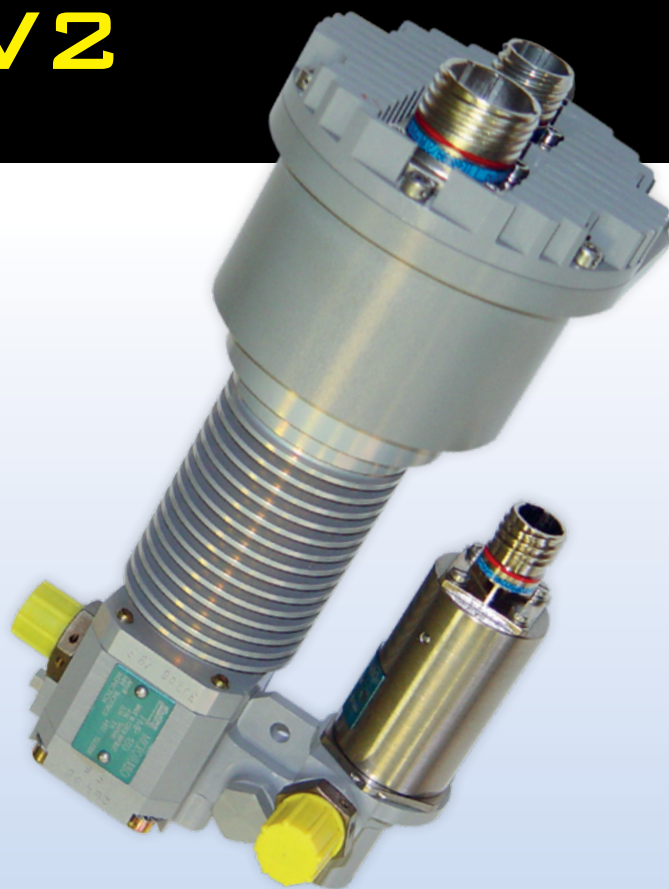
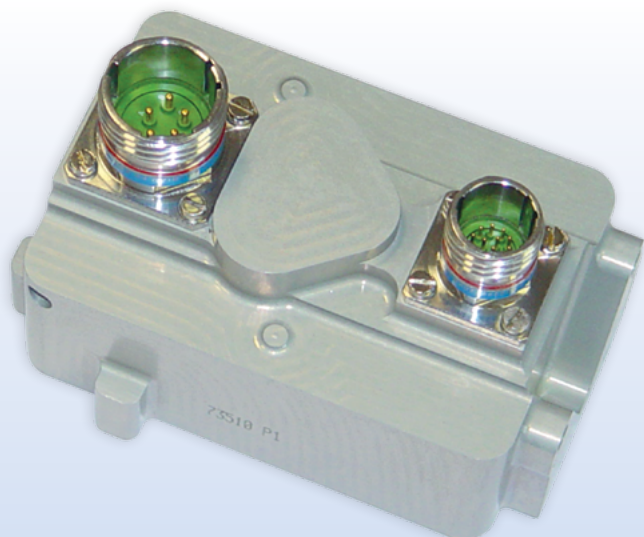


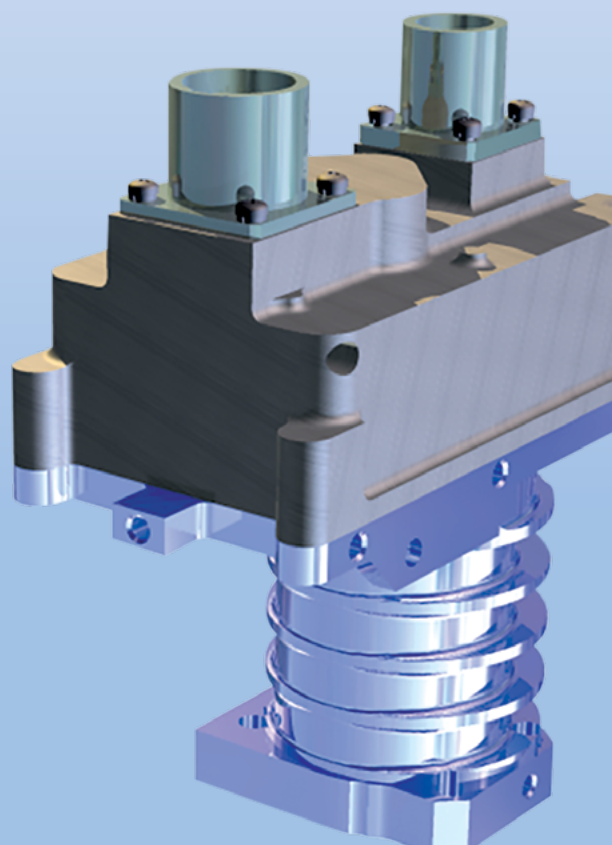
THE FMPC-V2



The FMPC-V2 is an electronic control system (composed of HW and SW parts developed by UNIS company) and together with the brushless DC motor, hydraulic pump and 3-wave solenoid valve presents the FMP (Fuel Metering Pump). The FMP is a part of the APU fuel system and its main function consists in feeding the gas generator nozzles of the APU with the required fuel flow and pressure to guarantee a constant turbine speed.

The FMPC-V2 is powered from the 28V primary and secondary on-board systems. The FMPC-V2 is controlled through the START/STOP digital input, RS-422 serial interface or by an analogue input signal for setting up the required fuel flow. The primary function of the FMPC-V2 is to control a six-pole 3-phase brushless DC motor; furthermore, it provides fuel temperature monitoring at the pump inlet, the current consumption, the temperature of power bridge transistors, the supply voltage level.

The FMPC-V2's control SW was developed in accordance with the document RTCA DO178B level B.



FMP architecture

FMPC-V2's main control application has a two main states:

- **Power-up state** - Power-up State serves for initialization of whole device, performs PBITs (Power-on Built in Tests)
- **Operational state** - In Operational State all the necessary functions for required behavior are performed, such as communication with ECU, general IO handling (measurement and evaluating of the signals, fuel flow regulation and compensation algorithm, rpm measurement, electronic commutation and CBITs (Cyclical Built in Tests). The FMP is controlled at variable flow by the ECU to maintain the APU speed constant. The FMP controls the fuel flow by varying the pump speed for the following APU operations:
 - » start the APU (open loop: no closed loop control on APU speed for the ECU),
 - » maintain the APU speed at a constant value (closed loop control on APU speed for the ECU) and transferred to the FMP via the digital data bus or/and the analog setting input.

Work environment

Operating ambient temperature: from -55 to $+85^{\circ}\text{C}$
 for a short-time from -55 to $+125^{\circ}\text{C}$
 Temperature storage range: from -40 to $+70^{\circ}\text{C}$
 Altitude range: from -1000 to 51000 ft

Power supply

Nominal voltage 28 VDC
 Operating voltage from 18 to 32 VDC

Input power

Max. input power 450 W

Motor type

Structure 3-phase with permanent magnets, brushless
 Number of poles 6

Operating period and technical life

Technical life 20 000 running hours or 20 years

FMPC-V2 unit weight

FMPC-V2 unit 495 g including the heat sink and connectors
 FMPC-S sensor board 3 g

FMPC-V2 unit dimensions

FMPC-V2 unit (l x w x h) 120 x 70 x 73.5 mm
 FMPC-S sensor board (l x w x h) 44 x 25 x 9.5 mm

Environmental conditions

The unit meets the RTCA/DO-160F regulations.

