/Equalize Battery Charger** available with 6 or 10 amp DC volt output. The 10 amp models are available with and without NFPA alarm to signal a battery charger fault.
- ☐ **Prime Power Switch** prevents battery drain during generator set non-operation periods and when the generator set battery cannot be maintained by an AC battery charger.
- ☐ **Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.
- ☐ **Remote Monitoring Panel.** The Kohler® Remote Serial Annunciator (RSA II) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations.
- ☐ **Run Relay** provides a relay indicating that the generator set is running.

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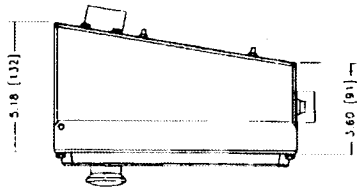
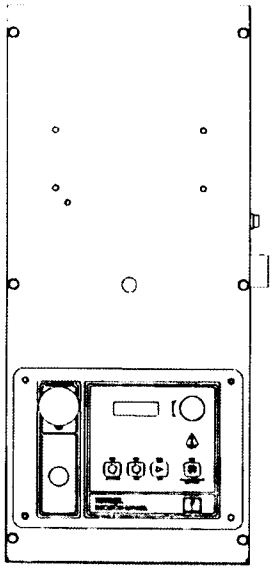
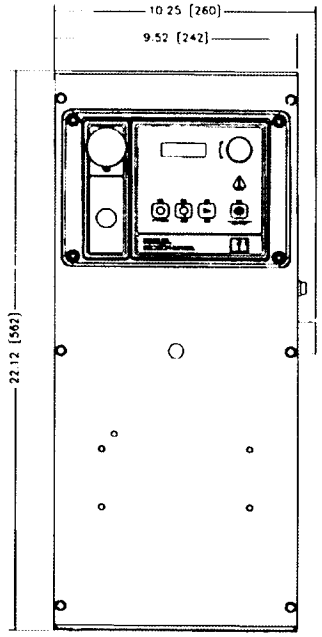
Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

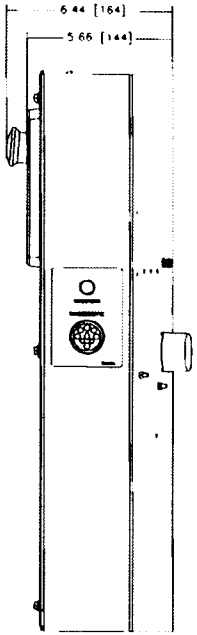




LOWER MOUNT CONTROLLER



UPPER MOUNT CONTROLLER



DECISION-MAKER 3000
20-275 KW SIDE MOUNTED CONTROL BOX

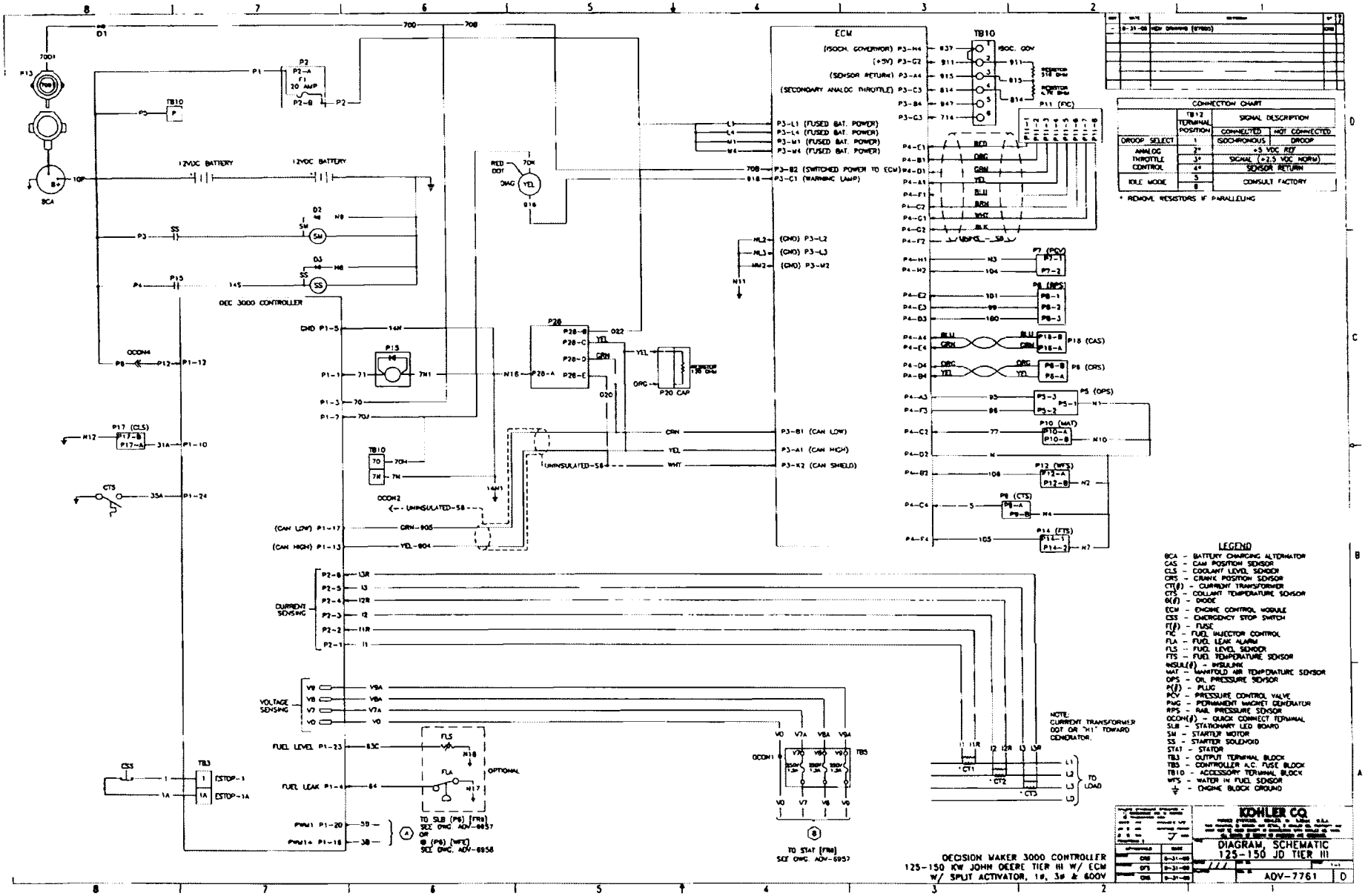
KOHLER CO.

