



**complete** LPG/CNG systems



### FIRE

c. 500 000 BC  
Eurasia  
Homo Sapiens



### WHEEL

c. 4 000 BC  
Mesopotamia  
Sumerians



### LIGHT BULB

1879  
USA  
T.A. Edison

# STAG-4 BOX

## Breakthrough discovery

2012, Poland



- ⊕ new platform based on 32-bit microprocessor
- ⊕ new compact body
- ⊕ hardware solutions for improved protection of data
- ⊕ controller development options
- ⊕ integration with new diagnostic application
- ⊕ ergonomic user interface
- ⊕ extended diagnostic functions
- ⊕ self-testing capabilities
- ⊕ high precision for gas dosage
- ⊕ resolution 5 microseconds
- ⊕ wide range of operating temperatures (-40°C +120°C)
- ⊕ extra petrol injection
- ⊕ extended functionality for managing oxygen sensors

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As provided by the program of continuous improvement at AC S.A., the information is subject to modification without notice.

## View of the LPG system

**6** gas filter



**5** pressure sensor



**3** solenoid valve



**4** LPG/Petrol switch with indicator



**1** sequential injection controller



**7** reducer



**2** injection rails





## STAG BENEFITS FOR EVERYONE

### STAG-200

This line of controllers is designed for owners of cars manufactured in mid 90's and 00's, who like economical and affordable driving.

**"This car is a present from my parents. I use it to get to the university, I have plenty of other things to pay for, so I have chosen the most affordable option – STAG-200-4. It was like hitting the bull's eye. The car drives perfectly, and I can save my time and money."**

**Marcin. Student from Cracow, Poland**



### STAG-4 plus

This line of controllers is designed for cars manufactured a few years ago, featuring a simple engine management system, with relatively little technological requirements as regards LPG systems. This controller will work equally well with modern cars. This is a perfect line for drivers with economical driving in mind, who also demand good quality.

**"I appreciate quick and simple choices that's why decided to get the new option of STAG-4 PLUS. It was quickly and easily installed and now I can appreciate reliable, low cost maintenance of my car."**

**Zbigniew, pensioner from Gdańsk, Poland**



### STAG-300 ISA2

This line of controllers is designed for modern cars owned by drivers who look for good-quality and reasonably priced solutions. The characteristic feature of this line of controllers is broad capabilities of the operating software.

**"I don't like to risk when it comes to my family. I'd rather avoid unpleasant surprises and I think the high quality should be the choice. That's why I choose STAG-300 ISA2."**

**The Piotrowski family from Sandomierz, Poland**



## STAG BENEFITS FOR EVERYONE

### STAG-300 premium

This line of controllers is designed for state-of-the-art cars with technical requirements calling for cutting edge controllers, featuring the Smart Autoadaptation System. Drivers who choose this line of products demand quality, prestige and reliability.

**"I work and travel a lot. My car is a important thing to me, I spend a lot of time driving. I must be absolutely sure that it is in working condition and does not fail me on the road, nor in rough terrain. I choose top-class cars, therefore I decided to buy a highly advanced LPG system. It will ensure comfortable driving and reliability. All in all, I love comfort and top quality, thus I invest only in the best solutions. I have chosen STAG-300 premium."**

**Monika, Brand Manager  
from Warsaw, Poland** Monika, Brand  
Manager z Warszawy



### STAG 400 DPI

The Line of controllers designed for high standard vehicles equipped with 4 cylinder Direct Petrol Injection engines from the Volkswagen group. Vehicles equipped with STAG 400 DPI become more economical and environmentally friendly. STAG 400 DPI is the only controller on the market guaranteeing precise gas injection within full RPM range.

