

Information Letter | Product Brochure 2018

Wind Tunnel 2.20 mtrs.



i DIVE



Have you ever dreamt of flying? Have you ever wanted to experience the thrill of skydiving, but didn't want to commit to jumping out of an airplane? Almost everyone wants to fly, and flying your body in a column of wind is one of the purest forms of flight there is. It allows you to freely fly your body and effortlessly control your movements.

OVERVIEW OF INDOOR SKYDIVING (WIND TUNNEL FLYING)

Indoor skydiving is an activity that almost anyone can partake in. Participants wear gear that includes a jumpsuit, goggles, a helmet, eye protection, and earplugs (for the noise). Each participant will fly within a column of wind created by a vertical wind tunnel. Flyers are accompanied by a rated safety instructor that helps flyers learn to control their bodies within the airflow.

During a first flight experience you will be guided by an instructor through all the necessary classroom information, given your flight gear, and taken into the wind tunnel. Once in the tunnel your instructor provides a safe 1-on-1 flying experience, guiding and teaching you how to fly your body. Once you have flown, your next flight will be less guided as you begin to grasp the concepts behind safely flying your body. Higher levels of learning are normally done with a tunnel coach and organized learning events are taking place in tunnels all over.

Flyers of nearly every age can fly. We recommend 4 or 5 years old as a minimum, but each tunnel has their own rules. The only real limitations preventing people from flying are weight limits and shoulder dislocations. Countless handicapped and physically challenged flyers have safely flown with the help of experienced instructors.

DIFFERENCES FROM OUTDOOR SKYDIVING

Indoor skydiving gets its name from the thrill-seeking sport of skydiving, but the similarities between the two are actually very few. A vertical wind tunnel creates the needed vertical wind flow for indoor skydiving. This simulates the conditions found in freefall without the need to jump from a great height. Because the wind tunnel environment is very controlled compared to the traditional freefall of a skydive, a wider range of flyers can take part in the experience.

Skydiving being an outdoor activity is seasonal, and even during favorable seasons, conditions such as the wind, rain, or snow can cancel your plans to jump. Indoor skydiving is amazing because in most cases it removes weather from the picture. Most modern wind tunnels are closed loop recirculating designs. This means that no matter the outside weather, the wind tunnel is a comfortable place to fly.

A normal skydive from 13,000 feet lasts between 45-60 seconds. Typical first-time indoor skydiving flights last between 2 and 5 minutes, giving you much more flying time than a traditional skydive. The ready access to much larger amounts of time gives you a chance to safely learn how to control your body.



DEAR COLLEAGUES,

In this letter, we will describe the opportunities for a beneficial partnership brought to you by **iDIVE**, in the field of vertical wind tunnels in India. We consider our mission to be able to provide a commercial solution, which will best fit the needs of your target customers as well as reflect contemporary trends. We believe that such an approach is the key for the sustained high profitability of your business. Profit from a vertical wind tunnel depends, first of all, on the chosen promotion strategy. In this regard, the technical part of a project should be considered as a constituent of the promotional strategy.

The technical and convenience parameters of the project must correspond to the desirable profit in both the short-term as well as the long-term. Performance of many of the small vertical wind tunnels is insufficient for sportsmen. That is, to say, sportsmen consider flights longer than 1-2 hours in such tunnels, to be useless due to the low quality of the airflow. However, sports training in vertical wind tunnels require long practice of various flight positions. Flying in a vertical tunnel has been an official sport of the FAI since 2014. Therefore, in the near future, activities associated with the wind tunnels will experience rapid growth. The field is receiving an increasing informational and financial support from many of the countries worldwide, which is reflected in, for example, national and international championships in this kind of sport. In addition to attracting athletes, such sports events and activities advertise your business amongst beginners alike.

Roughly speaking, there are hundreds of attracted beginners for each professional athlete. By investing in and implementing one of our commercial solutions you can meet the needs of all the groups of customers listed below with a high level of convenience, service and aesthetic solutions.