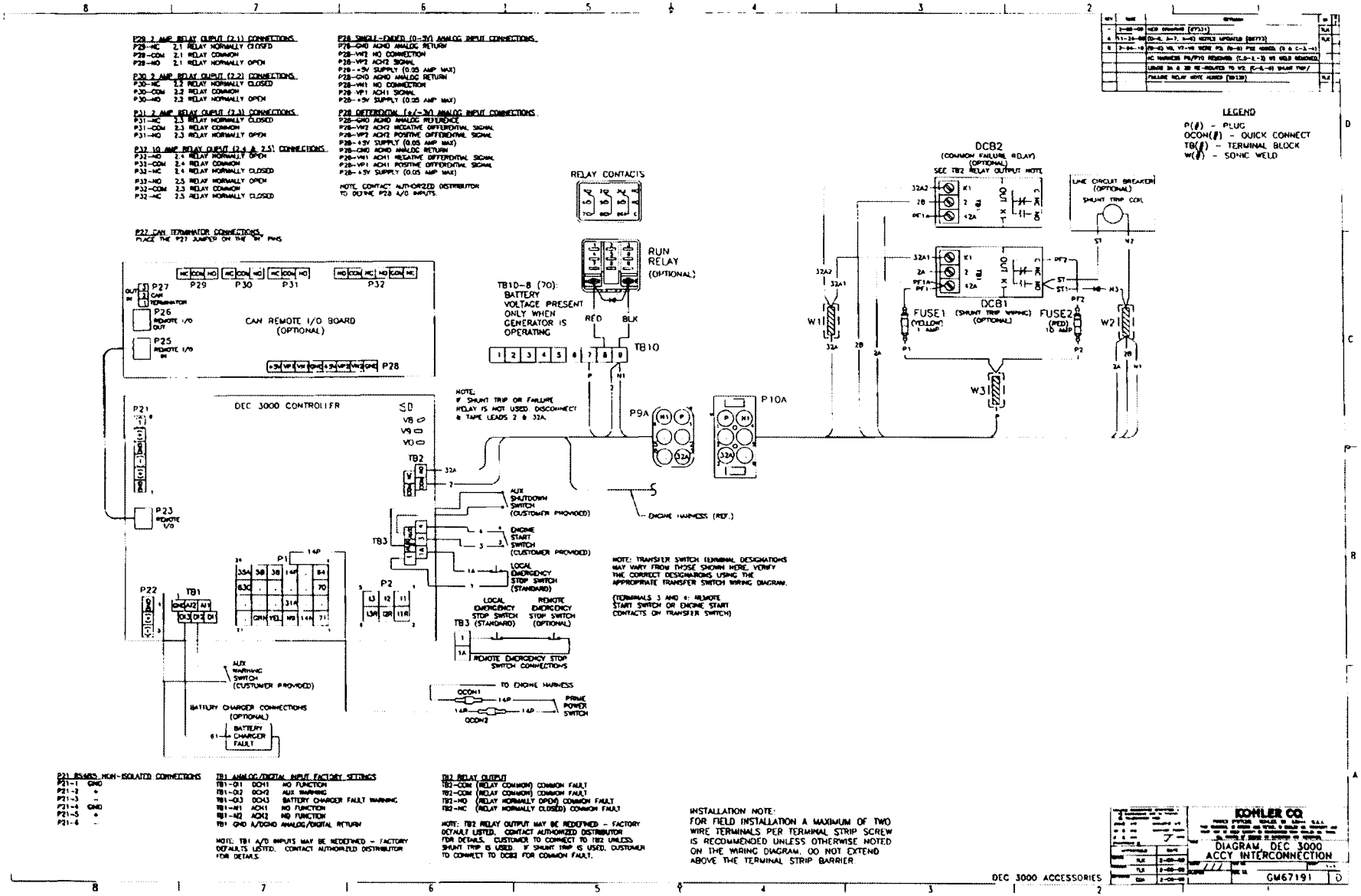
DIMENSION PRINT

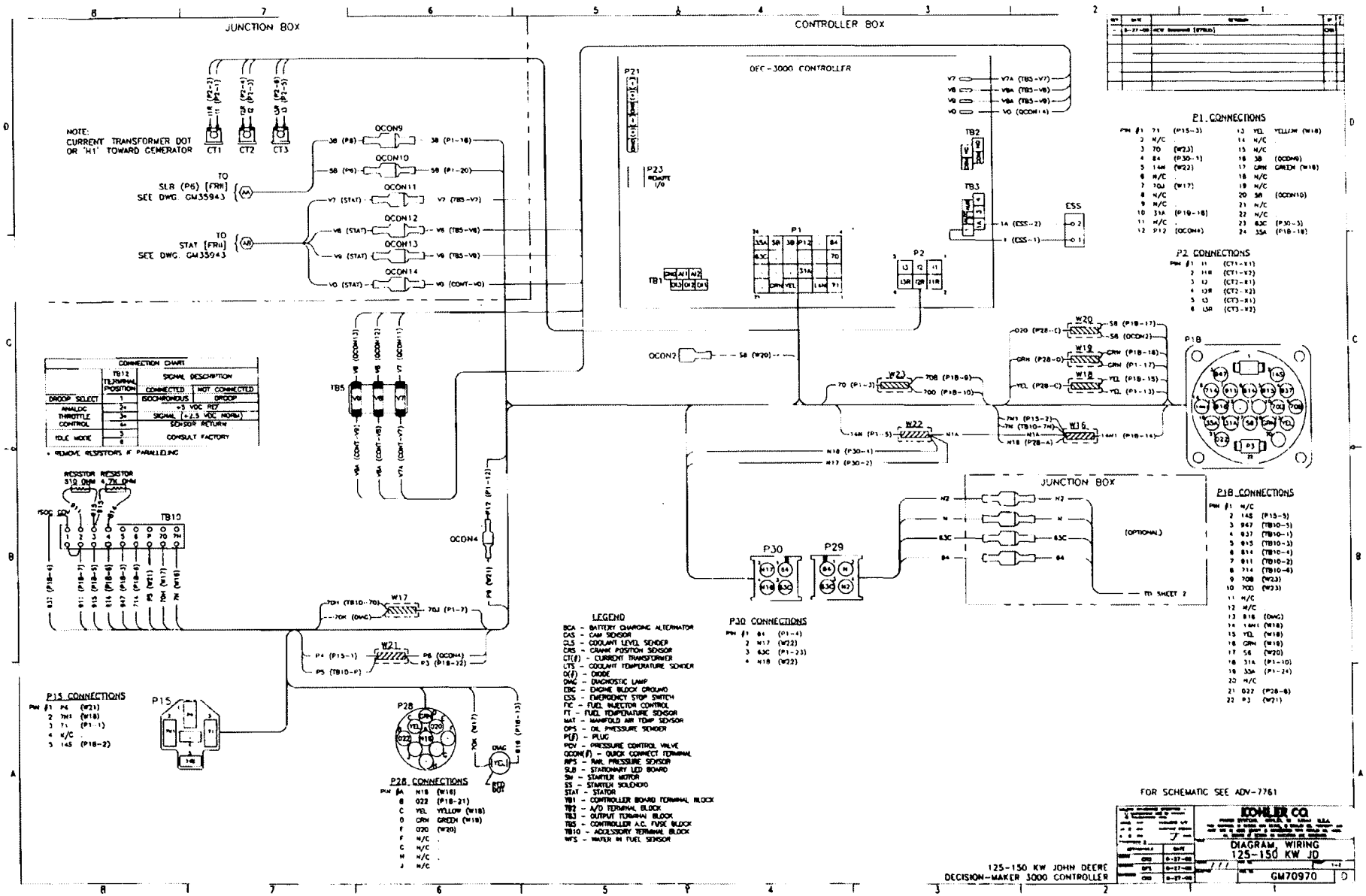
ADV-5849 D

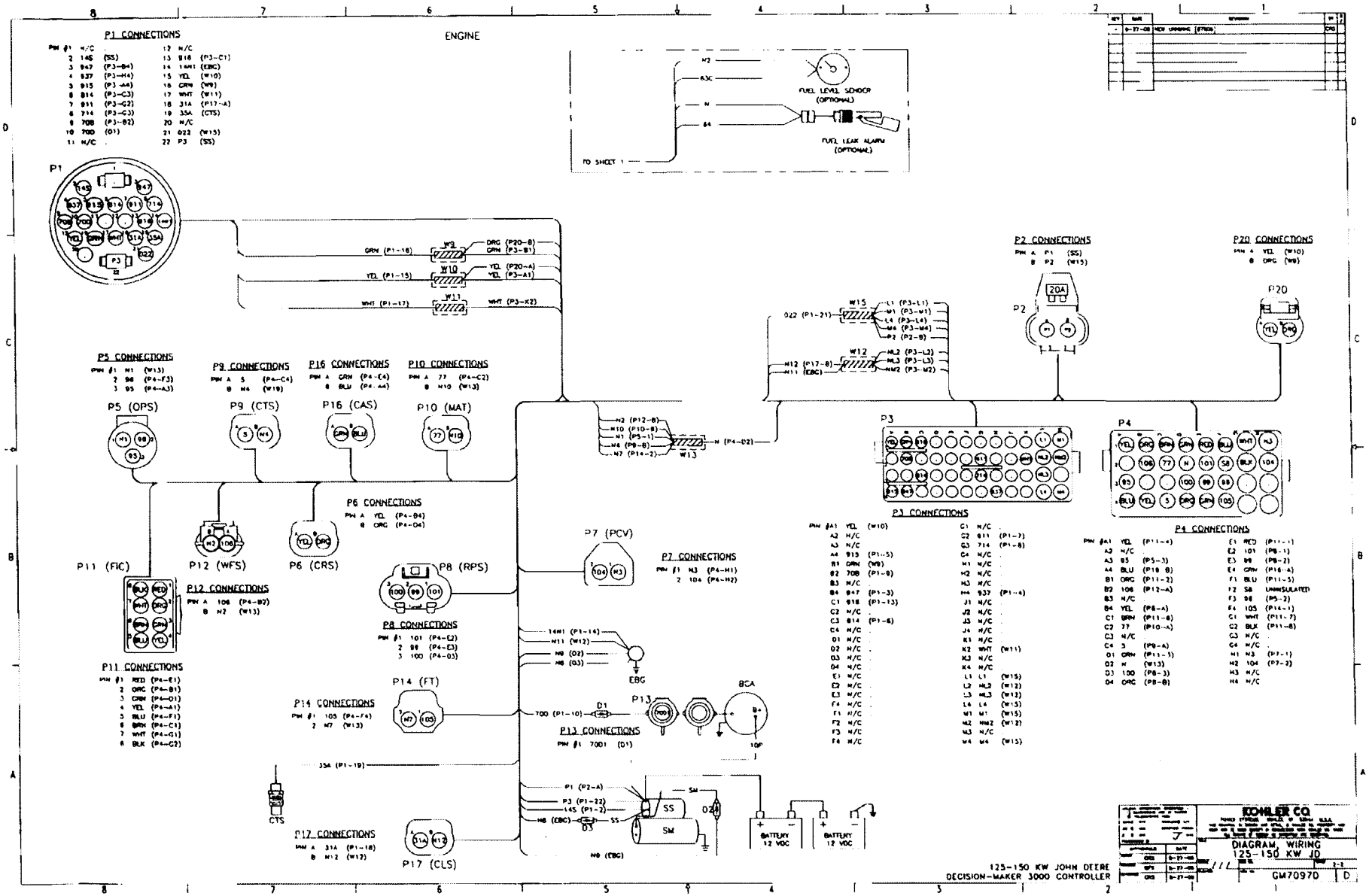
KOHLER POWER SYSTEMS

Wiring Schematics


ECM
TB10
(ISOCH. GOVERNOR) P3-H4
(+5V) P3-G2
(SENSOR RETURN) P3-A4
(SECONDARY ANALOG THROTTLE) P3-C3
P3-B4
P3-G3
ISOC. GOV
P11 (PIC)
P3-L1 (FUSED BAT. POWER)
P3-L4 (FUSED BAT. POWER)
P3-M1 (FUSED BAT. POWER)
P3-M4 (FUSED BAT. POWER)
P3-B2 (SWITCHED POWER TO ECM)
P3-C1 (WARNING LAMP)
(GND) P3-L2
(GND) P3-L3
(GND) P3-M2
P3-B1 (CAN LOW)
P3-A1 (CAN HIGH)
P3-K2 (CAN SHIELD)
P4-C1
P4-B1
P4-D1
P4-A1
P4-F1
P4-C2
P4-G1
P4-G2
P4-F2
P4-H1
P4-H2
P4-E2
P4-E3
P4-D3
P4-A4
P4-E4
P4-D4
P4-B4
P4-A3
P4-F3
P4-C2
P4-D2
P4-B2
P4-C4
P4-F4
P7 (PSV)
P8 (OPS)
P18 (CAS)
P8 (CRS)
P5 (OPS)
P10 (MAT)
P12 (MPS)
P9 (CTS)
P14 (FTS)
CONNECTION CHART
TB12 TERMINAL POSITION
SIGNAL DESCRIPTION
CONNECTED
NOT CONNECTED
DROOP SELECT
ISOCHRONOUS
Ddroop
ANALOG THROTTLE CONTROL
+5 VDC REF
SIGNAL (+2.5 VDC NOM)
SENSOR RETURN
IDLE MODE
CONSULT FACTORY
* REMOVE RESISTORS IF PARALLELING
LEGEND
BCA - BATTERY CHARGING ALTERNATOR
CAS - CAM POSITION SENSOR
CLS - COOLANT LEVEL SENSOR
CRS - CRANK POSITION SENSOR
CT(#) - CURRENT TRANSFORMER
CTS - COLLANT TEMPERATURE SENSOR
D(#) - DIODE
ECM - ENGINE CONTROL MODULE
ESS - EMERGENCY STOP SWITCH
F(#) - FUSE
FIC - FUEL INJECTOR CONTROL
FLA - FUEL LEAK ALARM
FLS - FUEL LEVEL SENSOR
FTS - FUEL TEMPERATURE SENSOR
INSULA(#) - INSULINK
MAT - MANIFOLD AIR TEMPERATURE SENSOR
OPS - OIL PRESSURE SENSOR
P(#) - PLUG
PCV - PRESSURE CONTROL VALVE
PMG - PERMANENT MAGNET GENERATOR
RPS - RAIL PRESSURE SENSOR
OCON(#) - QUICK CONNECT TERMINAL
SLB - STATIONARY LED BOARD
SM - STARTER MOTOR
SS - STARTER SOLENOID
STAT - STATOR
TB3 - OUTPUT TERMINAL BLOCK
TB5 - CONTROLLER A.C. FUSE BLOCK
TB10 - ACCESSORY TERMINAL BLOCK
WPS - WATER IN FUEL SENSOR
- ENGINE BLOCK GROUND
NOTE: CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR.
TO LOAD
TO SLB (P6) [FRB]
TO STAT [FRB]
DECISION MAKER 3000 CONTROLLER
125-150 KW JOHN DEERE TIER III W/ ECM
W/ SPLIT ACTIVATOR, 1Ø, 3Ø & 600V
KOHLER CO.
DIAGRAM, SCHEMATIC
125-150 JD TIER III
ADV-7761
D


P29 2 AMP RELAY OUTPUT (2.1) CONNECTIONS
P29-NC 2.1 RELAY NORMALLY CLOSED
P29-COM 2.1 RELAY COMMON
P29-NO 2.1 RELAY NORMALLY OPEN
P30 2 AMP RELAY OUTPUT (2.2) CONNECTIONS
P30-NC 2.2 RELAY NORMALLY CLOSED
P30-COM 2.2 RELAY COMMON
P30-NO 2.2 RELAY NORMALLY OPEN
P31 2 AMP RELAY OUTPUT (2.3) CONNECTIONS
P31-NC 2.3 RELAY NORMALLY CLOSED
P31-COM 2.3 RELAY COMMON
P31-NO 2.3 RELAY NORMALLY OPEN
P32 10 AMP RELAY OUTPUT (2.4 & 2.5) CONNECTIONS
P32-NO 2.4 RELAY NORMALLY OPEN
P32-COM 2.4 RELAY COMMON
P32-NC 2.4 RELAY NORMALLY CLOSED
P33-NO 2.5 RELAY NORMALLY OPEN
P32-COM 2.5 RELAY COMMON
P32-NC 2.5 RELAY NORMALLY CLOSED
P28 SINGLE-ENDED (0-5V) ANALOG INPUT CONNECTIONS
P28-GND AGND ANALOG RETURN
P28-VM2 NO CONNECTION
P28-VP2 ACH2 SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28-GND AGND ANALOG RETURN
P28-VM1 NO CONNECTION
P28-VP1 ACH1 SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28 DIFFERENTIAL (+/-5V) ANALOG INPUT CONNECTIONS
P28-GND AGND ANALOG REFERENCE
P28-VM2 ACH2 NEGATIVE DIFFERENTIAL SIGNAL
P28-VP2 ACH2 POSITIVE DIFFERENTIAL SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
P28-GND AGND ANALOG RETURN
P28-VM1 ACH1 NEGATIVE DIFFERENTIAL SIGNAL
P28-VP1 ACH1 POSITIVE DIFFERENTIAL SIGNAL
P28-+5V SUPPLY (0.05 AMP MAX)
NOTE: CONTACT AUTHORIZED DISTRIBUTOR TO DEFINE P28 A/D INPUTS.
P27 CAN TERMINATOR CONNECTIONS
PLACE THE P27 JUMPER ON THE "IN" PINS
P27 CAN TERMINATOR
P26 REMOTE I/O OUT
P25 REMOTE I/O IN
CAN REMOTE I/O BOARD (OPTIONAL)
P29
P30
P31
P32
P28
RELAY CONTACTS
RUN RELAY (OPTIONAL)
TB10-8 (70): BATTERY VOLTAGE PRESENT ONLY WHEN GENERATOR IS OPERATING
RED
BLK
TB10
NOTE: IF SHUNT TRIP OR FAILURE RELAY IS NOT USED DISCONNECT & TAPE LEADS 2 & 32A.
DEC 3000 CONTROLLER
SD
VB
VS
VO
P21
P23 REMOTE I/O
P22
TB1
P1
P2
TB2
TB3
P9A
P10A
32A
AUX SHUTDOWN SWITCH (CUSTOMER PROVIDED)
ENGINE START SWITCH (CUSTOMER PROVIDED)
LOCAL EMERGENCY STOP SWITCH (STANDARD)
ENGINE HARNESS (REF.)
LOCAL EMERGENCY STOP SWITCH
REMOTE EMERGENCY STOP SWITCH (OPTIONAL)
TB3 (STANDARD)
REMOTE EMERGENCY STOP SWITCH CONNECTIONS
TO ENGINE HARNESS
OCON1
OCON2
PRIME POWER SWITCH
AUX WARNING SWITCH (CUSTOMER PROVIDED)
BATTERY CHARGER CONNECTIONS (OPTIONAL)
BATTERY CHARGER FAULT
NOTE: TRANSFER SWITCH TERMINAL DESIGNATIONS MAY VARY FROM THOSE SHOWN HERE. VERIFY THE CORRECT DESIGNATIONS USING THE APPROPRIATE TRANSFER SWITCH WIRING DIAGRAM.
(TERMINALS 3 AND 4: REMOTE START SWITCH OR ENGINE START CONTACTS ON TRANSFER SWITCH)
DCB2
(COMMON FAILURE RELAY) (OPTIONAL)
SEE TB2 RELAY OUTPUT NOTE
DCB1
(SHUNT TRIP WIRING) (OPTIONAL)
FUSE1 (YELLOW) 1 AMP
FUSE2 (RED) 10 AMP
LINE CIRCUIT BREAKER (OPTIONAL)
SHUNT TRIP COIL
W1
W2
W3
LEGEND
P( ) - PLUG
OCON( ) - QUICK CONNECT
TB( ) - TERMINAL BLOCK
W( ) - SONIC WELD
P21 RS485 NON-ISOLATED CONNECTIONS
P21-1 GND
P21-2 +
P21-3 -
P21-4 GND
P21-5 +
P21-6 -
TB1 ANALOG/DIGITAL INPUT FACTORY SETTINGS
TB1-D1 DCH1 NO FUNCTION
TB1-D2 DCH2 AUX WARNING
TB1-D3 DCH3 BATTERY CHARGER FAULT WARNING
TB1-A1 ACH1 NO FUNCTION
TB1-A2 ACH2 NO FUNCTION
TB1 GND A/DGND ANALOG/DIGITAL RETURN
NOTE: TB1 A/D INPUTS MAY BE REDEFINED - FACTORY DEFAULTS LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS.
TB2 RELAY OUTPUT
TB2-COM (RELAY COMMON) COMMON FAULT
TB2-COM (RELAY COMMON) COMMON FAULT
TB2-NO (RELAY NORMALLY OPEN) COMMON FAULT
TB2-NC (RELAY NORMALLY CLOSED) COMMON FAULT
NOTE: TB2 RELAY OUTPUT MAY BE REDEFINED - FACTORY DEFAULT LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS. CUSTOMER TO CONNECT TO TB2 UNLESS SHUNT TRIP IS USED. IF SHUNT TRIP IS USED, CUSTOMER TO CONNECT TO DCB2 FOR COMMON FAULT.
INSTALLATION NOTE:
FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.
DEC 3000 ACCESSORIES
KOHLER CO.
DIAGRAM, DEC 3000 ACCY INTERCONNECTION
GM67191
D

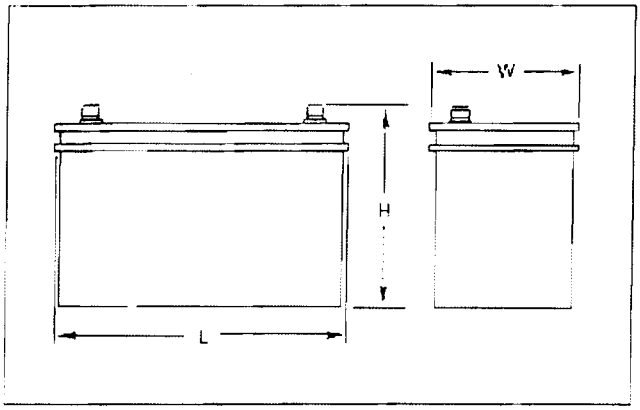

JUNCTION BOX
CONTROLLER BOX
DEC-3000 CONTROLLER
NOTE:
CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR
CT1
CT2
CT3
TO SLR (P6) [FRM] SEE DWG. GM35943
TO STAT [FRM] SEE DWG. GM35943
OCON9
OCON10
OCON11
OCON12
OCON13
OCON14
OCON2
OCON4
TB1
TB2
TB3
TB5
TB10
P1
P2
P18
P21
P23
P29
P30
ESS
W16
W17
W18
W19
W20
W21
W22
CONNECTION CHART
DROOP SELECT
ANALOG THROTTLE CONTROL
IDLE MODE
SIGNAL DESCRIPTION
CONSULT FACTORY
* REMOVE RESISTORS IF PARALLELING
RESISTOR 510 OHM
RESISTOR 4.7K OHM
JUNCTION BOX
(OPTIONAL)
TO SHEET 2
LEGEND
BCA - BATTERY CHARGING ALTERNATOR
CAS - CAM SENSOR
CLS - COOLANT LEVEL SENDER
CRS - CRANK POSITION SENSOR
CT(#) - CURRENT TRANSFORMER
CTS - COOLANT TEMPERATURE SENDER
D(#) - DIODE
DMG - DIAGNOSTIC LAMP
EBG - ENGINE BLOCK GROUND
ESS - EMERGENCY STOP SWITCH
FIC - FUEL INJECTION CONTROL
FT - FUEL TEMPERATURE SENSOR
MAT - MANIFOLD AIR TEMP SENSOR
OPS - OIL PRESSURE SENDER
PL(#) - PLUG
PCV - PRESSURE CONTROL VALVE
QCON(#) - QUICK CONNECT TERMINAL
RPS - RAIL PRESSURE SENSOR
SLB - STATIONARY LED BOARD
SM - STARTER MOTOR
SS - STARTER SOLENOID
STAT - STATOR
TB1 - CONTROLLER BOARD TERMINAL BLOCK
TB2 - A/D TERMINAL BLOCK
TB3 - OUTPUT TERMINAL BLOCK
TB5 - CONTROLLER A.C. FUSE BLOCK
TB10 - ACCESSORY TERMINAL BLOCK
WFS - WATER IN FUEL SENSOR
P1 CONNECTIONS
P2 CONNECTIONS
P18 CONNECTIONS
P30 CONNECTIONS
P15 CONNECTIONS
P28 CONNECTIONS
FOR SCHEMATIC SEE ADV-7761
KOHLER CO.
DIAGRAM, WIRING
125-150 KW JD
GM70970
125-150 KW JOHN DEERE
DECISION-MAKER 3000 CONTROLLER


ENGINE
P1 CONNECTIONS
P1
P3
P2 CONNECTIONS
P20 CONNECTIONS
P20
P5 CONNECTIONS
P5 (OPS)
P9 CONNECTIONS
P9 (CTS)
P16 CONNECTIONS
P16 (CAS)
P10 CONNECTIONS
P10 (MAT)
P6 CONNECTIONS
P6 (CRS)
P12 (WFS)
P11 (FIC)
P11 CONNECTIONS
P12 CONNECTIONS
P8 (RPS)
P8 CONNECTIONS
P7 (PCV)
P7 CONNECTIONS
P14 (FT)
P14 CONNECTIONS
P13
P13 CONNECTIONS
P17 (CLS)
P17 CONNECTIONS
CTS
EBG
BCA
FUEL LEVEL SENDER (OPTIONAL)
FUEL LEAK ALARM (OPTIONAL)
TO SHEET 1
P3 CONNECTIONS
P4
P4 CONNECTIONS
W9
W10
W11
W12
W13
W15
20A
SS
SM
D1
D2
D3
BATTERY 12 VDC
125-150 KW JOHN DEERE
DECISION-MAKER 3000 CONTROLLER
KOHLER CO.
DIAGRAM, WIRING
125-150 KW JD
GM70970
D

KOHLER POWER SYSTEMS

ISO 9001 KOHLER

Typical Overall Dimensions



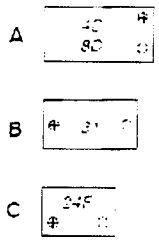
Standard Features

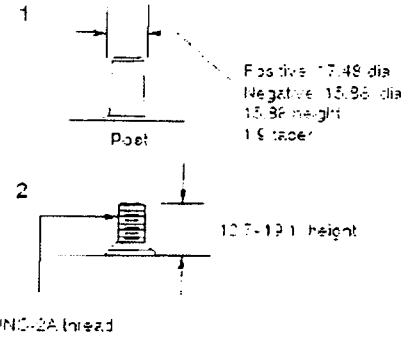
- Kohler Co. selects batteries to meet the engine manufacturer's specifications and to comply with NFPA requirements for engine-cranking cycles.
- Heavy-duty starting batteries are the most cost-effective means of engine cranking and provide excellent reliability in generator set applications.
- Batteries are rated according to SAE standard J-537. All batteries are 12-volt and have lead-calcium or lead-antimony plates with sulfuric acid electrolyte.
- Most generator set battery kits offer dry-charged or wet-charged batteries.
- Tough polypropylene cases protect against life-shortening vibration and impact damage.
- Removable cell covers allow checking of electrolyte specific gravity.

						Battery SAE Dimension, mm (in.)					
Charge Type*	Voltage	Fuel	Battery Part Number	Battery Qty. per Kit	BCI Group Size	L	W	H	Cold Cranking Amps at -18°C (0°F) Min.	Reserve Capacity Minutes at 27°C (80°F) Min.	Battery Post Layout and Style
Wet			324586	1	31	330.2 (13.0)	173.0 (6.8)	239.8 (9.4)	950	185	B/2

Battery Specifications

Battery Post Layouts A–C and Styles 1-2



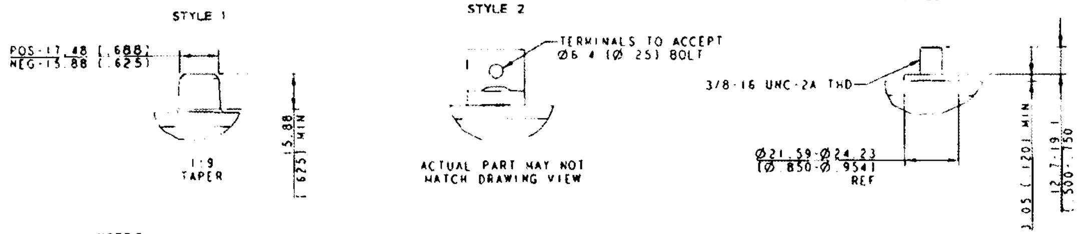


3.6-15 UNC-2A thread

Notes: Dimensions are in mm. 25.4 mm equals 1 inch. BCI group numbers shown in italics.
Order stud kit 264427 to convert from Style 2 to Style 1.

