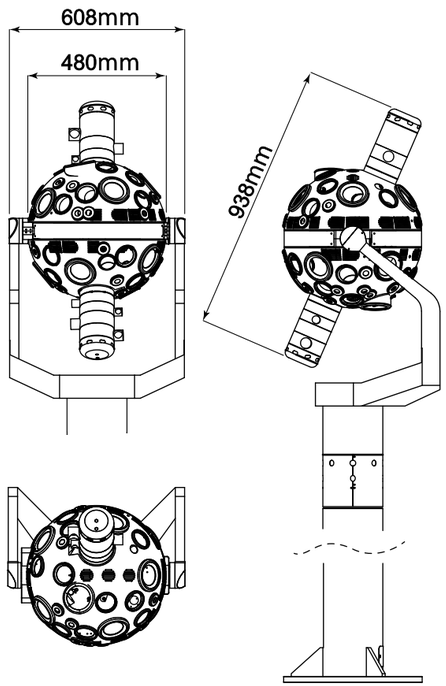
ORPHEUS - GOTO HYBRID PLANETARIUM®

Compact, LED, opto-mechanical planetarium

GOTO ORPHEUS is offered in two types.
Type A (in blue) is primarily for larger domes. Type B (in red) is primarily for smaller domes.
Which one is best for you?

Scope	Dome Type	Tilted or Horizontal
	Dome Diameters	Type A 8-21m Type B 8-16m
Star Field		
	Fixed star magnitude	Down to mag 6.55
	Number of fixed stars	Approximately 9,500 stars
	Color temperature	5700ºK, 20 or 299 showing appropriate colors
	Star diameter	No larger than 4 or 5 arc min, or 6,3 for over 12m
	Light source	LED
	Lifetime	30,000 hours or more
	Horizon cutoff	Digital Shutters
	Number of Bright Stars	20 or 27 independently controlled with appropriate color temperature
	Number of Variable Stars	Betelgeuse only or 10
	Variable scintillation	All stars or brightest 20 stars
	Urban, light-polluted, or hazy sky view function	Stars of mag 3,51 or dimmer can be switched or dimmed in groups defined by every half-magnitude in brightness
Milky Way		
	Image composition	Made of individual micro-stars
	Magnitude	Including stars from mag 6.56 to mag 15.5
	Number of stars	Approximately 8 million micro-stars
	Dimming	16 bit PWM (independent from fixed stars)
	Segmentation	6 (Galactic latitude +/- 50º)
	Nebulae and Clusters	56
Sun, Moon, and Planet Projectors		
	Position of projectors	Mounted on the diurnal motion axis of the main body
	Sun	1º image fades to red at sunrise/sunset
	Moon	1º digital projection with phasing, detailed surface features and lunar eclipses in full color
	Mercury, Venus, Mars, Jupiter, Saturn	Angular size : 8m-16m (12m) 4' - 6.3' Upto 21m (16m), 5' - 8.6'
	Alternate use modes	Orrery, Orbiting Earth satellite, Moons of Jupiter, and others. It depends on fulldome video system.
Main Body Motions		
	3-axis starball	High speed, high accuracy motions
	Latitude/Diurnal/Azimuth	3 RPM maximum
	Annual	Up to 60 sec./year in continuous mode, or "jump" to any time or date in less than 10 sec.
Basic specifications		
	Power	85-264VAC (50/60 Hz)
	Noise Level	41dB or less with fixed stars on
	Weight	200kg
	Maintenance	Ten year maintenance cycle for most slip rings. Low cost maintenance contracts available.

GOTO HYBRID PLANETARIUM ORPHEUS



* The neck can be any height that the customer requires.

Option Packages : Choose from A, B (any one of the three), C, D

A	Constellation pictures	88 constellations: 66 individually controlled, 22 as a southern group projection
B	Room Effects	Sunrise/sunset, Twilight, Blue light
	Coordinate Lines	Equator, Ecliptic, Precession Circle, Polar Point
	Room Effects & Coordinate Lines	Sunrise/set, Twilight, Blue light, Equator, Ecliptic, Precession Circle, Polar Point, Meridian
	Cardinal	Optical cardinal projectors "N" "S" "W " " E"
C	Elevators	Scissors lifts of 60cm or more are available
D	Console Desk	GOTO's steel desk to accept the control panels of the ORPHEUS HYBRID

* All specifications subject to change without notice.

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8~21m

GOTO HYBRID PLANETARIUM ORPHEUS

Origins of ORPHEUS

In Greek mythology, Orpheus was a minstrel famous for his beautiful playing of the harp. It is said that people and forest animals, even trees and rocks loved his music. The starry sky of the new ORPHEUS projector will stir the heart, just as the music of Orpheus did.

GOTO INC
www.goto.co.jp/

GOTO HYBRID PLANETARIUM ORPHEUS

The Next Generation of opto-mechanical projectors has arrived
Its name is GOTO ORPHEUS

ORPHEUS is not only GOTO INC's newest projector, but it is also the most versatile. By choosing different configurations of ORPHEUS, planetariums with tilted or horizontal domes with diameters from 8 to 21 meters can be served. Whether the need is for a state of the art HYBRID planetarium with totally unique features for a large, multi-purpose, public planetarium, or an easy-to-use basic astronomy education tool for a small school, or anything in between, ORPHEUS can supply what is needed.

With two major versions and a host of available optional features, the ORPHEUS can be custom-built to meet your specific needs. Designed to be hybridized and synchronized with select fulldome video systems, it also can function as an amazing stand-alone projector for special users, or as a show-saver should a fulldome computer or video projector fail.

