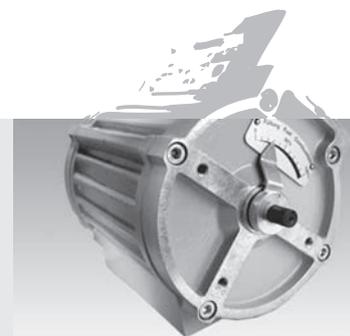
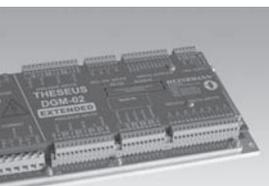
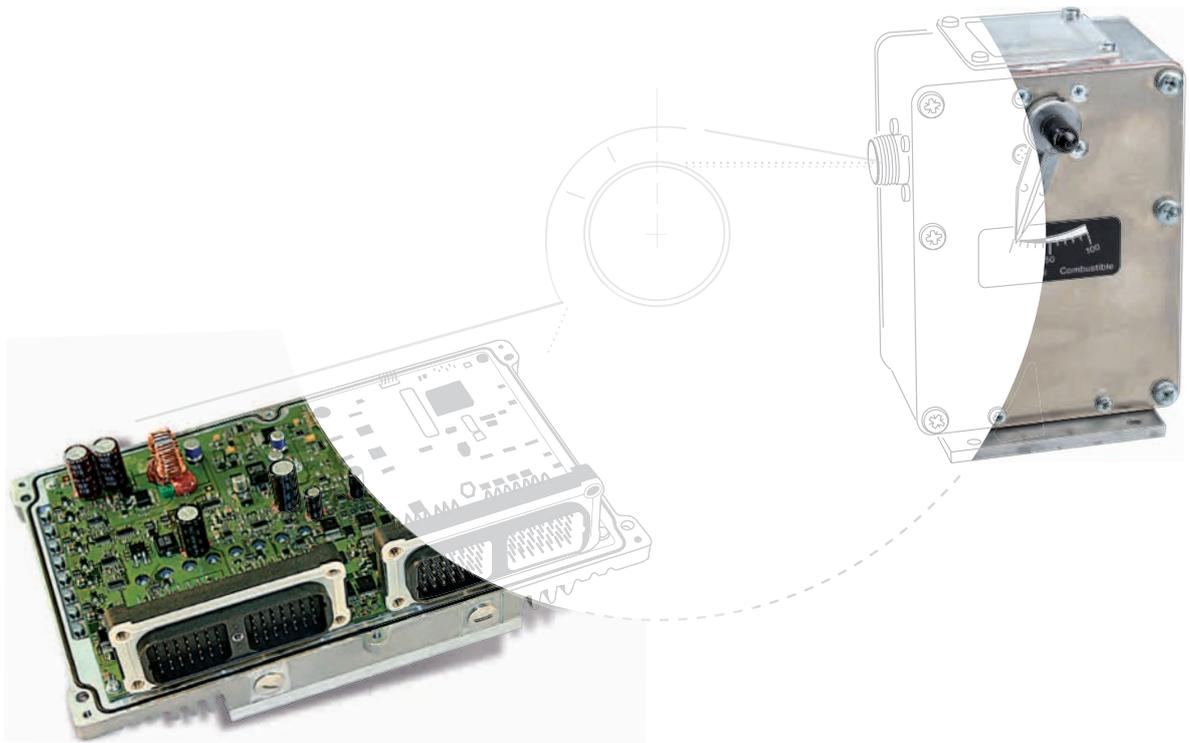
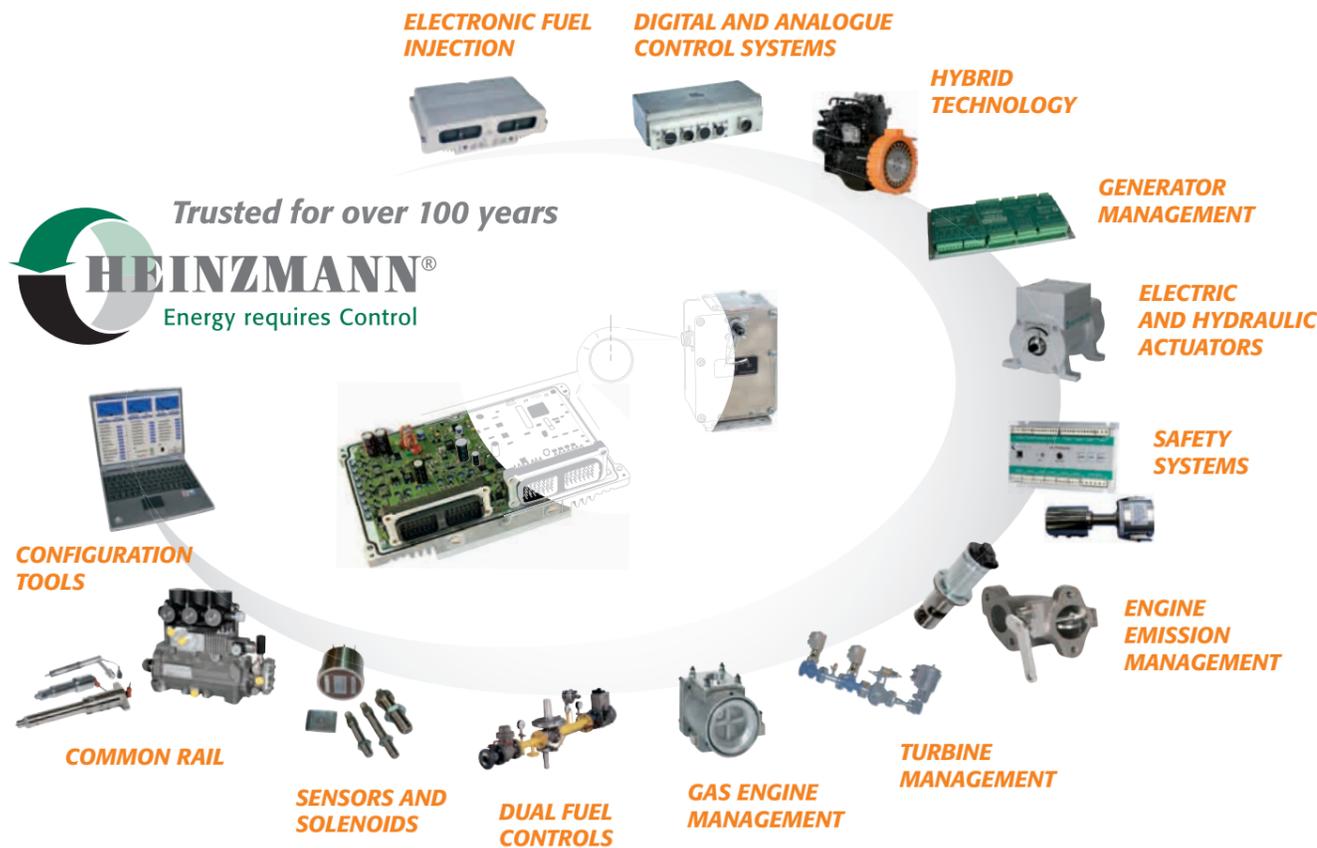


# PRODUCT GUIDE

## Engine & Turbine Management



# HEINZMANN Engine & Turbine Management



Engine & turbine management is our core business. Precise speed governors ensure that energy is used in the most economical way by internal combustion engines and turbines.

For every application – road, rail, marine or stationary – HEINZMANN has the control solution. From complex mechanical and hydraulic speed governors, to analogue and digital electronic controls, all the way to electronic fuel injection controls in common rail systems, HEINZMANN masters all the relevant technologies. This enables us to offer our customers the best possible solutions, now and in the future. Since late 2005, REGULATEURS EUROPA has been a member of the Heinzmann Group, expanding our range with electro-hydraulic actuators and governors of the highest quality.

**HEINZMANN – flexible & reliable solutions**

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## DARDANOS

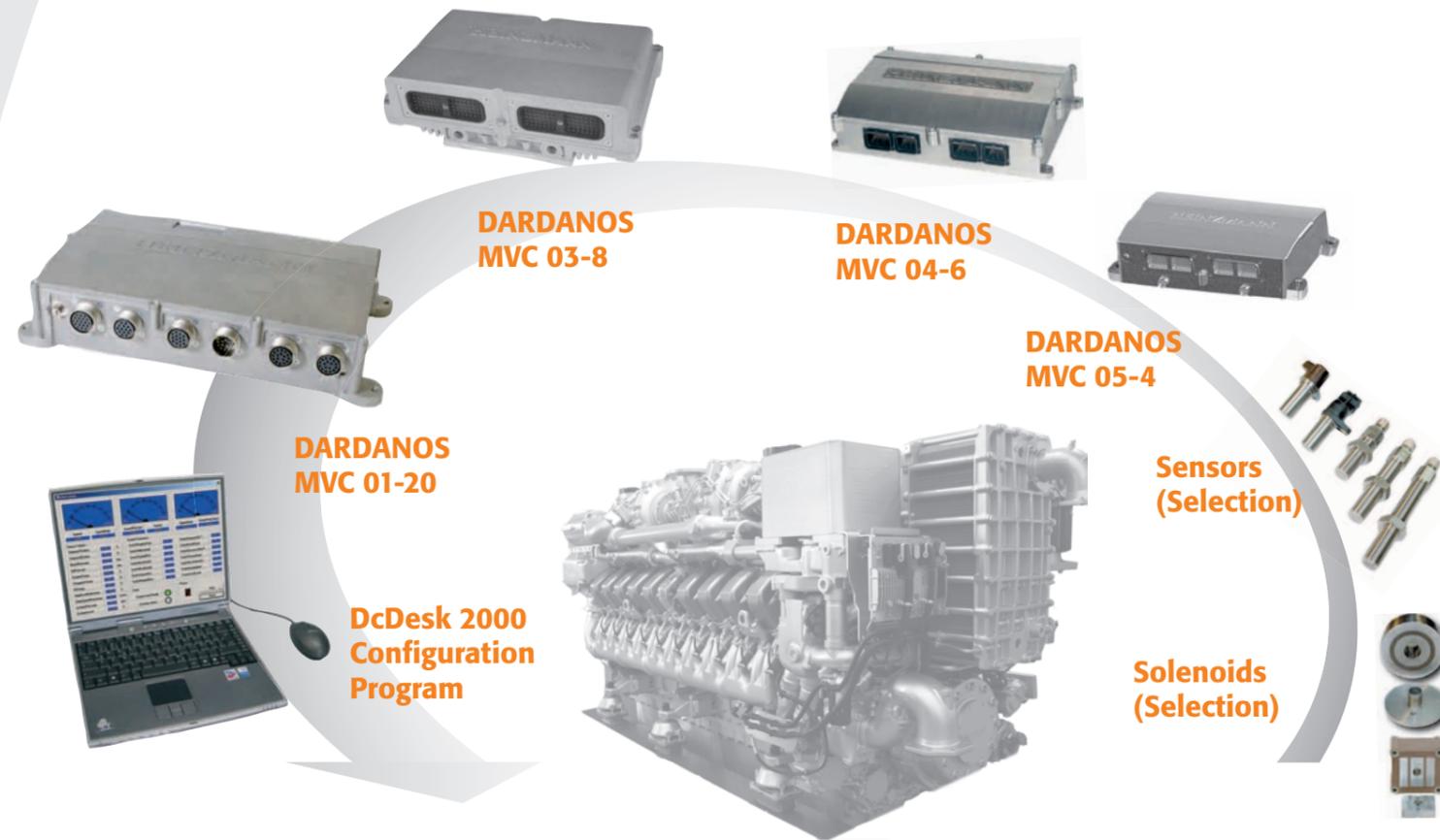
### Electronic Fuel Injection controls (EFI)

The DARDANOS series is designed as universal speed controllers for engines with electronically controlled injection systems.

In addition to their primary purpose of controlling speed, these controllers provide additional features that offer other benefits for your diesel engines like optimised fuel efficiency, increase of engine power, lower environmentally harmful emissions and reduced smoke especially during start-up and acceleration. Thus electronic fuel injection helps in an essential way to comply emission laws.



The systems are designed to fulfill a wide range of applications. Therefore, HEINZMANN offers devices for engines with different numbers of cylinders and modified housing tailored for the respective application. A choice of HEINZMANN sensors and solenoids completes the systems. They may be programmed by our configuration tool DcDesk 2000.



### System Benefits

- ✓ Optimised fuel efficiency
- ✓ Increase of engine power
- ✓ Lower environmentally harmful emissions
- ✓ Reduced smoke especially during start-up and acceleration

### DARDANOS series Electronic fuel injection controls

#### DARDANOS MVC 01-20

for up to 20 cylinders

#### DARDANOS MVC 03-8

for up to 8 cylinders

#### DARDANOS MVC 04-6

for up to 6 cylinders

#### DARDANOS MVC 05-4

for up to 4 cylinders

### Basic speed control functions

- ➔ Start fuel quantity adjustment
- ➔ Speed ramps
- ➔ Variable speed setpoint demands
- ➔ Adaption of PID parameters
- ➔ Fuel quantity limitation
- ➔ Integrated engine monitoring functions
- ➔ Sensor monitoring functions
- ➔ Speed droop
- ➔ Proven functionality for marine, generator, locomotive & vehicle applications

### Applications

The DARDANOS control units are used in locomotive, marine, genset and vehicle applications.

For marine single main propulsion engines HEINZMANN offers a fully redundant EFI system (HERMES), which ensures high reliability and availability.

### EFI functions

- ➔ Map-controlled start of injection
- ➔ Start of injection adaptation to environmental conditions
- ➔ Single cylinder injection begin and period correction
- ➔ Map-controlled rail pressure regulation
- ➔ Rail pressure adaptation to environmental conditions
- ➔ Up to five injections per cylinder
- ➔ Cylinder faults monitoring

### General functions

- ➔ Two independent CAN bus lines (various protocols)
- ➔ Communication software DcDesk 2000 for monitoring & adjustment
- ➔ Remote communication tool SATURN

## ODYSSEUS

### Common Rail (CR)

HEINZMANN offers the ODYSSEUS Common Rail Fuel Injection System including complete fuel injection equipment (HP pumps, injectors, accumulators, HP piping, safety valves, etc.) for different engine sizes, applications and fuel qualities.

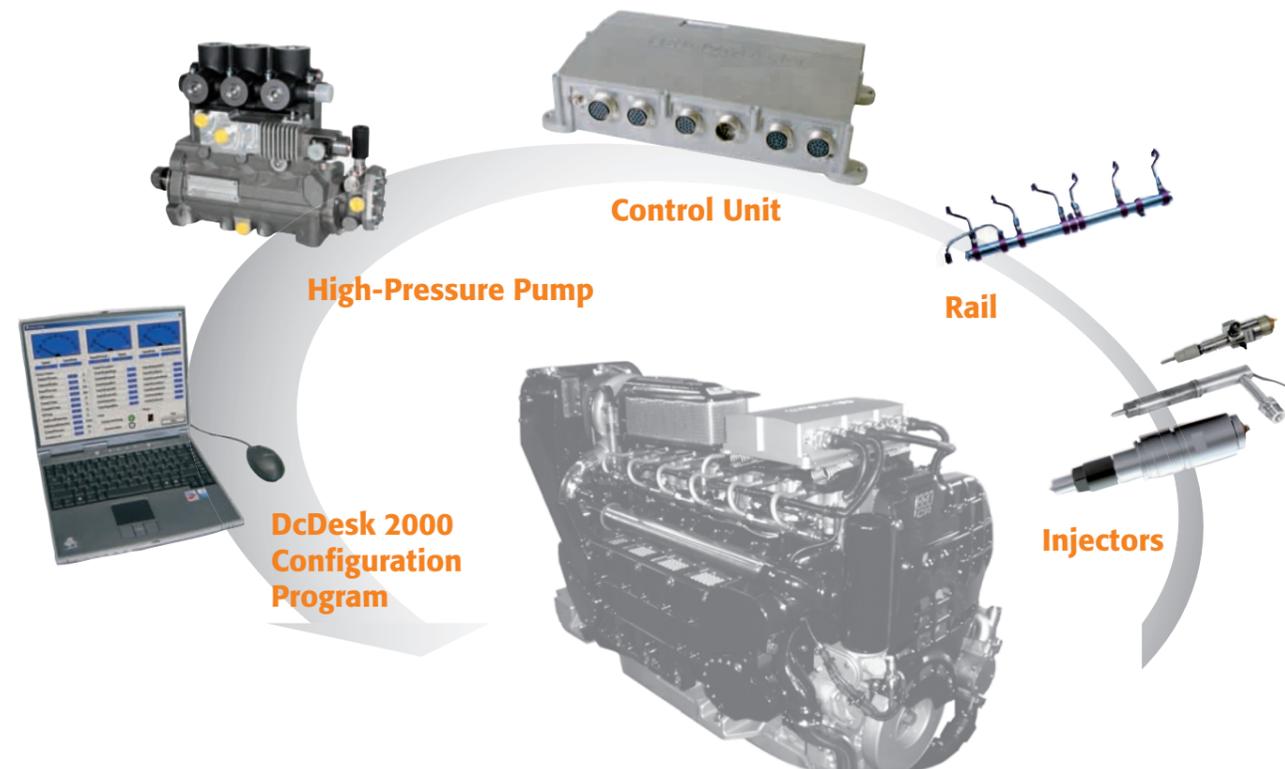
The product range of HEINZMANN hydraulic high-pressure components covers the following engine power outputs:

1. ODYSSEUS "S" for engines up to 130 kW
2. ODYSSEUS "M" for engines up to 560 kW
3. ODYSSEUS "L" for engines up to 1.500 kW
4. ODYSSEUS "XL" for engines up to 10.000 kW



5. ODYSSEUS "MP" Micro Pilot Common Rail

The ultra-high precision ODYSSEUS hydro-mechanical components and the sophisticated engine management systems DARDANOS forge an integrated and complete solution for modern fuel injection technology. All key components – hydraulics, electronic hardware and software – are developed and manufactured in-house exclusively by HEINZMANN.