PART NO	REV	SAE DIMENSION L	SAE DIMENSION W	SAE DIMENSION H	VOLTAGE	COLD CRANKING AMPS AT 0°F MINIMUM	RESERVE CAP MINUTES AT 80°F MINIMUM	POST LAYOUT /STYLE	CHARGE TYPE	BATTERY CONSTRUCTION	BCI GROUP
244578	BE	333.5 [13.13]	181.1 [7.13]	238.5 [9.39]	6	700	275	B/1	DRY	SEE NOTE 1	
244258	BB	342.9 [13.50]	173.2 [6.82]	238.3 [9.38]	12	600	165	B/1	DRY	SEE NOTE 1	
[illegible]	BR	198.1 [7.80]	133.4 [5.25]	187.5 [7.38]	12	200	32	B/2	DRY	SEE NOTE 1	
[illegible]	BE	539.8 [21.25]	[illegible]	276.4 [10.88]	12	1150	450	A/1	DRY	SEE NOTE 1	
[illegible]	BE	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	WET	SEE NOTE 1	
[illegible]	BB	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	DRY	SEE NOTE 1	
[illegible]	BB	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	1000	200	C/3	WET	SEE NOTE 1	
[illegible]	BE	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	950	200	C/3	DRY	SEE NOTE 1	
324367	BB	288.8 [11.37]	179.4 [7.06]	196.9 [7.75]	12	625	90	E/1	WET	SEE NOTE 1	
324368	BE	206.5 [8.13]	160.3 [6.31]	205.2 [8.08]	12	525	90	E/1	DRY	SEE NOTE 1	
324586	BR	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	950	185	C/3	WET	SEE NOTE 2	31
324587	BR	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	950	200	C/3	DRY	SEE NOTE 2	31
258984	BR	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	650	120	D/1	WET	SEE NOTE 1	24
225289	BR	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	650	130	D/1	DRY	SEE NOTE 1	24
345197	BS	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	510	80	E/1	WET	SEE NOTE 2	24F
354147	BR	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	170	C/3	WET	SEE NOTE 2	31
354148	BR	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	DRY	SEE NOTE 2	31
345309	BR	219.2 [8.63]	153.9 [6.06]	212.9 [8.38]	12	525	-	E/1	WET	SEE NOTE 1	55
GM22348	BE	525.3 [20.68]	228.5 [8.68]	253.0 [9.88]	12	1000	320	A/1	DRY	SEE NOTE 1	
GM22349	BR	527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1150	400	A/1	DRY	SEE NOTE 1	8D
GM34399	BR	527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1150	430	A/1	WET	SEE NOTE 1	8D
GM48784	BR	208.0 [8.19]	173.0 [6.81]	196.9 [7.75]	12	525	70	D/1	WET	-	26
GM75512	BS	238.0 [9.38]	129.0 [5.06]	223.0 [8.81]	12	500	85	D/1	WET	-	51

NOTE: DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.

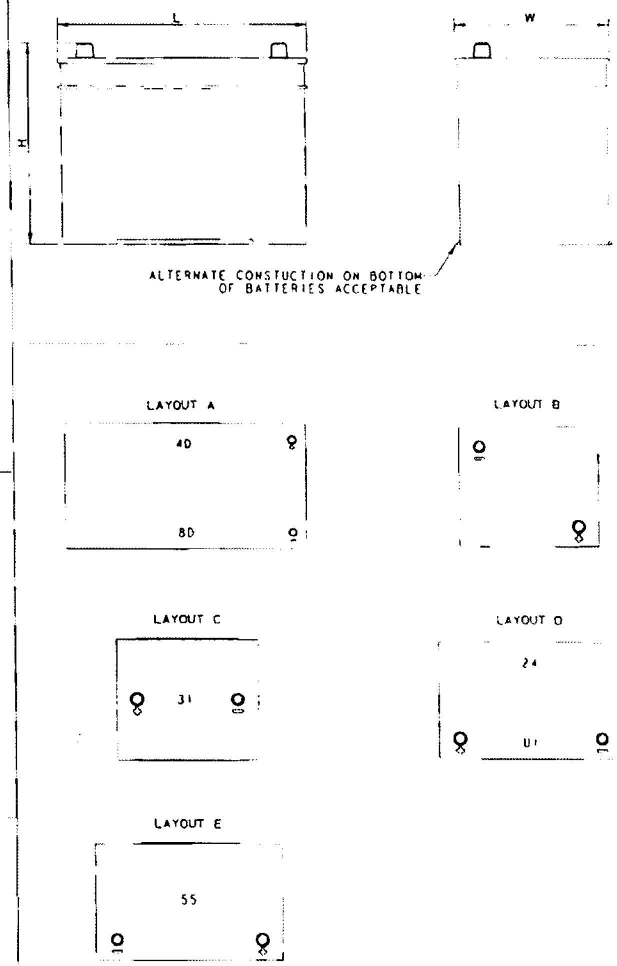


NOTES:
1) STYLE 3 CAN BE CONVERTED TO STYLE 1 BY INSTALLATION OF 254427 STUD CONVERTION KIT.
2) BATTERIES USING "STYLE 3" STUDS MUST HAVE EITHER THE "POS" OR "NEG" STUD CLEARLY IDENTIFIED
3) STYLE 3 TERMINAL TORQUE 10 Nm [15 FT LBS]

NOTES (APPLIES TO ALL BATTERIES)
SAE J537 DIMENSIONS ARE MAX ALLOWABLE DIMENSIONS.
COLD CRANKING AMPS ARE MINIMUM ACCEPTABLE VALUES.
HOLD DOWN DESIGN IN COMPLIANCE WITH SAE STANDARDS.
BATTERY WARNING LABEL TO BE LOCATED ON TAP OF BATTERY. (BETWEEN TERMINALS ON LAYOUT D)
MANUFACTURER MUST PROVIDE A CERTIFICATE CONTAINING MFGRS. NAME, MFGRS. PART NUMBER
AND KOHLER PART NUMBER CERTIFYING THAT THE BATTERY WAS BUIT TO INDUSTRY STANDARDS
SEE N.F.P.A.-110 FOR SPECIFIC DETAILS. CERTIFICATE REQUIRED ONLY ONCE PER BATTERY PART NUMBER.
MAY NOT BE CALCIUM-CALCIUTYPE

NOTES: (CHARGE TYPE)
ALL DRY CHARGED BATTERIES MUST BE SUPPLIED WITH ACTIVATION INSTRUCTIONS ADHERED TO BATTERY
AND LOOSE. BATTERY MUST ALSO BE IDENTIFED ON TOP AS: "DRY CHARGED, MUST ADD BATTERY GRADE
ELECTROLYTE. SEE ACTIVATION INSTRUCTIONS".
BATTERIES SHOULD BE RECEIVED APPROPRIATELY MARKED AS DRYCHARGED OR WET STORAGE.
ONE OF THE BATTERY POSTS MUST BE SHIELDED WHEN BATTERIES ARE WET CHARGED.
BATTERIES WHEN SHIPPED DRY - DO NOT REQUIRE POST PROTECTORS

NOTES: (BATTERY CONSTRUCTION)
1) MUST BE LEAD-CALCIUM HYBRID OR LEAD-ANTIMONY TYPE.
2) LEAD-CALCIUM GRID



REV	DATE	REVISION (SEE INDIVIDUAL PART NO. FOR REVISION LEVEL)	BY
BR	10-22-07	TO 4) BCI COLUMN ADDED (B-7) 15.88 DIM LOCATIONS CORRECTED (D-8) 324586 330.0 WAS 328.4, 173.0 WAS 171.2, 239.8 WAS 217.8, 324587: 330.2 WAS 333.2, 258984 & 225289: 273.0 WAS 270.0, 173.0 WAS 171.5, 228.6 WAS 225.6, 345197 273.0 WAS 260.4, 228.6 WAS 225.6, 354147 & 354148: 330.2 WAS 333.2 (83327)	SAM
BS	4-7-10	(C-8) 345197 VOIDED PER 87080, GM75512 ADDED (89560)	BAL

KOHLER CO. METRIC PROJE
POWER SYSTEMS KOHLER, WI 53044 U.S.A.

BATTERY

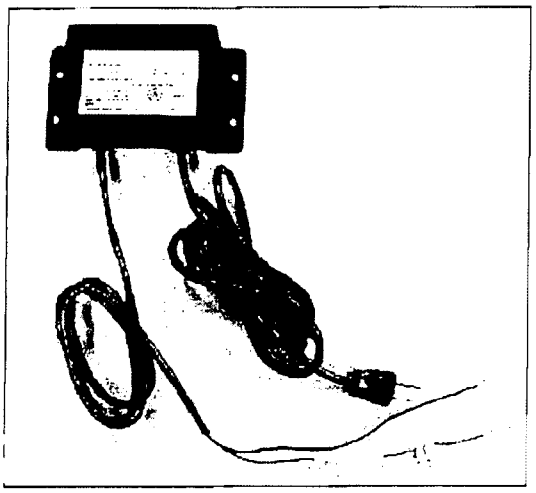
APPROVALS		DATE
	SLR	2-4-80
	ED	9-13-83
	RAD	9-20-83

244578 D

KOHLER POWER SYSTEMS

Float/Equalize Battery Charger

ISO 9001 KOHLER



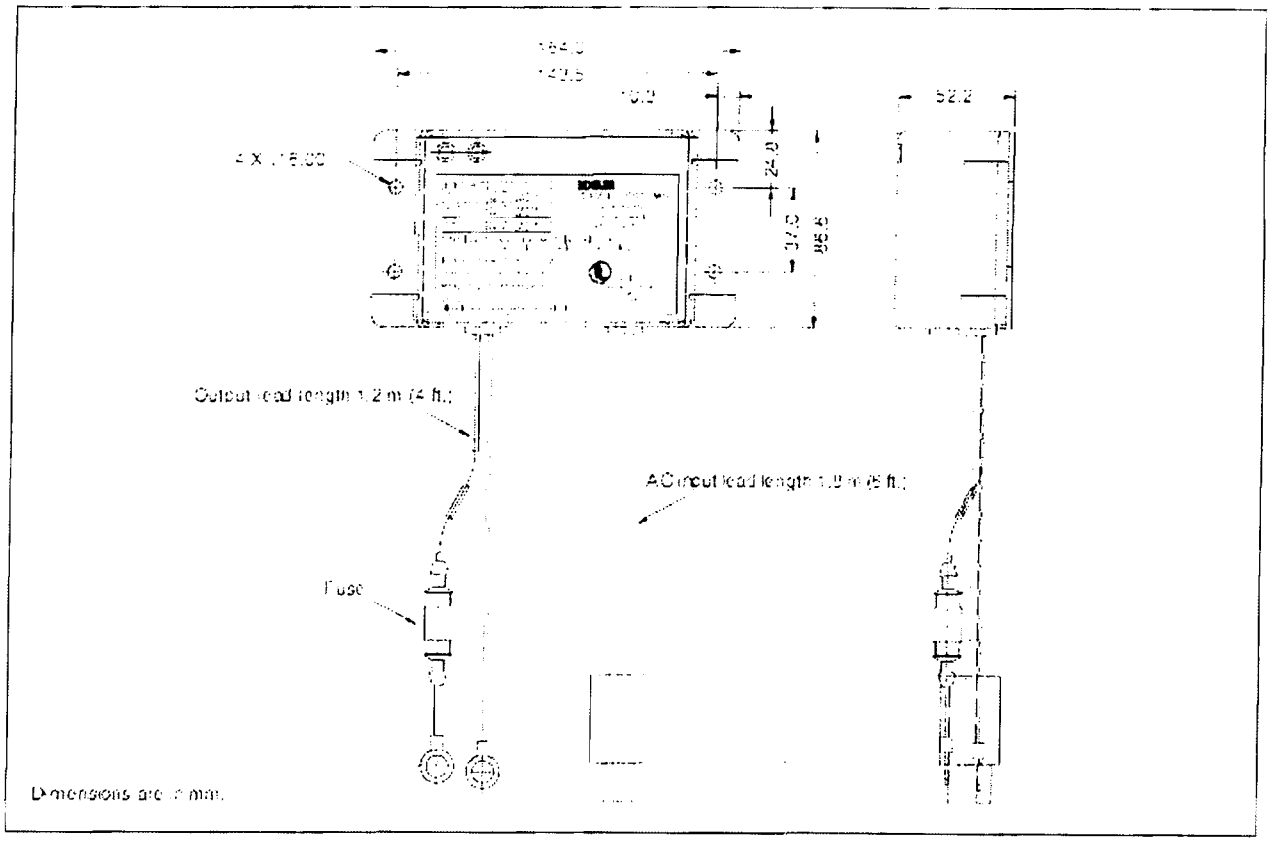
Standard Features

- 12 VDC output. * Use two battery chargers for 24-volt electrical systems
- Automatic 3-stage float/equalize battery charger
- Charges both lead-acid and gel-cell type batteries
- Indicator lamps: red and green LEDs indicate bulk charge, absorption, and float charge stages
- Durable potted assembly for full waterproofing and shockproofing
- Reverse-polarity protection
- Short-circuit protection
- UL 1236 listed
- UL 2200 compliant
- UL 991 compliant for vibration and shock
- UL listed to Canadian safety standards
- UL rated inline fuse
- FCC Class B-compliant for EMI/RFI (Date code 8/26/04 or later)
- 1-year warranty
- Easy installation:
- Integral mounting flanges
- Ring terminals for battery connection
- Standard US style 3-prong AC plug

Specifications

Battery Charger Kit	GM28569-KA1
Input Voltage	90-135 VAC
Input Frequency	50/60 Hz
DC Output: Bulk	11.8-14.0 VDC @ 5.0-6.0 amps
DC Output: Absorption	14.0-14.5 VDC @ 1.5-5.0 amps
DC Output: Float	13.3-14.5 VDC @ 0.1-1.5 amps
Steady Full-Load Output Current	6 amps
Current Limit	7 amps
Output Power Limit	70 +2/-5 watts
Line Regulation Across Input Voltage Range	0.01
Isolation, Input to Output	2500 V
Dimensions (L x W x D)	164 x 87 x 53 mm (6.4 x 3.5 x 2.1 in)
Weight	1.6 kg (3.5 lb.)
Temperature Range, Operating and Storage	--40°C to 70°C (--40°F to 158°F)
Humidity	0 to 100% (condensing)

Float/Equalize Battery Charger, continued



Battery Connections

Lead Length	1.2 m (4 ft.)
Battery Connections	9.5 mm (3/8 in.) ring terminals

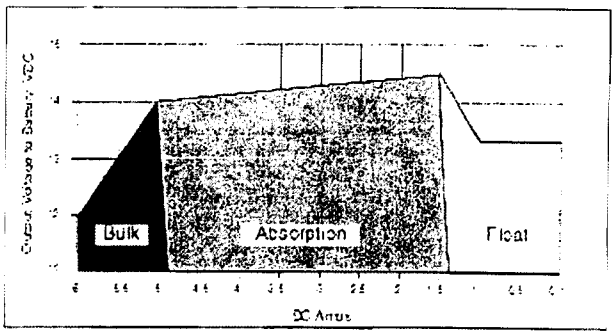
AC Power Connections

Lead Length	1.8 m (6 ft.)
Connection	Standard US style 3-prong AC plug

Shipping Information

Carton Size	254 x 152 x 89 mm (10 x 6 x 3.5 in.)
Shipping Weight	1.8 kg (4 lb.)

Charging Curves



OVERVIEW:
THE AUTOMATIC MULTI-LEVEL FLOAT/ EQUALIZE CHARGER SPECIFIED BELOW IS INTENDED TO CHARGE ENGINE STARTING BATTERIES EITHER INDEPENDENT OR IN CONJUNCTION WITH AN ENGINE DRIVEN CHARGING SYSTEM.

BATTERY TYPES TO BE CHARGED:
LEAD ACID
GEL CELL

INPUT:

INPUT VOLTAGE:	90-135 VOLTS AC
INPUT FREQUENCY:	50/60 Hz

INPUT LEAD:
APPROXIMATELY 1.8M (72") (REF) TYPE SJTOW -40°C TO 105°C UL RATED WIRE.
TERMINATED IN PRE-MOLDED US STYLE 120 V 3 PRONG AC PLUG.

DC OUTPUT:

AUTOMATIC FLOAT EQUALIZE		
STEADY FULL LOAD CURRENT:	6 AMPS	
BULK	11.8-14.0 VOLTS	@ 5.0-6.0 AMPS
ABSORPTION VOLTAGE:	14.0-14.5 VOLTS	@ 1.5-5.0 AMPS
FLOAT VOLTAGE:	13.3-14.5 VOLTS	@ 0.1-1.5 AMPS
BULK TO ABSORPTION TRANSITION:	14.0 VOLTS	
ABSORPTION TO FLOAT TRANSITION:	1.5 AMPS	
CURRENT LIMIT	7 AMPS	
OUTPUT POWER LIMITS:	70 +2/-5 WATTS	
FLOAT TO ABSORPTION TRANSITION:	2.06 VOLTS PER CELL	
LINE REGULATION ACROSS INPUT VOLTAGE RANGE:	1%	
SPARK PROTECTION	CONNECTION AND OPERATION	

OUTPUT LEAD:
APPROX. 1.2M (48") (REF) TYPE SJTOOW -50°C TO 105°C UL RATED WIRE WITH RED AND BLACK WIRE INSULATION. TERMINATED IN 9.5 mm (REF) RING STYLE TERMINALS.

FUSES:
THE FUSE MUST BE LOCATED APPROXIMATELY 5" FROM RING TERMINAL ON RED OUTPUT LEAD.
DC OUTPUT — RATED PER UL (125% RATED OUTPUT)

ISOLATION:
INPUT TO OUTPUT: 2500V

ENVIRONMENTAL:

STORAGE TEMPERATURE RANGE:	-40 TO +70°C (-40 TO +158°F)
OPERATING TEMPERATURE RANGE:	-40 TO +70°C (-40 TO +158°F)
HUMIDITY	0 TO 100% (CONDENSING)
VIBRATION AND SHOCK:	UL991

REVERSE POLARITY PROTECTION:
THE CHARGER SHALL SUSTAIN NO DAMAGE WHEN INCORRECTLY CONNECTED TO THE BATTERY IN REVERSE ORIENTATION.

MOUNTING: SHALL HAVE INTERGRAL MTG. FLANGES.