Saku Children's Science Dome for the Future

GOTO HYBRID
The Best Gets Better

GOTO ORPHEUS Standard Features:

- Extremely compact size – with a starball only 48cm in diameter
- 9,500 tiny stars down to mag 6.55, against an ink-black sky
- The detailed Milky Way, made of 8,000,000 micro stars, is independently dimmable
- Brilliant, LED illumination of all objects, for a long lifetime of low power consumption
- "Library quiet" operation – 41dB is much quieter than previous GOTO models
- Digital horizon shutters for tilted or horizontal domes, or to raise the horizon above panoramas, or "all open" for a theater literally full of stars – even aimed downward
- Embedded video projector shows gorgeous moon features, sliver-thin crescents, and lunar eclipses in full color
- 56 nebulae and clusters beg for binocular viewing
- Accurately positioned, very bright sun moon and planets are mounted on the ORPHEUS main body for the smallest projector footprint in your dome
- Unmatched reliability and low maintenance costs due to GOTO's 30-year design lifetime

Exciting Optional Features:

- You can choose to have all 88 constellation outlines projected from the starball, 66 with independent control
- Choose whether all stars or only the brightest stars twinkle, with user-controlled intensity
- Choose only Betelgeuse or up to 10 stars to exhibit variable star dimming
- Choose 20 or 299 stars showing correct color temperatures
- Choose detailed ecliptic, equator, and precession circle coordinate lines
- Choose environmental lighting including Cardinal Points, blue sky, twilight glow, and colored sunrise and sunset glows
- Elevator lifts to lower or raise ORPHEUS projectors

The GOTO ORPEHUS HYBRID Planetarium™

While all ORPHEUS planetarium projectors can perform beautifully as stand-alone projectors, they are even better when synchronized with a colorful, dynamic fulldome video system in GOTO's superb HYBRID configurations. When the stars, sun, moon, and planets of the ORPHEUS move, all fulldome video projections move with them. So the operator can elect to add even more complex computer-generated coordinate lines, pointers, and markers onto the sky, use constellation outlines from various cultures, leave star or planet trails, move the planets to show an orrery with orbital paths marked, and create hundreds of other demonstrations.

GOTO joins with only a few selected fulldome manufacturers in creating these HYBRID systems. And since each HYBRID includes a complete fulldome system, fulldome movies can be shown, simulated flights through deep space are possible, and a myriad of other fulldome effects are available to the operator.

GOTO knows that fulldome video systems are increasing resolutions to as much as 8K and even more in a few cases. But the tiny stars of the ORPHEUS have a resolution equivalent to 70K! Likewise, the ORPHEUS sky shows much more dynamic range in brightness of objects, and a much blacker sky between stars than any fulldome video system can. ORPHEUS is unarguably best at showing the pure night sky. Fulldome is best at showing animated color scenes. With the ORPHEUS HYBRID, you get the best of both technologies synchronized under one user-friendly control system.

A new, totally unique capability

ORPHEUS projectors designed for larger domes have a feature never seen before in an opto-mechanical projector. In this configuration, stars dimmer than magnitude 3.5 are grouped in half-magnitude sets which can be dimmed or switched on or off individually. So an operator can selectively turn off dimmer sets of stars to very realistically simulate an urban, light-polluted sky, or a smoke-filled sky, or to simply tune the sky to precisely match the sky just outside the planetarium door. ORPHEUS produces the most realistic skies ever seen in a dome.

GOTO HYBRID Control

In addition to standard automated control, ORPHEUS HYBRID systems are equipped with GOTO's unique HYBRID manual control system. Consisting of 5 panels containing over 200 dedicated button switches, analog sliders, and knobs, this control system is without equal in the planetarium world. Each discrete physical control triggers a specific effect.

Like a master pianist playing a piano without conscious thought of particular notes, a GOTO HYBRID planetarium operator smoothly touches the controls to bring forth the desired sky scene without being forced to squint into bright computer monitors, read down long feature menus, or click on tiny on-screen control targets.

The result is that GOTO HYBRID operators can maintain an uninterrupted rapport with their audiences. Their speech has no awkward pauses when trying to interpret a complex computer screen. They easily control all functions of the planetarium without the need for a second operator to "wrestle the computers." Live programs are a pleasure to present with a GOTO HYBRID.

The Smartest Choice – The Best Value

With its superior sky resolution, brightness, color, contrast, and ease of control, the ORPHEUS HYBRID planetarium is obviously the system of choice. But did you know that it also delivers the best value? Depending upon system configurations, a new GOTO ORPHEUS HYBRID using the 70K starry sky and synchronized 4K fulldome video may cost less than many 6K video-only fulldome systems. And it costs much less than 8K video-only systems!

While the ORPHEUS projector is designed for a lifetime of 30 years or more, video projectors in all fulldome systems have a life cycle of 5 to 7 years. So whenever video projectors approach failure, a 6K system must typically replace all 6 of its projectors at a high cost, and an 8K system must replace all 10 of its expensive video projectors - every cycle! Yet a 70K ORPHEUS in a synchronized HYBRID system using 4K video must replace only 2 video projectors each cycle. So… do the math. The ORPHEUS HYBRID not only costs less initially, but it will cost much, much less over the full lifetime of your planetarium.

Choose the best sky and the best value – choose GOTO ORPHEUS HYBRID.

* Kashiwazaki City Museum