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on DEMAND **on** CALL

KOHLER® Controls
DEC4000

KOHLER®

GENERATOR SET CONTROLLER

DEC4000

THE KOHLER® DEC4000 CONTROLLER is fitted as standard, or as an option, to all our generator sets to ensure efficient operation and surveillance of your installation. Streamlined and modernized, the new generation DEC4000 offers new functions in addition to those taken from the previous version. In its basic configuration, it is able to cover 80 percent of standard applications.

The DEC4000 offers a large LCD display and unique scroll wheel for quick-viewing selections. More than ever, Kohler has placed the emphasis on the user-friendliness of its product, the particular strength being communication (USB connections, PC connections, control software and remote operation).

SIMPLICITY

The straightforward DEC4000 interface ensures it is easy to use: START button, STOP button, MENU button, ESCAPE button and three LEDs (operation, alarm and fault). The scroll selection wheel makes this interface particularly easy to operate, as it allows you to scroll through the menus and make selections with a single touch.

USER-FRIENDLINESS

The DEC4000 has a large, backlit screen, the contrast for which does not need to be adjusted. This feature makes the controller a pleasure to use, whether inside or out, both day and night. The drop-down menus and descriptions ensure that no further explanation is needed. The integrated maintenance tool warns you of future servicing requirements and the diagnostics aid guides you through any alarms or faults signalled by the DEC4000. Pictograms ensure that all information given can be immediately understood.

MODULARITY

The DEC4000 fits the same footprint as the DEC1000, to facilitate upgrades and replacements. To improve the control of your parameters and increase the potential of your installation, two cards can be connected to the DEC4000 (Inputs/Outputs, Speed/Voltage adjustment). Certain aftermarket options can also be added to update the product and/or to personalize your generator sets.

COMMUNICATION

The generator set can be controlled and operating parameters viewed remotely—without having to install specific software—via a computer network, a landline telephone network or a mobile telephone network. The USB ports ensure that it is easy to remotely view any events connected to the operation of the generator sets, to change parameters or to update the software. Also, the DEC4000 is multilingual as standard and includes optional languages (Arabic, Chinese, Russian).

Generator Model 50 Hz	Generator Model 60 Hz	DEC1000 Controller	DEC4000 Controller
All KM models	All KM models	Standard	Option
KD22 – KD300	KD20U – KD275U	Standard	Option
KD400 – KD440	KD350U – KD400U	Not Available	Standard
KV220	KV200U	Standard	Option
KV275 – KV630	KV250U – KV550U	Not Available	Standard

The DEC4000 has been developed following a process which exacts the highest quality. It complies with all major European, American and International standards and directives:

- Electromagnetic Compatibility (EMC) general standards:
EN 61000-6-2 and EN 61000-6-4 (emission and protection)
- Low voltage standards
- Salt spray test performance: in accordance with standard EN 68011-2-11
- Protection index of a DEC4000 mounted to a console:
IP31 with the soft USB port protective cover fitted (according to EN 60529)
- UL and CSA standards

In addition, the DEC4000 complies with directives 2002/95/CE and 2002/96/CE, which relate to Electrical and Electronic Equipment (DEEE).



