

# BAHAMA<sup>®</sup>

## MAGNUM

### Mfg. line of ultra-sized heavy & super heavy, yet collapsible all-weather umbrella structures.

- Designed, engineered & warranted to withstand wind i.e. peak gust velocity up to 130 km/h<sup>1)</sup> [80 mph/70 kts] particularly when in UNFOLDED configuration. Snow load range under normal (no or low-wind conditions) basically limited at 10 cm [4 in] in maximum.

<sup>1)</sup> Definition applying to winds/peak gusts acting on the unfolded structure more or less horizontally – not, however, to incalculable stresses by uplifts in rotors as these may occur e.g. in hurricanes/tornados (cyclones) travelling through.

- Structures are suitable for permanent in-ground/-concrete footing only.

#### Standard production sizes:

'ROUND' canopy shape:	Ø 7 m	Ø 8 m	Ø 9 m	Ø 10 m <sup>3)</sup>	Ø 11 m <sup>3)</sup>	Ø 12 m <sup>3)</sup>
Effective ground coverage*:	37 m <sup>2</sup>	48 m <sup>2</sup>	61 m <sup>2</sup>	76 m <sup>2</sup>	92 m <sup>2</sup>	109 m <sup>2</sup>
Arithmetic ground coverage:	[38.4 m <sup>2</sup> ]	[50.2 m <sup>2</sup> ]	[63.6 m <sup>2</sup> ]	[78.5 m <sup>2</sup> ]	[95.0 m <sup>2</sup> ]	[113.0 m <sup>2</sup> ]
SQUARE canopy shape:	□ 7 m	□ 8 m	□ 9.3 m <sup>2)</sup>	□ 10 m <sup>2+3)</sup>	□ 11 m <sup>2+3)</sup>	□ 12 m <sup>2+3)</sup>
Effective ground coverage*:	49 m <sup>2</sup>	64 m <sup>2</sup>	84 m <sup>2</sup>	97 m <sup>2</sup>	117 m <sup>2</sup>	140 m <sup>2</sup>
Arithmetic ground coverage:	[49.0 m <sup>2</sup> ]	[64.0 m <sup>2</sup> ]	[86.5 m <sup>2</sup> ]	[100.0 m <sup>2</sup> ]	[121.0 m <sup>2</sup> ]	[144.0 m <sup>2</sup> ]

\* Resulting from actual canopy edge contours projected vertically – as given upon unfolding and prestraining.

<sup>2)</sup> For reasons of structural stability & redundancy of the superstructure, plan view of these models showing 4 slightly truncated corner sections (twinned diagonal ribs).

<sup>3)</sup> Models/sizes design & tooling works of which have been completed (see <sup>4)</sup>, <sup>5)</sup>, <sup>6)</sup> & <sup>7)</sup> on page 2) and are being built as of 01/2013.

#### Standard supply scope per unit including:

- The ( 1 pc.) factory-preassembled, approx. 180 kg [397 lb] weighing **Standard (In-ground) Footing Console # M-2451** ready to be cast in on site in compliance with manufacturer's foundation drawing coming with. If the the MAGNUM structure(s) is(are) to be equipped & operated with any of the electro-mechanical options, the technically suitable (other than Standard # M-2451) In-Ground **Footing Console** is required – see currently applicable MAGNUM Export Pricelist.
- Model & quantity-related **stowage & cargo-securing custom means** (materials & man-work) on board **either** factory's crane truck (confined to destinations in European countries neighbouring Germany) **or** 40ft open-top sea container (other international destinations) in compliance with most recent EC and German national cargo transport regulations [latter holding factory personnel and employer's executive managers, individually and commonly each, liable under civil and criminal law aspects as well].

#### Design & Function

An ultra-sized standing umbrella structure on a telescopic centre pole with a collapsible superstructure formed by structural compressional and tensional members. Together with the standing centre pole, each 16 articulated arms and 16 stretchers per model are the "compressional members", whereas the polyfunctional high-tenacity fabric membrane provides a universal number of complementary "tensional members" required to stiffen the superstructure in its unfolded i.e. prestrained condition. The only MAGNUM model that has each 20 arms and stretchers (rather than each 16 & 16) is the exceptionally large 12x12 m square structure. The centre pole consists of a major standing pole and a sliding inner pole that retracts down into to unfold/"open" and extends up out of the major pole to refold/"close" the umbrella. Multiple slider bearings allocated longitudinally inside the major pole make safe that the inner moving pole cannot twist axially during its extending and/or retracting motion. Close to its top the inner pole is equipped with a fourfold heavy-duty mechanical device that engages during the final phase of the inner pole's retracting into the major pole – equivalent to unfolding & prestraining the structure – so to ensure that the opened superstructure is protected from damaging axial torsion when exposed to strong winds acting on it. The load-bearing one-piece fabric membrane has 16 (20 with the 12x12 m square model) radially allocated major sections, its welded sectional joints aligning with the structural arms. These joints are slaved to the arms laterally/peripherally but not radially as they must be free for prestraining them in longitudinally radial direction during in-factory completion of the structure. Whilst the arms are linked to the top of the inner pole in heavy-duty double-shear metal bearings, stretchers with one end each are linked to the major pole, with their other end to the arms [in a longitudinally predetermined precession centre within latters' overall length]. Overall prestraining loads required to stiffen the superstructure as in its unfolded condition are induced into its frame-work by unfolding it to the effect that the 16 (20 with the 12x12 m square model) peripheral, slightly curved armed edges of the membrane get expanded up to their (factory-preetermined) target maximum.