WHAT KEEPS INDOOR SKYDIVING SAFE?

Indoor skydiving has had a fairly short history. Modern tunnel flying has only been around since the mid-80's. Throughout the formative years, the specialized knowledge of working in a wind tunnel was gathered by the businesses, manufacturers, and individuals working in tunnels. These players ultimately came to formalize and standardize training and safety procedures for tunnels and their staff.

While most people associate skydiving with a thrill or bucket list activity, indoor skydiving is much more than that! Because people of all ages can fly, and fly as much as they like, indoor skydiving is becoming a worldwide sport. As of 2014, indoor skydiving was even recognized by the World Air Sports Federation (FAI) and now FAI competitions are taking place around the world.



ABOUT iDIVE WIND TUNNELS

iDIVE Indoor Skydiving is the Flagship brand under Waltair Skydive India LLP (a part of the Waltair Group conglomerate) based out of Bangalore, India. Having pioneered the sport of Commercial Skydiving in India and established itself in the year 2010 in the field of Tourism, Hospitality, Travel & Adventure, the Waltair Group is the first ever Company in the country to set up Wind tunnels for Indoor Skydiving.

Our **iDIVE** Wind tunnels are equipped with three-phase asynchronous motors. This choice is determined by the high efficiency, reliability and durability of the three-phase asynchronous motors. In contrast to the internal combustion engines, the asynchronous motors don't have rubbing elements, high local temperatures and high local mechanical stress. Design of the asynchronous motors uses minimum of the functional elements, namely a rotor, a stator and two bearings. Such a simple design results in high durability of the motors. In our wind tunnels we use asynchronous motors manufactured by the Top of the line companies which is one of the leading manufacturers of electric motors in Russia.

The quality of the **iDIVE** wind tunnel motors is ensured by the **ISO 9001** standard quality management system which was certified by DQS Holding GmbH, Germany.

BENEFITS OF THE iDIVE WIND TUNNELS

The motors of our Wind tunnels have the following advantages:

- High efficiency;
- High torque;
- Low noise levels;
- Low warming of the coils;
- Low starting current;
- Low weight;
- Small dimensions;
- High durability.

When one is evaluating the project costs he/she should also take into account the running expenses. In our commercial solutions we reduce the running expenses by increasing the tunnel efficiency and achieve the optimum price-quality ratio.

The technology of our direct **competitors** requires higher consumption of electric power to achieve the maximum airflow. The cost of a connection to a power supply network depends on the consumption. Thus, the energy efficiency of a wind tunnel determines the total cost of the project. And if the legislation in the country of a wind tunnel installation is similar, then the facts listed below will help you understand the cost-efficiency of our constructions.

In contrast, **our technology** allows achieving the same velocity of the airflow in a wind tunnel of the same diameter at only **500 kW** of energy consumption. Thus, by using advanced technologies we obtain the same result at lower expenses. For every 1000 hours of running of the wind tunnel **you save more than 8,100 \$**. Also, you save more than 49,000 \$ at installation due to the reduced cost of the electric power supplies. If you need to power the wind tunnel using diesel fuel, **our company** suggests purchasing the wind tunnel with electric motors and a diesel generator (typical price of a diesel generator suitable for our wind tunnels starts at 25,000 \$).

Such an approach will allow you to avoid the smell of the fuel in the building and to suppress the noise of the diesel engine because the generator can be easily acoustically isolated from the building. Also, this approach enables to connect an emergency power shutdown system which will eliminate the risk of sudden loss of power.



WHO CAN FLY IN A WIND TUNNEL?

The short answer to this question is - **almost everyone!** The information found below is general to indoor skydiving. Each location may differ, check with the tunnel you wish to fly in for specific rules and restrictions.

Age Limit

The age requirement really only has a minimum - 3 years old! The maximum age limit is more defined by how physically fit and injury free you are. With that being said, there have been flyers that have been 100+ years old. Read more below for additional information on physical requirements.

