HIGRA

UCHA - Compact Amphibious Electric Hydrogeneration Unit

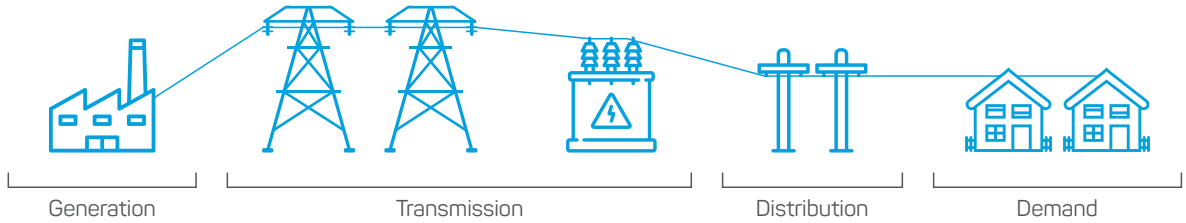

Distributed Generation

Distributed generation might be defined as every power production coming from concessionaires or authorized agents, directly connected to the electric distribution and/or located at the consumer.

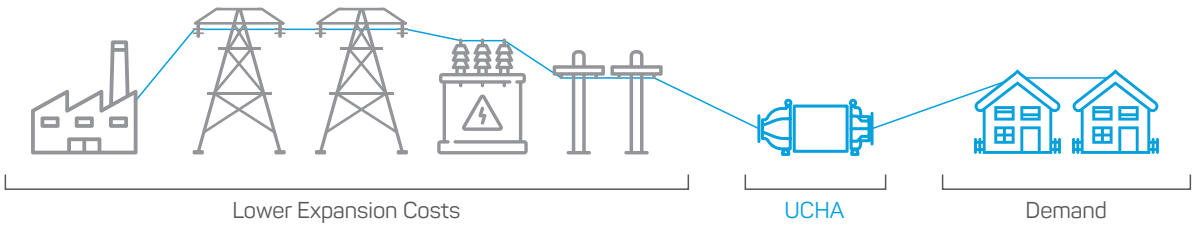
It is an expression used to designate the electric generation made near to the consumer, independently from power, technology or energy source.

The distributed generation offers advantages over the central generation, since it saves large investments in installation and transmission, reducing loses in this process and improving the energy service stability.

Conventional Generation



Distributed Generation

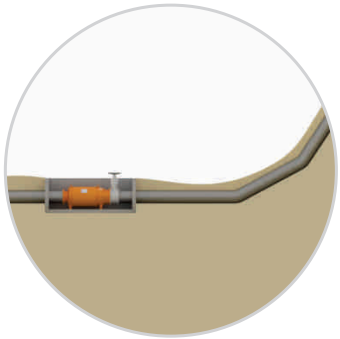


Compact Amphibious Electric Hydrogeneration Unit (UCHA)

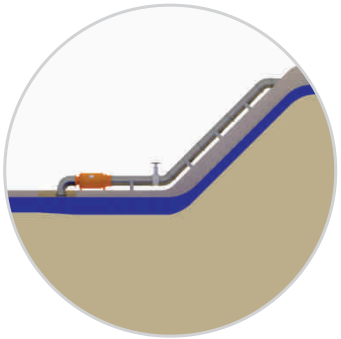
UCHA is an integrated solution to generate clear and renewable energy through the use of potential hydropower available in many different hydric sources, such as:

