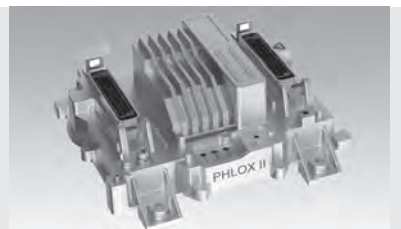
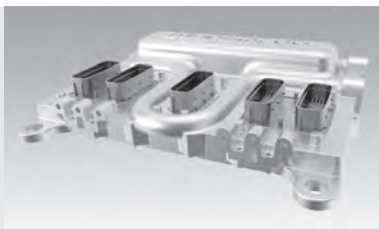
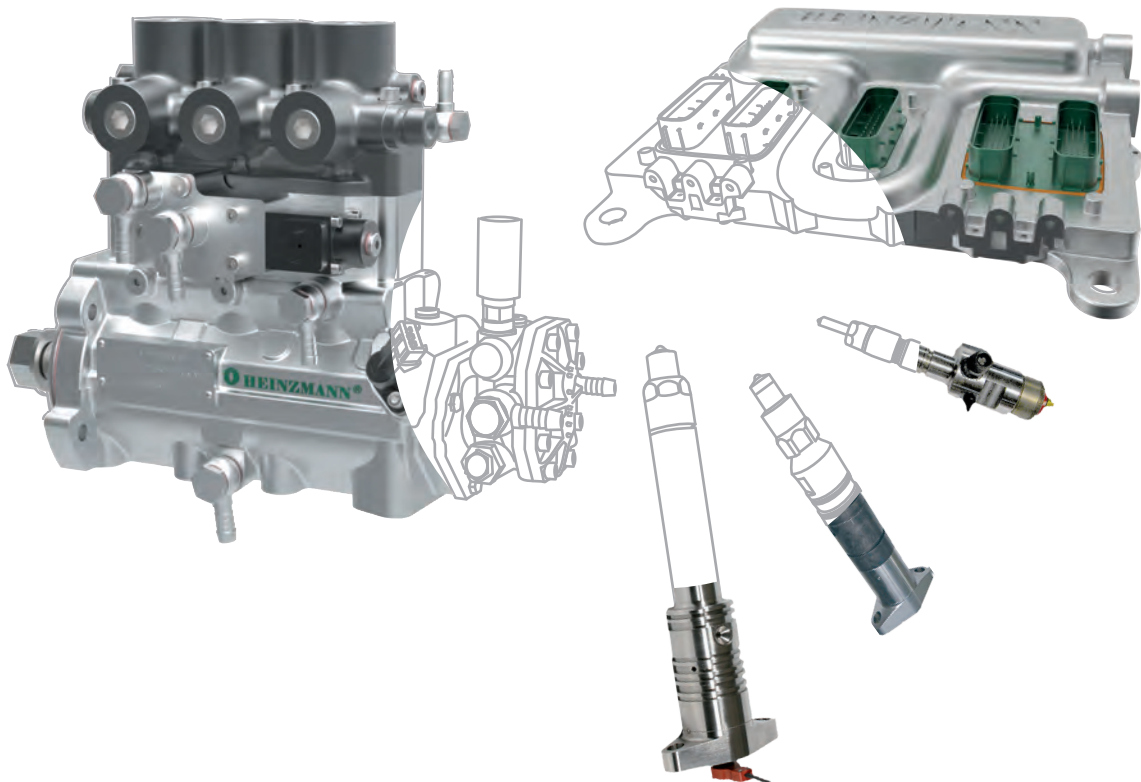




# PRODUCT GUIDE

## Engine & Turbine Management



# HEINZMANN

## Engine & Turbine Management

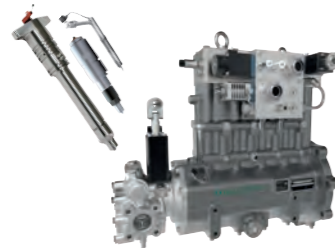
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**Engine & turbine management is our core business. Precise speed governors ensure that energy is used in the most economical way by internal combustion engines and turbines.**

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 product range by electrohydraulic actuators and governors of the highest quality. In 2011, the integration of DATA PROCESS followed; adding naval alarm, control and monitoring systems to the HEINZMANN portfolio. In October 2013 HEINZMANN acquired CPK Automotive, a specialist for engine emission control & monitoring systems. With the acquisition of HEINZMANN Australia (former Dawson Technology) in 2014 the group is adding expertise to the turbine management range.

**HEINZMANN – clean engine technology**

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## DARDANOS

### Electronic Fuel Injection (EFI) Control Systems

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

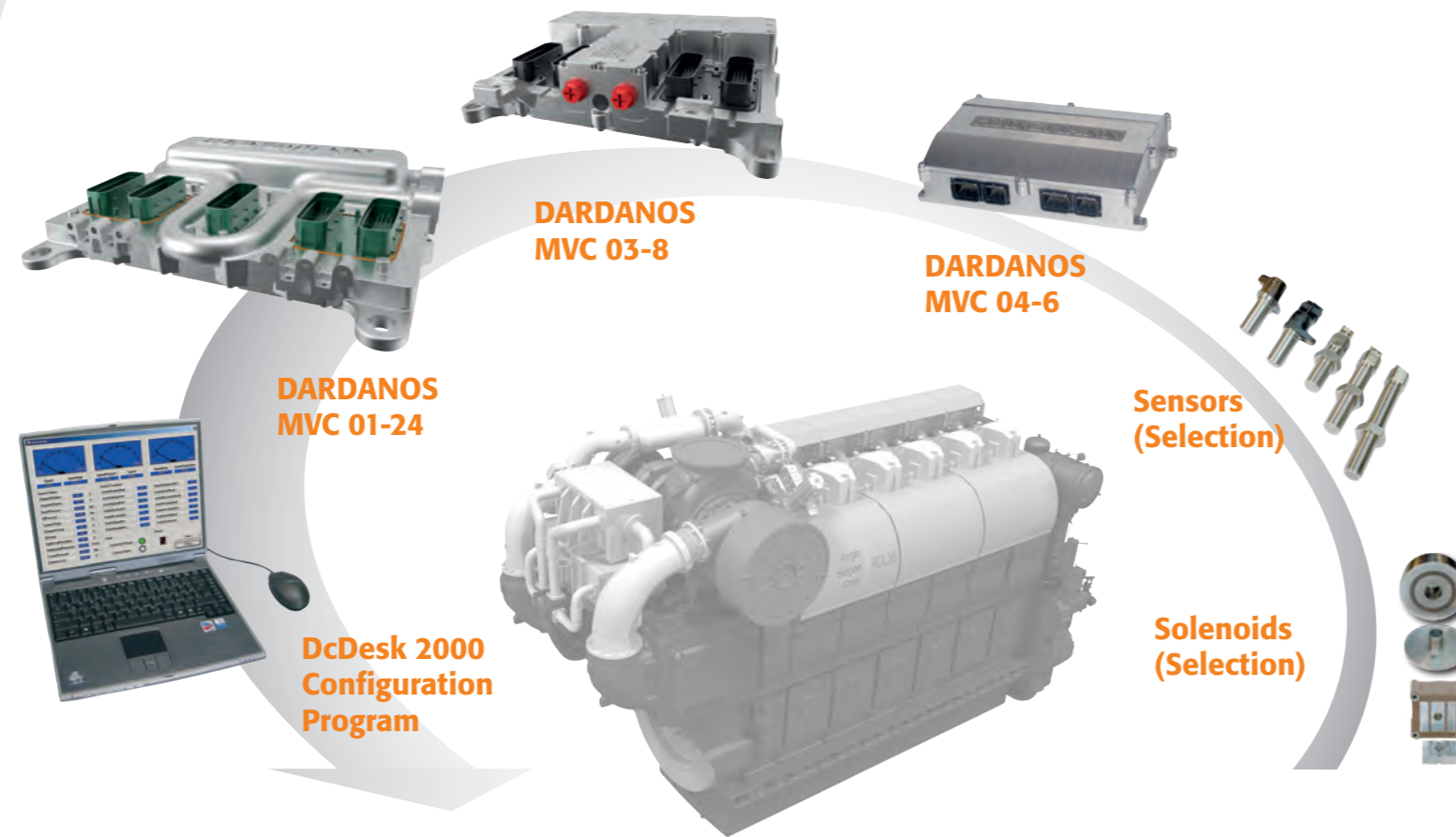
In addition to their primary purpose of speed control, these controllers provide features that offer other benefits for your diesel engines like optimised fuel efficiency, increase of engine power, less pollutant emissions and reduced smoke. Thus electronic fuel injection helps in an essential way to comply emission laws.

Besides that they can perform monitoring tasks and enhance engine reliability.



The systems are designed to fulfil a wide range of applications. Therefore, HEINZMANN offers devices for engines with different numbers of cylinders and modified housing. A choice of HEINZMANN sensors and solenoids completes the systems.

The DARDANOS system components are an essential part of HEINZMANN's complete common rail solution ODYSSEUS.



### DARDANOS series Electronic fuel injection controls

#### DARDANOS MVC 01-24

for up to 24 cylinders

#### DARDANOS MVC 03-8

for up to 8 cylinders

#### DARDANOS MVC 04-6

for up to 6 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

### General functions

- ➔ Up to three independent CAN bus lines (various protocols)
- ➔ Communication software DcDesk 2000 for monitoring & adjustment

### System Benefits

- ✓ Precise injection control
- ✓ Application-tailored configurability
- ✓ For diesel, gas & dual fuel engines
- ✓ Compatible with various fuel injection systems
- ✓ Full functional redundancy capability

### 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 seven injections per cylinder
- ➔ Cylinder faults monitoring
- ➔ Solenoid click test (tool for wiring check)

### 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.

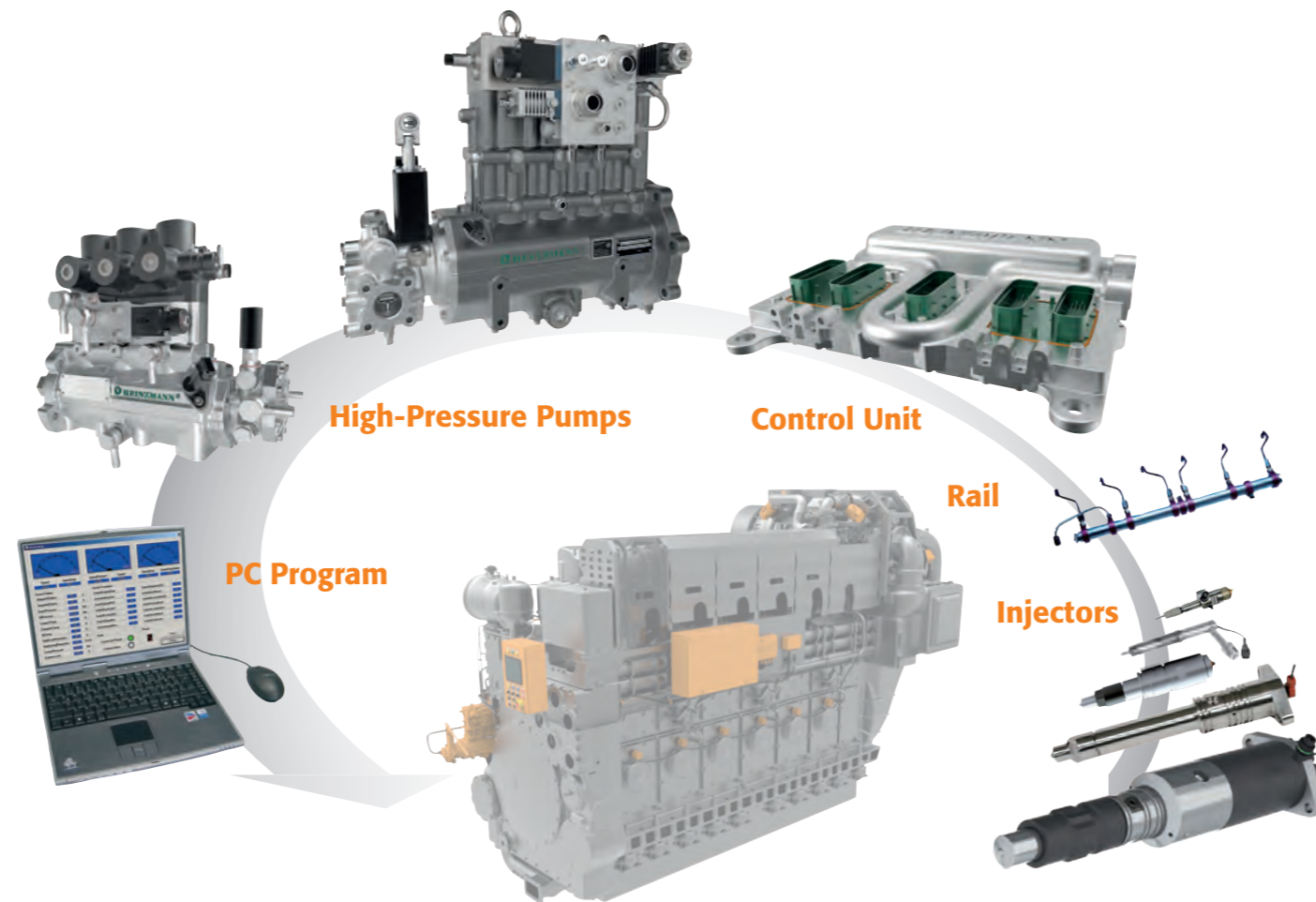
## ODYSSEUS

### Common Rail (CR) System

HEINZMANN offers the ODYSSEUS Common Rail Fuel Injection System including complete fuel injection equipment (high-pressure pumps, injectors, accumulators, high-pressure piping, safety valves).

The product range of ODYSSEUS hydraulic high-pressure components covers engine power outputs from 150 up to 10,000 kW and more for different engine sizes, applications and fuel qualities.

The 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.

HEINZMANN experts assist customers in complete common rail start-up and support for combustion optimisation. Comprehensive system training completes the package.

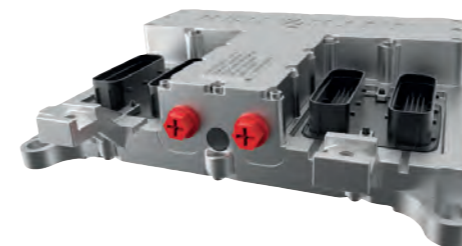
### ODYSSEUS

- ➔ Permanently high fuel system pressures at any engine speed/load point for optimised fuel vapourisation 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 24 cylinders
- ➔ Safe and compact rail, piping
- ➔ Cable harness adapted to motor
- ➔ Support of design process and reliability approach by using SolidWorks®\* Simulation Professional & Flow Simulation
- ➔ Hydraulic system optimisation using AMESim®\* and ANSYS\* simulation software
- ➔ Applicable for micro pilot common rail fuel injection for gas engines

### ODYSSEUS control units

The ODYSSEUS control system is based upon the reliable and proven EFI control system DARDANOS including all belonging sensors and solenoids.