ENCLOSURE:
SHALL PROTECT THE CHARGER COMPONETS FROM RAIN, SNOW, DUST AND DRIPPING WATER. ALL INTERNAL COMPONENTS PROTECTED FROM WATER DROPLETS

INDICATORS:
SHALL HAVE CHARGE INDICATOR LAMP TO INDICATE BULK CHARGE AND FLOAT CHARGE CYCLES.

OPERATIONAL:
CAPABLE OF WITHSTANDING AN INDEFINITE OUTPUT SHORT CIRCUIT WITHOUT DAMAGE TO THE CHARGER. SHALL OPERATE PROPERLY AND SUSTAIN NO DAMAGE WHEN CONNECTED TO INPUT POWER WHILE CONNECTED TO THE BATTERY AND CHARGING SYSTEM OF ENGINE WHILE ENGINE IS CRANKED, RUNNING OR SHUTDOWN.

DOCUMENTATION:
THERE SHALL BE AN INSTALLATION / OPERATIONAL MANUAL SUPPLIED WITH EACH CHARGER. PER KOHLER SUPPLIED ARTWORK.

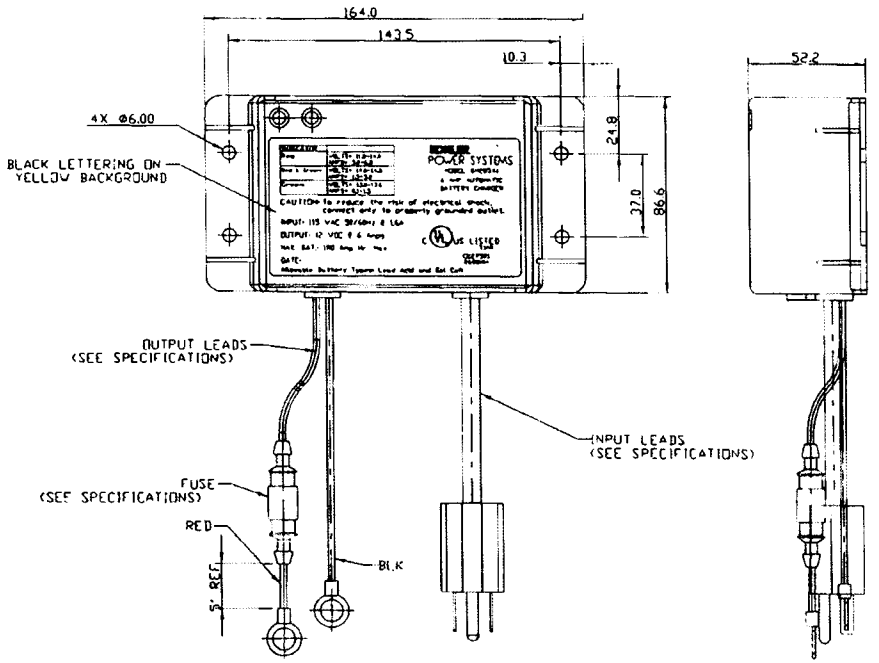
CERTIFICATIONS (US AND CANADA):
MUST COMPLY WITH UL2200
UL1236
MUST MEET CSA REQUIREMENTS
EMI / RFI FCC CLASS B COMPLIANT AFTER CHARGER DATE CODE 8/26/04

PRODUCT LABELING:
THE LABEL ATTACHED TO THE CHARGER SHALL HAVE THE FOLLOWING INFORMATION:
UL LISTING
KOHLER PART NUMBER
DESCRIPTION OF ALL INDICATOR
ALLOWABLE RANGE OF BATTERY UNIT CAPACITY
ALLOWABLE BATTERY TYPES
OUTPUT CURRENT AND VOLTAGE
INPUT VOLTAGE AND FREQUENCY

PACKAGING:
EACH CHARGER TO BE SHIPPED IN 254mm x 152mm x 89mm (10" x 6" x 3.5") (REF) CARTON WITH AN APPROPRIATE LABEL ATTACHED. AN OPERATIONAL / INSTALLATION MANUAL SHALL BE SUPPLIED WITH EACH INDIVIDUAL PACKAGE.

PACKAGING LABEL:
THE PACKAGING LABEL SHALL CONTAIN THE FOLLOWING INFORMATION:
KOHLER P/N
DESCRIPTION - BATTERY CHARGER
MFG. MODEL NO.
MFG. PART NUMBER
DATE CODE

WARRANTY:
2 YEAR FROM DATE OF PURCHASE FROM MANUFACTURE.



REV	DATE	REVISION	BY	APPROVALS	DATE
A	5-1-02	(C0-0)UPDATED INPUT LEAD NOTE;(C 0)UPDATED OUTPUT LEADS & FUSES NOTES; (C0-2) ADDED COLOR, FUSE & LENGHT NOTES TO OUTPUT LEADS; (C-3) "BATTERY CHARGER" REMOVED FROM DECAL; (69512)	BTV		
B	10-7-02	(C0-0) CLASS B COMPLIANT AFTER CHARGER DATE CODE 8/26/04 WAS CLASS A COMPLIANT(73350)	BTV	BTV	11-1-02
C	2-12-02	(C-3) UPDATE DRAWING TO MATCH LABEL ON PART ADD UL FILE(E227501) (80682)	BTV	JS	11-1-02
				DB	11-1-02

KOHLER CO. METRIC PROJ.
POWER SYSTEMS, KOHLER WI 53044 U.S.A.
THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

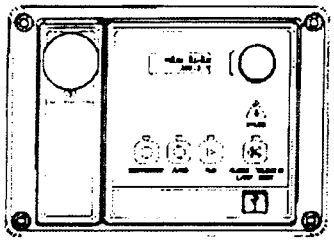
TITLE: BATTERY CHARGER, 12V-6A FLOAT EQUALIZES

SIZE: FULL | SHEET 1 of 1 | DWG NO. GM28341 | REV D

KOHLER POWER SYSTEMS

ISO 9001 KOHLER

Integral Voltage Regulator with Kohler® Decision-Maker® 3000 Controller (20-300 kW Generator Set Models)



Decision-Maker® 3000 Controller with integral Voltage Regulator

The voltage regulator is integral to the controller and ses microprocessor logic providing ±0.5% no-load to full-load regulation using root-mean-square (RMS) voltage sensing.

The voltage regulator features three-phase sensing and is available for 12- or 24-volt engine electrical systems.

Voltage Regulators

The following information provides general features, specifications, and functions of available voltage regulators.

This information generally applies to a single generator set and multiple generator sets with paralleling applications. Refer to the respective generator set specification sheet and see your authorized distributor for information regarding specific voltage regulator applications and availability.

Integral Voltage Regulator with Decision-Maker® 3000 Controller

Adjustment	Digital Display	Range Setting	Default Selection
Voltage Adjustment	Volt Adj.	±10% of System Voltage	System Voltage
Underfrequency Unload or Frequency Setpoint	Frequency Setpoint	42 to 62 Hz	2.5 Hz Below System Frequency
Underfrequency Unload Slope	Slope	0 - 10% of System Voltage (Volts per Cycle)	5 Volts per Cycle

Voltage Regulators, continued

pecification	Integral with DEC 3000 Controller
Generator Set Availability	20-300 kW Models
Type	Microprocessor based
Status and Shutdown Indicators	LEDs and Digital Display
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5-95% Non-Condensing
Circuit Protection	Solid-State, Redundant Softward and Fuses
Sensing, Nominal	100-240 Volts (L-N), 50-60 Hz
Sensing Mode	RMS, Single- or 3-Phase
Input Requirements	8-36 VDC
Continuous Output	100 mA at 12 VDC
Maximum Output	100 mA at 12 VDC
Transition Frequency	50-70 Hz
Exciter Field Resistance	NA
No-Load to Full-Load Voltage Regulation	±0.5%
'hermal Drift	less than 0.5% (-40 C to 70 C) [-40 F to 158 F] Range
Response Time	Less Than 5µS
Voltage Adjustment (of system voltage)	±10%
Voltage Adjustment	Controller Menu Knob
Remote Voltage Adjustment	NA
Paralleling Capability	NA
VAR/PF Control Input	NA

DVR® is a registered trademark of Marathon Electric Mfg. Corp.

NA - Data not available at time of print.

Integral Voltage Regulators with Decision-Maker® 3000 Controller

- A digital display and pushbutton/rotary dial provide access to data. A two-line LCD display provides complete and concise information.
- The controller provides ISO 8528-5, Class G3, compliance for transient response on some 20-300 kW generator set models. See the respective generator set spec sheet for specific applications
- See G6-100 Decision-Maker® 3000 for more information.

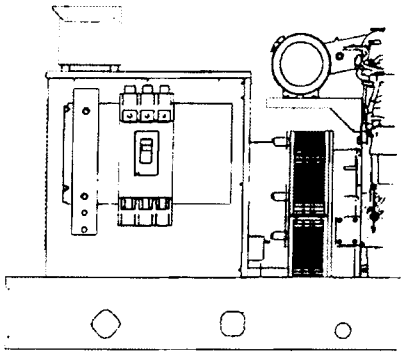
Generator Set Calibration Menu
- L1-L2 Volts
- L2-L3 Volts (3-phase)
- L3-L1 Volts (3-phase)
- L1-N Volts
- L2-N Volts
- L3-N Volts (3-phase)

Voltage Regulation Menu
- Adjust voltage, ±10%

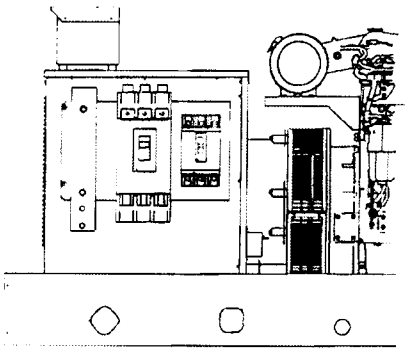
KOHLER.POWER SYSTEMS

Line Circuit Breakers 20-2250 kW

ISO 9001
KOHLER POWER SYSTEMS
NATIONALLY REGISTERED



Single Circuit Breaker Kit with Neutral Bus Bar
20-300 kW Model Shown



Dual Circuit Breaker Kit with Neutral Bus Bar
20-300 kW Model Shown

Standard Features

- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and are available standard with load-side lugs or bus bars and neutral bus bar.
- Kohler Co. offers a wide selection of molded-case line circuit breaker kits including single and dual configurations for each generator set.
- Four types of line circuit breakers are available:
  - Magnetic trip
  - Thermal magnetic trip
  - Electronic trip
  - Electronic with Ground Fault Circuit Interruption (GFCI) trip
- In addition, line circuit breakers are offered with 80% and 100% ratings (thermal magnetic available only in 80% rating).
- Single line circuit breaker kits allow circuit protection of the entire electrical system load.
- Dual line circuit breaker kits allow circuit protection of selected priority loads from the remaining electrical system load.
- Line circuit breakers comply with the following codes and standards unless otherwise stated.
  - UL 489 Molded Case Circuit Breakers
  - UL 1077 Supplementary Protectors
  - UL 2200 Stationary Engine Generator Assemblies

Line Circuit Breaker Types

Magnetic Trip

The magnetic trip features an electromagnet in series with the load contacts and a moveable armature to activate the trip mechanism. When a sudden and excessive current such as a short circuit occurs, the electromagnet attracts the armature resulting in an instantaneous trip (UL 1077 circuit breakers).

Thermal Magnetic Trip

Thermal magnetic trip contains a thermal portion with a bimetallic strip that reacts to the heat produced from the load current. Excessive current causes it to bend sufficiently to trip the mechanism. The trip delay is dependant on the duration and excess of the overload current. Elements are factory-calibrated. A combination of both thermal and magnetic features allows a delayed trip on an overload and an instantaneous trip on a short circuit condition.

Electronic Trip

These line circuit breakers use electronic controls and miniature current transformers to monitor electrical currents and trip when preset limits are exceeded.

Electronic with Ground Fault Trip

The ground fault trip feature is commonly referred to as Ground Fault Circuit Interruption (GFCI). Models with GFCI compare current flow in phase and neutral lines, and trip when current unbalance exists.

Ground fault trip units are an integral part of the circuit breaker and are not available as field-installable kits. The ground fault pickup switch sets the current level at which the circuit breaker will trip after the ground fault delay. Ground fault pickup values are based on circuit breaker sensor plug only and not on the rating plug multiplier. Changing the rating plug multiplier has no effect on the ground fault pickup values.

80% Rated Circuit Breaker

Most molded-case circuit breakers are 80% rated devices. An 80% rated circuit breaker can only be applied at 80% of its rating for continuous loads as defined by NFPA 70. Circuit conductors used with 80% rated circuit breakers are required to be rated for 100% of the circuit breaker's rating.

The 80% rated circuit breakers are typically at a lower cost than the 100% rated circuit breaker but load growth is limited.

100% Rated Circuit Breaker

Applications where all UL and NEC restrictions are met can use 100% rated circuit breakers where 100% rated circuits can carry 100% of the circuit breaker and conductor current rating.

The 100% rated circuit breakers are typically at a higher cost than the 80% rated circuit breaker but have load growth possibilities.

When applying 100% rated circuit breakers, comply with the various restrictions including UL Standard 489 and NEC Section 210. If any of the 100% rated circuit breaker restrictions are not met, the circuit breaker becomes an 80% rated circuit breaker.

Accessories

❑ Alarm Switch

The alarm switch indicates that the circuit breaker is in a tripped position caused by an overload, short circuit, ground fault, the operation of the shunt trip, an undervoltage trip, or the push-to-trip pushbutton. The alarm resets when the circuit breaker is reset.

❑ Auxiliary Contacts

These switches send a signal indicating whether the main circuit breaker contacts are in the open or closed position.

❑ Bus Bars (units without circuit breakers installed)

Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered. Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present.

❑ Ground Fault Annunciation

A relay contact for customer connection indicates a ground fault condition and is part of a ground fault alarm.

❑ Lockout Device (padlock attachment)

This field-installable handle padlock attachment is available for manually operated circuit breakers. The attachment can accommodate three padlocks and will lock the circuit breaker in the OFF position only.

❑ Neutral Lugs

Various neutral lug sizes are available to accommodate multiple cable sizes for connection to the bus bar only.

❑ Overcurrent Trip Switch

The overcurrent trip switch indicates that the circuit breaker has tripped due to overload, ground fault, or short circuit and returns to the deenergized state when the circuit breaker is reset.

❑ Undervoltage Trip, 12 VDC or 24 VDC

The undervoltage trips the circuit breaker when the control voltage drops below the preset threshold of 35%-70% of the rated voltage.

❑ Shunt Trip, 12 VDC or 24 VDC

A shunt trip option provides a solenoid within the circuit breaker case that, when momentarily energized from a remote source, activates the trip mechanism. This feature allows the circuit breaker to be tripped by customer-selected faults such as alternator overload or overspeed. The circuit breaker must be reset locally after being tripped. Tripping has priority over manual or motor operator closing.

❑ Shunt Trip Wiring

Connects the shunt trip to the generator set controller.

Line Circuit Breaker Specifications

80% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Style
20-60	4P/4Q	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
60-180	4S/4V	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
		300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		800	Electronic	P
		800	Electronic GFCI	
200-300	4UA	15-150	Thermal magnetic	H
		175-250	Thermal magnetic	J
		300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		1000-1200	Thermal magnetic	P
		800-1200	Electronic	P
		800-1200	Electronic GFCI	
350-900 (small ext. box) (no 5M4044)	4M/5M w/leads	300-400	Thermal magnetic	L
		600	Electronic	D
			Electronic GFCI	
		700-800	Thermal magnetic	M
		1000-1200	Thermal magnetic	P
		800-1200	Electronic	P
			Electronic GFCI	
350-900 (large ext. box) (no 5M4044) *†	4M/5M w/leads	1600-2500	Thermal magnetic	R
			Electronic	
			Electronic GFCI	
1000- 2250 and 900 kW with 5M4044 (large ext. box) *‡	5M/7M w/bus bars	1200-2500	Thermal magnetic	R
			Electronic	
			Electronic GFCI	

100% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Style
20-60	4P/4Q	150-400	Electronic	D
			Electronic GFCI	
60-180	4S/4V	150-400	Electronic	D
			Electronic GFCI	
		600-800	Electronic	P
			Electronic GFCI	
200-300	4UA	150-400	Electronic	D
			Electronic GFCI	
		600-1200	Electronic	P
			Electronic GFCI	
350-900 (small ext. box) (no 5M4044)	4M/5M w/leads	150-400	Electronic	D
			Electronic GFCI	
		600-1200	Electronic	P
			Electronic GFCI	
350-900 (large ext. box) (no 5M4044) *†	4M/5M w/leads	1600-2500	Electronic	R
			Electronic GFCI	
		3000	Electronic	NW
			Electronic GFCI	
1000- 2250 and 900 kW with 5M4044 (large ext. box) *‡	5M/7M w/bus bars	1200-2500	Electronic	R
			Electronic GFCI	
		3000	Electronic	NW
			Electronic GFCI	

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
E (480 V max.)	30-100	Up to two wire terminals fitting 10-32 or 1/4-20 stud
H	15-150	One #14 to 3/0
J	175	One 1/0 to 4/0
	200-250	One 3/0 to 350 kcmil
L	300-400	One #1 to 600 kcmil Al
D	150-400	One #2 to 500 kcmil Al
		One #2 to 600 kcmil Cu
	600	Two 2/0 to 500 kcmil Al
		Two 2/0 to 350 kcmil Cu
M	700-800	Three 3/0 to 500 kcmil
P	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
R	1600-2500	(8) lugs per phase rated for (1) #4-600 kcmil or (2) 1/0-250 kcmil
NW	3000	

* Available as front or rear facing circuit breaker on junction box.
Front facing circuit breakers are not available on the 600-2000REOZM, 600-2000REOZMB, and 400-800RZW models
† Front facing circuit breakers for 450/500REOZVB models are available for units with standard air cleaner and not with heavy-duty air cleaner.
‡ The 5M4044 is a 4-bus alternator and has bus-type mounting.

