APTS TECHNICAL DATASHEET

APTS SENSORS – Abdominal Pressure Twin Sensors

Since 2016, Transpolis has been manufacturing Abdominal Pressure Twin Sensors (*) for the Q-series infant to child dummies used for crash tests (front and side impact testing). APTS sensors are an essential tool for in-depth assessment of child restraint systems. This is a unique sensor to evaluate abdominal injury and sub-marining for occupant safety prediction. The use of APTS has been specified in UN-ECE regulation R129 in replacement of the UN-ECE R44. Moreover, most NCAP programs worldwide use Q dummies in their injury assessment capabilities. Each sensor is made of a soft and robust cylindrical elastomer bladder, filled with a specific liquid and sealed with a mechanical head. The sensor head includes a miniature pressure cell and signal conditioning electronics. The key design of the fluid-elastomer assembly enables a very high biofidelity with the real stiffness of abdominal tissues. The ability of the restraint system to meet injury regulatory criteria is assessed by recording the pressure inside the abdomen during the crash impact. For impact testing, the sensors are inserted vertically by pair in the abdomen. APTS sensors are available in three variants:

- APTS-D30 for Q1 and Q1.5 child dummy
- APTS-D40 for Q3 and Q6 child dummy
- APTS-D50 for Q10 child dummy

(*) patented by IFSTTAR

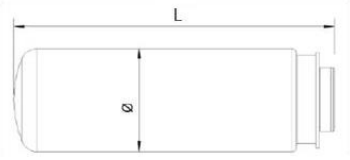
TECHNICAL SPECIFICATIONS

Performance, environmental and electrical characteristics

Range (bar / psi / kPa)	5 / 73 / 500	Safe temperature (°C)	-20 to 70
Safe overload	150%	Compensated temperature (°C)	0 to 50
Rated output (mV/bar) (1)	0.42 ±20%	Temperature effect on zero (%RO/°C)	±1%
Non linearity (%RO)	±1.5% max.	Safe excitation (VDC)	2.4 to 18
Hysteresis (%RO)	±1% max.	Bridge resistance (Ω)	350 ±10%
Cable	Length 9m, PTFE coated, copper wires 6 x AWG 28/7	Compliance	RoHS 3 directive (2015/863/CE)
Plug	Lemo FGG.00.306.CLAD35Z	TEDS (IEEE P1451.4)	DS2431 1024-bit EEPROM chip

Mechanical characteristics

Sensor type	APTS-D30	APTS-D40	APTS-D50
Dimensions L × D (mm)	105 × 30	125 × 40	141 × 50
Weight (g)	81±2%	160±2%	272±2%
Special abdomen P/N	Q1/1.5 : 036-5005	Q3 : 020-5005 Q6 : 033-5005	Q10 : 010-4309
Biofidelity static response (bar/mm) (2)	1.01/10.81 ±10%	0.67/16.51 ±10%	0.60/15.81 ±10%



(1) With constant reference voltage 2.05 VDC
(2) Data obtained after static compression test with a belt: measurement of the pressure (bar) and the deflection (mm) with 250 N load.

NOTA 1. – APTS sensors are provided with a calibration certificate of conformance (pressure and biofidelity)
NOTA 2. – APTS sensors are designed to support severe impact when used in standard conditions (see user manual). In case of damage, repair services are available under certain conditions (see warranty conditions and technical change notice).

INFORMATION

➔ Adapter cord assembly on request
➔ New features:

- Miniature strain gage pressure cell
- High stability excitation voltage reference
- TEDS ready
- Robust and low ageing bladder elastomer
- Robust PTFE cable

NEW

Plug pin assignment

1 + Excitation (red)
2 – Excitation (black)
3 + Signal output (green)
4 – Signal output (white)
5 + TEDS IO (yellow)
6 GND

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