### ODYSSEUS features

- ➔ Permanently high fuel system pressures at any engine speed/load point for optimised fuel vaporisation inside the combustion chamber
- ➔ Flexibly programmable multiple injection strategy
- ➔ Engine speed/load dependent injection mapping
- ➔ Injectors can be adapted to fit various cylinder heads
- ➔ Wide range of control units: for engines up to 20 cylinders
- ➔ Safe and compact rail, piping and cable harness
- ➔ Complete common rail startup, support for combustion optimisation, system training by HEINZMANN Technical Service
- ➔ Support of design process and reliability approach by using SolidWorks®\* Simulation Professional & Flow Simulation
- ➔ Hydraulic system optimisation using AMESim®\* simulation software
- ➔ Applicable for Micro Pilot common rail fuel injection for gas engines

\* All trademarks are the property of their respective owners.

### ODYSSEUS control units

Please refer to the reliable DARDANOS EFI control systems (pages 2-3).



### ODYSSEUS high-pressure pumps

HEINZMANN common rail high-pressure pumps feature the new and unique crank mechanism design. The reciprocal movement of pressure elements is driven by a solid con-rod connection with pump crank shaft. This state-of-the-art principle in the field of diesel fuel pumps is featured in all HEINZMANN pumps in various versions and sizes for different applications, delivery rates and fuel qualities (distillate and heavy fuel oils).

### System Benefits

- ✓ System pressure up to 2000 bar
- ✓ Various sizes of injectors and pumps
- ✓ All components from one supplier
- ✓ Applicable for diesel fuels and heavy fuel oil

### HDP-K2

- ➔ Unique crank mechanism design
- ➔ 2 pressure elements
- ➔ System pressures up to 2000 bar
- ➔ Versions with 6, 8, 10 & 12 mm stroke
- ➔ Plunger diameter: Ø 8 mm
- ➔ Pump speed up to 2400 rpm
- ➔ Delivery rates up to 2.3 l/min
- ➔ Oil lubricated
- ➔ Flow control valve with HEINZMANN solenoid (actuated via DARDANOS ECU)
- ➔ With or without pre-feed pump
- ➔ Rated for long endurance
- ➔ Good serviceability
- ➔ Flange mounted



### HDP-K3



- Unique crank mechanism design
- 3 pressure elements
- System pressures up to 2000 bar
- Versions with 12 & 16 mm stroke
- Plunger diameter: Ø 10, Ø 12, Ø 14 mm
- Pump speed up to 3600 rpm (12 mm stroke)
- Delivery rates up to 15 l/min (1 x pump; redundant concept: 2 x pump up to 30 l/min)
- Oil lubricated
- Flow control valve with HEINZMANN solenoid (actuated via DARDANOS ECU)
- With or without pre-feed pump
- Robust design, rated for long endurance
- Good serviceability
- Easy adaptable (flange or socket version)

### HDP-K3 HFO



- Unique crank mechanism design
- 3 pressure elements
- System pressures up to 1.800 bar
- Designed for HFO operation
- Delivery rates up to 15 l/min (1 x pump; redundant concept: 2 x pump up to 30 l/min)
- Engine oil lubricated
- Special two-way HFO/lube-oil sealing concept

- Mix oil drain
- Sealing oil
- Flow control valve with HEINZMANN solenoid (actuated via DARDANOS ECU)
- Special design for high-temperature operation (HFO)
- Robust design, rated for long endurance
- Good serviceability

### HDP-K4 HFO



- Unique crank mechanism design
- 4 pressure elements
- System pressures up to 1.800 bar
- Designed for HFO operation
- Delivery rates up to 35 l/min (1 x pump; redundant concept: 2 x pump up to 70 l/min)
- Engine oil lubricated
- Special two-way HFO/lube-oil sealing concept
- Mix oil drain
- Sealing oil
- Flow control valve with HEINZMANN solenoid (actuated via DARDANOS ECU)
- Special design for high-temperature operation (HFO)
- Robust design, rated for long endurance
- Good serviceability

## ODYSSEUS injectors

HEINZMANN has developed a completely new injector generation with sophisticated features: The new ICR-DS injector generation features a leak free design. Only a small amount of control volume returns to fuel backflow. HEINZMANN has achieved a considerable reduction of fuel backflow by 75 % (compared to conventional leakage afflicted common rail injector designs) and of fuel return temperatures. The main design attribute for leak free operation is the "diving needle".

### ODYSSEUS ICR-DS-50

- For engines with cylinder power up to 50 kW
- Small-sized common rail injector for injection pressures up to 1800 bar and injection quantities in a range of 2...170 mm<sup>3</sup>/shot
  - Designed for distillate diesel fuels
  - Suitable/adaptable for Micro Pilot common rail fuel injection systems



### ODYSSEUS ICR-DS-100

- For engines with cylinder power up to 100 kW
- Medium-sized common rail injector for injection pressures up to 2000 bar and injection quantities in a range of 10...500 mm<sup>3</sup>/shot
  - Designed for distillate diesel fuels
  - Suitable/adaptable for Micro Pilot common rail fuel injection systems



### ODYSSEUS ICR-DS-200

- For engines with cylinder power up to 200 kW
- Medium-sized common rail injector for injection pressures up to 2000 bar and injection quantities in a range of 50...2200 mm<sup>3</sup>/shot
  - Designed for distillate diesel fuels.



### ODYSSEUS ICR-DS-300

- For engines with cylinder power up to 300 kW
- Large-sized common rail injector for injection pressures up to 1800 bar and injection quantities in a range of 50...4000 mm<sup>3</sup>/shot
  - Designed for distillate diesel fuels and heavy fuel oil (HFO)
  - Cooled nozzle



### ODYSSEUS ICR-DS-500

- For engines with cylinder power up to 500 kW
- Large-sized common rail injector for injection pressures up to 1800 bar and injection quantities in a range of 70...7000 mm<sup>3</sup>/shot
  - Designed for distillate diesel fuels and heavy fuel oil (HFO)
  - Cooled nozzle



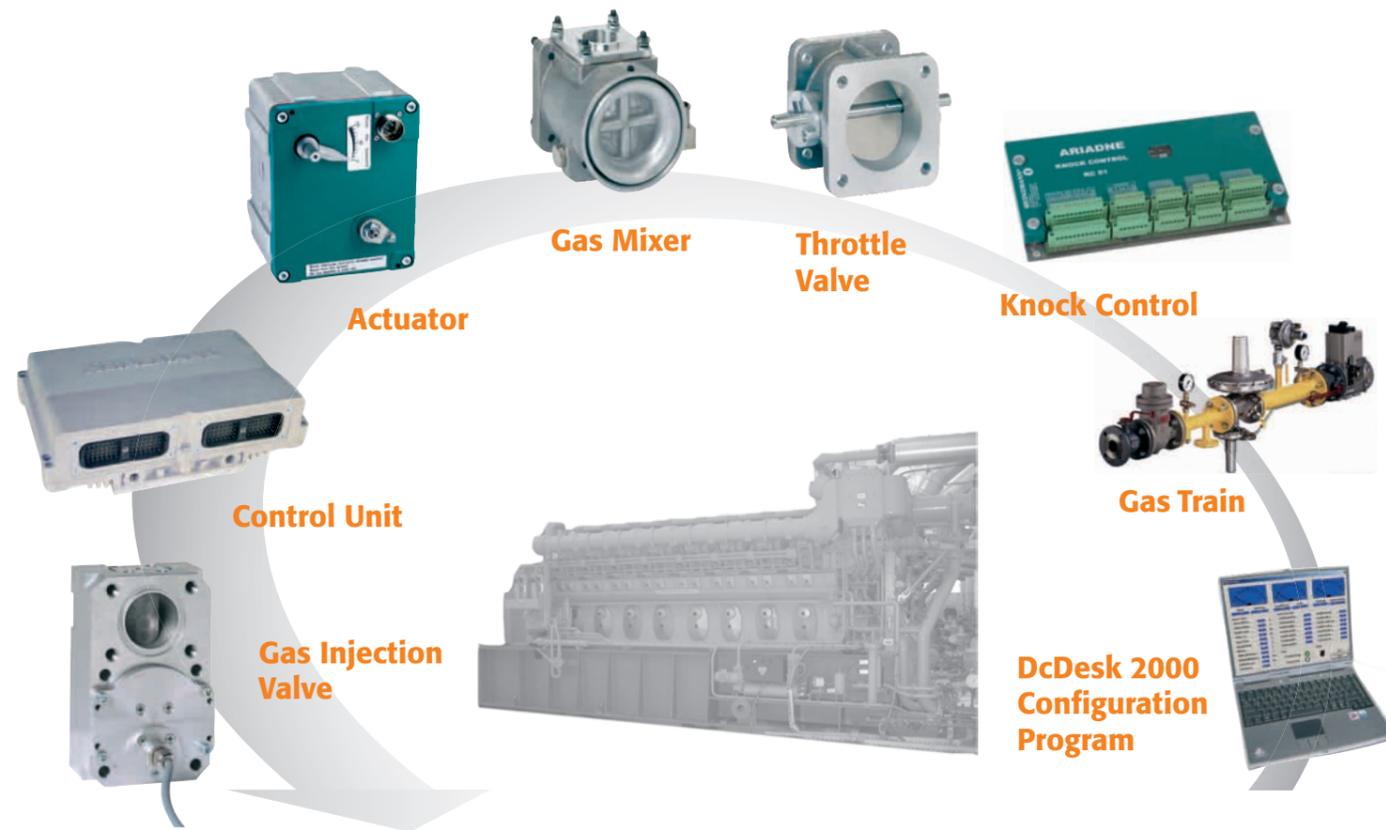
## ARTEMIS

### Dual fuel management

Diesel fuel has become increasingly more expensive than gas fuel, especially in countries with no oil but only gas resources. Dual fuel combustion allows the cheaper gaseous fuel to be used instead of diesel; in addition, dual fuel combustion has the advantage of a clear reduction of emissions. These are the main reasons for dual fuel conversion.

The costs of such a conversion are relatively low and they are quickly compensated by remarkable fuel savings.

Another advantage is the continuous operation of the engine, even if no gas is available. In such a case the engine is running as a pure diesel engine. The precise control of



### System Benefits

- ✓ Remarkable fuel cost savings by using gaseous fuel instead of diesel
- ✓ Clear reduction of emissions
- ✓ Easy installation and commissioning
- ✓ High reliability based on proven components
- ✓ Tailored for customer needs
- ✓ Technical support and service worldwide



diesel and gas metering ensures an optimal performance under all operating conditions.

The HEINZMANN dual fuel management systems can be used for stationary genset or compressor applications, for vehicles and different sized high- or low-speed engines. They ensure precise control in diesel mode as well as in dual fuel mode.

### Available features

- ➔ Applicable for diesel engines to be converted into dual/pilot fuel engines
- ➔ For different gas qualities like natural gas, sewage gas and landfill gas
- ➔ Separate governor settings for diesel, gas and transfer mode
- ➔ Fixed or variable (load dependent) diesel fuel in gas mode
- ➔ Advanced diesel-gas mode transfer sequences
- ➔ Diesel assistance for load step compensation in gas mode
- ➔ Power (kW) droop for parallel operation in gas mode
- ➔ Automatic mode selection depending on current conditions
- ➔ Automatic switch to diesel mode operation if gas supply fails
- ➔ Different sized actuators
- ➔ Different equipped ARTEMIS Dual Fuel systems

### Optional features

- ➔ Misfire detection
- ➔ Knock control
- ➔ Complete gas train with pressure regulator
- ➔ Electronic foot pedal for vehicle applications
- ➔ Remote control system SATURN
- ➔ Generator management
- ➔ Fire detection system
- ➔ Gas detection system

### ARTEMIS systems

HEINZMANN offers a modular range of ARTEMIS systems. The user can choose from different control units and actuators, which fit their application (stationary or vehicle) and engine sizes.

We offer both full authority and conventional gas control systems. Besides control of gas flow all ARTEMIS systems limit the exhaust temperature via a temperature sensor.

The systems differ in being based on gas mixer or gas admission technology (single port gas admission or mono-valve). Speed/load control is either realised by a diesel or gas regulation.

We offer a complete dual fuel system as a high end solution based on:

- ➔ ODYSSEUS Common Rail Diesel Injection System
- ➔ MEGASOL Single Port Gas Admission System

Advantages are maximum operational cost reduction and fulfillment of future emission regulation. One source solution guarantees optimum compatibility and connectivity.

The HEINZMANN team will help the customer to find a tailor-made solution to fit individual needs.

System setup and diagnosis is made via the HEINZMANN communication software DcDesk 2000.

## KRONOS

### Gas engine control systems

The KRONOS product range comprises four systems for air fuel ratio control as well as speed/load control systems. You are sure to find a solution to meet your requirements, independent of engine size, specific application, operational demands and emission requirements.

All KRONOS systems are based on proven mechanical and electronic components, with each system specially designed for a specific range of applications.

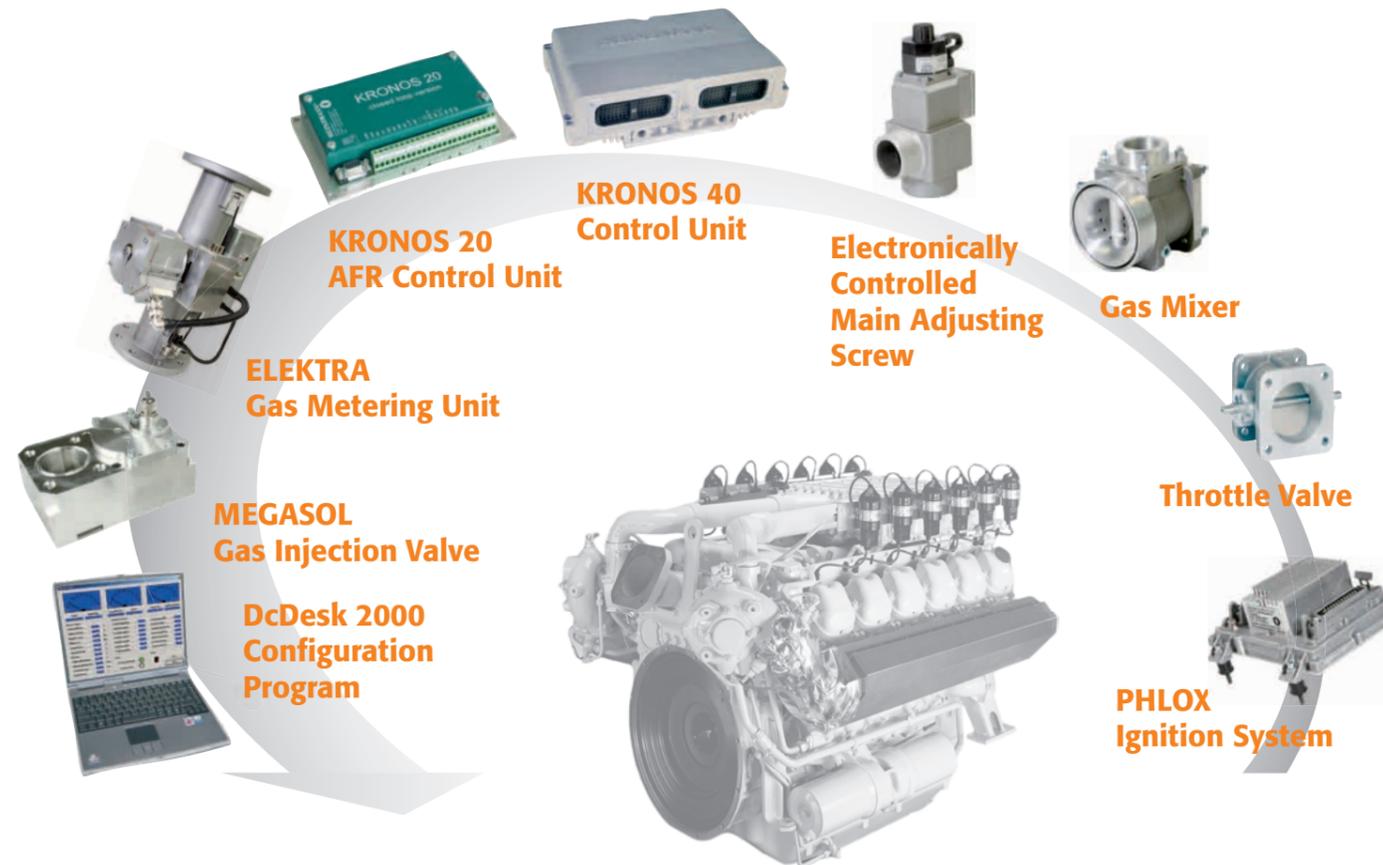
Customer specific adaptations to the basic systems guarantee optimised, economical solutions for OEMs, packagers and retrofit customers. Mechanical parts such as throttle valves, gas mixers and gas valves



are available in many different sizes and are compatible with products from other manufacturers, ensuring that installation is always as simple as possible.