Weight Limit

This varies from tunnel to tunnel, but the average weight limit is around 250 lbs/113 kg. The limit could also depend on the height and how physically in-shape the individual is.

CUSTOMER GROUPS

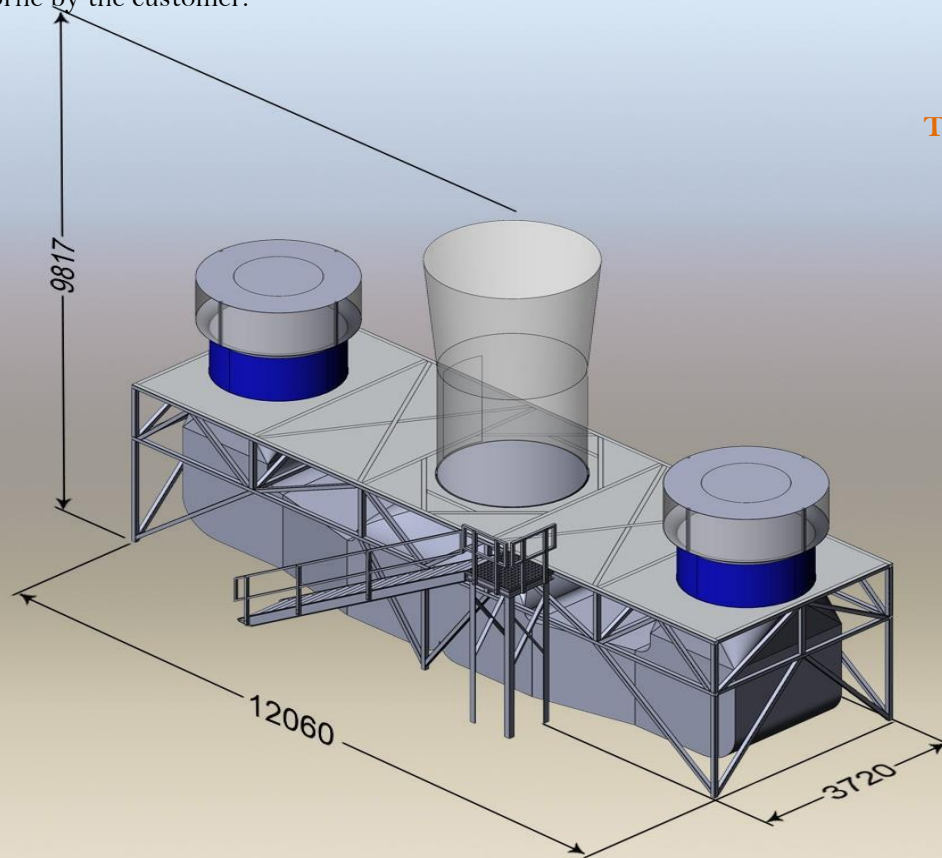
The customers of a vertical wind tunnel can be categorized into the following groups:

- People, purchasing presents for kids, relatives/friends;
- People purchasing a present for a VIP;
- People regularly purchasing gift certificates as they are very loyal to your business;
- People regularly purchasing gift certificates and actively recommending it to their friends;
- People eager to experience free-fall flying. Such customers purchase the service for themselves right before the flight;
- Celebration of birthdays for kids and adults and Organizing corporate holiday parties;;
- Journalists and bloggers. These customers are interested in your business, and they are ready to reimburse by regularly advertising your business;
- Military personnel, special forces;
- People intending to complete an instructor course for a vertical wind tunnel. These customers purchase 10-20 hours of flight time at once;
- Aero fitness. This modern branch of fitness is practiced in a vertical wind tunnel and substitutes the wearisome trainings in a gym;
- Skydivers practicing individual elements for group acrobatics, Free fly (individual and group elements), freestyle for skydiving and wind tunnel competitions;;
- Athletes participating in wind tunnel competitions at the 2-way VFS level;
- Beginner skydivers practicing AFF;
- Athletes from abroad practicing individual Free fly techniques;
- Sports organizations for kids.