Dams / Reservoirs

Water Pipeline

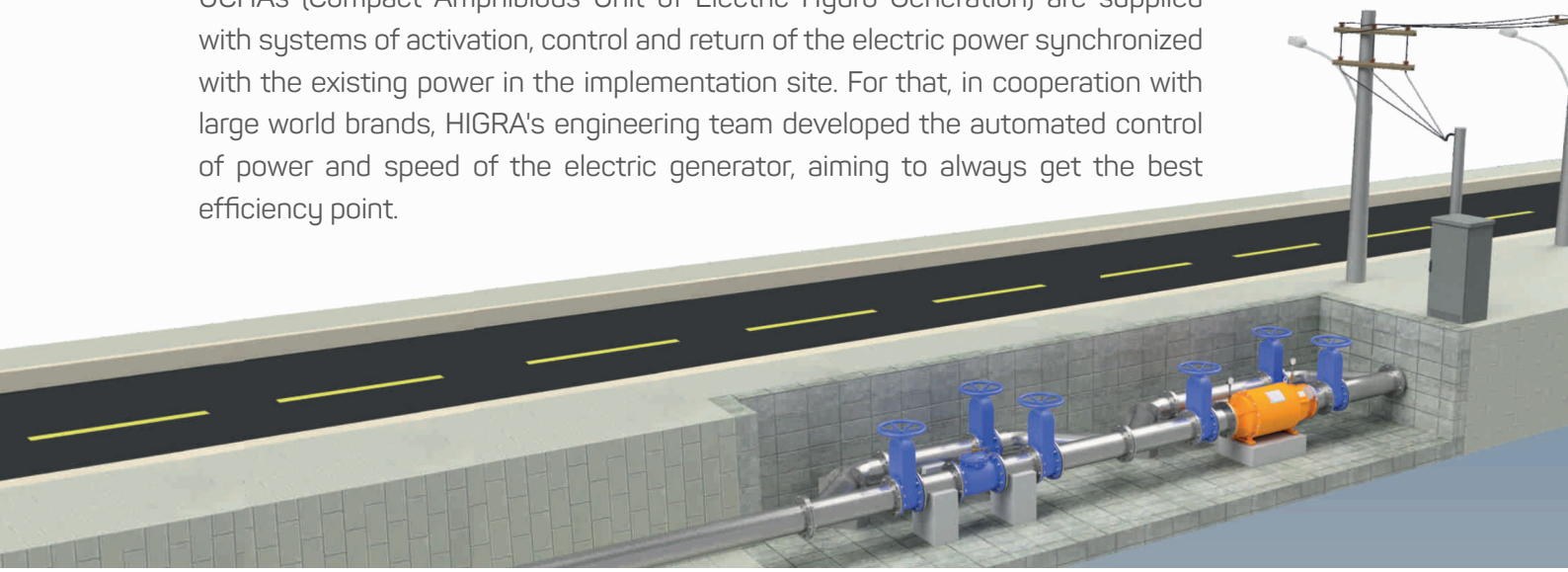


Water Fall



Energy Hydrogeneration Integrated Solution

UCHAs (Compact Amphibious Unit of Electric Hydro Generation) are supplied with systems of activation, control and return of the electric power synchronized with the existing power in the implementation site. For that, in cooperation with large world brands, HIGRA's engineering team developed the automated control of power and speed of the electric generator, aiming to always get the best efficiency point.



Amphibious Turbogenerator (TGA)

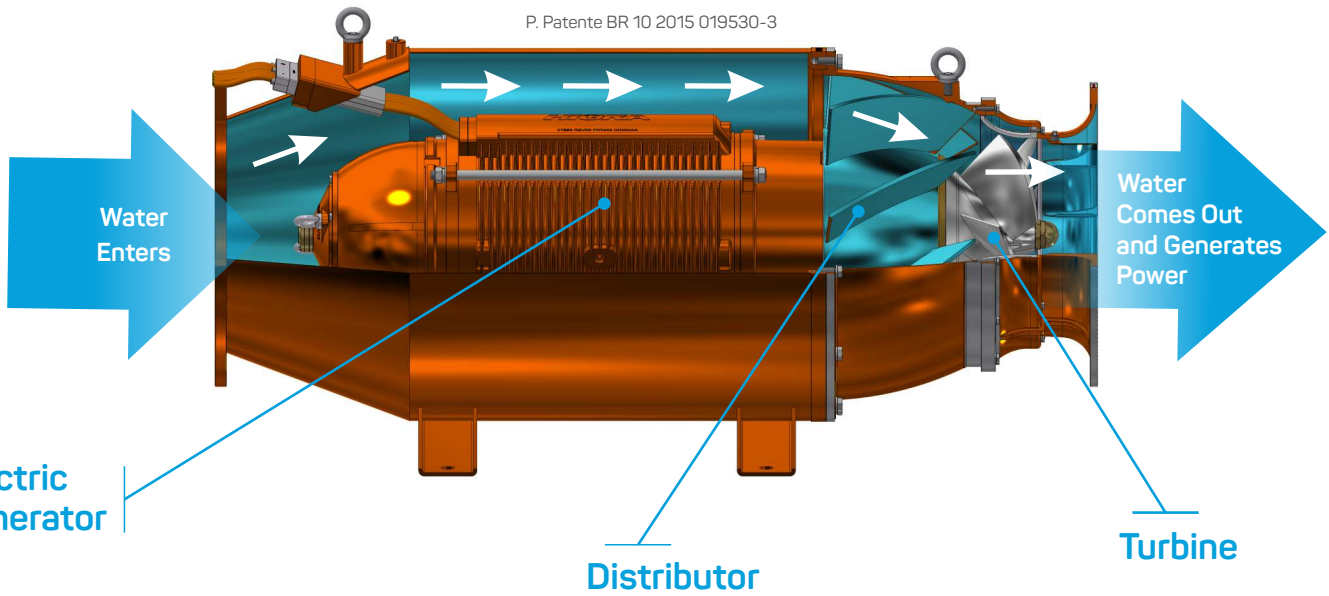
The TGA (Amphibious Turbogenerator) is the core and main component of a UCHA. It is an integrated equipment, composed by turbine and power generator.