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 2,200 bar
- ✓ Various sizes of injectors and pumps
- ✓ All components from one supplier
- ✓ Applicable for diesel fuels and heavy fuel oil

### ODYSSEUS HDP-K series

The HEINZMANN HDP-K high-pressure pump family consists of three basic sizes: HDP-K2, HDP-K3 and HDP-K4. They all stand out due to

- ➔ Unique crank mechanism design
- ➔ Good serviceability
- ➔ Robust design, rated for long endurance
- ➔ Flow control valve with HEINZMANN solenoid (actuated via DARDANOS ECU)
- ➔ With or without pre-feed pump
- ➔ Engine oil lubricated

#### HDP-K2

- ➔ 2 pressure elements
- ➔ System pressures up to 2,200 bar
- ➔ Versions with 6, 8, 10 & 12 mm stroke
- ➔ Plunger diameter: Ø 8 mm
- ➔ Pump speed up to 2,400 rpm
- ➔ Delivery rates up to 2.5 l/min
- ➔ Flange mounted



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

### HDP-K3



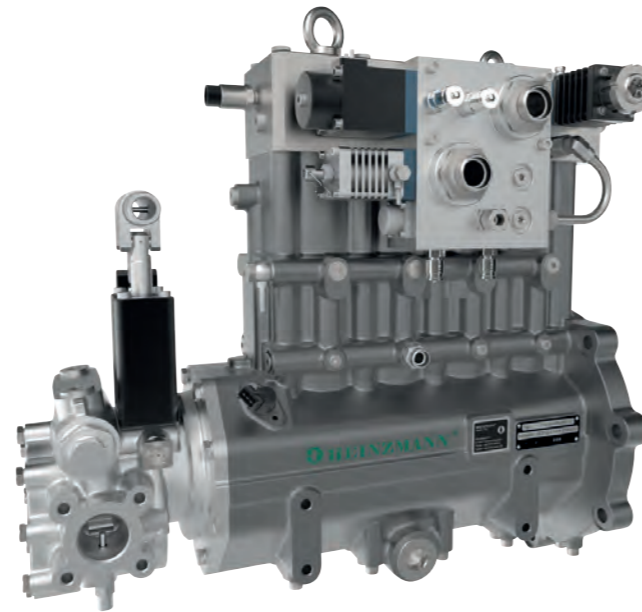
- 3 pressure elements
- System pressures up to 2,200 bar
- Versions with 12 & 16 mm stroke
- Plunger diameter: Ø 10, Ø 12, Ø 14 mm
- Pump speed up to 3,000 rpm (12 mm stroke)
- Delivery rates up to 15 l/min (1 x pump; redundant concept: 2 x pump up to 30 l/min)
- Easy adaptable (flange or socket version)

### HDP-K3 HFO



- 3 pressure elements
- System pressures up to 2,200 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)
- Special two-way HFO/lube-oil sealing concept
- Mix oil drain
- Special design for high-temperature operation (HFO)

### HDP-K4 HFO



- 4 pressure elements
- System pressures up to 2,400 bar
- Designed for HFO operation
- Delivery rates up to 65 l/min (1 x pump; redundant concept: 2 x pump up to 130 l/min)
- Special two-way HFO/lube-oil sealing concept
- Mix oil drain
- Special design for high-temperature operation (HFO)

## ODYSSEUS injectors

With its ODYSSEUS ICR-DS series, HEINZMANN has developed a completely new injector generation that reduce fuel backflow by impressive 75 % (compared to conventional common rail injectors) and lower fuel backflow temperatures at the same time.

The electronically controlled injectors are actuated by HEINZMANN solenoid technology with strong magnetic force, fast response time and compact size.

### ODYSSEUS ICR-DS-50

- For engines with cylinder power up to 50 kW
- Small-sized common rail injector for injection pressures up to 2,000 bar and injection quantities in a range of 2...200 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 2,200 bar and injection quantities in a range of 10...500 mm<sup>3</sup>/shot
- Designed for distillate diesel fuels



### ODYSSEUS ICR-DS-200

- For engines with cylinder power up to 200 kW
- Medium-sized common rail injector for injection pressures up to 2,200 bar and injection quantities in a range of 50...2,200 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 2,200 bar and injection quantities in a range of 50...4,000 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 2,200 bar and injection quantities in a range of 70...7,000 mm<sup>3</sup>/shot
- Designed for distillate diesel fuels and heavy fuel oil (HFO)
- Cooled nozzle



### ODYSSEUS ICR-DS-1000

- For engines with cylinder power up to 1,250 kW
- Large sized common rail injector for injection pressure up to 2,400 bar and injection quantities in a range of 150...14,000 mm<sup>3</sup>/shot
- Designed for distillate diesel fuels and heavy fuel oil (HFO)
- Cooled nozzle
- Sealed and cooled control armature separated from fuel line
- Accumulator volume integrated, no rail accumulator required
- Built in flow limiter
- High multi-injection accuracy



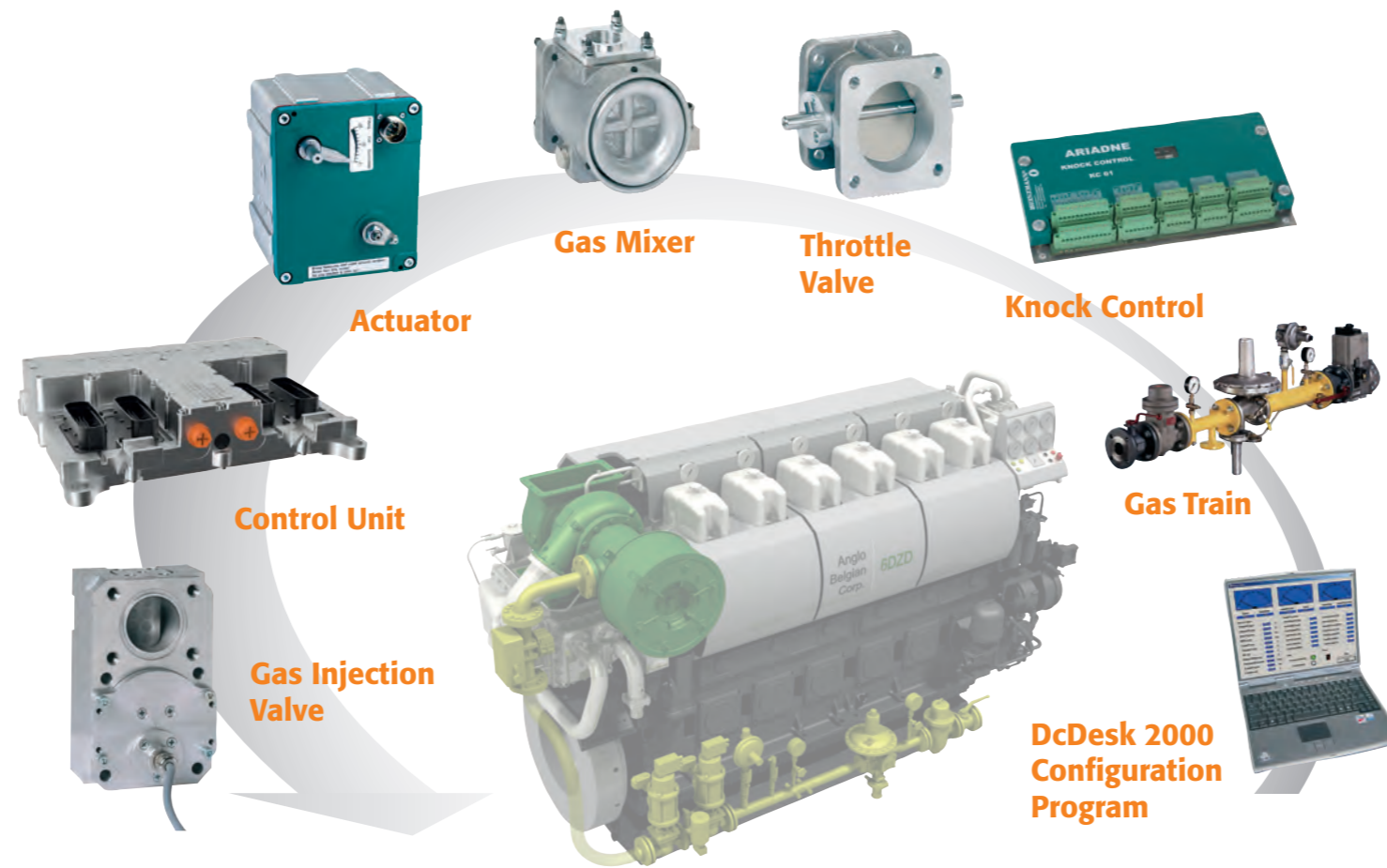
## ARTEMIS

### 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 use of cheaper gaseous fuel instead of diesel hence delivering maximal operational cost savings. At the same time, emissions are reduced notably, ensuring the compliance with future emission regulations.

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

Dual fuel combustion ensures the continuous operation of the engine, even if no gas is available and the engine is running



### System Benefits

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



on pure diesel. As a result, performance can be maintained optimal under all 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 gas mode.

### Available features

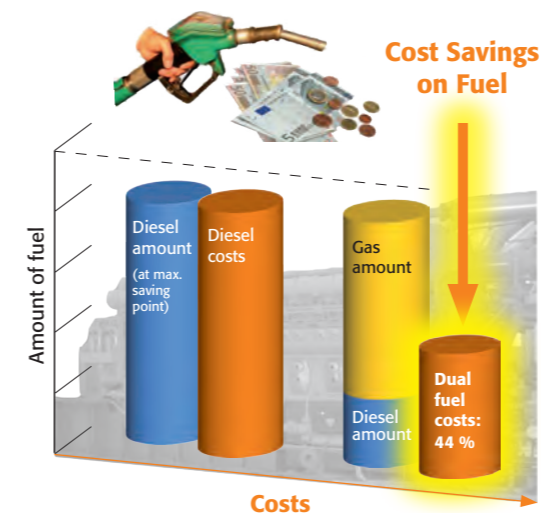
- ➔ Applicable for diesel engines to be converted into dual/pilot fuel engines
- ➔ Separate governor settings for diesel, gas and transfer mode
- ➔ Advanced diesel-gas mode transfer sequences
- ➔ Automatic mode selection depending on current conditions
- ➔ Automatic switch to diesel mode operation if gas supply fails

### Optional features

- ➔ Misfire detection
- ➔ Knock control
- ➔ Complete gas train with pressure regulator
- ➔ Generator management

### Cost reduction with dual fuel conversion

**56 % possible savings**  
Assumption: gas price 40 % of diesel fuel price.



### ARTEMIS systems

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

We offer both, full authority and gas control systems. Besides control of gas flow, all ARTEMIS systems limit the maximum exhaust temperature via a temperature sensor for engine protection.

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.

HEINZMANN offers 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 fulfilment of foreseeable future emission regulations. Our one source solution guarantees optimum compatibility and connectivity.

System setup and diagnosis is made via the HEINZMANN communication software DcDesk 2000. HEINZMANN helps finding the tailor-made solution to fit customers individual needs.

## KRONOS

### Gas engine control systems

The KRONOS product range comprises four systems for Air Fuel Ratio (AFR) control as well as speed/load control systems. Customers can be sure to find a solution to meet their 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.

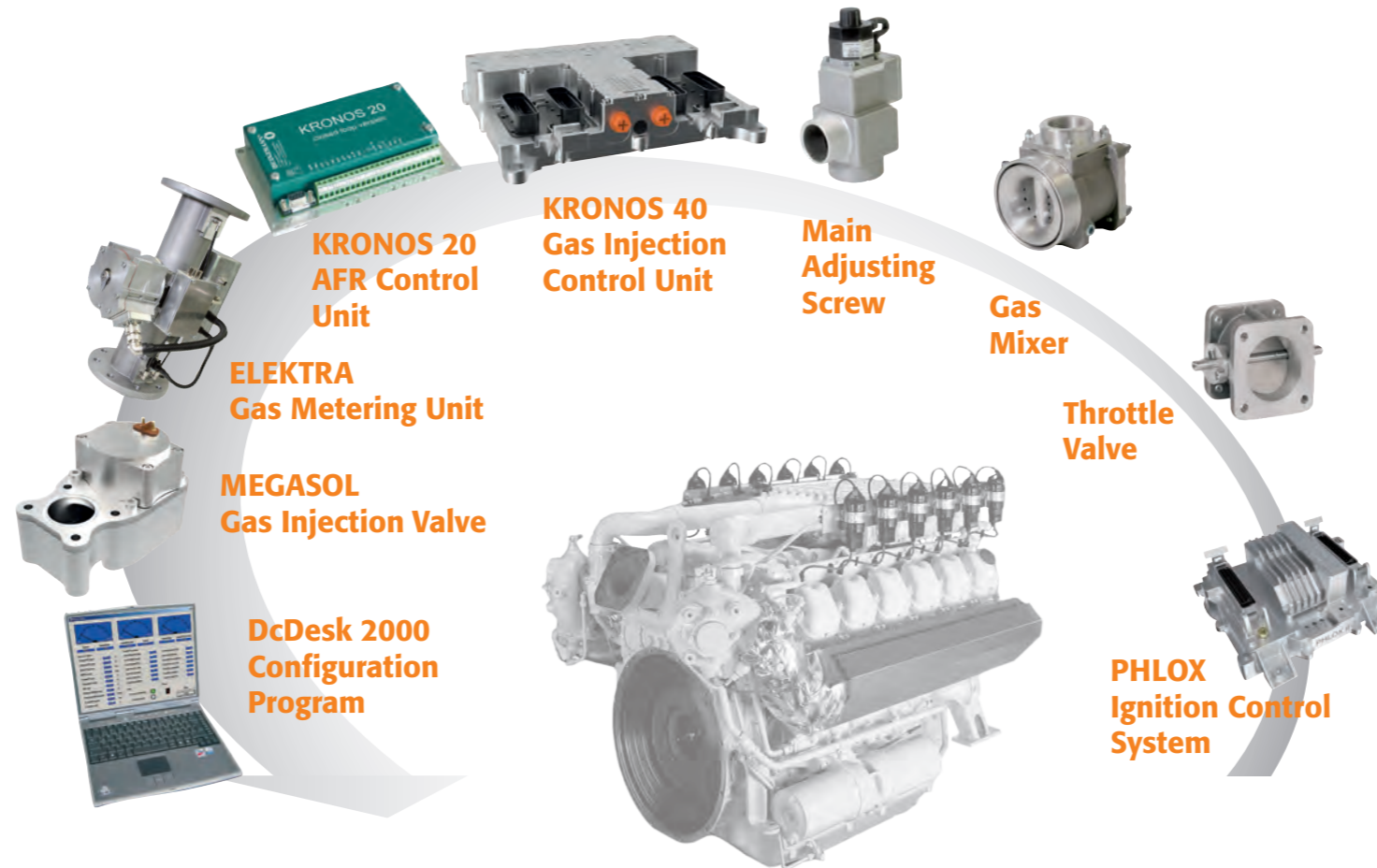
Customer specific adaptations to the basic systems guarantee optimised, economical solutions for OEMs, packagers and retrofit customers. Mechanical parts such as throttle



valves, gas mixers and gas valves are available in all prevalent 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.



### System Benefits

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

### KRONOS features

- ➔ Homogeneous air and gas mixing, low pressure drop, enhanced efficiency
- ➔ KRONOS systems are used for various types of gases such as natural gas, biogases and weak gases like wood gas.
- ➔ System setup and diagnosis are provided 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.

### KRONOS 10 - mechanically controlled

KRONOS 10 is a simple mechanical air fuel ratio 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, long service intervals and minimal maintenance.

### KRONOS 20 - electronically controlled

KRONOS 20 is a progression of KRONOS 10 that represents an electronically controlled AFR trim control system. It 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.

### KRONOS 30 M - full authority

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 - gas injection

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 1 MW 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-combustion 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.