### Drive for Opening & Closing:

Major pole-contained metal-encapsulated (maintenance-free) reduction gear for manual cranking with a custom handle. A buttress-type spindle fixed to the output shaft of the gear retracts the inner pole back into the major standing pole to open/unfold & prestrain, and extends it up and out of the major pole to close/refold the superstructure. The factory-predetermined & -adjusted (amount of) target prestrain is displayed by a horizontal-line mark on the major pole. Maintenance is confined to lubricating the buttress-type spindle once in six months. For particulars of both operation and maintenance procedures please refer to the manufacturer's illustrated instructions »MAGNUM\_GB\_illdt\_Manual.docx«. • • The non-retrofitable **Motorized Drive option**, available for any MAGNUM model since January 2013, requires a 400V 3-phase power source, a different i.e. respectively suitable type of footing console (see MAGNUM Exp. Pricelist) to be cast in, and the underground power supply cable from the External Control Box (ECU) to be laid up to & into the cable stand-by trunk of the footing console. The electronic control of the [geared] electric motor protects the structure from getting overstressed when being unfolded. In the event of any local or general electricity outage, the motorized driving system allows to operate the structure manually.

### Materials & Dimensionings employed:

<b>Standing major pole:</b>	Inside & outside functionally chambered extruded aluminium, Ø 220 x 10 mm
<b>Inner pole:</b>	Inside & outside functionally chambered extruded aluminium, Ø 130 x 6 mm
<b>Arms<sup>4)</sup>:</b>	Functionally chambered extruded aluminium 42.0/26.0/3.0 mm <sup>4)</sup>
– " – where stressed <sup>5)</sup>	80.0/42.9/7.5 mm <sup>5)</sup> (where stretchers linked to the arms)
<b>Binding beams/arms<sup>6)</sup>:</b>	Extruded alu H-profile 61.0/42.9/4.5 mm <sup>6)</sup> (diagonal arm sections: 72.0/50.0/9.5 mm)
<b>Stretchers<sup>7)</sup>:</b>	Functionally chambered extruded aluminium 42.2/26.1/3.0 mm <sup>7)</sup>
<b>Bearings:</b>	Double-shear, U-shaped extruded aluminium profile
<b>Footing console:</b>	Structural steel, H-T hot-dipped ["H-T" = high-temperature]
<b>Installation console:</b>	Structural steel, H-T hot-dipped, additionally PES/RAL-powder-coated & baked
<b>Buttress spindle:</b>	C15 machine-type steel, 36 x 6 mm
<b>Spindle bearing:</b>	Block made of high-tenacity molybdenous-type "black" synthetic resin
<b>Lubricant:</b>	Spindle grease
<b>Gear box:</b>	Alu- & steel-encapsulated & sealed (factory-lubricated)
<b>Slider bearings:</b>	High-tenacity molybdenous-type "green" synthetic resin
<b>Axle bolts:</b>	Standard V2A stainless steel, except if with »maritime« option: V4A/off-shore st. steel
<b>Assembling screws:</b>	Standard V2A stainless steel, except if with »maritime« option: V4A/off-shore st. steel
<b>Other functional parts:</b>	Standard V2A stainless steel, except if with »maritime« option: V4A/off-shore st. steel
<b>Membrane material:</b>	»FERRARI PRÉCONTRAIT« – vinyl-coated high-tenacity polyester fabric, weight: approx. 590 g/m <sup>2</sup> , fire-retardant to DIN 4102/class B1 (building materials), colour shade to be selected from the fabric manufacturer's »FERRARI PRÉCONTRAIT« Selector
<b>Crank handle:</b>	V2A stainless steel, fitting both standard and optional motorized drive edition
<b>Spiral strap:</b>	h.-d. 80-mm wide PES webbing [for details see manufacturer's illustrated »MAGNUM Manual«]
<b>Ø10-m &amp; □10-m up models:</b>	<sup>4)</sup> 66.5/42.0/6.0 mm • <sup>5)</sup> 110.1/54.0/13.5 mm (where stretchers linked to the arms) <sup>6)</sup> 79.5/54.0/6.6 mm • <sup>7)</sup> 48.5/34.0/6.9 mm

### Surface Finish:

- Surfaces of all alu components are pickled, PES/RAL powder-coated & baked at >190° C.
- The pole-receiving **installation console** (all steel, connecting to the in-ground console) is H-T hot-dipped and additionally PES/RAL powder-coated & baked ["H-T" = high-temperature].

### Erection Weights of Structures:

Approx. 700 through 2,500 kg (including each the factory-premounted installation console) – relative to the very MAGNUM model/size.

### Optional (non-retrofitable) Equipment available with any of the BaHaMa® MAGNUM models:

**Light** – local power source: 240V AC   **Magic** – local power source: 240V AC   **Sound** (BOSE) – local power source: 240V AC

**Heater** – local primary source: 400V/3-phase (connected load: 16 kW) – secondary (radiators): 240V AC (2 kW per radiator unit)

**WirelessTV** – local power source: 240V AC   **TVR-VR** – framework only   **TVR** – ready-to-install gutter(s)   **Motorization** – see above

Manufacturer's website:

[www.bahama.de](http://www.bahama.de)

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