If required, special customised designs can be provided to meet individual customer requirements.

Our customers are using KRONOS systems for genset, compressor and vehicle applications (busses, trucks). Stationary applications with small- and medium-sized high-speed engines mainly operate with gas mixer technology. Stationary plants with large low-speed engines rather use gas admission valves. Also for vehicles primarily gas admission comes into operation due to available high gas pressure and increased dynamics.



### KRONOS features

- ➔ KRONOS systems are used for various types of gases such as natural gas, biogases and weak gases like wood gas.
- ➔ System setup and diagnosis via the HEINZMANN communication software DcDesk 2000.
- ➔ All KRONOS systems can be extended to an integrated engine management solution. The HEINZMANN modular system PANTHEON offers a comprehensive product range from one supplier.
- ➔ All digital HEINZMANN controls communicate via CAN bus. HEINZMANN also supplies interfaces for external CAN communication such as CANopen.

### KRONOS 10

KRONOS 10 is a simple mechanical Air Fuel Ratio (AFR) control system consisting of a throttle valve, a Venturi based gas/air mixer and a mechanical gas main adjusting screw. It is a good solution for all sizes of engines from 25 kW to 3 MW where precise control of emissions is not required. The mixer and gas regulator screw have no moving parts, ensuring high reliability and a long service life with minimal maintenance required.

### KRONOS 20

Based on the KRONOS 10 solution, the KRONOS 20 is an electronically controlled AFR trim control system that allows speed/load dependent lambda values to be set within a certain range, thereby improving the engine behaviour under all operating conditions. The closed-loop version uses engine output signals to automatically correct for variations in gas quality and pressure.

### System Benefits

- ✓ Air fuel ratio control
- ✓ Speed and load control
- ✓ Lower emissions
- ✓ Savings on fuel
- ✓ Outstanding flexibility
- ✓ Proven reliability
- ✓ Long life time

### KRONOS 30 M

The KRONOS 30 M is a full authority system including speed/load control. The modular concept is very flexible and can be extended to accommodate applications with larger variations in gas-, engine- and ambient parameters. The application specific, independent gas mixer configuration permits operation using a variety of gases, including low calorific gas. The system provides outstanding closed-loop accuracy, enabling systems to meet the latest emission reduction requirements.

### KRONOS 40

KRONOS 40 is a speed/load control system for gas engines with gas injection valves controlled by solenoid valves. The system can handle single cylinder outputs from 100 to 600 kW and up to 20 cylinders.

The design features individual cylinder injection and exhaust gas temperature sensing which makes precise gas metering possible and therefore enables accurate sensing of each cylinder (cylinder balancing) and real-time monitoring of the engine's combustion processes. The basic system is used on injection engines in the lean-burn mode when the gas-air mixture is ignited in a pre-chamber. By integrating additional HEINZMANN components the system can be built into a complete engine management system.

## PHLOX

### Ignition control systems

As it triggers the combustion process of the air-fuel mixture, the ignition system has major influences on performances and emissions of gas fuelled engines. Thus it plays an important role in modern gas engine management systems.

Based on HEINZMANN's many years of experience in the field of gas engine control and monitoring systems, HEINZMANN offers complete solutions tailored for all types of gas engines. All needed components, such as ignition control units, coils, cable harnesses, trigger discs, sensors and spark plugs, are available in an integrated solution. The HEINZMANN ignition kits meet all customer requirements. The customers can

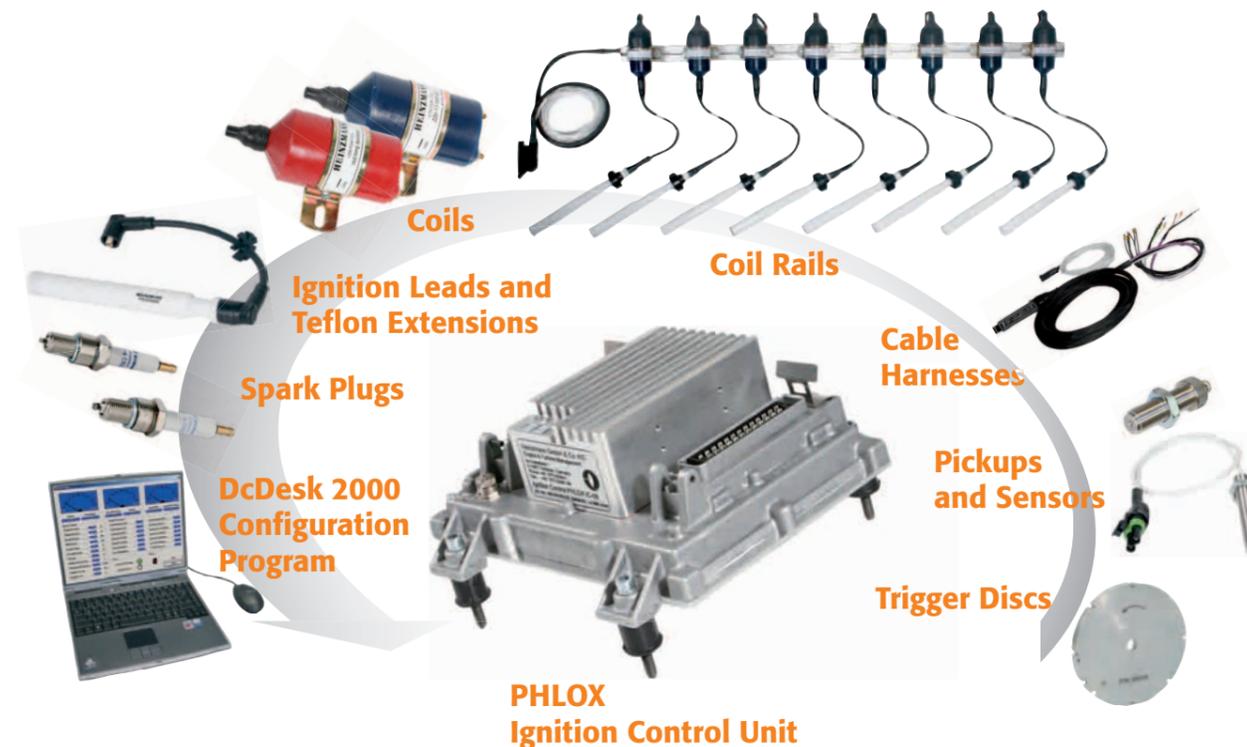


choose from a variety of system components.

The core of the system is a flexible high-energy capacitive spark ignition control unit designed for up to 16-cylinder engines. It provides precise ignition timing and high ignition capabilities. Its variable energy levels and on-board diagnostics help increase the spark plugs durability by reducing wear.

At the top of the family range and for bigger engines with up to 24 cylinders, HEINZMANN offers the IC24 ignition system, based on 2 PHLOX IC12 in Master-Slave operation.

PHLOX Ignition Systems guarantee best performance as part of the HEINZMANN gas engine management solution PANTHEON.



### PHLOX features

- ➔ Complete system from one source
- ➔ Configurable solution
- ➔ Precise ignition timing
- ➔ High ignition capabilities
- ➔ Hall or inductive pickups to cover all engine configurations
- ➔ Variable energy level to reduce spark plug wear
- ➔ On-board diagnostics for safe operation
- ➔ I/Os and CAN bus available for simple integration
- ➔ Customised cable trees
- ➔ Variety of coils suitable for all applications and fuels

### PHLOX control units IC series

PHLOX control units are highly flexible high-energy capacity spark ignition control devices. They are available in 3 versions up to 8, 12 or 16 cylinders.



### PHLOX pickups

HEINZMANN offers inductive sensors and Hall effect sensors with different lengths and threads.



### PHLOX coils

HEINZMANN coils are available in two versions with either standard or extended spark durations.



### PHLOX wiring rails

With HEINZMANN completely wired ignition rails, coils are directly mounted on the rail.



### System Benefits

- ✓ Complete ignition system
- ✓ Precise ignition timing
- ✓ Increased spark plug durability
- ✓ Easy integration via CAN
- ✓ On-board diagnostics
- ✓ Up to 16 cylinders
- ✓ Master-Slave operation possible for up to 24 cylinders

### Cable harnesses

HEINZMANN can provide standard ready-to-use input and output cable harnesses.



### PHLOX ignition leads

High-quality Teflon made spark plug boots are high-temperature resistant and ensure high-voltage resistance and best insulation against spark flashover.



### PHLOX trigger discs

Trigger discs are available in different designs for any application.



### PHLOX spark plugs

The special industrial spark plugs for stationary gas engines have iridium reinforced electrodes to provide long life and reliable operation.



## OLYMPUS G

### Gas turbine controls

OLYMPUS is a range of products and services offered by HEINZMANN for gas, steam and water turbines and related equipment.

HEINZMANN can handle any turbine control application. Based on our trusted and established digital controllers and electric actuators, HEINZMANN offers OEM or retrofit upgrade governing and generator control systems for any size of make of steam and gas turbines.

This allows us to offer a high level of functional and design commonality between applications and to eliminate special purpose parts. This impacts very favourably on familiarisation and operational costs for turbine owners.

Our fuel controls all use HEINZMANN electric actuators to



implement the final element of control. These are fully certified for use in hazardous conditions where required.

For existing turbines with troublesome pilot actuated electro-hydraulic throttle and guide vane controls, HEINZMANN offers either a modern electric only or hydraulically assisted solution which completely eliminates the problem of sticking servovalve spools caused by wear, low temperatures or contaminated oil.

If required, HEINZMANN can supply complete integrated control panels with colour graphic operator interfaces as well as auxiliary systems such as hydraulic power packs and power actuators.



### System Benefits

- ✓ Only low voltage electrical power required
- ✓ Hazardous area certification
- ✓ Self-cleaning valves
- ✓ Universal flow control algorithms
- ✓ Calibrated flow metering
- ✓ Fuel supply pressure and temperature compensation

### Fuel valve components

- ➔ Only low voltage electrical power required
- ➔ Hazardous area certification
- ➔ Self-cleaning valves
- ➔ Matched to fuel and turbine by user software parameter adjustment
- ➔ Gas throttle can be compensated for changes of supply temperature and pressure

### Fuel systems

- ➔ Meet current shut-off standards
- ➔ No requirement for gas vent
- ➔ Fast acting
- ➔ Black station start capability
- ➔ Dual fuel and purge systems available

### Governing and generator controllers

- ➔ Cost effective
- ➔ Single-, twin- and three-shaft governing
- ➔ Single-, dual- or multi-fuel systems
- ➔ Anti-surge control for compressor applications
- ➔ Customer specified functions welcome
- ➔ Measurement, synchronisation, load and power factor controls in one controller
- ➔ DeviceNet or ModBus interfaces to PLC systems

### Integrated turbine control panels

- ➔ Hazardous area or control room based systems with colour graphic HMI
- ➔ Repeat remote operators/supervisors panels or links to customer DCS
- ➔ Multiplex interfaces to turbine frame mounted input/output modules

- ➔ Customer's choice of PLC e.g.: Siemens, Allen-Bradley, Mitsubishi
- ➔ Option for triple modular redundant PLC
- ➔ Integrated vibration, fire, gas and generator protection equipment

### Complete turbine upgrade services

- ➔ Consultation service with survey and upgrade proposals
- ➔ Problem solving
- ➔ Supplier co-ordination
- ➔ Station control systems
- ➔ Mechanical overhaul services
- ➔ Maintenance and support contracting
- ➔ Overhauls and repairs

## OLYMPUS S

### Steam turbine controls

Based on our trusted and established digital controllers and electric actuators, HEINZMANN offers OEM or retrofit upgrade governing and generator control systems for various sizes or makes of steam turbines. Our governors can support anything from simple speed and load control applications up to complex multi-stage steam extraction applications through configuration and extension. HEINZMANN's leading range of electric actuators can match the drive requirements of all sizes of hydraulic pilot valve actuation providing the highest levels of flexibility and reliability. If required, HEINZMANN can supply complete integrated control panels with colour graphic operator interfaces

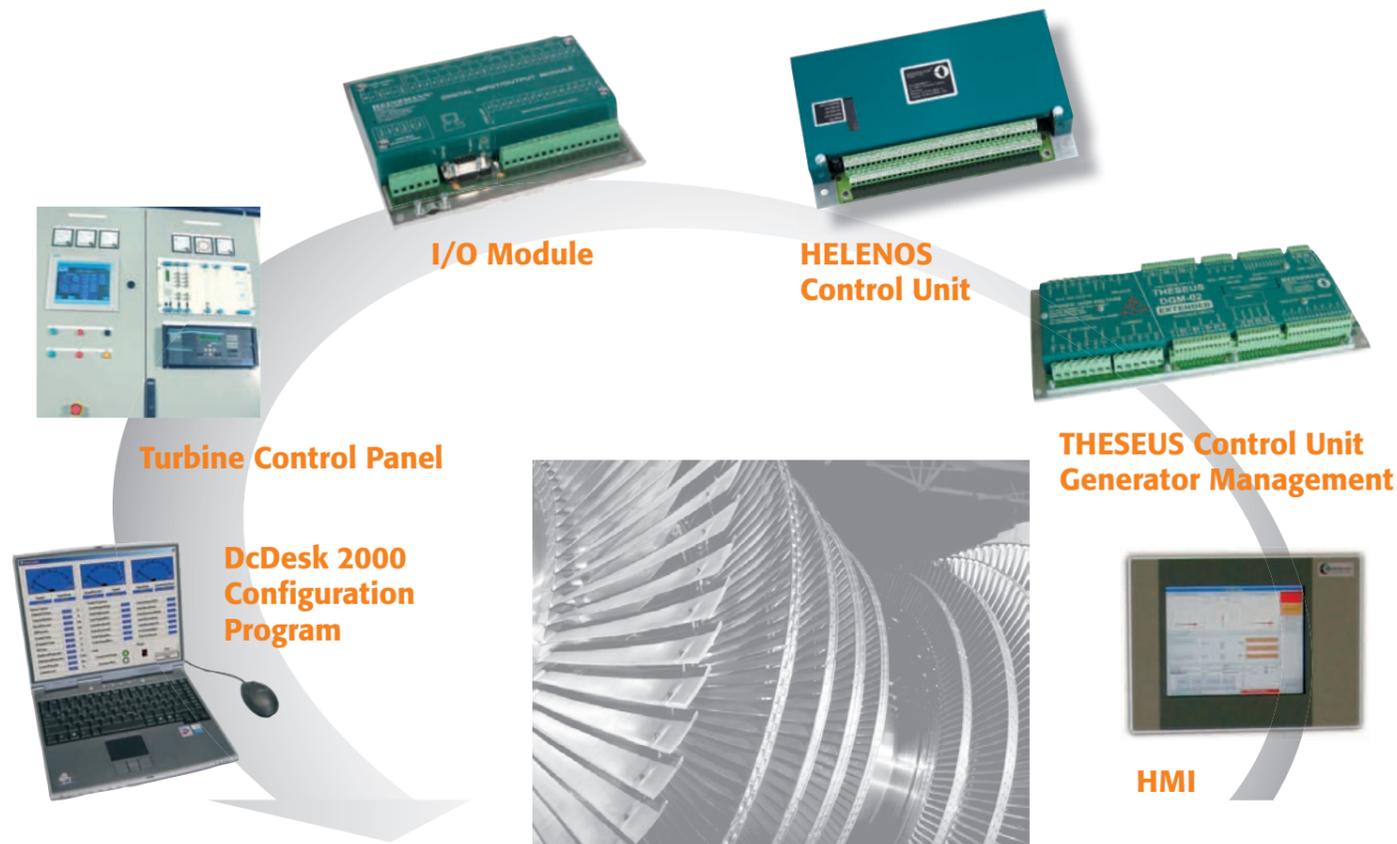


as well as auxiliary systems such as hydraulic power packs and power actuators.