KV400U generator, shown with DEC4000 controller



KV630 generator, shown with DEC4000 controller

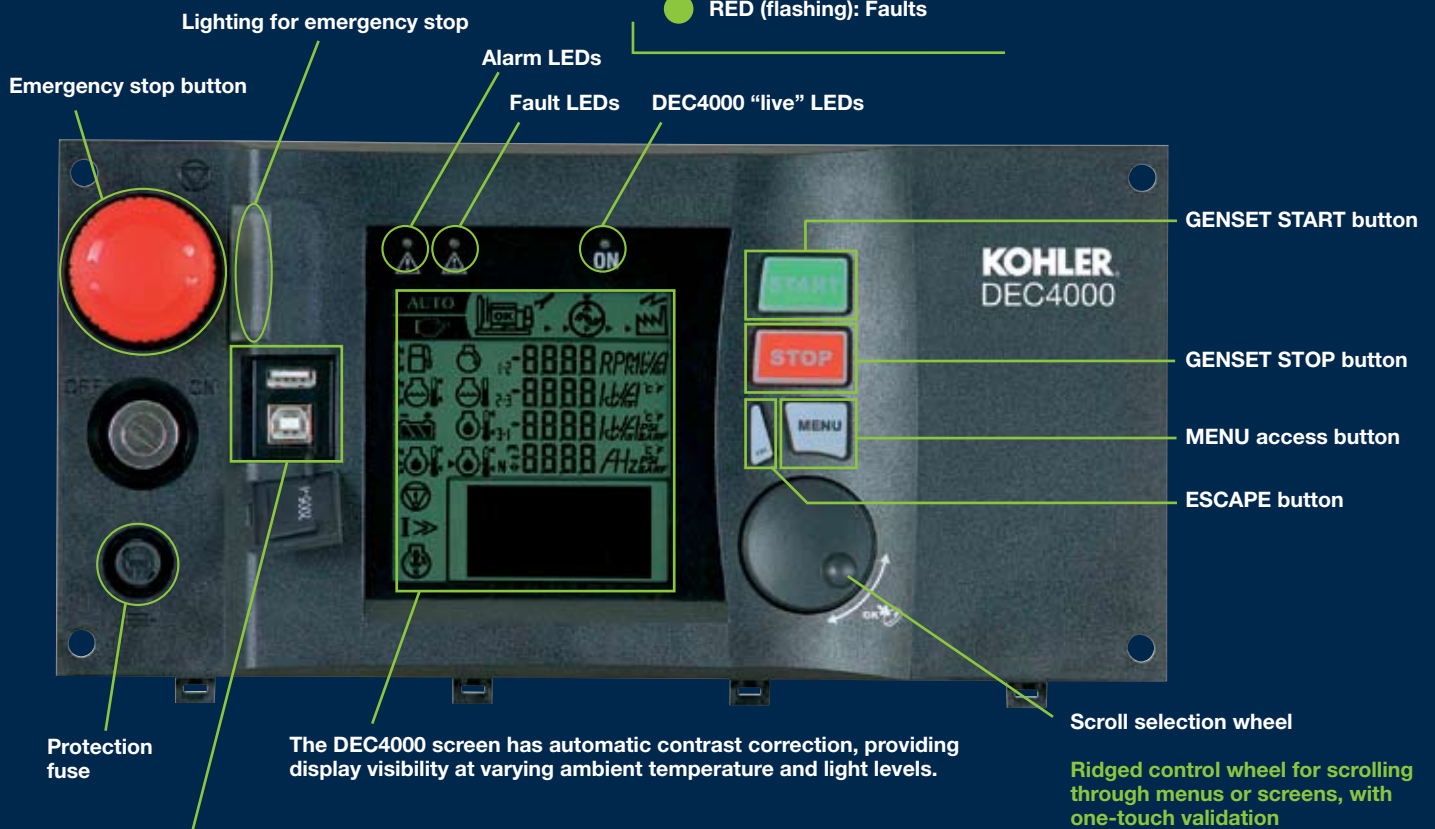
GENERATOR SET CONTROLLER

PRESENTATION OF THE DEC4000

THE DEC4000 DESIGN offers a simple interface and scroll selection wheel.

Operation and alarm and fault warning LEDs:

- GREEN (constant): DEC4000 operating
- YELLOW (flashing): Alarms
- RED (flashing): Faults



Lighting for emergency stop

Emergency stop button

Alarm LEDs

Fault LEDs

DEC4000 "live" LEDs

GENSET START button

GENSET STOP button

MENU access button

ESCAPE button

Protection fuse

The DEC4000 screen has automatic contrast correction, providing display visibility at varying ambient temperature and light levels.

Scroll selection wheel

Ridged control wheel for scrolling through menus or screens, with one-touch validation

Two USB ports under a sealed cover

Two USB ports for configuration, maintenance or updating the product, for example:

- Transfer of the configuration parameters (DEC4000 -> USB key)
- Updating the software (USB key -> DEC4000)
- Modification of the DEC4000 configuration (PC -> DEC4000)
- Setting up a new language (USB key -> DEC4000)

Display

The large personalized DEC4000 screen makes different information easy to read (pictograms, measurements and messages). Its backlit design gives it a contrast which is adapted to all types of ambient light. The section with graphics is split into four zones.

ZONE 1

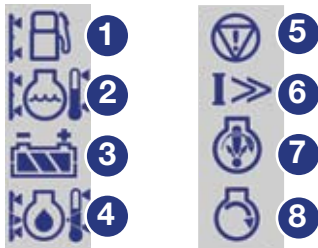
Zone 1 informs the user of the generator set operating mode.