The electric generator is submersed and cooled with the fluid that passes alongside the system, resulting excellent efficiency conditions.

The turbine is projected according to the application operation conditions, applying a CFD (Computational Fluid Dynamics) Software to optimize the geometry and reach the maximum efficiency.

*CFD (Computional Fluid Dynamics) is a computer simulation tool used worldwide, by the aeronautical and automobile industries, for example.

P. Patente BR 10 2015 019530-3



TGA - Main Features:

- Three-phase submerged electric generator
- Amphibious technology
- Compact and monoblock system
- Easy to install in any application position
- Low implementation cost
- No need for shaft alignment
- Concept that makes the equipment installation and disassembly easy
- High efficiency and long life
- Low noise level
- Submersed, burried or outdoor installations
- "On-Grid" distributed microgeneration

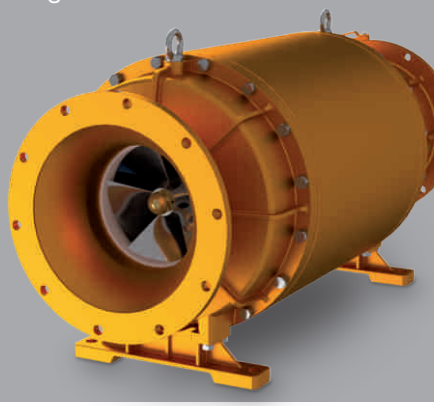
Generation Power: 5 to 500 kW*

Flow Rates up to 10000 m3/h*

Pressure Fall: 4 to 200 wcm*

On-Grid Technology

*Unit amount per TGA, possible to reach through series or parallel modulation.



Every Application is Unique. So Is the Ideal UCHA.

To make sure the potential hydropower available is used at most, HIGRA projects and optimizes each turbine, through an advanced simulation software. Every application is unique, and so are the turbines:

Types of Turbines | TGA

Low Flow Rates

Fixed Blades

Francis Turbine
High Pressure
50m to 100m

Francis Turbine
Medium Pressure
40m to 70m

Francis Turbine
Low Pressure
25m to 50m

Medium Flow Rates

Fixed Blades

Propeller Turbine
Medium Pressure
15m to 30m

Propeller Turbine
Low Pressure
5m to 10m

High Flow Rates

Launching

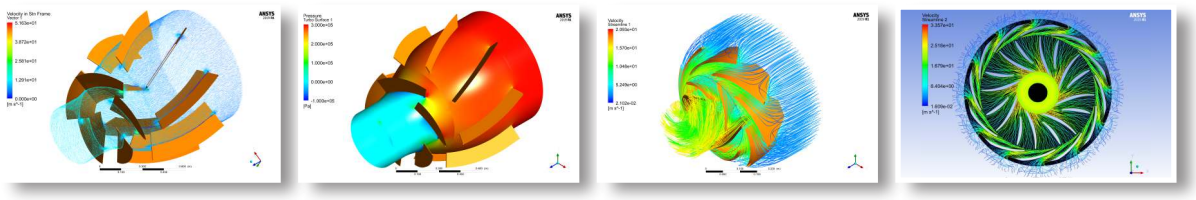
Mobile Blades

Kaplan Turbine
Variável Pressure
5m to 20m

Watch the video through a QR Code Reader.

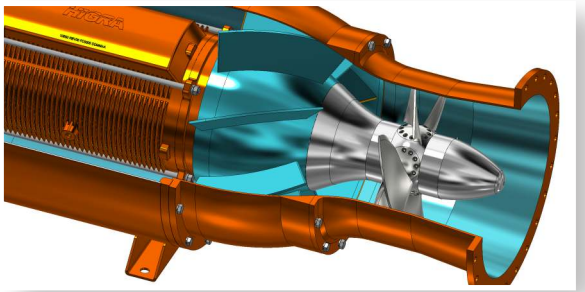
Computational Fluid Dynamics (CFD)

Turbines and distributors are developed with CFD (Computational Fluid Dynamics) by simulating the fluid's drainage numerically. This software is applied to get excellence in the development of the products, reaching the maximum Hydroenergetic efficiency, speed and quality.