## OLYMPUS W

### Water turbine controls

For water turbines, HEINZMANN can offer OEM or retrofit upgrade systems to control any size and make of Francis, Kaplan or Pelton type water turbine. The high forces and stability required in the control of guide vanes, deflectors or spear valves are met by HEINZMANN electric or electro-hydraulic cylinder actuators with precision electronic feedback of position. Where hydraulics are used, reliability and availability are enhanced by the use of variable delivery and dual redundant pump systems. Fail safety is assured by independent trip systems.



### Steam turbine control solution

- For single and extraction turbine
- Independent backup over-speed detection hardwired to shut-off system
- Direct electrical actuation of steam valve for small turbines
- Full automatic process control
- Replacement of hydro-mechanical governor, speeder motor and mechanical valve linkages on old turbines with modern electric instrumentation

### Water turbine control solution

- Complete control solutions with fully automated sequencing, control and protection of the machine including vibration and electrical protection.
- For remote unattended sets, HEINZMANN offers scheduled, event based or continuous telemetry systems providing full remote control and monitoring facilities to centralised control stations.
- Operators can select manual, maximum load or maximum efficiency operating modes in the water turbine control based on instrumentation such as head measurement, time/calendar, characteristics of the turbo-generator and the load profile.

### System Benefits

- ✓ **Common approach for various sizes, makes and applications of turbines**
- ✓ **Speed and load control**
- ✓ **Isochronous speed control**
- ✓ **Extraction pressure control**
- ✓ **Boiler header and/or intermediate and/or exhaust control**

### Turbine control panels

- Option of fully automated start and warm-up sequencing
- Replacement of high-pressure control oil systems with electric systems on certain machines (to eliminate risk of fire and injury from high-pressure oil leaks)
- Integrated digital generator controls with synchronisation, active and reactive load sharing with generator protection
- Complete PLC based replacement control panels with electronic instrumentation, automatic sequencing and protection

### Turbine generator controls

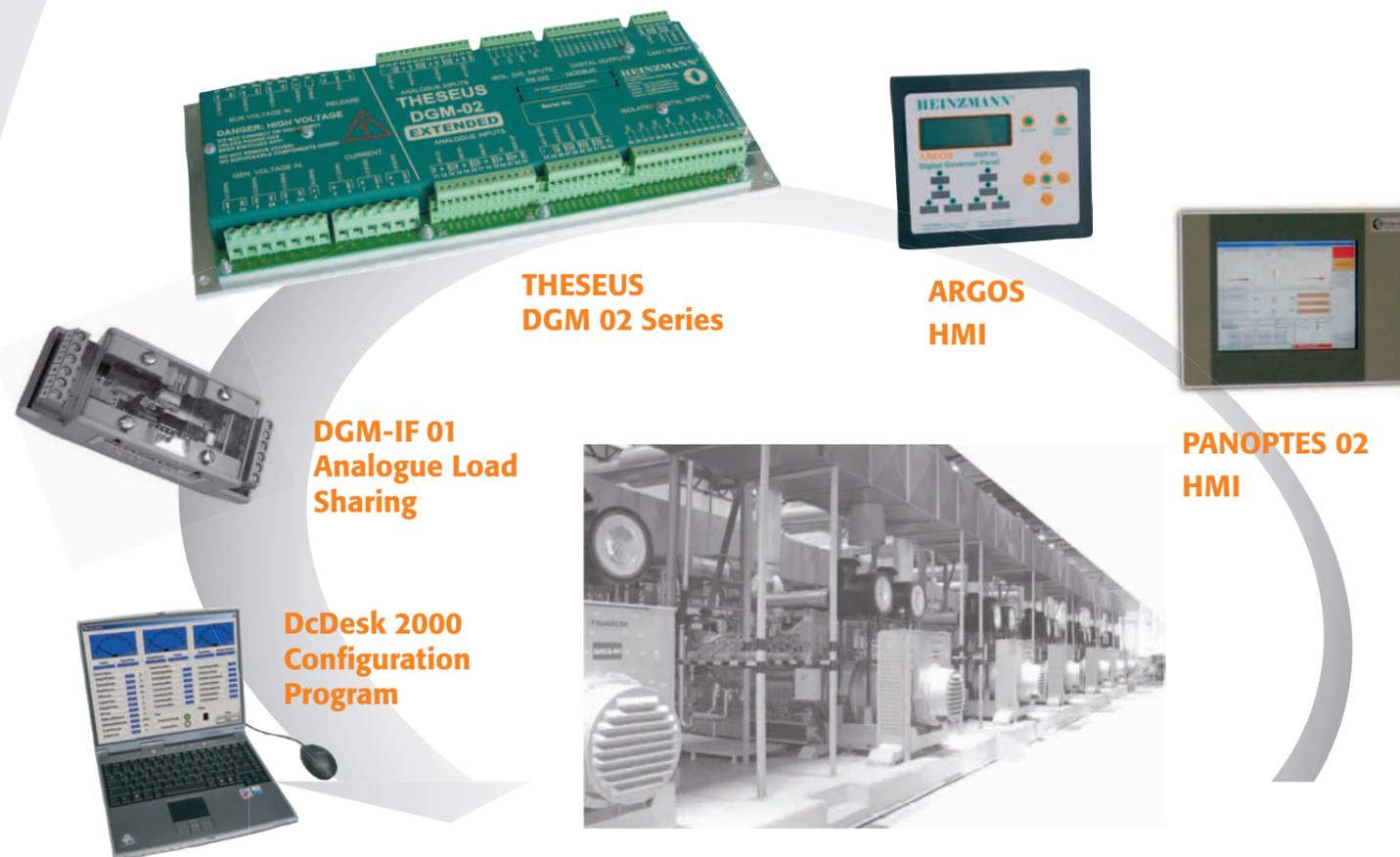
- Replacement of obsolete tachometer speed monitoring systems with modern phonic wheel magnetic speed pickup systems
- Colour graphic HMI systems with trend and sequence of events recording

## THESEUS

### Generator management

HEINZMANN's digital generator management control unit THESEUS DGM-02 is an all-rounder. Whether in island- or mains-parallel operation, single genset or group, there is an appropriate version for every application which, in conjunction with the HMI ARGOS or PANOPTES, provides a comfortable and user-friendly system.

THESEUS DGM-02 is available in four main variants: BASIC, MEDIUM, EXTENDED and GROUP. Each of these has a predetermined range of functions and communication interfaces suitable for user configuration via the powerful DcDesk 2000 Communication Software.



With exception of the BASIC variant all units also allow custom-engineered solutions to be developed to meet specific needs. Further optional enhancements such as ModBus, for interfacing to external PLC/SCADA packages as well as the PANOPTES touch screen HMI, and integral speed governor, for interfacing with most standard positioner electronics, make THESEUS DGM-02 the complete generator management solution.

In addition to the digital THESEUS control units HEINZMANN also provides analogue generator control units for isolated and mains parallel operation.

#### PANOPTES 02 Touch screen unit

- ➔ Operating through touch screen
- ➔ CAN connection to DGM-02
- ➔ Generator/mains breaker status
- ➔ Generator and engine monitoring
- ➔ Alarm display and logging
- ➔ ModBus connection to external PLC/SCADA
- ➔ Interfaces: Ethernet, RS485, CAN
- ➔ Two sizes: 5.7 and 10.4 inch

#### ARGOS Display unit

- ➔ Operation through push buttons
- ➔ CAN or serial connection to DGM-02
- ➔ Generator/mains breaker status
- ➔ Generator and engine monitoring
- ➔ Alarm display

#### THESEUS DGM-02 Digital generator control unit

- ➔ Synchronising
- ➔ kW power control
- ➔ kW load sharing
- ➔ Voltage-matching
- ➔ PF control
- ➔ kVA load sharing
- ➔ Genset protection
- ➔ Automatic sequencing
- ➔ CAN communication
- ➔ Real time alarm/data log options
- ➔ ModBus or SAE J1939
- ➔ Integrated speed governor accessories
- ➔ PC based adjustment
- ➔ Monitoring
- ➔ Interface with existing analogue load sharing
- ➔ Different HMIs

- ### System Benefits
- ✓ Suits all engine sizes
  - ✓ For island- and mains-parallel operation
  - ✓ Compatible with engines and governors from all manufacturers

#### THESEUS AT-01 Analogue generator control unit

- ➔ Three-phase multi-function unit for island- and mains-parallel operation
- ➔ Auto synchronising
- ➔ kW measuring and control
- ➔ Adjustable load ramps
- ➔ Load transfer

#### AT 10-01 Analogue generator control unit

- ➔ Single-phase multi-function unit
- ➔ For synchronising and isochronous kW load sharing in island-parallel operation
- ➔ For small generator plants

## APOLLON

### Engine emission management

Emissions regulations are becoming more stringent, requiring sophisticated aftertreatment systems of exhaust gases as well as improved internal combustion and engine management. HEINZMANN's APOLLON system keeps your engine emissions clean.

Exhaust Gas Recirculation (EGR) minimises the formation of nitrogen oxides (NOx) when fuel is burned in internal combustion engines. HEINZMANN offers customised EGR solutions.

The active regeneration of Diesel Particulate Filters (DPF), independent of the engine

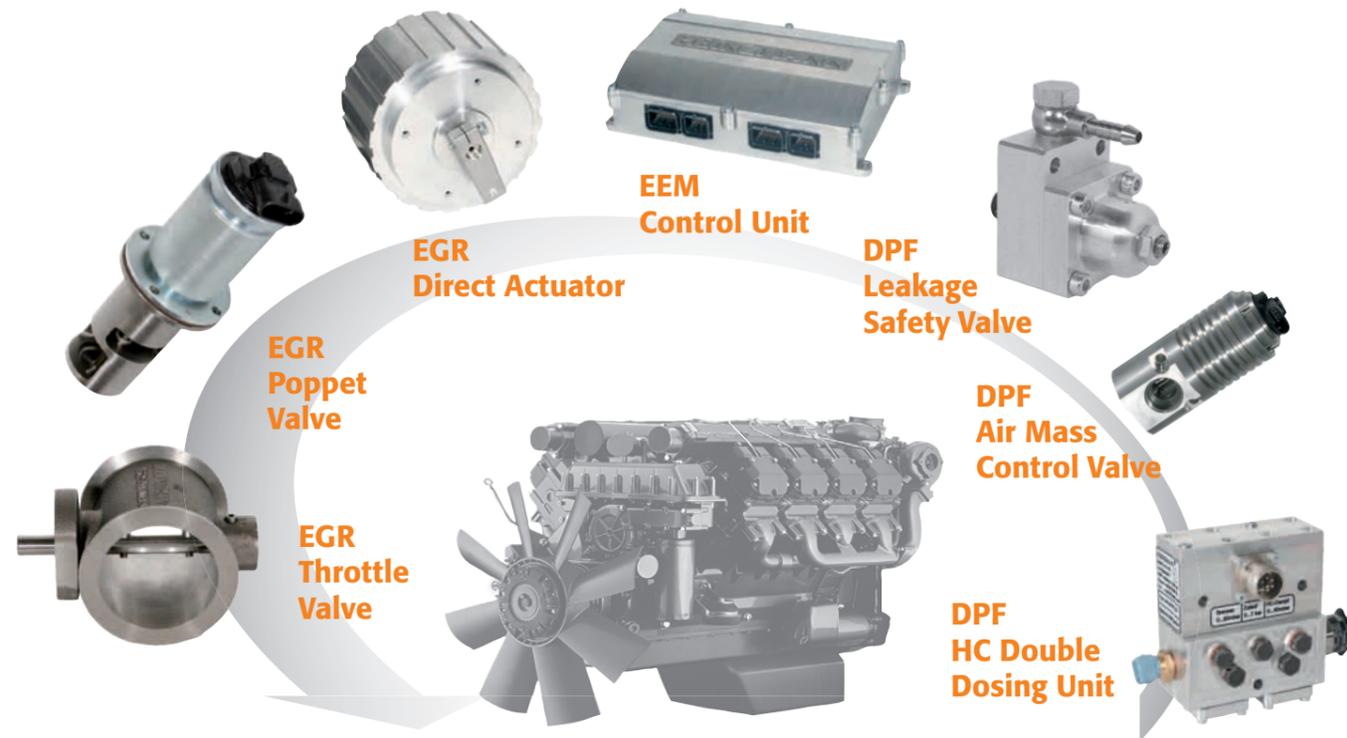


operation, will be demanded more often for off-highway applications. HEINZMANN delivers the main system components.

Wastegate valves with corresponding actuators complete the HEINZMANN Engine Emission Management (EEM) product line.

APOLLON technology is suitable for on-road and off-road vehicles, industrial and stationary applications, locomotive and marine applications as well as for generators.

HEINZMANN can provide full development service to meet current and future exhaust gas emission limits.



### APOLLON features

- ➔ Short opening and closing times
- ➔ Steady-state and dynamic control modes
- ➔ Low leakage
- ➔ Mapped control for optimised operation
- ➔ Diagnostic capabilities
- ➔ Robust and durable
- ➔ Simple system integration

### APOLLON exhaust gas recirculation systems

- ➔ EGR throttle valves and actuators
- ➔ APOLLON EGR-TV Throttle valves with direct actuator
- ➔ APOLLON EGR-DA Direct actuators for the EGR-TV valves
- ➔ APOLLON EGR-PV Double poppet valves

### APOLLON EGR-TV systems Throttle valve with direct actuator

The APOLLON EGR range uses a modular design and is therefore very flexible. The actuators can be combined with different valves to meet individual customer requirements. It is also possible to integrate the control and driver unit in the valve. The system can be connected via a CAN bus interface.

### APOLLON EGR-PV systems Dual poppet valve with proportional solenoid and control system

The APOLLON range of EGR-PV valves provides exhaust gas metering using pressure compensated dual-seat valves controlled by high performance, compact actuators.

The required valve position is achieved using a PWM current. Positional feedback is provided by a position sensor, which can also be used for diagnostic purposes.

The design of the valves provides force compensation, making them largely insensitive to pulsations in the exhaust flow.

### System Benefits

- ✓ Reduction of PM and NOx emissions
- ✓ A broad range of engine sizes
- ✓ For on-road or off-road engines
- ✓ Full system integration

### APOLLON particulate filter regeneration systems

HEINZMANN delivers the following components for active filter regeneration:

- ➔ Double dosing unit PFR-DDU Leakage safety valve PFR-LSV
- ➔ Single dosing unit PFR-SDU
- ➔ Electric motor
- ➔ Air mass control valve PFR-ACU

### APOLLON turbo wastegate systems

HEINZMANN provides wastegate throttle valves for turbo boost control and suitable actuators with optional water cooling.

### Customised solutions

HEINZMANN develops and produces customised solutions for specific needs like Venturi nozzles and customer specific valves.

## TRITON I

### Oil Mist Detection (OMD)

The advanced HEINZMANN oil mist detection system is especially designed to meet the requirements of large diesel and gas engines, like ship or power plant engines. It protects your diesel engine from damage and explosion due to oil mist generated by local overheating.

