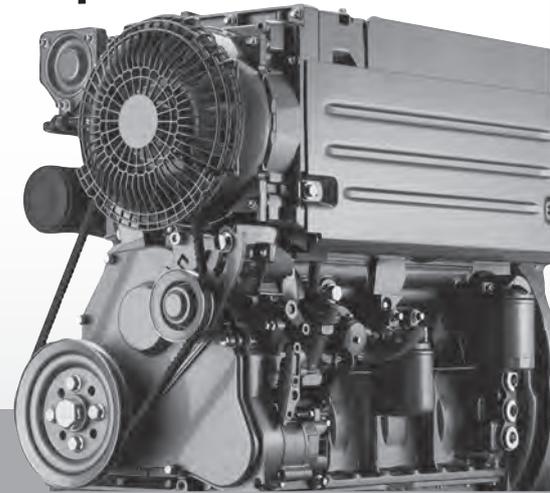


# Analogue Control Systems

for Diesel & Gas Engines, Gensets,  
Combined Heat & Power, Pump Drives



*Control Unit*



*Electronic Governors*



*Actuators*



*Accessory Units*

- ✓ For elementary governing tasks
- ✓ Easy to install
- ✓ Cost efficient

- ✓ Very short response times
- ✓ High accuracy of speed control
- ✓ Accessories for genset related tasks

## ANALOGUE CONTROL SYSTEMS

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.



## TEST UNIT PG 01

With the help of the build-in engine simulator it is possible to adjust the speed with the engine stopped. In addition, the unit may be used for checking the governor system before first engine start or in case of service.

Furthermore, the unit offers monitoring of the feedback voltage and real-time frequency (speed) measurement.



*Test unit PG 01*

For further information please ask for the manual E 83 008-e, Test unit PG 01.

## ACCESSORY PARTS AND UNITS

Available are:

- Speed sensors
- Setpoint adjusters
- Power supplies
- Power supplies with emergency supply
- Synchronisers
- Load measuring & sharing units
- Load anticipation units
- Speed switches
- Load switches

# ELECTRONIC GOVERNOR

## E 1-F / E 2-F

Consisting of control units KG 1-04-F / KG 2-04-F and actuators StG 1 or StG 2.  
Usable for an engine power up to 100 kW with governor E 1-F, 150 kW with governor E 2-F.



KG 1-04-F / KG 2-04-F



StG 1-02-F



StG 2-02-F

- Non-contact feedback system
- High accuracy
- Low current consumption
- Start fuel limitation
- Speed switch relay

For further information please ask for manual E 82 001-e, Basic Systems E 1-F / E 2-F.

### Technical data E 1-F / E 2-F

Supply voltage	12 VDC or 24 VDC
Maximum current consumption	approx. 5 A
Current consumption in steady state condition	approx. 1.7 A
Effective rotation at output shaft	68°
Maximum torque at output shaft at E 1-F	0.6 Nm = 0.44 lb-ft with 12 V 0.9 Nm = 0.66 lb-ft with 24 V
at E 2-F	0.9 Nm = 0.66 lb-ft with 12 V 1.4 Nm = 1.03 lb-ft with 24 V
Max. available torque in steady state condition at E 1-F	0.2 Nm = 0.15 lb-ft with 12 V 0.3 Nm = 0.22 lb-ft with 24 V
at E 2-F	0.3 Nm = 0.22 lb-ft with 12 V 0.46 Nm = 0.34 lb-ft with 24 V

# ELECTRONIC GOVERNOR

## E 6 / E 6V / E 10

Consisting of control unit KG 6-04 and actuators StG 6-01 or StG 6-02V or control unit KG 10-04 and actuator StG 10.

Usable for an engine power up to 500 kW with governor E 6, 1,000 kW with governor E 10.



KG 6-04 up to KG 10-04



StG 6



StG 10

- Non-contact feedback system
- High accuracy
- Low current consumption
- Start fuel limitation on request

For further information please ask for manual E 87 012-e, Basic Systems E 6 / E 6V / E 10.

