

# EVOLUTION III

## DATA SHEET

### Description

The EVOLUTION III Fuel throttle valve is a mechatronic assembly consisting of a valve, position servo and digital flow controller with associated redundant pressure instrumentation. In application, the assembly is mounted between pipe reducers as part of a complete fuel system. An optional temperature sensor can be fitted in the upstream pipe section to permit the flow controller to compensate for changes in gas fuel temperature.

The valve is normally fitted in a line between the safety shut off system and the gas turbine fuel manifold. In use the flow controller receives a process demand signal from the turbine control system which may be calibrated in terms of heat, mass or volume flow units. The EVOLUTION III simply positions its throttle valve to deliver the demanded flow to the turbine manifold independently of fuel supply pressure or temperature so long as the fuel supply pressure is sufficient.

EVOIII is designed to meet ATEX IIC standards to operate with hydrogen, or hydrogen mix fuels.

With the demand for new fuels and the practice of mixing hydrogen into the gas supply grids in Europe: EVOIII systems are already certified.

For multistream dry low emission systems, an EVO III valve is required for each stream.

The EVO III is designed to operate at higher output torque levels than the standard EVO II-HT G unit, extending its range of application to larger and tighter valve types.

### Applications

- Gas fuelled gas turbines up to 6" valve size
- DLE gas fuelled gas turbines up to 6" valve size

### Certificates

- Certified for use in hazardous areas.  
 ATEX IIC standards: II 2G Ex db IIC T4 Gb -20°C Ta +85°C  
 Suitable for use with Hydrogen and Hydrogen-natural gas mixtures.



### Features

High accuracy, flow fully compensated for fuel pressure and temperature, suitable for DLE systems

Absolute repeatability

Highly responsive and stable

Hydrogen ready

Reliable and tolerant to dirty fuel supplies, does not use flow sensor, self-cleaning valve

User configurable and maintainable using free PC application

Network enabled for Profibus, DeviceNet field busses

24 VDC power source only required

Competitive for wide range of turbine sizes

Lifetime self-adjusting seals protect against leakage

## Technical data

Power supply voltage range	18 ... 32 VDC
Power supply current range	<1 A (steady state) through 20 A (accelerating)
Ambient temperature range	-20 up to +85°C
Environmental rating	IP56
Hazardous area certification	Ex'd' IIC T4 Gb
Maximum torque	42 Nm at 20 A
Maximum power	500 W
Small signal bandwidth	5 Hz
10 ... 90 % positioning transit time	300 ms
Fuel gas pressure measurement range	0 ... 25 bara standard
Fuel gas temperature measurement range	-40 ... +150°C (with optional external 2 wire Pt 1000 sensor) otherwise fixed to customer defined temperature
Position feedback accuracy	0.024 % with no short or long term drift (measured at valve shaft)
Signal demand	4 ... 20 mA isolated user scalable to heat (kW thermal) mass (kg/min) or volume (Ncm/h) flow units.
Position achieved feedback	4 ... 20 mA isolated equivalent to 0 ... 90 % valve position
Dry contact output 1	Throttle valve min pos (NC when valve is closed)
Dry contact output 2	Fault detected (NO when fault is detected)
Faults monitored	<p>Watchdog timeout</p> <p>Upstream pressure sensors disagree</p> <p>Downstream pressure sensors disagree</p> <p>Upstream pressure sensor out of range</p> <p>Downstream pressure sensor out of range</p> <p>Upstream temperature sensor out of range (if configured)</p> <p>Valve position sensor out of range</p> <p>Valve position error</p> <p>Excessive internal temp. (TRIP = 95°C)</p>
Fault log	Event counter for each fault type since last reset
Fieldbus network types available	DeviceNet, Profibus (1)
Flow metering algorithm	IEC S75.01 standard for real gas
Flow control recursion rate	10 milliseconds
Position servo recursion rate	1 millisecond
Final drive type and frequency	Four quadrant pulse width modulated 5kHz
Transient maximum current limit	Up to 90% of power supply current rate reducing to < 1 A after 2-3 sec (measured with 3" T5 Neles valve)
Servo gearbox type and ratio	25:1 two stage planetary low backlash
Field electrical connection	Screw terminals at non valve end accessed through threaded cover in end plate. Cable entry through four radial M20 x 1.5 threaded gland holes
Pressure connection	Four ¼" NPT female ports in valve end plate
Maintenance connection	RS232 protocol, connection for freeware PC application supplied by HEINZMANN Regulateurs Europa
Valve actuator shaft	20 mm keyed

**Notes**

DeviceNet is a trade name of Allen Bradley Inc. Profibus is a trade name of Siemens.

Must be specified at the time of ordering

Where the protocol is control-device type, all implementations are device type.

Valve shown on drawing is a Metso T5 3" valve.

Overall weight will vary with valve selected for use.

**Dimensions**

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