**"I wanted to make my Volkswagen more economical, but it took a long time to find a good system for direct petrol injection. Finally I did, and now I have a new generation LPG controller STAG 400 DPI. I'm really glad I found it."**

**Łukasz  
Businessman from Zielona Góra,  
Poland**



# STAG 400 DPI CONTROLLER

## STAG 400 DPI

STAG 400 DPI first and only controller on the market guaranteeing precise gas injection for direct petrol injection engines



design	Aluminum, water-resistant housing	●
	Built-in advanced petrol injector emulator	●
functional features	Precise gas injection within full RPM range and optimized gas dosing	●
	Maintainig key engine performance parameters:HP, toprque, RPM on exactly the same level as in the case of petrol injection	●
	Automatic gas level indicator	●
	Automatic changeover to petrol on empty tank	●
	Automatic changeover to gas	●
	LPG ignition	●
	Gas system inspection reminder	●
installation and calibration	Intuitive controller calibration	●
	Precise view of working parameters on the oscilloscope	●
	Aligning the mixture ratio based on information on petrol injection times	●
	Communication with every OBD II and EOBD system	●
	Fixed connection with the car's OBD, with no impact on the OBD system operation, allowing for connection of testing and diagnostic equipment, etc.	●
	Working parameters can be adjusted manually	●
software features	3D graphical map	●
	Engine's RPM signal filters	●
	Setting maximum engine overload for gas propulsion	●
	Standard and turbocharged engine types	●



## ELECTRONICS

### SEQUENTIAL GAS INJECTION SYSTEMS

#### STAG-4 Q-BOX



STAG-4 Q-BOX controller for sequential gas injection has been designed for vehicles with 4-cylinder engines with multiple fuel injection. The unit is equipped with all the functions available in our well-known controllers: STAG-4 and STAG-300 series. The construction of the controller is based on a modern, high-efficiency 32-bit processor, which allows the precise dosage of LPG or CNG improving the response to changing engine parameters. The new hardware platform makes possible to add new functions, and further extend or improve the auto-adaptation capabilities.

#### STAG-300 premium



STAG-300 premium is a new generation controller equipped with Smart Self-Adaptation System ISA. System constantly monitors short and long term STFT and LTFT corrections. STAG-300 Premium easily communicates with every OBD II and EOBD auto systems (not only CAN) by the STAG-OBDDAPTER which aside from standard parameters enables the read out of your vehicle's ECU corrections.

## CONTROLLERS

#### STAG-300 ISA2



The sequential gas injection controller STAG-300 ISA2 is fitted with the second generation Smart Self-Adaptation System ISA2. The main task of the ISA2 System is the continuous and automatic modification of the gas maps as a function of the engine's rotational speed based on master petrol map.

#### STAG-4 plus



Miniaturized microprocessor sequential gas injection controller STAG-4 plus is fitted with software and contains an additional 3D graphical map which allows the precise control of gas injection depending on the rotational speed of the engine.

#### STAG-200



Microprocessor based gas injection controller. The device controls gas injection on the basis of sequential or non-sequential petrol injection

### MIXER GAS INJECTION SYSTEMS

#### STAG-150



Microprocessor based stepper motor controller (actuator). It controls gas dose with respect to lambda probe readings.

Features:

- internal emulator of four petrol injectors with the option of changing the effective resistance 100/50  $\Omega$ .
- control panel with gas level indicator
- parameters adjusted by computer

#### STAG-100



Microprocessor based stepper motor controller (actuator). It controls gas dose with respect to lambda probe readings.

Features:

- single point internal emulator
- control panel with gas level indicator
- parameters adjusted by computer.

#### STAG-50



Microprocessor based stepper motor controller (actuator). It controls gas dose with respect to lambda probe readings.

Features:

- control panel with gas level indicator
- parameters adjusted by computer.

#### STAG-XL



Microprocessor based stepper motor controller. It controls gas dose with respect to lambda probe readings as well as throttle position sensor and simulates lambda probe. Parameters adjusted by switches\computer.

#### STAG-L plus



Microprocessor stepper motor controller controls the gas flow on the basis of lambda probe and TPS indications. Simple configuration by means of switches.

**STAG-E1-2**

Universal emulator of 1 or 2 petrol injectors. If the device emulates single petrol injector, emulation resistance may be set to 100/50/33/25  $\Omega$ . If the device emulates two petrol injectors, emulation resistance may be set to 100/50  $\Omega$ .

**STAG2-E6**

Emulator for 6 cylinder engines with multipoint fuel injection and internal resistance of 100  $\Omega$ .