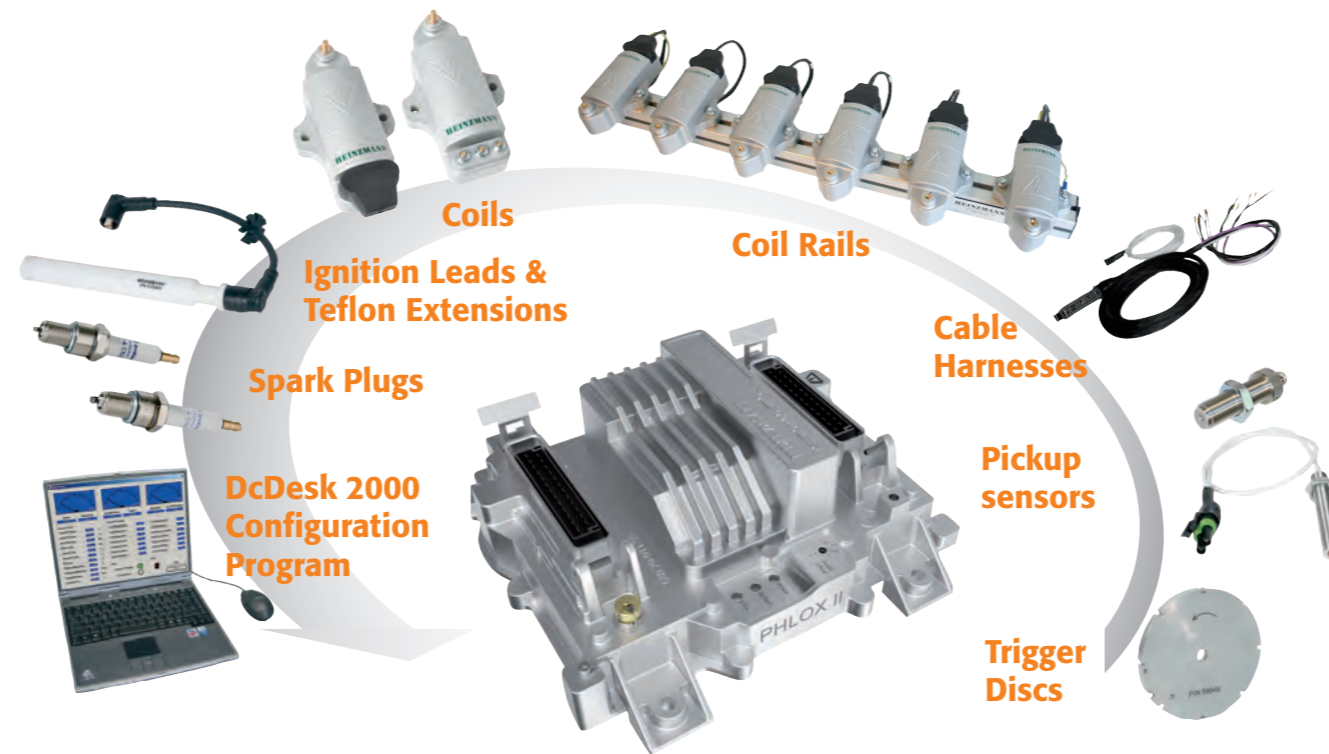
Based on HEINZMANN's many years of experience in the field of gas engine control and monitoring systems, HEINZMANN offers complete solutions tailored for all types of gas engines. All needed components, such as ignition control units, coils, cable harnesses, trigger discs, sensors and spark plugs, are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



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.

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.

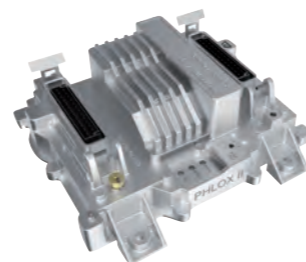


### PHLOX features

- ➔ 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 4 versions up to 8, 12, 16 or 24 cylinders.



### PHLOX pickup sensors

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
- ✓ 32 adjustable levels of ignition energy to reduce spark plug wear
- ✓ 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 primary and secondary 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.





## THESEUS

### Generator management

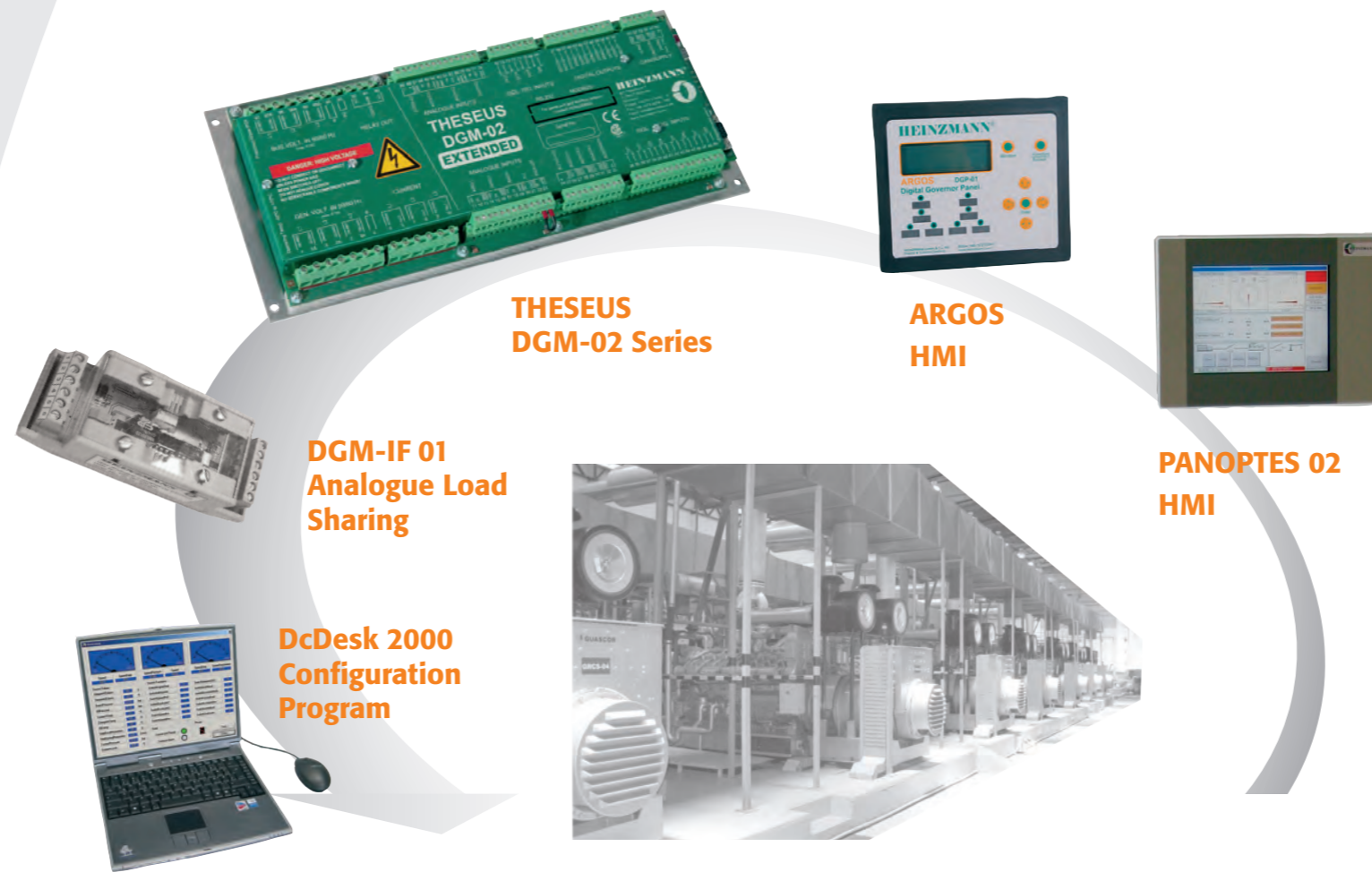
HEINZMANN's digital generator management control unit THESEUS DGM-02 is an all-rounder. Whether in island or mains-parallel operation, single genset or group, there is an appropriate version for every application which, in conjunction with the HMI ARGOS or PANOPTES, provides a comfortable and user-friendly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



### System Benefits

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

#### PANOPTES 02 Touchscreen

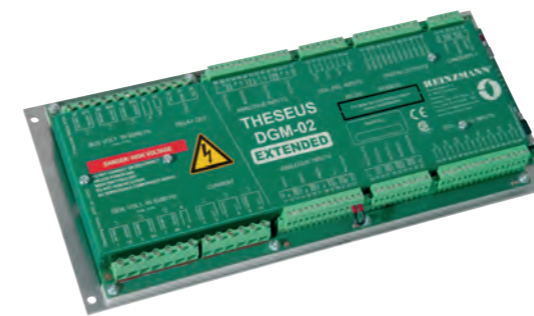
- Operating through touch screen
- CAN connection to DGM-02
- Generator/mains breaker status
- Generator and engine monitoring
- Alarm display and logging
- Modbus connection to external PLC/SCADA
- Interfaces: Ethernet, RS485, CAN
- Two sizes: 5.7 and 10.4 inch

#### 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 management

- Synchronising
- kW power control
- kW/kVAr load sharing
- Voltage-matching
- PF control
- Genset protection and monitoring
- Automatic sequencing
- CAN, Modbus or SAE J1939 communication
- Real time alarm/data log options
- Integrated speed governor accessories
- PC based configuration tool
- Interface with existing analogue load sharing
- Different HMIs



THESEUS DGM-02

## OLYMPUS G

### Gas turbine control systems

OLYMPUS products and services are offered 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.

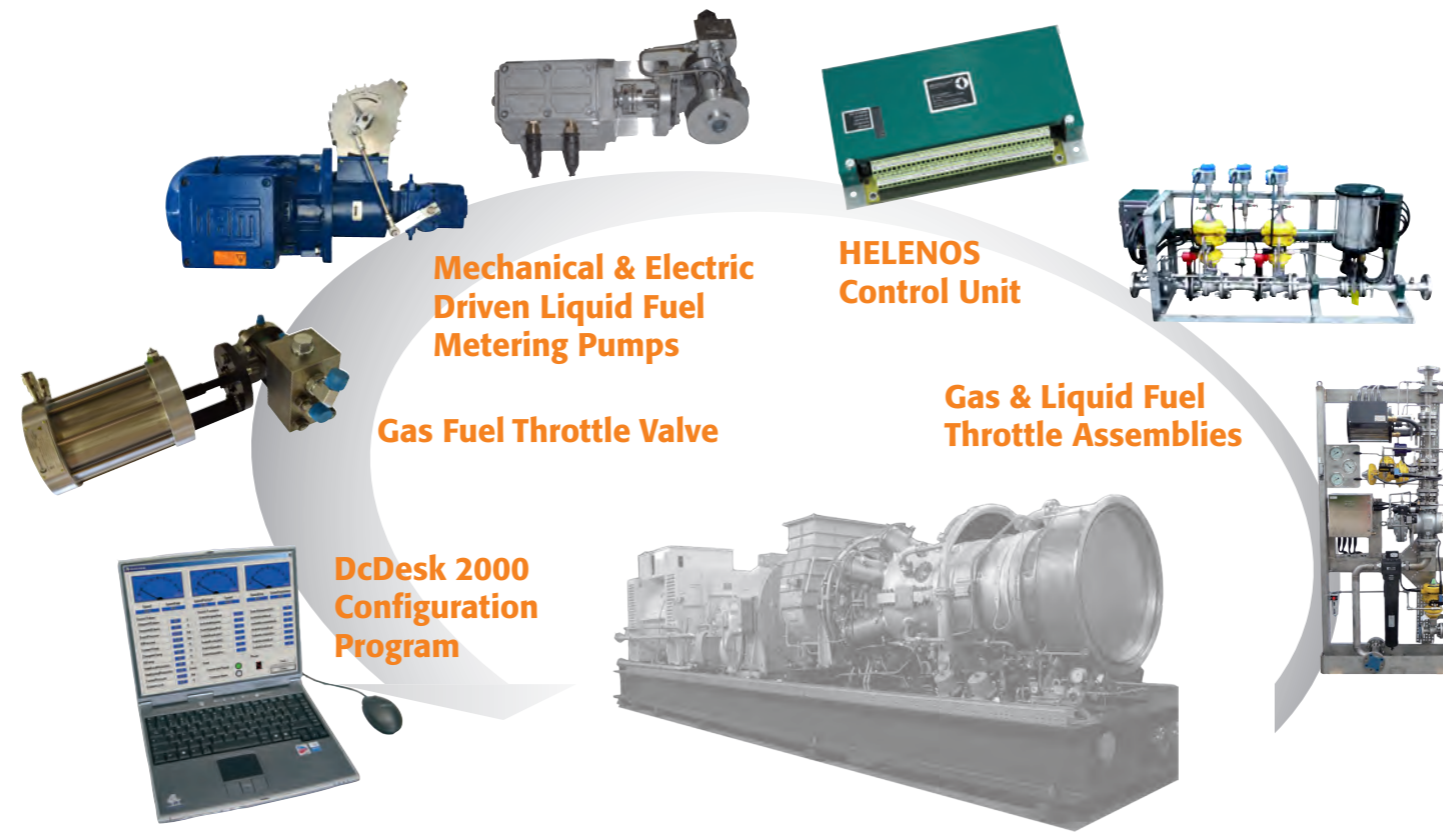
This allows to offer a high level of functional and design commonality between applications and to omit special purpose parts. This impacts very favourably on familiarisation and operational costs for turbine owners.



Our systems all work with HEINZMANN actuators and 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 servo valve 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
- Adapted to fuel and turbine by user software parameter adjustment
- Gas throttle compensates 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 & 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 can be considered
- 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 digital control systems
- 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 control systems

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 both simple speed and load control applications and complex multi-stage steam extraction applications through configuration and extension. HEINZMANN's range of electric actuators matches 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 control systems

For water turbines, HEINZMANN can offer OEM or retrofit upgrade systems to control any size and type of 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 solutions

- For single and extraction turbines
- 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 solutions

- 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

## Si-TEC

### Steam turbine controls

HEINZMANN Australia is a steam turbine control specialist and member of the HEINZMANN Group since 2014 adding their expertise to the group's turbine management product range.

After decades of distributing and servicing HEINZMANN control systems in 1994 HEINZMANN Australia developed their own range of digital turbine speed governor systems called Si-TEC (Smart Integrated Turbine Engine Control).

The Si-TEC system was developed and produced in-house. The microprocessor based controls combine an electronic governor with multiple PID functions,



synchroniser, load sharer for control of kW and automatic voltage regulator trimming signal for control of kVAR. This product range covers island and grid-parallel applications for both reciprocating engines and steam turbines.

Together with steam turbine control solutions HEINZMANN Australia also develops, produces and provides grid parallel controls, hydraulic actuators and control accessories.

Coupled with any sale of a Si-TEC Xtend product, HEINZMANN Australia deliver professional engineering and commissioning services support.



### Steam turbine control solution

The Si-TEC Xtend series of digital governor systems include:

#### ADC Advanced Digital Governor

Governor for steam turbine mechanical drive applications (i.e. pumps, compressors, fans, shredders, etc.). Utilised for constant and variable speed "Single Drive" application, and for "Dual Drive" (tandem) mechanical load sharing application.



#### CGC Co-Generation Control

Digital governing and load control module for either backpressure or condensing steam turbine generator applications. Also including single extraction or admission turbine generators. The digital governor function is integrated with generator control functions (i.e. synchronising, kW load control, kVAR/PF control, process, etc.) for improved control response and reliability.

### Grid-parallel controls

Control for grid-paralleled and islanded power generation applications. Includes auto synchronising, import/export, kW & kVAR control, grid Volt control, as well as kVA limiting and grid fault detection.



### Hydraulic actuators

Hydraulic amplifiers for large steam turbine control valve actuation/positioning. This may be via mechanical input (i.e. with electric actuator) or electrical input (i.e. with "In-Built" electro-hydraulic actuator).



### System Benefits

- ✓ Smart automatic turbine start sequence
- ✓ Wide range of PIDs for precise governing and generator control
- ✓ Basic to complex power generation applications
- ✓ Over 4000 systems in operation globally
- ✓ User-friendly tuning and diagnostic software
- ✓ Optimum and reliable electro-hydraulic actuators/amplifiers

### Control accessories

Accessories including: OPAL Annunciators, for remote display, along with independent electrical overspeed protection & turbine monitoring, further temperature scanners, remote I/O, MPU expanders, advanced software for diagnostics and monitoring.



### Application areas

- Power generation
- Co-generation
- Island stations
- Standby power
- Sugar industry
- Paper industry
- Petro chemical
- Mining
- Oil & gas
- Shipping

## TRITON OMD

### Oil Mist Detection

The advanced HEINZMANN oil mist detection system is especially designed to meet the requirements of large diesel engines, like ship or power plant engines.

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. Therefore these systems are made mandatory by the IACS for vessel engines exceeding a certain size.

