



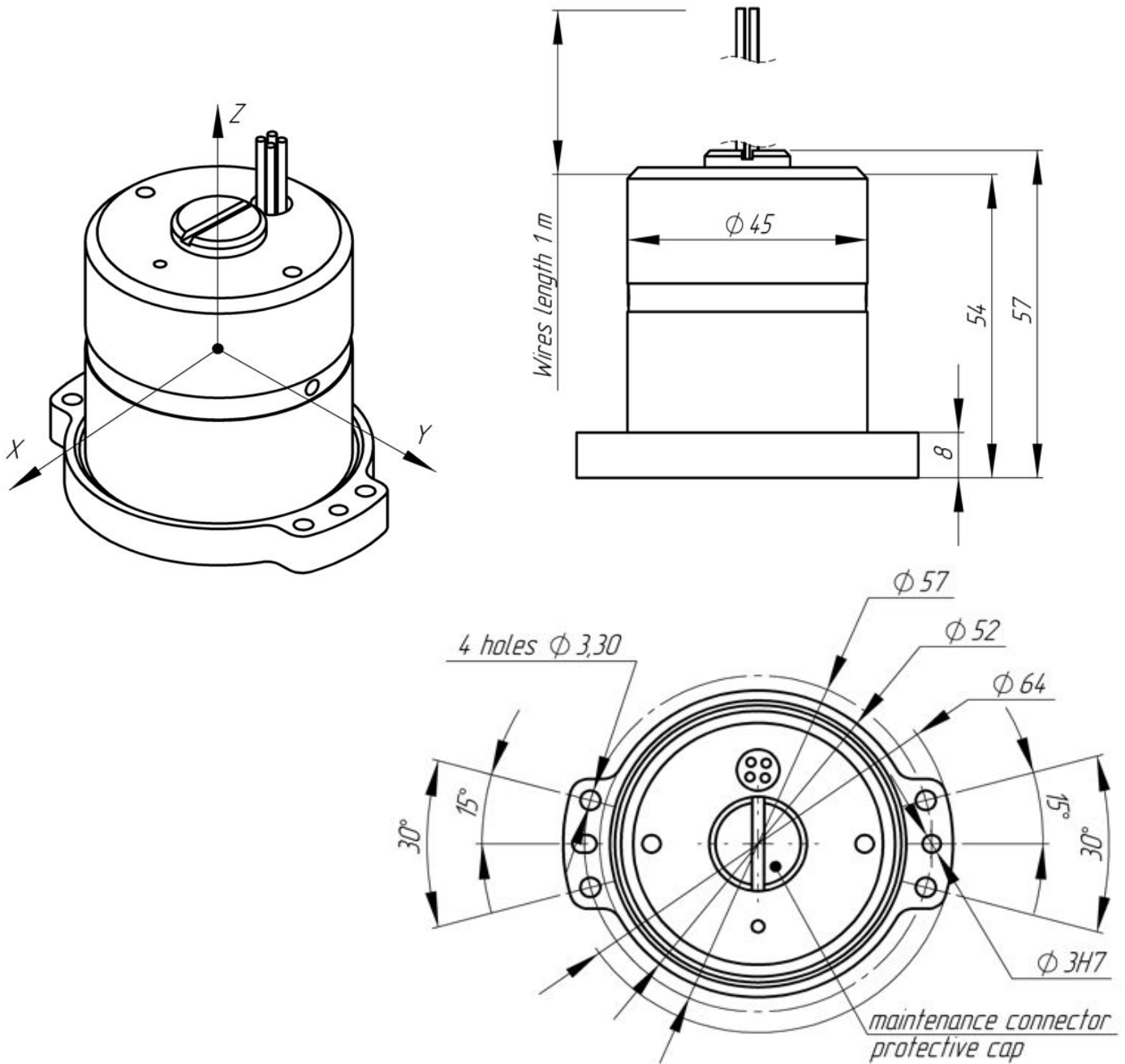
## MEMS IMU AIST-350

AIST-350 is a 6 DOF, fully factory calibrated unit built with two 2-axis STM LPY-510 MEMS gyros (STMicroelectronics) and one 3-axis ADXL-326 MEMS (Analog Devices) accelerometer. The sensors inside the IMU are ovenized with a miniature and smart oven that keeps the temperature of the sensors stable with accuracy of 0.05C if the outside temperature change rate (measured on the mounting flange) is less than 2C/min. If the unit temperature is -40C while initial turn-on, the oven reaches its stable operating temperature in less than 3 minutes provided needed power supply is given. In order for the oven to operate properly, the outside temperature should not be more than +80C.