- 1 Manual or automatic mode
- 2 Generator set operating - voltage and frequency stable
- 3 The generator set is powered by the installation (flashing arrows)
- 4 Maintenance indicator

ZONE 2

In Zone 2, the function pictograms are displayed: measurements, alarms or faults.



- 1 Fuel Level
- 2 Coolant temperature and level
- 3 Battery voltage and charge level
- 4 Oil pressure, temperature and level
- 5 Emergency stop
- 6 Overload
- 7 Failure to start, underspeed and overspeed
- 8 Engine speed

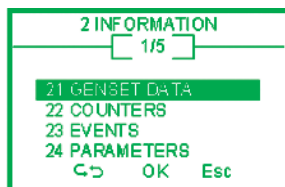
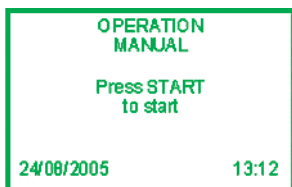
ZONE 3

In Zone 3, the electrical and mechanical values and the associated units of measurement are shown.

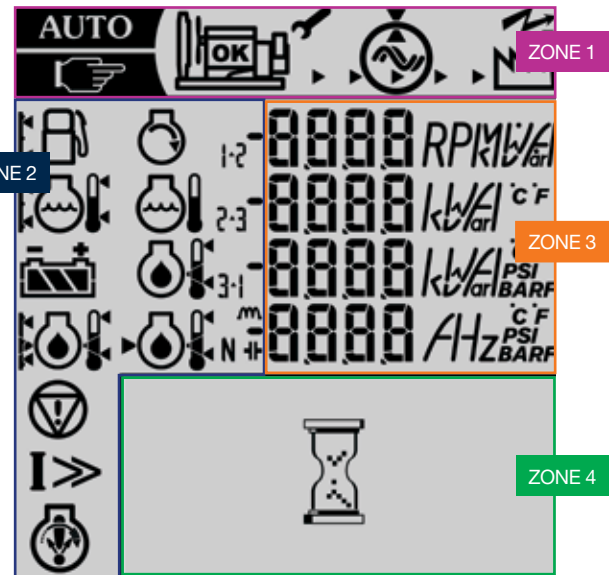


ZONE 4

The menus and messages connected to the operation of the generator set are found in Zone 4.



DEC4000 SCREEN



EXAMPLE OF SCREEN, GENSET STOPPED

AUTO	Genset in automatic mode, stopped
B 80 %	Fuel level indicator
11 °C	Coolant temperature indicator (units according to settings menu)
252 V	Battery voltage indicator
12 °C	Oil temperature indicator (units according to settings menu)
OPERATION AUTO WARNING START UP POSSIBLE IMMEDIATELY	Warning message
24/08/2005 13:12	

EXAMPLES OF SCREEN, GENSET RUNNING

AUTO	Genset in automatic mode, starting in progress
600 RPM	Engine speed indicator
48 °C	High coolant temperature indicator (units according to settings menu)
17 bar	Oil pressure indicator (units according to settings menu)
43 °C	Oil temperature indicator (units according to settings menu)
STARTING IN PROGRESS	Information message
24/08/2005 13:12	

AUTO	Genset in automatic mode, powered by the installation
B 80 %	Fuel level indicator
402 V	Voltage-supplied indicator
226 kW	Indicator of active power drawn from the installation
502 Hz	Current frequency indicator
AVAILABLE POWER 75%	Bar graph of available power
24/08/2005 13:12	