**STAG2-E4**

Emulator for 4 cylinder engines with multipoint fuel injection and internal resistance of 100  $\Omega$ .

**STAG-EU4**

Range of universal emulators for 4 cylinder engines with multi-point fuel injection. Adjustable effective resistance of emulation 100/50/33  $\Omega$ .

## FPE-V



Fuel Pressure Emulator FPE dedicated for Volvo vehicles. While powered by gas there is a lack of fuel intake from petrol rail and the petrol pressure rises above the base value. Because of that petrol ECU shortens injection timing and/or reports an error.

## FPE-GM



Fuel Pressure Emulator (variable pressure) to eliminate the error report in vehicles equipped with the pressure sensor at the petrol injection rail

## FPE



Fuel Pressure Emulator FPE duplicates the correct petrol pressure in vehicles powered by LPG or CNG. FPE type EMULATOR should be used to avoid the error report. FPE EMULATOR is necessary in following types of vehicles: Ford: Escape 3.0 V6, 2007 Explorer, 2004 F150, Jaguar X-Type 2.5 V6 24v Multipoint '02 XB (OBD), Jaguar 2.5l and 3.0l, Mustang 4.0, Volvo 5cyl. 2.4l. Fuel Pressure Emulator FPE is also compatible with other types of vehicles, not mentioned above, with fuel pressure sensor in petrol rail (mostly Ford group engines).

## FLE-P



FLE-P type EMULATOR restores the correct fuel level readout in vehicles powered by LPG/CNG which are equipped with on-board computer ECU.

## FLE-FC



The emulator of fuel level type FLE-FC is designed for vehicles (mainly by French manufacturers) equipped with float switch resistance rated 0 - 600Ω; the measurement is based on the current and the ECU calculates the amount of used petrol based on fuel injection pulses and distance.

## ELECTRONICS

## CHANGEOVER SWITCHES

### SEQUENTIAL GAS INJECTION SYSTEMS

#### LED 300



Changeover switch LED 300 with LPG level gauge indicating operating mode. External buzzer produce sound and acoustic effects.

#### LED 400



Basic features

- suitable for vertical and horizontal orientation.
- AC dual color LED with LPG level gauge and operating mode indicator
- light intensity control (LED-400)
- integrated buzzer
- buzzer volume control (LED-400)

### MIXER GAS INJECTION SYSTEMS

#### STAG2-G



Control panel - automatic changeover switch for carburetor engines.

#### STAG2-W



Control panel - automatic changeover switch for fuel injection engines.

## ELECTRONICS

## Time Advance Processors

#### TAP-01



Timing Advance Processor TAP-01 is a microprocessor device used in petrol engine vehicles converted to LPG or CNG. It is designed for vehicles equipped with the Inductive Crankshaft Sensor.

#### TAP-02



Timing Advance Processor TAP-02 is a microprocessor device used in petrol engine vehicles converted to LPG or CNG. It is designed for vehicles equipped with Digital Crankshaft Sensor.



## MECHANICS

## INJECTOR RAILS

### AC W01



AC injector rail is designed for autogas sequential injection systems in cars with internal combustion engines. It ensures the precise dosages of vaporized gas to the engine inlet and each cylinder. AC W01 injector rail is designed for engines with horse power up to 40 hp/cyl.

### AC W01 BFC



AC injector rail is designed for autogas sequential injection systems in cars with internal combustion engines. It ensures the precise dosages of vaporized gas to the engine inlet and each cylinder. AC W01 BFC injector rail is designed for engines with horse power up to 55 hp/cyl.

## MECHANICS

## REDUCERS

### R01 type 150



AC reducer is designed for autogas vapor phase sequential injection systems and ensures continuous stable pressure while supplying the precise fuel dosage to the gas injectors. AC type 150 reducer can be easily fitted in all cars with engines of up to 150 hp.

### R01 type 250



AC reducer is designed for autogas vapor phase sequential injection systems and ensures continuous stable pressure while supplying the precise fuel dosage to the gas injectors. AC type 250 reducer can be easily fitted in all cars with engines of up to 250 hp, particularly turbocharged.

## WORKSHOP EQUIPMENT

### BLUETOOTH



BLUETOOTH interface allows wireless communications between STAG controllers and PC computer equipped with BLUETOOTH module.

