HAGAR DISTRIBUTION

DSE® DEEP SEA ELECTRONICS

PRODUCT CATALOGUE 2023/24

INDUSTRY LEADING CONTROL SYSTEMS

Contents

COMPANY PROFILE

Established in 1998, Hagar Marketing emerged into the emergency power industry as the agents and distributors for Deep Sea Electronics.

In 2013, the sister company Hagar Distribution was formed. Today, Hagar Distribution specialises in sales and technical support for the complete DSE Genset, ATS, Power and Control range.

We pride ourselves with having good stock holdings of all the popular DSE units and offer the complete package from sales inquiries, electrical design, on site commissioning and after sales technical support.

We are also suppliers of equipment directly related to the DSE brand. These include: Governors America Corp. (GAC), VDO engine protection devices, ABB switchgear, a comprehensive range of DSE Automatic Voltage Regulators (AVR's), as well as some popular aftermarket AVR products. Our printed and electronic catalogue covers most of what we supply and is viewable on our website or available on request.

Situated in the industrial city of Germiston, (15kms east of Johannesburg) we are in the heart of the African sub-continent-powerhouse and often pay visits to neighbouring countries.

Our supply and service chain covers areas such as Angola, Botswana, Congo, Lesotho, Malawi, Madagascar, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe.

Our Product

The DSE Brand has established a world-wide reputation for providing outstanding quality products packed with features and benefits for both the installer and the user. The product range includes controllers for manual start, remote start, automatic start and synchronising applications. We also supply battery chargers, powers supplies and current transformers. To enhance the features of the above controllers, items like the DSE Webnet makes it possible to remotely monitor and control your generator. With our UK principal continuously improving the features, the product will keep on growing to stay the market leader.

Our Mission

Our mission is to build successful long-term relationships with our customers by understanding their needs, delivering advance control solutions and providing unrivalled support services. We know the importance of establishing long-standing relationships. We have been working with a wide range of customers and our understanding of their requirements ensures we are able to meet our customers' expectations time and time again.

Our Vision

Our vision is nothing less than realising the full potential of successful relationships and to keep on building on our relationships not only with our customers and suppliers, but also with our families, friends and community.

Dedicated Support

Hagar Distribution has an excellent track record for our ability to resolve customer issues quickly and professionally. We also have technical staff on standby over weekends and holidays to assist with any on site issues.

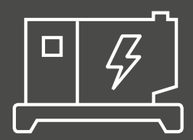
Hagar Distribution also offers CAD generated drawings and electrical design assistance when so requested by our customers. With a vast understanding of our customer's needs we can offer the right product at the right price. By constantly keeping in contact with our principles in the UK, we stay up to date with all new products from DSE to ensure full understanding of the range of products.

Specialist Areas

DSE product supplier and technical expertise.
Electrical design with professional CAD generated drawings.
Fault finding, testing and commissioning.
Synchronising and load sharing specialist.
Industrial processing for vehicle and off-highway equipment specialists.

Proud suppliers and stockists of ABB Switchgear, VDO engine protection devices, GAC, fuel level sensors, and much more.

MULTIPLE APPLICATION SPECIALIST



GENERATOR CONTROL

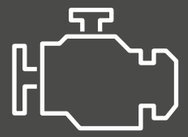
LOAD SHARING & SYNCHRONISING

DC/HYBRID GENERATOR CONTROL

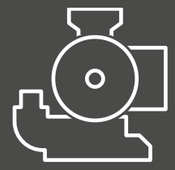
MAINS (UTILITY) PROTECTION

LIGHTING TOWER CONTROL

ATS CONTROL

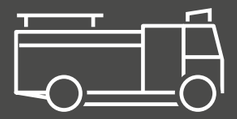


ENGINE CONTROL



PUMP CONTROL

DIGITAL AVR CONTROL



VEHICLE & OFF-HIGHWAY CONTROL

REMOTE MONITORING

BATTERY CHARGING

DSE**Genset®**

DSE**Genset®** is an intelligent range of auto start and auto mains (utility) failure single-set generator control solutions, load sharing & synchronising multi-set control solutions, DC / hybrid generator control solutions, digital automatic voltage regulators (AVR), mains (utility) protection relays & power meters, lighting tower control solutions, remote communications devices & overview displays and expansion modules.

Each range has been designed, developed and manufactured by our industry leading experts, to deliver a range of features and benefits that set new standards across the industry.

SUITABLE FOR:

RENTAL **HYBRID** **TELECOMS** **DATA CENTRES** **HOSPITALS** **EVENTS**

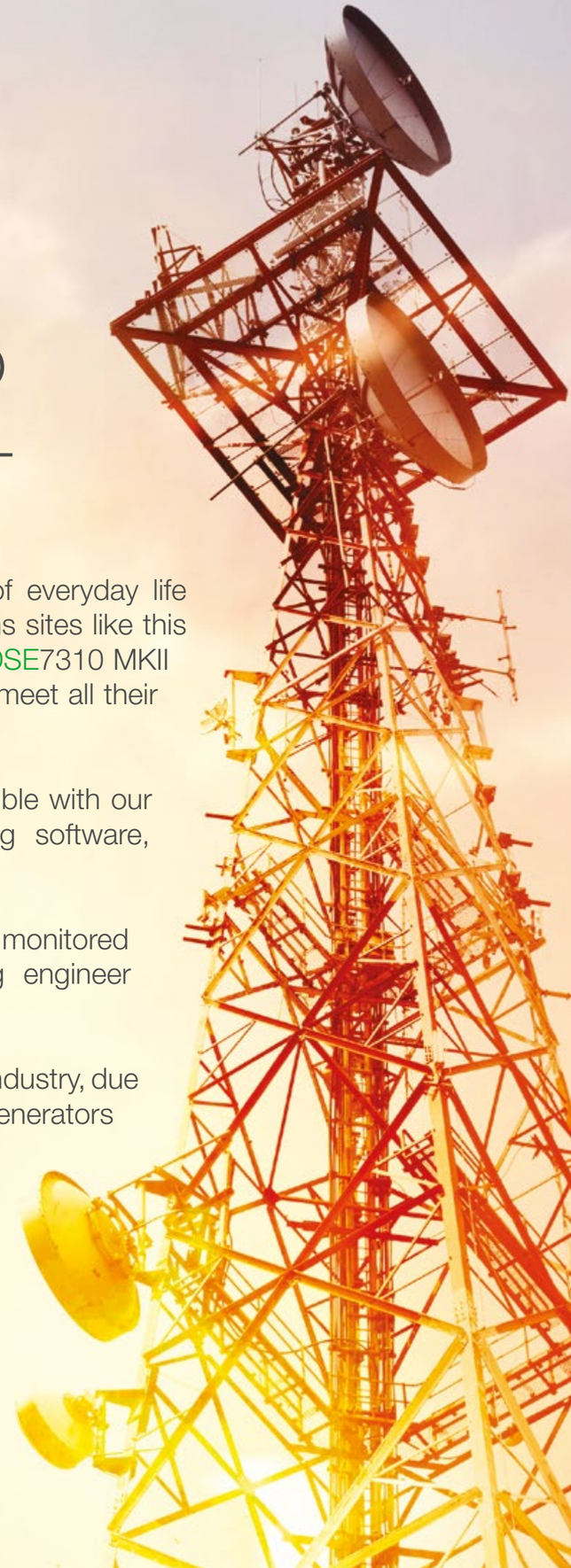
MANUAL & AUTO START CONTROL MODULES

Communications are a key part of everyday life all over the globe. Remote telecoms sites like this one, located in the Africa use the DSE7310 MKII to control the on-site generator to meet all their power requirements.

The DSE7310 MKII is fully compatible with our industry-leading remote monitoring software, DSE**WebNet®**.

The software allows the site to be monitored and controlled remotely, reducing engineer call-outs.

Remote monitoring is suited to this industry, due to the large number of telecoms generators being used in remote locations.



DSE3110
Manual & Auto Start Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs (6)
- Configurable DC outputs (2)
- Fuel and start outputs (configurable on CAN variant)
- Remote start input

COMMUNICATIONS
- USB for PC configuration

ENGINE COMPATIBILITY
- CAN engine support
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel

OVERALL SIZE
98 mm x 79 mm x 40 mm

PANEL CUT-OUT SIZE
80 mm x 68 mm

FEATURES
- Configurable timers and alarms
- Alternative configuration
- Tamper-proof hours counter
- Engine monitoring and protections
- Automatic shut-down
- Displays generator voltage, generator frequency, battery voltage and engine speed

DSE4510 MKII
Auto Start Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (4)
- Configurable analogue / digital inputs (3)
- Configurable DC outputs (6)

COMMUNICATIONS
- USB for PC configuration
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- 3-phase generator sensing
- Sophisticated alarms including water in fuel and tank bund
- 0-10 V & 4-20 mA oil pressure sensor support
- ECU periodic wake up for information retrieval
- Comprehensive engine and alternator protections
- Generator / load power & current monitoring and protection

OVERALL SIZE
140 mm x 113 mm x 43 mm

PANEL CUT-OUT SIZE
118 mm x 92 mm

DSE6110 MKIII
Auto Start Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable / analogue inputs (4)
- Configurable DC outputs (6)
- Independent fuel and start outputs

COMMUNICATIONS
- USB for PC configuration
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- PLC editor
- Generator current & power monitoring
- 0-10 V & 4-20 mA oil pressure sensor support
- Fuel level alarms
- 1 alternative configuration
- 3-phase generator sensing & protection
- 5-key menu navigation / front panel breaker control buttons
- Text based display
- DSENet® expansion compatible

OVERALL SIZE
216 mm x 158 mm x 43 mm

PANEL CUT-OUT SIZE
184 mm x 137 mm

DSEGenset

DSE7310 MKII
Auto Start Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable analogue / digital inputs (6)
- Configurable DC outputs (6)
- Independent fuel and start outputs
- Configurable volt-free outputs (2)

COMMUNICATIONS
- Simultaneous use of RS485 & RS232 ports
- MODBUS RTU
- USB for PC configuration
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Supports 7 languages
- Advanced protections
- Oil pressure disconnect delay
- Configurable icon screens
- CAN support for DSEA109 AVR
- Charge alternator disable functionality
- Dedicated inputs for ECU specific operations
- Advanced PLC editor
- DSE**WebNet®** Alert & Control
- Dual mutual standby
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE7410 MKII
Auto Start Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable analogue / digital inputs (6)
- Configurable outputs (8)
- Independent fuel & start outputs
- Configurable volt-free outputs (2)

COMMUNICATIONS
- SNMP, GET, SET & TRAP support
- MODBUS TCP IP / MODBUS RTU
- USB for PC configuration
- Simultaneous use of RS485, RS232 & Ethernet ports
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Embedded web server
- Supports 7 languages
- Advanced protections
- Oil pressure disconnect delay
- Configurable icon screens
- CAN support for DSEA109 AVR
- Charge alternator disable functionality
- Dedicated inputs for ECU specific operations
- Advanced PLC editor
- DSE**WebNet®** Alert & Control
- Dual mutual standby
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

Manual/Auto Start Control Modules Comparison Chart




	4510MKII	6110MKIII	7310MKII	7410MKII
Mains voltage control	no	no	no	no
Generator voltage control	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N
Rated frequency	3.5Hz - 75Hz	3.5Hz - 75Hz	3.5Hz - 75Hz	3.5Hz - 75Hz
Configurable DC Outputs	4	6	6	8
Configurable Inputs	4	8	8	8
Volt Free Outputs	no	no	2	2
Fuel & Crank Outputs	√	√	√	√
Analogue Sender Inputs	3	4	6	6
Dedicated Emergency Stop Input	no	√	√	√
Canbus	√	√	√	√
Power supply range	8v - 35v	8v - 35v	8v - 35v	8v - 35v
Max Rated Voltage	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)
VT programming	no	√	√	√
Current Input	√	√	√	√
MPU pick-up	no	√	√	√
Phase rotation protection	no	no	√	√
DSENET Expansion	no	√	√	√
Configuration Suite	√	√	√	√
USB Port	√	√	√	√
USB Host	no	no	no	√
RS232 port	no	no	√	√
RS485 port	no	no	√	√
Ethernet Port	no	no	no	√
Event logging	√	√	√	√
Load sharing & generator paralleling	no	no	no	no
Data logging	no	√	√	√
Synchronising	no	no	no	no
PLC Editor	no	√	√	√
Remote Station Display	no	no	√	√
IP protection from front with suitable rubber seal	IP65	IP65	IP65	IP65
Front configuration access	Full	Limited	Limited	Limited
Dimensions	140 x 113 x 43	216 x 158 x 43	245 x 184 x 51	245 x 184 x 51
Panel Cut-Out	118 x 92	184 x 137	220 x 160	220 x 160

AUTO MAINS (UTILITY) FAILURE CONTROL MODULES

Hospitals across the UK, Europe and South Africa are using the DSE7320 MKII for automatically resuming critical power supplies in times of unexpected power failures.

The sophisticated built-in no-break return to mains (utility) feature, minimises power disruptions enabling vital services to continue without any interruption.

DSE4520 MKII
Auto Mains (Utility) Failure Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (4)
- Configurable analogue / digital inputs (3)
- Configurable DC outputs (6)

COMMUNICATIONS
- USB for PC configuration
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- 3-phase mains (utility) sensing
- Automatic transfer between mains (utility) & generator
- Configurable for use as an auto start or auto mains (utility) failure control module
- Sophisticated alarms including water in fuel and tank bund
- ECU periodic wake up for information retrieval
- Comprehensive engine and alternator protections
- Alternator frequency & CAN speed sensing
- Generator / load power & current monitoring and protection

OVERALL SIZE
140 mm x 113 mm x 43 mm

PANEL CUT-OUT SIZE
118 mm x 92 mm

DSE6120 MKIII
Auto Mains (Utility) Failure Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable digital / analogue inputs (4)
- Configurable DC outputs (6)
- Independent fuel and start outputs

COMMUNICATIONS
- USB for PC configuration
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Mains (utility) supply monitoring
- Automatic transfer between mains (utility) & generator
- PLC editor
- Generator / mains (utility) current & power monitoring
- 0-10 V & 4-20 mA oil pressure sensor support
- Fuel level alarms
- 1 alternative configuration
- 3-phase generator sensing & protection
- 5-key menu navigation / front panel breaker control buttons
- DSENet® expansion compatible

OVERALL SIZE
216 mm x 158 mm x 43 mm

PANEL CUT-OUT SIZE
184 mm x 137 mm

DSE7320 MKII
Auto Mains (Utility) Failure Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable analogue / digital inputs (6)
- Configurable DC outputs (6)
- Independent fuel and start outputs
- Configurable volt-free outputs (2)

COMMUNICATIONS
- Simultaneous use of RS485 & RS232 ports
- MODBUS RTU
- USB for PC configuration
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Mains (utility) supply monitoring
- Automatic transfer between mains (utility) & generator
- Supports 7 languages
- Crank disconnect on generator voltage
- Oil pressure disconnect delay
- Configurable icon screens
- CAN support for DSEA109 AVR
- Charge alternator disable functionality
- Dedicated inputs for ECU specific operations
- Advanced PLC editor
- DSE**WebNet®** Alert & Control
- Dual mutual standby
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE7420 MKII
Auto Mains (Utility) Failure Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (8)
- Configurable analogue / digital inputs (6)
- Configurable outputs (8)
- Independent fuel & start outputs
- Configurable volt-free outputs (2)

COMMUNICATIONS
- SNMP, GET, SET & TRAP support
- MODBUS TCP IP / MODBUS RTU
- USB for PC configuration
- Simultaneous use of RS485, RS232 & Ethernet ports
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Embedded web server
- Mains (utility) supply monitoring
- Automatic transfer between mains (utility) & generator
- Supports 7 languages
- Crank disconnect on generator voltage
- Oil pressure disconnect delay
- Configurable icon screens
- CAN support for DSEA109 AVR
- Charge alternator disable functionality
- Dedicated inputs for ECU specific operations
- Advanced PLC editor
- DSE**WebNet®** Alert & Control
- Dual mutual standby
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

Auto Mains Failure Control Modules Comparison Chart




	4520MKII	6120MKIII	7320MKII	7420MKII
Mains voltage control	√	√	√	√
Generator voltage control	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N	1ph / 2ph / 3ph / N
Rated frequency	3.5Hz - 75Hz	3.5Hz - 75Hz	3.5Hz - 75Hz	3.5Hz - 75Hz
Configurable DC Outputs	4	6	6	8
Configurable Inputs	4	8	8	8
Volt Free Outputs	no	no	2	2
Fuel & Crank Outputs	√	√	√	√
Analogue Sender Inputs	3	4	6	6
Dedicated Emergency Stop Input	no	√	√	√
Canbus	√	√	√	√
Power supply range	8v - 35v	8v - 35v	8v - 35v	8v - 35v
Max Rated Voltage	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)	415Vac (Ph-N) - 719Vac (Ph-Ph)
VT programming	no	√	√	√
Current Input	√	√	√	√
MPU pick-up	no	√	√	√
Phase rotation protection	no	no	√	√
DSENET Expansion	no	√	√	√
Configuration Suite	√	√	√	√
USB Port	√	√	√	√
USB Host	no	no	no	√
RS232 port	no	no	√	√
RS485 port	no	no	√	√
Ethernet Port	no	no	no	√
Event logging	√	√	√	√
Load sharing & generator paralleling	no	no	no	no
Data logging	no	√	√	√
Synchronising	no	no	no	no
PLC Editor	no	√	√	√
Remote Station Display	no	no	√	√
IP protection from front with suitable rubber seal	IP65	IP65	IP65	IP65
Front configuration access	Full	Limited	Limited	Limited
Dimensions	140 x 113 x 43	216 x 158 x 43	245 x 184 x 51	245 x 184 x 51
Panel Cut-Out	118 x 92	184 x 137	220 x 160	220 x 160

LOAD SHARING & SYNCHRONISING

DSE's load sharing control modules are used in off-grid mining applications in Texas and South Africa.