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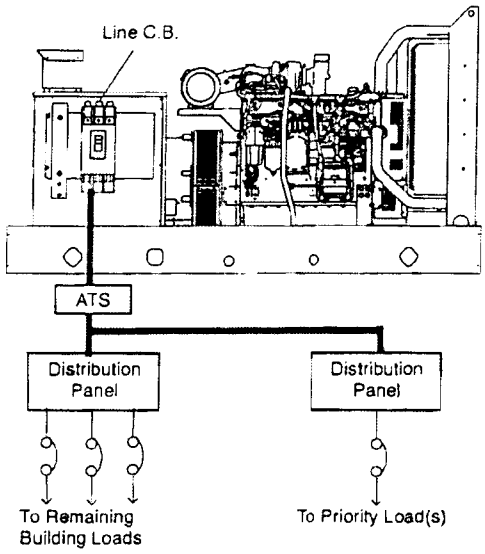
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KohlerPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Line Circuit Breaker Applications

Single Circuit Breaker Installations

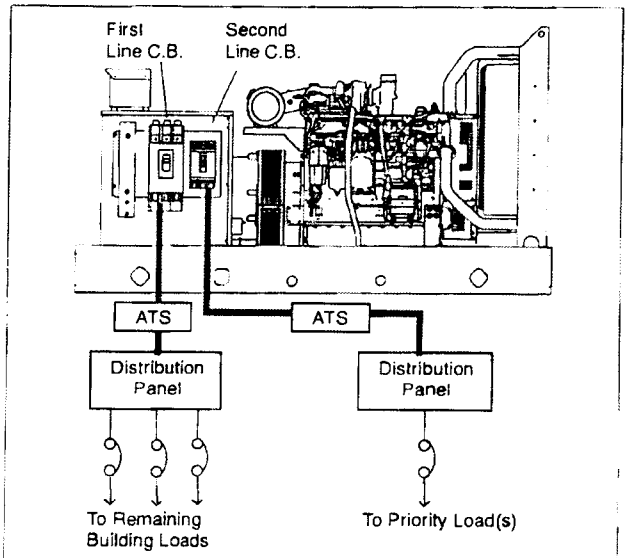
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



Single line circuit breaker configuration where circuit breaker trip can trip causing all power to building loads including priority load to be disrupted.

Dual Circuit Breaker Installations

A generator set with dual circuit breakers installed is used to segregate critical loads. Typically, one circuit breaker will feed a main transfer switch with noncritical loads and the other circuit breaker will feed a second transfer switch that feeds critical loads.



Dual line circuit breaker configuration where first circuit breaker can trip allowing second circuit breaker to continue supplying power to priority load(s).

Dual Circuit Breaker Combinations

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
4P/4Q/4S/ 4V/4UA	H	—	
	J	—	
4S/4V/4UA	L	—	
4P/4Q/4S/ 4V/4UA	D	—	100% rating, standard or GFCI
4S/4V/4UA	M	—	
	P	—	100% rating, standard or GFCI
4P/4Q/4S/ 4V/4UA	H	H	
	J	H or J	
4S/4V/4UA	L	H, J, or L	
4P/4Q/ 4S/4V	D	H, J, L, or D	100% rating, no GFCI
4UA	D	H, J, L, or D	Primary or sec. available as 100% rating, std. or GFCI

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
4S/4V	M	H, J, L, or D	100% rating, no GFCI
4UA	M	H, J, L, or D	D available as GFCI
4S/4V	P	H, J, L, or D	100% rating, no GFCI
4UA	P	H, J, L, or D	P and/or D available as GFCI
	P	P	100% rating, no GFCI
4M/5M/7M	All	—	Dual circuit breaker configurations available as Engineered Specials

DISTRIBUTED BY:

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

AL/CU MECHANICAL LUGS PER PHASE			
BREAKER FRAME	AMPS	WIRE RANGE	A WIRE BENDING
H	15-150	ONE #14 TO 3/0	427 [16.8]
J	175	ONE 1/0 TO 4/0	413 [16.3]
L	200-250	ONE 3/0 TO 350 KCMIL	369 [14.5]
D	150-400	ONE #2 TO 500 KCMIL AL	362 [14.2]
		ONE #2 TO 600 KCMIL CU	
	600	TWO 2/0 TO 350 KCMIL AL	
		TWO 2/0 TO 500 KCMIL CU	
M	700-800	THREE 3/0 TO 500 KCMIL	341 [13.4]
P	600-800		

STANDARD BREAKER COMBINATIONS		
BREAKER 1	BREAKER 2	COMMENT
H	-	
J	-	
L	-	
D	-	STD OR GFI
M	-	
P	-	STD OR GFI
H	H	
J	H OR J	
L	H, J OR L	
D	H, J, L OR D	NO GFI
M OR P	H, J, L OR D	NO GFI

NOTES:

1) SEE UNIT DIMENSION PRINT (ADV-YXXX) FOR ADDITIONAL DIMENSIONS JUNCTION BOX AND STUB UP LOCATION.

2) ADD SKID DEPTH TO WIRE BENDING HEIGHTS ON THIS PRINT TO ARRIVE AT FULL WIRE BENDING SPACE.

3) CONSULT FACTORY FOR BREAKER COMBINATIONS NOT SHOWN ON THIS PRINT.

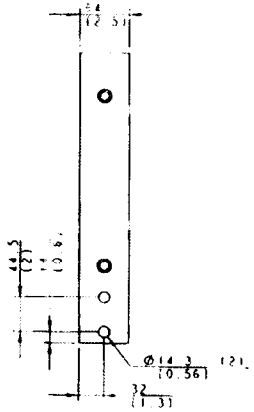
4) MECHANICAL LUGS ARE AVAILABLE FOR M [illegible] SEE ADV 7376.

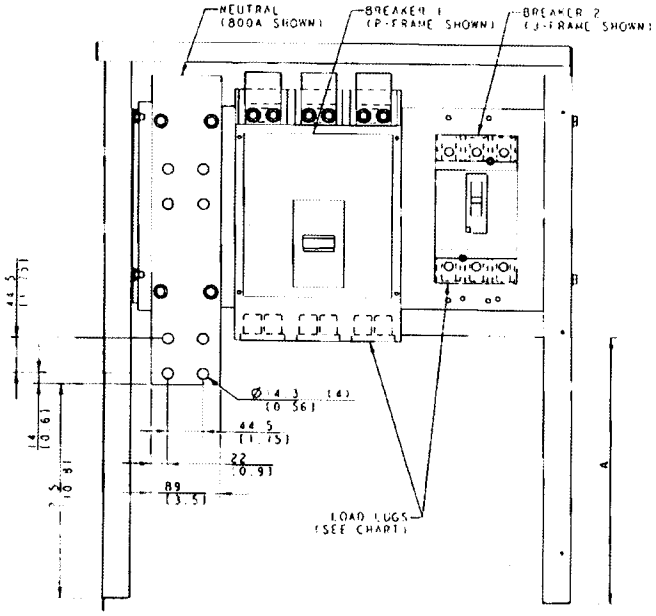
5) NEUTRALS ARE BONDED [illegible] GROUND AS STANDARD. CONSULT LOCAL CODES OR SYSTEM REQUIREMENTS.

6) CIRCUIT BREAKER FRAMES REFER TO STANDARD SQUARE D PRO[illegible]

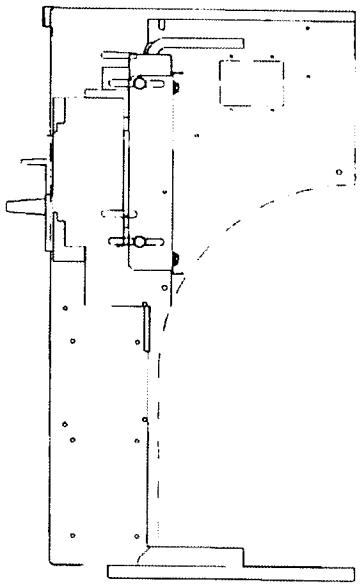
7) STANDARD NEUTRALS PROVIDED ARE SIZED FOR MAXIMUM UNIT AMPS GFI NEUTRALS ARE MATCHED TO THEIR CIRCUIT BREAKER AMPS.

8) DIMENSIONS IN [illegible] ARE INCHES.





SHOWN WITH COVERS REMOVED
(ALL VIEWS)



VIEW FROM ENGINE END
(HALF VIEW SHOWN)

LINE CIRCUIT BREAKER (LCB) KITS
4S/4SW/4V/4W ALTERNATOR FRAME STYLES

REV	DATE	BY
	5 16 07	WSD
*	4 22 08	WSD

KOHLER CO. METRIC PRO-E

DIMENSION PRINT

APPROVALS	DATE
WSD	5 16 07
WSD	5 16 07
WSD	5 16 07

ADV-7371 D

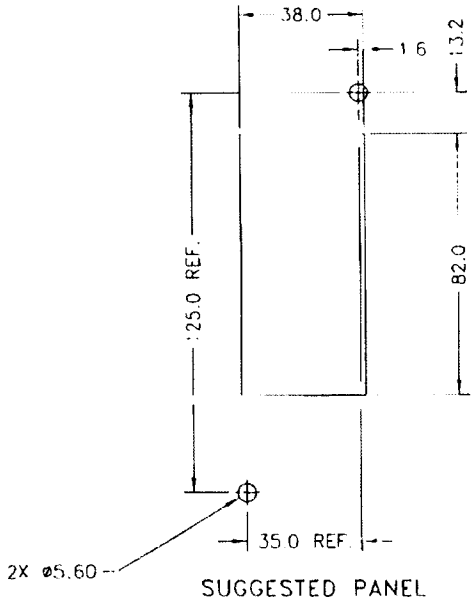
PART NO.	RL	PS	POLES	SQUARE-D NO.	LUGS/WIRE/TORQUE (TYP PER POLE EACH E
GM47476-1	A	175	3	JDL36175	AL175JD (1) 1/0-4/0 @ 26 Nm [225 IN-LB]
GM47476-2	A	200	3	JDL36200	AL250JD (1) 3/0-350 MCM @ 26 Nm [225 IN-LB]
GM47476-3	A	225	3	JDL36225	AL250JD (1) 3/0-350 MCM @ 26 Nm [225 IN-LB]
GM47476-4	A	250	3	JDL36250	AL250JD (1) 3/0-350 MCM @ 26 Nm [225 IN-LB]

REV	DATE	REVISION	BY
-	10-21-05	NEW DRAWING [79677]	RAC
A	12-18-06	(D-4) JDL WAS JDP (4 PLACES), LUG DATA ADDED [79677]	WSD

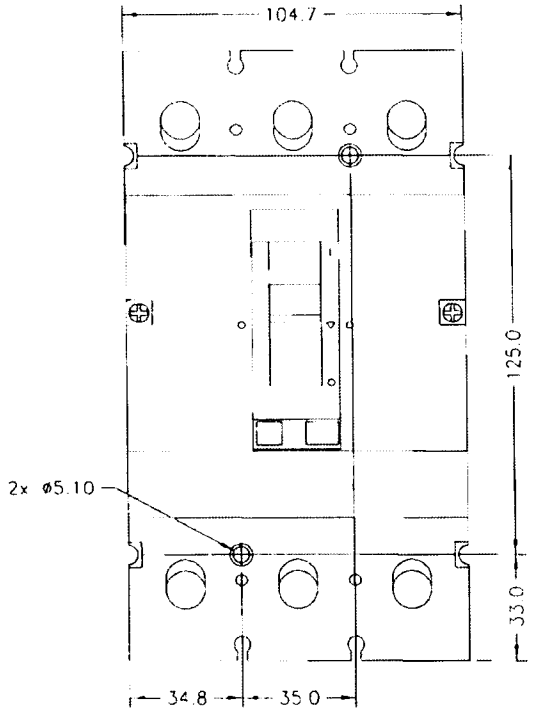
REVISION BLOCK INDICATES REVISION LEVEL OF DRAWING NOT PART REVISION. SEE PART REVISION LEVEL BEHIND PART NUMBER FOR CURRENT PART REVISION LEVEL.

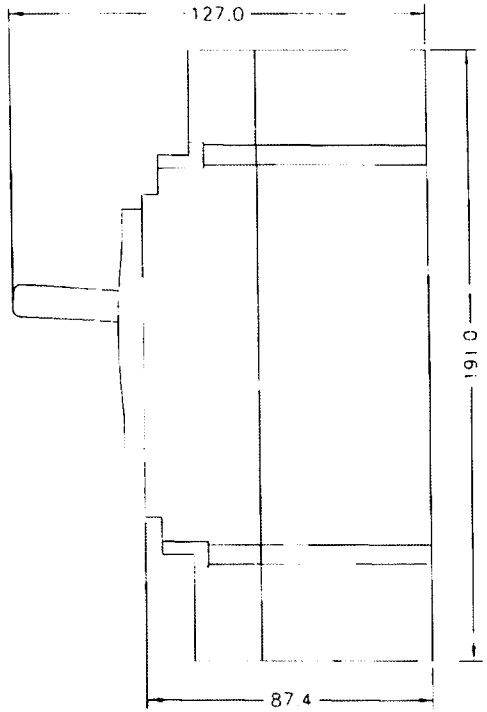
NOTES:

HARDWARE INCLUDED: (2) #8-32 SCREWS



SUGGESTED PANEL CUTOUT & MOUNTING





METRIC CAD FILE

MODELLED IN PRO/E

SQUARE D JD-FRAME CIRCUIT BREAKER
THERMAL MAGNETIC 3P TOGGLE LUGS LOAD SIDE ONLY

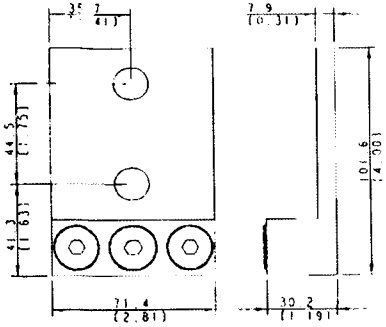
UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.YY ± 0.25
X.Y ± 1.0
X ± 1.5
ANGLES ± 0°30'
SURFACE FINISH 3.2 MAX
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	RAC	10-21-05
CHECKED	JMS	6-13-06
APPROVED	SLJ	6-15-06

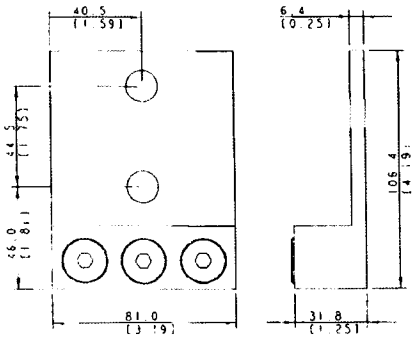
TITLE: DWG, CIRCUIT BREAKER

SCALE	CAD NO	SHEET
NONE	GM47476.DWG	1 of 1

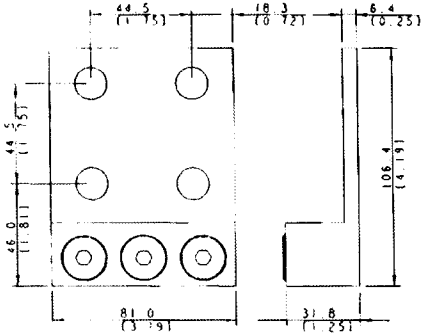
DWG NO: GM47476 C



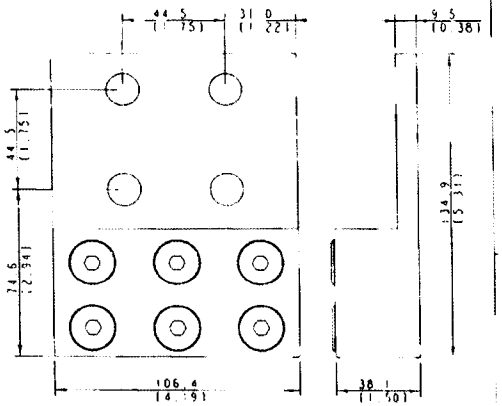
GM53097-KP1
LUG, #6 AWG-370 AWG X3
(USE WITH NEUTRAL WITH 2-HOLE MTG)



GM53097-KP2
LUG, #6 AWG-350 KCMIL X3
(USE WITH NEUTRAL WITH 2-HOLE MTG)



GM53097-KP3
LUG, #6 AWG-350 KCMIL X3
(USE WITH NEUTRAL WITH 4-HOLE MTG)



GM53097-KP4
LUG, #2 AWG-600 KCMIL X3
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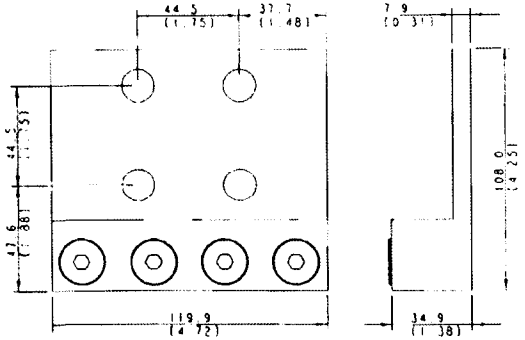
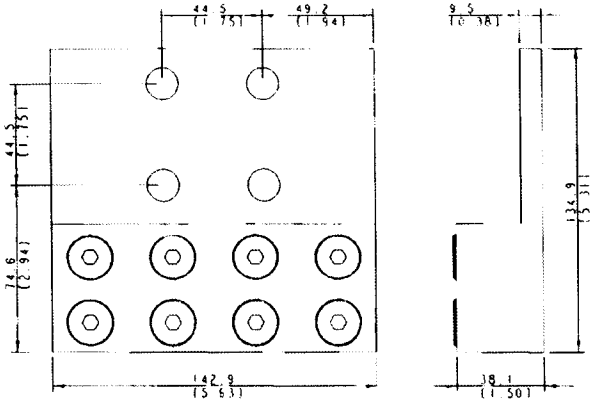
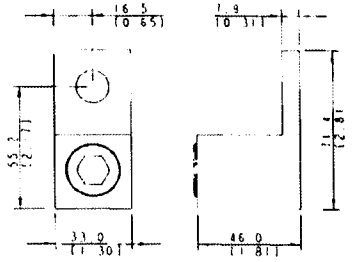


GM53097-KP5
LUG, #6 AWG-350 KCMIL X4
(USE WITH NEUTRAL WITH 4-HOLE MTG)



GM53097-KP6
LUG, #2 AWG-600 KCMIL X4
(USE ONLY WITH 48A NEUTRAL WITH 4-HOLE MTG)



GM53097-KP7
LUG, 1/0 AWG-750 KCMIL X1

NOTES:

1) ALL LUGS ARE SIZED FOR 1/2" MOUNTING HARDWARE
2) ALL KITS ARE SUPPLIED WITH 1/2" HARDWARE FOR MOUNTING TO BUS UP TO 3/8" THICK.
3) REFER TO CIRCUIT BREAKER ADV'S FOR NEUTRAL TYPE
4) DIMENSIONS IN [ ] ARE INCHES

REV	DATE	REVISION
	7-12-07	NEW DRAWING [79677]

KOHLER CO. METRIC | PRO-E

POWER SYSTEMS KOHLER, WI 53044 U.S.A.

THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO PROPERTY AND MUST NOT BE USED (EXCEPT IN CONNECTION WITH KOHLER CO. WORK) ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

APPROVALS	DATE
WSO	7-12-07
WSO	7-12-07
AJM	7-12-07

DIMENSION PRINT
LUG KITS

ADV-7376 D

Manual Transfer Switch Submittal

Fort Bend County

for

Mcdonald Electric

ELECTRICAL SUPPLIER:

CONSOLIDATED ELECTRICAL DISTRIBUTORS

7/20/2010

SERVICE * INTEGRITY * RELIABILITY

TABLE OF CONTENTS

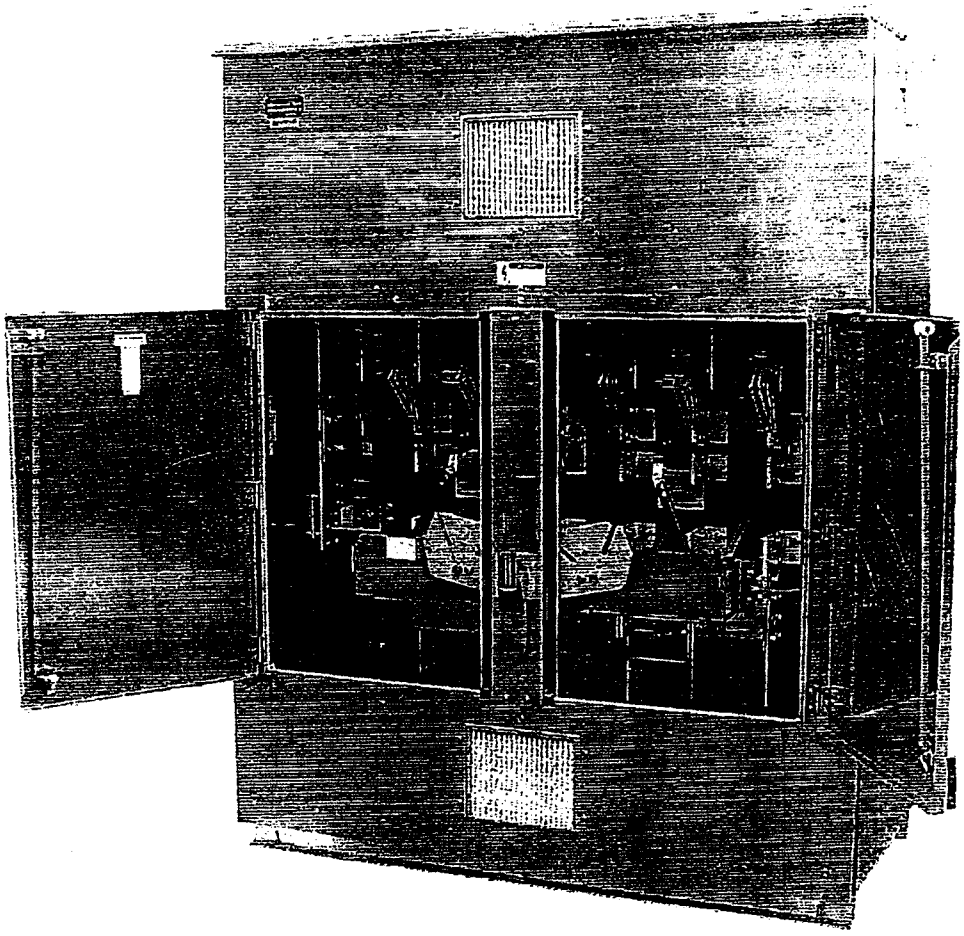
TYPE	MANUFACTURER	CATALOG NUMBER
1000AMP 240V MTS	BOLTSWITCH	ELV468-8N-NM3R
800AMP 240V NM3R	BOLTSWITCH	ELV467-7N-NM3R
400AMP 600V NM3R	BOLTSWITCH	ET465-5N-NM3R
400AMP 240V NM3R	BOLTSWITCH	ET425-5N-NM3R

PART NUMBER # *ELV468-8N-S4*

1200AMP, 240/120VAC, 3POLE 4 WIRE, SOLID NUETRAL,
NM3R
FUSED @ 1000AMP ON NORMAL POWER.

BULLETIN 114

Enclosed Double Throw Fused Power-Circuit Devices



Patented Break-Before-Make Mechanism
Designed for use in accordance with
Article 702 of the National Electrical Code.

Suitable for Use as Service Equipment

Type 1 or Type 3R enclosures
made of lightweight aluminum

200 kA short circuit current rating at
600 VAC with Class L fuses installed

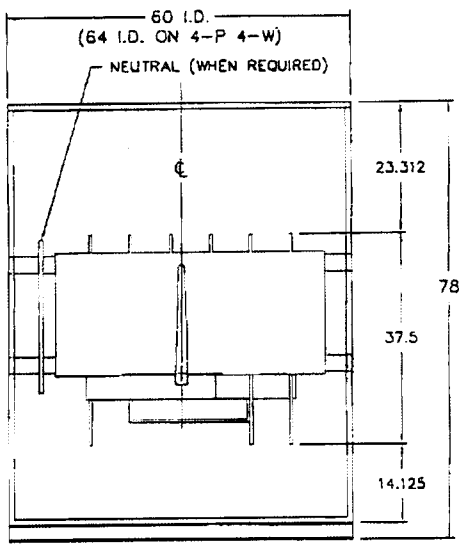
600 VDC ratings available

boltswitch, inc.
6208 COMMERCIAL ROAD
CRYSTAL LAKE, ILLINOIS 60014
Phone 815-459-6900
FAX 815-455-7788
www.boltswitch.com

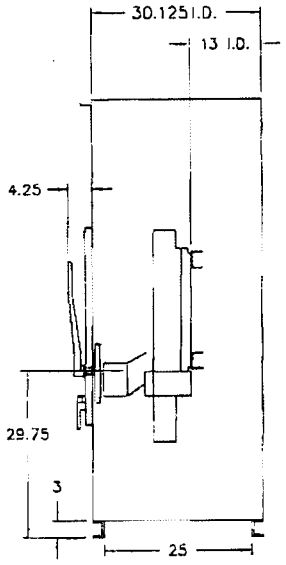
Enclosed Double Throw
Fused Power-Circuit Devices

boltswitch®
bolted pressure contact switches

Enclosed Series VL Geneva



FRONT VIEW
(COVER REMOVED)



SIDE VIEW

These units are constructed in accordance with UL 977. The switch described in **Bulletin 116** is UL Listed as a "Fused Power-Circuit Device" under File No. E44498.
The enclosure is ETL listed as "Fused Power-Circuit Device Enclosure" under File No. 509803.

AC rated devices are suitable for use on circuits capable of delivering up to 200,000 RMS symmetrical amperes at 600 VAC. These units are suitable for use as service equipment and are so marked.

DC rated devices are suitable for use on circuits capable of delivering 50,000 amperes at 600 VDC or 100,000 amperes at 500 VDC, depending upon the rating of the fuses installed.

CATALOG NUMBERS

AMP	2-POLE 2-WIRE 600 VDC	2-POLE 3-WIRE 600 VAC	3-POLE 3-WIRE 600 VAC	3-POLE 4-WIRE 600 VAC	4-POLE 4-WIRE 600 VAC
800/800	EVLDC267-7	EVL367-7N	EVL367-7	**EVL467-7N**	EVL467-7
1200/1200	EVLDC268-8	EVL368-8N	EVL368-8	**EVL468-8N**	EVL468-8
1600/1600	EVLDC269-9	EVL369-9N	EVL369-9	**EVL469-9N**	EVL469-9
2000/2000	EVLDC2610-10	EVL3610-10N	EVL3610-10	**EVL4610-10N**	EVL4610-10
2500/2500		EVL3611-11N	EVL3611-11	**EVL4611-11N**	EVL4611-11
3000/3000		EVL3612-12N	EVL3612-12	**EVL4612-12N**	EVL4612-12

Bus ties are included and installed on the load side of the switch. If alternate line side bus ties are required, specify when ordering.

Type 1 Indoor is standard.* Type 3R Rainproof is optional.

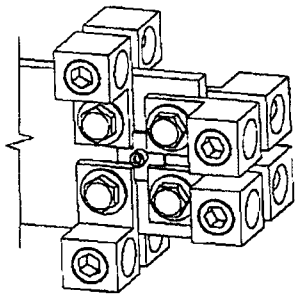
For Make-Before-Break applications, add suffix -C (i.e. EVL368-8-C).

For different ampere ratings on left and right switches, (i.e. 1200/2000) consult factory.

For no-fuse applications, order dummy fuses.

4-Pole 4-Wire switches are for switched neutral applications. The two outermost poles switch the neutral conductors and are not fusible.

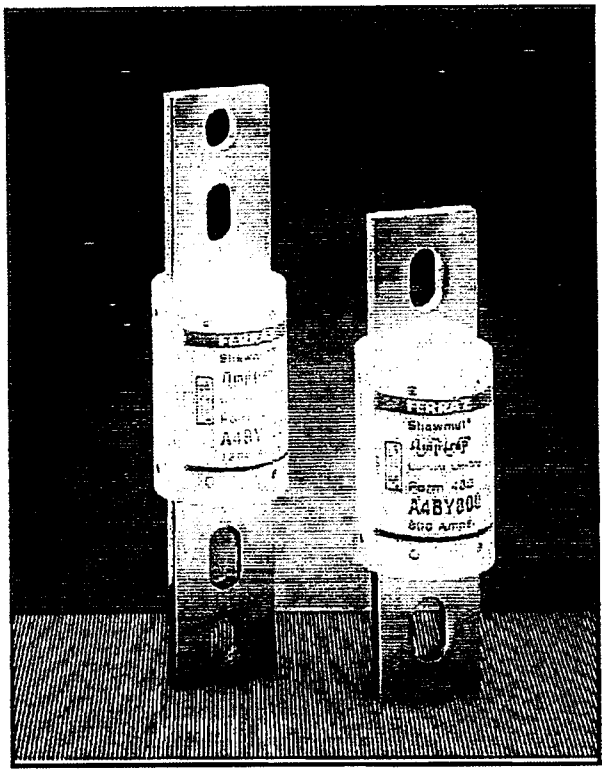
OPTIONAL RA600 TERMINAL LUGS
600 kcmil - 4 CU9AL
Max. 4 Per Terminal on 800 Amp Device
Max. 8 Per Terminal on 1200-3000 Amp Device



boltswitch, inc. 6208 COMMERCIAL ROAD, CRYSTAL LAKE, ILLINOIS 60014

H:\ENG\ART-CAT\BUL-114\BUL-114.VP FEBRUARY 2010

A4BY



COUNT ON THE HIGH INTERRUPTING RATING OF OUR *MOST WIDELY-USED* CLASS L FUSE

When it comes to protecting service entrance equipment, feeder circuits, and circuit breakers, A4BY fuses have been the industry's favorite. The A4BY is a 100% rated device and may be applied at continuous currents up to its ampere rating. A 4-second minimum time delay at 500% rating allows the A4BY to pass normal current surges and to coordinate with ground fault relays.

B

Features/Benefits

- **Unique dimensions** prevent replacement by other fuse classes
- **Blade stamped catalog numbers** for permanent identification
- **Glass melamine body and plated terminals** provide superior reliability in harsh environments

HIGHLIGHTS:

- Current-Limiting 4-Second Time Delay
- DC Ratings
- Uniform Characteristics in all Ampere Ratings

APPLICATIONS:

- Mains, Feeders
- Circuit Breakers
- Loadcenters
- Panelboards
- Switchboards
- Metering Centers

Ratings

- **AC:** 200 to 6,000A 600VAC,200kA I.R.
- **DC:** 200 to 2500A 300VDC, 100kA I.R.

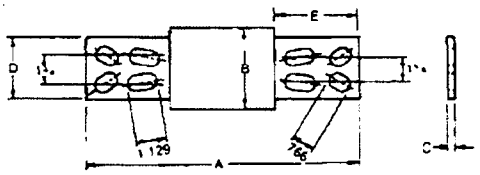
Approvals

- UL Listed to Standard 248-10 (601-6000A) File E2137
- CSA Certified to Standard C22.2 No. 248.10 (601-6000A)
- Ferraz Shawmut Certified for DC per UL248 (601-6000A)

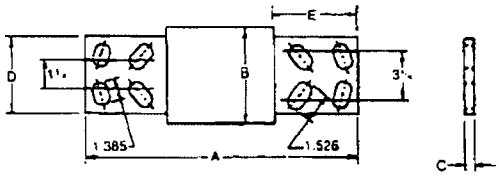
Indicators
Optional built-in fuse indicators (-TI) are available. Consult factory.

CLASS L FUSES

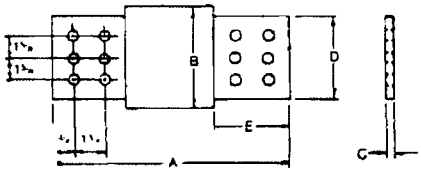
AMPERE RATING	CATALOG NUMBER	AMPERE RATING	CATALOG NUMBER	AMPERE RATING	CATALOG NUMBER
200	A4BY200	801	A4BY801	2000	A4BY2000
250	A4BY250	900	A4BY900	2001	A4BY2001
300	A4BY300	1000	A4BY1000	2200	A4BY2200
350	A4BY350	1100	A4BY1100	2500	A4BY2500
400	A4BY400	1200	A4BY1200	3000	A4BY3000
450	A4BY450	1201	A4BY1201	3001	A4BY3001
500	A4BY500	1350	A4BY1350	3500	A4BY3500
600	A4BY600	1400	A4BY1400	4000	A4BY4000
601	A4BY601	1500	A4BY1500	4001	A4BY4001
650	A4BY650	1600	A4BY1600	4500	A4BY4500
700	A4BY700	1601	A4BY1601	5000	A4BY5000
750	A4BY750	1800	A4BY1800	6000	A4BY6000
800	A4BY800				



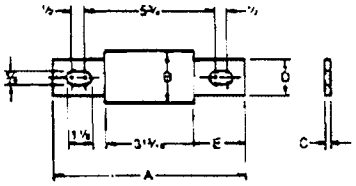
2001-3000A



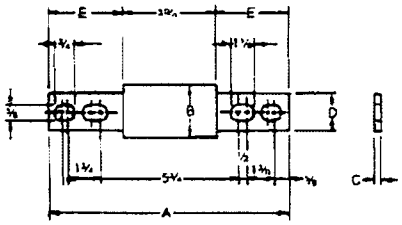
3001-4000A



4001-6000A



200-800A



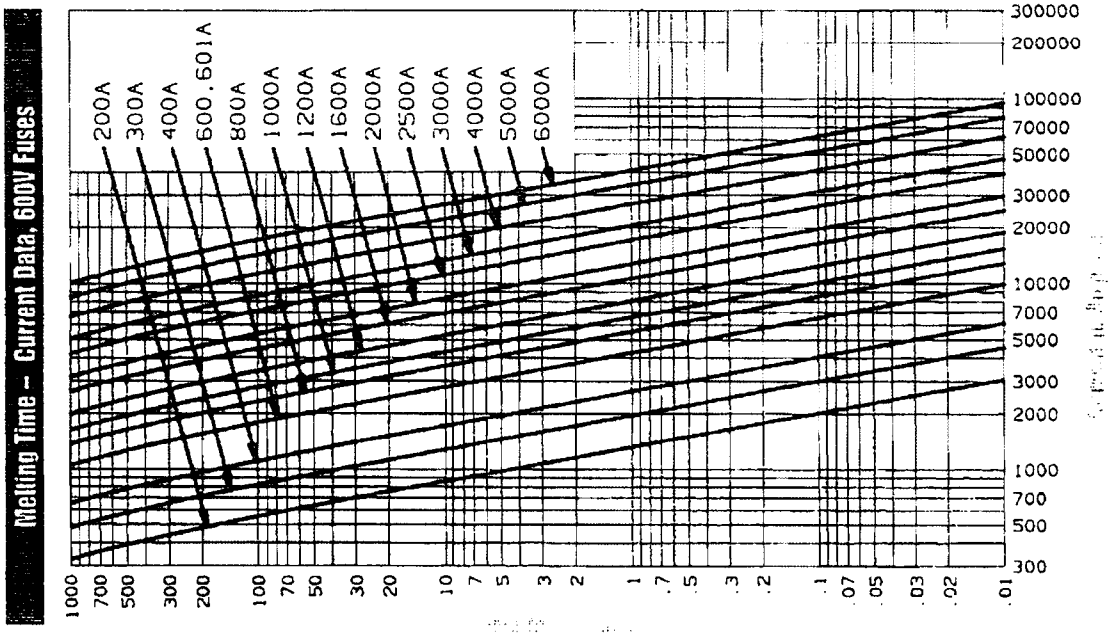
801-2000A

AMPERE RATING	A		B		C		D		E	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
200-600	8-5/8	219	2	51	5/16	8	1-5/8	41	2-13/32	61
601-800	8-5/8	219	2-1/2	63	3/8	9	2	51	2-13/32	61
801-1200	10-3/4	273	2-1/2	63	3/8	9	2	51	3-15/32	88
1201-1600	10-3/4	273	3	76	7/16	11	2-3/8	60	3-15/32	88
1601-2000	10-3/4	273	3-1/2	89	1/2	13	2-3/4	70	3-15/32	88
2001-2500	10-3/4	273	4-1/2	114	3/4	19	3-1/2	89	3-15/32	88
2501-3000	10-3/4	273	5	127	3/4	19	4	102	3-15/32	88
3001-4000	10-3/4	273	5-3/4	146	3/4	19	4-3/4	121	3-15/32	88
4001-5000	10-3/4	273	6-1/4	159	1	25	5-1/4	133	3-15/32	88
5001-6000	10-3/4	273	7-1/8	181	1	25	5-3/4	146	3-15/32	88