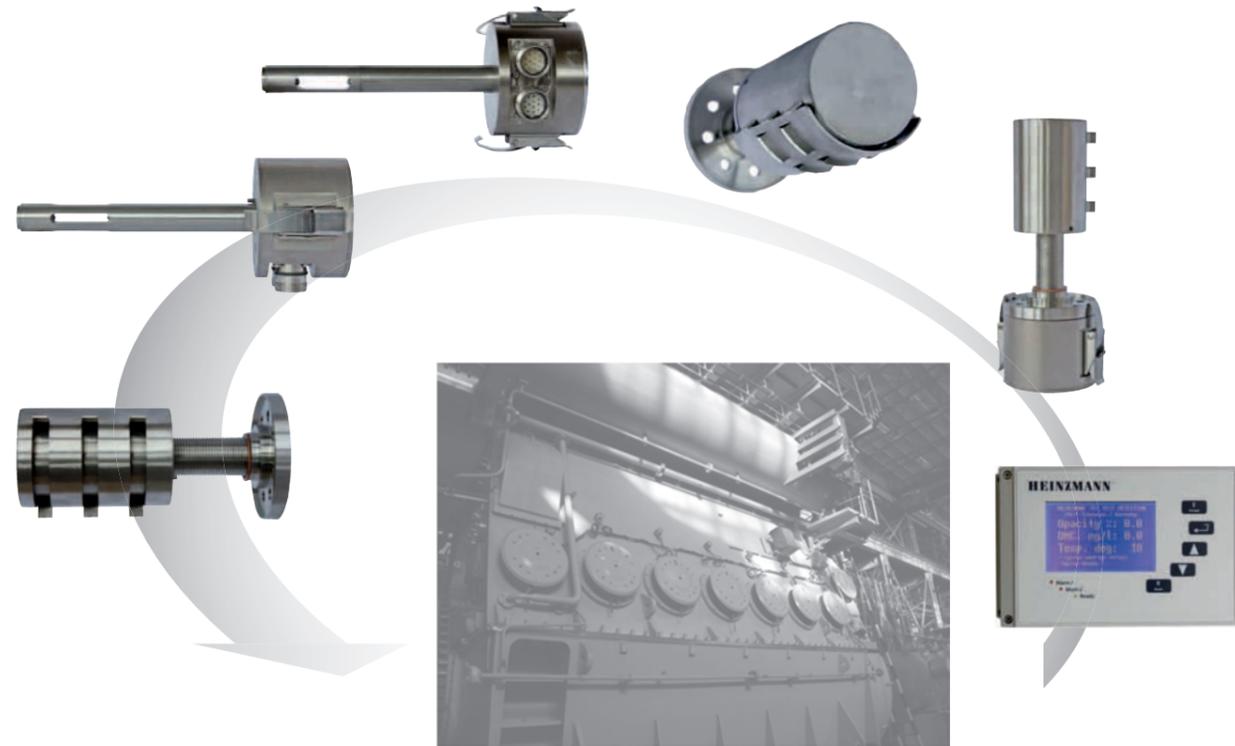
The hazard of highly ignitable oil mist produced when lubricants or fuel come in contact with hot surfaces, within the engine, has become one of the most significant risks for engine operators and personnel.

Oil mist concentration of 50 mg/l and higher is sufficient for an explosion to occur,



resulting in large scale engine damage and in severe cases in the loss of lives.

The presence of oil mist inside the engine can also indicate a damage of sliding surfaces, because the lubricant film can vaporise in cases of excessive friction caused by wear.



### TRITON I features

- Pipeless and suction free: direct detection inside crankcase
- Online and continuous monitoring
- Maintenance-free optical sensor system protected against splash oil contamination
- Measurement of lube oil temperature in each compartment
- Self-redundant measurement system
- Simple electrical installation requirement
- No moving parts
- Sensor replacement is possible at any time
- Minimising engine maintenance and service costs
- For diesel and gas engines
- CAN communication via CAN bus and ModBus
- Remote monitoring unit for long distance information transfer

### OMD control unit

The control unit is designed to withstand the environment in the engine room. The vibration resistance of the unit allows installation directly on the engine. The electrical wiring interface is done by means of robust connectors with sealed metallic housings.

The control unit consists of a metallic case, a Liquid Crystal Display (LCD), three LEDs (Alarm1, Alarm2 and Ready), four control keys and one reset button. The electronics and the display of the control units are installed in a closed, shock-proof, water, dust and EMC resistant aluminium case, protection class IP67.

The control unit can be mounted close to the engine or in the engine control room. It operates reliably at temperatures between 0 °C to 70 °C with a relative humidity up to 80 %.



### System Benefits

- ✓ Protection from damage and explosion
- ✓ Pipeless and suction free: direct detection
- ✓ Online and continuous monitoring
- ✓ Self-redundant measurement system
- ✓ ATEX version available
- ✓ Marine-classified

### OMD sensors

The OMD sensor has no moving parts and is therefore not subjected to wear and tear. A special protection design prevents the optical system from being impaired by splash oil contamination. The intelligent firmware avoids false alarms and consequently only allows oil mist occurrence to trigger an alarm.

The measuring unit for a compartment consists of a finger-shaped optical sensor with system redundancy, and a multiple chamber splash oil protection system, which prevents the sensor from being soiled with splash oil, but allows the oil mist and water vapour to enter the sensor light beam. So, the reaction time of each sensor and the whole system is less than one second.



The intelligent and sensitive sensor is designed to detect instantly any slight change of oil mist concentrations inside each engine compartment.

## TRITON II

### Arc Protection System (APS)

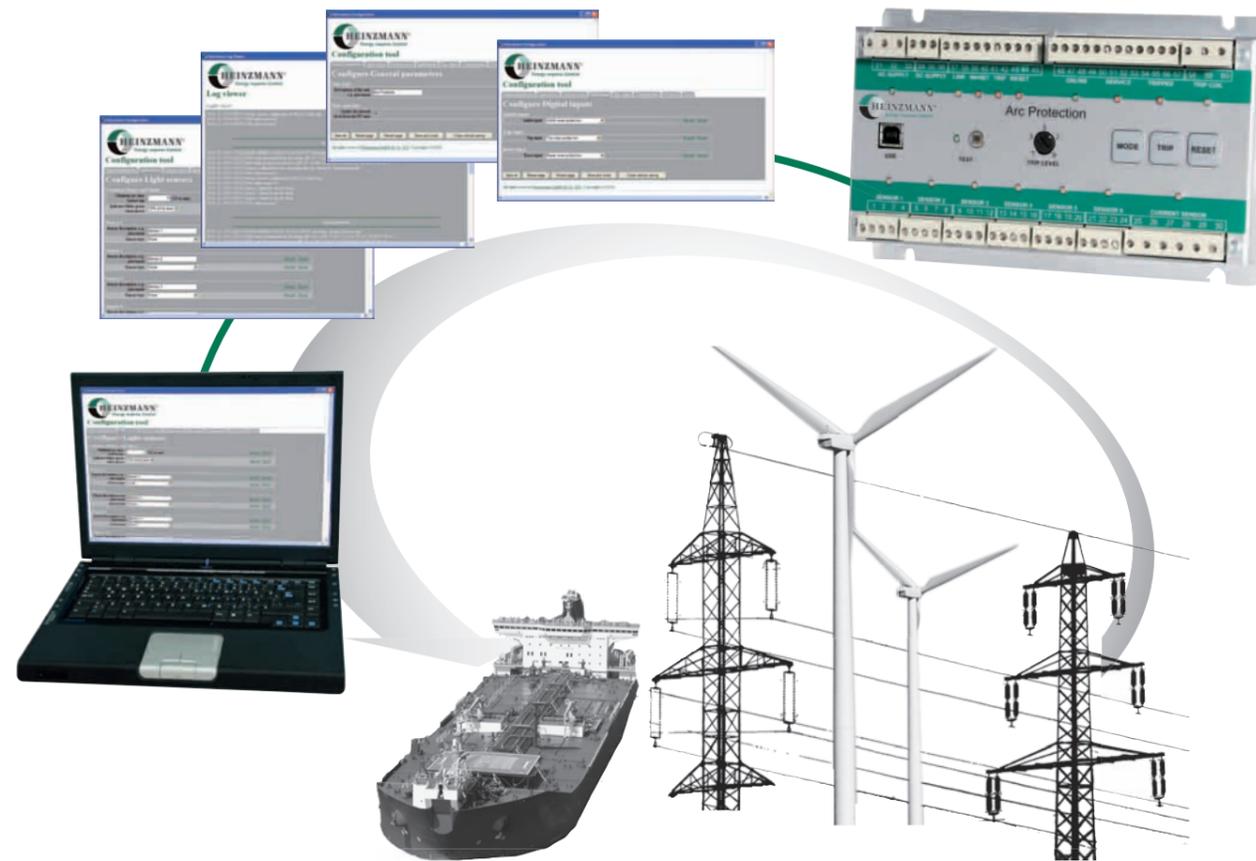
TRITON II is an advanced arc protection system and reduces damages to material - switchgear equipment and electrical installations are valuable assets. Arc fault protection can minimise or even avoid severe damage to costly electrical equipment and allows a fast and safe power restoration.

A rapid reaction from the HEINZMANN arc fault protection system reduces the production downtime to a minimum or even to nonexistence.



Insurance companies have seen the benefits of arc fault protection. In some cases it is a requirement and some insurance companies are willing to offer better conditions when an efficient arc protection system like the APS control unit is installed to protect the electrical installation.

TRITON II improves personnel safety - serious injuries to personnel can be avoided. Extreme heat, fire and pressure are some of the fatal results which an arc fault develops. HEINZMANN arc fault protection helps minimising this risk and improves safety.



### TRITON II features

- Compact unit - arc fault and over-current protection
- High speed arc fault detection in less than 1 ms
- Over-current protection with detection within 1 ms
- Combined optical fibre and point sensors
- Self-supervision of sensors and protection unit
- Real-time event logging
- Easy installation and configuration via USB



### APS control unit

The APS control unit is a stand-alone and high speed arc protection device for electrical power distribution systems. It supports both point and fibre sensor technologies for arc flash detection and incorporates up to six sensors. Sensor types can be combined to provide the best possible coverage and thereby ensuring protection at all areas (e.g. within a switchboard) where an arc is likely to happen.

In case of an arc flash fault, the APS control unit detects and generates a tripping pulse in less than 1 millisecond to the circuit breaker(s) installed. The total arcing time is thus reduced to the mechanical opening time of the circuit breaker, which is typical around 50-75 ms. The trip circuit is based on a solid state switch, providing fast reaction and drive capability for even the largest circuit breakers.



### System Benefits

- ✓ **Reduced damage and decreased repair cost**
- ✓ **Minimised production downtime**
- ✓ **Improved personnel safety**

### APS sensors

Parts of the TRITON II Arc Protection System are flexible and efficient sensors.

#### APS point sensor

The APS point sensor is a light-sensitive element based on photo cell technology. It detects visible light radiation which is captured at the cylindrical top. The APS point sensor has a detection area of up to 2 m with a characteristic of 180° x 360°. It supports self-supervision and a clear blinking built-in LED indicates that the sensor is active. If the sensor reaches the trigger level, the LED will light up constantly. The sensor is supplied with a 10 m shielded cable.



#### APS fibre sensor

The APS fibre sensor is a light sensitive element based on optical fibre technology. It is a fully flexible fibre with a detection angle of 360° throughout the length of the fibre. The detection radius is up to 2 meter. Its fibre has 8 meter active cable length sensitive to light. The fibre sensor is ideal to be installed in electrical cabinets with drawer sections.



## TRITON III

### Hydraulic Cranking Systems (HCS)

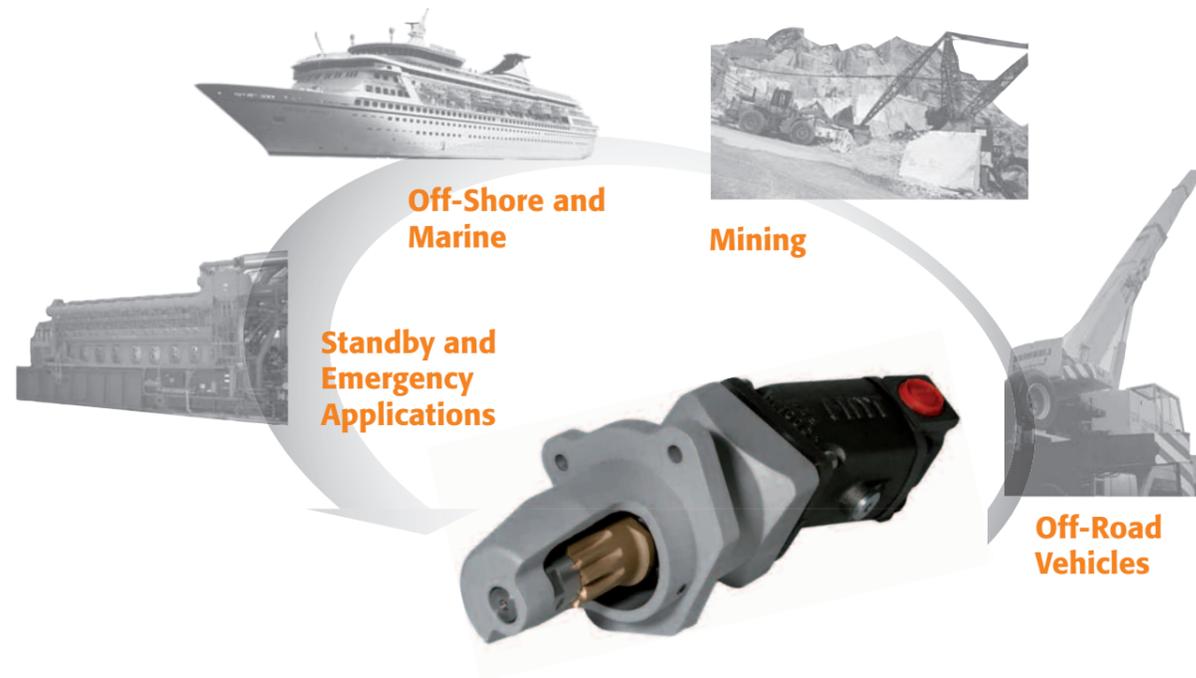
In cooperation with Longday, HEINZMANN has developed hydraulic powered cranking systems that are designed to provide instant and reliable high cranking speeds for the fast and secure start-up of engine applications, under the harshest environmental conditions.

Unlike electrical or air starting systems, the hydraulic system is unrivalled in the cranking of engine applications in terms of reliability, instant torque and durability. It provides a much higher torque, which ensures cranking even at temperatures as low as -40 °C. Neither a flat



battery nor a failed electrical system will affect the hydraulic cranking system's operation.

The accumulator stores hydraulic power for a long period of time, which can be released immediately upon a request to power the hydraulic cranking motor for attempted start-up. The hydraulic power itself is supplied either by an engine-powered, electrical or air-driven pump. For the purpose of redundancy, each system is equipped with a manual charging hand pump, which enables the system to be started manually if all other means have failed.



#### TRITON III features

- ➔ Enhanced hydraulic cranking motor (bend axis piston motor) permitting high torque and speed for fast cranking at temperatures as low as -40 °C
- ➔ HCS motor with standardised smooth pinion engagement mechanisms, which provides almost wear free pinion entry to ring gear
- ➔ Hydraulic cranking motor range covers engine sizes from 100 kW to 5 MW
- ➔ Safe and reliable cranking of engines in hazardous areas
- ➔ Black start
- ➔ System assemblies, which meet ex-proof and marine classification requirements
- ➔ 3 system pressure levels – 280 / 350 / 400 bar
- ➔ Long lifecycle and virtually maintenance-free
- ➔ Sturdy, compact design
- ➔ Wide range of system features
- ➔ Built and engineered by experts in hydraulic power units
- ➔ Worldwide support

#### HCS motor

Integration of the cranking motor in existing hydraulic applications in closed-loop systems.

- ➔ Hydraulic power comes directly from the application
- ➔ Compact individual solutions
- ➔ Enhancement by additional components according to demand
- ➔ Main or back-up cranking system

Applications for larger engines or off-road vehicles with existing hydraulic systems.



Hydraulic cranking motor

#### System Benefits

- ✓ **Reliable, instant cranking power**
- ✓ **Cranking up engines from 100 kW to 5 MW**
- ✓ **Wide operating temperature range down to -40 °C**
- ✓ **Smooth pinion engagement mechanism**
- ✓ **Ex-proof and marine classification versions**
- ✓ **Worldwide support**

#### Complete cranking package combinations

Each TRITON III system consists of three selectable main modules to meet application demands.

- 1. Accumulator recharge selection**
- 2. Start release valve selection**
- 3. System assembly types**



#### TRITON III systems

The TRITON III systems are modular in design to meet each customer's individual requirements, and are supplied fully assembled and tested. Furthermore, the hydraulic cranking motors can also be integrated in existing applications in closed-loop systems.

Thanks to the high user friendliness, reliability and economy of our TRITON III Cranking Systems, as well as our worldwide service network, we are a key supplier in the market for hydraulic cranking systems.

# HYPERION

## Hybrid drives

HEINZMANN's electric motor/generator for the diesel hybrid drive combines the know-how of the Engine & Turbine Management division with that of the Electric Drives division. As a specialist in control systems for diesel engines, HEINZMANN now offers a major contribution to this pioneering drive technology for the off-road application sector. Furthermore, the HEINZMANN electric motor/generator can also be combined with gaseous fuelled and gasoline engines. Thus HEINZMANN supplies hybrid solutions for the full line of industrial engines.