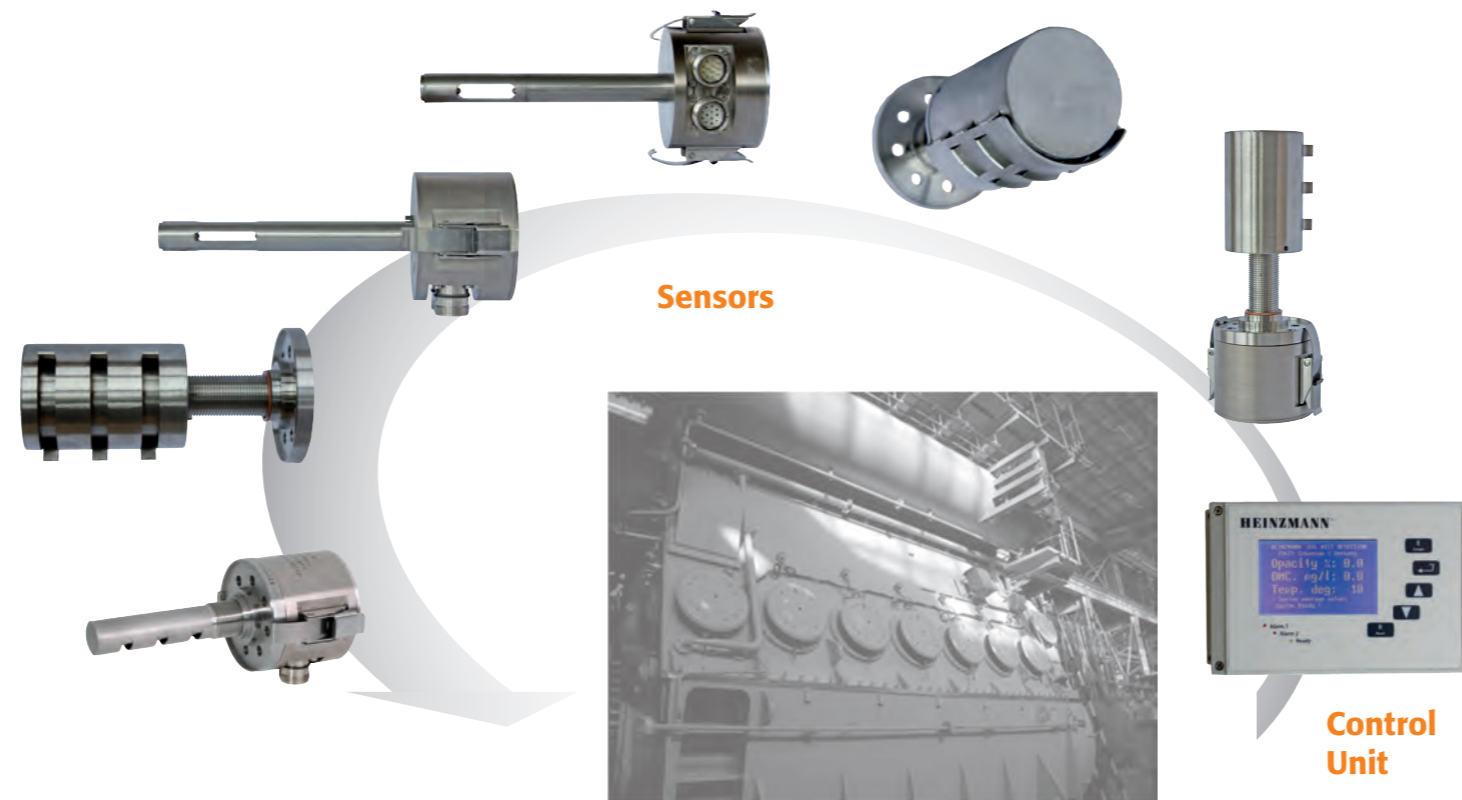
Oil mist concentration of 50 mg/l and higher is sufficient



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 protects the operating personnel and helps to prevent from severe engine damages



### TRITON OMD features

- ➔ Pipeless and suction free: direct detection inside crankcase
- ➔ Continuous online 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
- ➔ No moving parts
- ➔ Sensor replacement is possible at any time
- ➔ Minimising engine maintenance and service costs
- ➔ For diesel, gas and dual fuel engines
- ➔ 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 %.



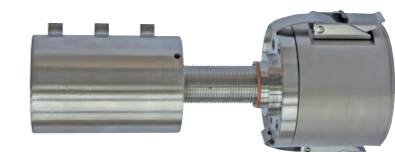
### System Benefits

- ✓ **Protection from damage and explosion**
- ✓ **Pipeless and suction free: direct detection**
- ✓ **Marine-classified through GL, LR, CCS and RMRS**
- ✓ **ATEX version available**

### 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 CPM

### Cylinder Pressure Monitoring

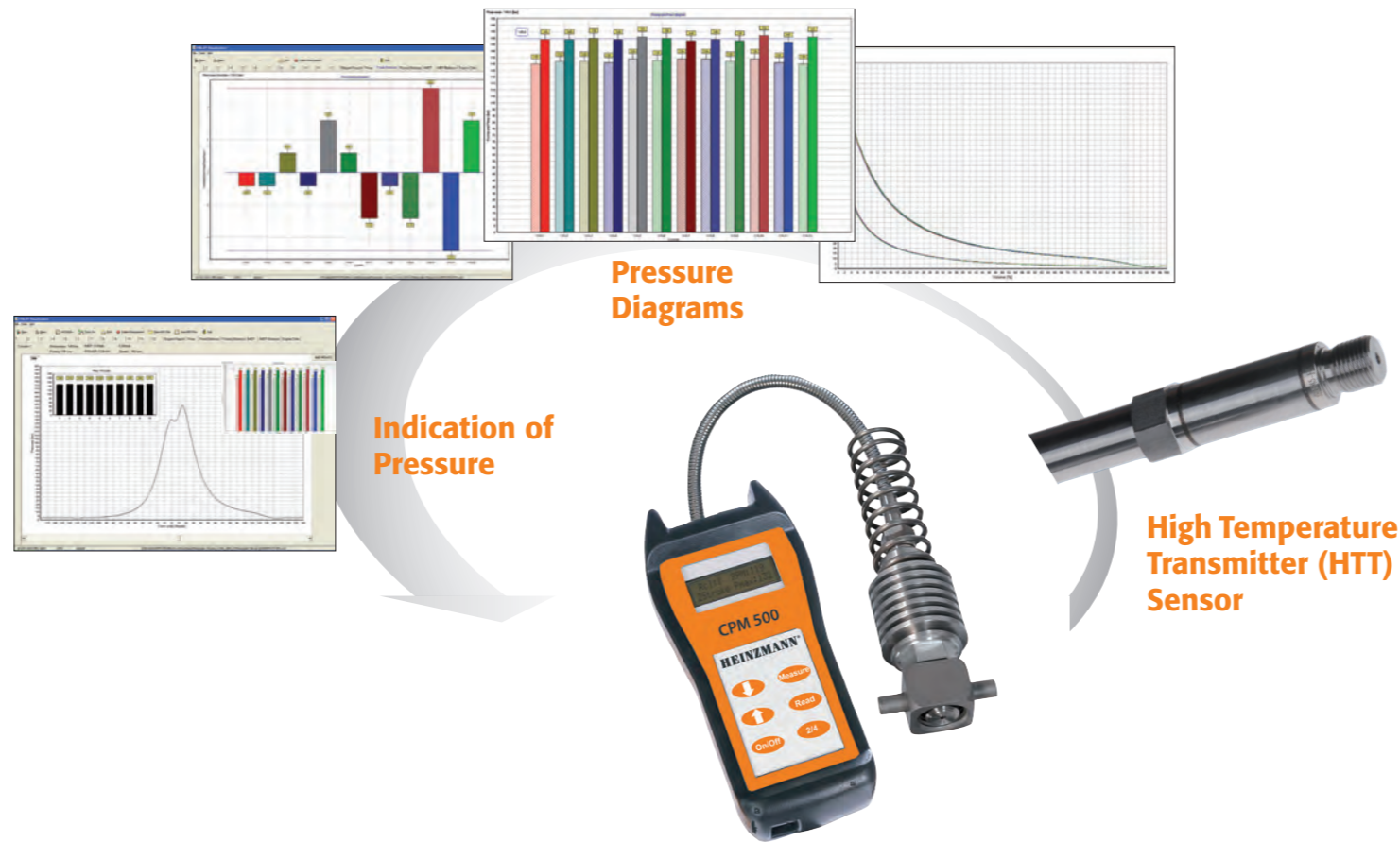
The proven advantage of the electronic TRITON CPM 500 compared to mechanical engine indicators is a considerably simpler and far more accurate operation.

After acquisition, recorded data can be downloaded right away to a PC or notebook via USB and processed through HEINZMANN's software. Transmitted by telephone or internet, information becomes available for expert analysis and condition monitoring at any remote location. An optional software extension allows power calculation for



every cylinder to assist cylinder balancing.

Designed for periodic monitoring of cylinder pressure on diesel engines, the electronic indicator CPM 500 can record cylinder pressure values on a maximum of 20 cylinders (max. 160 values) on two-stroke diesel engines operating at speeds of 40 to 300 rpm and on four-stroke engines with rated speeds up to 1,000 rpm.



### System Benefits

- ✓ Replaces mechanical indicators on diesel engines
- ✓ Improves combustion
- ✓ Reduces fuel consumption and emissions

#### CPM 500 features

- ➔ Periodic and accurate monitoring of cylinder pressure on diesel engines
- ➔ Accurate, reliable, durable and cost-effective pressure sensor
- ➔ User friendly electronic measuring and recording device
- ➔ Maximum pressure values for up to 20 cylinder
- ➔ USB interface for data downloading
- ➔ Rechargeable battery
- ➔ Software upgrade available
- ➔ Pressure calculation without TDC (Top Dead Centre) encoder system

#### CPM 500

The user friendly CPM 500 is a powerful electronic indication device.

The CPM 500 contains the basic components, handheld data acquisition unit calibrated together with HTT cylinder pressure sensor as well as analysing software.



#### CPM 500 HTT sensor

- ➔ Suitable for high temperatures
- ➔ Designed life expectancy of 16,000 h at 1,000 rpm
- ➔ Digital electronic with event storing
- ➔ Improved thermodynamic performance

#### CPM 500 visualisation software

There are several different versions of CPM 500 software available.

The basic software calculates  $p_{comp}$  without TDC position marking. The enhanced version calculates IPOWER and IMEP using a mathematical algorithm.

The most advanced CPM 500 software which is available monitors a maximum of 160 measurements on different load cycles with or without a connection to a TDC encoder system.

## TRITON BTM

### Bearing Temperature Monitoring

One of the most common causes of downtimes in modern low and medium-speed combustion engines is the failure of the main or connecting rod bearing.

In the monitoring systems sector, HEINZMANN constantly strives to develop solutions for optimising the availability and reliability of engines.

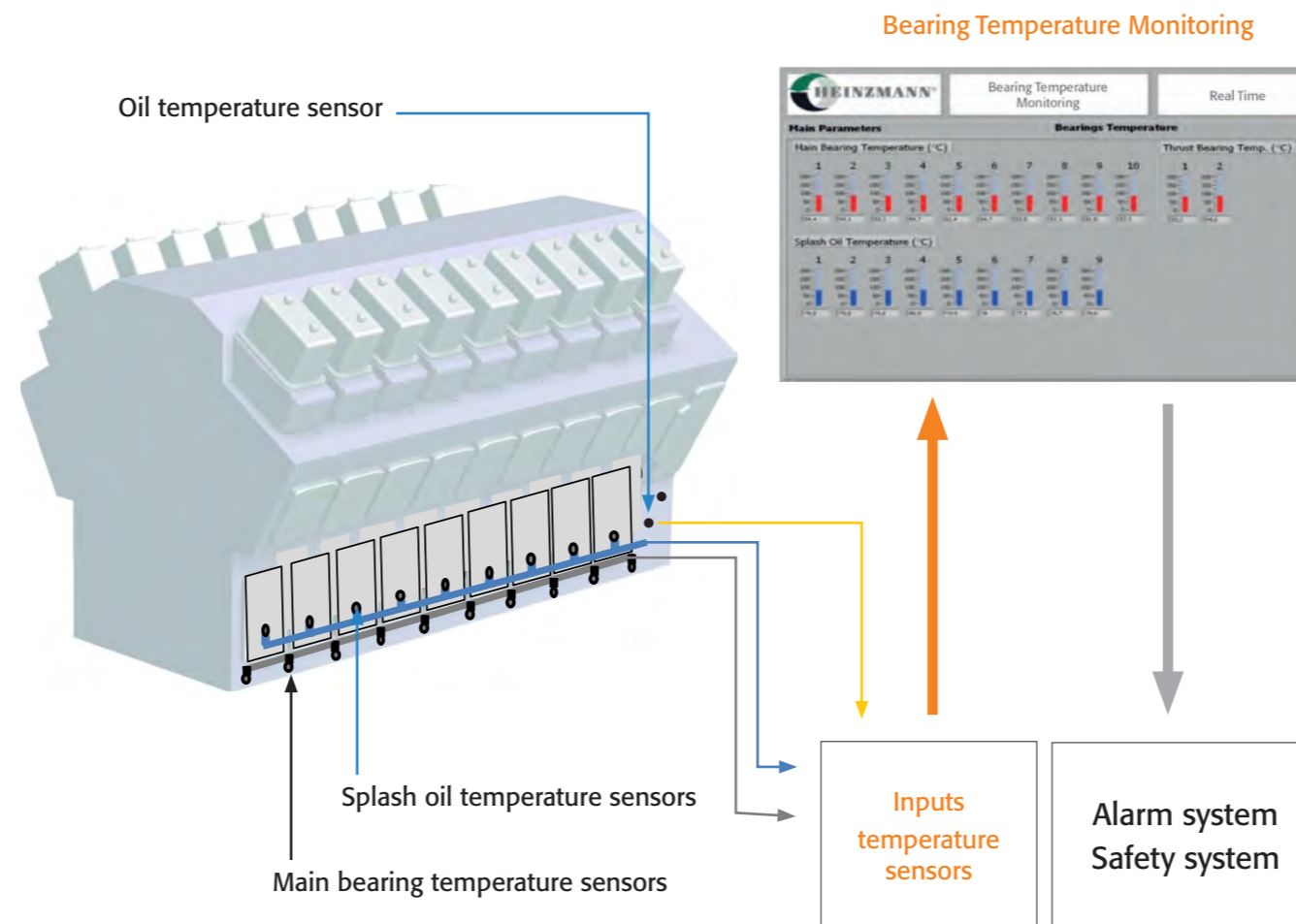
The result of this research is the TRITON BTM system, which makes an important contribution to preventing damage and ensuring high availability.



The BTM system is very stable and helps to monitor, optimise and protect the engine.

In addition to monitoring all the relevant bearing temperatures, the system indirectly supervises the thermal load of the cylinders via splash oil monitoring. This ensures a quick reaction in order to avoid damaging the engine.

Applications are all combustions engines like diesel, gas and dual fuel engines and compressors.



### TRITON BTM features

- Individual display of current main bearing temperature and lubrication oil temperature in the crankcase for each cylinder
- Bearing failure detection
- Engine shut down before serious damage occurs
- Non redundant or redundant version (double thermo element)
- Stand-alone system or fully integrated in the existing safety and alarm system
- Including main bearing monitoring or add-on system to an oil mist detection monitoring system
- Together with main bearing monitoring it can be used as an crankcase monitoring system following the rules of all major classification societies
- Applicable for detection of piston seizure



### System Benefits

- ✓ **Early prediction of severe damages**
- ✓ **Easy installation without modifying major engine parts**
- ✓ **Fast reaction time to avoid major damages**
- ✓ **Simple principle without interference**
- ✓ **High measuring accuracy**
- ✓ **Maintenance-free**
- ✓ **Retrofittable**

### TRITON BTM principle

- Direct measurement of main bearing temperature
- Direct indication of splash oil temperature In crankcase cover
- Measuring of the lubrication oil temperature of each connecting rod bearing
- Building the temperature average
- Calculating temperature deviation for each compartment
- Alarm or shut down depending on degree of deviation



TRITON BTM control unit IP6K/9K

## TRITON BMS

### Bearing Monitoring System

TRITON BMS is one of the most advanced and revolutionary monitoring systems available on the market.

It's applicable to diesel engines, pumps and turbines - where it is possible to measure electrical signals between a rotating shaft and its bearings.

The BMS is able to monitor the condition of sliding bearings and sliding surfaces. Thus, it helps to diagnose failures in those moving parts at early stages, preventing the engine from serious damages.

