

## APTS - THOR 5F/50M DESCRIPTION



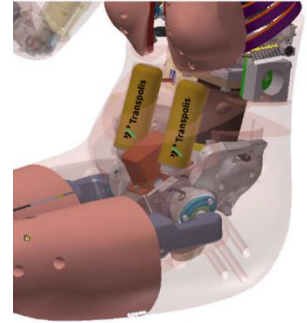
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Since 2016, Transpolis has been manufacturing Abdominal Pressure Twin Sensors (patented by Gustave Eiffel University) for the Q-series infant to child dummies used for crash tests (front and side impact testing). APTS sensors are an essential tool for in-depth assessment of abdominal risk injuries and occupant safety prediction. The THOR series represents the future of crash-test technology – the most sophisticated ATDs for assessing whole body trauma in a variety of occupant restraint environments. Transpolis has been committed to the ABISUP project aiming at developing a new abdomen to improve injury prediction on crash test dummies and extending the use of APTS sensors to adult ATDs. In place of IR-TRACCs, Abdomen Pressure Twin Sensors (APTS) are utilized in the upper and lower abdomen as an alternative way to predict abdomen injury and submarining.

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 bio-fidelity 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. They are available in 4 variants:

- 2 APTS - THOR 5F for female ATD dummies and female Autonomous Vehicles ATD dummies
- 2 APTS - THOR 50M for male ATD dummies and male Autonomous Vehicles ATD dummies



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## 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
Sensitivity (mV/bar) <sup>(1)</sup>	0.42 ±20%	Temperature effect on zero (%FS/°C) and output (%/°C)	±1% and ±0.3%
Bridge excitation (VDC) <sup>(2)</sup>	2.048	Non linearity (%FS)	±1.5% max.
Nominal range excitation (VDC)	5 to 15	Hysteresis (%FS)	±1% max.
Cable	Length 9m, black polyurethane coated, 32AWG copper wire, outer diameter 2.6 mm	Bridge resistance (Ω)	350 ±10%
Plug	Lemo FGG.00.306.CLAD35Z	Compliance EC directives	RoHS 3 directive (2015/863/EU) EMC directive (2014/30/EU)
TEDS (IEEE P1451.4)	DS2431 1024-bit EEPROM chip		

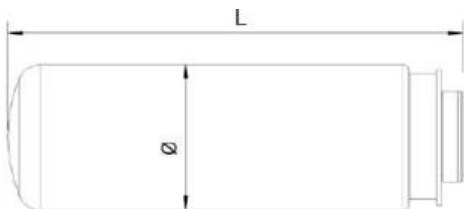
(1) With an excitation voltage from 5 VDC to 15 VDC

(2) Constant and regulated voltage (conditioning electronics in sensor head)

### Mechanical characteristics

Sensor reference P/N	APTS - THOR 5F	APTS - THOR AV-5F	APTS - THOR AV-50M	APTS - THOR 50M-Abisup
Dimensions L × ØD (mm)	125 × 40	125 × 40	141 × 50	121 × 50
Weight (g) <sup>(3)</sup>	160±2%	160±2%	272x±2%	236x±2%
Special abdomen P/N	<i>Humanetics</i> 474-4306 <i>Cellbond</i> 147600	474-4306	478-4400	
Bio-fidelity static response (bar/mm) <sup>(4)</sup>	0.67/16.51 ±10%	0.67/16.51 ±10%	0.60/15.81 ±10%	0.65/15.32 ±10%

(3) Cable not included (4) Data obtained after static compression test with a belt: measurement of the pressure (bar) and deflection (mm) with 250 N load.



**NOTA 1.** – APTS sensors are provided with a calibration and conformance certificate (pressure and bio fidelity) – see calibration service policy

**NOTA 2.** – APTS sensors are designed to support severe impact when used in standard conditions (see user manual).

**NOTA 3.** – Service maintenance and warranty conditions upon request

**NOTA 4.** – User manual, options list, safety datasheet, CE certificate upon request

## NOTES

- Adapter cord assemblies and shorter cable length in option
- Other features:
  - Miniature strain gage pressure cell
  - High stability excitation voltage reference
  - TEDS ready
  - Robust and low ageing bladder elastomer
- Standard compliance : ISO 6487, SAE J2570
- LEMO plug pin assignment
 

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



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