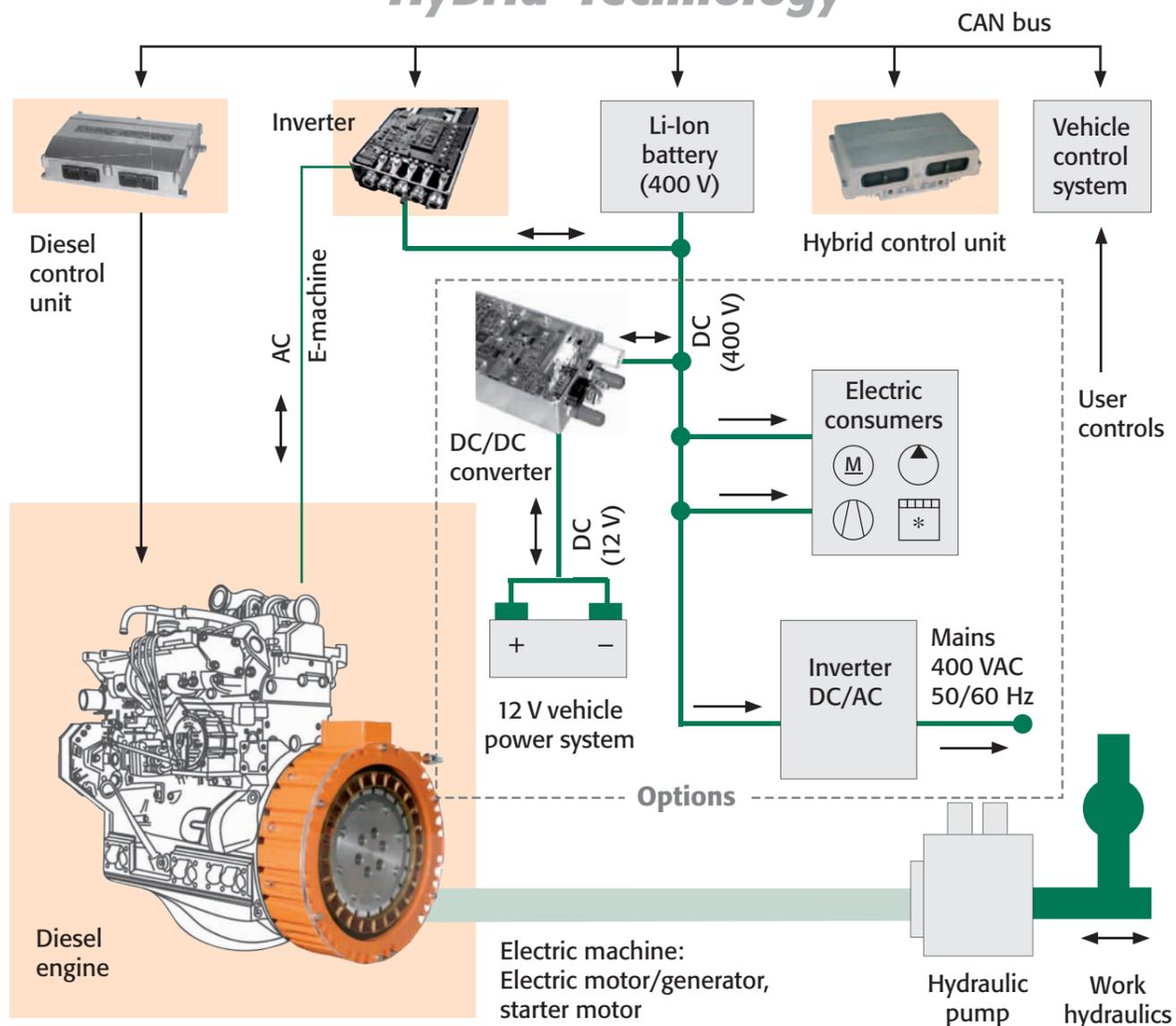
HEINZMANN is developing hybrid concepts for industry, municipalities and the



construction industry thus being a partner to all combustion engine manufacturers.

The advantages of the hybrid drives are clear: the resource-efficient drive concept considerably reduces fuel consumption. The unique way in which the electric machine works leads to a significant improvement in the performance of the entire drive system. When the electric machine is working as a motor, power from the battery is transferred to the drivetrain. Conversely, when operating as a generator, it uses the power of the drivetrain in order to recharge the battery. Thus it is possible to right-size the internal combustion engine running at its most efficient operating point and to recuperate the energy during braking. Finally, the hybrid concept provides considerable emission reductions.

# Hybrid Technology



## System components

### Electric machine

- ➔ Operation as an electric motor/generator or starter motor

### System control unit

- ➔ Control and management of the complete system. Provides boost, load, recuperation and starter functionality

### Diesel control unit

- ➔ Speed/torque governor for the diesel engine

### Inverter

- ➔ Speed/torque governor for the electric motor/generator

### DC/DC converter (optional)

- ➔ Converts 400 VDC bus voltage to vehicle power system voltage

## Applications

Possible applications for the HYPERION Hybrid Drive are off-road applications such as:

### Construction vehicles

- ➔ e.g. wheeled loaders, hydraulic excavators

### Material handling

- ➔ e.g. forklift trucks

### Genset application

- ➔ e.g. compact variable speed generator

Implemented as a full hybrid system, it is also possible to install the system in closed rooms, tunnels and aircraft hangars.

## System Benefits

- ✓ Fuel savings: energy recuperation, start/stop operation
- ✓ Optimum operating point of the combustion engine
- ✓ Corresponding reductions in pollutant emissions
- ✓ Noise reduction: power peaks supported by the noiseless electric motor
- ✓ Improved dynamic performance due to the torque characteristics of the electric motor at low speeds
- ✓ Downsizing of the combustion engine and better utilisation of rated power
- ✓ Positive impact on emission after-treatment
- ✓ No starter or alternator required
- ✓ Potential efficiency savings by use of electrically driven water pumps, oil pumps, fuel pumps and cooling fans

## Hybrid designs

- ➔ Mild hybrid
- ➔ Full hybrid
- ➔ Serial hybrid

## Digital Control Units

### Comprehensive range

HEINZMANN designs and produces a comprehensive range of control systems for reciprocating engines, gas and steam turbines as well as generator management systems.

HEINZMANN's digital control systems are acknowledged for their high flexibility, which meets all customer needs and requirements. These systems, which are known for their long-life cycle and proven reliability, can be used for any size, type or make of machine. Beside our standard products we also offer customised solutions tailored to your particular application.

HEINZMANN offers a comprehensive selection of digital control systems for industrial,



marine, locomotive, genset, turbine, off-road and dual fuel applications.

Our control units are the core of the HEINZMANN system solutions described in this product guide.

All digital control units in the HEINZMANN range offer excellent governing performance with extensive functionality configured by DcDesk 2000 programming software.

### ORION series

ORION is a new generation of HEINZMANN control systems for small- and medium-sized diesel and gas engines with an optimal price-performance ratio and high efficiency. All solutions have a highly intelligent and precise feedback system and are available with rotary or linear actuators.

#### ORION DC 9

ORION DC 9 cost-effective speed control units are highly flexible and have a good speed control performance on small and medium combustion engines.



DC 9

#### ORION DC 10

The economically advantageous ORION DC 10 control unit with protection grade IP 66 is tailored for direct engine mounting without panel and can be used for small combustion engines.



DC 10

### PANDAROS DC 6

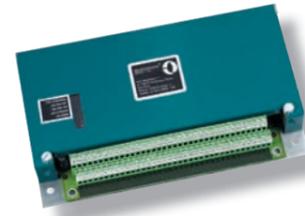
HEINZMANN's smallest digital control for high-speed engines, which drives HEINZMANN actuators rated up to 30 Nm torque. You can parametrise PANDAROS with DcDesk 2000 software, as well as with external or internal programmer. For user's convenience it has 6 configurations with assigned I/O on-board CAN bus.



DC 6

### HELENOS DC 2-02

HEINZMANN's digital control for medium-speed engines and turbines. The HELENOS unit forms the core control of application-dedicated systems for marine, locomotive and turbine applications. Like all HEINZMANN digital controls it allows to change the control parameters with DcDesk 2000 program software. It has assignable I/O and comes in two different enclosures. External communication via variable CAN protocols and ModBus.



DC 2-02

### PRIAMOS DC 1-03

HEINZMANN's digital control for medium- and large-sized engines and turbines in a IP55 enclosure that can drive HEINZMANN's most powerful actuators rated up to 300 Nm torque. Configurable with DcDesk 2000 program software. It has assignable I/O with dedicated cable harness. External communication via various CAN protocols.



DC 1-03

### ARTEMIS series DC 1-04

HEINZMANN's digital control for dual fuel engines that drives two actuators for diesel and gas fuel metering. Diesel/gas rationing as a function of selectable engine parameters is performed with the DcDesk 2000 software program. Enclosure meets typical gas environment requirements. External communication via CAN protocols.



DC 1-04

### THESEUS digital DGM-02 series

HEINZMANN's digital generator control, management and protection system. Suitable for stand-alone and active parallel operation with real kW and reactive kVAR load management functions for soft loading, load sharing and import/export control. External communication via CAN protocols or ModBus.



DGM-02

### DARDANOS MVC series

HEINZMANN's electronic fuel injection controls that drive solenoid actuated diesel and gas injection systems. DARDANOS is available for 6, 8 and up to 20 cylinders. Injection timing and duration is set with DcDesk 2000 Software and can be mapped according to engine designer's requirements. Together with our MEGASOL solenoid operated gas admission valves, it forms an injection control system for gas engines. External communication via CAN protocols or ModBus.



MVC 01



MVC 03



MVC 04



MVC 05

For further information please see pages 2 and 3.

## Analogue Control Units

### Ease of adjustment

Although digital control systems are today's dominant technology when it comes to speed control of combustion engines, there is still a great deal of interest in the market for analogue systems, especially for small engines and simple applications.

Advantages are the ease of adjustment of control parameters (e.g. speed range, PID and speed droop) and the isochronous operation (zero speed droop).

In addition to their excellent controllability characteristics, analogue systems have another advantage: there is neither software nor programming device required – just a small screwdriver to adjust the potentiometers.



Analogue control systems are particularly well suited for applications that require constant speed control (generator systems).

Analogue speed governors are available in versions for different engine sizes. They are easy to connect to upstream accessory units to form complete generator sets. The units are easy to use and can be put into service rapidly.

### E 1-F / E 2-F

#### Electronic governor

##### KG 1/2-03-F

Excellent dynamics make this unit ideal for small gas engines.

Applications: Single generator sets

##### KG 1/2-06-03-F

Features an extended range of functions with extra interfaces for connection to synchronisers and load measuring units.

Applications: Generator sets operating in parallel



KG 1

### E 6 / E 6V / E 10

#### Electronic governor

This governor system is designed principally for gas and diesel engines with medium power ratings up to 1000 kW. A wide range of standard interfaces make this unit suitable for a wide variety of applications.

Applications: Mainly generator sets



KG 6

### E 16 / E 30 / E 40

#### Electronic governor

This governor system is designed for large gas and diesel engines with power ratings up to 4 MW. Interfaces can be adjusted to the customer's needs, which make this governor suitable for a wide range of tasks and applications.

Applications: Mainly generator sets

### ORION AC 3

#### Analogue control unit

This control unit has been developed for simple applications employing small diesel engines with power ratings up to 100 kW. It can be used together with a solenoid or a linear actuator (StG 3005, LA 30).

Applications: Generators, pump drives



AC 3

### AT-01

#### Analogue generator control unit

Three-phase multi-function unit for island- and mains-parallel operation. The AT-01 unit provides auto synchronising, kW measuring and control as well as adjustable load ramps and load transfer.



AT-01

### AT 10-01

#### Analogue control unit

Simple, single-phase multi-function unit for synchronising and isochronous kW load sharing in island-parallel operation for small generator plants.



AT 10-01

### LMG 11-01

#### Analogue isochronous kW load sharing unit

This unit enables three-phase kW measurement and can be used in conjunction with HEINZMANN electronic controllers for isochronous load sharing in island-parallel and mains-parallel operation.

LEDs indicate reverse power and the switching status of the power circuit breaker (generator and bus).



LMG 11-01

### SYG 02

#### Analogue synchroniser unit

This synchroniser unit incorporates a three-phase comparison of voltage, frequency and phase angle (indicated by LEDs) between the busbar and the generator.

The unit operates with a controller in the 4% nominal frequency range and can therefore also be used for standby synchronising.

A dedicated signal output enables inverse synchronising of the unit with the mains.



SYG 02

## Actuators

Based on HEINZMANN's more than 100 years experience in developing and producing high-performance actuators, their proven reliability and long-life cycle is well known in the market.

They are driven electronically. Therefore, no mechanical or hydraulic drive is needed.

This allows HEINZMANN actuators to be easily fitted to any engine. This is another reason why our units are also suitable for retrofit systems.

Our actuators feature high torque ratings packed into a lightweight, compact unit and have a high protection grade.

HEINZMANN provides a wide range of actuators including direct working actuators, actuators with gears and



actuators with integrated positioning electronics and brushless motors.

We have a large range of actuator models covering practically any application and sector. This means that customers can find a product tailored to their exact requirements.

Alongside the wide range of HEINZMANN control units we offer a complete series of control systems covering a broad spectrum of applications.

HEINZMANN systems provide complete solutions to match all customer needs.

### Direct acting actuators with rotary output

The actuators of this family are rotary and direct acting all electric actuators with 0.55 to 13 Nm output torque and 36°, 53° or 68° travel. Their main application is on automotive and industrial diesel and gas engines from 100 to 1000 kW. These actuators provide a contactless position feedback. Their distinctive features are a compact design and a high-dynamic performance. They may be combined with various analogue or digital HEINZMANN control units.

#### StG 3005

- 0.55 Nm
- 53° rotation



#### StG 1 / StG 2

- 0.9 and 1.4 Nm
- 68° rotation



#### StG 2005

- 0.8 Nm
- 36° rotation



#### StG 2010 / StG 2040 / StG 2080

- 2, 7.4 and 11 Nm (at 36°)
- up to 68° rotation
- fast acting



#### StG 2005 DP / StG 2040 DP

- 0.8 and 5.6 Nm
- directly mounted at injection pump



#### StG 2120

- 13 Nm
- 68° rotation
- meets specific environmental requirements



### Rotary actuators with integrated positioners

This family of HEINZMANN actuators is based on similar standard versions, equipped with integrated positioning electronics. Output torque range is 4 Nm to 44 Nm at 68° or 90° rotary travel. Main applications are medium and large gas engines and dual fuel engines. The actuators may be driven by any electronic speed control unit, supplying an analogue position demand signal. An analogue position feedback is available as a 4 - 20 mA or a 0 - 5 V signal. Versions with integrated control unit are available on request.

#### StG 2040-P / StG 2080-P

- 6.6 and 7.8 Nm
- 68° rotation
- with integrated positioner



#### StG 30.90-P / StG 40.90-P

- 28 and 44 Nm
- 90° rotation
- with integrated positioner



### System Benefits

- ✓ Easily fitted to any engine
- ✓ Proven reliability and long-life cycle
- ✓ Covering any field of application
- ✓ Direct acting actuators with rotary or linear output
- ✓ Actuators with gears
- ✓ Actuators with integrated positioning electronics
- ✓ EC versions with brushless drive

### Brushless actuators with integrated gearbox and positioner

This new generation of actuators provides high performance combined with rapid response, irrespective of direction of rotation or shaft position. Functional ranges are provided for marine applications and industrial purposes.

StG EC 40 and StG EC 250 come with a fully maintenance-free brushless disc motor which has a typical high torque multiplied by the use of a planetary gear. In case of power loss the self-locking gear is able to prevent undesired reactions of the linkage. Manual override is also possible.

The electronics are fully EMC protected and all customer interfaces are totally galvanically insulated from each other and from ground. The high protection grade IP66 guarantees optimum resistance to adverse environments. They are used in marine applications, cooling water valves and industrial engine applications.

### StG EC 40

- ➔ 40 Nm
- ➔ brushless
- ➔ 90° rotation



### StG EC 250

- ➔ 250 Nm
- ➔ brushless
- ➔ 90° rotation



## Actuators with gears

This series of gear-type all-electric actuators is based on a DC disc motor and gear transmission, with 4 Nm to 180 Nm output torque and 36° or 42° travel. Applications are medium-sized and large diesel and gas engines, as well as gas and steam turbines. The actuators can be combined with various analogue or digital HEINZMANN control units and provide a contactless position feedback.