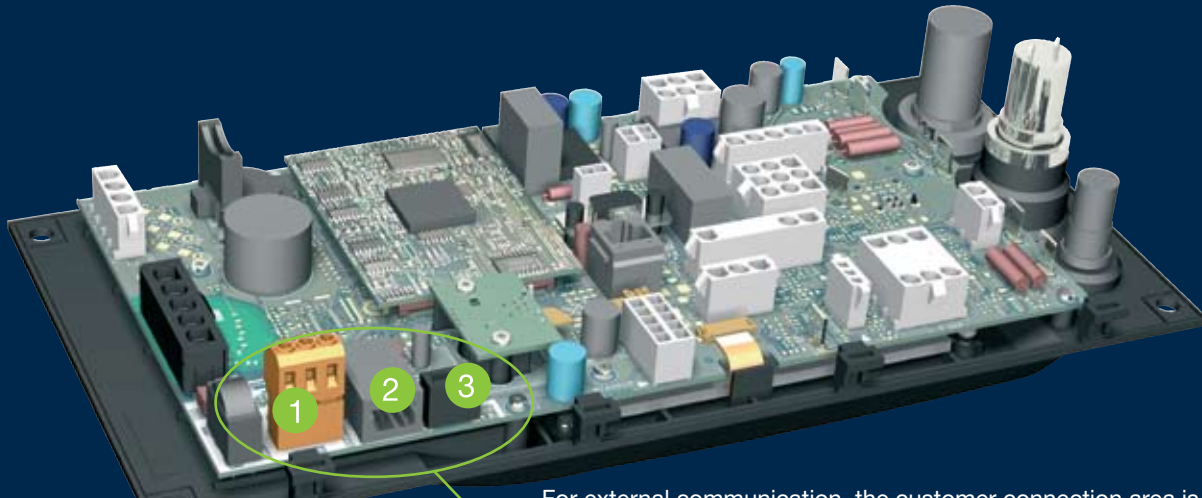
AUTO	Genset in manual mode
12 404 V	Indicator of the three V phase voltages (individual line-to-line voltages)
23 403 V	
31 403 V	
502 Hz	Current frequency indicator
FAULT ALARM Low Fuel level 29/12/05 15:30	Warning message
OH-HELP	

GENERATOR SET CONTROLS

DEC4000 / COMPONENTS

Main Board

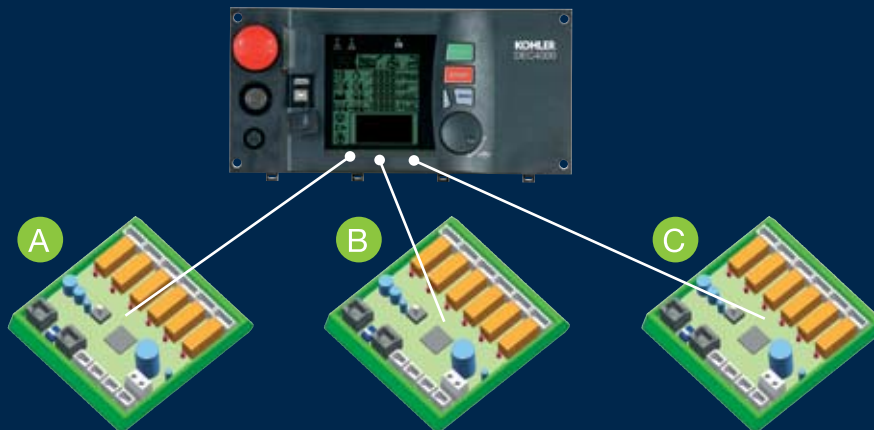
The standard version of the DEC4000 consists of a main board and a Human Machine Interface (HMI). This board is available in two versions, to ensure that all types of engines (electronic, traditional or mixed engines) can be managed.



For external communication, the customer connection area is marked in white and offers three connection possibilities, for controlling and displaying parameters and remote operation.

- 1 RS 485 PORT - For specialized communication
- 2 ETHERNET PORT - For connection to a modem or for working on the intranet
- 3 USB HOST PORT - For connecting a USB key

Optional Cards



- A 1 input/output card** — The input/output module enables additional inputs and outputs to be provided, as a supplement to those already available on the main board. Up to five input/output modules can be used for additional alarms or faults and outputs can be used for data transfers or to control options.
The input/output module is composed of four inputs and six outputs. A green LED is used to check the status of each output.
- B 1 card for speed and voltage trimming** — This card enables the engine speed and voltage supplied by the generator set to be adjusted.
- C 1 coupling card (1 for each generator set)** — The coupling card enables two types of configuration:
 - coupling between generator sets (without grid)
 - temporary coupling of a generator set to a grid

Standard Specifications

ELECTRICAL MEASUREMENTS	ENGINE MEASUREMENTS
Single voltages	Fuel level (%)
Composite voltages	Oil pressure (Bar/Psi)
Frequency	Coolant temperature (°C/°F)
Active/reactive/apparent power	Oil temperature (°C/°F)
Power factor	Battery voltage
Total and partial counter	Charging alternator current
Total and partial active/reactive power meter	Engine speed
Currents	