### Technical data E 6 / E 6V / E 10

Supply voltage	24 VDC
On request	12 VDC
Maximum current consumption	approx. 5 A
Current consumption in steady state condition	approx. 1.7 A
Effective rotation at output shaft	36°
Maximum torque at output shaft at E 6 at E 6V at E 10	4 Nm = 2.95 lb-ft 6 Nm = 4.43 lb-ft 10 Nm = 7.4 lb-ft
Maximum available torque in steady state condition at E 6 at E 6V at E 10	1.4 Nm = 1.03 lb-ft 2 Nm = 1.48 lb-ft 3.3 Nm = 2.44 lb-ft

# ELECTRONIC GOVERNOR

## E 16 / E 30 / E 40

Consisting of control unit KG 16-04 and actuator StG 16-01 or control unit KG 30-04 and actuator StG 30-01 or control unit KG 40-04 and actuator StG 40-01.

Usable for an engine power up to 2,000 kW with governor E 16, 4,000 kW with governor E 40.



KG 16-04 up to KG 40-04



StG 16



StG 30

- Non-contact feedback system
- High accuracy
- Low current consumption
- Start fuel limitation on request

For further information please ask for manual E 87 009-e, Basic Systems E 16, E 30, E 40.

### Technical data E 16 / E 30 / E 40

Supply voltage	24 VDC
Maximum current consumption	approx. 5 A (E 16, E 30) approx. 7 A (E 40)
Current consumption in steady state condition	approx. 1.7 A (E 16, E 30) approx. 2.3 A (E 40)
Effective rotation at output shaft	42°
Maximum torque at output shaft	
at E 16	15 Nm = 11 lb-ft
at E 30	31.5 Nm = 23.2 lb-ft
at E 40	44 Nm = 32.5 lb-ft
Maximum available torque in steady state condition	
at E 16	5 Nm = 3.7 lb-ft
at E 30	10.7 Nm = 7.9 lb-ft
at E 40	14.5 Nm = 10.7 lb-ft

## ELECTRONIC GOVERNOR E 2010 / E 2040 / E 2080

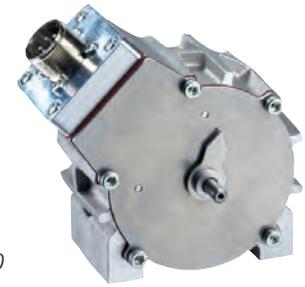
E 2010 usable for engine power up to 100 kW consisting of control unit KG 2010 with actuator StG 2010.

E 2040 usable for engine power up to 400 kW consisting of control unit KG 2040 with actuator StG 2040.

E 2080 usable for engine power up to 800 kW consisting of control unit KG 2080 with actuator StG 2080.



Control unit KG 20XX



StG 2010



StG 2040



StG 2080

- ☑ Non-contact feedback system
- ☑ High accuracy
- ☑ Low current consumption
- ☑ Start fuel limitation on request

For further information please ask for manual E 94 004-e, Basic Systems E 2010, E 2040, E 2080.

### Technical data E 2010 / E 2040 / E 2080

Supply voltage	24 VDC
On request	12 VDC
Maximum current consumption	approx. 8 A
Current consumption in steady state condition	approx. 4 A
Effective rotation at output shaft	36°
Maximum torque at output shaft at E 2010 at E 2040 at E 2080	2 Nm = 1.47 lb-ft 7.4 Nm = 5.45 lb-ft 11 Nm = 8.14 lb-ft
Maximum available torque in steady state condition at E 2010 at E 2040 at E 2080	1 Nm = 0.73 lb-ft 3.7 Nm = 2.72 lb-ft 5.5 Nm = 4.05 lb-ft

## ORION ANALOGUE CONTROL UNIT AC 3

### A new low cost generation

For small and medium-sized diesel & gas engines. Rotary or linear actuators optional.



AC 3



LA 25

StG 3005 / StG 3010



### Technical data Control Unit AC 3

Supply voltage	24 VDC
Current consumption	max. 5 A
Steady state consumption	max. 1.7 A
Control frequency	3100 up to 7000 Hz
Steady state variation	+/- 0.25 %
Protection grade	IP20
Weight	approx. 0.5 kg

For further information please ask for manual DG 06 005-E, ORION Low Cost Governor.