These applications have built-in redundancy ensuring sufficient capacity for at least one or two gensets to be off-line at any one time. This allows for maintenance, servicing and unplanned shut-downs.

The DSE8610 MKII is configured to automatically run the built-in redundancy feature. The modules communicate information to the site management team who supervise the site from a remote location.

G8 series

NEW

DSEG8600
Parallel Genset Controller
with Integral Heater

The G8600 is a parallel Genset controller, designed for complex paralleling applications.

The G8600 can be configured to provide paralleling for up to 4032 generators on a single site and provides a wide range of high-end features for multiple application environments.

The module is configurable for use as a single-set controller, multi-set controller, mains (utility) controller or group controller.

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (9)
- Configurable analogue / digital inputs (8)
- Configurable outputs (9)
- Configurable volt-free outputs (2)

COMMUNICATIONS
- MODBUS RTU / TCP IP
- USB for PC configuration
- USB port for data logging
- Fully isolated RS485 ports (2)
- Ethernet Port (10/100)
- 3 full isolated can ports
- Integrated SNMP

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Multiple bus sectioning
- Group controller functionality
- Spinning reserve
- Load demand schemes
- AMSC (Advanced multi-set comms)
- Advanced PLC functionality
- Multi-purpose PIDs
- Phase locking
- Virtual inputs
- On-screen mimic (SLDs)
- Multiple application support
- Multi-level pin protected front panel editor
- Integral LCD display heater
- Enhanced high-resolution 240 x 128 pixel display
- Single or multiple generator control
- Latest ECU / ECM support
- Load sharing & VAr sharing
- Virtual shared inputs, outputs and data via advanced multi-set comms
- Zero sequence voltage protection
- Integral gasket (IP65 protection)
- Built-in governor & AVR control
- DSE digital AVR support
- Base load (kW export) control
- Positive & negative kVAr export control
- Dead bus synchronising
- Mains (utility) decoupling protection
- Multiple language support
- 3-phase generator sensing & protection
- 3-phase mains (utility) sensing
- 3-phase bus sensing
- Mains (utility) failure detection
- Generator current, protection & power monitoring
- Configurable timers
- DSENet® (Expansion support)
- Flexible I/O (inputs/outputs)
- Automatic and front panel breaker control
- Power-save mode

OVERALL SIZE
245 mm x 180 mm x 45 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

G8 series

NEW

DSEG8660
Mains (Utility) Control

The G8660 is an ATS / Mains (Utility) controller designed to work with the G8600 that is configured for use as a multi-set controller.

The G8660 allows multiple generators to synchronise with a mains (utility) supply and controls switching power between generator and mains (utility) sources without loss of supply to the load.

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (9)
- Configurable outputs (8)
- Configurable volt-free outputs (2)

COMMUNICATIONS
- MODBUS RTU / TCP IP
- USB for PC configuration
- USB port for data logging
- Fully isolated RS485 ports (2)
- Ethernet Port (10/100)
- 3 full isolated can ports
- Integrated SNMP

CONFIGURATION
- DSE Configuration Suite PC software
- Configurable front panel (PIN protected)

ADVANCED FEATURES
- Ability to configure multiple bus Segments
- Spinning reserve
- Load demand schemes
- Advanced multi set communications link AMSC (Advanced multi-set comms)
- Advanced PLC functionality including multi-purpose PIDs
- Phase locking
- Virtual inputs
- On-screen mimic
- Multiple application support
- Integral LCD display heater
- Enhanced high-resolution 240 x 128 pixel display
- Load sharing & VAr sharing
- Virtual shared inputs, outputs, states and instrumentation values via Advance multi-set comms
- Zero sequence voltage protection
- Integral gasket (IP65 protection)
- Base load (kW export) control
- Positive & negative kVAr export control
- Mains (utility) decoupling protection
- Multiple language support
- 3-phase mains (utility) sensing
- 3-phase bus sensing
- Mains (utility) failure detection
- Mains (utility) current & power monitoring
- Configurable timers
- DSENet® (Expansion support)
- Flexible I/O (inputs/outputs)
- Automatic and front panel breaker control
- Power-save mode

OVERALL SIZE
245 mm x 180 mm x 45 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE8920
7” Colour Load Share & Synchronising Control Module

Module can be configured to function as a DSE8910 Synchronising and Load Sharing Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (12)
- Configurable analogue / digital inputs (4)
- Configurable flexible sender inputs (2)
- Configurable DC outputs (8)
- Configurable volt-free outputs (2)
- Configurable 5 stage dummy load and load shedding outputs

COMMUNICATIONS
- Independent ports for RS485, RS232, CAN, USB and Ethernet
- MODBUS RTU / TCP IP
- SNMP
- DSEWebNet® compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software

COMPATIBLE LOAD SHARE MODULES
- DSE8660 MKII (When DSE8920 is configured as an DSE8910)

ADVANCED FEATURES
- 3-phase mains (utility) & generator voltage and current sensing
- 7-inch full colour TFT display
- Optically bonded, sunlight readable screen
- High-clarity 800 x 480 pixel graphical user interface
- Built-in AVR, Governor & CAN control
- Two types of kW/VAr sharing support (isochronous or droop)
- Drag and drop advanced PLC editor
- IEEE 1547TM - 2018 compliant
- Configurable for use as a DSE8910 via PC software
- 2 starting sequences: start all / start as load requires
- Peak lopping / load sharing
- Manual voltage / frequency adjustment
- RoCoF and vector shift protection
- Generator load demand
- Automatic hours run balancing
- Mains (utility) decoupling
- Bus failure detection
- Volts and frequency matching
- Dead bus synchronising
- DSENet® expansion compatible

OVERALL SIZE
310 mm x 162 mm x 51 mm

PANEL CUT-OUT SIZE
282 mm x 136 mm

DSE8610 MKII
Synchronising & Load Sharing Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (12)
- Configurable analogue / digital inputs (4)
- Configurable flexible sender inputs (2)
- Configurable DC outputs (8)
- Configurable volt-free outputs (2)
- Configurable 5 stage dummy load and load shedding outputs

COMMUNICATIONS
- Independent ports for RS485, RS232, CAN, USB and Ethernet
- MODBUS RTU / TCP IP
- SNMP
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

ADVANCED FEATURES
- Generator load demand with sequential set start
- 0-10 V & 4-20 mA oil pressure sensor support
- Power monitoring
- RoCoF and vector shift monitoring
- Automatic hours run balancing
- Sophisticated fuel monitoring and alarms
- 3-phase generator voltage and current sensing
- Sophisticated bus sensing (3-phase)
- Direct governor and AVR control
- Multiple configurable maintenance alarms
- Advanced SMS messaging
- Advanced PLC editor
- Support for worldwide languages
- Extensive data logging & trending
- DSE**WebNet®** Alert & Control
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

Option to use as a rear-mounted solution using a DSE rear mount panel bracket (020-1044)

DSE8620 MKII
Synchronising & Load Sharing Auto Mains (Utility) Failure Control Module

Module can be configured to function as a DSE8610 MKII Synchronising and Load Sharing Control Module

Option to use as a rear-mounted solution using a DSE rear mount panel bracket (020-1044)

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (12)
- Configurable analogue / digital inputs (4)
- Configurable flexible sender inputs (2)
- Configurable DC outputs (8)
- Configurable volt-free outputs (2)
- Independent fuel and crank outputs
- Configurable 5 stage dummy load and load shedding outputs

COMMUNICATIONS
- Independent ports for RS485, RS232, CAN, USB and Ethernet
- MODBUS RTU / TCP IP
- SNMP
- SCADA software
- DSE**WebNet®** compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

COMPATIBLE LOAD SHARE MODULES
- DSE8660 MKII (When DSE8620 MKII is configured as a DSE8610 MKII)

ADVANCED FEATURES
- 3-phase mains (utility) & generator voltage and current sensing
- 0-10 V & 4-20 mA oil pressure sensor support
- Peak lopping and peak shaving functionality
- kW & kVAr load sharing
- RoCoF and vector shift protection
- Automatic mains (utility) decoupling with no-break return
- Positive & negative kVAr export control
- Volts and frequency matching
- Sophisticated fuel monitoring and alarms
- Direct governor and AVR control
- Multiple configurable maintenance alarms
- Advanced SMS messaging
- Advanced PLC editor
- Support for worldwide languages
- Extensive data logging & trending
- DSE**WebNet®** Alert & Control
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE8660 MKII
Auto Transfer Switch & Mains (Utility) Control Module

Option to use as a rear-mounted solution using a DSE rear mount panel bracket (020-1044)

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (12)
- Configurable DC outputs (6)
- Configurable volt-free outputs (2)

COMMUNICATIONS
- Independent ports for RS485, RS232, CAN, USB and Ethernet
- MODBUS RTU / TCP IP
- SCADA software
- DSE**WebNet®** compatible

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

COMPATIBLE LOAD SHARE MODULES
- DSE8610 MKII
- DSE8620 MKII (When DSE8620 MKII is configured as an DSE8610 MKII)

ADVANCED FEATURES
- 3-phase mains (utility) voltage and current sensing
- Peak lopping and peak shaving functionality
- kW & kVAr load sharing
- RoCoF and vector shift protection
- Mains (utility) kW export protection
- Automatic mains (utility) decoupling with no-break return
- Generator load demand
- Advanced SMS messaging
- Advanced PLC editor
- Support for worldwide languages
- Data logging & trending
- Multiple event scheduler
- Native no bus breaker support for signal ATS applications
- Separate ramp up and ramp down rates configurable via PLC
- DSENet® expansion compatible

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE8680
Synchronising Generator Bus Tie Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (11)
- Configurable DC outputs (6)
- Configurable volt-free outputs (2)

COMMUNICATIONS
- Independent ports for RS485, RS232, USB and Ethernet
- MODBUS RTU / TCP IP

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

COMPATIBLE LOAD SHARE MODULES
- DSE86xx
- DSE86xx MKII
- DSE87xx

ADVANCED FEATURES
- Enhanced bus sensing of 2 buses for improved synchronising functionality
- Multiple DSE8680's can be used within one synchronising system
- Advanced PLC editor
- Instrumentation shows the status and measurements of both buses
- Advanced SMS control and fault messaging
- Supports multiple global languages
- Easy access diagnostic pages including modem diagnostic pages
- Advanced data logging and trending
- Eliminates the need for costly PLC systems
- DSENet® expansion compatible

OVERALL SIZE
240 mm x 181 mm x 42 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DC / HYBRID GENERATOR CONTROL MODULES

DSE modules are being used in hybrid applications where solar energy is consistent and mains (utility) supplies are unreliable. This factory in South Africa is connected to a mains (utility) supply which suffers from regular disruptions.

The DSEM870 PV / Diesel Load Sharing FSC works in conjunction with DSE8610 MKII control modules to provide cost efficient energy from the hybrid solar / diesel genset system when mains (utility) power is unavailable.

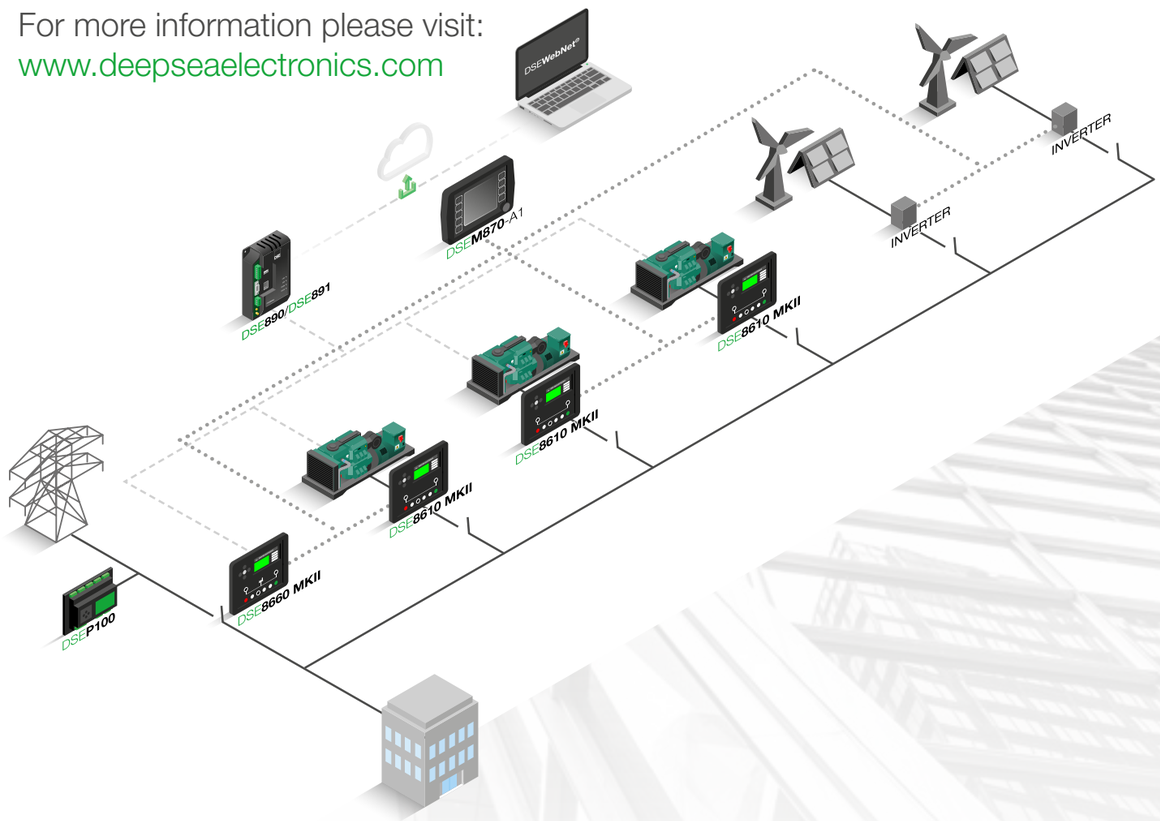
On-Grid Load Sharing & Synchronising Solutions for Renewable Applications

When the mains (utility) is supplying the load the inverters produce as much power as possible.

When the mains (utility) is unavailable the gensets start and supply power to the load. At this time the inverters are able to re-sync and supply power.

As the inverter power increases, the dependency on the gensets reduces and the gensets begin to shut down. Whenever the mains (utility) power is unavailable, one genset must continue to run at all times. To prevent damage to this genset the inverters are instructed to reduce power, so that the genset can maintain its minimum operating load.

