



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



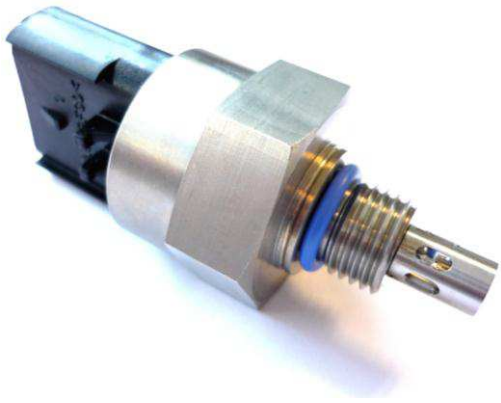
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





FPS2800B12C4

Fluid Property Sensor

SPECIFICATIONS

- Fully integrated, stand-alone module combines sensor and processing electronics
- Accurate, repeatable temperature, viscosity, density and dielectric constant
- Factory calibrated with NIST traceable fluids
- Digital output as per J1939, CAN2.0B standard or CAN2.0A featuring high-resolution parameter readings

The FPS2800B12C4 is a novel fluid property sensor that will directly and simultaneously measure the viscosity, density, dielectric constant and temperature of fluids. Relying on patented tuning fork technology, the sensor monitors the direct and dynamic relationship between multiple physical properties to determine the quality, condition and contaminant loading of fluids such as engine oil, fuel, transmission and brake fluid, hydraulic and gear oils, refrigerants and solvents. The multi-parametric analysis capability improves fluid characterization algorithms. The FPS provides in-line monitoring of fluids for a wide range of OEM and aftermarket installations including fluid reservoirs, process lines and pressurized high flow conduits (e.g., engine oil gallery) for applications that include on and off highway vehicles, HVAC&R, compressors, industrial equipment and turbines. A universal digital CAN J1939 compliant protocol provides easy to connect interface to main Host controller. A simple 4 pin connector allows for cost effective mounting options.

FEATURES

- Rugged construction for high pressure and high flow environments
- Proprietary corrosion and contaminant resistant coating for wetted parts
- On-board microprocessor for real-time data analysis with 12 - 24 volts supply
- Highly reliable and long term stability

APPLICATIONS

- On and Off Highway Vehicles
- HVAC&R
- Compressors
- Industrial Equipments
- Turbines

PERFORMANCE SPECIFICATIONS

MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Supply Voltage (Peak)	V_{cc}	60	V _{dc}
Ambient Operating Temperature (electronics)*	T_e	-40 to +125	°C
Ambient Operating Temperature (fluid)*	T_f	-40 to +150	°C
Storage Temperature**	T_{stg}	-50 to +150	°C
Input Current @12Vdc (In rush)	I_{max}	< 200	mA
Operating Pressure	P	25 (Note 1)	Bars
Vibration (Peak)		20	Grms

Peak conditions: less than 10% of the operating time.

NOTE: 1 Elevated pressure ratings are available, contact MEAS France for specs.

* Ambient Operating Temperature: Service temperature range at which the sensor and its electronics can operate securely.

** Storage Temperature: Temperature range at which the sensor can be stored with no risk of damage.

METROLOGICAL CHARACTERISTICS

(@V_{cc}=12V_{dc}, T=100°C, unless otherwise noted)