## ACTUATOR LA 25

### Linear version

### Technical data Actuator LA 25

Stroke	19.5 mm
Force in stop position	20 N
Force in start position	25 N
Response time 0 - 100 % without load	100 msec
Current consumption of whole governor	approx. 3 A
Storage temperature	-40 up to +130 °C
Ambient temperature in operation	-40 up to +90 °C
Humidity	up to 98 %
Protection grade (housing)	IP65
Weight	0.7 kg

## ACTUATOR STG 3005/STG 3010

### Rotary version

### Technical data StG 3005/StG 3010 for 2q-operation

Output shaft rotation angle	StG 3005: 53° StG 3010: 50°
Max. torque at output shaft in stop direction	StG 3005: 0.18 Nm StG 3010: 0.36 Nm
Max. torque at output shaft in start direction	StG 3005: 0.3 Nm StG 3010: 0.6 Nm
Response time without load 0 - 100 %	70 ms
Current consumption of whole governor	approx. 3 A
Storage temperature	-40 ... 130 °C
Ambient temperature in operation	-40 ... 90 °C
Humidity	up to 98 %
Protection grade (housing)	IP65
Weight	approx. 0.8 kg

## GENSET CONTROLLER

### AT 01 Generator power controller and synchronizer



Three-phase generator power controller for synchronisation, load sharing and ramping in isochronous isolated and mains-parallel operation and for controlled mains supply (import/export).  
Soft load function.

Detailed information: Manual THESEUS AT 01

Application: Gensets

## ACCESSORIES

### LMG 11-01 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.

Detailed information: Manual LMG 10-01.

Application: Power generation

### LMG-IF-02 Load share interface unit



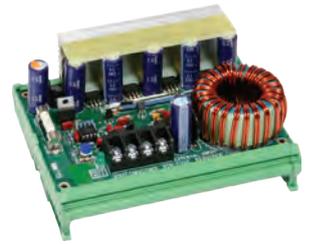
The Load Share Interface Unit LMG-IF-02 is used to couple load share lines of control systems, operating at different voltage levels.

Detailed information: Manual LMG-IF-02.

Application: Power generation

### NG 111 DC-DC converter

Voltage step-up converter for applications with high-power actuators StG 90 and StG 180.



Application: Universal

### LTG 03 Device for mechanical load sharing

The LTG 03 provides precise load sharing for installations with two engines on the same shaft, using analogue control systems.

Application: Marine

### SYG 02 Synchroniser unit



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

Detailed information: Manual SYG 02.

Application: Power generation

### SW 01-1/SW 02-10 Single-turn / ten-turn potentiometer

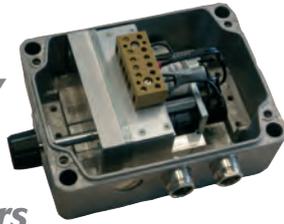


Setting potentiometers are used for manual speed setting. Single turn types satisfy standard demand, ten-turn versions allow fine tuning.

Application: Speed control

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**SW-03-1-M-15 sec,  
SW 04-10-M-150 sec,  
SW-07-1-M-120 sec  
Speed setting  
motor potentiometers**



Motor potentiometers allow speed setting manually or via a raise/lower contact.

A DC motor adjusts the potentiometer via a gearbox. Adjustment angle approx. 300°, floating time approx. 15 s SW-03, approx. 120 s SW-07, approx. 150 s SW-04.

- ☑ Applications: Speed control  
Marine

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**EFP  
Electronic foot  
pedal**



Electronic signal transducer, converting a rotary position to a voltage signal processable by the speed control equipment of the engine.

- ☑ Applications: Vehicle application  
Fuel rack positioning

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**SW 09-URI  
Setting  
converter**



Converts current or voltage signal into an analogue speed setting signal.

- ☑ Applications: Speed control  
Power generation  
Marine

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**ESW 01  
Electronics  
setting  
potentiometer**



To be used with HEINZMANN governing systems in the range from E1/2-F up to E40 and E2000.

ESW 01 is converting digital speed increase/decrease to an analogue setpoint signal.

- ☑ Applications: Power generation  
Speed control on vessels

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**LR 01  
Ramp  
generator  
unit**



Accessory for existing LMG 11 load share units to ramp up or down the load of generators, connected to the grid. Also usable as a speed ramp unit for analogue speed governors.