For more information please visit:
www.deepseaelectronics.com



DSEGenset

DSEM870 PV

PV / Diesel Load Sharing Fuel Save Controller For Solar And Wind Applications

PRODUCT HIGHLIGHTS

I/O
- Configurable digital outputs (4)

COMMUNICATIONS
- Ethernet
- USB

ADVANCED FEATURES
- Communicates with the genset using DSE GenComm protocol, removing the need for additional CTs
- Displays fuel usage and economy info from compatible DSE controllers
- Log of all three sources: genset / solar / inverter
- Pi chart or histogram displays % supply load info
- Displays sunrise / sunset times
- Provides sun position and height
- Supports up to 20 inverters + 10 load sharing genset controllers in one system
- Sophisticated reverse power monitoring provides a stable supply by preventing nuisance tripping
- High resolution, optically bonded 7” screen
- IP67 / NEMA 6 protection

OVERALL SIZE
272 mm x 165 mm x 81 mm

PANEL CUT-OUT SIZE
231 mm x 133 mm

DSE7450

DC / Hybrid Generator Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs (10)
- Configurable DC shunt inputs (2)
- Configurable DC outputs (6)
- Configurable volt-free outputs (2)
- Independent fuel and start outputs

EXPANSION CAPABILITY
- DSENet® compatible

COMMUNICATIONS
- Simultaneous use of RS485, RS232 & Ethernet ports
- MODBUS RTU / TCP IP
- USB for PC configuration
- DSE**WebNet®**

ENGINE COMPATIBILITY
- Conventional engine support (MPU & Hz)
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Configurable maintenance alarms (3)
- Configurable battery maintenance alarms (3)
- 0-10 V AVR output
- Fuel usage monitor and low level alarms
- Charge alternator failure alarm
- kW overload alarms
- Manual fuel pump control
- Manual & automatic start with configurable start / stop timers
- AC & DC voltage measurement
- Mains (utility) failure detection
- Dedicated load test button
- Comprehensive electrical protections
- PLC editor
- Multi-event exercise timer
- Automatically start / stop a generator based on depth of discharge of a battery bank

OVERALL SIZE
245 mm x 184 mm x 57 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DIGITAL AUTOMATIC VOLTAGE REGULATORS (AVR)

DSE digital automatic voltage regulators eliminate the complexities associated with traditional analogue AVRs and provide a stable AC output voltage regardless of changes in temperature or changes to the connected electrical load.

Suitable for any application, including the most complex genset synchronising & load sharing applications. Sophisticated features such as connections for a quadrature droop are included as standard.

DSEA109 / DSEA106 MKII
Digital Automatic Voltage Regulators (AVR)

The DSE digital automatic voltage regulator (AVR) range is designed to maintain regulated, smooth & stable AC output voltages, irrespective of the connected electrical load or changes in temperature.

The digital AVRs eliminate the complexities associated with analogue AVRs and are supplied by either a stator auxiliary winding or a shunt system taking power from the output windings.

Each variant is suitable for generator synchronising and load sharing (with connections for a quadrature droop), and other applications.

A DSE815 is required for programming.

DSEA109 Digital Automatic Voltage Regulator (AVR) with CAN Communications & PMG

PRODUCT HIGHLIGHTS
- Power input compatible with PMG, auxiliary and shunt windings (single phase / 3-phase)
- 3-phase or single phase generator output voltage sensing
- CAN port providing J1939 communications
- Soft start ramping
- Under frequency roll off (UFRO) protection with optional instantaneous step
- Loss of voltage sensing protection
- Over excitation protection
- Potted electronics

OVERALL SIZES

DSEA109
180 mm x 145 mm x 61 mm

DSEA106 MKII
179 mm x 108 mm x 61 mm

DSEA106 MKII Digital Automatic Voltage Regulator (AVR)

PRODUCT HIGHLIGHTS
- Soft start ramping
- Under frequency roll off (UFRO) protection with optional instantaneous step
- Loss of voltage sensing protection
- Over excitation protection
- Potted electronics

MAINS (UTILITY) PROTECTION RELAYS & POWER METERS

The DSEP100 Mains (Utility) Decoupling Relay is being used increasingly across Great Britain as changing regulations to grid codes are making G59 equipment obsolete.

The DSEP100 is used to detect a fault on the mains (utility) network and disconnect the connected application under relevant circumstances. The DSEP100 is fully configurable, making it future proof against further grid code changes.

G99/1
G98/1
COMPLIANT

DSEP100
Mains (Utility) Decoupling Relay

The DSEP100 is fully compliant with the latest G99/1, G98/1 and G59 requirements, RfG and other global standards for power applications connecting with local networks.

The DSEP100 monitors the mains (utility) supply and on detection of a fault, disconnects the application to prevent an island being formed.

The DSEP100 supports diesel gensets, PV (solar) installations and wind turbine applications.

OVERALL SIZE
157 mm x 95 mm x 67 mm

PRODUCT HIGHLIGHTS
- 3 separate RoCoF protections
- Isolated AC / DC power supply
- Can be used to trip one or more breakers
- Incorrect phase sequence protection
- Lockable security tab to prevent configuration changes after commissioning
- Two stage under & over frequency protection
- Five stage under & over voltage protection
- Voltage asymmetry protection
- Vector shift protection
- Positive & negative sequence under/over voltage protection
- Zero sequence over voltage protection (NVD protection)
- Power up in trip position
- Breaker failed to open alarm
- True 3-phase mains (utility) RMS measurement
- Configurable automatic reset timer
- Future proofed to allow for changes in regulations
- Event log (250)
- DIN rail / chassis mount

COMMUNICATIONS
- RS485 (DSE857 required)
- USB for PC configuration

CONFIGURATION
- DSE Configuration Suite PC Software

DSEP961 / DSEP962
pView® Multi-Function Power Meters

PRODUCT HIGHLIGHTS

I/O
- CT input terminals allow series connection of multiple power meters
- Configurable CT and VT ratio
- Pulse output
- Volt-free output

COMMUNICATIONS
- Built-in MODBUS RS485
- Web SCADA or Ethernet MODBUS TCP IP available with additional DSEP915

ADVANCED FEATURES
- Active energy class 0.5
- Multi metering for: frequency, current, voltage, power factor, active power, reactive power, apparent power
- Full energy monitoring
- Measured voltage 80 V to 500 V
- 50Hz / 60 Hz (phase to phase)
- Harmonic analysis (THDV/THDI)

PRODUCT VARIANTS
- P961-01 - pView® Multi-Function Power Meter (80 V AC to 265 V AC / 110 V DC to 300 V DC)
- P962-01 - pView® Multi-Function Power Meter (11 V DC to 60 V DC)
- P915-01 - pView® Ethernet Plug-In Adapter

DSEP961 / DSEP962

OVERALL SIZE
96 mm x 96 mm x 62 mm

PANEL CUT-OUT SIZE
92 mm x 92 mm

DSEP915
pView® Ethernet Plug-In Adapter

The DSEP915 Ethernet Plug-In Adapter is an optional module designed to be connected to the back of a DSE961 or DSE962 to provide Ethernet connectivity.

LIGHTING TOWER CONTROL MODULES

On-site engineers using lighting towers to illuminate their work space in large open cast mines in Botswana and Congo, praise the DSEL401 MKII intelligent lighting tower control module.

The sophisticated light sequencing, auto start / stop and timing features of the control module has significantly improved the mining company's operating efficiencies.

DSEL401 MKII
Intelligent Lighting Tower Control Module

OVERALL SIZE
140 mm x 113 mm x 43 mm

PANEL CUT-OUT SIZE
118 mm x 92 mm

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (6)
- Configurable analogue / digital inputs (3)
- Configurable DC outputs (8)
- Independent fuel and start outputs
- Configurable staged light control outputs

COMMUNICATIONS
- USB for PC configuration

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Fuel monitoring allows automatic 'selected lights off' to enable longer running hours
- DC alternator compatibility
- Lighting tower mast and holding support control
- Automatic & manual light control
- Automatic light sequencing
- Individual lighting control
- Configurable light re-strike timer
- Light failure detection
- Sophisticated engine monitoring and protections
- 8 event scheduler and 4-stage load output, protects the generator from stalling on start-up
- Heated display option

REMOTE OVERVIEW DISPLAYS

The DSE8003 MKII is used by engineers in this Glass production facility to remotely view the genset system providing power to vital factory equipment in the event of a mains (utility) failure.

The load sharing genset system is situated in an adjacent building, so real-time remote monitoring of the system from the shop floor helps to maximise engineering resources.

DSE8003 MKII

7” Graphical Colour Multi-Set Remote Overview Display

PRODUCT HIGHLIGHTS

I/O
- DC alarm outputs (2)

COMMUNICATIONS
- RS232, RS485 and Ethernet
- USB for PC configuration

COMPATIBLE LOAD SHARING MODULES
- DSE86xx MKII

CONFIGURATION
- DSE Configuration Suite PC software
- SCADA software

ADVANCED FEATURES
- 7” LCD display presenting graphs, charts, metering, power and engine status information in full colour
- High screen resolution for optimum clarity
- Touchscreen enabled
- View multiple modules within the same load sharing system (max 20)
- Connects via a data communication link up to a maximum distance of 1.2 km
- Enhanced graphical user interface
- Powerful processor for fast operating response times
- Audible alarm
- Configurable as a single-set remote overview display

TOUCHSCREEN

OVERALL SIZE
310 mm x 160 mm x 40 mm

PANEL CUT-OUT SIZE
282 mm x 136 mm

DSE7310 MKII / DSE7320 MKII

Configured as DSE2510 MKII / DSE2520 MKII
Auto Start Remote Display Module / Auto Mains (Utility) Failure
Remote Display Module

PRODUCT HIGHLIGHTS

I/O
- Configurable DC outputs (2)

ADVANCED FEATURES
- 3 display modules can be connected to 1 host control module
- RS232, RS485 & DSENet® connection to host control module
- Remote displays can be located up to 1.2 km from the host module
- Designed to replicate the instrumentation, control and monitoring capabilities of the host control module
- Remote displays connected to the same system show the same information screens at all times
- The host controller can be set to show different information to the connected remote displays
- Audible alarm
- Five-key menu navigation

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

OVERALL SIZE
245 mm x 184 mm x 51 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

NB: The DSE 2510MKII and DSE2520MKII are firmware variants of the DSE7310MKII & DSE7320MKII respectively. To configure as remote display, a standard DSE7310MKII or DSE 7320MKII should be ordered and configured using the DSE Configuration Suite Software

REMOTE MONITORING SOFTWARE

A major international OEM utilises DSE**WebNet®** to monitor a fleet of gensets across Algeria that are powering a wide variety of critical applications including telecoms, banking, petroleum and industrial.

DSE**WebNet®** provides the OEM with key system information for engineer analysis, ensuring accurate diagnoses can be made to avoid major long-term problems.

The OEM is able to take full control of the genset and issue commands when required to maximise run-time.

DSE**WebNet®** also enables the OEM to improve its operating efficiencies, by providing detailed site operating information prior to engineers being sent out to site.

DSEWebNet®

Advanced Remote Monitoring of Gensets, Pumps & Compressors

DSE890 MKII

Industry-leading online management tool for remote monitoring of generators, pumps and compressors.

Provides 24/7 access to multiple applications from anywhere in the world.

DSEWebNet® has been developed to support remote monitoring of single and multiset generator systems, pump and compressor applications, being controlled by DSE products. The intelligent software includes mapping with static locations, real time instrumentation & control, event log tables and automatic system alerts. Alerts can be sent to multiple users via email and SMS. Available for laptop, desktop, tablet and smart phone use.

ADVANCED FEATURES

- User configurable access
- Single user or organisational accounts
- Configurable reporting
- Start / stop equipment
- Clear alarm conditions
- Configurable user interfaces
- App for mobile and tablet (iOS / Android)
- Geo-fencing and asset tracking
- Maintenance scheduling and logging
- Event triggers
- Works across any phone network

DSEWebNet® / IoT Gateway - 4G (GSM/Ethernet)

The DSE890 MKII is an Ethernet/4G gateway device that enables compatible DSE controllers to be monitored remotely via DSEWebNet® software or third-party MQTT brokers.

DSE890 MKII
Gateway 4G (GSM/Ethernet)

OVERALL SIZE
85 mm x 149 mm x 51 mm

Works Across Multiple Platforms:

*View DSE**WebNet®** manual for full list of compatible DSE control modules.

Full list of features available at **deepseaelectronics.com**

DSE892
Simple Network Management Protocol (SNMP) Gateway

PRODUCT HIGHLIGHTS

ADVANCED FEATURES
- Status LEDs for each communications port
- DIN rail mounting
- Plug & socket connections
- Firmware upgradeable via USB
- SNMP SET to change controller mode
- SNMP GET for instrumentation
- Simple Internet browser configuration
- Controller event / operating status change SNMP TRAP email messaging
- Single gateway device can be connected to multiple controllers
- SNMP management system integration for third-party equipment monitoring
- Compatible with SNMP V2c specifications
- Monitor controller state, operating mode and alarms

COMPATIBLE MODULES
- Refer to DSE892 operators manual for control module compatibility

COMMUNICATIONS
- RS232, RS485, USB & Ethernet

OVERALL SIZE
85 mm x 149 mm x 51 mm

DSE8005
SCADA Suite Software

PRODUCT HIGHLIGHTS

COMPATIBLE MODULES
- DSE73xx / DSE73xx MKII
- DSE74xx / DSE74xx MKII
- DSE86xx / DSE86xx MKII
- DSE87xx
- DSE88xx

CONNECTION TO MODULES
- RS485
- Ethernet

OPERATING SYSTEMS
- Windows 10, 8, 7, Vista & XP operating systems
- Compatible with 32-bit & 64-bit operating systems

ADVANCED FEATURES
- Monitors up to a maximum of 40 DSE controllers in any combination up to 32 generators and 16 mains (utilities) e.g. 32 generators and 8 mains (utilities), 30 generators and 10 mains (utilities)
- User-friendly set up using the integral graphical design tool with simple drag and drop facility
- Compatible with touchscreen enabled PC's
- Engine start / stop
- Switching on and off load
- Load demand priority
- Mains (utility) base load power levels

EXPANSION MODULES

Existing applications requiring additional features and functionality to meet newer, more demanding specifications are utilising DSE input and output expansion modules for system upgrades.

Many new installations also use expansion devices to meet the demands of complex applications.

G0123
Analogue Load Share Lines Interface

PRODUCT HIGHLIGHTS

The DSEG0123 Analogue Load Share Lines Interface converts DSE AMSC / MSC digital load share communications to universal analogue load share lines, allowing DSE paralleling controllers to seamlessly deliver kW and kVAr load sharing with third party manufactured products.

COMPATIBLE DSE MODULES

- Compatible with multiple manufacturers paralleling controllers, including Cummins, Selco, Barber Colman, DEIF and Woodward.
- DSE5510
- DSE7510
- DSE8610
- DSE8610MKII

FEATURES

- Converts a G8 Series AMSC* link to analogue load share lines.
- Converts a DSE MSC link to analogue load share lines.
- PC SCADA instrumentation for system diagnostics.
- Power on / status LEDs.
- USB programming port.

OVERALL SIZE
165 mm x 76 mm x 49 mm

DSE124
MSC/CAN Extender

PRODUCT HIGHLIGHTS

- The DSE124 is designed to extend a multi-set comms (MSC) load share link or engine CAN bus. Multiple DSE124s can be linked together. The extenders can be located between 250 meters and 2000 meters apart, depending on the module variant being used.

COMPATIBLE DSE MODULES

- DSE5510
- DSE7510
- DSE8610
- DSE8610MKII

OVERALL SIZE
134 mm x 76 mm x 49 mm

DSE2130
Input Expansion Module

PRODUCT HIGHLIGHTS

- Digital inputs (4)
- Configurable analogue / digital inputs (4)

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Up to four DSE2130 modules can be linked together and connected to the host module up to a maximum distance of 1.2 km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
134 mm x 76 mm x 49 mm

DSE2131
Ratiometric Input Expansion Module

PRODUCT HIGHLIGHTS

- Ratiometric analogue inputs configurable for digital / resistive (10)

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Up to four DSE2131 modules can be linked together and connected to the host module up to a maximum distance of 1.2 km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
165 mm x 76 mm x 49 mm

DSEGenset

Expansion Devices

DSE2133
Rtd/Thermocouple Input Expansion Module

PRODUCT HIGHLIGHTS

- RTD / thermocouple inputs (8)

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Provides additional protections for temperature, engine, enclosure, etc.
- Up to four DSE2133 modules can be linked together (max 32 inputs) and connected to the host module up to a maximum distance of 1.2 km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
165 mm x 76 mm x 49 mm

DSE2152
DSENET® Analogue Output Expansion Module

PRODUCT HIGHLIGHTS

- Configurable analogue outputs (6)

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Up to four DSE2152 modules can be linked together and connected to the host module up to a maximum distance of 1.2 km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
165 mm x 76 mm x 49 mm

DSE2157
DSENET® Output Expansion Module

PRODUCT HIGHLIGHTS

- Configurable, normally open, volt-free outputs (4)
- Configurable volt-free changeover outputs (4)

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Relay contacts with LED indication
- Up to ten DSE2157 modules can be linked together and connected to the host module up to a maximum distance of 1km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
165 mm x 76 mm x 49 mm

DSE2548
DSENET® LED Output Expansion Module

PRODUCT HIGHLIGHTS

- Configurable LEDs (8)
- Audible alarm with mute function

COMPATIBLE DSE MODULES

- DSE61xx MKIII
- DSE73xx MKII
- DSE74xx MKII
- DSE86xx MKII

FEATURES

- Up to ten DSE2548 modules can be linked together and connected to the host module up to a maximum distance of 1km away
- ID switch
- Flashing LED for ‘link lost’

OVERALL SIZE
180 mm x 116 mm x 43 mm

PANEL CUT-OUT SIZE
154 mm x 98 mm

DSE**Control®**

DSE**Control®** is an extremely powerful collection of programmable controllers and displays for vehicles and off-highway machinery and a dynamic range of control systems for engines, pumps and compressors.