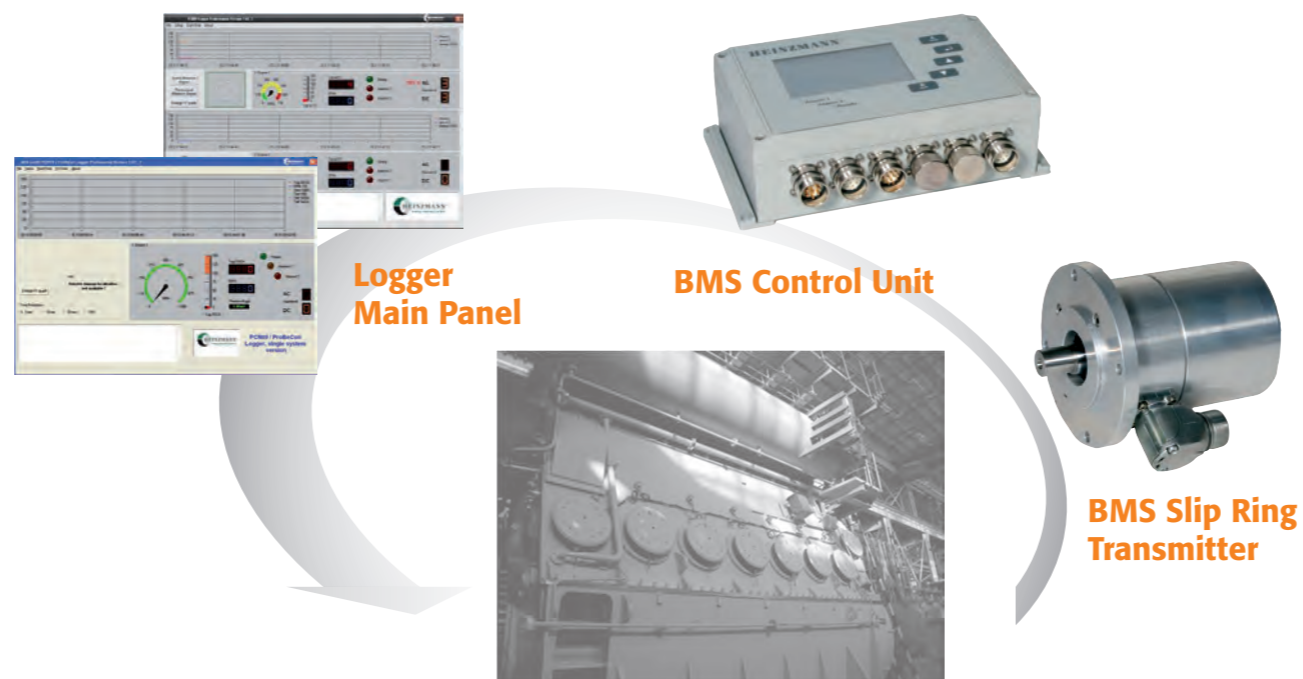
These damages to bearings can be caused by metal particles within the bearing clearance, low oil pressure, overheated oil, etc..



The result of such malfunctions is a breaking oil film between the sliding parts. As soon the oil film no longer separates the moving parts a thermo voltage occurs due to the friction between the different metallic alloys.

The basic principle of the system is to measure this thermo voltage. The location of failing oil film is determined by the measured thermo voltage, the incremental encoder signal and firing sequence.

This information proved to be essential in engine diagnostics, making BMS an extremely successful tool in reducing engine maintenance costs.



### System Benefits

- ✓ **Easy installation**
- ✓ **Optimised engine availability and reliability**
- ✓ **Early and reliable detection of bearing anomalies**
- ✓ **No unnecessary bearing inspections**
- ✓ **Maintenance-free**

### TRITON BMS features

- ➔ Installation on free end of the crankshaft
- ➔ Online and continuous monitoring
- ➔ Localisation of damage inside the engine
- ➔ Communication via Modbus and CAN bus
- ➔ Minimising engine maintenance and service costs

### BMS control unit

The control unit analyses the measured data continuously, displays the data on the LCD and triggers the alarm relays in case of thermo voltage.

- ➔ Power supply 24 VDC
- ➔ Ambient temperature 0 - 70 °C
- ➔ Shock, water, dust and EMC resistant design due to enclosing aluminium case
- ➔ Protection class IP67



BMS control unit

### BMS slip ring transmitter

The Slip Ring Transmitter (SRT) is identical for all engines.

- ➔ Receiving the thermo voltage signal in relation to the crankshaft rotation
- ➔ Redundant carbon brushes



BMS slip ring transmitter

### BMS logger software

The logger software is used to store, display and analyse collected data.

- ➔ Firmware updates available
- ➔ Data storage of up to six connected systems



## REGULATEURS EUROPA

### Control & monitoring systems

The HEINZMANN subsidiary REGULATEURS EUROPA (RE) provides control and governing solutions to engine builders and users worldwide. The longstanding expertise with prime movers can be seen in the products and services that it now offers.

RE customers benefit from the outstanding professional competence and in-depth knowledge of engineering of the RE experts.

Thus we are in the unique position to offer either standard or customised control, monitoring and power management solutions for engine builders and



users. Therefore we also offer individual designs for special applications.

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

Overhauls and retrofit service for governors and control systems round of our portfolio.

### Marine systems

REGULATEURS EUROPA has a range of standard solutions for control, monitoring and safety systems for commercial and military vessels. 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 independence that is necessary for safe operation.

Systems may be for new vessels or to upgrade existing installations.



### 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 60 years' experience of controlling rail traction engines including the generator load. Modern digital controls optimise operation and to communicate with the locomotive systems via serial links. Additionally 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 & retrofits

REGULATEURS EUROPA can offer overhauls of governors and control systems or complete 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 spare-parts service.



### 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 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.

ICENI distributed I/O is installed in military marine, industrial and nuclear installations.

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



# HEINZMANN DATA PROCESS

## Automation systems

The Norwegian company HEINZMANN DATA PROCESS is part of the HEINZMANN Group since 2011. Their automations systems for vessels are an ideal complement to the existing products of the HEINZMANN Group, thus enabling the company to further expand in the maritime market as a complete system provider offering solutions for engine, turbine and generator management.

A reliable provider to both navy and civilian market since 1984, HEINZMANN DATA PROCESS adds three decades of experience in maritime automation to HEINZMANN's portfolio.



Offered solutions range from single alarm systems to inspection and supervision of propulsion and machinery. Besides products and services ship propulsion and power management, overhauls, repairs and engineering services are also offered.

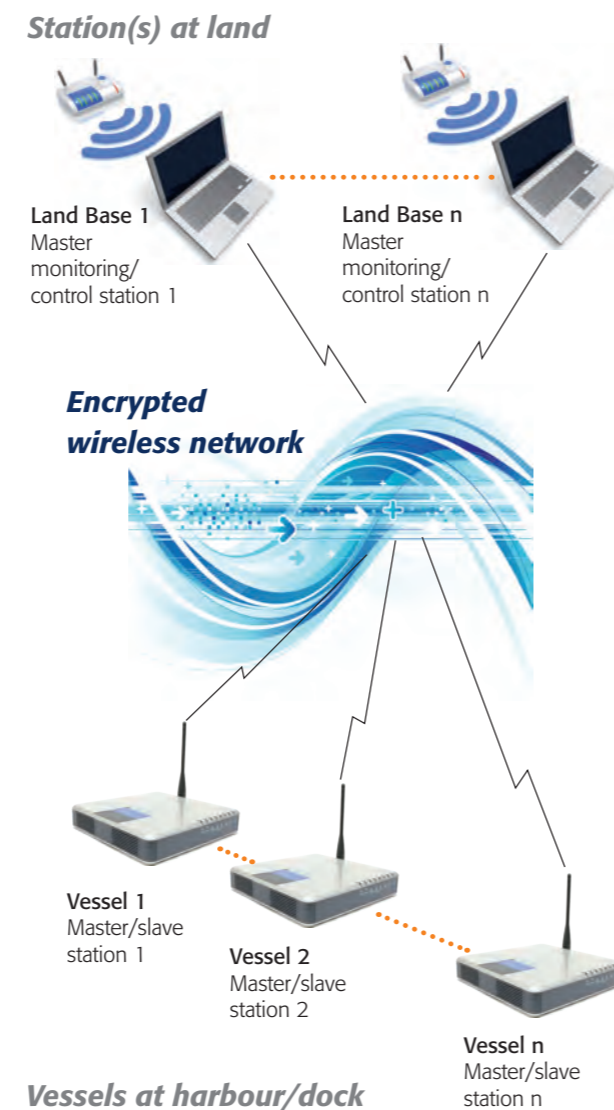
Our professional staff is experienced in handling projects of different size and complexity combined with HEINZMANN's comprehensive product range.



## NavyMACS Integrated Platform Management System (IPMS)

The NavyMACS is a reliable, flexible and scalable solution. It is designed to meet the requirements and demanding needs for navy vessels. NavyMACS offers complete integration with the vessels platform systems. All operator tasks are performed on configurable multifunctional integrated workstations, which are placed in the engine control room, on the bridge or at any other station required.

- Main propulsion plant control system
- Power generation and distribution control system
- Damage control information support system
- Data exchange system



## SeaMACS Marine Automation System

Integrated system designed to meet the requirements and demanding needs of a modern maritime automation system. The system is designed to meet the classification societies for unmanned machinery spaces.

- Integrated vessel control
- Distributed data processing
- Systems for merchant marine, offshore and navy
- Advanced trending and analysis
- Full redundancy

## ReMACS Remote Monitoring of Alarm and Control Systems

With this system several ships can be connected to one remote wireless monitoring system. The system easily integrates with most alarm and control systems. One can choose to either monitor several ships from another connected ship, or from a station at shore.

- Increased safety for vessels at harbour
- Integrates with any standard alarm and control system
- Reduced need for manpower
- Reduced costs
- Encrypted wireless network for security



## APOLLON

### Exhaust gas recirculation & wastegate

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 reduces your engine emissions.

Exhaust Gas Recirculation (EGR) minimises the formation of nitrogen oxides (NO<sub>x</sub>) when fuel is burned in internal combustion engines. HEINZMANN offers customised EGR solutions.

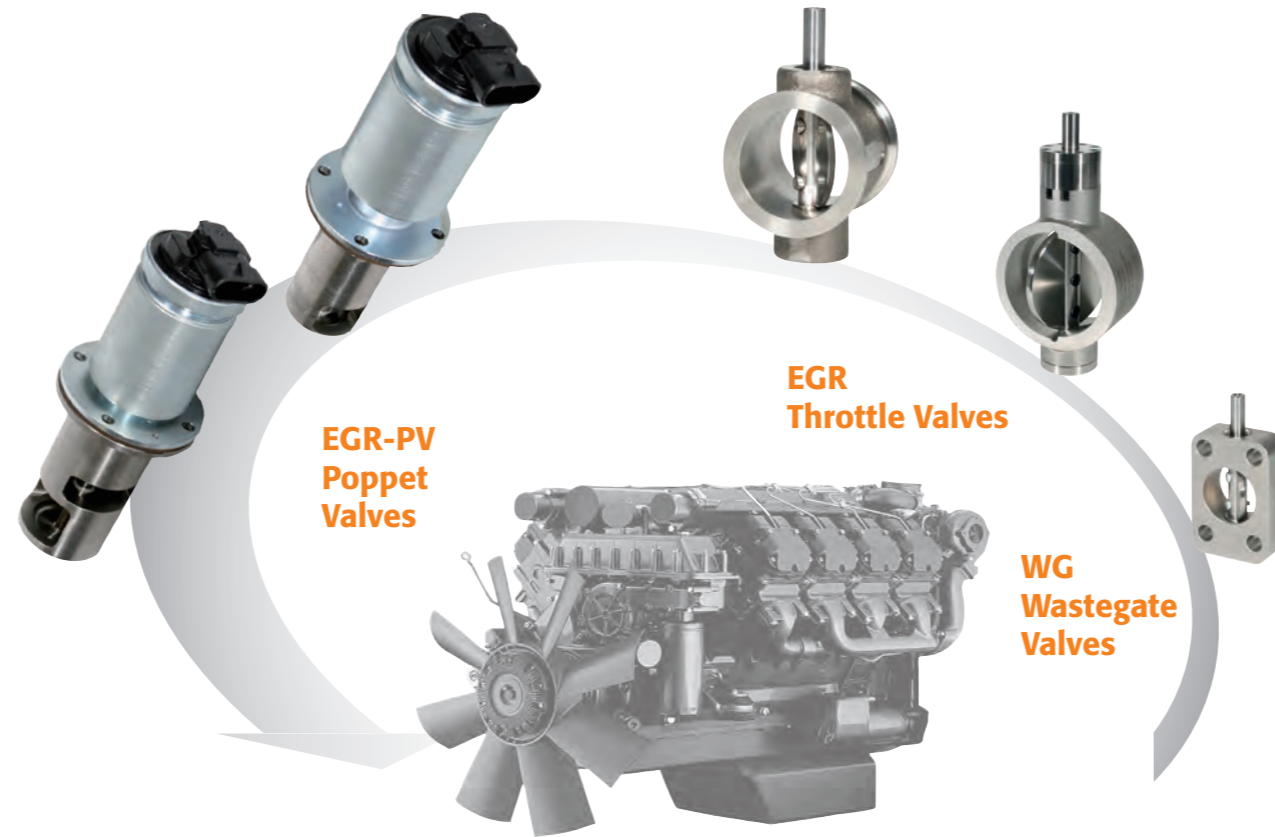
Wastegate valves with corresponding actuators complete the HEINZMANN



engine emission management 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

- ➔ Fast response times
- ➔ Steady-state and dynamic control modes
- ➔ Low leakage
- ➔ 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-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 at 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 NO<sub>x</sub> emissions
- ✓ A broad range of engine sizes
- ✓ For on-road or off-road engines
- ✓ Full system integration

### APOLLON turbo wastegate systems

HEINZMANN provides wastegate throttle valves for turbo boost control and suitable actuators.

### Customised solutions

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

## APOLLON<sup>PLUS</sup>

### Selective catalytic reduction (SCR)

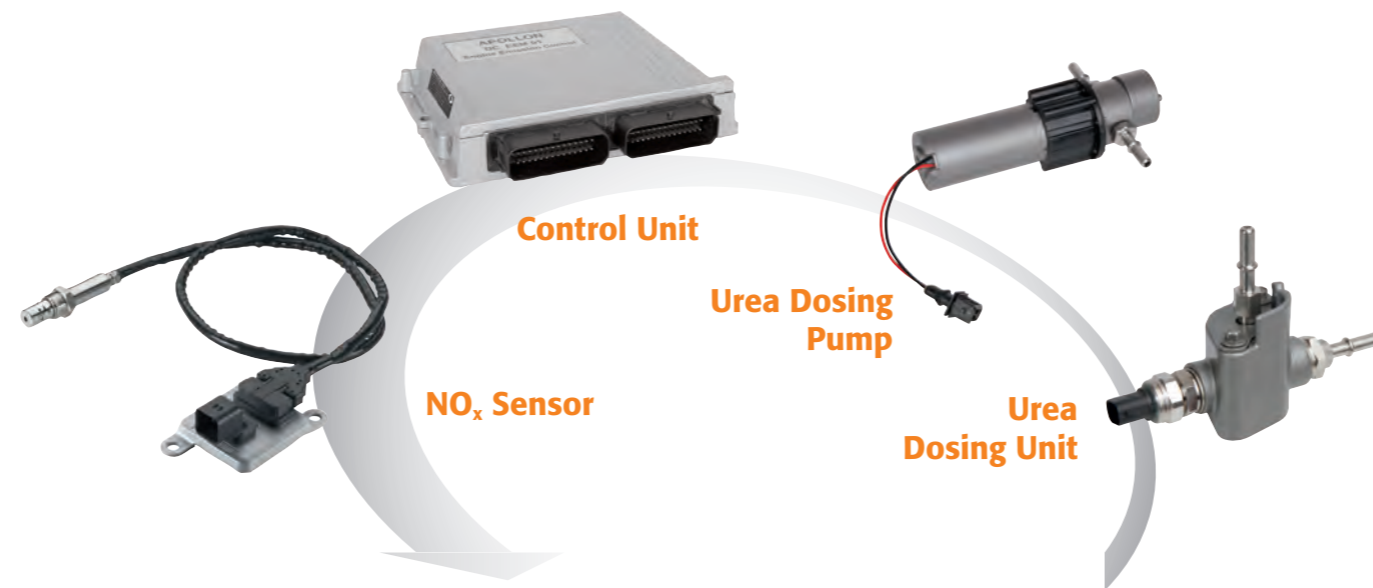
In addition to its established exhaust gas recirculation systems, HEINZMANN provides further systems for exhaust gas aftertreatment of medium and heavy-duty diesel engines. The APOLLON<sup>PLUS</sup> SCR control system is designed for on-road, off-road and stationary diesel engines.