## INTERFACES

### USB



USB interface enables communication between STAG controllers and PC computer via USB port.

### RS 232



RS 232 interface enables communication between STAG controllers and PC computer via COM serial port.

### Adapter STAG-50



Control panel - automatic changeover switch for engines with single-point fuel injection.

## WORKSHOP EQUIPMENT

### SCANNERS

### SXC 1011



SXC 1011 Diagnostic Code Scanner is a reliable diagnostic tool for EOBD and OBD II recommended for every LPG/CNG installation workshop.

## WORKSHOP EQUIPMENT

### DATA RECORDERS

### Data recorder



Data Recorder constantly registers parameters from the engine and it is an irreplaceable tool in detecting flaws and errors.

## OTHER COMPONENTS

### WPG-2 WPG-4



WPG-2 (90  $\Omega$  increasing).  
WPG-4 (50 k $\Omega$  decreasing).

## GAS LEVEL INDICATORS

### WPGH-1



Non-contact (Hall sensor) gas level indicator with a linear voltage output.

## OTHER COMPONENTS

### STAG-300 ISA2/ / STAG-4 plus



Controller connection adapter allows switch from STAG-300 ISA2 to STAG-4 plus controller without changing the whole wire set.

## CONTROLLER CONNECTION

### STAG-4 plus/ /STAG-300 ISA2



Controller connection adapter allows switch from STAG-4 plus to STAG-300 ISA2 controller without changing the whole wire set..

## OTHER COMPONENTS

### OBD adapter wireset



It enables quick integration of STAG-300 premium controller with diagnostic interface OBDII/EOBD.

## WIRESSETS

We make wiring harnesses for:

- towing hooks,
- battery (ground) cables,
- automotive gas systems,
- tractors,
- fork-lift trucks and motorcycles,
- special-purpose vehicles (including ambulances and fire trucks).



## MINIKIT

In order to provide our end customers with products which meet all their expectations regarding quality and operation, we have created MINIKIT AC.

MINIKIT AC is a LPG kit including STAG-300ISAI or STAG-4 plus controller with wire set and accessories (pressure sensor, two temperature sensors, petrol/LPG switch, LPG level indicator, buzzer, software, and cable ties), reducer, injection rail and gaseous phase filter.

In our kits, only those components which have been tested for reliability and appropriate configuration have been used. As the result of our efforts, we offer a few dozen of MINIKITS AC for 3, 4, 5, 6 and 8-cylinder engines. When selecting MINIKIT, please make sure that the reducer matches the engine power (sometimes it is necessary to use two reducers).

Currently, in our MINIKITS we use components of the following manufacturers:



- Injector rails: AC W01  
AC W01 BFC  
VALTEK typ 34  
VALTEK typ 30  
RAIL IG1/ AC  
MAGIC JET  
OMVL REG FAST  
HANA
- Reducers: AC-R01 150 (for engines with power up to 150 hp)  
AC R01 250 (for engines with power up to 250 hp)  
TOMASETTO ALASKA (for engines with power up to 90 hp)  
ZAVOLI ZETA/N (for engines with power up to 150 hp)  
KOLTEC VG 392 (for engines with power up to 200 hp)

## CONTACT

### AC Spółka Akcyjna

ul. 27 Lipca 64, 15-182 Białystok, Poland  
tel. secretary +48 85 743 81 00  
fax secretary +48 85 653 93 83  
e-mail: [info@ac.com.pl](mailto:info@ac.com.pl)  
[www.ac.com.pl](http://www.ac.com.pl)

### Trade Department - Autogas Export Selling

tel. +48 85 743 81 48  
tel. +48 85 743 81 58  
tel. +48 85 743 81 68  
tel. +48 85 743 81 69  
tel. +48 85 743 81 76  
fax +48 85 653 86 49

### Trade Department - Automotive Parts & Accessories

tel. +48 85 743 81 11  
tel. +48 85 743 81 46

## AC S.A. IN THE WORLD







**NEW!**

**STAG  
DIESEL**

**COMING SOON!**

**LPG/CNG system for **DIESEL** engines**