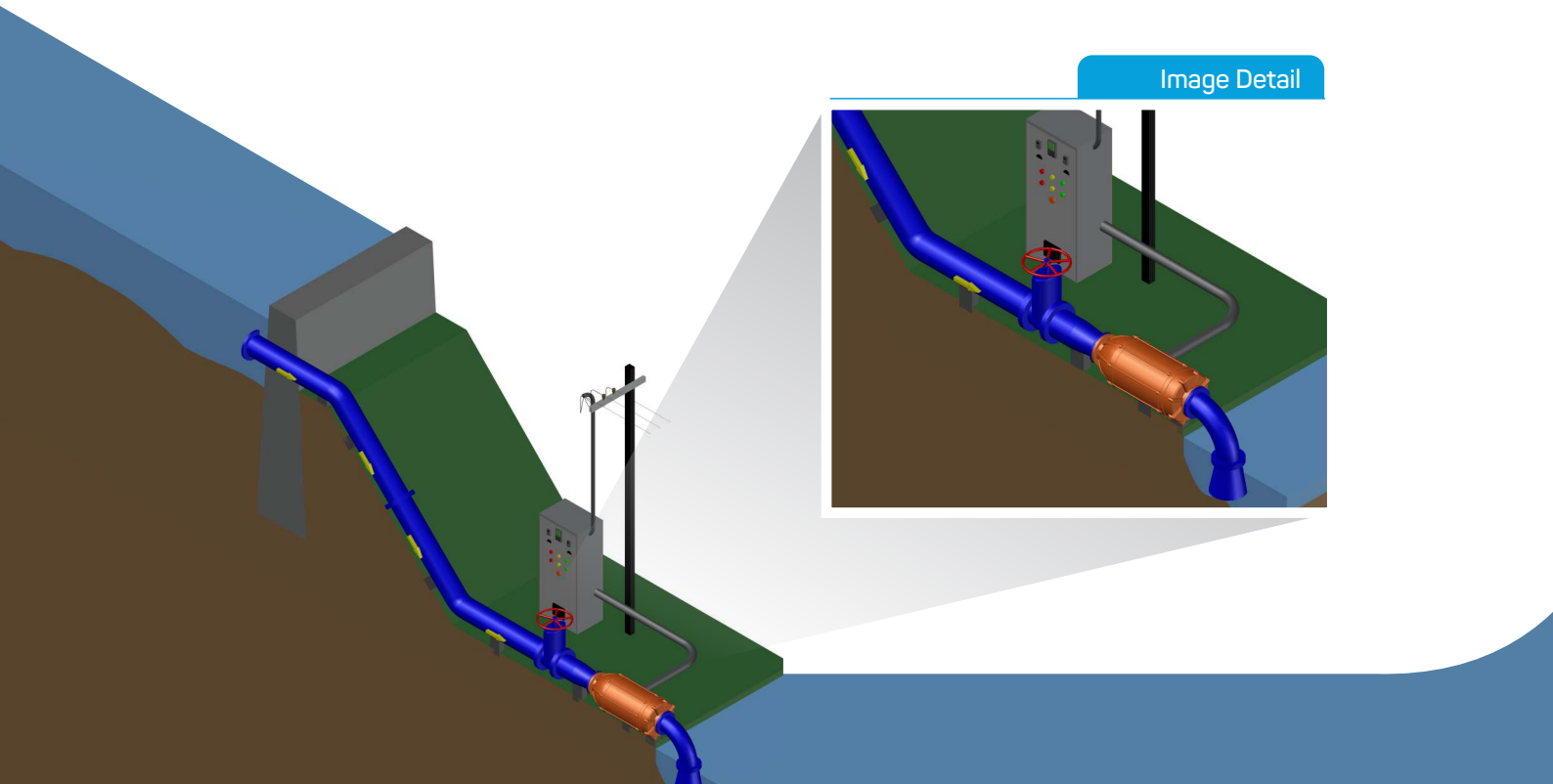
CAD 3D

The CAD (Computer-Aided Design) is the tool used for molding all components of the Amphibious Turbogenerator, keeping a high pattern in every step of the development. It assists the development process and makes it agile.