SAFETY FEATURES
Min/Max alternator voltage
Min/Max alternator frequency
Min/Max battery voltage
Overload and/or short circuit
Active/reactive power return
Oil pressure
Coolant temperature
Overspeed
Underspeed

Accessory Options

CM402	Prewiring for auto start-up
CM403	Automatic Pack (Charger (12 V) + Engine preheating 220/240 V (Relay + resistance))
CM404	Automatic Pack (Charger (24 V) + Engine preheating 220/240 V (Relay + resistance))
CM406B	Adjustable mains detection in the control unit
CM407	On-screen display for analog variables (Oil pressure/Water temp.)
CM408	Remote starter unit
CM409	Battery ammeter
CM410	Voltage trimming
CM411	Speed trimming (If elec regulator is possible and selected)
CM412	Sound alarm fitted in the control unit
CM415	Safety feature for low coolant level
CM416	Low fuel level safety feature for chassis tank (Alarm as standard)
CM418	Earth-fault protection 30 or 300 mA (Non adjustable <= 50 A)
CM419	Earth-fault protection 30 or 300 mA (Non adjustable <= 125 A)
CM420	Adjustable earth-fault protection
CM603	Low coolant temperature
CM604	Charger fault (24 V)
CM605	EJP pack (Detection, warning management, forcing key) (France only)
CM607	Central processing unit with neutral (ITAN) (France only)
CM608	Central processing unit without neutral (ITSN) (France only)
CM610	NFPA110 module level 1 (60 Hz only)
CM611	NFPA Visible transfer unit
CM613	GES pack fitted on the genset (60 Hz only) (France only)
CM615	Genset information transfer and inhibition unit
CM616	Low fuel level safety feature for separate tank
CM617	Low fuel level alarm for separate tank

INFORMATION REPORT	
CE100	Fixed distance report pack (Genset running, General fault, Low fuel level fault or alarm)
CE220	Configurable distance report pack (six report maximum)
CE221	Genset ON
CE222	Genset in automatic mode
CE223	Genset in non-automatic mode
CE224	Genset in manual mode
CE225	Genset in test mode
CE226	Genset in stop mode
CE22A	General fault
CE22B	Nonstarting fault
CE22C	Oil pressure fault
CE22D	Water temperature fault
CE22E	Low level fault
CE22F	Overspeed fault
CE22G	Alternator voltage fault
CE22I	Overload fault
CE22J	Emergency stop triggered fault
CE22K	Bulk tank fault (Separate tank)
CE22L	Earth-fault triggered
CE22M	Fuel level low for exterior tank fault
CE22S	General alarm
CE22T	Low fuel level alarm
CE22U	Loss of coolant preheating alarm
CE22V	Min battery voltage alarm
CE22W	Battery charger fault alarm
EXTERNAL COMMUNICATION	
CEA12	Remote control via local ETHERNET network or RS485 Mod Bus
CEA52	Remote control via Public Switched Telephone Network
CEA72	Remote control via Global System for Mobile Communications

- Five basic languages: English, French, German, Portuguese, Spanish, (Arabic, Chinese and Russian optional).
- Integrated software accessible via an Internet browser, enabling certain parameters to be modified, DEC4000 data to be displayed and the genset to be remotely controlled.
- Integrated maintenance tool displaying future servicing requirements.
- Integrated fault finding tool aiding the user in the event of any alarms and/or faults.
- Ability to send e-mail, Short Message System or fax in the event of any alarms or faults (optional).
- Operation at -20°C to +60°C.
- Humidity: 95% at 45°C, 70% at 50°C, 50% at 60°C. Optional tropical conformal coating of the circuit boards provide protection in extremely humid environments.
- Different levels of access to the configuration parameters.

Kohler Asia Pacific Headquarters

Kohler Power Systems – Asia Pacific
 7 Jurong Pier Road
 Singapore 619159
 Phone: +65 6264 6422
 Fax: +65 6264 6455
 E-mail: sales@kohler.com.sg
 Web site: Kohler.com.sg

China Manufacturing

Kohler Power Systems, Ltd.
 Kohler Road, Xin Bei District
 Changzhou, Jiangsu 213032
 China
 Phone: +86 519 8515 2728
 Fax: +86 519 592 2259 / 592 2250

India Manufacturing

Lombardini India Private Ltd
 POB 754 J-2/1 MIDC Ind. Aerea
 Chikalthana
 431210 Aurangabad
 India
 Phone: +91 / 240/2471452
 Fax: +91/240 / 2486234

