10 MICRON
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by COMEC-TECHNOLOGY

GM2000 HPS II COMBI - TECHNICAL SHEET

TYPE	German Equatorial Mount
WEIGHT (MOUNT)	Combi design: 18,5 kg + 15 kg = 33,5 kg Total weight (73 lb) without accessories
INSTRUMENT PAYLOAD CAPACITY	Up to 50 kg (110 lb)
LATITUDE RANGE	20° – 70°
AZIMUTH FINE ADJUSTMENT RANGE	+/- 10°
COUNTERWEIGHT SHAFT	40 mm diameter, stainless steel, weight 4 kg – 9 lb
AXES	50 mm diameter, alloy steel
BEARINGS	Pre-loaded tapered roller bearings / Roller thrust bearings
WORM WHEEL	215 teeth, 172 mm diameter, B14 bronze
WORM SCREW	24mm diameter, tempered alloy steel, grinded and lapped
TRANSMISSION SYSTEM	Backlash-free system with timing belt and automatic backlash recovery
MOTORS	2 axes AC servo brushless
POWER SUPPLY	24 V DC
POWER CONSUMPTION	~ 0,7 A while tracking ~ 3 A at maximum speed ~ 5 A peak
GO-TO SPEED	Adjustable from 2°/s to 20°/s
POINTING ACCURACY	<20" with internal 25-stars software mapping (max 100 stars). Modeling software available for automatic alignment, such as "Model Maker"

AVERAGE TRACKING ACCURACY	~ 1" typical for 15 minutes / ~ 0,6" RMS with internal 25-stars software mapping and compensation of system flexures and polar alignment errors
SECURITY STOP	+/- 30° past meridian in r.a. (software) +/- 45° past meridian in r.a. (mechanical)
OPERATIONAL TEMPERATURE RANGE (STANDARD)	- 15° C to + 35° C + 05° F to + 95° F
STORAGE TEMPERATURE RANGE	- 40° C to + 50° C - 40° F to +122° F
SPECIAL OPERATIONAL TEMPERATURE RANGE	Optional for very low temperature: -30/-35 °C (-22/-23,8 °F)
COMMUNICATION PORTS	RS—232 port; GPS port; autoguide ST-4 protocol port; Ethernet port
DATABASE	Stars: by Common Names, Bayer designation, Flamsteed designation, Bright Star Catalogue, SAO, HIP, HD, PPM, ADS, GCVS. Deep-sky: M, NGC, IC, PGC ,UGC limited up to mV = 16. Solar system: Sun, Moon, planets, asteroids, comets, artificial satellites. Equatorial and altazimuth coordinates. User definendo objects. Quick slewing positions recalls for frequent focusing or useful operation.
FIRMWARE FEATURES	Integrated 10Micron proprietary firmware as the intelligent core of every mount, engineered for unparalleled pointing and tracking precision. The system features advanced sky modeling capabilities using up to 100 alignment points to compensate for polar alignment, orthogonality, and atmospheric refraction, providing a real-time estimate of the average pointing error. It ensures absolute temporal accuracy through UTC-UT1 and leap second corrections, with synchronization via GPS, PPS signals, or proprietary ClockSync software. Operational flexibility is maximized through adjustable tracking speeds (including sidereal, solar, lunar, and custom rates) complemented by declination-based autoguide speed correction. The firmware supports pointing and tracking past the meridian, user-defined horizon height limits for equipment safety, dedicated filters for comets and asteroids, and a multi-language interface for global accessibility. Direct RS-232 dome control and professional remote assistance via a dedicated server ensure seamless observatory integration. For Direct Drive (DDS) systems, an integrated dynamic Auto-Tuning function eliminates payload-induced resonances.

PC CONTROL	Integrated professional-grade Remote PC control through a versatile architecture supporting Ethernet, Wi-Fi, and RS-232 connectivity. Integration is seamless via proprietary ASCOM drivers or Meade compatible protocols, industrial CANopen protocols, or LX200-compatible command sets. This facilitates comprehensive remote management, including firmware and orbital data updates for satellites and minor planets. The system features a virtual control panel replicating the physical keypad's functionality while supporting multiple concurrent connections for robust observatory automation. Wi-Fi included to control the mount via PC, Tablet, Smartphone etc.
KEYPAD CONTROL	Rugged keypad with metal housing and reliable professional micro switches, Large graphic display – heated for operation under lowest temperatures, dimmable display and keyboard with back-lit keys, five information menu lines for coordinates, object information and symbols showing mount status and active external connections and accessories. All the functionality of the mount is available through the keypad without requiring an external PC.
WEB INTERFACE	Integrated professional-grade web interface for comprehensive remote mount management and configuration directly from any browser, eliminating the need for specialized software. It features a virtual keypad with full operational functionality alongside secure firmware updates and direct access to technical documentation. The proprietary system integrates orbital data management for satellite TLEs, comets, and asteroids, ensuring seamless performance across all devices and operating systems via robust Ethernet or Wi-Fi connectivity.