### StG 6 / StG 10

- ➔ 6 and 10 Nm
- ➔ 36° rotation



### StG 16 / StG 30 / StG 40

- ➔ 15 Nm / 28 Nm / 44 Nm



### StG 64 / StG 90

- ➔ 64 and 90 Nm
- ➔ 42° rotation



### StG 180

- ➔ 180 Nm
- ➔ 42° rotation



## Direct acting actuators with linear output

This group of all-electric direct acting actuators is designed for direct mounting at diesel in-line injection pumps. The linear actuators are driven by HEINZMANN's ORION control units. The ORION family consists of either the dedicated analogue control unit AC 3 or a range of digital control units as DC9 and DC10. The LA actuators provide a special contactless position feedback.

### LA Series

- ➔ Force up to 35 N
- ➔ up to 19.5 mm



## Applications

HEINZMANN actuators are used in

- ➔ Power generation
- ➔ Pump drives
- ➔ Locomotives
- ➔ Marine applications
- ➔ Mechanical drives
- ➔ Industrial applications
- ➔ All turbine applications

## Actuator descriptions

Applicable control units and direction of work

Actuator type	Max. rotation/stroke	Max. torque/force	Torque/force in steady state position	No load response time	Steady state current	Max. current	Ambient temperature °C	Protection grade	Weight approx.	Applicable control units and direction of work						
										PRAMOS DC1	HELENOS DC2	PANDAROS DC6	DC11	ORION DC9	ORION DC10	Analogue
StG 3005	53°	0.55 Nm	0.3 Nm	70 ms	3 A	5 A	-40° ... 90°	IP65	0.8 kg			4Q		4Q	2Q	2Q
StG 3005-F	53°	0.3 Nm	0.15 Nm	70 ms	3 A	5 A	-40° ... 90°	IP65	0.8 kg			4Q		4Q	2Q	2Q
StG 1	68°	0.9 Nm	0.3 Nm	40 ms	1.7 A	5 A	-25° ... 90°	IP50	1.9 kg							4Q
StG 2	68°	1.4 Nm	0.45 Nm	40 ms	1.7 A	5 A	-25° ... 90°	IP50	1.9 kg							4Q
StG 2005	36°	0.8 Nm	0.4 Nm	40 ms	3 A	6 A	-25° ... 90°	IP65	1.4 kg			4Q		4Q	2Q	2Q
StG 2010	36°	2 Nm	1 Nm	45 ms	3 A	6 A	-25° ... 90°	IP65	2.2 kg			4Q	4Q			4Q
StG 2010	68°	1.4 Nm	0.7 Nm	60 ms	3 A	6 A	-25° ... 90°	IP65	2.2 kg			4Q	4Q			4Q
StG 2040	36°	7.4 Nm	3.7 Nm	50 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg			4Q	4Q	4Q		4Q
StG 2040	68°	6.9 Nm	3.4 Nm	70 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg			4Q	4Q	4Q		4Q
StG 2080	36°	11 Nm	7.3 Nm	60 ms	4 A	6 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg			4Q	4Q	4Q		4Q
StG 2080	68°	8.4 Nm	4.2 Nm	85 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg			4Q	4Q	4Q		4Q
StG 2005 DP	36°	0.8 Nm	0.4 Nm	50 ms	3 A	6 A	-25° ... 90°	IP55	2.4 kg			4Q	4Q			
StG 2040 DP	36°	5.6 Nm	2.8 Nm	50 ms	3 A	6 A	-25° ... 90° -40° ... 90°	IP55	4.2 kg			4Q	4Q			
StG 2120	68°	13 Nm	4.3 Nm	<100 ms	2.3 A	7 A	-20° ... 60°	IP55	31 kg			4Q				4Q
StG 30	42°	28 Nm	9.3 Nm	170 ms	1.7 A	5 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q				4Q
StG 30.90	90°	28 Nm	9.3 Nm	235 ms	1.7 A	5 A	-20° ... 60°	IP55	24.5 kg			4Q				4Q
StG 40	42°	44 Nm	14.7 Nm	190 ms	1.7 A	5 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q					4Q
StG 40.90	90°	44 Nm	14.7 Nm	275 ms	2.3 A	7 A	-20° ... 60°	IP55	24.5 kg			4Q				4Q
StG 6-01	36°	4 Nm	1.4 Nm	70 ms	1.7 A	5 A	-25° ... 90°	IP55	3.5 kg			4Q	4Q			4Q
StG 6-02V	36°	6 Nm	2 Nm	75 ms	1.7 A	5 A	-25° ... 90°	IP55	3.5 kg			4Q	4Q			4Q
StG 10	36°	10 Nm	3.3 Nm	80 ms	1.7 A	5 A	-25° ... 90° -40° ... 90°	IP55	4.3 kg			4Q	4Q			4Q
StG 16	42°	15 Nm	5 Nm	120 ms	1.7 A	5 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q				4Q
StG 64	42°	64 Nm	21 Nm	270 ms	2.3 A	7 A	-25° ... 90°	IP65	32 kg	4Q						4Q
StG 90	42°	90 Nm	30 Nm	320 ms	2.3 A	7 A	-25° ... 90°	IP65	32 kg	4Q						4Q
StG 180	42°	180 Nm	60 Nm	320 ms	2.2 A	6.5 A	-25° ... 90° -40° ... 90°	IP 55	39 kg	4Q						
StG 2040-P	68°	6.6 Nm	3.3 Nm	< 80 ms	3.5 A	7 A	-20° ... 80°	IP55	6.5 kg	Integrated position control						
StG 2080-P	68°	7.8 Nm	4.6 Nm	< 90 ms	4 A	7 A	-25° ... 90°	IP65	8.6 kg							
StG 30.90-P	90°	28 Nm	9.3 Nm	< 240 ms	1.7 A	5 A	-20° ... 60°	IP55	24.5 kg							
StG 40.90-P	90°	44 Nm	14.7 Nm	< 280 ms	2.3 A	7 A	-20° ... 60°	IP55	24.5 kg							
StG EC 40	90°	> 40 Nm	> 20 Nm	< 200 ms (40°) 500 ms (90°)	5 A		-40° ... 80°	IP66	19 kg							
StG EC 250	90°	> 250 Nm	> 125 Nm	< 250 ms (40°) 500 ms (90°)	external power supply		-40° ... 80°	IP66	37 kg							
Linear output																
LA 25	19.5 mm	25 N	20 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg						2Q	2Q
LA 30	15.5 mm	30 N	24 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg						2Q	2Q
LA 35	12.5 mm	35 N	28 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg						2Q	2Q

2Q = unidirectional/spring return, 4Q = bidirectional

## REGULATEURS EUROPA

### Governors and hydraulic actuators

Since 2005 REGULATORS EUROPA has been part of the Heinzmann Group as an ideal complement to HEINZMANN's existing products. REGULATORS EUROPA has been providing diesel engine governors since the 1960s, and offering totally integrated solutions for control and monitoring technology in the industrial, marine, traction and power generation industries. In particular, HEINZMANN adds REGULATORS EUROPA's state-of-the-art range of electro-hydraulic diesel engine governors to our own range of mechanical, analogue and digital electronic engine governors. REGULATORS EUROPA also adds its long-standing experience in the



control of locomotive diesels into the HEINZMANN portfolio.

The range of controls of REGULATORS EUROPA and HEINZMANN together establishes us as a full line provider of controls for all major types of prime movers including complex applications such as gas and steam turbine combined cycle power systems.

There are also substantial synergies through the merging of the distribution and aftermarket arrangements of the two companies. The service and repair activities of REGULATORS EUROPA represent a useful extension to HEINZMANN's global sales and service network.

### Viking 35 Diesel engines & generator systems



The digital electronic governor Viking 35 is designed to control all diesel engines in propulsion, traction or generator systems. A wide variety of software is available to suit these applications. Especially for complex load sharing the Viking 35 has proven to be the best available solution.

In its base format 16 digital inputs and outputs and 8 analogue inputs and outputs are available together with RS485, RS232 and CAN bus. The user-friendly Viking Vision PC programming package or a hand held interface unit allows control and status parameters to be edited or displayed in real time.

### 1500-3G Generator/marine governor 2223 / 2233-1G Actuator

The most powerful governor/actuator produced by REGULATORS EUROPA. The output range is 120 to 250 ft lbf (= 160 to 340 Nm). The governor can have either motorised speed setting or speed setting by means of a pneumatic or 4 – 20 mAmp. signal.

The unit is available as a governor or an actuator to be driven by an electronic governor. The actuator may be equipped with a mechanical governor backup.



### 1800-2G Generator/marine governor 2222 / 2232-1G Actuator

The 1800 governor/actuator has a 2 stage high stiffness backlash free hydraulic servo mechanism to enable best possible control. Furthermore, the feedback system incorporates a unique reset cut off feature which assists in optimising the governor response.

The output range is 60 and 80 ft lbf (= 80 and 110 Nm). The governor is available with motorised pneumatic and 4 - 20 mAmp. speed setting. A start/boost pressure fuel limiter may be incorporated. The 1800 is also available as an actuator, with and without mechanical backup, to be controlled by an electronic governor.



### 2231-1G Marine applications

A hydraulic actuator with a mechanical ballhead backup governor.

This actuator is based upon the 1100 series governor and is specially designed for marine applications requiring electronic speed control and a complete backup in the event of control unit or power failure.



### 2221-1G Generator/traction actuator

The 2221 is a proportional actuator in which the output shaft position is proportional to the electric input signal 0 - 1 Amp. Output range is 8 to 40 ft lbf (= 10 to 55 Nm).

Typical application of this actuator is the use on medium- and high-speed diesel engines for generator or traction applications. The actuator in the photo is a 40 ft lbf (= 55 Nm) unit including a start booster.



### System Benefits

- ✓ Wide range of hydraulic governors
- ✓ Digital electronic governors/engine management systems
- ✓ Hydraulic actuators with ballhead backup option

### 2800-1G Actuator

A compact hydraulic proportional actuator for use with the REGULATORS EUROPA Viking range or other manufacturer's governors. Work output of 30 ft lbf (40.5 Nm) and fully interchangeable with UG range actuators.



### 1115-4G Marine applications

Hydraulic governor for marine application. Output range 8 to 40 ft lbf (= 10 to 55 Nm). Available with 4-20 mAmp speed setting and electric or pneumatic start fuel limiter.



### 1102-4G Generator applications

Hydraulic governor for generator applications. Output range is 8, 12, 15, 25, 34 or 40 ft lbf (= 10 to 55 Nm).

Available with several types of speed setting motors voltage range 24 V to 440 V.



## REGULATEURS EUROPA

### Control & monitoring systems

REGULATEURS EUROPA (RE) maintain a wide range of skills that allows it to provide control and governing solutions to engine builders and users in all corners of the world. Its history of involvement with prime movers can be seen in the products and services that it now offers.

REGULATEURS EUROPA is uniquely placed to offer either standard or customised control and monitoring power management solutions for engine builders and users of prime movers.



RE engineers are experienced in controlling engines and power generation in ships, power stations, buildings and locomotives etc..

The wide range of engineering experience means that REGULATEURS EUROPA can provide a product or design that will fully meet the needs of an application.

### Marine systems

REGULATEURS EUROPA has a range of standard solutions that can be supplied for the commercial and military marine control, monitoring and safety market. Systems can be custom-designed for a specific vessel and are often based around the marine approved RE Viking digital electronic hardware. REGULATEURS EUROPA specialises in integrated solutions that incorporate governing, control monitoring and safety, whilst maintaining the



### Industrial systems

REGULATEURS EUROPA projects include generator and power management solutions for many different applications. These include banks, hospitals, hotels, telecommunication centres, airports, water treatment works, sewage treatment works, nuclear power stations and process plants. Customers for these systems are not only located in the UK and other European countries but around the world; from Brazil to India and Africa to Australia.



### Rail traction systems

REGULATEURS EUROPA can capitalise on over 40 years experience of controlling rail traction engines including the generator load. The move to digital electronic control has made it possible to optimise operation and to communicate with the locomotive systems via serial links. Alternatively RE can provide the complete package. The controls package may include monitoring that is relayed back to the depot for real time analysis or logged for later review.



### Overhauls and retrofits

REGULATEURS EUROPA can offer overhauls of governors and control systems or fully engineer retrofits to update installations. Service exchange units are also available from stock in many cases. It is all part of the service that includes on-site fault recovery, commissioning and spares support.

The DG2800 is particularly designed as an easy form and fit upgrade for existing proprietary governors.



### ICENI distributed I/O modules

The ICENI range of distributed I/O modules can be used to communicate with PC or PLC equipment or extend the range of the RE Viking35 ECU. The DIN rail mounted modules are designed to be cost effective and easy to configure, via a colour display keypad, without the need for a programmer or laptop. "ICENI" has been built to a high specification to encompass the extended temperature range of an engine environment but be equally suited to a much wider role; both to enhance RE control and monitoring solutions or as a product for other OEMs.

- Open protocols to PLCs, PCs, etc.
- Extended temperature range (-20 to +70 °C)
- Inbuilt user interface for commissioning and support
- Robust construction
- Independent electrical isolation
- Redundant power supply capability
- "Plug and Play" automatic configuration
- Cost effective solution for a wide range of applications



## Sensors

### for digital control systems

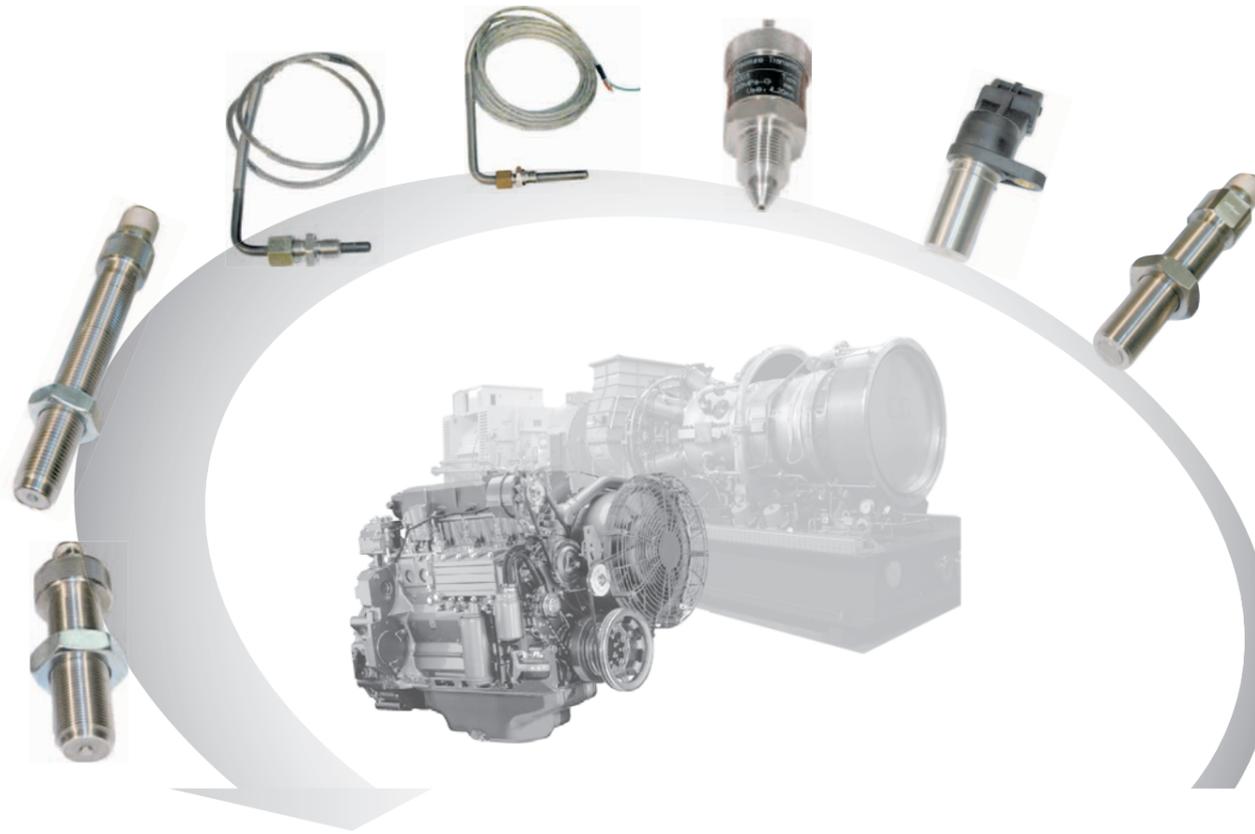
HEINZMANN offers complete solutions for the monitoring and control of engines and turbines and it is therefore only natural that the company also offers a complete range of high-quality sensors. Sensors are fully customisable and can be configured to match any HEINZMANN or customer product specification.

HEINZMANN sets very high standards for its sensors to ensure that they comply with the most stringent industrial standards and customer specifications.

