APOLLON
Engine Emission Management (EEM)

- Exhaust gas recirculation (EGR)
- Active diesel particulate filter (DPF) regeneration
- Turbo wastegate

HEINZMANN®
Energy requires Control

Engine & Turbine Management
**APOLLON**

**Components for engine emission management**

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

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

The active regeneration of diesel particulate filters (DPF), independent of the engine operation, will be demanded more often for off-highway applications. HEINZMANN delivers the main system components.

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

**APOLLON Benefits**

- Steady-state and dynamic control modes
- Mapped control for optimised operation
- Diagnostic capabilities
- Robust and durable
- Simple system integration
- EGR system with valves, actuators and ECU
- Open loop or closed loop
- Components for actively controlled diesel particulate filter regeneration
- Fuel dosing units and safety valves for catalytic regeneration and/or exhaust gas temperature increase
- Wastegate system with valves and actuators

**APOLLON applications**

- Off-Road
  - Construction vehicles
  - Agricultural vehicles and machinery
- Industrial applications
- Stationary engines
- Locomotive engines
- Marine applications
- Commercial road vehicles
- Generator sets
**APOLLON SYSTEM OVERVIEW – INTEGRATED EMISSION MANAGEMENT**

In order to comply with ever-increasing emission limits, the interactions within the entire engine management system must be taken into account. HEINZMANN has risen to this challenge and offers customer-specific emission management systems that comprise the complete common rail high-pressure injection system, wastegate control, EGR control, exhaust treatment, sensors and development tools.

**Example EGR system**

![EGR System Diagram](image)

**HEINZMANN components for active particulate filter regeneration with burner and HC-Evaporation**

![Active Particulate Filter Diagram](image)
EXHAUST GAS RECIRCULATION

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

APOLLON EGR-TV
(Throttle valve with direct actuator)
The EGR-TV is designed to be used for exhaust temperatures up to 720 °C. Thus it is qualified for installation without exhaust gas cooling. The EGR-TV valves in the APOLLON range are operated by high-performance actuators. The throttle valve demonstrates excellent control dynamics.

APOLLON EGR-PV
(Double poppet valve)
The EGR-PV with integrated solenoid actuator is designed for installation in the cooled exhaust gas area for exhaust gas temperatures up to 150 °C. The APOLLON range of EGR-PV valves provides exhaust gas control using pressure-compensated double-seat valves controlled by high-performance, compact actuators. Positional feedback is provided by a position sensor, which can also be used for diagnostic purposes. High opening forces mean that the unit is largely insensitive to lacquering.
APOLLON - EGR-T SYSTEMS: THROTTLE VALVES AND ACTUATORS

EGR-DAs are actuators with direct drive to control the deflection of EGR-TV throttle valves. The actuators and throttle valves are matched to each other and can also be used in different pairings according to the particular application. The EGR-DA line comprehends water cooled versions and temperature resistant versions which do not need cooling. The double poppet valves are solenoid actuated.

Technical information

<table>
<thead>
<tr>
<th>APOLLON Throttle Valves EGR-TV</th>
<th>EGR-TV 35</th>
<th>EGR-TV 50</th>
<th>EGR-TV 70</th>
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<tbody>
<tr>
<td>Power range of diesel engine</td>
<td>up to 0.5 MW</td>
<td>up to 0.8 MW</td>
<td>up to 1.5 MW</td>
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<tr>
<td>Flow rate at 100 mbar</td>
<td>200 kg/h</td>
<td>500 kg/h</td>
<td>1000 kg/h</td>
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<tr>
<td>Rotation angle</td>
<td>68°</td>
<td>68°</td>
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<td>Throttle valve diameter</td>
<td>35 mm</td>
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<td>Operation temperature</td>
<td>-40 °C up to +720 °C</td>
<td>-40 °C up to +720 °C</td>
<td>-40 °C up to +720 °C</td>
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<tr>
<td>Weight</td>
<td>0.9 kg</td>
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<table>
<thead>
<tr>
<th>APOLLON Actuators for EGR-TV</th>
<th>EGR-DA 18</th>
<th>EGR-DA 35</th>
<th>EGR-DA 45</th>
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<tbody>
<tr>
<td>Operating voltage</td>
<td>9 - 30 V</td>
<td>9 - 30 V</td>
<td>9 - 30 V</td>
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<tr>
<td>Peak torque</td>
<td>1.8 Nm</td>
<td>3.5 Nm</td>
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<tr>
<td>Continuous holding torque</td>
<td>1.2 Nm</td>
<td>2.0 Nm</td>
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<td>Rotation angle</td>
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<td>90°</td>
<td>90°</td>
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<tr>
<td>Opening/closing response</td>
<td>200 ms</td>
<td>250 ms</td>
<td>300 ms</td>
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<td>Protection class</td>
<td>IP6K9K</td>
<td>IP6K9K</td>
<td>IP6K9K</td>
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<td>Operating temperature</td>
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<td>-40 °C up to +150 °C</td>
<td>-40 °C up to +150 °C</td>
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<tr>
<td>Weight</td>
<td>Accord design: with or without water cooling</td>
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<td>up to 0.5 MW</td>
</tr>
<tr>
<td>Flow rate at 100 mbar</td>
<td>145 kg/h</td>
<td>315 kg/h</td>
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<tr>
<td>Minimum flow area</td>
<td>430 mm²</td>
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<td>Maximum stroke</td>
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<td>Maximum opening force</td>
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<td>Valve diameter</td>
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<td>-40 °C up to +150 °C</td>
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**ACTIVE PARTICULATE FILTER REGENERATION**

HEINZMANN delivers the following components for active DPF regeneration:

### Double dosing unit PFR-DDU
Double dosing unit for active DPF regeneration: fuel dosing for burner and evaporation for catalytic combustion.

### Electric motor
Electric motors for air supply blowers in burners.

### Leakage safety valve PFR-LSV
Leakage safety valve for all diesel engines with active DPF regeneration system to be installed in fuel pipes.

### Air mass control valve PFR-ACU
Air mass control valve for burner applications in different sizes.

### Single dosing unit PFR-SDU (Injection nozzle)
Single dosing unit for active DPF regeneration. Fuel dosing for catalytic combustion of soot in filters and for burners.

### Injection nozzle with water cooling
**TURBO WASTEGATE**

**Wastegate throttle valves**
For turbo boost control.

![Throttle valve EGR-TV 50](image1.png)

**Wastegate actuators**
Actuators for deflection control of the wastegate throttles (with and without water cooling).

![Actuator EGR-DA 35](image2.png)

**CONTROL UNITS**
Control units for exhaust gas after-treatment systems.

![Control unit MVC 03-8](image3.png)

**CUSTOMISED SOLUTIONS**
HEINZMANN provides customised solution for your specific needs.

**Examples**

![Venturi nozzle](image4.png)

![EEM-TV customised](image5.png)

![Control unit HELENOS DC 2-02](image6.png)
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