DESCRIPTION / TECHNICAL CHARACTERISTICS – iDIVE 2.20 Mtr OPEN WIND TUNNEL

The **iDIVE 2.20 Meter Open Vertical wind tunnel** is an open flow wind tunnel intended for training skydivers and providing entertaining flights in conditions imitating free fall. The wind tunnel can be easily assembled and disassembled and can be transported to any location in the world in standard sea containers. In addition, our company provides a 50% discount on a course of giving professional training to instructors with the skills of a technical specialist. Training is carried out by highly qualified athletes-instructors. The training program consists of 30 hours, including 15 hours of theory, and 15 hours of practical trainings. The training course includes acquaintance with the technical characteristics and the design of the wind tunnel, which will allow inspection and maintenance. The cost of flight time is borne by the customer.

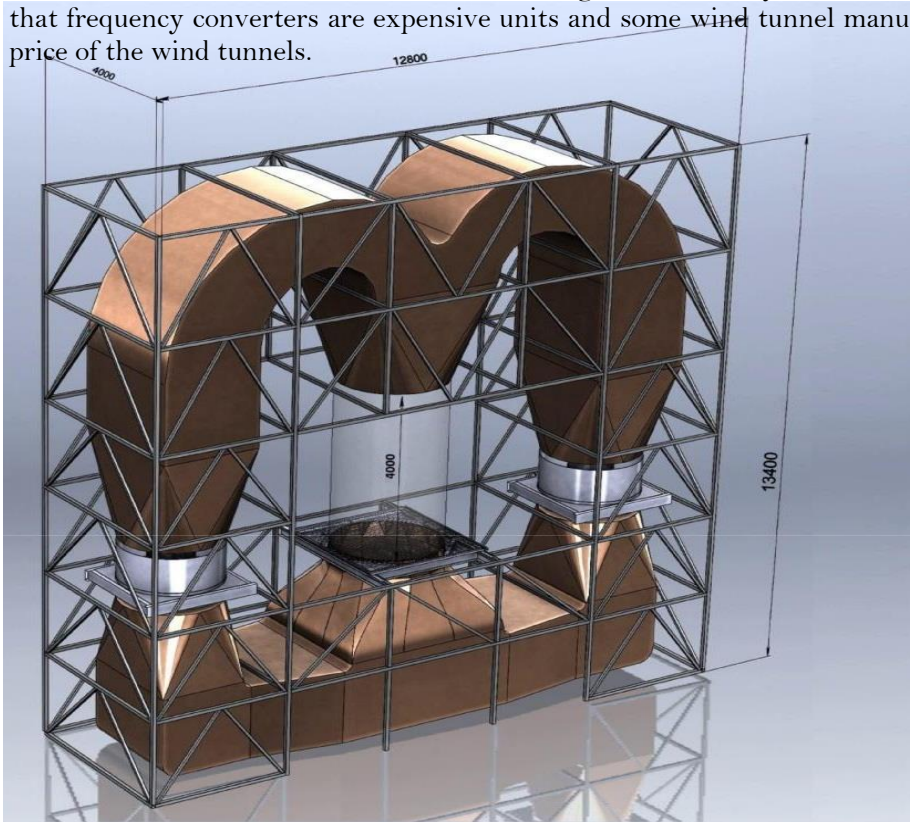


TECHNICAL FEATURES

- Dimensions: length 12,06 m, width 3,72 m, height 9,82 m
- Height of the flight chamber 5,7 m
- Diameter of the flight chamber D1 2,20 m, D2 2,45m
- Glazing: the glass is made of a hardened triplex 0.1 m thickness
- Power of electric motors 2x200 kW
- Maximum speed of the airflow ≥ 70 m/s
- Applied turning vanes straightening air flow
- Weight: 15 500 kg
- Power supply mains or diesel generator
- The airflow is laminar, without axial torsion and with uniform velocity field