Our specialist team of development engineers have created a range of products that combine outstanding performance, features and reliability, making each product suitable for use across multiple application environments.

SUITABLE FOR:

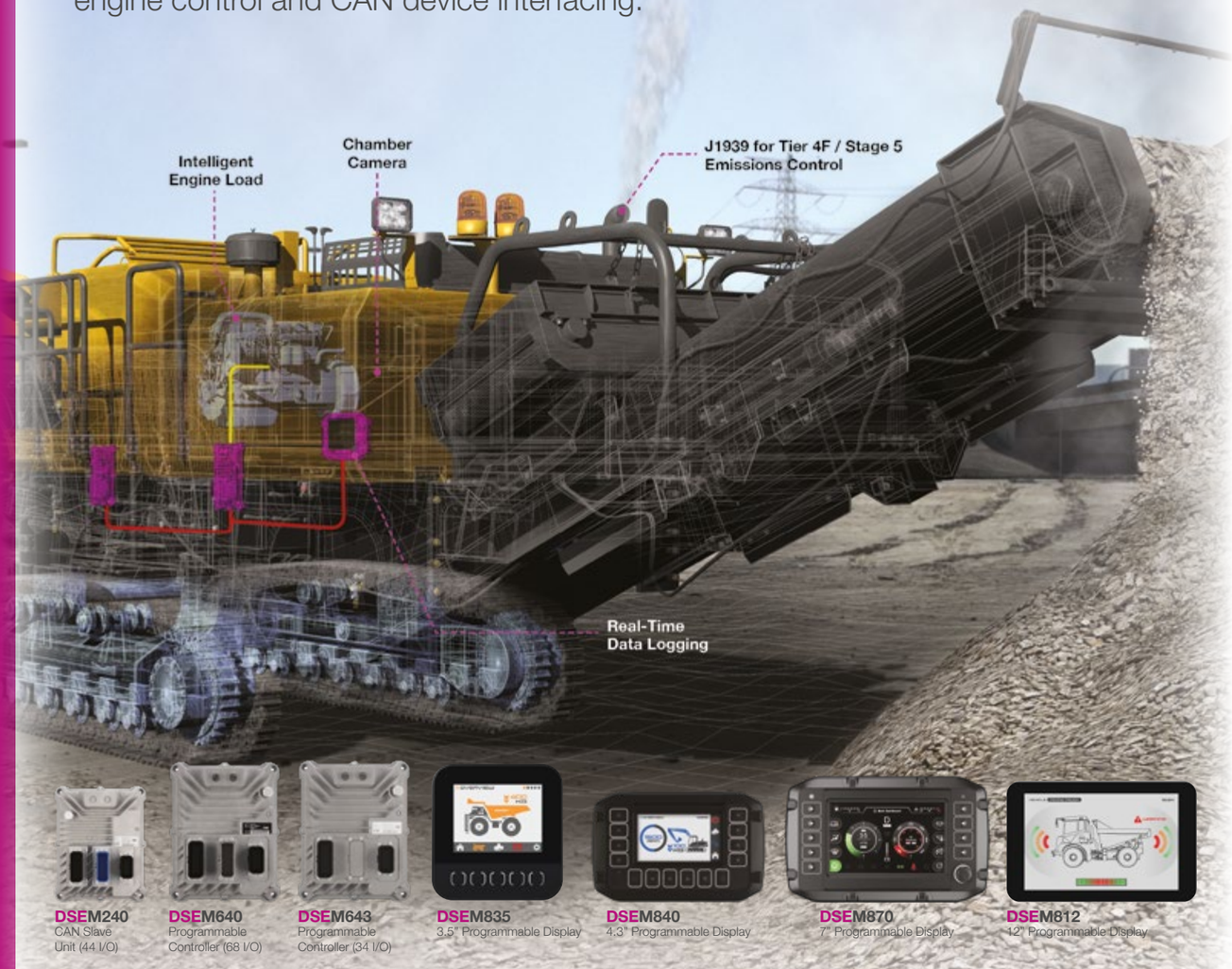
EMERGENCY VEHICLES
MILITARY
CONSTRUCTION
MUNICIPAL VEHICLES
AGRICULTRUAL
TRANSPORT & LOGISTICS
ENGINES
COMPRESSORS
PUMPS

DSEM-Series

VEHICLE & OFF-HIGHWAY MACHINERY CONTROL SYSTEMS

DSE's range of programmable controllers are installed on construction machinery all over the world.

DSEM-Series controllers provide users with powerful solutions that meet complex control requirements. Key areas of control include hydraulic movement control, engine control and CAN device interfacing.



DSEM835
3.5” Programmable Display

PRODUCT HIGHLIGHTS
- Can be used independently or in conjunction with DSEM64x programmable controls
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- Designed for in-cab or panel mounting
- Equipment controls can be incorporated into the DSEM835 display for simplified user operation
- Clear information is presented on the screen in graphic, text and icon formats
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- IP67 / NEMA 6 protection

I/O
- Configurable inputs with digital and analogue capability (4)
- Configurable digital outputs (3)

COMMUNICATIONS
- CAN interfaces (1), J1939, and Raw CAN

PROGRAMMING LANGUAGE
- Via PCAN Device on CODESYS 3.5

ADVANCED FEATURES
- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 3.5” colour screen for the harshest environments
- Powerful Processor with Cortex M7 400MHz clock speed
- 512kB of SDRAM and 8MB of NAND flash storage

OVERALL SIZE
112 mm x 115 mm x 49 mm

PANEL CUT-OUT SIZE
ø82 mm

DSEM840
4.3” Programmable Display

PRODUCT HIGHLIGHTS
- Can be used independently or in conjunction with DSEM64x programmable controls
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- Designed for in-cab or panel mounting
- Equipment controls can be incorporated into the DSEM840 display for simplified user operation
- Clear information is presented on the screen in graphic, text and icon formats
- Outstanding response & performance through a powerful processor, internal components and superior electronic design
- IP67 / NEMA 6 protection

I/O
- Configurable inputs with digital and analogue capability (4)
- Configurable digital outputs (4)
- Camera Input (1)

COMMUNICATIONS
- Independent CAN interfaces (2), J1939, CAN Open and Raw CAN
- Ethernet interface
- USB

PROGRAMMING LANGUAGE
- CODESYS 3.5
- C (on request)

ADVANCED FEATURES
- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 4.3” colour screen for the harshest environments
- Powerful Cortex M4 + M processor with 200 MHz clock speed
- 32 MB of SDRAM and 16 MB of NAND flash storage

OVERALL SIZE
208 mm x 131 mm x 56 mm

PANEL CUT-OUT SIZE
163 mm x 98 mm

DSEM870
7” Programmable Display

PRODUCT HIGHLIGHTS
- Can be used independently or in conjunction with DSEM64x programmable controls
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- Designed for in-cab or panel mounting
- Equipment controls can be incorporated into the DSEM870 display for simplified user operation
- Clear information is presented on the screen in graphic, text and icon formats
- Camera inputs offer enhanced operator viewing and safer equipment control
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- E11 type approval
- IP67 / NEMA 6 protection

I/O
- Configurable inputs with digital and analogue capability (4)
- Configurable digital outputs (4)
- Camera inputs (2)

COMMUNICATIONS
- Independent CAN interfaces (2), J1939, CAN Open and Raw CAN
- Ethernet interface
- USB

PROGRAMMING LANGUAGE
- CODESYS 3.5
- QT (on request)

ADVANCED FEATURES
- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 7” colour screen for harsh environments
- Powerful ARM Cortex A9 processor with 800 MHz clock speed
- 512 MB of DDR3 SDRAM and 2 GB of NAND flash storage
- Touchscreen and WebVisu variant avaliable

OVERALL SIZE
272 mm x 165 mm x 81 mm

PANEL CUT-OUT SIZE
231 mm x 133 mm

DSEM812
12.1” Programmable Display

TOUCHSCREEN

PRODUCT HIGHLIGHTS
- Can be used independently or in conjunction with DSEM64x programmable controls
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- Designed for in-cab or panel mounting
- Equipment controls can be incorporated into the DSEM812 display for simplified user operation
- Clear information is presented on the screen in graphic, text and icon formats
- Camera inputs offer enhanced operator viewing and safer equipment control
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- E11 type approval
- IP67 / NEMA 6 protection
- 2 Variants - with buttons or without buttons

I/O
- Configurable inputs with digital and analogue capability (6)
- Configurable digital outputs (6)
- Camera inputs (4)

COMMUNICATIONS
- Independent CAN interfaces (3), J1939, CANopen and Raw CAN
- Ethernet interface 10/100Mbit/s, Duplex (2)
- USB 2.0 (1)
- WiFi 2.4GHz 801.11 a/b/g/n/ac (External Antenna Required)
- Bluetooth 4.1 (External Antenna Required)
- GPS (External Antenna Required)

PROGRAMMING LANGUAGE
- CODESYS 3.5
- QT (on request)

ADVANCED FEATURES
- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 12.1” colour screen for harsh environments
- Powerful iMX6 Quad A9 processor @ 1GHz clock speed
- 2GB of DDR3 SDRAM and 16GB of NAND flash storage
- 16GB flash, 2GB RAM
- Capacative touchscreen with glove support

OVERALL SIZE
Non-keyed version
330 mm x 210 mm x 59.7mm

Keyed version
330 mm x 210 mm x 63.5 mm

PANEL CUT-OUT SIZE
231 mm x 133 mm

DSEM240
CAN Slave Unit
(44 I/O)

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs with digital and analogue capability (20)
- Configurable outputs with digital, PWM and PWMi (24)

COMMUNICATIONS
- CAN interface, J1939 or CAN Open

ADVANCED FEATURES
- Engineered for durability and reliability in extreme environmental conditions
- Tough die-cast aluminium for direct mounting to chassis or machine frameworks
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- Fully programmable to meet the extra challenges of complex off-highway and vehicle applications
- IP67 / NEMA 6 protection

OVERALL SIZE
240 mm x 190 mm x 49 mm

DSEM640
Programmable Controller
(68 I/O)

PRODUCT HIGHLIGHTS

- Can be used independently or in conjunction with any programmable display
- Engineered for durability and reliability in the most extreme environmental conditions
- Tough die-cast aluminium for direct mounting to chassis or machine frameworks
- Sophisticated breather valve to equalise pressure and reduce condensation
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- E11 type approval
- IP67 / NEMA 6 protection

I/O
- Configurable inputs with digital and analogue capability (32)
- Configurable outputs with digital, PWM and PWMi capability (36)

COMMUNICATIONS
- Independent CAN interfaces, J1939, CAN Open or Raw CAN (4)
- J1939 communications compatible with Tier 4F / Stage V
- Ethernet interface

PROGRAMMING LANGUAGE
- CODESYS 3.5
- C (on request)

ADVANCED FEATURES
- Powerful 32-bit processor with 220 MHz clock speed
- 4 MB application memory

OVERALL SIZE
240 mm x 190 mm x 49

DSEM643
Programmable Controller
(34 I/O)

PRODUCT HIGHLIGHTS

- Can be used independently or in conjunction with any programmable display
- Engineered for durability and reliability in the most extreme environmental conditions
- Tough die-cast aluminium for direct mounting to chassis or machine frameworks
- Sophisticated breather valve to equalise pressure and reduce condensation
- Outstanding response & performance through powerful processors, internal components and superior electronic design
- Fully programmable to meet the challenges of multiple off-highway and vehicle applications
- E11 type approval
- IP67 / NEMA 6 protection

I/O
- Configurable inputs with digital and analogue capability (16)
- Configurable outputs with digital, PWM and PWMi capability (18)

COMMUNICATIONS
- Independent CAN interfaces, J1939, CAN Open or Raw CAN (4)
- J1939 communications compatible with Tier 4F / Stage V
- Ethernet interface

PROGRAMMING LANGUAGE
- CODESYS 3.5
- C (on request)

ADVANCED FEATURES
- Powerful 32-bit processor with 220 MHz clock speed
- 4 MB application memory

OVERALL SIZE
240 mm x 190 mm x 49 mm

DSEControl

DSEControl® Accessories

The DSE**Control®** range features a wide selection of accessories for use with M-Series and E-Series products. Accessories include: connector sets, connector harness sets, configuration harnesses, Deutsch connectors, Ampseal connectors, IP plugs, USB interface cables and Ethernet programming leads.

M640 Connector Set (Part No. 007-035)
Set of 3 coded AMP SEAL connectors with crimps / contacts

M640 Connector Harness Set (Part No. 007-036)
Set of 3 coded AMP SEAL connectors pre-wired with 1.2 metre cable

DT16 Deutsch Connector A (Part No. 007-850)
18-way connector complete with pins

DT16 Deutsch Connector C (Part No. 007-851)
18-way connector complete with pins

Ethernet Programming Cable (Part No. 016-160)
MJ12/RJ45 Ethernet cross-over patch cable

USB Interface Cable (Part No. 016-161)
M12 B-code / USB type A socket

M643 Connector Set (Part No. 007-1020)
Set of 3 coded AMP SEAL connectors with crimps / contacts

M643 Connector Harness Set (Part No. 016-174)
Set of 3 coded AMP SEAL connectors pre-wired with 1.2 metre cable

M812 Panel Mount Kit (Buttons) (Part No. 100-411-01)
Panel mount kit for use with the M812 with buttons.

M812 Panel Mount Kit (No Buttons)(Part No. 100-411-02)
Panel mount kit for use with the M812 without buttons.

M812 Connector Harness (Part No. 016-185)
Set of 2 coded AMP SEAL connectors pre-wired with 1.2 meter cable.

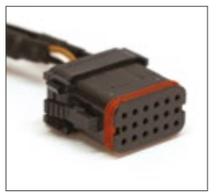
M812 Connector Set (Part No. 007-1073)
Set of 2 coded AMP SEAL connectors complete with crimps/contacts.

DT16 Deutsch Connector IP Plug (Part No. 020-1042)
DT16 blanking plug

M870 Connector Harness Set (Part No. 016-176)
Coded M870 connectors with 1.0 metre pre-wired cable

M840 Connector Harness Set (Part No. 016-168)
Coded M840 connector pre-wired with 1.0 metre cable

E400 Connector Harness Set (Part No. 007-852)
Coded E400 connectors pre-wired with 1.2 metre cable



E050/M835 Configuration Harness (Part No. 016-177)
Coded AMP SEAL connector configuration harness pre-wired with 0.5 metre CAN cable and 1.0 metre DC power cable

E050/M835 Connector Harness (Part No. 016-176)
Coded AMP SEAL connector harness pre-wired with 1.0 metre cable.

GPS Antenna (SMA) (M) 3m Cable (Part No. 020-1079)
GPS Antenna (SMA) M with 3 metre cable.

PCAN to USB interface required to configure the E050 & M835

ENGINE & PUMP CONTROLLERS

Mobile pumps are being used during times of severe flooding after heavy rainfall and riverbank breaches affect housing and developed areas across Africa.

Using the DSE E-Series controllers, the pumps drain the water into nearby unused areas and drainage ditches. Sophisticated data logging, particularly oil pressure and engine coolant temperature, allow maintenance engineers to keep the pumps running at optimum efficiency.

Sophisticated communications through DSE**WebNet®** allow remote monitoring of the pumps throughout their 24/7 operation.