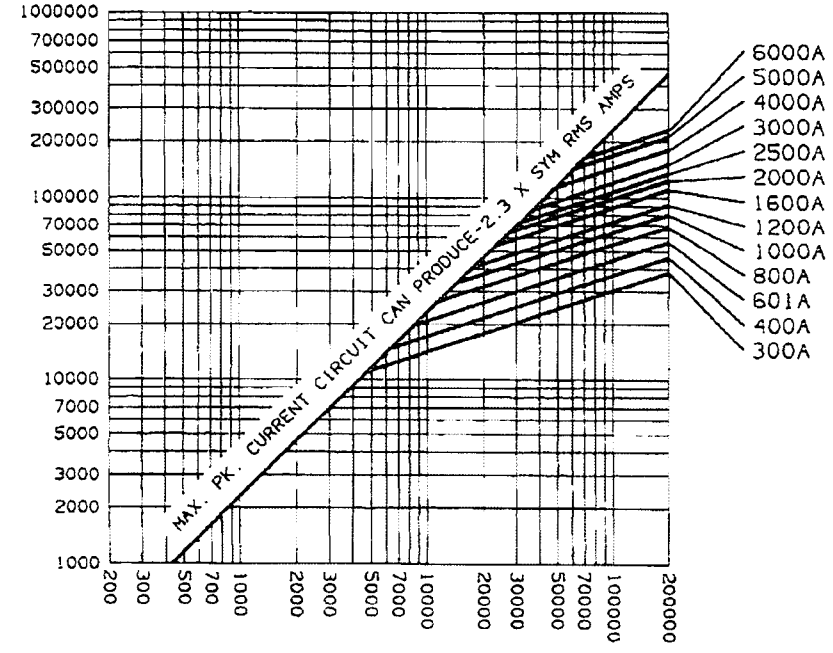
Safety Note: Class L fuses are dimensioned for one-way interchangeability.
A Class L fuse of any lower ampere rating can be substituted for a given Class L fuse.

CLASS L FUSES

A4BY200 to 6000



Peak Let-Thru Current Data – A4BY300 to 6000, 600 Volts AC

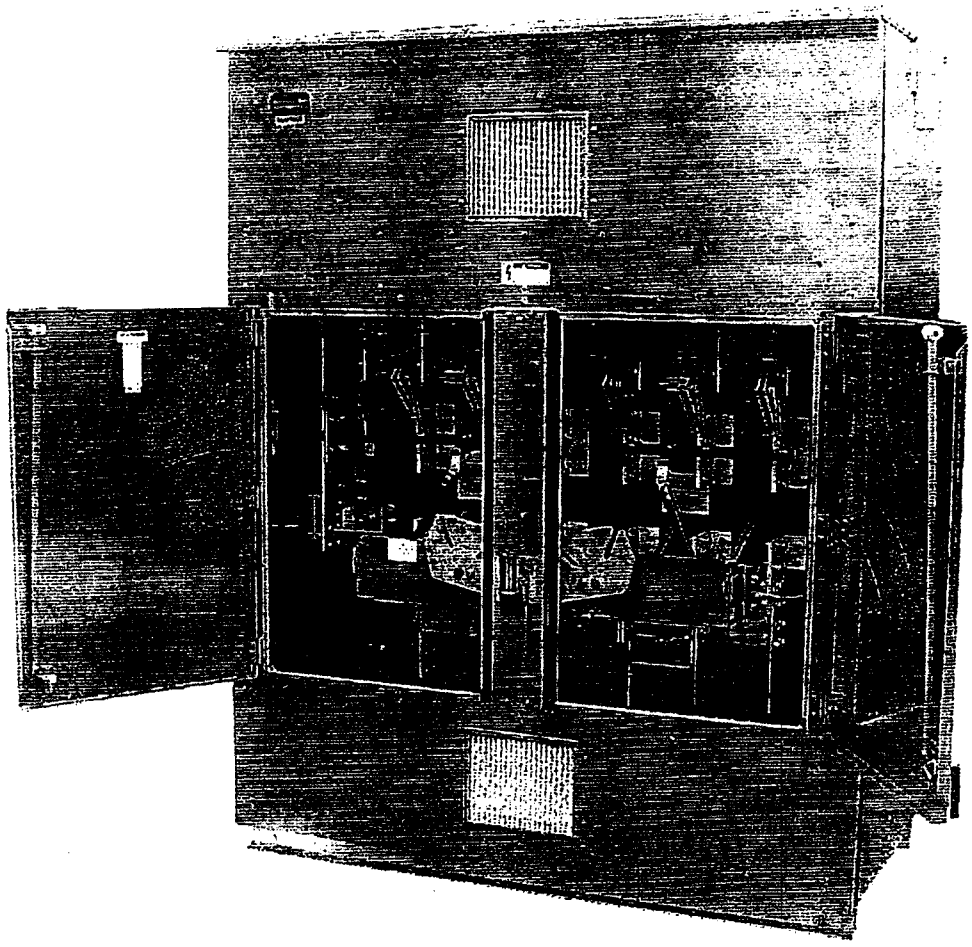


PART NUMBER # *ELV467-7N-S4*

800AMP, 240/120VAC, 3POLE 4 WIRE, SOLID NUETRAL,
NM3R.
NO FUSE

BULLETIN 114

Enclosed Double Throw Fused Power-Circuit Devices



Patented Break-Before-Make Mechanism
Designed for use in accordance with
Article 702 of the National Electrical Code.

Suitable for Use as Service Equipment

Type 1 or Type 3R enclosures
made of lightweight aluminum

200 kA short circuit current rating at
600 VAC with Class L fuses installed

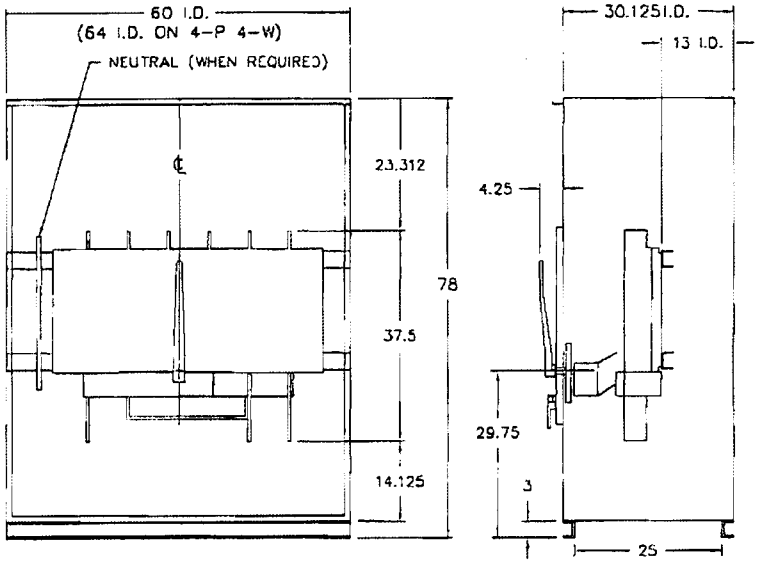
600 VDC ratings available

boltswitch, inc.
6208 COMMERCIAL ROAD
CRYSTAL LAKE, ILLINOIS 60014
Phone 815-459-6900
FAX 815-455-7788
www.boltswitch.com

Enclosed Double Throw Fused Power-Circuit Devices

boltswitch®
bolted pressure contact switches

Enclosed Series VL Geneva



These units are constructed in accordance with UL 977. The switch described in **Bulletin 116** is UL Listed as a "Fused Power-Circuit Device" under File No. E44498.
The enclosure is ETL listed as "Fused Power-Circuit Device Enclosure" under File No. 509803.

AC rated devices are suitable for use on circuits capable of delivering up to 200,000 RMS symmetrical amperes at 600 VAC. These units are suitable for use as service equipment and are so marked.

DC rated devices are suitable for use on circuits capable of delivering 50,000 amperes at 600 VDC or 100,000 amperes at 500 VDC, depending upon the rating of the fuses installed.

CATALOG NUMBERS

AMP	2-POLE 2-WIRE 600 VDC	2-POLE 3-WIRE 600 VAC	3-POLE 3-WIRE 600 VAC	3-POLE 4-WIRE 600 VAC	4-POLE 4-WIRE 600 VAC
800/800	EVLDC267-7	EVL367-7N	EVL367-7	EVL467-7N	EVL467-7
1200/1200	EVLDC268-8	EVL368-8N	EVL368-8	EVL468-8N	EVL468-8
1600/1600	EVLDC269-9	EVL369-9N	EVL369-9	EVL469-9N	EVL469-9
2000/2000	EVLDC2610-10	EVL3610-10N	EVL3610-10	EVL4610-10N	EVL4610-10
2500/2500		EVL3611-11N	EVL3611-11	EVL4611-11N	EVL4611-11
3000/3000		EVL3612-12N	EVL3612-12	EVL4612-12N	EVL4612-12

Bus ties are included and installed on the load side of the switch. If alternate line side bus ties are required, specify when ordering.

Type 1 Indoor is standard. Type 3R Rainproof is optional.

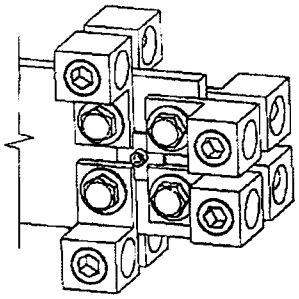
For Make-Before-Break applications, add suffix -C (i.e. EVL368-8-C).

For different ampere ratings on left and right switches, (i.e. 1200/2000) consult factory.

For no-fuse applications, order dummy fuses.

4-Pole 4-Wire switches are for switched neutral applications. The two outermost poles switch the neutral conductors and are not fusible.

OPTIONAL RA600 TERMINAL LUGS
600 kcmil - 4 CU9AL
Max. 4 Per Terminal on 800 Amp Device
Max. 8 Per Terminal on 1200-3000 Amp Device



boltswitch, inc. 6208 COMMERCIAL ROAD, CRYSTAL LAKE, ILLINOIS 60014

H:\ENG\ART-CAT\BUL-114\BUL-114.VP FEBRUARY 2010

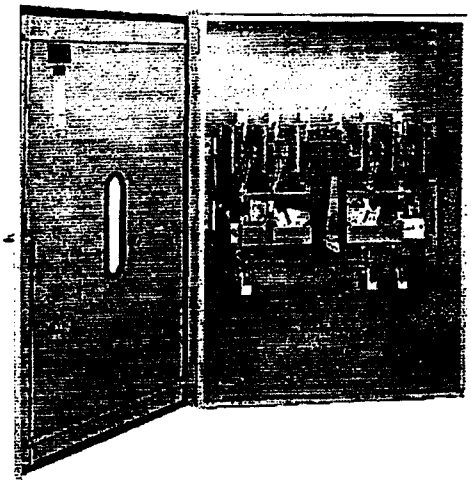
PART NUMBER # *ET465-5N*

400AMP, 600VAC, 3POLE 4 WIRE, SOLID NUETRAL, NM3R.
NO FUSE

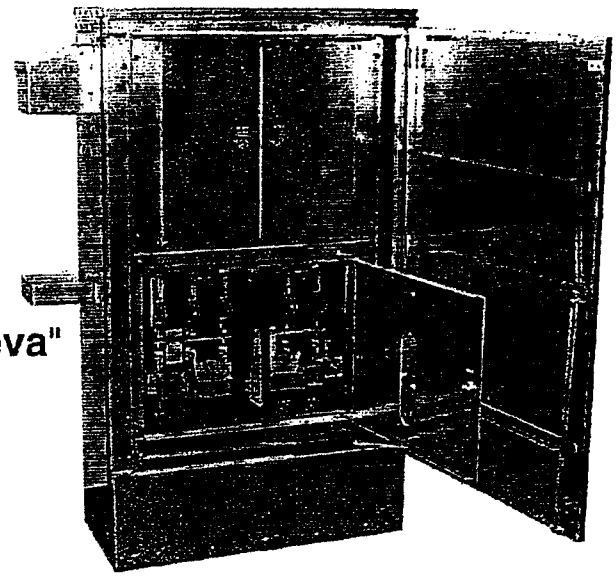
400 and 600 amp
class T fusible
manual transfer switches

Bulletin 136

enclosed series T & GT "geneva"



series T "geneva"



series GT "geneva"

c UL US

Constructed in accordance with UL98, and listed as "Enclosed Switches" under File No. E38735.

Suitable for use on circuits capable of delivering 200,000 RMS symmetrical amperes at rated voltage (or 50,000 amperes at 125 volts DC), with class T fuses installed.

Suitable for use as service equipment (S.U.S.E.).

Indoor/outdoor (Type 3R) construction.

Positive Quick-Make Quick-Break contacts.

Patented Break-Before-Make operating mechanism, designed for use on optional standby systems so to prevent the inadvertent interconnection of normal and alternate power sources.

boltswitch,® inc.

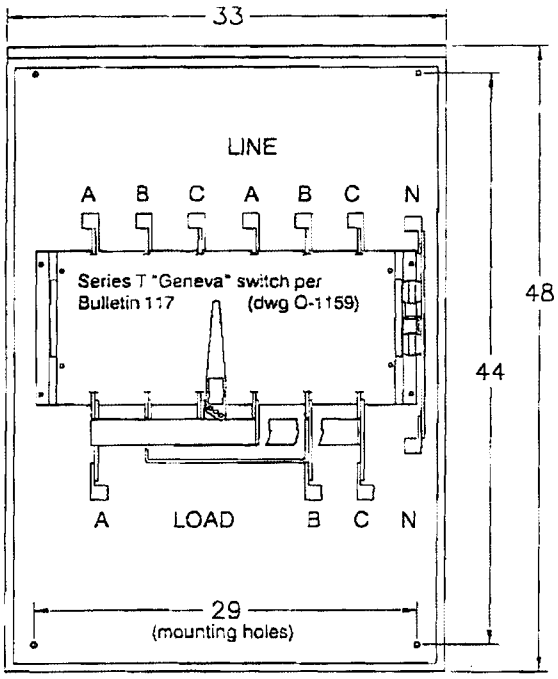
6208 COMMERCIAL ROAD
CRYSTAL LAKE, IL 60014
PHONE 815-459-6900
FAX 815-455-7788
www.boltswitch.com

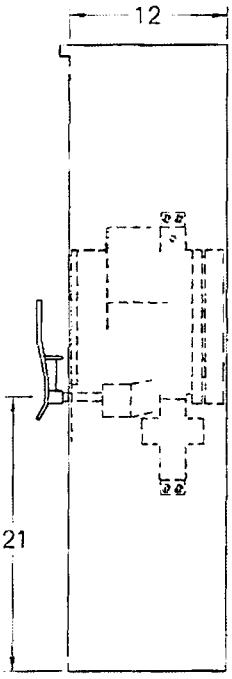
400 and 600 ampere
class T fusible
manual transfer switches

boltswitch®
bolted pressure contact switches

enclosed series T "geneva"

Ideal for use as the service entrance main when there is a permanently installed generator or alternate power source.





3-Pole, 4-Wire switch illustrated.

Enclosure is 14 ga. steel painted ASA 61 grey.

Bus ties are included and mounted on the load side of the switch.

Intended for wall mounting.

Terminal lugs are included as follows:
400 amp
(2) 250kcmil - 6 CU9AL
600 amp
(2) 350kcmil - 6 CU9AL

SERIES T CATALOG NUMBERS

VOLTAGE	AMP	2P - 2W	2P - 3W *	3P - 3W	3P - 4W *
240 AC (or 125 DC if specified)	400	ET225-5	**ET325-5N**	ET325-5	**ET425-5N**
	600	ET226-6	**ET326-6N**	ET326-6	**ET426-6N**
600 AC	400	ET265-5	**ET365-5N**	ET365-5	**ET465-5N**
	600	ET266-6	**ET366-6N**	ET366-6	**ET466-6N**

* Marked Suitable For Use As Service Equipment (S.U.S.E.).

Approximate net weight is 225 lbs.

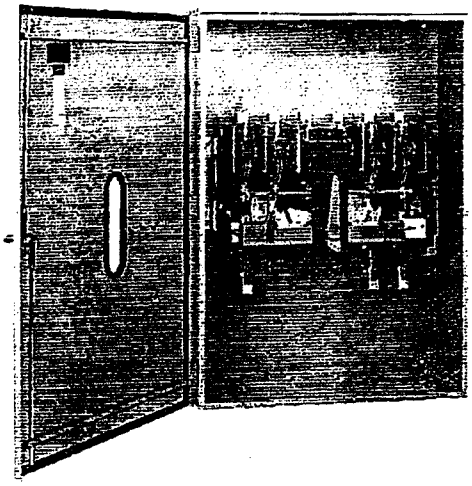
PART NUMBER # *ET425-5N*

400AMP, 240VAC, 3POLE 4 WIRE, SOLID NUETRAL, NM3R.
FUSED @ 400 AMP ON NORMAL POWER.