Due to a high-tech control unit with numerous sensor inputs, a highly flexible control software, data logging function and CAN bus ability the system provides an ideal solution for different emission control requirements.

The system can be used as an OEM or a retrofit solution.



To pass international emission requirements, the HEINZMANN selective catalytic reduction solution provides a high efficient possibility to reduce NO<sub>x</sub> emissions in diesel exhaust gas by urea injection.



### APOLLON<sup>PLUS</sup> Selective Catalytic Reduction (SCR)

APOLLON<sup>PLUS</sup> provides a highly flexible control system for the reduction of NO<sub>x</sub> emissions through selective catalytic reduction. On base of various monitored engine, system and application conditions, urea is injected into the SCR catalyst at the optimum equilibrium between NO<sub>x</sub> reduction, urea consumption and system performance. Unlike Diesel Particulate Filter (DPF) regeneration, SCR does not lead to higher fuel consumption but allows the engine to run at its optimal operating points and to save fuel.

- ➔ Airless urea injection
- ➔ OEM and retrofit solutions
- ➔ Optimised AdBlue<sup>®</sup> consumption
- ➔ High NO<sub>x</sub> conversion
- ➔ Quick SCR start up
- ➔ Exhaust gas temperature management

#### NO<sub>x</sub> reduction – SCR

The HEINZMANN SCR control is a high flexible solution for OEM and retrofit applications to reduce NO<sub>x</sub> emissions by selective catalytic reduction. Detecting several engine, system and application conditions, the control unit calculates and monitors the urea injection into the SCR catalyst to ensure the optimal equilibrium between NO<sub>x</sub> reduction, urea consumption and system performance.

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

### System Benefits

- ✓ High NO<sub>x</sub> reduction
- ✓ On-board diagnosis (OBD)
- ✓ Longer maintenance intervals

### SCR control unit



SCR control unit

The digital APOLLON<sup>PLUS</sup> SCR control unit which, on base of monitoring several engine, system and application parameters, calculates the urea injection into the SCR catalyst, featuring a highly flexible control software, data logging function and CAN bus connection.

### APOLLON applications

- ➔ On-road
  - Trucks
  - Buses
- ➔ Off-road
  - Construction vehicles
  - Agricultural vehicles and machinery
- ➔ Marine applications
- ➔ Industrial applications
- ➔ Stationary engines
- ➔ Locomotive engines
- ➔ Generator sets

## CPK AUTOMOTIVE

### Emission control & monitoring

CPK Automotive GmbH & Co. KG, which belongs to the HEINZMANN Group since 2013, has for many years specialised in the development of environmental solutions, chiefly in the field of automotive technology. Today, the main business is the development and production of systems for monitoring and controlling the after treatment of engine exhaust gases.

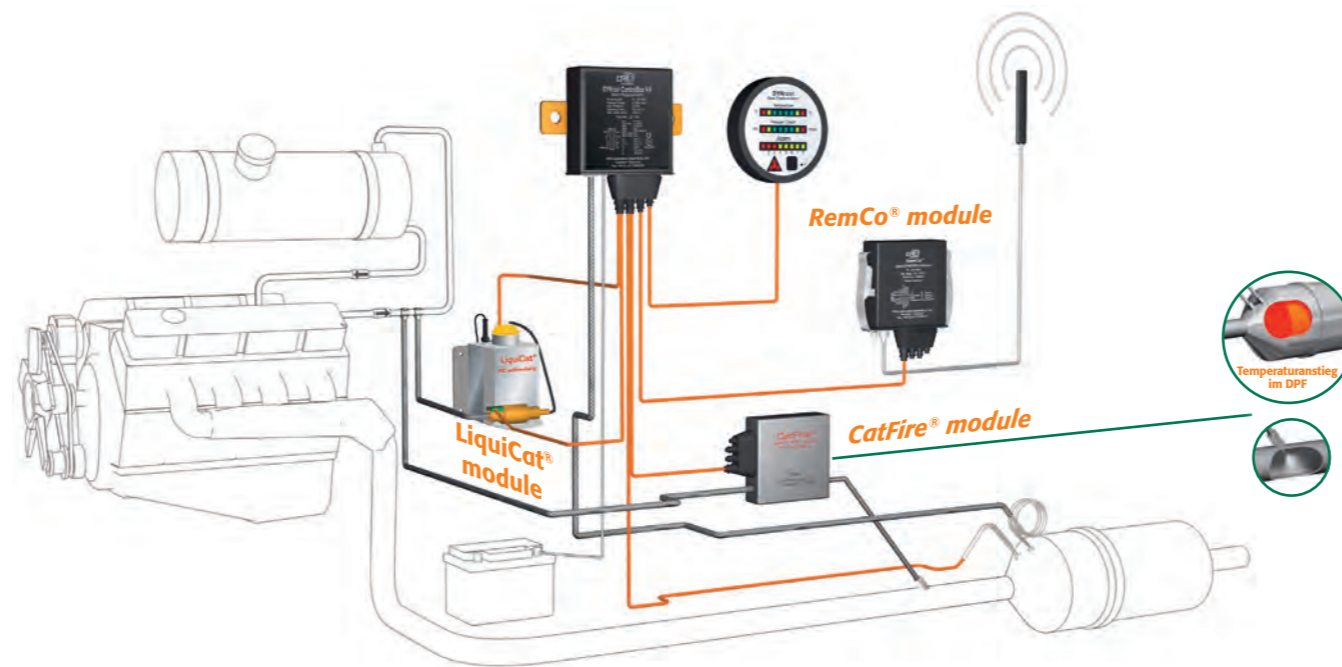
The best known product is the DYNTEST system which is in demand all over the world. The system is used to control, monitor and log the data of particulate filters.

Further control capabilities, as active Diesel Particulate Filter (DPF) regeneration by HC dosing or passive DPF regeneration by



FBC dosing are part of a modular principle and can be expended or combined according to individual requirements.

It is suitable for on-road and off-road vehicles, industrial and stationary applications, locomotive and marine applications as well as for generators. It is designed as an OEM and retrofit solution. It is easy to install, robust, and attractively priced. It will work with just about any type of exhaust system. CPK can provide full development service to meet current and future exhaust gas emission limits.



### DYNTEST system – control system for DPFs

The DYNTEST system is a system for monitoring particulate filters and exhaust gas back-pressure levels. It prevents engine damage or damage to filters and allows the control of active regeneration and alarm systems. All values preset as standard have been thoroughly tried and tested.

The DYNTEST system is able to withstand rigorous everyday operating conditions and is designed for manufacturer-independent operation. It is a versatile analytical tool for the evaluation of data gathered over extended periods. In addition, the system is flexibly upgradeable.

### Advantages

- ➔ Improved DPF regeneration
- ➔ Controls active regeneration and alarm systems
- ➔ Robust and durable
- ➔ Simple system integration
- ➔ On-Bord Diagnostic (OBD)
- ➔ Versatile analytical tool
- ➔ Evaluation of data gathered over extended periods
- ➔ DPF OEM warranty control
- ➔ Attractively priced and flexibly upgradeable

### System Benefits

- ✓ Improved regeneration
- ✓ Minimum FBC consumption
- ✓ Monitoring/data logging system
- ✓ On-board diagnosis (OBD)
- ✓ Longer maintenance intervals

### CatFire® module

The catalytic burner (diesel post-injection system) ensures fast active regeneration of the diesel particulate filter. The CatFire® module is safe and highly versatile. It can raise temperatures upstream of the DPF to a variety of widely different levels. This highly cost-effective arrangement is at all times under the control of the DYNTEST system. This module performs efficiently at temperatures of as low as 200 °C (depending on the oxidation catalyst coating). And as an intelligent system, it permits diesel post-injection for coated filters and additive systems, independent of the engine management system.

### RemCo® module

Maintaining global contact: This module supports data retrieval (e.g. for filter maintenance) from vehicles just about anywhere on earth. Communication is either via the GSM network, which covers almost the entire globe, or the internet. The communication module provides direct contact with individual vehicles for monitoring and control purposes, and also supports the triggering of alarms. The GPS network can be used as a modern and highly cost-effective fleet-management tool.

### On-Road PanelBox

Displays temperature, pressure, and engine-rev data, as well as a setup menu. The module has a switchable illuminated display and 6 function keys, 2 of which provide backlit alarm, signals and buzzer.

### Off-Road PanelBox IP67

Displays current temperature and back-pressure values. The module has a waterproof display (IP67) to withstand rigorous outdoor operating conditions. LED illumination guarantees clear signalling and alarm resets by means of a touch sensor.

### LiquiCat® module

This pre-installed Fuel Borne Catalyst (FBC) additive-dosing module is complete in itself. It is supplied ready to use, and under dependable control of the DYNTEST system. It is used for passive DPF regeneration of uncoated diesel particulate filters. The FBC module comprises an electric level indicator, an electromagnetic metering pump, and a stainless steel tank. Electronically controlled – the module is a part of the DYNTEST ControlBox.



## Digital Governors

### 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. Next to standard products we also offer customised solutions tailored to particular applications.



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.

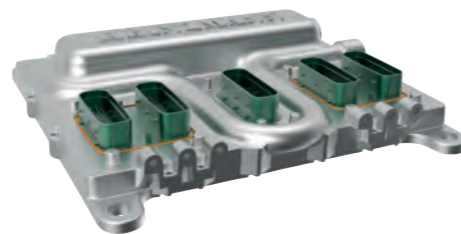
All digital control units in the HEINZMANN range offer excellent governing performance with extensive functionality configured by DcDesk 2000 programming software.

### DARDANOS MVC series

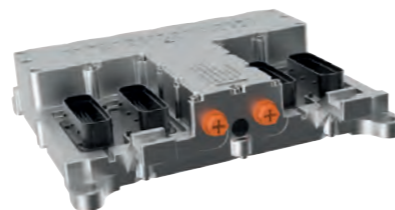
HEINZMANN's electronic fuel injection controls that drive solenoid actuated diesel and gas injection systems. DARDANOS is available for 6, 8 and up to 24 cylinders.

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.



DARDANOS MVC 01-24  
for up to 24 cylinders



DARDANOS MVC 03-8  
for up to 8 cylinders



DARDANOS MVC 04-6  
for up to 6 cylinders

### XIOS UC 1

With XIOS, HEINZMANN presents an entirely new generation of controller and monitoring unit. Unlike conventional controllers, the application-specific configurable modular XIOS package offers a previously unmatched breadth of functions and features. XIOS is based on advanced control technology: to relieve the CPU, a logic chip (FPGA) developed by HEINZMANN takes control of all I/O functionalities, leaving more computing power for PLC functions or processor intensive regulation tasks.

Specific adaption to application is achieved by a variety of plug-on modules tailored for different tasks.

The result is a scalable, very flexible and cost effective control unit, which features various and numerous I/Os. Additional factors are custom configuration and multi-functional application. XIOS controls and monitors manifold different types of engines, such as diesel, gas and dual fuel engines plus hydraulic generators and turbines.



XIOS control unit

### PRIAMOS DC 1-03 / DC 1-04

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/Os with dedicated cable harness. External communication via various CAN protocols. The PRIAMOS variant DC 1-04 is driving up to 2 actuators. A maximum of 3 actuators can be controlled.



DC 1-03

### 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/Os and comes in two different enclosures. External communication via variable CAN protocols and Modbus.



DC 2-02

### PANDAROS DC 6

Biggest digital control for high-speed engines, which drives HEINZMANN actuators rated up to 30 Nm torque. You can parameterise PANDAROS with DcDesk 2000 software, as well as with external programmer. For the user's convenience it has 6 configurations with assigned I/O on-board CAN bus. It can be used for small and medium-sized combustion engines.



DC 6

### PANDAROS DC 6-200

The DC 6-200 is the low current version of digital PANDAROS controls. With assisting actuator systems of hydraulic type for instance torques up to 20 Nm are possible. DC 6-200 hardware is well adapted for small actuator currents therefore it comprises an appropriate software version.



DC 6-200

### DC 8

At the heart of the digital control DC 8 is a very rapid and highly powerful microprocessor. DC 8 provides speed governor functions as well as positioner capabilities.

In addition, DC 8 can be applied as peripheral module in control systems to extend I/O abilities of main controller and drive another actuator.



DC 8

### ORION DC 9

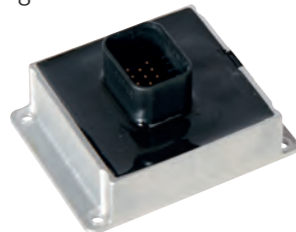
ORION DC 9 represents a highly efficient and flexible but still cost-effective speed control unit with first-rate control performance on small and medium-sized combustion engines.



DC 9

### ORION DC 10

The ORION DC 10 control unit is meant for direct engine mounting. Small in size, extremely enduring with tailor-made functionality but economically advantageous, it is ideal for speed control of small combustion engines.



DC 10

### DC 12

DC 12 is a digital control for small and medium-sized high-speed engines.

It is able to drive direct working actuators in 4Q-operation. Two separate speed pickups are possible. CAN bus is integrated.



DC 12

### DG EC 40 / DG EC 250

Combining the capacities and features of brushless actuators with the faculties of a high-grade digital speed controller, these governors are designed for applications that require both large regulating powers and outstanding control performance.

A large number of inputs and outputs offer a great variety of control options and allows to involve a lot of relevant signals in the control functions.



DG EC 40



DG EC 250

### DG 2080.11

Effective integration of new control unit DC 11 into well-tried and tested actuator StG 2080. Providing excellent dynamic characteristics in speed/load control at low consumption and flexible I/O options. The compact design reduces restrictions of mounting position and opens interchangeability with other proprietary units.



DG 2080.11

### DG 3010.10 / DG 3005.10

Combination of actuator StG 3005-3010 with speed controller DC 10 for direct mounting on small engines and applicable in many fields of use e.g. operating butterfly valves, pump rods, etc.



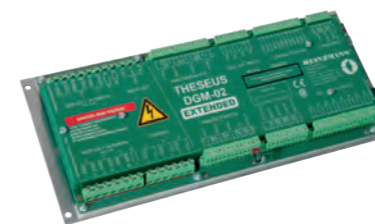
DG 3010.10



DG 3005.10

### THESEUS DGM-02 Digital generator control

Comprehensive 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, Modbus or SAEJ1939.



DGM-02

### AFR control KRONOS 20

Electronically controlled air fuel ratio 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. In closed loop lambda is maintained by the engine output signal. Variations in ambient conditions (such as gas quality and pressure) are fully compensated.



KRONOS 20

### PHLOX ignition control

The PHLOX control unit is a highly flexible high-energy capacity spark ignition control device. Its flexibility and I/O possibilities allow easy integration into any gas engine management system. Ignition control versions for 8, 12, 16 or 24 cylinders are available.



PHLOX

### ARIADNE knock control

Used as part of a gas engine management system, ARIADNE can act on ignition AFR and load governing, implementing a real-time knock control. It offers advantages in terms of engine protection, performance and cost.



KC-01

## Analogue Governors

### Easy parameter setting

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: no software or programming device is 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.