DSEControl

DSEE050
eView® Engine Display

PRODUCT HIGHLIGHTS

I/O
- Configurable multi-functional inputs for digital, current, voltage & resistance (4)
- Outputs for external relays, LEDs and audible buzzer (3)

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)

CONFIGURATION
- DSE Configuration Suite PC software

ADVANCED FEATURES
- 3.5” optically bonded TFT display screen
- 320 x 240 pixel display for high clarity viewing
- Auto on / off heated display screen
- Monitors engine speed, oil pressure, coolant temperature, fuel level & more
- TSC 1 messaging for speed control
- DTCs for the display of DM1 and DM2 diagnostic trouble codes
- Configurable CAN baud rate (250 kbit/s or 500 kbit/s)
- Configurable start-up screen and instrumentation pages
- Dark and light screen themes
- 80 mm circular panel cut-out for simple replacement of traditional gauges
- 120 Ω resistor software switchable
- Customised image display (30 screen support)
- IP67 / NEMA 6 protection
- Industry standard Deutsch 18 pin connector
- Low power / power save mode

OVERALL SIZE
112.5 mm x 115 mm x49 mm

PANEL CUT-OUT SIZE
80 mm Diameter

DSEE100
Engine Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable analogue / digital inputs (3)
- Configurable digital inputs (4)
- Configurable remote start input
- Configurable DC outputs (4)
- Fuel and start outputs

COMMUNICATIONS
- USB for PC configuration
- DSEWebNet® compatible

ENGINE COMPATIBILITY
- Conventional engine support (MPU & W terminal)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- 3 engine maintenance alarms
- Engine speed protection
- Comprehensive warning, controlled shut down or shut down protection on fault condition
- Engine hours counter
- Real-time clock for accurate event logging
- Engine pre-heat
- Engine run-time scheduler
- Battery voltage monitoring
- Large display screen
- Power save mode
- Start on low battery voltage

OVERALL SIZE
140 mm x 113 mm x 43 mm

PANEL CUT-OUT SIZE
118 mm x 92 mm

DSEE400
Engine Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (4)
- Configurable analogue inputs (7)
- Configurable DC outputs (2)
- Configurable PWM / PWMi outputs (2)
- Configurable analogue output (1)

COMMUNICATIONS
- RS485 communications
- MODBUS RTU
- USB for PC configuration
- DSEWebNet® compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Sophisticated pump control for fill / empty, maintain fill / empty
- Configurable timers and alarms
- 3 configurable maintenance alarms
- Built-in governor and clutch control
- Manual and automatic speed control
- Automatic speed ramping
- Fuel usage monitor and low fuel alarms
- Flexible automatic start control
- Advanced support for multiple languages
- Protections disabled feature
- Customisable status and instrumentation screens
- Backed-up real time clock
- Multiple date and time engine scheduler
- Extensive event logging

OVERALL SIZE
189 mm x 125 mm x 54 mm

PANEL CUT-OUT SIZE
148 mm x 112 mm

DSEE800
Engine Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable digital inputs (11)
- Configurable ratio-metric inputs (12)
- Configurable DC outputs (4)
- Configurable volt-free outputs (2)
- Configurable PWMi outputs (4)
- Independent fuel and start outputs

COMMUNICATIONS
- User selectable RS232, RS485 & Ethernet communications
- MODBUS RTU & TCP IP
- USB for PC configuration
- DSEWebNet® compatible

ENGINE COMPATIBILITY
- CAN engine support (Tier 4F / Stage 5)
- Conventional engine support (MPU & Hz)

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Float contact support
- Configurable timers and alarms
- 3 configurable maintenance alarms
- Built-in governor and clutch control
- Automatic and manual speed control
- Automatic speed ramping
- Fuel usage monitor and low fuel alarms
- Flexible automatic start control
- Advanced support for multiple languages
- Sophisticated data logging and trending reports
- Advanced SMS control including start / stop and fault messaging
- User configurable MODBUS pages
- Customisable status screens
- Multiple date and time engine scheduler
- PLC editor
- Modem diagnostics
- Protections disabled feature
- Backed-up real time clock
- DSENet® expansion compatible

OVERALL SIZE
240 mm x 172 mm x 57 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

DSE**Power®**

DSE**Power®** is a range of 12 and 24 volt compact, vertical, intelligent, enclosed and dual output battery chargers, ranging from 3 amp to 30 amp. Each charger has been developed and manufactured by our specialist power engineering team.

All chargers within the range include multiple industry-leading features that are setting new standards in charging technology and enhancing multiple customer charging applications across a wide range of different industry sectors.

SUITABLE FOR:

CCTV

RAIL

SMOKE AOV

SHIPPING VESSELS

EMERGENCY VEHICLES

LIGHTING TOWERS

GENSETS

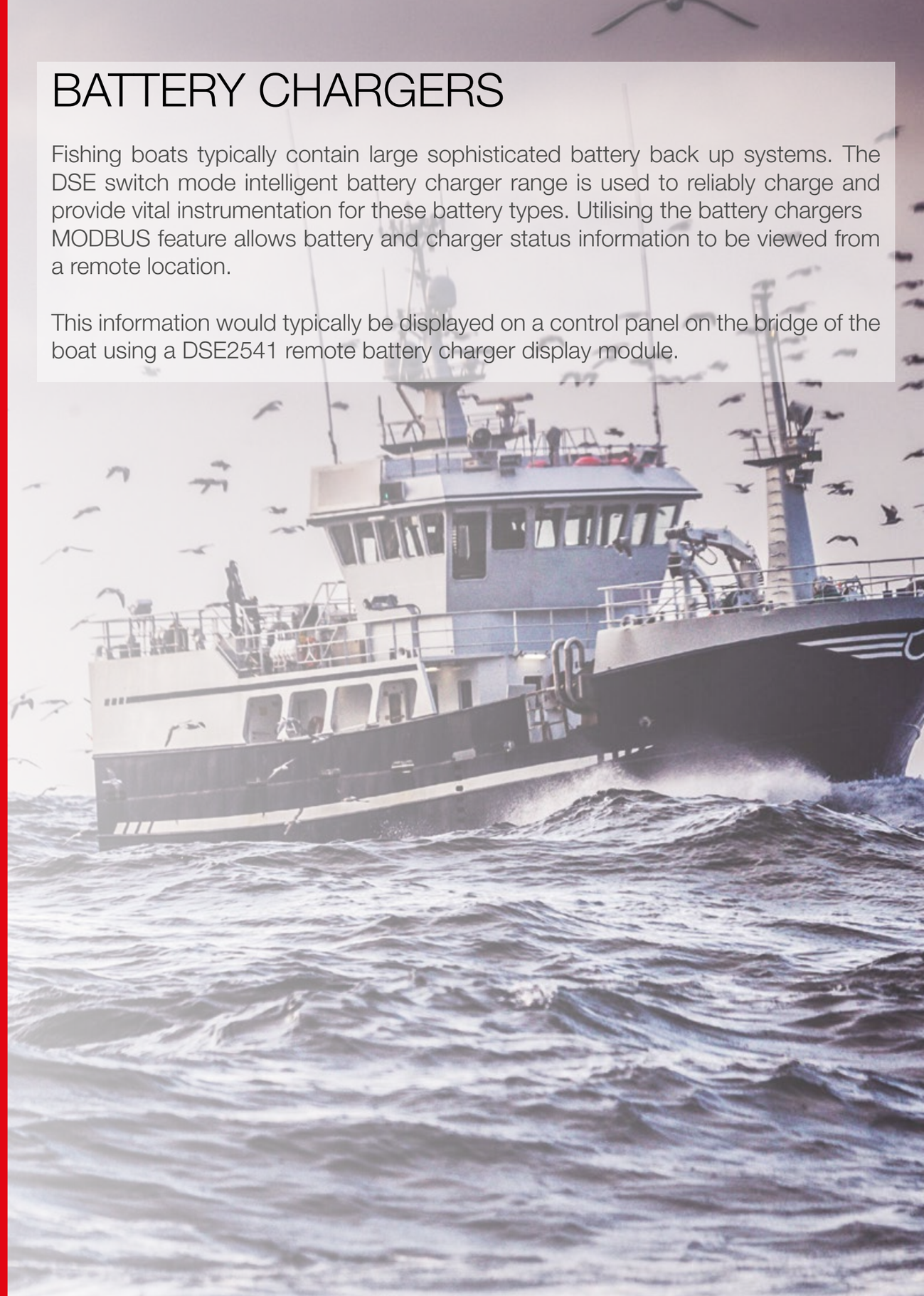
PUMPS

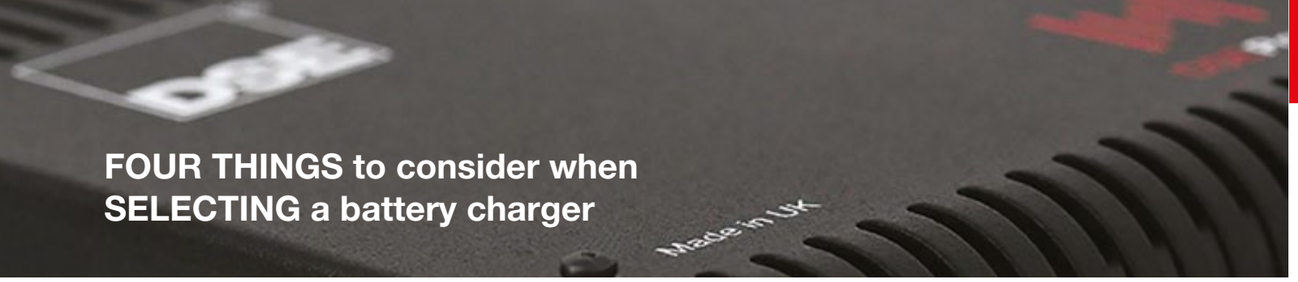
COMPRESSORS

BATTERY CHARGERS

Fishing boats typically contain large sophisticated battery back up systems. The DSE switch mode intelligent battery charger range is used to reliably charge and provide vital instrumentation for these battery types. Utilising the battery chargers MODBUS feature allows battery and charger status information to be viewed from a remote location.

This information would typically be displayed on a control panel on the bridge of the boat using a DSE2541 remote battery charger display module.





FOUR THINGS to consider when SELECTING a battery charger

BATTERY TYPE

Our battery chargers have a configurable float voltage making them suitable for most battery types (i.e. NiCd, lead acid, gel type).

If your battery manufacturer has specific charging requirements, these settings can be matched within our DSE Configuration Suite PC software and uploaded to your charger.

VOLTAGE

Both AC and DC voltages in and out of the battery charger must be considered. Our battery chargers are designed with a wide AC voltage input range of 90 V – 305 V AC for use all over the world. In addition to this, the DC output of the charger can be put in series or parallel.

Float voltage can be changed via an on-board pot to allow adjustments for specific battery requirements.

Each charging stage output voltage can be changed using our DSE Configuration Suite PC software.

CURRENT OUTPUT

It is advisable to use a battery charger with a current rating of 1:10 of the Ah capacity of the battery. For example a 100 Ah battery would need a 10 A battery charger.

This varies between battery chemistries and if you want to charge at a higher rate, your battery manufacturer will be able to advise you.

The DSE Configuration Suite PC software can be used to limit the maximum current output of your battery charger to perfectly suit your battery.

STANDING LOAD

The standing load on a battery is the main requirement for the charge current. The battery charger must be able to supply this current, with the remaining capacity used to charge the battery.

Battery charging top-up requires only a small amount above this, as bulk charging.

Example: for a 2 A standing load, a 5 A or 10 A battery charger is considered suitable for the majority of applications.

DSE chargers can be used as battery chargers, power supplies or both simultaneously.

DSE9702

12 Volt 5 Amp Vertical Charger

PRODUCT HIGHLIGHTS

- Constant current / constant voltage
- Automatic float mode return
- Low output ripple
- Reverse polarity, short-circuit and current limiting protection
- Auto recovery on fault condition removal
- Cell charge boost and equalizing
- Power save mode
- No moving parts-convection cooled
- Chargers can be linked together in parallel or series
- Charge fail output
- 80% operating efficiency
- Dedicated manual boost connection terminals
- DIN rail / chassis mount

COMPATIBILITY

- All DSE modules
- All common battery types

DIN RAIL MOUNTED
133 mm x 110 mm x 48 mm

SCREW MOUNTED
153 mm x 112 mm x 48 mm

DSE9130

12 Volt 5 Amp Compact Charger

PRODUCT HIGHLIGHTS

- Constant current / constant voltage
- Automatic float mode return
- Low output ripple
- Reverse polarity, short-circuit and current limiting protection
- Auto recovery on fault condition removal
- Cell charge boost and equalizing
- Power save mode
- No moving parts-convection cooled
- Chargers can be linked together in parallel or series
- Charge fail output
- 80% operating efficiency
- Dedicated manual boost connection terminals
- DIN rail / chassis mount

COMPATIBILITY

- All DSE modules
- All common battery types

OVERALL SIZE
136 mm x 140 mm x 63 mm

DSE9701
24 Volt 5 Amp Vertical Charger

DSE9255
24 Volt 5 Amp Vertical Charger

PRODUCT HIGHLIGHTS

- Constant current / constant voltage
- Automatic float mode return
- Low output ripple
- Reverse polarity, short-circuit and current limiting protection
- Auto recovery on fault condition removal
- Cell charge boost and equalizing
- Power save mode
- No moving parts-convection cooled
- Chargers can be linked together in parallel or series
- Charge fail output
- 80% operating efficiency
- Dedicated manual boost connection terminals
- DIN rail / chassis mount

COMPATIBILITY
- All DSE modules
- All common battery types

OVERALL SIZE (9255)
136 mm x 140 mm x 63 mm

DIN RAIL MOUNTED (9701)
133 mm x 110 mm x 48 mm

SCREW MOUNTED (9701)
153 mm x 112 mm x 48 mm

DSE9470 MKII
12 Volt / 24 Volt 10 Amp
Intelligent Battery Charger

PRODUCT HIGHLIGHTS

ADVANCED FEATURES
- Configurable for 12 V / 24 V operation
- Intelligent two, three and four stage charging profiles
- Adjustable current limit
- Digital micro-processor technology
- Low output ripple and tight load & line regulation
- Customisable charging curves
- AC input under / over voltage
- Battery charger over voltage protection
- Battery charger over current protection
- Battery under voltage alarm
- Auto battery detection
- Auto self-test function
- Output short circuit and inversion polarity with auto recovery
- Auto power de-rating at high ambient temperatures
- Optional battery temperature compensation using a PT1000 temperature sensor
- Cell charge boost & equalizing
- Configurable soft-start feature using DSE Configuration Suite software “View remaining charge time via SCADA”
- Digital input within SCADA
- Configurable bulk to absorption transmission
- 12 V / 24 V auto voltage battery detection
- Configurable charge termination
- Battery health check
- Battery voltage sensing (down to 1 V)
- Deep sleep mode
- PSU mode
- Automatic voltage detection (down to 1 V)
- Max current mode
- 86% operating efficiency
- DIN rail / chassis mount
- External remote LCD option (see DSE2541)

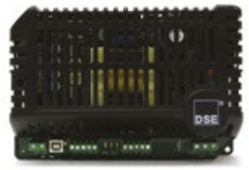
COMMUNICATIONS
- MODBUS RTU using RS485
- USB

COMPATIBILITY
- All DSE modules
- All common battery types including lithium-ion

CONFIGURATION
- DSE Configuration Suite PC software

OVERALL SIZE
200 mm x 130 mm x 70 mm

DSE9473 / DSE9474 / DSE9476
24 Volt Intelligent Battery Chargers



DSE9473
15 Amp

DSE9476
20 Amp

DSE9474
30 Amp

OVERALL SIZE (DSE9473)
205mm x 135mm x 80mm

OVERALL SIZE (DSE9474)
240mm x 263mm x 89mm

OVERALL SIZE (DSE9476)
183mm x 233mm x 76mm

PRODUCT HIGHLIGHTS

ADVANCED FEATURES
- Intelligent two, three and four stage charging profiles
- Adjustable current limit
- Digital micro-processor technology
- Low output ripple and tight load & line regulation
- Customisable charging curves
- AC input under / over voltage alarms
- Battery charger over voltage protection
- Battery charger over current protection
- Battery under voltage alarm
- Auto battery detection
- Auto self-test function
- Output short circuit and inversion polarity with auto recovery
- Auto power de-rating at high ambient temperatures
- Optional battery temperature compensation using a PT1000 temperature sensor
- Cell charge boost & equalizing
- Boosts and equalises cell charge improving battery performance and life
- 86% operating efficiency
- DIN rail / chassis mount (DSE9474 & DSE9476 chassis only)
- External remote display option (DSE2541)

COMMUNICATIONS
- MODBUS RTU using RS485
- USB

COMPATIBILITY
- All DSE modules
- All common battery types

CONFIGURATION
- DSE Configuration Suite PC software

DSE9462
12 Volt / 24 Volt 10 Amp / 15 Amp Dual Output Intelligent Battery Charger