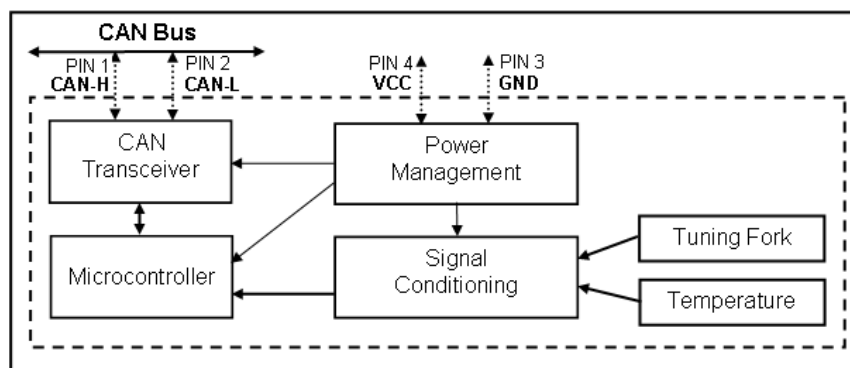
Multi-Parametric Measurement Ranges	Symbol	Min	Typ	Max	Unit
Viscosity (dynamic)	μ	0.5	15	50	mPa-s (cP)
Viscosity (dynamic) Accuracy for viscosity > 10 mPa-s (cP)		-5	+/-2	+5	% Value
Viscosity (dynamic) Accuracy for viscosity < 10 mPa-s (cP)			+/- 0.2		mPa-s (cP)
Density	ρ	0.65	0.85	1.50	gm/cc
Density Accuracy		-3	+/-1	+3	% Value
Dielectric Constant	ϵ	1.0	2.0	6.0	-
Dielectric Constant Accuracy		-3	+/- 1	+3	% Value
Fluid Temperature	T	-40		150	°C
Temperature Accuracy	T		0.1		°C

ELECTRICAL CHARACTERISTICS

(@V_{cc}=12V_{dc}, T=100°C, unless otherwise noted)

Electrical Characteristics	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{cc}	9	12	36	V _{dc}
Supply Current (steady state)	I_{avg}		70	100	mA

BLOCK DIAGRAM



TRANSMISSION DATA

Viscosity	Min	Typ	Max
Data Range (mPa-s)	0.0		1003.9
Limits (DATA)	0x0000		0xFAF9
Resolution (mPa-s per bit)		0.015625	
Update period (s)		30	

Density	Min	Typ	Max
Data Range (gm/cc)	0.000		1.9608
Limits (DATA)	0x0000		0xFAF6
Resolution (gm/cc per bit)		0.00003052	
Update period (s)		30	

Dielectric Constant	Min	Typ	Max
Data Range (-)	0.00		7.842
Limits (DATA)	0x0000		0xFAF1
Resolution (- per bit)		0.00012207	
Update period (s)		30	

Temperature	Min	Typ	Max
Data Range (°C)	-273.0		+1735
Limits (DATA)	0x0000		0xFB00
Resolution (°C per bit)		0.03125	
Update period (s)		30	

SELF DIAGNOSTIC

Status message code	Bit position
Tuning Fork – impedance below normal or shorted to ground	1
Tuning Fork – impedance above normal or sensor damaged	2
Tuning Fork – ASIC over temperature conditions	3
Fit – simplex algorithm failed to converge	4
RTD – resistance below normal or shorted to ground	5
RTD – resistance above normal or sensor damaged	6
RTD – sensor temperature over temperature conditions	7
Internal – system error	8

Diagnostic bit is set to '1' when error is detected

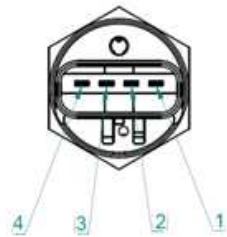
FPS2800 Standard SPN and Standard PGN

Parameter	SPN	PGN	Byte Position	Length (byte)
Dynamic Viscosity	5055	64776	1	2
Density	5056	64776	3	2
Dielectric Constant	5468	64776	7	2
Oil Temperature Sensor	175	65262	3	2
Status code message	N/A	65329	1	1

No delay is required between command write and data read.
CAN transmission Baudrate = 250kbps