DESCRIPTION / TECHNICAL CHARACTERISTICS – iDIVE 2.20 Mtr CLOSED WIND TUNNEL

The iDIVE 2.20 Meter Closed Vertical wind tunnel is a closed, double-circuit wind tunnel intended for the training of skydivers and entertaining flights in a regime simulating a free fall. The wind tunnel consists of two electrical power units with a control system, air channels, a frame, flight chamber and air cooling system. The flight chamber is a transparent cylindrical chamber and is equipped with a safety net in its base. There is also a door in the flight chamber for the entrance and exit of sportsmen, and a transitional entrance to eliminate pressure differences. For the sake of safety, we have installed an expanding channel with a safety net above the flight chamber. Expansion of the channel reduces the speed of the airflow and, thus, limits the height of flights. To stabilize the air temperature in the flight chamber during hot seasons we have installed a heat exchanger. To reduce the noise in the building, we can supply a special coating in our wind tunnels which absorbs the noise, for an additional charge. The delivery set of our wind tunnel includes the project of the building and the frequency converters. We note that frequency converters are expensive units and some wind tunnel manufacturers specify the price without them. In our systems they are already included in the price of the wind tunnels.



TECHNICAL FEATURES

The distinctive feature and advantage of the iDIVE 220 is that motors and fans are installed directly inside the tunnel, which results in the absence of external motor sections and the total absence of transmission. This makes the wind tunnel more compact, reliable and durable. The wind tunnel can be easily assembled and disassembled and can be transported to any location in the world in standard sea containers.

- Dimensions: length 12,8 m, width 4 m, height 13,4 m;
- Diameter of the flight chamber: 2,2 m;
- Height of the flight chamber (from net to net) is 6 m, cylindrical transparent part is 4 m high;
- Weight: 26 000 kg; (with carrier, forced cooling system, and external electrical equipment);
- Power of electric motors of fan drive: 2x200 kW;
- Fans speed: 0 – 1500 rpm;
- Control - frequency converters;
- Smooth start;
- Electric motor to provide air exchange in the duct;
- Maximum speed of the airflow ≥ 75 m/s (270 km/h);
- Ambient air temperature $-25+30$ deg. C.;
- Time of manufacturing: 6 months.

EQUIPMENT LIST

- Carrier 1 pcs. / Wind channels 2 pcs.;
- Working (flight) zone with a glazing and a door (a door with el. drive) 1 pcs. / Transitional lock with a door (a door with el. drive) 1 pcs.; / Fans 2 pcs.;
- Electrical motors 2 pcs., 3-phase induction, max. power of 200 kW, designed for operation with frequency converters;
- Frequency converters of 2x200 kW;
- Forced cooling system (Pmax 11 kW), inlet fans 2 pcs.;
- Fans 2 pcs.;
- Control panel 1 pcs. / Electrical cabinet 1 pcs.;
- Electrical cables and wires (set for connection);
- Vibration sensors 2 pcs.;
- Temperature sensor for air flow 1 pcs.;

FLIGHT CHAMBER

Maximum air-flow speed in the flight chamber of the wind tunnel - at least 75 m/s. Air flow is laminar, without axial torsion, with a uniform speed field.

Dimensions: The flight chamber is a transparent cylindrical chamber (glass), internal diameter of 2200 mm, height is 4000 mm, non-transparent expanding chamber is located above the cylindrical part.

Safety Nets: The flight chamber is limited by safety nets from the top and from the bottom. The bottom net has a mesh of 60x60 mm. (rope with D of 3 mm). The top net has a mesh of 150x150 mm, rope with D of 1,5 mm. Net (rope) fastening device provides access for its quick replacement and service.