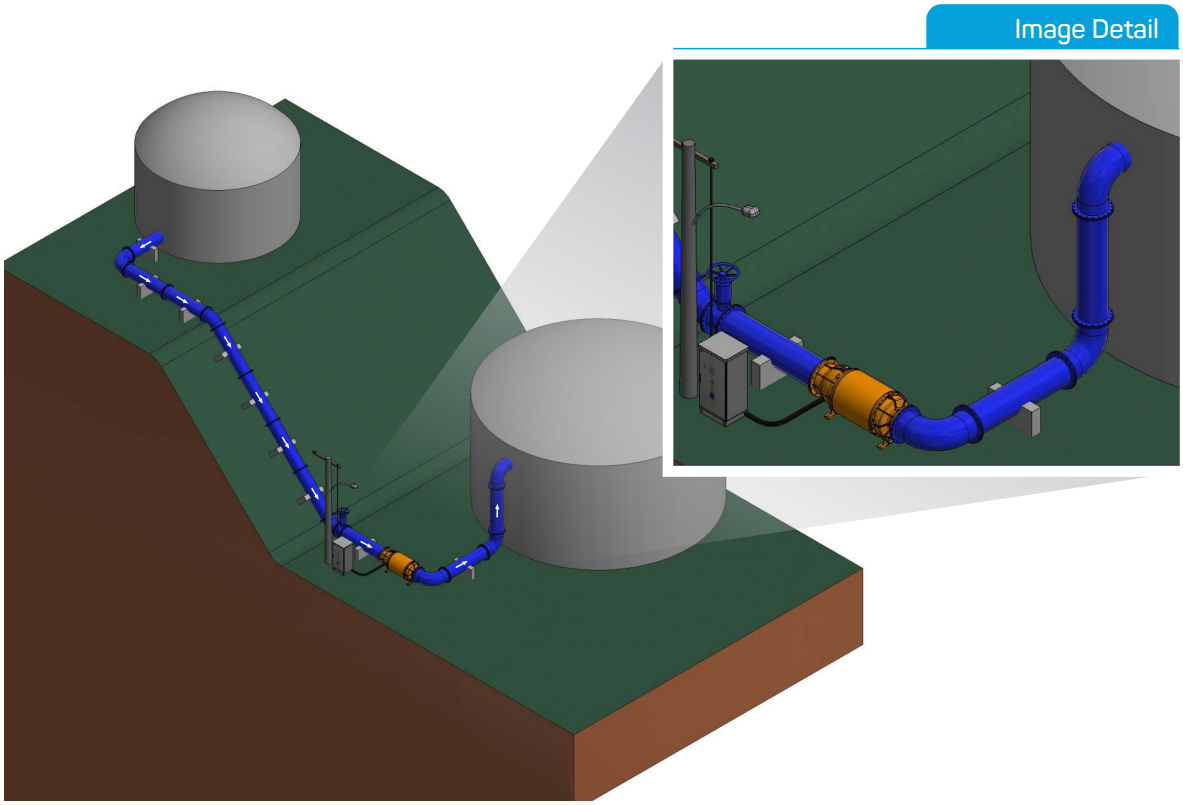


Usual Application | UCHA

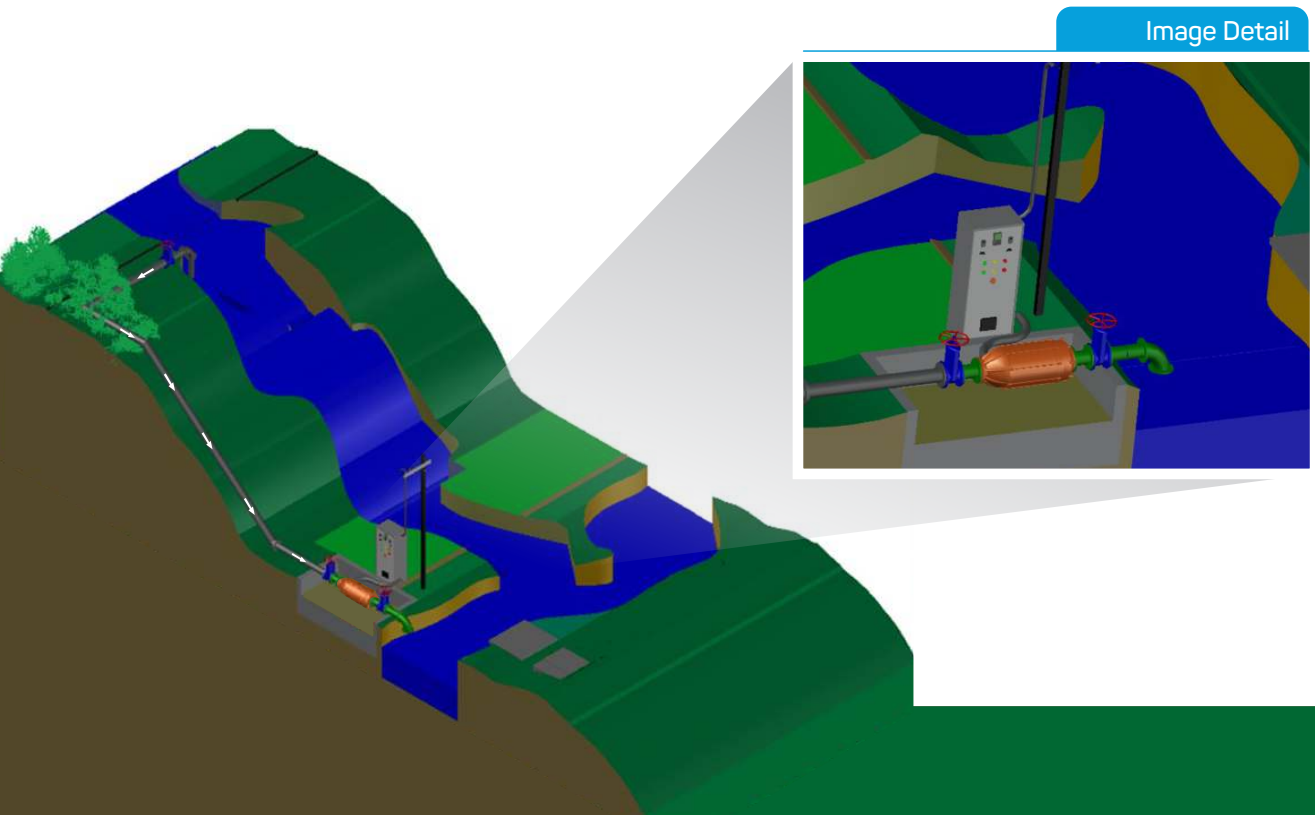
Dams | Cannals



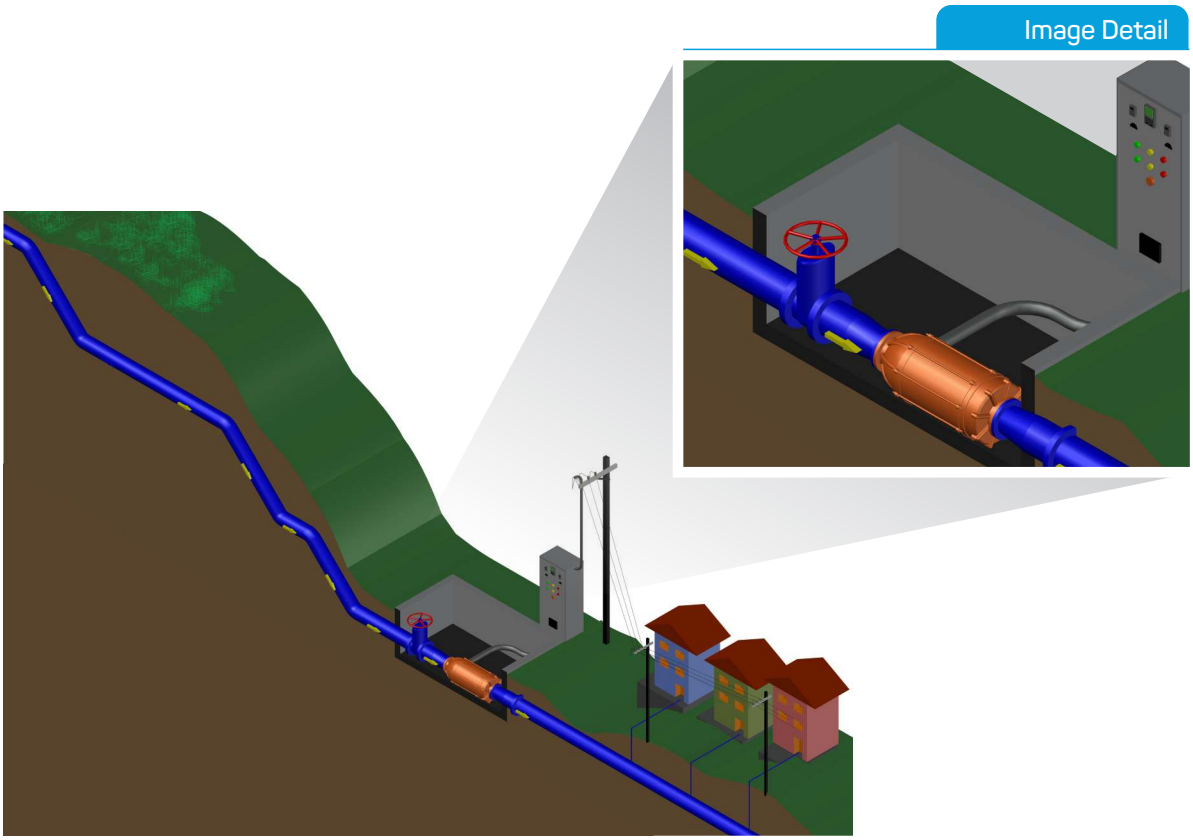
Reservoirs



Rivers I Chutes I Waterfalls

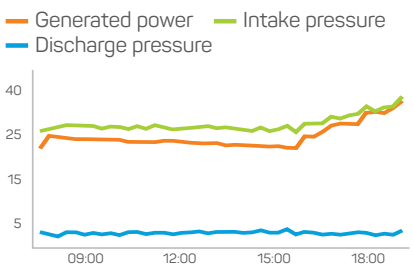


Water Lifting - Raw Water I Clear Water I Treated Sewage

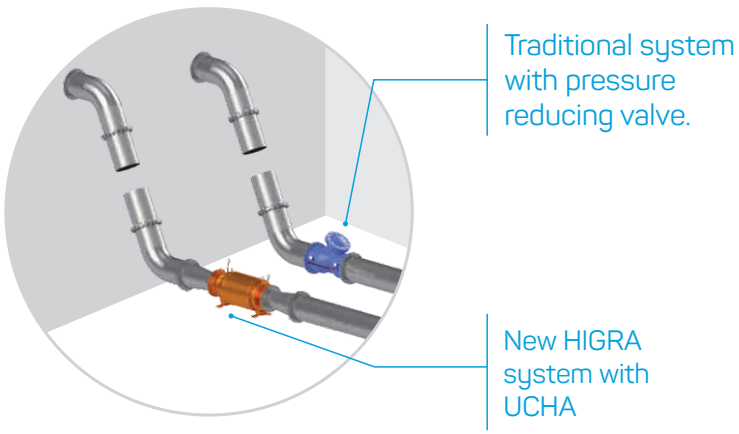


PRV Replacement