Sales Offices

China

Kohler Power Systems – Asia Pacific
 Shanghai Representative Office
 Unit 19 B, Huamin Empire Plaza
 726 Yan An Road (W)
 Shanghai 200050 PRC
 Phone: +86 21 5238 9966
 Fax: +86 21 5238 5880
 E-mail: inquiry@kohlerpower.com.cn
 Web site: Kohler.com.sg

Kohler Power Systems – Asia Pacific
 Beijing Representative Office
 Unit 518, Talent International Building
 No. 80 Guang Qu Men Inner Avenue
 Chong Wen District
 Beijing 100062 PRC
 Phone: +86 10 5169 6700
 Fax: +86 10 5169 6705
 E-mail: inquiry@kohlerpower.com.cn
 Web site: Kohler.com.sg

Kohler Power Systems – Asia Pacific
 Shenzhen Office
 Room 915, 9/F, Qiushi Center
 Zhuzilin, Shennan Avenue
 Futian District
 Shenzhen
 Guangdong 518040 PRC
 Phone: +86 755 8831 6791
 Fax: +86 755 8831 6790
 E-mail: inquiry@kohlerpower.com.cn
 Web site: Kohler.com.sg

Kohler Power Systems – Asia Pacific
 Chengdu Office
 Room 801, Minhang Zongnan Building
 No. 19, 2nd Ring Road, Sec 2S
 Chengdu 610041 PRC
 Phone: +86 28 8290 9287
 Fax: +86 28 8522 3611
 E-mail: inquiry@kohlerpower.com.cn
 Web site: Kohler.com.sg

Kohler Power Systems – Asia Pacific
 Xi'an Office
 Unit 5003, Western Electronic Trading City
 No. 18, Dianziyilu, Xi'an
 Shaanxi 710065 PRC
 Phone: +86 29 8827 2260
 Fax: +86 29 8827 2265
 E-mail: inquiry@kohlerpower.com.cn
 Web site: Kohler.com.sg

South Asia

Kohler India Corporation Pvt Ltd
 #138/6, 6th 'A' Cross
 Raj Mahal Vilas Extension
 Sadashivnagar
 Bangalore 560 080
 India
 Phone: +91 80 2361 6208 / 6831 / 0231
 Fax: +91 80 2361 5972
 E-mail: info@kohlerindia.com
 Web site: Kohler.com.sg

Kohler India Corporation Pvt Ltd
 'Tarangan', 1098/8-B,
 Opp. DSK Toyota Showroom
 Model Colony, Pune – 411 016
 India
 Phone: +91-20-25666311
 Fax: +91 20 25666311
 E-mail: info@kohlerindia.com
 Web site: Kohler.com.sg

Kohler India Corporation Pvt Ltd
 6th Floor, Office Tower,
 Ambience Island,
 NH-8, Gurgaon-122001
 India
 E-mail: info@kohlerindia.com
 Web site: Kohler.com.sg

North Asia

Kohler Power Systems – Asia Pacific
 North Asia Office
 SBS Hills-II, No. 53
 4-10-3, Yoga, Setagaya-Ku
 Tokyo 158-0097
 Japan
 Phone: +81 3 6807 1730
 Fax: +81 3 3708 4377
 E-mail: kawasaki@kohler.co.jp
 Web site: Kohler.com.sg

Kohler Power Systems – Asia Pacific
 Room 1707 Lg Twintel 2
 157-3 Samsung –Dong
 Gangnam-Gu
 Seoul 135-090
 Korea
 Phone: +82 2 563 9266
 Fax: +82 2 563 9730
 E-mail: chanusohn@kohler-korea.com
 Web site: Kohler.com.sg

South East Asia & Taiwan

Kohler Power Systems – Asia Pacific
 7 Jurong Pier Road
 Singapore 619159
 Phone: +65 6264 6422
 Fax: +65 6264 6455
 E-mail: sales@kohler.com.sg
 Web site: Kohler.com.sg

Australasia

Kohler Power Systems – Asia-Pacific
 C/O P O Box 324, Highgate
 South Australia 5063
 Phone: +61 439 338 166
 Fax: +61 8 8338 6424
 E-mail: bob.morgan@kohler.com.sg
 Web site: Kohler.com.sg

KOHLER

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