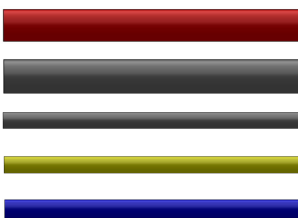
To simplify the unit' operation in integrated with GNSS navigation systems, a PPS channel that synchronizes the IMU data packets with the GNSS receiver PPS signal is implemented in the IMU AIST-350 as a standard feature. Connection to the IMU is done via high-performance silicon wires of 1 meter total length, that keep its mechanical properties (including flexibility) over truly extensive temperature range of -50C to +100C. The wires end with a technological connector JST XHP-5([www.jst.com](http://www.jst.com)) that can be freely cut by the user. In case this connector is kept by the user, we provide the matching connector JST B6B-XH-A with each IMU. The IMU needs to be mounted on a flat surface and positioned accurately with 2 alignment pins (please, refer to the installation guide). The unit is sealed and filled with drained gas with the dew point of -40C. The unit is currently available in 2 modifications, i.e. with the 400 deg/sec gyros measurement range (AIST-350-400) and with 100 deg/sec measurement range (AIST-350-100). The key features of the IMUs are shown for AIST-350-400 and in parenthesis for AIST-350-100.

Parameter	AIST-350	
Number of gyros	3	
Number of accelerometers	3	
Start-up time	< 3 sec.	
Start-up to full performance	<3 min. (from -40C at 20W power)	
Axes non-orthogonality	<2 mrad (<6 ang.min.)	
MTBF ( $\lambda$ -estimate)	>50 000 hours	
<b>Gyros (STM-LPY510)</b>		
Measurement range	400 deg./sec	(100 deg./sec)
SF non-linearity ( $1\sigma$ )	0.1%	
SF instability from turn-on to turn-on ( $1\sigma$ )	0.1%	
In-run bias stability ( $1\sigma$ ) (Allan variance estimation)	15 deg./hour	(12 deg./hour)
Turn-on to turn-on bias stability ( $1\sigma$ )	50 deg./hour	
ARW	0.7 deg./ $\sqrt{\text{hour}}$	(0.5 deg./ $\sqrt{\text{hour}}$ )
Bias G-sensitivity (RMS)	5 deg./hour/g	
Bandwidth (-3 dB)	100 Hz	
<b>Accelerometers (Analog devices ADXL-326)</b>		
Measurement range	16 g	
In-run bias stability ( $1\sigma$ ) (Allan variance estimation)	2 mg	
Noise density	320 $\mu\text{g}/\sqrt{\text{Hz}}$	
Bandwidth	100 Hz	
<b>Interfaces and Operation conditions</b>		
Power supply	8..31 V	
Power consumption of the IMU	0.3 W	
Power consumption of the oven	-40C: 6 W/ +20C: 3W/ +60C: 1W	
Quick warm-up	up to 20W (programmable)	
Interface	RS-232, 115 kbaud, 250 Hz	
Operational vibration	5g (RMS)	
Operating temperature	-40°C .. +80°C	
Dimensions	Ø45x54 mm (Ø64x57 mm by flange and connector cap)	
Weight	< 170 g	

**Due to the ovenized sensor chamber in the IMU, the above given technical specs are guaranteed on a whole operating temperature range, i.e. from -40C to +80C, and with applied random vibration of 5G RMS magnitude in 20-2000Hz spectrum.**



**Power/output connector table**



Color	Description
red (thick)	8-31 B
black (thick)	GND
black (thin)	PPS
yellow	RS-232 RXD
blue	RS-232 TXD

⊕ dimensions are in millimeters