### KG 1 / KG 2 Analogue control units

Control units KG 1 and KG 2 are the core parts of electronic governor systems E 1-F and E 2-F which are designed for engines with small power ratings. KG 1-04-F and KG 2-04-F are ideal for small gas engines due to their excellent dynamics. Applications are single generator sets. KG 1-08-F and KG 2-08-F feature an extended range of functions with extra interfaces for connection to synchronisers and load measuring units. Applications are generator sets operated in parallel mode.



KG 1

### KG 6 / KG 10 Analogue control units

Control units KG 6-04 and KG 10-04 are the main components of electronic governor systems E 6 and E 10. These systems are designed principally for gas and diesel engines with medium power ratings up to 1,000 kW. Both units dispose of a wide range of standard interfaces and are suitable for various applications, mainly generator sets.



KG 6

### KG 16 / KG 30 / KG 40 Analogue control units

Control units KG 16-04, KG 30-04 and KG 40-04 are the core parts of electronic governor systems E 16, E 30 and E 40. These are designed for large gas

and diesel engines with power ratings up to 4 MW. For both units, interfaces can be adjusted to customer's needs. This makes them suitable for a wide range of applications, mostly generator sets.

### ORION KG-LC-D / 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 combined with rotary or linear actuators (StG 3005 and 3010, LA 25, 30 and 35). Applications: Generators, pump drives



KG-LC-D / AC 3

### 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). Application: Power generation



LMG 11

### SYG 02 Synchronising unit

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

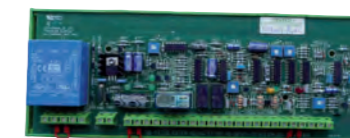
The unit operates with a controller in the 4 % nominal frequency range and can therefore also be used for standby synchronising. A dedicated signal output enables inverse synchronising of the unit with the mains. Application: Power generation



SYG 02

### GSLU 01 Ramp generator Accessories for LMG 11

The GSLU 01 Generator Soft Load Unit has been designed for use with the HEINZMANN LMG 11-01 isochronous load sharing unit. The GSLU 01 allows single sets to soft load and unload isochronously while parallel to other sets. The primary function of this unit is isochronous loading and unloading of island generator sets or base load parallel to the mains. Application: Power generation



GSLU 01

### ESW 01 Electronics setting potentiometer

To be used with HEINZMANN governing systems in the range from E 1/2-F up to E 40 and E 2000. ESW 01 is converting digital speed increase / decrease pulses to an analogue setpoint signal. Application: Power generation, speed control on vessels



ESW 01



## Actuators & Positioners

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

Driven electrically, no mechanical or hydraulic drive is needed. This allows for them to be easily fitted to any engine, making them also suitable for retrofit systems.

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

Known in the market HEINZMANN provides a wide range of actuators. This



includes devices with rotary shafts or linear actuators.

Actuators are equipped with direct acting magnetic systems or with motor and gear.

Also available are versions with integrated positioning electronics are available as well as with brushless motors.

So customers can find a product tailored to their exact requirements.

Main applications are power generation, locomotives, marine, industrial and all kind of turbine applications.

### 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°, 68° or 70° travel. They are mainly applied in automotive and industrial diesel and gas engines from 100 to 1,000 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 / StG 3010

- 0.60 Nm
- 53° rotation



#### StG 1 / StG 2

- 0.9 and 1.4 Nm
- 68° rotation



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

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



#### StG 3

- 3 Nm
- 72° rotation
- very short actuating times



#### 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-PD / StG 2080-PD

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



#### StG 30.90-PD / StG 40.90-PD

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



## Benefits

- ✓ Easily fitted to any engine
- ✓ Proven reliability and long-life cycle
- ✓ Covering any field of application
- ✓ High torque ratings from 0.3 to 250 Nm
- ✓ Linear actuators from 20-35 N

### Positioners with brushless drives

This series 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.

Any devices of this type comes 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 possible.

The electronics are fully EMC protected and all 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 15/30-P

- ➔ 15 and 30 Nm
- ➔ brushless
- ➔ 75° - 90° rotation



### 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 / 31.5 Nm / 44 Nm
- ➔ 42° or 90° rotation



### 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 inline injection pumps. The linear actuators are driven by HEINZMANN ORION control units. The ORION family consists of either the dedicated analogue control unit KG-LC-D / AC 3 or a range of digital control units as DC 9 and DC 10.

### LA Series

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



Actuator data											Applicable control units and direction of work																		
Actuator type	Max. rotation/stroke	Max. torque/force Nm/N	Torque/force in steady state position (Nm/N)	No load response time (ms)	Steady state current	Ambient temperature °C	Protection grade	Weight approx.	PRIAMOS DC 1-03	PRIAMOS DC 1-04	HELENOS DC 2	PANDAROS DC 6	DC 8	ORION DC 9	ORION DC 10	ORION DC 11	ORION DC 12	XIOS	Analogue										
									4Q	4Q	4Q	4Q	4Q	2Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q				
StG 3010	50°	0.60 Nm (spring)	0.36 Nm	70 ms	3 A	-40° ... 90°	IP65	0.8 kg				4Q		4Q	2Q		4Q												
StG 3005	53°	0.30 Nm (spring)	0.18 Nm	70 ms	3 A	-40° ... 90°	IP65	0.8 kg				4Q		4Q	2Q		4Q												
StG 1	68°	0.9 Nm	0.3 Nm	40 ms	1.7 A	-25° ... 90°	IP50	1.9 kg											4Q										
StG 2	68°	1.4 Nm	0.45 Nm	40 ms	1.7 A	-25° ... 90°	IP50	1.9 kg											4Q										
StG 3	72°	3 Nm	1.5 Nm	70 ms	3.5 A	-40° ... 125°	IP6K9K	4.9 kg											4Q										
StG 2005	32°	0.8 Nm	0.4 Nm	40 ms	3 A	-25° ... 90°	IP65	1.4 kg				4Q		4Q	2Q		4Q												
StG 2010	36°	2 Nm (spring)	1 Nm	45 ms	3 A	-25° ... 90°	IP65	2.2 kg				4Q	4Q	4Q					4Q										
StG 2010	68°	1.4 Nm (spring)	0.7 Nm	60 ms	3 A	-25° ... 90°	IP65	2.2 kg				4Q	4Q	4Q	4Q				4Q										
StG 2040	36°	7.4 Nm (spring)	3.7 Nm	50 ms	4 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg				4Q	4Q	4Q	4Q		4Q		4Q										
StG 2040	68°	5.6 Nm	3.4 Nm	70 ms	4 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg				4Q	4Q	4Q	4Q		4Q		4Q										
StG 2080	36°	11 Nm (spring)	5.5 Nm	60 ms	4 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg				4Q	4Q	4Q	4Q		4Q		4Q										
StG 2080	68°	8.4 Nm (spring)	4.2 Nm	85 ms	4 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg				4Q	4Q	4Q	4Q		4Q		4Q										
StG 2005 DP	32°	0.8 Nm	0.4 Nm	50 ms	3 A	-25° ... 90°	IP55	2.4 kg				4Q	4Q				4Q												
StG 2040 DP	36°	5.6 Nm	2.8 Nm	50 ms	3 A	-25° ... 90° -40° ... 90°	IP55	4.2 kg				4Q	4Q				4Q												
StG 2120	68°	13 Nm	4.3 Nm	<100 ms	2.3 A	-20° ... 60°	IP55	17.8 kg				4Q							4Q										
StG 6-01	36°	4 Nm	1.4 Nm	75 ms	1.7 A	-25° ... 90°	IP55	3.5 kg	4Q	4Q	4Q	4Q	4Q	4Q					4Q										
StG 6-02V	36°	6 Nm	2 Nm	50 ms	1.7 A	-25° ... 90°	IP55	3.5 kg	4Q	4Q	4Q	4Q	4Q	4Q					4Q										
StG 10	36°	10 Nm	3.3 Nm	60 ms	1.7 A	-25° ... 90° -40° ... 90°	IP55	4.3 kg	4Q	4Q	4Q	4Q	4Q	4Q					4Q										
StG 16	42°	15 Nm	5 Nm	120 ms	1.7 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q	4Q	4Q	4Q					4Q										
StG 30	42°	31.5 Nm	10.7 Nm	190 ms	1.7 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q	4Q							4Q										
StG 30.90	90°	31.5 Nm	10.7 Nm	235 ms	1.7 A	-20° ... 60°	IP55	24.5 kg				4Q							4Q										
StG 40	42°	44 Nm	14.5 Nm	190 ms	2.3 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q								4Q										
StG 40.90	90°	44 Nm	14.5 Nm	275 ms	2.3 A	-20° ... 60°	IP55	24.5 kg				4Q							4Q										
StG 64	42°	64 Nm	21 Nm	270 ms	2.3 A	-25° ... 90°	IP65	32 kg	4Q	4Q				4Q					4Q										
StG 90	42°	90 Nm	30 Nm	320 ms	2.3 A	-25° ... 90°	IP65	32 kg	4Q	4Q				4Q					4Q										
StG 180	42°	180 Nm	60 Nm	320 ms	4.4 A	-25° ... 90° -40° ... 90°	IP 55	39 kg				4Q		4Q															
StG 2040-PD	68°	6.6 Nm	3.3 Nm	< 150 ms	3.5 A	-25° ... 90°	IP65	6.5 kg	Integrated position control																				
StG 2080-PD	68°	7.8 Nm	4.6 Nm	< 90 ms	3,5 A	-25° ... 90°	IP65	8.6 kg																					
StG 30.90-PD	90°	31.5 Nm	10.7 Nm	< 240 ms	1.7 A	-20° ... 60°	IP55	24.5 kg																					
StG 40.90-PD	90°	40 Nm	14.5 Nm	< 280 ms	2.3 A	-20° ... 60°	IP55	24.5 kg																					
StG EC 15-P	75° - 90°	15 Nm	8 Nm	80 ms	~3.5 A	-40° ... 85° -40° ... 120° -40° ... 150° *)	IP6K9K	12.5 kg																					
StG EC 30-P	75° - 90°	30 Nm	15 Nm	80 ms	~3.5 A	-40° ... 85° -40° ... 120° -40° ... 150° *)	IP6K9K	12.5 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°)		-40° ... 80°	IP66	37 kg																					
LA 25	19.5 mm	25 N	20 N	100 ms	2 A	-40° ... 90°	IP65	0.7 kg																2Q	2Q				
LA 30	15.5 mm	30 N	24 N	100 ms	2 A	-40° ... 90°	IP65	0.7 kg																2Q	2Q				
LA 35	12.5 mm	35 N	28 N	100 ms	2 A	-40° ... 90°	IP65	0.7 kg						2Q	2Q														

4Q = bidirectional; 2Q = unidirectional/spring return  
\*) = with external electronics

## REGULATEURS EUROPA

### Governors & hydraulic actuators

Since 2005 REGULATEURS EUROPA (RE) has been part of the HEINZMANN Group as an ideal complement to HEINZMANN's existing products. REGULATEURS EUROPA has been providing diesel engine governors since the 1960s, offering fully integrated solutions for control and monitoring technology for the industrial, marine, traction and power generation industry.

In particular, HEINZMANN adds REGULATEURS EUROPA's state-of-the-art range of electro-hydraulic diesel engine governors to its range of systems.



The range of controls of REGULATEURS 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.

The common sales and service network of both companies guarantees customer proximity and competent service and overhaul support all parts of the world.

### Viking35 Digital governor



The digital governor Viking35 is designed for manifold and highly specific control of all diesel engines in propulsion, traction or generator systems. Especially for complex load sharing the Viking35 has proven to be the best available solution.

The governor has a comprehensive software package as well as a wide selection of inputs and outputs. 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 Hydraulic Actuator

The most powerful governor/actuator produced by REGULATEURS 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.



### 2231-1G Hydraulic actuator

A hydraulic actuator with a mechanical ballhead backup governor. Output range is 8 to 40 ft. lbf. (= 10 to 55 Nm).

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 Hydraulic 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.



### 2800 Hydraulic Actuator

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



### Benefits

- ✓ **Wide range of hydraulic governors**
- ✓ **Digital governors**
- ✓ **Complete engine management systems**
- ✓ **Hydraulic actuators with mechanical backup governor**

### 1115-4G Marine governor

Hydraulic governor for marine application. Output range 8 to 40 ft. lbf. (= 10 to 55 Nm). Available with analogue (4-20 mA) and digital speed setting (raise/lower speed commands).



### 1102-4G Generator governor

Hydraulic governor for generator applications. Output range is 8 to 40 ft. lbf. (= 10 to 55 Nm). Available with several types of speed setting motors voltage range 24 V to 440 V.



## Sensors

### for digital control systems

HEINZMANN offers complete solutions for the monitoring and control of engines and turbines. This involves a complete range of high-quality sensors that are fully customisable and can be configured to match any HEINZMANN or customer product specification.

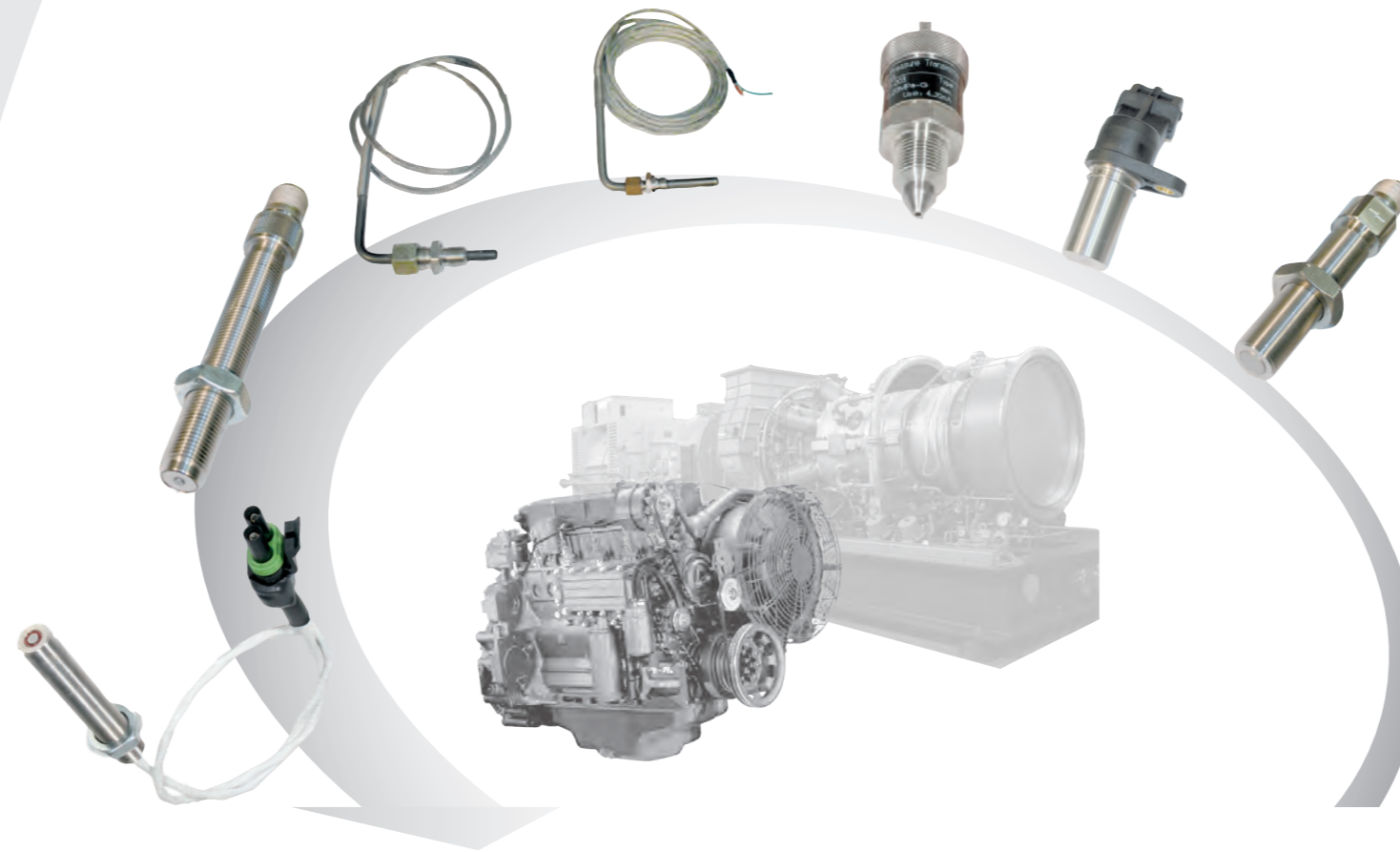
HEINZMANN sets very high standards for its sensors to ensure that they comply with the most stringent industrial standards and suit customers' needs even in most severe environments. Some of our sensors are certified for use in special applications.