This ensures that our sensors are suitable for applications even in the most severe environments. Some of our sensors are certified for use in special applications.



HEINZMANN operates a policy of continuous improvement and systematic product development. We are continuously improving existing systems and developing new products and sensor solutions. That is why we would like to hear from customers who have an application not covered by our current sensor range. HEINZMANN offers experience and expertise and is glad to work in cooperation with customers in the development of new sensor types including those for use in difficult conditions.



### Features

- Reliable, high-precision sensing
- Wide range of measuring applications
- Designed to suit the HEINZMANN products
- Strong, compact construction
- Long life cycle
- Maintenance-free

### Temperature sensors

HEINZMANN high-quality temperature sensors based on PT100, PT200 or PT1000 measuring cells are used on all HEINZMANN systems and have become the industry benchmark for response times, long term stability and measurement precision.

Our temperature sensors are suitable for measuring fluids and gases. They have IP65 protection rating. Measuring range of PT100/PT200 -40 °C up to +800 °C (short time + 900 °C) and PT1000 -40 °C up to +150 °C.



### Pressure sensors

HEINZMANN offers gas, boost and oil pressure sensors tailored for almost any specification.

HEINZMANN pressure sensors are renowned for their accuracy and reliability and guarantee precision pressure sensing.

Sensors have a IP65 protection rating and are available for pressures ranging from 0 to 2.5, 4, 10, 16 and up to 2000 bar.



### Speed sensors

#### Inductive speed sensors

Inductive speed sensors are one of the most cost-effective methods for measuring speed.

These are contactless sensors and therefore free of wear and tear. They can be customised to a wide range of requirements. Strongly built, the sensors are designed for applications in severe environments.

### System Benefits

- ✓ Temperature sensors
- ✓ Pressure sensors
- ✓ Speed sensors

HEINZMANN inductive speed sensors are available with metric or inch threading. Sensors have IP55 protection rating and are designed for frequencies from 50 to 12,000 Hz and air gap range 0.5 - 2.5 mm.



#### Hall-effect speed sensors

Hall-effect sensors are ideal for the contactless, wear-free measurement of speed. The advantage of hall sensors in comparison with inductive speed sensors is that the output signal does not depend on speed. Sensing is based on tooth position. Varying the tooth configuration makes it possible to tailor this sensor type to a wide variety of applications. Hall-effect speed sensors are also less sensitive to external interference.

Hall-effect speed sensors are ideal for electronic injection systems and electrically controlled gas valves.

Hall speed sensors have a IP 65 protection class rating and operate at a switching frequency of 10 to 12,000 Hz and air gap range 0.5 - 2 mm.



See the relevant manual for operation temperature and other technical details of each sensor.

## Solenoids

### for electronic fuel injection

Solenoids are used on modern fuel injection pumps to vary the start and stop of the injection cycle.

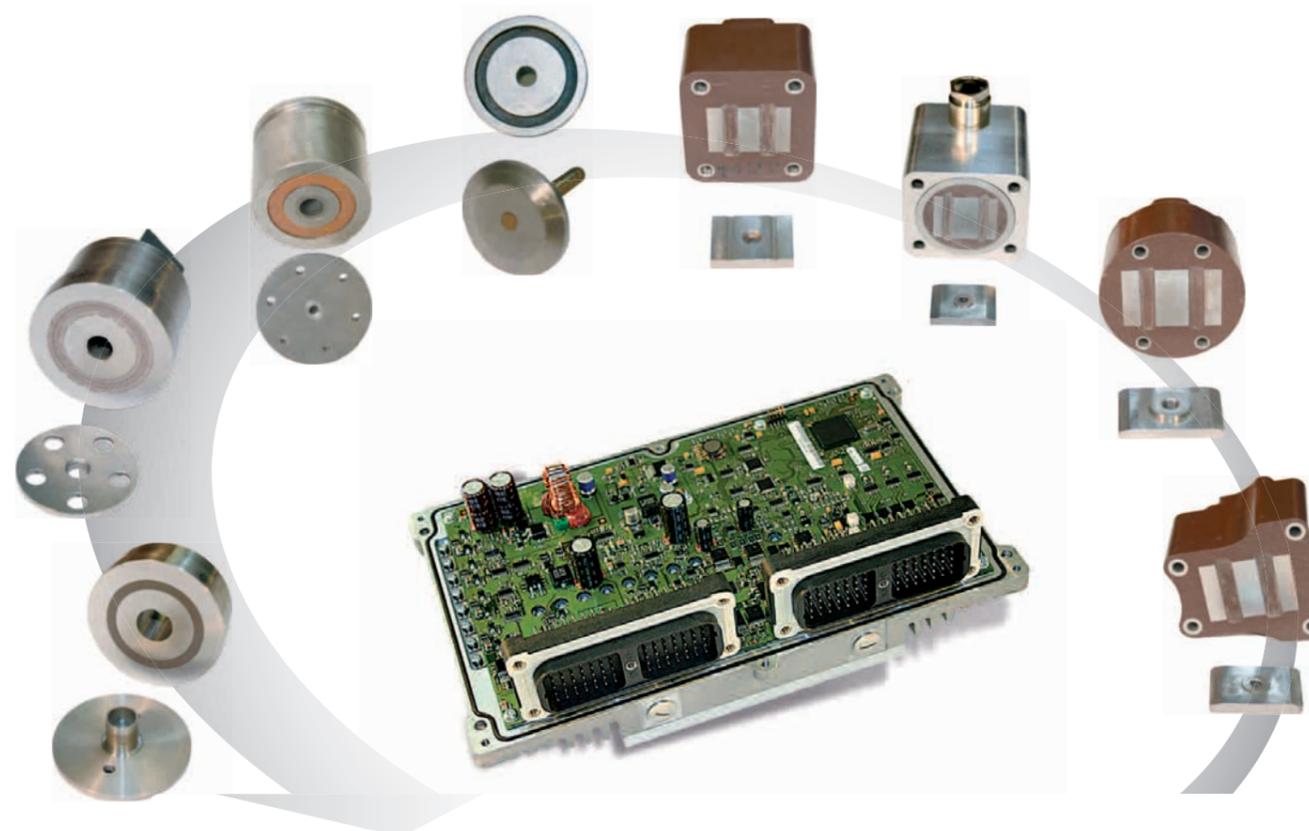
Common rail injection systems are increasingly used on diesel engines due to their reduced fuel consumption, exhaust emissions and noise. Solenoid actuation is especially qualified for common rail systems. Electrical solenoid injectors have the advantage of very fast response times. They are required for accurate control of injection timing and fuel dosing into the combustion chamber. The use of HEINZMANN solenoid actuated injectors also enables the control of pre-injection, main-injection and post-injection.



In addition, solenoids can be used for precise cylinder dosing of gas charge per cylinder.

The pressure of fuel pumps can also be controlled using solenoid-actuated flow valves of high-pressure pumps.

HEINZMANN solenoids are available in various sizes and power ratings in order to meet any customer requirement.



### System Benefits

- ✓ Solenoids for injectors
- ✓ Solenoids for high-pressure pumps
- ✓ Solenoids for gas valves
- ✓ Solenoids for hydraulic valves

### Applications

- ➔ Control components for PNU, PPN and CR injection systems for diesel engines:
  - Injectors for engine power ratings from 50 kW to 3000 kW
  - Plug-in pumps
  - High-pressure pumps
- ➔ Control components for gas engine dosing systems
  - Gas injectors
  - Gas valves for engine power ratings from 200 kW to 3000 kW
- ➔ Hydraulic valves
  - On-off valves
  - Proportional valves
- ➔ Special applications (robotics, linking systems)

### Features

- ➔ High force in a compact unit
- ➔ Short opening and closing times
- ➔ Precise force adjustment
- ➔ Robustness and durability
- ➔ Diagnostic capability (BIP detection)
- ➔ Easy system integration
- ➔ Round and rectangular (E-core) versions available

### Round solenoids

These pot solenoids have a closed, circular shape and ensure easy assembly. HEINZMANN round solenoids are available in a variety of sizes with solid or laminated cores.

### E-core solenoids

These rectangular solenoids have a characteristic E-shaped core made from separate laminate plates. Features of these solenoids are a very high density of the magnetic field and minimum loss of Foucault current. E-core solenoids are available in a variety of sizes.



Round solenoids



E-core solenoids

## Configuration & visualisation tools

### for digital HEINZMANN systems

The HEINZMANN tools can be used with any of the digital HEINZMANN systems such as speed governors, magnetic valve systems, generator set controls and hybrid drive controls to adjust and view operational data. They offer all features required for configuration, testing, commissioning and servicing.

#### DcDesk 2000

Thanks to its design as a Windows<sup>®</sup>\* program, DcDesk 2000 offers a lot of graphical features, printouts and records of data for documentation purposes. Using DcDesk 2000, the parameters of any connected



device may be adjusted while the system is running and the response can be observed directly.

It is also possible to prepare a data set not being connected with the device and to download it later on.

#### SATURN

The SATURN technology expands the HEINZMANN PC program DcDesk 2000 by a remote control functionality. All features of DcDesk 2000 are available from a distance. SATURN can be used with any of the digital HEINZMANN systems.

\* All trademarks are the property of their respective owners.



#### DcDesk 2000 Configuration and visualisation software

##### Commissioning

DcDesk 2000 assists you at any time during the configuration of the control's inputs and outputs as well as the functionality of your application.

##### Monitoring

DcDesk 2000 provides measured values of your application. Data may be shown in different graphics under various aspects. An extremely short transfer time allows a high resolution on all real time records.

##### Service/Diagnosis

DcDesk 2000 offers access to the control's error memory and working data informations. This supports the service technicians for a fast error diagnosis which enables to eliminate the cause.

##### User authorisation

DcDesk 2000 is equipped with a customer dependent access authorisation. This protects the control system against illegitimate modifications.

#### ARGOS Human machine interface

The ARGOS unit as a HMI combines the features of the hand programmer with multiple measurement displays and engine or generator status indication on LED's. It is intended for use in control panels (see page 18 – THESEUS).

#### System Benefits

- ✓ **Parameterisation**
- ✓ **Visualisation**
- ✓ **Diagnosis**

#### Hand programmer configuration tool

The hand programmer offers an easy access to the control unit. It can be used for adjusting parameters, reading measurements and error diagnosis. It needs no battery since it is powered by the control. Therefore it is the ideal tool for servicing.

#### Panoptes 02 Touch Screen Unit

PANOPTES 02 is a compact Human Machine Interface (HMI) for visualising, operating and controlling.

With its features of 10.4 or 5.7 inch full VGA TFT display, touch screen and a powerful PowerPC processor it is particularly suited to THESEUS applications but can equally be used with other systems. A wide range of interfaces allows data exchange with PLC or SCADA via ETHERNET, CAN bus

## Engine & Turbine Management Solutions

### Customised solutions

In addition to a broad range of standard systems, our customers also value tailor-made solutions for their individual needs. After consultation with the customer, HEINZMANN specialists can ascertain what exact requirements locomotives, ships, turbines or generators demand from our digital control systems. They always develop the ideal control technology for the respective customer motor. Both the hardware and the software are conceived for their specific requirements.

Total customer focus is the driving force at HEINZMANN. As a global leader in control technology, we constantly develop new products



to keep pace with our customers' growing demands. Satisfying the needs and expectations of our customers is the ultimate goal of our in-depth R&D initiatives.

### Professional service worldwide

Our strength is the comprehensive on-site service that we deliver to our customers. Of course, we are also there for them if problems happen to arise with existing systems - wherever they may be located. Fast response is only natural for us: as a rule, error detection and correction takes no longer than 24 hours. With our worldwide net of branches, representatives and authorised dealers we can make sure we are always close to our customers.

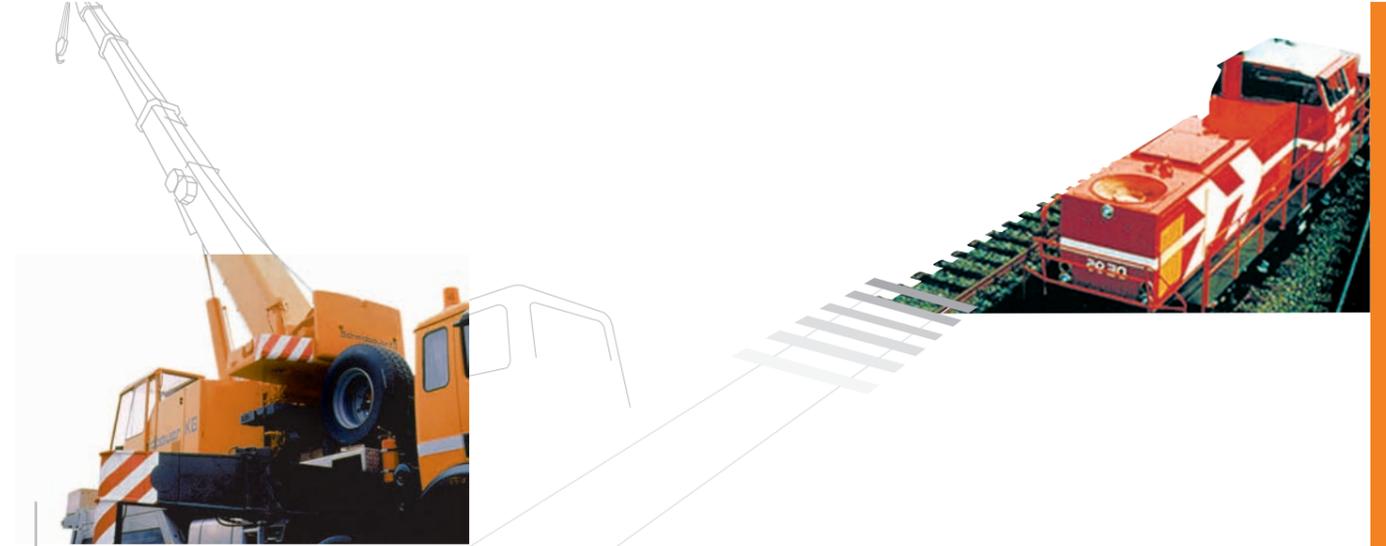
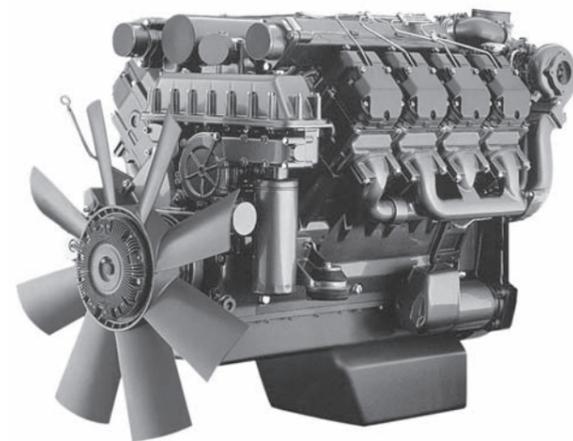
### HEINZMANN – trusted for over 100 years

Ever since the company was founded in 1897, we have made major contributions to progress in the field of speed governors. From mechanical versions, all the way to state-of-the-art digital control systems.

A decade ago, HEINZMANN achieved its goal to be a system provider for digital generator management, dual fuel control solutions, gas engine management, turbine control solutions and hybrid technology. And, as we want to offer our customers all solutions from one source, we developed complete common rail equipment as well as for small-, medium-sized or large-bore engines.

Our complete systems for engine emission management include exhaust gas recirculation, active diesel particulate filter regeneration and wastegate. The latest milestones are safety systems for oil mist detection, arc protection and hydraulic cranking systems.

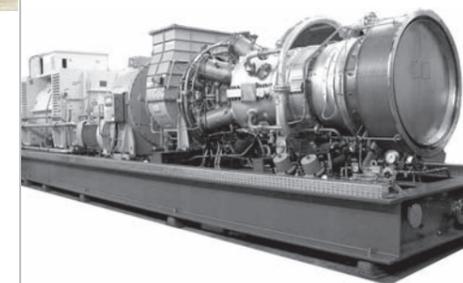
At HEINZMANN innovation is a longstanding tradition and at the same time an obligation for the future.



### HEINZMANN – always one step ahead

Decades of experience, unparalleled innovative drive and an outstanding price/performance ratio make HEINZMANN a highly respected and dependable partner. We have branches, representatives and authorised dealers in nearly 30 countries around the globe. Proximity to the customer is our strength – a strength we shall further expand in the years to come.

Our latest breakthrough: HEINZMANN is the first manufacturer offering hybrid technology for off-road vehicles driven by diesel, gaseous fuel or gasoline engines.





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***HEINZMANN – custom made solutions***