One of the main UCHA's applications is total or partial replacement of PRV (Pressure Reducing Valves) in water supplying systems, controlling the pressure required at the exit and using the energy dissipated by the valves to generate electric energy.



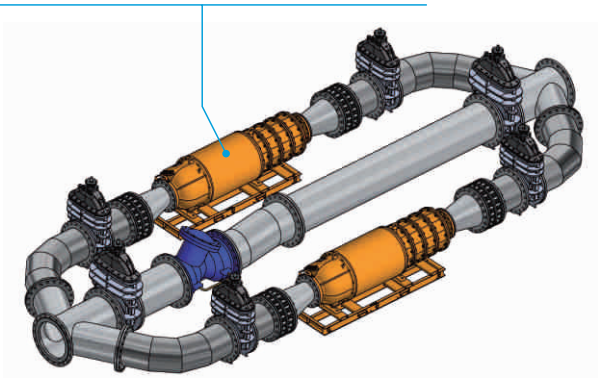
The discharge pressure of the equipment is kept constant independently from the pressure variation at the intake.



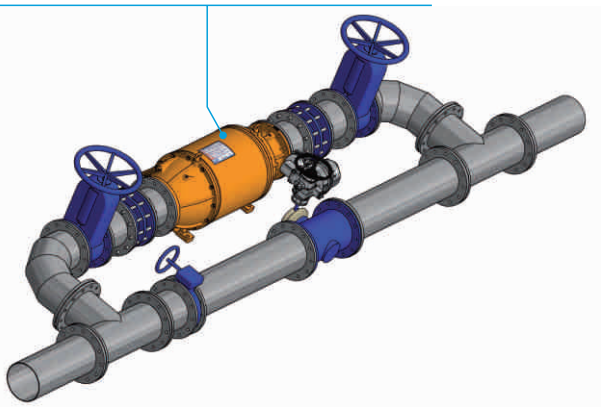
Customized Projects

Every UCHA is unique. HIGRA's experience in customized turnkey projects concentrates the application engineering efforts to also present the best solution for each application. The main objective of each UCHA is using the maximum energy passing through the TGA and generating the higher volume of energy possible. Understanding the needs of customers is the first step to get the ideal solution.