Continuous improvement and systematic product development are parts of HEINZMANN's philosophy.

HEINZMANN would like to hear from customers who have an application not covered by our current sensor range.

We offer experience and expertise and would be glad to work in cooperation with customers in the development of new sensor types.



## Benefits

- ✓ **Reliable, high-precision sensing**
- ✓ **Wide range of measuring applications**
- ✓ **Designed to suit HEINZMANN products**
- ✓ **Strong, compact design**
- ✓ **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.

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

Sensors have an IP65 protection rating and are available for pressures ranging from 0 to 2.5, 4, 10, 16 and up to 2,000 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.

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.

They are ideal for electronic injection systems and electrically controlled gas valves.

They have an IP65 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

Modern common rail systems make use of solenoid-actuated injectors and/or flow valves for their very fast response times, assuring the most accurate control of fuel injecting regarding timing and dosing.

The use of HEINZMANN solenoid actuated injectors also enables the control of pre-injection, main-injection and post-injection. The pressure of fuel pumps can also be controlled using solenoidactuated flow valves of highpressure pumps.

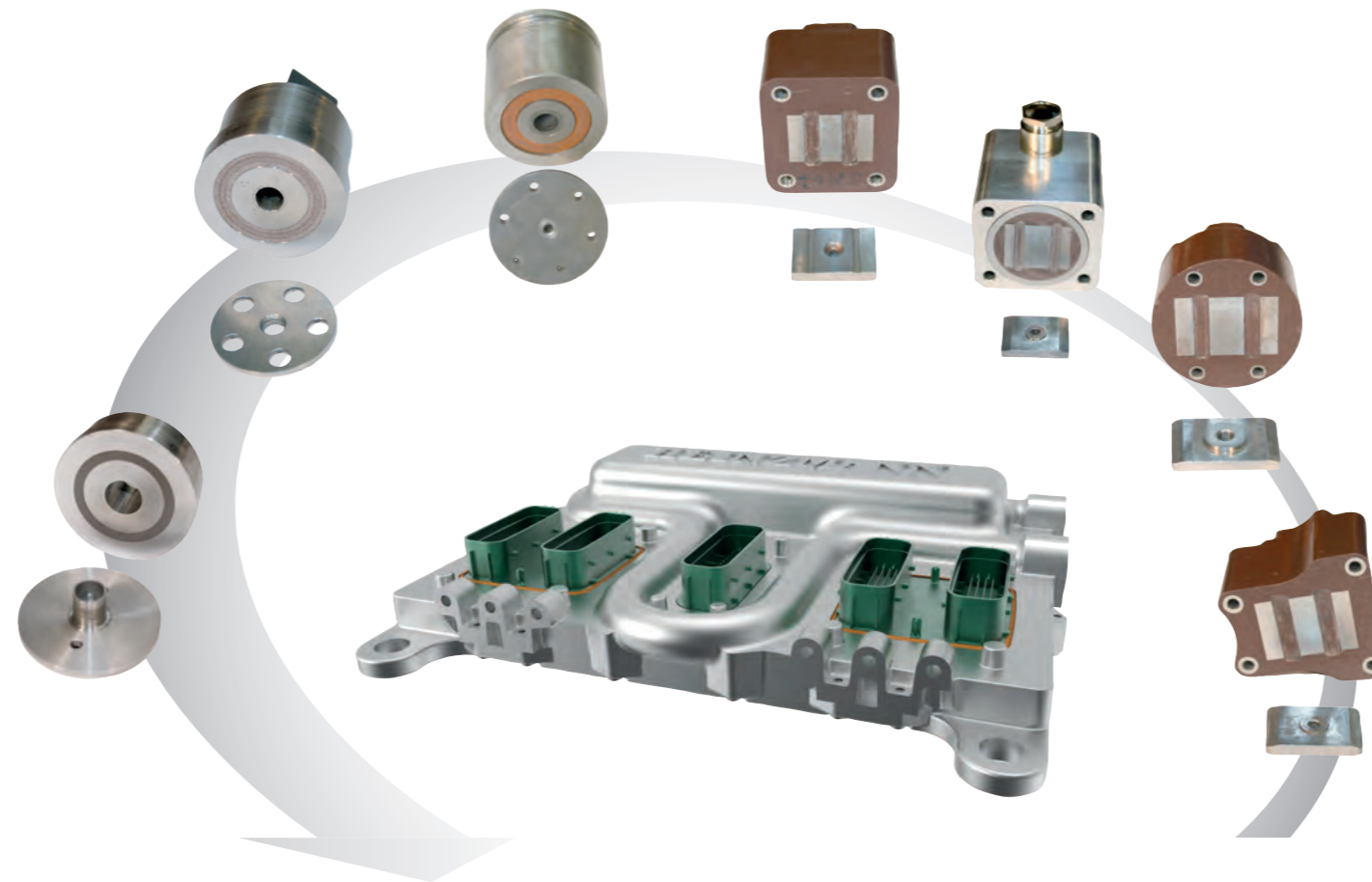
Common rail injection systems are increasingly used on diesel engines due to their reduced



fuel consumption, exhaust emissions and noise.

HEINZMANN solenoids are available in various sizes and power ratings for any application. They feature a robust, durable design, easy system integration and diagnostic capability.

HEINZMANN offers solenoids in a variety of sizes and power ratings in order to meet every application's requirements.

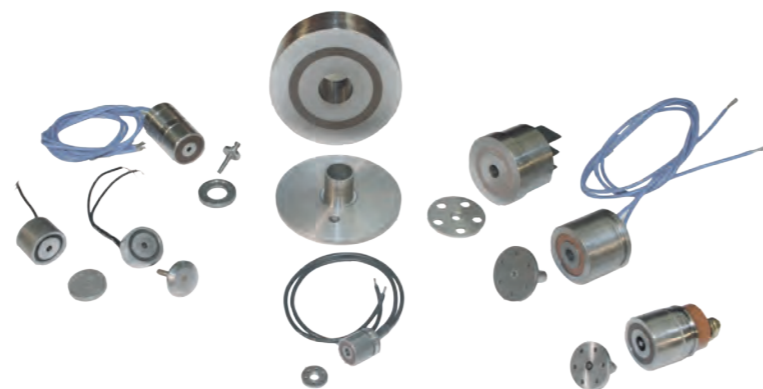


### Benefits

- ✓ **High & precise magnetic force, compact device**
- ✓ **Short floating times**
- ✓ **Robust and durable**
- ✓ **Diagnostic function (BIP recognition)**
- ✓ **Easy system integration**
- ✓ **Pot core and 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.



Round solenoids

### 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.



E-core solenoids

### Applications

- Control components for PNU, PPN and CR injection systems for diesel engines:
  - Injectors for engine power ratings from 50 kW to 3,000 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 3,000 kW
- Hydraulic valves
  - On-off valves
  - Proportional valves
- Special applications (robotics, linking systems)

## Configuration & Visualisation Tools

### for digital HEINZMANN systems

HEINZMANN tools can be used with any of the digital HEINZMANN systems such as speed governors, magnetic valve systems, generator set controls and ignition control systems. They offer all features required for configuration, testing, commissioning and servicing.

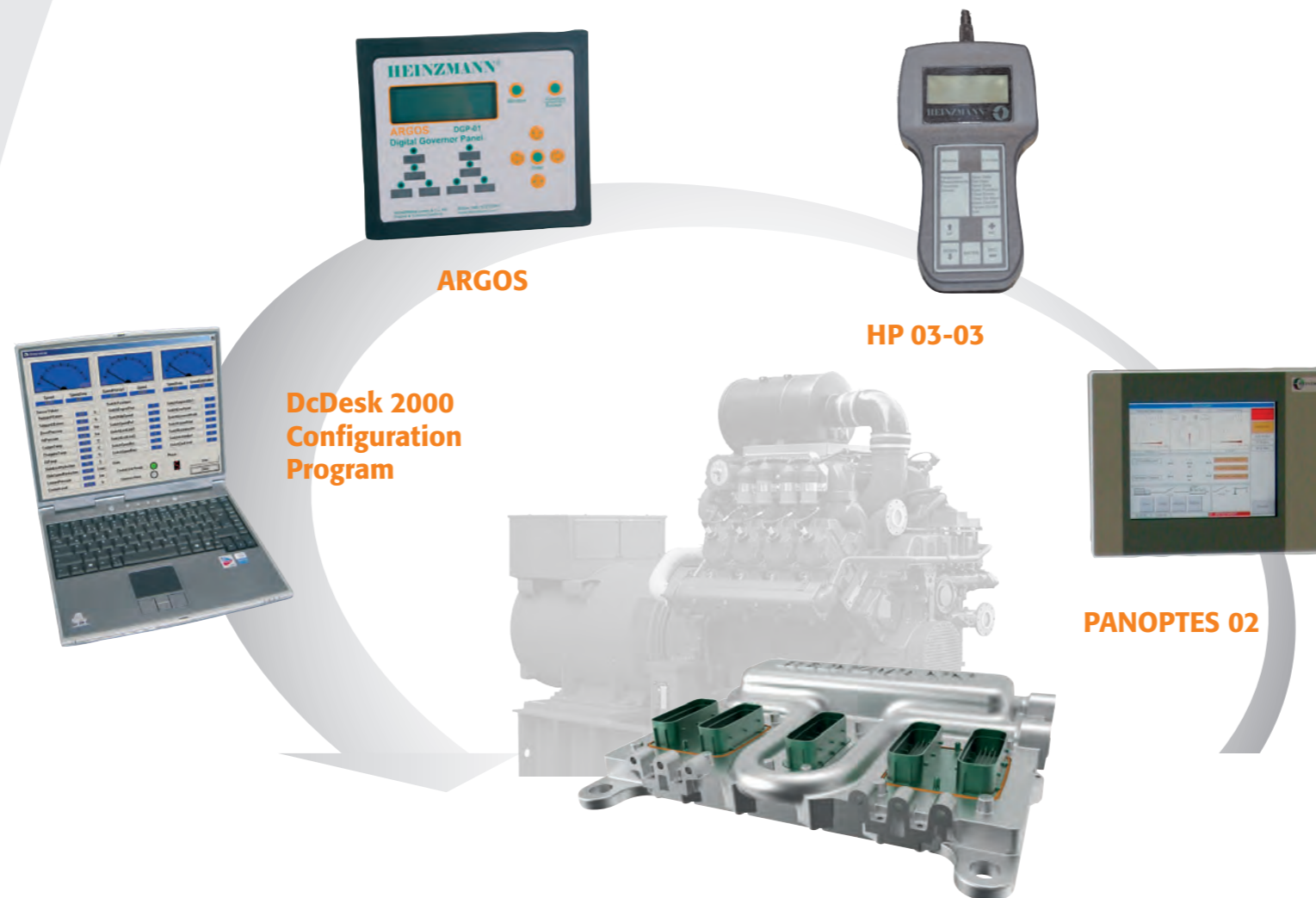
#### DcDesk 2000

Thanks to its design as a Windows®\* program, DcDesk 2000 offers a variety 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.

Data sets can also be collected whilst not connected to the device and downloaded later on.



#### DcDesk 2000 Configuration & 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 information. This allows the service technicians to faster diagnose errors and eliminate their sources.

##### User authorisation

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

#### ARGOS HMI 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 LEDs. It is intended for use in control panels (see page 14 – THESEUS).

### Benefits

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

#### Hand programmer PG 02 / HP 03-03

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 and RS485.

## 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. Based on that they develop the ideal solution. Both hardware and software are conceived for the specific requirement of the individual customer.

Total customer focus is the driving force at HEINZMANN. Satisfying the needs and expectations of our customers is the ultimate goal of our in-depth R&D initiatives.



### Professional service worldwide

The comprehensive on-site service offered to our customers is our strength. This also includes support for problems with existing systems - wherever they might be located. As a rule, error detection and correction take no longer than 24 hours. Thanks to a worldwide network of branches, representatives and authorised dealers, HEINZMANN is always close to you - our customers.

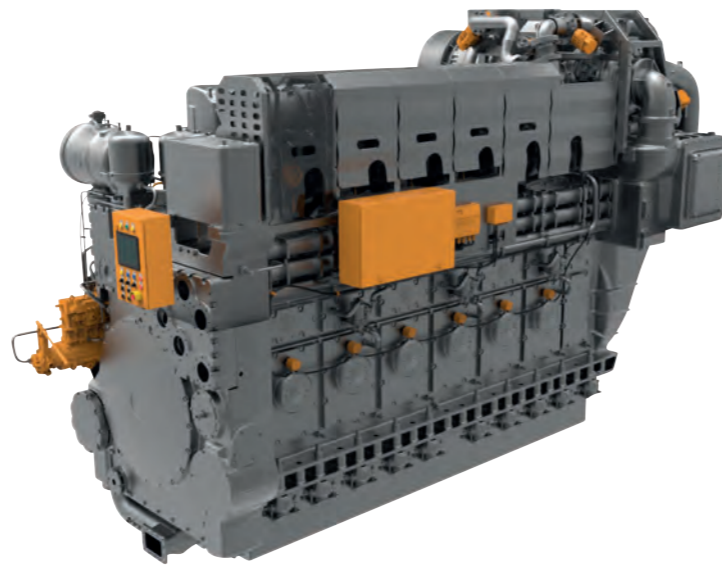
### HEINZMANN – trusted for over 100 years

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 engine monitoring systems for oil mist detection, bearing monitoring and cylinder pressure monitoring.

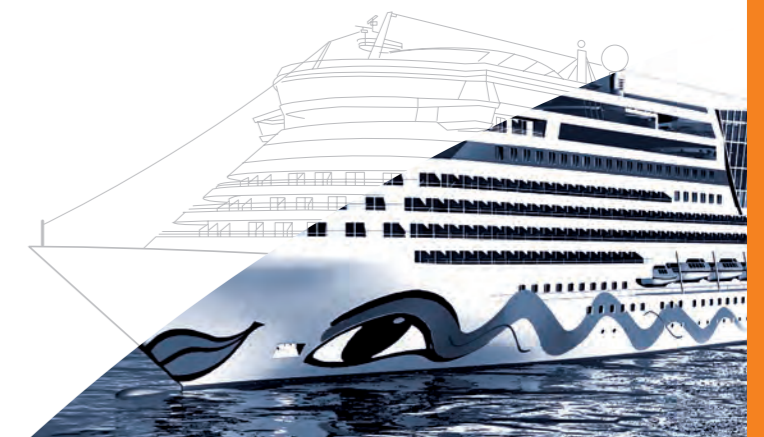
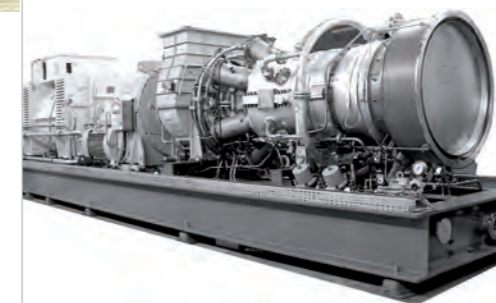
At HEINZMANN innovation is a longstanding tradition and at the same time an obligation for the future.



### 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.



# The HEINZMANN Group

Quality & Precision since 1897



The Group started 1897 with Heinzmann GmbH & Co. KG, and now counts REGULATEURS EUROPA, HEINZMANN DATA PROCESS and CPK Automotive as member companies.

The HEINZMANN Group boasts a combined total of fourteen global subsidiaries, including seven production sites and an international distributor network.

The product portfolio comprises engine management system solutions, as well as exhaust gas aftertreatment solutions, for industrial combustion engines and turbines; it also encompasses automation systems, primarily for the shipping industry.

## HEINZMANN Subsidiaries

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lei.hao@heinzmann.com

### Germany

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