Glazing: The glass is made of bent triplex. Vertical joints of glass panels are connected by polyurethane or silicone glue line. The glass consists of two parts mounted one upon another and divided by the metal ring.

CONTROL PANEL

CP – wind tunnel operator's station includes the following elements:

- Digital engine control panel, cooling control unit;
- Digital engine control panel has connector for PC (USB, RS-232);
- PC-based (Windows OS) CP software;
- Limit indicator of accepted vibration level.

SAFETY

Emergency stop buttons are located in the following locations:

- Control panel
- Inside or in front of the transfer chamber

In addition, it is possible to install the smooth and safe shutdown system.

ACCESS TO SERVICE AND REPAIR EQUIPMENT

The wind tunnel design provides access for service of the following elements: main electric motors, fans, forced cooling and wiring, safety nets, turning vanes and other elements important for the system operation. All metal parts of the wind tunnel are painted.

TECHNICAL DOCUMENTS:

- Dimensional and overview drawings;
- TS for foundation and electrical ground;
- Certificate;
- Operation Manual;
- Conformance certificate;

ADDITIONAL COOLING SYSTEM USING EXTERNAL HEAT EXCHANGERS:

- Cooling system heat exchanger 1 pcs.;
- Insulated chamber of the heat exchanger 1 pcs.;
- Air ducts of the heat exchanger 2 pcs.;
- External Heat exchanger fan 1 pcs.

INSTALLATION AND OPERATION

The service life of our wind tunnels is determined by the actual state of the system, but no less than 10 years. The tunnel has a 3 year limited warranty, and individual units are subject to the warranty of the corresponding manufacturer. The period between the maintenance services of the fans is 3000 hours, with periodic inspections as specified in the manual. Service life extension for the fans is possible.

iDIVE 2.20 mtrs features low running expenses, excellent ecological characteristics, low noise (because it is a closed type of tunnel), zero expenses for fuels and lubricants, expendables and spare parts, repair and service of transmission during the operation. The wind tunnel can be installed at almost any location subject to availability of a 400 kW electric power supply connection.

A significant advantage of the iDIVE 2.20 mtrs is its ability to be easily dismantled, transported and installed at a new location. Operation of a closed type wind tunnel is not impacted by either the season or adverse weather conditions: during warm seasons the airflow is cooled down by the gas exchange with the environment and in cooler seasons the airflow is warmed up by the dynamic heating and the heat from the electric motors. There is also an option to connect an additional cooling system which enables you to maintain comfortable temperature inside the flight chamber, even in tropical climates.

Optionally, we can minimize noise levels by using a special noise-absorbing coating for the air ducts. An alternative solution could be to install the entire setup inside an ancillary building. The manufacturer provides supervision of installation and start-up of the unit, warranty service during warranty period and post - guarantee technical support during the entire period of the unit's operation.

The wind tunnel design provides access for servicing the following elements:

Main electric motors, fans, cooling system and wiring, safety nets, other elements important for product operation.

All metal surfaces in the wind tunnel are painted.



iDIVE WIND TUNNEL 2.20 Mtrs – OPEN VS CLOSED

Model	« iDive Tunnel 2.20 Meter (US\$)	« iDive Tunnel 2.20 Meter (US\$)
	2.2m Electrical Open	2.2m Electrical Closed
Actual cost of minimum workpackage	222000	410000
Price of the basic supply set	222000	410000
	Complete package	Complete package
Frequency converters for electric motors	+	+
Motors	+	+
Possibility of operation using diesel fuel	25000	25000
	(cost of a diesel generator)	(cost of a diesel generator)
Possibility of operation from electric mains	+	+
Height of glass	7m	4m
Wind tunnel support structure	+	+
Wind tunnel ducts	+	+
Availability of standard freight	+	+
Air flow cooling system	-	Designed into the basic complete set. Additional payment is required for extra chillers
Compatibility with European standards	Extra payment for import motors	Extra payment for import motors
	50000	50000