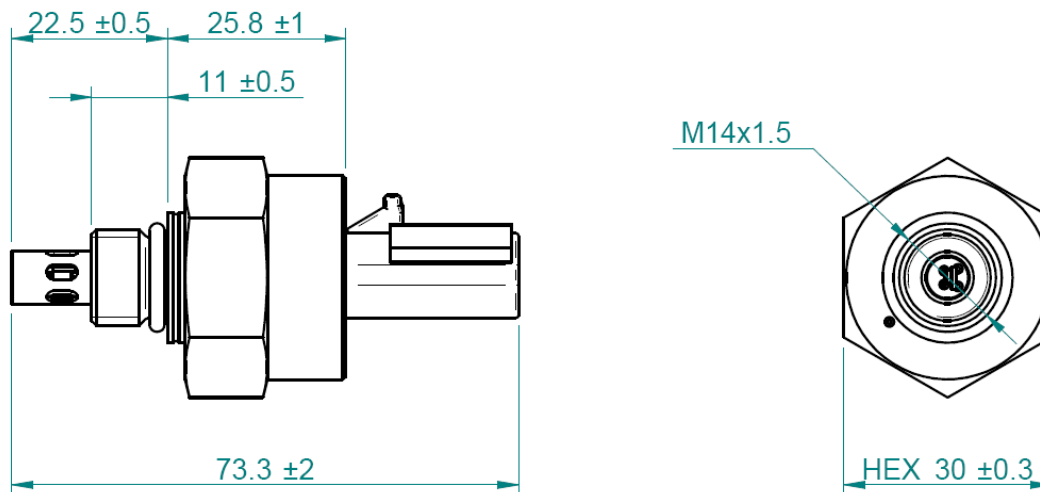
CONNECTING & MECHANICAL PACKAGING

PINOUT ASSIGNMENT (SUBJECT TO FURTHER CONFIRMATION)



N ₀	Function
1	CAN_H
2	CAN_L
3	GND – Ground
4	VCC – Voltage Supply

MECHANICAL CHARACTERISTICS: FPS2800B12C4 PACKAGE OUTLINE



All dimensions are millimeters (mm). Mating connector type is FCI female receptacle ref. 54200409 (black-sealed). Sensor body is stainless steel.
M14 Viton O'ring provided for hermetical mounting.

NOTE: For installation details, please refer to the MEAS France FPS Installation Guide – FPC013.

FPS OPTIONAL PARTS

The FPS can be provided with

- A CAN Viewer Software which allows to visualize the measured values with a PC
- A CAN-USB interface, which enables communication between PC and FPS
- A Mating connector with pigtail wires

These parts should be ordered on purchase.

RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- FPS2800B12C4 contains circuits to protect its inputs and outputs against Electrostatic discharges (ESD) up to $\pm 25\text{kV}$ (air discharge)
- FPS2800B12C4 is protected against EMC interferences (SAE J1113-4)
- FPS2800B12C4 is protected against reverse polarity
- FPS2800B12C4 is cross wire protected
- Additional tests under harsh chemical conditions demonstrate good operation in presence of 5% nitric acid, soot, fuel, water, oxidized oil, a non-exhaustive list

NOTE: This FPS and its use may be covered by one or more patents, including US Patents 6,957,565; 6,873,916; 6,494,079; 6,336,353; 7,043,969 and other pending US and worldwide patents.

ORDERING INFORMATION

Part Number for the Generic Version is **FPP800A110**.

For any specific application, please contact MEAS.

* The FPS2810B12C4 has been replaced by the FPS2800B12C4.

* Without specification, each order will be delivered with the Generic version of the FPS2800B12C4 (Calibration point at medium viscosity and medium temperature).

EUROPE

MEAS France SAS
a TE Connectivity Company
Impasse Jeanne Benozzi
CS 83 163
31027 Toulouse Cedex 3
FRANCE
Tél: +33 (0) 5 820 822 02
Fax: +33 (0) 5 820 821 51
Sales: fluid.sales@meas-spec.com

TE.com/sensorsolutions

Measurement Specialties, Inc., a TE Connectivity company.

Measurement Specialties, TE Connectivity, TE Connectivity (logo) and EVERY CONNECTION COUNTS are trademarks. All other logos, products and/or company names referred to herein might be trademarks of their respective owners.

The information given herein, including drawings, illustrations and schematics which are intended for illustration purposes only, is believed to be reliable. However, TE Connectivity makes no warranties as to its accuracy or completeness and disclaims any liability in connection with its use. TE Connectivity's obligations shall only be as set forth in TE Connectivity's Standard Terms and Conditions of Sale for this product and in no case will TE Connectivity be liable for any incidental, indirect or consequential damages arising out of the sale, resale, use or misuse of the product. Users of TE Connectivity products should make their own evaluation to determine the suitability of each such product for the specific application.

© 2015 TE Connectivity Ltd. family of companies All Rights Reserved.