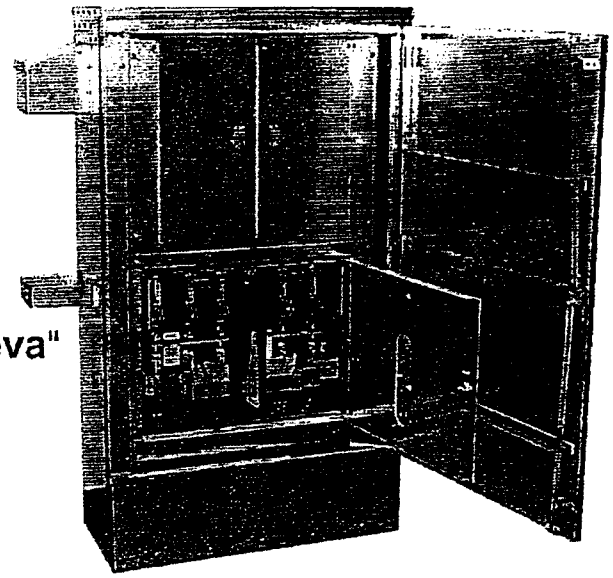
400 and 600 amp
class T fusible
manual transfer switches

Bulletin 136

enclosed series T & GT "geneva"



series T "geneva"



series GT "geneva"

c UL US

Constructed in accordance with UL98, and listed as "Enclosed Switches" under File No. E38735.

Suitable for use on circuits capable of delivering 200,000 RMS symmetrical amperes at rated voltage (or 50,000 amperes at 125 volts DC), with class T fuses installed.

Suitable for use as service equipment (S.U.S.E.).

Indoor/outdoor (Type 3R) construction.

Positive Quick-Make Quick-Break contacts.

Patented Break-Before-Make operating mechanism, designed for use on optional standby systems so to prevent the inadvertent interconnection of normal and alternate power sources.

boltswitch® inc.

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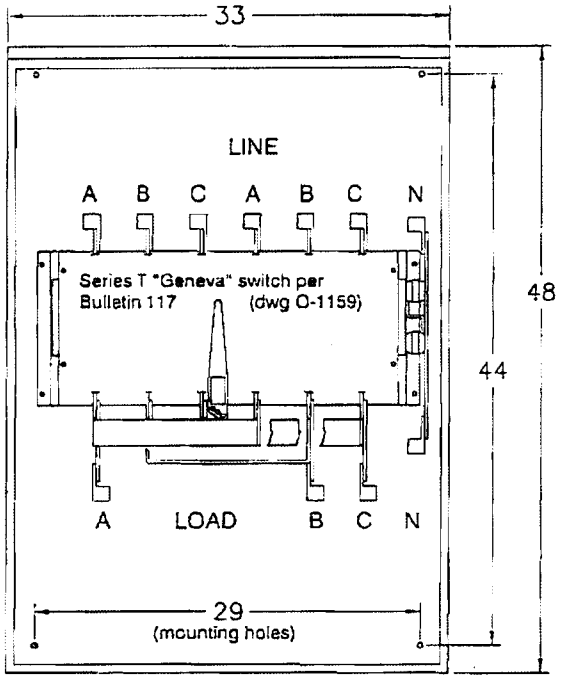
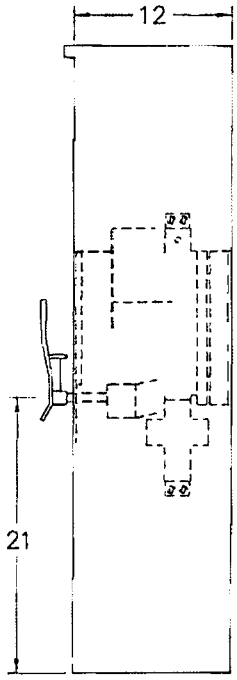




3-Pole, 4-Wire switch illustrated.

Enclosure is 14 ga. steel painted ASA 61 grey.

Bus ties are included and mounted on the load side of the switch.

Intended for wall mounting.

Terminal lugs are included as follows:
400 amp
(2) 250kcmil - 6 CU9AL
600 amp
(2) 350kcmil - 6 CU9AL

SERIES T CATALOG NUMBERS

VOLTAGE	AMP	2P - 2W	2P - 3W *	3P - 3W	3P - 4W *
240 AC (or 125 DC if specifiec)	400	ET225-5	**ET325-5N**	ET325-5	**ET425-5N**
	600	ET226-6	**ET326-6N**	ET326-6	**ET426-6N**
600 AC	400	ET265-5	**ET365-5N**	ET365-5	**ET465-5N**
	600	ET266-6	**ET366-6N**	ET366-6	**ET466-6N**

* Marked Suitable For Use As Service Equipment (S.U.S.E.).

Approximate net weight is 225 lbs.

A3T & A6T

FAST ACTING/

THESE SMALL DIMENSION FUSES ARE THE RIGHT FIT... FOR A TIGHT FIT

Fast acting A3T and A6T Class T fuses combine two highly desirable features -- high current limitation and a small physical size. Their unique dimensions prevent the substitution of other fuses with lower voltage ratings or current limiting capability. These fuses have glass melamine bodies for superior dimensional stability and catalog numbers stamped into the blades for permanent identification.

B

HIGHLIGHTS:

- Fast Acting
- Extremely Current Limiting
- Small Physical Size
- DC Ratings

APPLICATIONS:

- Loadcenters
- Panelboards
- Switchboards
- Circuit Breakers
- Metering Centers

Features/Benefits

- **Extremely current limiting** for low peak let-thru current
- **Unique dimensions** prevent replacement by other fuse classes
- **Blade-stamped catalog numbers** for permanent identification
- **Small physical size** for greater design flexibility

Ratings

- **A3T**
  AC: 1 to 1200A
  300VAC, 200kA I.R.
  DC: 1 to 1200A
  160VDC, 50kA I.R.
- **A6T**
  AC: 1 to 800A
  600VAC, 200kA I.R.
  DC: 1 to 800A
  300VDC, 100kA I.R.

Approvals

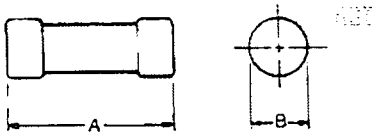
- UL Listed to Standard 248-15 File E2137
- CSA Certified to Standard C22.2 No. 248.15
- DC Listed to UL Standard 248

Ampere Rating	Catalog Number			
	300V		600V	
	1-pole	3-pole	1-pole	3-pole
30	30306T	30308T	60306T	60308T
60	30606T	30608T	60606T	60608T
100	31031T	31033T	61031T	61033T
200	32031T	32033T	62031T	62033T
400	34031T	34033T	64031T	-
600	36031T	-	66031T	-

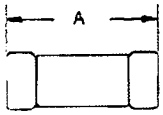
A variety of pole configurations and termination provisions are available. Refer to the fuse block section of this catalog for details.

FAST ACTING/CLASS T FUSES

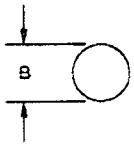
Ampere Rating	Catalog Number 300V	Catalog Number 600V	Ampere Rating	Catalog Number 300V	Catalog Number 600V	Ampere Rating	Catalog Number 300V	Catalog Number 600V
1	A3T1	A6T1	60	A3T60	A6T60	300	A3T300	A6T300
3	A3T3	A6T3	70	A3T70	A6T70	350	A3T350	A6T350
5	A3T6	A6T6	80	A3T80	A6T80	400	A3T400	A6T400
10	A3T10	A6T10	90	A3T90	A6T90	450	A3T450	A6T450
15	A3T15	A6T15	100	A3T100	A6T100	500	A3T500	A6T500
20	A3T20	A6T20	110	A3T110	A6T110	600	A3T600	A6T600
25	A3T25	A6T25	125	A3T125	A6T125	700	A3T700	A6T700
30	A3T30	A6T30	150	A3T150	A6T150	800	A3T800	A6T800
35	A3T35	A6T35	175	A3T175	A6T175	1000	A3T1000	
40	A3T40	A6T40	200	A3T200	A6T200	1200	A3T1200	
45	A3T45	A6T45	225	A3T225	A6T225			
50	A3T50	A6T50	250	A3T250	A6T250			

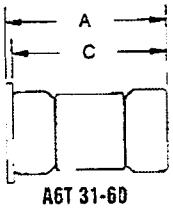


A3T 1-60

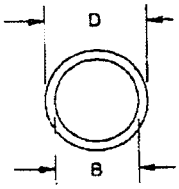


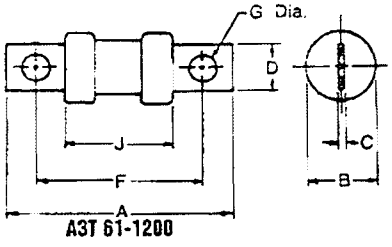
A6T 1-30



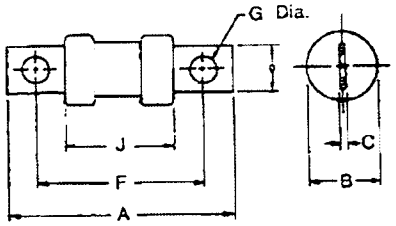


A6T 31-60





A3T 61-1200

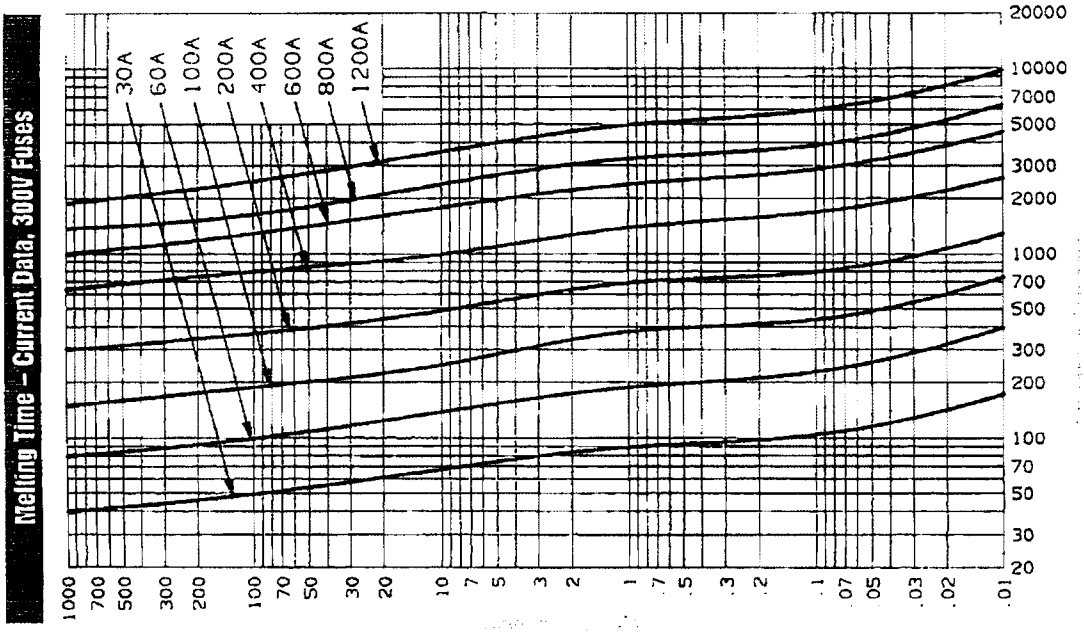


A6T 61-800

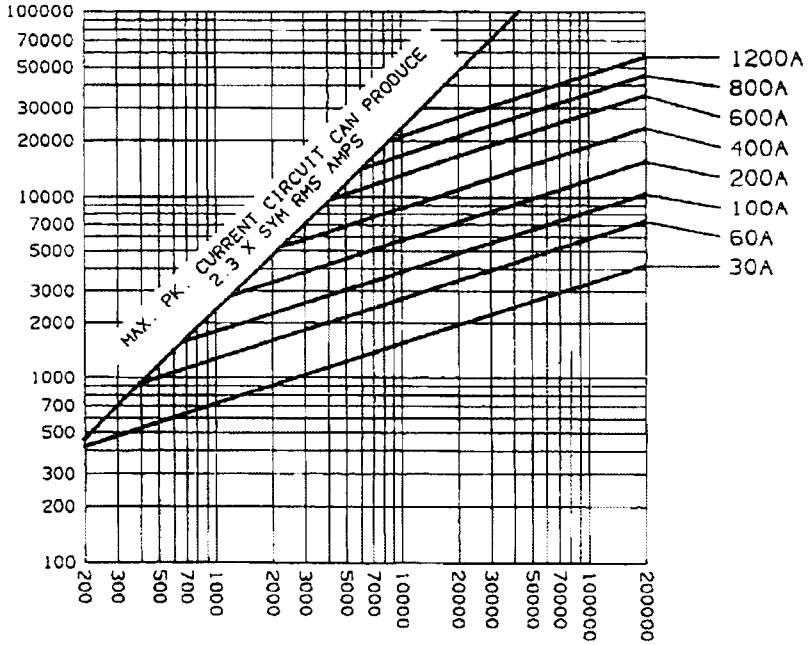
AMPERE RATING	A In.	A mm	B In.	B mm	C In.	C mm	D In.	D mm	F In.	F mm	G In.	G mm	J In.	J mm
A3T														
1-30	.88	22.4	.41	10.3	-	-	-	-	-	-	-	-	-	-
31-60	.88	22.4	.56	14.1	-	-	-	-	-	-	-	-	-	-
61-100	2.16	54.9	.81	20.6	.12	3.2	.75	19.0	1.56	39.6	.28	7.1	.82	20.8
101-200	2.44	62.0	1.06	26.9	.19	4.8	.88	22.4	1.70	43.2	.34	8.6	.83	21.1
201-400	2.75	69.8	1.33	33.8	.25	6.4	1.00	25.4	1.84	46.7	.41	10.4	.84	21.3
401-600	3.06	77.7	1.62	41.1	.31	7.8	1.25	31.8	2.03	51.6	.48	12.2	.84	21.3
601-800	3.38	85.8	2.08	52.8	.38	9.7	1.75	44.4	2.22	56.4	.55	14.0	.86	22.4
801-1200	4.00	102	2.52	64.0	.44	11.2	2.00	50.8	2.53	64.3	.61	15.5	1.03	26.2
A6T														
1-30	1.50	38.1	.57	14.5	-	-	-	-	-	-	-	-	-	-
31-60	1.57	39.9	.81	20.6	1.51	38.4	1.00	25.4	-	-	-	-	-	-
61-100	2.95	75.0	.82	20.8	.12	3.2	.75	19.0	2.35	59.7	.28	7.1	1.58	40.1
101-200	3.25	82.6	1.07	27.2	.19	4.8	.88	22.4	2.51	63.7	.34	8.6	1.61	41.0
201-400	3.62	92.1	1.62	41.3	.25	6.4	1.00	25.4	2.72	69.1	.41	10.4	1.70	43.2
401-600	3.98	101.2	2.06	52.4	.31	7.9	1.25	31.8	2.95	75.0	.48	12.2	1.70	43.2
601-800	4.33	110.0	2.50	63.5	.37	9.5	1.75	44.4	3.17	80.5	.56	14.1	1.70	43.2

FAST ACTING/CLASS T FUSES

A3T30 to 1200

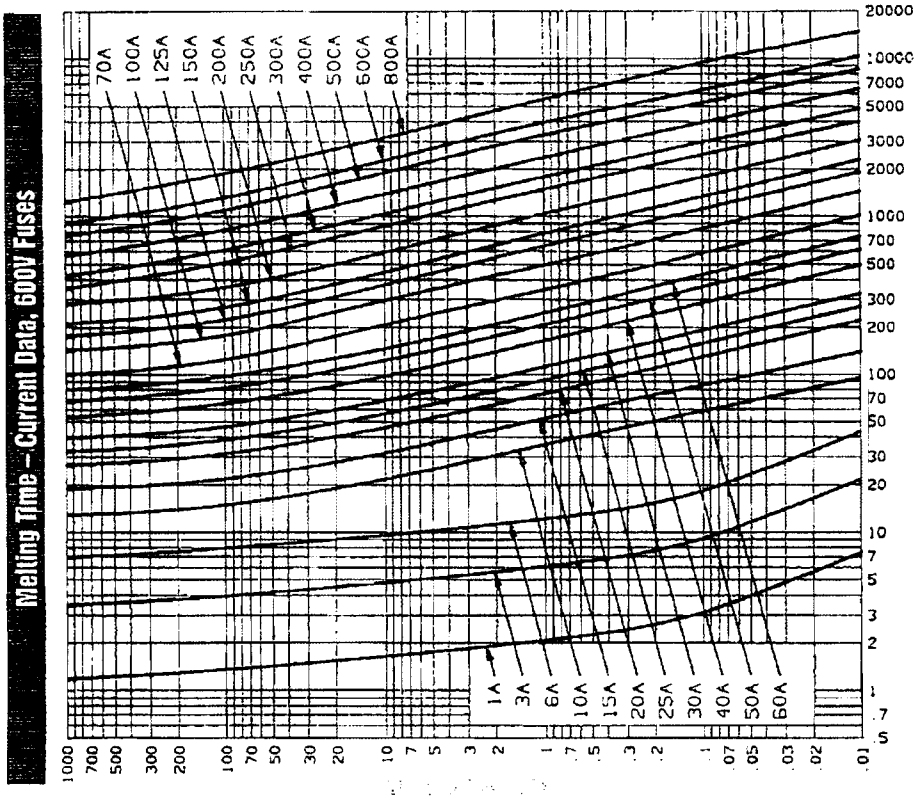


Peak Let-Thru Current Data – A3T30 to 1200, 300 Volts AC



FAST ACTING/CLASS T FUSES

A6T1 to 800



Peak Let-Thru Current Data – A6T30 to 800, 600 Volts AC