PRODUCT HIGHLIGHTS

ADVANCED FEATURES
- Intelligent two, three and four stage charging profiles
- Remote voltage sensing to compensate for voltage drop
- Independent adjustable current limit on both charge outputs Output 1 (24 V) 15 amp max, output 2 (12 V) 10 amp max
- Simultaneously power 12 volt ancillary equipment and charge a 24 volt battery
- Automatic or manual boost and storage charge functions to help maintain battery condition
- Digital micro-processor technology
- Low output ripple
- Four red indicator LEDs
- AC input under voltage
- AC input over voltage
- Battery charger output over voltage
- Battery charger output over current
- Battery low voltage detection
- Output short circuit and inversion polarity with auto recovery
- Automatic power de-rating at high ambient temperatures
- Optional battery temperature compensation using a PT1000 temperature sensor
- Boosts and equalizes cell charge to improve battery performance and life
- ECO power mode
- Minimum 90% operating efficiency
- Chassis mount

COMMUNICATIONS
- J1939 CAN bus
- USB

COMPATIBILITY
- All DSE modules
- All common battery types

CONFIGURATION
- DSE Configuration Suite PC software

OVERALL SIZE
290 mm x 157 mm x 67 mm

DSEBC2410Ei

12 Volt / 24 Volt 10 Amp Enclosed Intelligent Battery Chargers

OVERALL SIZE
170 mm x 305 mm x 116 mm

PRODUCT HIGHLIGHTS

ADVANCED FEATURES

- Intelligent two, three and four stage charging profiles
- Front panel control with multiple display variants
- Front panel meters
- 12 V / 24 V configurable
- Adjustable current limit
- Can be used as a battery charger or power supply
- Manual & automatic boost
- Digital micro-processor technology
- Battery charging temperature compensation
- Low output ripple / excellent line regulation
- Customisable charging curves
- AC input over / under voltage
- Battery charger over voltage protection
- Battery charger over current protection
- Battery under voltage alarm
- 12 V / 24 V auto voltage battery detection
- Auto self test function
- Output short circuit and inversion polarity with auto recovery
- Auto power de-rating at high ambient temperatures
- Optional battery temperature compensation using a PT1000 temperature sensor
- Power save mode
- 86% operating efficiency
- Chassis mount
- External remote display option (DSE2541)

COMMUNICATIONS

- MODBUS RTU using RS485
- USB
- NFPA 110 (QWIR) COMPLIANT / UL LISTED

COMPATIBILITY

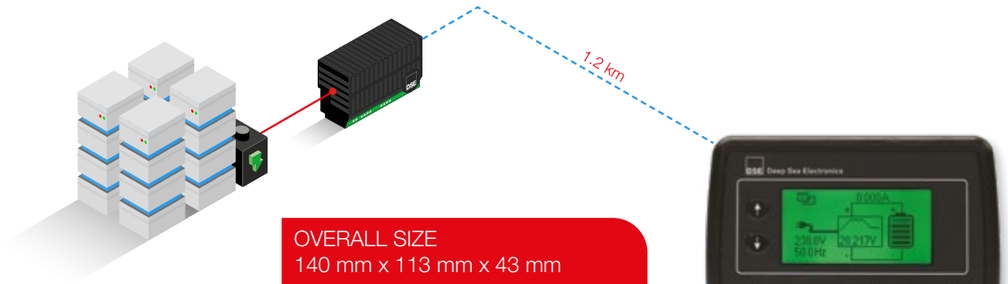
- All DSE modules
- All common battery types

CONFIGURATION

- DSE Configuration Suite PC software

DSE2541

Remote Battery Charger Display Module



OVERALL SIZE
140 mm x 113 mm x 43 mm

PANEL CUT-OUT SIZE
118 mm x 92 mm

The DSE**2541** remote battery charger display has been designed to work with our full range of intelligent and enclosed battery chargers. The display presents information to the operator on charge output, charge cycle, mains (utility) supply status and indicates when fault conditions are present.

ADVANCED FEATURES

Battery charger power and temperature monitoring

Alarm indication

Remote boost and battery charger output control

Mains AC voltage and frequency monitoring

Full list of features available at www.hagar.co.za

DSE**Ats®**

DSEAts® features an advanced range of automatic transfer switch control modules and power supplies.

Our dedicated development team have an in-depth understanding of ATS markets ensuring all products provide a perfect balance of advanced features and functionality relevant to the demands of the industry.

SUITABLE FOR:

TELECOMS **DATA CENTRES** **HOSPITALS**

DSE160
Self-Seeking Power Supply

PRODUCT HIGHLIGHTS

- 1 A output
- 12 V and 24 V variants
- Powered by mains (utility), generator or battery
- LED indicators
- Wide operating input voltage
- Output auto restart short circuit protection
- Output over voltage protection
- Less than 1% output ripple
- Can be used as an AC / DC power supply
- DIN rail / chassis mount
- Compatible with DSE335, DSE334, DSE331, DSE330 ATS controller

OVERALL SIZE
136 mm x 140 mm x 63 mm

DSE327
Auto Transfer Switch Control Module

PRODUCT HIGHLIGHTS

I/O
- Volt-free outputs (3)

CONFIGURATION
- Two precision time adjustable potentiometers

ADVANCED FEATURES
- Source 1 / source 2 control
- Self powered - No DC required
- Configurable timers
- Automatic switch-over between supplies
- LED indicators
- DIN rail mount

OVERALL SIZE
72 mm x 90.5 mm x 65 mm

DSE331
Auto Transfer Switch Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs (4)
- Configurable volt-free outputs (4)
- Configurable DC outputs (4)

COMMUNICATIONS
- USB for PC configuration

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Automatic switch-over between supplies
- Source 1 / source 2 control
- Manual restore to S1
- Check sync feature
- Icon or text display
- Configurable timers
- Start inhibit & load inhibit
- Manual & automatic return
- Supports multiple topologies
- Rotary ATS configuration
- 3-phase display
- Compatible with DSE160 power supply

OVERALL SIZE
180 mm x 116 mm x 42 mm

PANEL CUT-OUT SIZE
154 mm x 98 mm

DSE334
Auto Transfer Switch Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs (10)
- Configurable outputs (5)

COMMUNICATIONS
- USB for PC configuration
- DSEWebNet® compatible

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- Automatic switch-over between supplies
- Source 1 / source 2 control
- Manual restore to S1
- Check sync feature
- Event log (10)
- Multiple topology support
- Front panel configuration
- External mains (utility) or generator failure inputs
- Compatible with DSE160 power supply

OVERALL SIZE
215 mm x 158 mm x 42 mm

PANEL CUT-OUT SIZE
182 mm x 137 mm

DSE335
Auto Transfer Switch Control Module

PRODUCT HIGHLIGHTS

I/O
- Configurable inputs (12)
- Configurable volt-free outputs (6)
- Configurable DC outputs (6)

COMMUNICATIONS
- Configurable for RS232 or RS485
- USB for PC configuration
- DSEWebNet® compatible

CONFIGURATION
- DSE Configuration Suite PC software
- Front panel (PIN protected)

ADVANCED FEATURES
- 3-phase monitoring of 2 independent AC supplies (S1 and S2)
- Additional display screens to help with modem diagnostics
- Source 1 / source 2 control
- Manual restore to S1
- Load switching (load shedding outputs)
- Check sync feature
- Power monitoring (kWh, kVAr, kVAh, kVArh)
- Start and load inhibit
- Manual and automatic return
- Supports multiple topologies
- Rotary ATS configuration
- Configurable timers and alarms
- Multiple date and time scheduler
- PLC editor
- Real-time clock
- SMS messaging
- Configurable GenComm pages
- DSENet® compatible
- Compatible with DSE160 power supply

OVERALL SIZE
245 mm x 184 mm x 42 mm

PANEL CUT-OUT SIZE
220 mm x 160 mm

Function

Fuses are used to protect equipment against overload and short-circuits. The fuse blows when current flowing through it exceeds the rating.

Fuse Holders

TYPE	MAX RATED CURRENT	NUMBER OF POLES	WIDTH	MAX RATED AC VOLTAGE
E91/32	32A	1	18mm	690
E93/32	32A	3	54mm	690

Fuses

TYPE	DESCRIPTION
1038	Fuse Link from 1A to 32A
1038 N	Neutral Link

- Single Pole plus Neutral Fuse Holders are available on request.
- Triple Pole plus Neutral Fuse Holders are available on request.
- Photovoltaic type (1000V) Fuse Holders are available on request.
- 500V Fuses are to IEC269 Standards.

Pluggable Interface Relays

CR-M range (without LED)

Type	Control voltage	Number contacts	Contact Ratings	Pins
CR-M012DC2	12VDC	2 c/o (SPDT)	12A @ 250V	8
CR-M024DC2	24VDC	2 c/o (SPDT)	12A @ 250V	8
CR-M230AC2	230VAC	2 c/o (SPDT)	12A @ 250V	8
CR-M012DC4	12VDC	4 c/o (SPDT)	6A @ 250V	14
CR-M024DC4	24VDC	4 c/o (SPDT)	6A @ 250V	14
CR-M230AC4	230VAC	4 c/o (SPDT)	6A @ 250V	14

Accessories

Socket (base) for CR-M relays

Type	Description
CR-M2SS	Standard socket for CR-M 2 c/o relay
CR-M4SS	Standard socket for CR-M 4 c/o relay

CR-U range (without LED)

Type	Control voltage	Number contacts	Contact Ratings	Pins
CR-U012DC2	12VDC	2 c/o (SPDT)	12A @ 250V	8
CR-U024DC2	24VDC	2 c/o (SPDT)	12A @ 250V	8
CR-U230AC2	230VAC	2 c/o (SPDT)	12A @ 250V	8
CR-U012DC3	12VDC	3 c/o (SPDT)	10A @ 250V	11
CR-U024DC3	24VDC	3 c/o (SPDT)	10A @ 250V	11
CR-U230AC3	230VAC	3 c/o (SPDT)	10A @ 250V	11

Accessories

Socket (base) for CR-U relays

Type	Description
CR-U2S	Standard socket for CR-U 2 c/o relay
CR-U3S	Standard socket for CR-U 3 c/o relay

- More options on the relays are available on request, ie; CR-M/CR-U with LED and nonstandard coil voltages.
- For accessories on the relays or sockets please enquire with us, ie; diode, varistor, gold contacts etc.

Contactors

Type	Description	Auxiliary	AC-3	AC-3	AC-1
AF09-30-01-13	3 Pole contactor with 230VAC coil	1 n/c	4kW	9A	25A
AF12-30-01-13	3 Pole contactor with 230VAC coil	1 n/c	5,5kW	12A	28A
AF16-30-01-13	3 Pole contactor with 230VAC coil	1 n/c	7,5kW	16A	30A
AF26-30-00-13	3 Pole contactor with 230VAC coil	-	11kW	26A	45A
AF30-30-00-13	3 Pole contactor with 230VAC coil	-	15kW	30A	50A
AF38-30-00-13	3 Pole contactor with 230VAC coil	-	18.5kW	38A	50A
AF40-30-00-13	3 Pole contactor with 230VAC coil	-	18.5kW	40A	70A
AF52-30-00-13	3 Pole contactor with 230VAC coil	-	22kW	52A	100A
AF65-30-00-13	3 Pole contactor with 230VAC coil	-	30kW	65A	105A
AF80-30-00-13	3 Pole contactor with 230VAC coil	-	37kW	80A	125A
AF96-30-00-13	3 Pole contactor with 230VAC coil	-	45kW	96A	130A
AF116-30-00-13	3 Pole contactor with 230VAC coil	-	55kW	116A	160A
AF140-30-00-13	3 Pole contactor with 230VAC coil	-	75kW	140A	200A
AF146-30-00-13	3 Pole contactor with 230VAC coil	-	75kW	146A	225A
AF190-30-00-13	3 Pole contactor with 230VAC coil	-	90kW	190A	275A
AF205-30-00-13	3 Pole contactor with 230VAC coil	-	110kW	205A	350A
AF265-30-00-13	3 Pole contactor with 230VAC coil	-	132kW	265A	400A
AF305-30-00-13	3 Pole contactor with 230VAC coil	-	160kW	305A	500A
AF370-30-00-13	3 Pole contactor with 230VAC coil	-	200kW	370A	600A
AF460-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	250kW	460A	700A
AF580-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	315kW	580A	800A
AF750-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	400kW	750A	1050A
AF1250-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	-	-	1260A
AF1350-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	475kW	860A	1350A
AF1650-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	560kW	1060A	1650A
AF2050-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	-	-	2050A
AF2650-30-11	3 Pole contactor with 230VAC coil	1 n/o + 1 n/c	-	-	2650A

Accessories

Auxiliaries

CA4-10	Front mount auxiliary for contactors AF09 - AF96	1 n/o
CA4-01	Front mount auxiliary for contactors AF09 - AF96	1 n/c
CAL4-11	Side mount auxiliary for contactors AF09 - AF96	1 n/o + 1 n/c
CAL19-11	Side mount auxiliary for contactors AF116 -AF370	1 n/o + 1 n/c
CAL18-11	Side mount auxiliary for contactors AF400 -AF2650	1 n/o + 1 n/c

Mechanical Interlocks

VM4	Mechanical interlock for contactors AF09 - AF38
VM96-4	Mechanical interlock for contactors AF40 - AF96
VM19	Mechanical interlock for contactors AF116 - AF370
VM750H	Mechanical interlock for contactors AF400 - AF1250
VM1650H	Mechanical interlock for contactors AF1350 - AF2650

- More options of contactors are available.
- 12 and 24VDC rated control coil voltages are available on request, as well as 4 pole contactors.

S201 Single Pole MCB's

Type	Rated Current	Rated kA @230VAC (Icu)	Rated kA @230VAC (Ics)	Description
S201-C2	2A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C6	6A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C10	10A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C16	16A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C20	20A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C25	25A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C32	32A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C40	40A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C50	50A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C63	63A	10kA	7.5kA	MCB din rail mount (230VAC-60VDC)
S201-C80	80A	6kA	6kA	MCB din rail mount (230VAC-60VDC)
S201-C100	100A	6kA	6kA	MCB din rail mount (230VAC-60VDC)

S202 Double Pole MCB's

Type	Rated Current	Rated kA @230VAC (Icu)	Rated kA @230VAC (Ics)	Description
S202-C2	2A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C6	6A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C10	10A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C16	16A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C20	20A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C25	25A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C32	32A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C40	40A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C50	50A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C63	63A	10kA	7.5kA	MCB din rail mount (400VAC-125VDC)
S202-C80	80A	6kA	6kA	MCB din rail mount (400VAC-125VDC)
S202-C100	100A	6kA	6kA	MCB din rail mount (400VAC-125VDC)

S203 Triple Pole MCB's

Type	Rated Current	Rated kA @230VAC (Icu)	Rated kA @230VAC (Ics)	Description
S203-C2	2A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C6	6A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C10	10A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C16	16A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C20	20A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C25	25A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C32	32A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C40	40A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C50	50A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C63	63A	10kA	7.5kA	MCB din rail mount (400VAC)
S203-C80	80A	6kA	6kA	MCB din rail mount (400VAC)
S203-C100	100A	6kA	6kA	MCB din rail mount (400VAC)

- Four Pole and Single Pole + N MCB's are available on request.
- Different Tripping Curve types are available on request.
- Higher kA ratings are available on request.
- For accessories on the MCB's please enquire with us.
- Accessories include auxiliaries, bridging bars, etc.