- ☑ Application: Power generation

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**LKG 02  
Load  
import/export  
controller**



Accessory for LMG 11. LKG 02 controls load import/export.

- ☑ Application: Power generation

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**GSLU 01  
Generator  
soft load unit**



Accessories for LMG 11. The GSLU 01 unit allows parallel engines to isochronously load ramp in mains parallel and island applications.

Detailed information/PDF: Data sheet GSLU 01, manual GSLU 01.

- ☑ Application: Power generation

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## **SLTU 01** **Soft Load** **Transfer Unit**



The unit allows soft load transfer from mains to generator, generator to mains and groups of generators to and from the mains.

Detailed information: Data Sheet SLTU 01.

- Application: Power generation

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## **KW-LKG-01** **Import-export** **controller**



The KW-LKG-01 controller is designed for controlling multiple generators in parallel to a mains incomer.

A true kW three phase  $V_{lx} \cos \phi$  calculation of power is made and is used in conjunction with an import/export controller to set the voltage of the analogue load share line.

There is also a separate kW output voltage or current available.

- Application: Power generation

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## **SPAG 03** **Voltage** **matching unit**



The voltage matching unit will match the voltages between the generator and a bus. The output is a raise/lower signal which will interface to the AVR motor potentiometer.

- Application: Power generation

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## **FSchG 02** **2 channel load** **switch unit**



Accessory for load sensing, based on an actual load signal of 0 ... 5 V.

- Application: Power generation

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## **PFC 01** **Power factor** **controller**



The power factor controller allows the control of reactive load via a motor potentiometer connected to the generator AVR.

- Application: Power generation

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## **FSCHG 02-3** **Three channel** **speed switch**

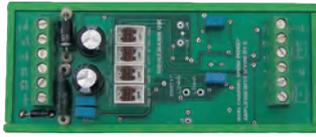


This unit has three output channels for cranking termination, under speed and over speed with a separate current or voltage output for a meter display.

- Application: Engine start  
Sequencing and over-speed protection

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## **IA-SPA** **Speed pickup** **amplifier**

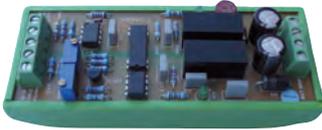


The IA-SPA unit is designed to amplify two speed pickup inputs where the pickup output voltage is low due either low-speed or very high-speed signal levels. The amplifier also has switchable filters and a divide by 2 functions.

- ✓ **Application:** Analogue and digital speed governing

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## **V-I** **Isolated** **transducer**



The newly developed isolated voltage to current transducer for use with all types of instrumentation. The innovative digital transmission design incorporates fully adjustable min. and max. settings and will accept a wide supply voltage range.

- ✓ **Application:** I/O isolation for governor controls

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## **SFBG 03** **Analogue** **start fuel limiter** **or load limiter**



Additional functionality for control units in the range of KG 6 to KG 40.

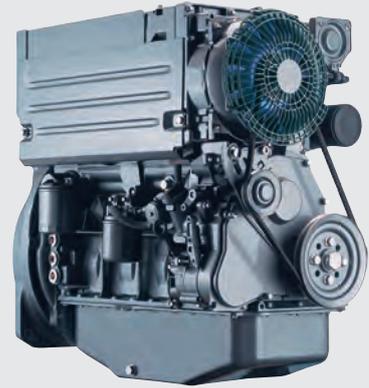
- ✓ **Application:** Any speed control

For further information please visit our website [www.heinzmann.com](http://www.heinzmann.com).

## **APPLICATIONS**

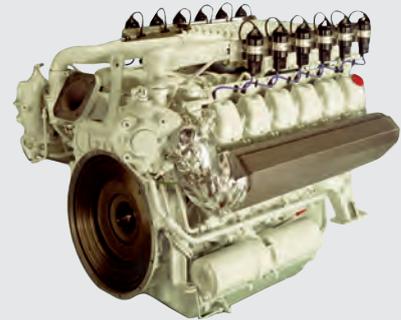
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### **Diesel** **engines**



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### **Gas** **engines**



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### **Generators**



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### **Marine** **applications**



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### **Locomotive** **applications**



# The HEINZMANN Group

Quality & Precision since 1897



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

The HEINZMANN Group boasts a combined total of fifteen global subsidiaries, including eight 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.

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