Tmax XT1/XT3 MCCB's

Frame	Amp	kA	Release Type	Description
XT1	44-63A	18kA	TMD	3 Pole XT1 MCCB
XT1	56-80A	18kA	TMD	3 Pole XT1 MCCB
XT1	70-100A	18kA	TMD	3 Pole XT1 MCCB
XT1	88-125A	18kA	TMD	3 Pole XT1 MCCB
XT1	112-160A	18kA	TMD	3 Pole XT1 MCCB
XT2	44-63A	36kA	TMA	3 Pole XT2 MCCB
XT2	56-80A	36kA	TMA	3 Pole XT2 MCCB
XT2	70-100A	36kA	TMA	3 Pole XT2 MCCB
XT2	88-125A	36kA	TMA	3 Pole XT2 MCCB
XT2	112-160A	36kA	TMA	3 Pole XT2 MCCB
XT3	112-160A	36kA	TMD	3 Pole XT3 MCCB
XT3	140-200A	36kA	TMD	3 Pole XT3 MCCB
XT3	175-250A	36kA	TMD	3 Pole XT3 MCCB
XT4	140-200A	36kA	TMA	3 Pole XT4 MCCB
XT4	158-225A	36kA	TMA	3 Pole XT4 MCCB
XT4	175-250A	36kA	TMA	3 Pole XT4 MCCB

Accessories

Auxiliary contacts (AUX)

Frame	Configuration		Description
	C/O contact	Trip contact	
XT1/XT2/XT3/XT4-XT4	1Q	1SY	Auxlary 250V rated
XT1/XT2/XT3/XT4-XT4	2Q	1SY	Auxlary 250V rated

Motor operators (MOD)

Frame	Motor Voltage	Type	Description
XT1/XT3	24VDC	MOD	Motor operator for XT1/XT3 MCCB's
XT1/XT3	230VAC	MOD	Motor operator for XT1/XT3 MCCB's
XT2/XT4	24VDC	MOE	Motor operator for XT2/XT4 MCCB's
XT2/XT4	230VAC	MOE	Motor operator for XT2/XT4 MCCB's

Shunts (SOR & UVR)

Frame	Voltage	Description
XT1/XT2/XT3/XT4-XT4	24VDC	Shunt opening release
XT1/XT2/XT3/XT4-XT4	230VAC	Shunt opening release
XT1/XT2/XT3/XT4-XT4	220-240VAC	Shunt undervoltage release
XT1/XT2/XT3/XT4-XT4	380-440VAC	Shunt undervoltage release

Mechanical Interlocks (MIR)

Frame	Type	Description
XT1, XT2, XT3 & XT4	MIR-H	Horizontal Interlock Frame (1 req per set)
XT1	Plate XT1 F	Interlock plates (1 req per breaker, 2 per set)
XT2	Plate XT2 F	Interlock plates (1 req per breaker, 2 per set)
XT3	Plate XT3 F	Interlock plates (1 req per breaker, 2 per set)
XT4	Plate XT4 F	Interlock plates (1 req per breaker, 2 per set)

- 4 Pole MCCB's are available on request.
- Higher and lower kA ratings available on request.
- The XT1/XT3 range is not suitable for syncronisation applications

Moulded Case Circuit Breakers

Tmax MCCB's

Frame	Amp	kA	Description
T4N	320A	36kA	3 Pole Tmax MCCB with PR221DS-LS/I release
T5N	400A	36kA	3 Pole Tmax MCCB with TMA release
T5N	630A	36kA	3 Pole Tmax MCCB with PR221DS-LS/I release
T6N	800A	36kA	3 Pole Tmax MCCB with TMA release
T6N	800A	36kA	3 Pole Tmax MCCB with PR221DS-LS/I release
T7M	1000A	50kA	3 Pole Tmax MCCB with PR231/P-LS/I release
T7M	1250A	50kA	3 Pole Tmax MCCB with PR231/P-LS/I release
T7M	1600A	50kA	3 Pole Tmax MCCB with PR231/P-LS/I release

Accessories

Auxiliary contacts (AUX)

Frame	Configuration		Description
	C/O contact	Trip contact	
T4/5/6N	1Q	1SY	Auxiliary 250V rated
T4/5/6N	3Q	1SY	Auxiliary 250V rated
T4/5/6N	1Q	1SY	Auxiliary 400V rated
T4/5/6N	2Q	-	Auxiliary 400V rated
T7M	2Q	-	Auxiliary 400V rated

Motor operators (MOD)

Frame	Motor voltage	Description
T4/T5N	24VDC	Motor operator for Tmax MCCB's
T4/T5N	230VAC	Motor operator for Tmax MCCB's
T6N	24VDC	Motor operator for Tmax MCCB's
T6N	230VAC	Motor operator for Tmax MCCB's
T7M	24VDC	Motor operator for Tmax MCCB's
T7M	230VAC	Motor operator for Tmax MCCB's

Shunts (SOR & UVR)

Frame	Voltage	Description
T4/5/6N	24VDC	Shunt opening release
T4/5/6N	230VAC	Shunt opening release
T7M	24VDC	Shunt opening release
T7M	230VAC	Shunt opening release
T4/5/6N	220-240VAC	Shunt undervoltage release
T4/5/6N	380-440VAC	Shunt undervoltage release
T7M	220-240VAC	Shunt undervoltage release
T7M	380-440VAC	Shunt undervoltage release

Mechanical Interlocks (MIR)

Frame	Type	Description
T4/5N	MIR-HB	Horizontal interlock frame (1 req per set)
T4/4N	MIR-P	Interlock plates for T4 + T4 breakers (1 req per set)
T5/5N	MIR-P	Interlock plates for T5 + T5 breakers (1 req per set)
T6N	MIR-HB	Horizontal interlock complete
T7M	-	Cable Kit for interlock
T7M	-	Plate for fixed unit (2 req per set)

- 4 Pole MCCB's are available on request.

Air Circuit Breakers

Emax ACB's

Frame	Amp	kA	Description
E1.2B	1000A	42kA	3P Emax ACB with Ekip touch LI release
E1.2B	1250A	42kA	3P Emax ACB with Ekip touch LI release
E1.2B	1600A	42kA	3P Emax ACB with Ekip touch LI release
E2.2B	2000A	42kA	3P Emax ACB with Ekip touch LI release
E2.2N	2500A	66kA	3P Emax ACB with Ekip touch LI release

Accessories

Auxiliary contacts (AUX)

Frame	Configuration C/O contact	Trip contact	Description
E1.2	4Q	-	Auxiliary 400V rated
E2.2-E6.2	4Q	-	Auxiliary 400V rated
E1.2	-	1SY	Auxiliary 250V rated
E2.2-E6.2	-	1SY	Auxiliary 250V rated

Motor operators (MOD)

Frame	Motor voltage	Description
E1.2	24VDC	Motor operator for Emax MCCB's
E1.2	230VAC	Motor operator for Emax MCCB's
E2.2-E6.2	24VDC	Motor operator for Emax MCCB's
E2.2-E6.2	230VAC	Motor operator for Tmax MCCB's

Shunts (SOR & UVR)

Frame	Release	Voltage	Description
E1.2-E6.2	Opening	24VDC	Shunt opening release
E1.2-E6.2	Opening	230VAC	Shunt opening release
E1.2-E6.2	Closing	24VDC	Shunt closing release
E1.2-E6.2	Closing	230VAC	Shunt closing release
E1.2-E6.2	Undervolt	24VDC	Shunt undervoltage release
E1.2-E6.2	Undervolt	230VAC	Shunt undervoltage release

Mechanical Interlocks (MIR)

Frame	Type	Description
E1.2-E6.2	Type A	Cable for mechanical interlock (1 req per set)
E2.2	-	Lever for mechanical interlock (2 req per set)
E1.2	Type A	Support for mechanical interlock (2 req per set)
E2.2-E6.2	Type A,B,D	Support for mechanical interlock (2 req per set)

- 4 pole, withdrawable and higher current rating ACB's are available on request.

Motorised Change-over Switches

Description	Rated operational Current	Rated operational Power
	AC22A AT 400VAC	AC22A AT 400VAC
OTM160E3CM24D	160A	110KVA
OTM200E3CM24D	200A	135KVA
OTM250E3CM24D	250A	170KVA
OTM315E3CM24D	315A	215KVA
OTM400E3CM24D	400A	275KVA
OTM630E3CM24D	630A	435KVA
OTM800E3CM24D	800A	550KVA
OTM1000E3CM24D	1000A	680KVA
OTM1250E3CM24D	1250A	850kVA

Accessories

Auxiliary contacts (AUX)

Type	Frame	Configuration
OA1G10	OTM160-OTM2500	1 Normally open
OA3G01	OTM160-OTM2500	1 Normally closed

Bridging Bars (3 per pack)

Frame	Type
OTM160-OTM250	OTZC13
OTM315-OTM400	OTZC23
OTM630-OTM800	OTZC33
OTM1000	OTZC43

- OTM's with 230VAC rated motors are available on request.
- OTM's with 4-pole option are available on request.
- OTM's with higher and lower Amperage ratings are available on request.

MEASUREMENT PROTECTION EQUIPMENT

Description

Temperature senders are used to measure different media in connection with an electrical display unit. Some senders are grounded. Senders without grounding have a separate ground connection.

Temperature senders can also be equipped with a warning contact to signal the reaching of a temperature level limit.

Pressure senders are used to measure fluid pressure in connection with an electrical display unit. Some senders are grounded. Senders without grounding have a separate ground connection.

Pressure senders can also be equipped with a warning contact to signal the reaching of a pressure level limit.

PRESSURE UNITS				
Part Number	Description	Range	Switch Point	Mounting
360-081-029-004C	VDO sender only	0-500kPa		1/8"-27NPTF
360-081-030-049C	VDO sender/switch combination	0-500kPa	40kPa	1/8"-27NPTF
360-081-029-012C	VDO sender only	0-1000kPa		1/8"-27NPTF
360-081-030-052C	VDO sender/switch combination	0-1000kPa	50kPa	1/8"-27NPTF
362-081-001-002K	VDO sender - Insulated	0-1000kPa		1/8"-27NPTF
230-112-001-001C	VDO switch (Closes as pressure rises)	N/O	100kPa	M10x1
230-112-001-002C	VDO switch (Closes as pressure rises)	N/O	70kPa	1/8"-27NPTF
230-112-002-001C	VDO switch (Closes as pressure rises)	N/O	50kPa	1/8"-27NPTF
230-112-003-013C	VDO switch (Closes as pressure falls)	N/C	70kPa	1/8"-27NPTF

TEMPERATURE UNITS				
Part Number	Description	Range	Switch Point	Mounting
323-801-005-001D	VDO sender only	40-120°C		1/8"-27NPTF
323-803-001-001D	VDO sender/switch combination (Closes as temp. rises)	40-120°C	100°C	M14x1.5
323-801-001-026N	VDO sender only	40-120°C		M14x1.5
323-805-001-001K	VDO sender only - Insulated	40-120°C		M14x1.5
323-801-003-001D	VDO sender only for air cooled engines	60-200°C		M10x1.5
232-011-005-019D	VDO switch (Closes as temperature rises)	N/O	96°C	1/8"-27NPTF
232-011-017-135D	VDO switch (Closes as temperature rises)	N/O	102°C	M14x1.5
232-011-017-034D	VDO switch (Closes as temperature rises)	N/O	100°C	M14x1.5

LEVEL (LIQUID)				
Part Number	Description	Range	Switch Point	Mounting
395-209	VDO water coolant level probe (Opens when dry)	N/O	Dry	Tapped M14x1.5 hole
220-003	VDO fuel sender (adjustable pivot float arm 150-600mm)	10 - 180Ω		Top (5 hole flg)
	There is a Generic Fuel Level Sender. Refer to our Fuel Related Products Price List.			
LS-103-3	Mechanical/Magnetic coolant level switch	N/O or N/C	Dry	Internal - Side Ø20mm
LS-103-4	Mechanical/Magnetic coolant level switch	N/O or N/C	Dry	External - Side 1/2" BSP
WL/100/01	Electronic interface, harness and probe - Full kit	N/C	Dry	Top or Side 1/8"-27NPTF
Probe	Spare probe for WL/100/01			Top or Side 1/8"-27NPTF
Interface/Harness	Spare interface & harness for WL/100/01			

GAUGE (ANALOGUE)			
Part Number	Description	Range	Mounting
350-030-016C	VDO Pressure Ø52mm 12VDC	0-500kPa	Panel (Door)
350-040-016C	VDO Pressure Ø52mm 24VDC	0-500kPa	Panel (Door)
350-030-017C	VDO Pressure Ø52mm 12VDC	0-1000kPa	Panel (Door)
350-040-017C	VDO Pressure Ø52mm 24VDC	0-1000kPa	Panel (Door)
310-030-002C	VDO Temperature Ø52mm 12VDC	40-120°C	Panel (Door)
310-040-002C	VDO Temperature Ø52mm 24VDC	40-120°C	Panel (Door)
301-030-001C	VDO Fuel Level Ø52mm 12VDC 10-180Ω	E 1/2 F	Panel (Door)
301-040-001C	VDO Fuel Level Ø52mm 24VDC 10-180Ω	E 1/2 F	Panel (Door)
230-038	VDO Ø52mm blanking plug/plate		Panel (Door)
800-005-002G	VDO Globe Holder and Globe for gauges above 12VDC		
800-005-003G	VDO Globe Holder and Globe for gauges above 24VDC		

MEASUREMENT PROTECTION EQUIPMENT

Fuel Level Sensors - Mechanical gauge

Description

Direct level display without the need of external power supply.
Suitable for static level detection of water, fuel & diesel.
Specifically designed for fuel tanks of generators and any engine driven applications.

Specifications

Material : The main body is made of aluminium alloy.
Length range : 150-900mm
Thread fitting : M45 x 2mm thread fitting is standard or 1 1/2" BSP on special request.
Optional flange : Standard 6-hole bolt on or welded flange.
Optional : High - low alarm contact or 10 - 180Ω sensor signal wires.
Operation Temperature : -40 to +85°C
Integrated Precision : 5%

Part No.	Details	Resolution
MG-150	150 mm Mechanical fuel level gauge	5%
MG-200	200 mm Mechanical fuel level gauge	5%
MG-250	250 mm Mechanical fuel level gauge	5%
MG-300	300 mm Mechanical fuel level gauge	5%
MG-350	350 mm Mechanical fuel level gauge	5%
MG-500	500 mm Mechanical fuel level gauge	5%
MG-650	650 mm Mechanical fuel level gauge	5%
MG-750	750 mm Mechanical fuel level gauge	5%
MG-800	800 mm Mechanical fuel level gauge	5%
MG-900	900 mm Mechanical fuel level gauge	5%

Fuel Level Sensors - Mechanical Gauge with resistive analogue signal (10-180 Ohm) combination

Part No.	Tank Depth and Resistance Range	Resolution
MGS-200	≥200mm - 10 to 180Ω	5%
MGS-250	≥250mm - 10 to 180Ω	5%
MGS-300	≥300mm - 10 to 180Ω	5%
MGS-350	≥350mm - 10 to 180Ω	5%
MGS-500	≥500mm - 10 to 180Ω	5%
MGS-650	≥650mm - 10 to 180Ω	5%
		5%
M45 BoltOn	M45 x 2 Flange, with 6 mounting holes	5%
M45 WeldOn	M45 x 2 Flange, weldable mild steel material	5%

HAGAR DISTRIBUTION

MEASUREMENT PROTECTION EQUIPMENT

Fuel Level Sensors - Tubular & Pivot type - Resistive Analogue.

Description

Fuel level senders are used to measure liquids in various fuel, water or chemical tanks. These sensors are installed in gensets, boats, trucks and off-road equipment all over the world. Measurements are done by series of reed switches positioned inside the level tube. The float is the only moving part of the sensor, thereby minimising potential mechanical failures, which contribute to the sensor's precise level measurements.

Specifications

Material : The main body is made of 304 stainless steel.
Length range : 150-2000 mm. Length can be custom ordered according to your requirements.
Mounting : SAE standard 5 holes, other mounting methods available.
Includes : 5 x M5 screws & 2 mm NBR gasket.
Protection rating : IP67.
Operation Temperature : -40 to +85°C

Part No.	Tank Depth and Resistance Range	Resolution
S5-E150	150 mm - 0 to 190Ω	10mm
S5-E200	200 mm - 0 to 190Ω	10mm
S5-E250	250 mm - 0 to 190Ω	10mm
S5-E300	300 mm - 0 to 190Ω	10mm
S5-E350	350 mm - 0 to 190Ω	10mm
S5-E500	500 mm - 0 to 190Ω	10mm
S5-E650	650 mm - 0 to 190Ω	10mm
S5-E800	800 mm - 0 to 190Ω	10mm
S5-E1000	1000 mm - 0 to 190Ω	10mm
S5-E1200	1200 mm - 0 to 190Ω	10mm
S5-E1500	1500 mm - 0 to 190Ω	10mm
S5-E1800	1800 mm - 0 to 190Ω	10mm
S5-E2000	2000 mm - 0 to 190Ω	10mm

Fuel level sensors - tubular (reed) - resistive analogue - 10mm Resolution/accuracy with digital low level alarm switch

Part No.	Tank Depth and Resistance Range	Resolution	Switch Point
S5-E150A	≥150mm - 0 to 190Ω	10 mm	50 mm
S5-E200A	≥200mm - 0 to 190Ω	10 mm	50 mm
S5-E250A	≥250mm - 0 to 190Ω	10 mm	50 mm
S5-E300A	≥300mm - 0 to 190Ω	10 mm	50 mm
S5-E350A	≥350mm - 0 to 190Ω	10 mm	55 mm
S5-E500A	≥500mm - 0 to 190Ω	10 mm	75 mm
S5-E600A	≥600mm - 0 to 190Ω	10 mm	100 mm
S5-E650A	≥650mm - 0 to 190Ω	10 mm	100 mm
S5-E750A	≥750mm - 0 to 190Ω	10 mm	115 mm
S5-E800A	≥800mm - 0 to 190Ω	10 mm	120 mm
S5-E1000A	≥1000mm - 0 to 190Ω	10 mm	150 mm
S5-E1200A	≥1200mm - 0 to 190Ω	10 mm	180 mm
S5-E1500A	≥1500mm - 0 to 190Ω	10 mm	225 mm
S5-E1800A	≥1800mm - 0 to 190Ω	10 mm	270 mm
S5-E2000A	≥2000mm - 0 to 190Ω	10 mm	300 mm

MEASUREMENT PROTECTION EQUIPMENT

Fuel Level Sensors - Tubular (Reed) Resistive Analogue - 5.5mm Resolution/ Accuracy

Description

Fuel level senders are used to measure different media in connection with an electrical display unit that accepts an analogue reading input.
The fuel sender is a single tubalar unit with no moving arm.

Specifications

Material : The main body is made of 304 stainless steel.
Length range : 150 to 2000mm length range. Length can be customised according to your requirements.
Mounting : SAE standard 5 holes.
Includes : 5 x M5 screws & a 2 mm thick nitrile rubber gasket is included.
Protection rating : IP67.
Optional flange : Standard 6-hole bolt on or welded flange.
Operation Temperature : -40 to +85°C
Resolution: 5.5mm

Part No.	Tank Depth and Resistance Range	Resolution
MS5-E150	≥150mm - 0 to 190Ω	5.5mm
MS5-E200	≥200mm - 0 to 190Ω	5.5mm
MS5-E250	≥250mm - 0 to 190Ω	5.5mm
MS5-E300	≥300mm - 0 to 190Ω	5.5mm
MS5-E350	≥350mm - 0 to 190Ω	5.5mm
MS5-E500	≥500mm - 0 to 190Ω	5.5mm
MS5-E650	≥650mm - 0 to 190Ω	5.5mm
MS5-E750	≥750mm - 0 to 190Ω	5.5mm
MS5-E800	≥800mm - 0 to 190Ω	5.5mm
MS5-E1000	≥1000mm - 0 to 190Ω	5.5mm
MS5-E1200	≥1200mm - 0 to 190Ω	5.5mm
MS5-E1500	≥1500mm - 0 to 190Ω	5.5mm
MS5-E1800	≥1800mm - 0 to 190Ω	5.5mm
MS5-E2000	≥2000mm - 0 to 190Ω	5.5mm

MEASUREMENT PROTECTION EQUIPMENT

Fuel level sensors - Supply, Return & Air Breather

Description

The L3-A range is suitable for fuel supply, return, air breather and wired signal.
The fuel sender incorporates a nylon strainer fitted to the beginning of the supply line.
The unit incorporates a low level alarm contact and 0-190Ω analogue sensor.

Specifications

Material: Main body material is made of 304 stainless steel.
Length range: 150 to 800 mm length range
Mounting: Standard SAE 5 hole mounting.
Includes: 5 x M5 screws & a 2 mm thick nitrile rubber gasket is included.
Protection rating: IP67 protection rating.
Vent or Breather tube: 6mm Ø
Operational Temp: -40 to 85°C operating temperature.
Resolution: 10mm Resolution.

Part No.	Supply Ø	Return Ø	Tank Depth & Ω Range	Switch Point
L3-A-TN-150	10mm	10mm	≥150mm - 0 to 190Ω	50mm
L3-A-TN-200	10mm	10mm	≥200mm - 0 to 190Ω	50mm
L3-A-TN-250	10mm	10mm	≥250mm - 0 to 190Ω	50mm
L3-A TN-300	10mm	10mm	≥300mm - 0 to 190Ω	50mm
L3-A-TN-350	10mm	10mm	≥350mm - 0 to 190Ω	55mm
L3-A-TN-400	10mm	10mm	≥400mm - 0 to 190Ω	75mm
L3-A-TN-500	10mm	10mm	≥500mm - 0 to 190Ω	100mm
L3-A-TN-600	10mm	10mm	≥600mm - 0 to 190Ω	100mm
L3-A-TN-700	10mm	10mm	≥700mm - 0 to 190Ω	115mm
L3-A-TN-800	10mm	10mm	≥800mm - 0 to 190Ω	120mm

Multi Purpose Fuel Level Sensors - Tubular (Capacitance) Resistive Analogue Type with High Resolution Sensing.

Description

This range of fuel level senders are ideal for non standard tank depths.
The fuel level senders can be shortened to the required length.

Specifications

Working voltage: 10-32VDC
Material: Main body material is made of Aluminium.
Length range: 200-1200mm
Mounting: Standard SAE 5 hole mounting.
Includes: 5 x M5 screws & a 2 mm thick nitrile rubber gasket is included.
Protection rating: IP65 protection rating.
Operational Temp: -40 to 85°C
Resolution: ≤1mm.
Accuracy: 2% (Extremely accurate).

Part No.	Tank Depth & Resistance Range	Type	Resolution
CLS2-200	≥200mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-300	≥300mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-400	≥400mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-500	≥500mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-600	≥600mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-700	≥700mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-800	≥800mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-900	≥900mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-1000	≥1000mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-1100	≥1100mm - 240 to 33Ω	Tubalar	≤ 1mm
CLS2-1200	≥1200mm - 240 to 33Ω	Tubalar	≤ 1mm
JS23110	Calibrator for the CLS2 range of probes	Tubalar	≤ 1mm

RAIN FLAPS

Description

Diesel Engine Generator Muffler Exhaust Rain Flap

Specifications

The exhaust pipe diameter must fall inside the diameter tolarance given.
Adjustment and clamping is obtained by turning the stainless steel bolt/nut.
Finish is either Black Powder Coated or ElectroGalvanised Steel.

Part No.	Outside Diameter of Exhaust Pipe
HRF-55	55 mm +/-5 mm (2.16")
HRF-60	60 mm +/-5 mm (2.36")
HRF-75	75 mm +/-5 mm (2.95")
HRF-90	90 mm +/-5 mm (3.54")
HRF-110	110 mm +/-5 mm (4.33")
HRF-160	160 mm +/-5 mm (6.30")
HRF-220	220 mm +/-5 mm (8.66")

FUEL FILLER CAPS

Specifications

Lockable caps come with a set of two keys.
Neck is made from mild steel and is weldable.
Key hole flap on cap to minimise ingress of water and dirt.
Large opening suitable for a standard fuel dispensing nozzle.
Small steel chain tethers the cap thereby preventing it from getting lost.
Tank top to have a Ø68 (±1mm) hole to accept the strainer.
Neck to be welded centrally over the strainer hole.

Part No.	Breather	Lockable	Description
JZM6640	No	Yes	Fuel Filler Cap
JZM6030	Yes	Yes	Fuel Filler Cap
JZM0932	N/A	N/A	Mounting neck (Mild steel-weldable)
JZP1095	N/A	N/A	Strainer with Nylon Filter

Cap, strainer & neck must be ordered as a triplet to make one set!

ACTUATORS

High performance is achieved when a speed control system incorporates a GAC actuator coupled with a GAC speed controller. The design baseline for GAC actuators incorporates fast responses, multi-voltage usage and proven reliability. All of GAC actuators are easy to install with no maintenance required.

PUMP MOUNTED

ADC100 12 or 24v
GAC's Pump Mounted Actuators are field proven proportional actuators designed to mount directly to fuel injection pumps to achieve an integrated proportional servo fuel package. Since the design has no sliding parts and its components are sealed; outstanding reliability results with no maintenance required.
* Mounting Gasket GA102 included
* For Stanadyne "D" Series (DB,JDB,DC,DB2,DB4,DM2,DM4) Pumps
* Packard connector

UNIVERSAL

ADC225 12 or 24v
GAC's Universal actuators are proportional electro servo designed for mechanical actuation of fuel system control levers. GAC's external actuators are simple to install and possess no sliding parts, resulting in outstanding reliability and no maintenance required.
* Commercial Connector
* Serrated Shaft
* Lesser rate return spring
* 2.2lb-ft(3.0N-m)Torque
* 25° Rotation
* < 45 msec Response
* For multi-plunger fuel pumps & carburetors

UNIVERSAL

ADC175 12 or 24V
GAC's Universal actuators are proportional electro servo designed for mechanical actuation of fuel system control levers. GAC's external actuators are simple to install and possess no sliding parts, resulting in outstanding reliability and no maintenance required.
* Commercial Connector
* Serrated Shaft
* Lesser rate return spring
* 2.2lb-ft(3.0N-m)Torque
* 25° Rotation
* < 45 msec Response
* For multi-plunger fuel pumps & carburetors

GOVERNORS

GAC's Speed Control Units are precise speed controls designed and manufactured in various configurations to meet application requirements using the latest analogue and digital control technologies. Reverse battery polarity and fail-safe protection in the event of loss of speed sensor signal or battery voltage is incorporated in every GAC speed control unit. A wide variety of application needs can be satisfied with GAC's constant or variable speed governing, in isochronous or droop operation. All circuit boards are hard potted or conformally coated to be vibration and moisture resistant.

ESD5500E

- Multi VDC / Standard unit
- Isochronous, Variable, & Droop
- Speed Ramping & Starting Fuel
- Soft Coupling & Lead Circuit
- Adjustable Idle Control
- Analogue Input 0-10V Supply
- CE Approved

ESD2110

- Multi VDC / Standard unit
- Isochronous Operation Only
- Adjustable PID Functions (proportional-intergral-derivative)
- Frequency Trim Input

ESD2210 12 or 24v

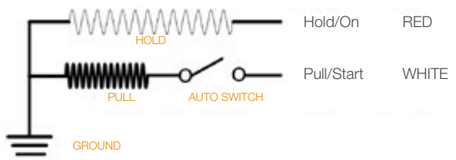
- Multi VDC / Standard unit
- Isochronous Operation
- Adjustable PID Functions
- Speed Trim Input
- Hard Potted
- CE Approved

EEG6500

- Multi VDC / Buil-in display / Works with all GAC Actuators
- Improved & Simplified PID
- Fault Protection & Logging
- Variable, Droop, & Isochronous Governing
- Load Sharing & Synchronizing Auxiliary Input
- CE Approved

2-wire 12/24VDC Solenoid

Part No.	Details
S12VDC-2W	Solenoid with 2-wire 12VDC
S24VDC-2W	Solenoid with 2-wire 24VDC



Specifications	
12VDC	24VDC
Pull Current: ≤48A	Pull Current: ≤24A
Hold Current: ≤0.6A	Hold Current: ≤0.3A
Pull Rating: 89N	Pull Rating: 89N
Hold Rating: 138N	Hold Rating: 138N
Rated Stroke: 25.4MM	Rated Stroke: 25.4MM

Body of solenoid is to be connected to ground/negative.

Red and white wire can be bridged together for a common hold and pull signal.

The solenoid has built-in protection. There is an auto switch that will shut off the pull signal after stroke movement.

3-wire 12/24VDC Solenoid

Part No.	Details
S12VDC-3W	Cut Solenoid 12VDC 3-wire
S24VDC-3W	Cut Solenoid 24VDC 3-wire

Specifications	
12VDC	24VDC
Pull Current: ≤48A	Pull Current: ≤24A
Hold Current: ≤0.6A	Hold Current: ≤0.3A
Pull Rating: 89N	Pull Rating: 89N
Hold Rating: 138N	Hold Rating: 138N
Rated Stroke: 25.4MM	Rated Stroke: 25.4MM

Diesel Engine Stop Solenoid

Part Number	Description
XHQ-PT-12V	Diesel Engine Stop Solenoid 12VDC
XHQ-PT-24V	Diesel Engine Stop Solenoid 24VDC

Specifications		
	12VDC	24VDC
Working Current	≤0.5 amp	≤0.5 amp
Max Current	2.0 amp	2.0 amp
Operating Time	≤1.5 sec	≤1.5 sec
Max Tension	90 Neutons	90 Neutons
Stroke Length	53mm ±1mm	53mm ±1mm

2-wire 12/24VDC Heavy Duty Body Solenoid

Part Number	Description
24059-BX	Solenoid 12VDC Coil
24063-BX	Solenoid 24VDC Coil

Specifications	
Circuitry	Single Pole, Single Throw (SPST)
Contact Form	Normally Open
Operating Temp	-40° to 85°C
Max Continuous Current	85 amp

NOTE
Terminals 2 & 3 (smaller studs) are the DC control coil rated at either 12 or 24V.
Terminal 1 & 4 (larger studs) are the heavy current connection points. These are rated at 85 amp continuous and max of 36VDC.

HAGAR DISTRIBUTION

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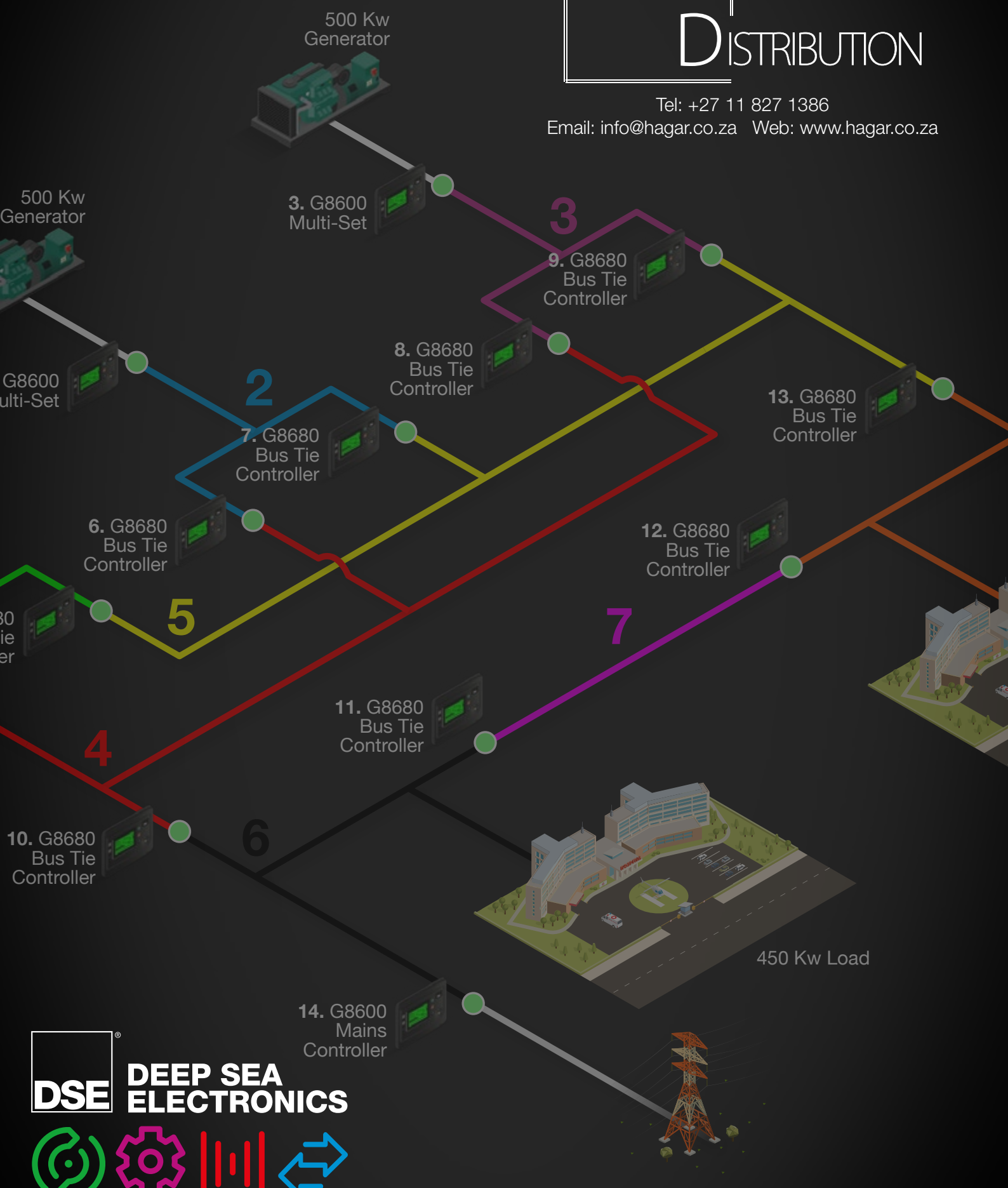

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