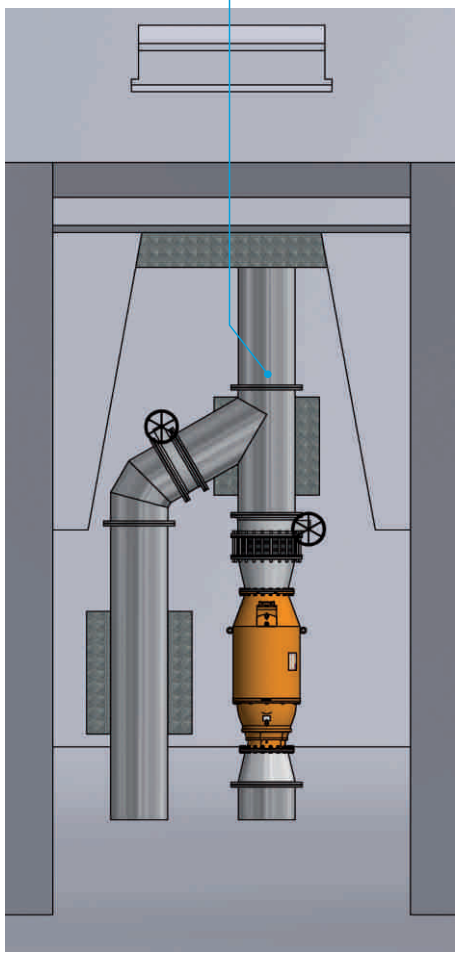
UCHA – Campo Limpo Project



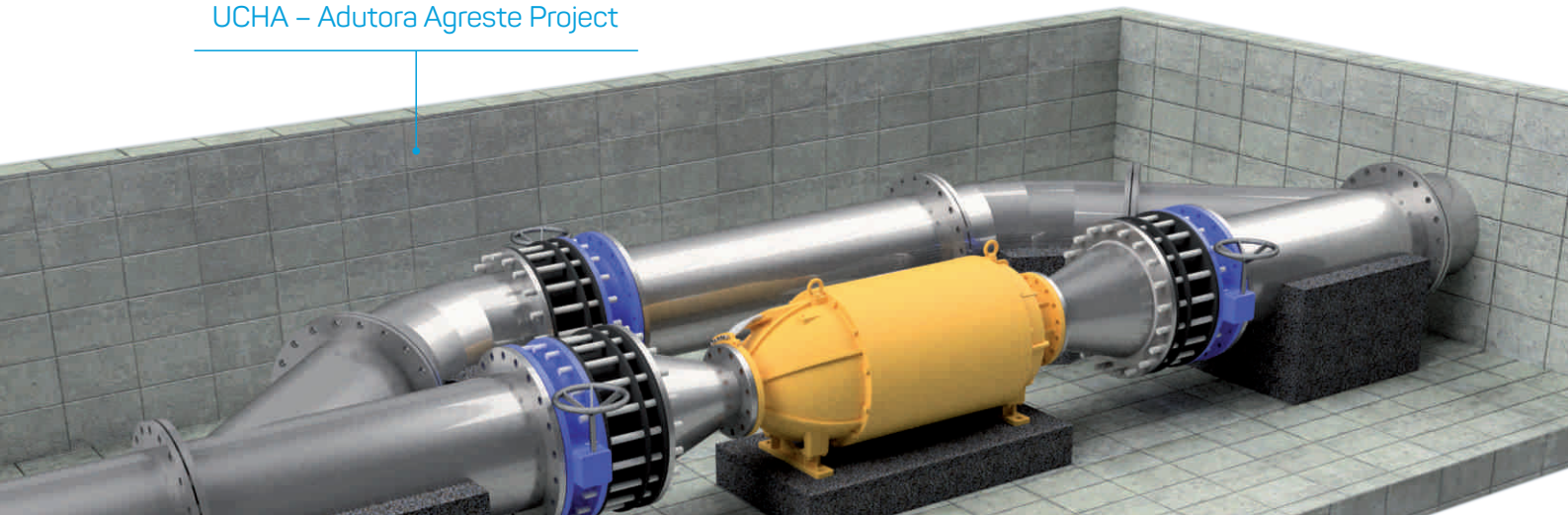
UCHA – Campo Santana Project



UCHA – Barragem Santana Project

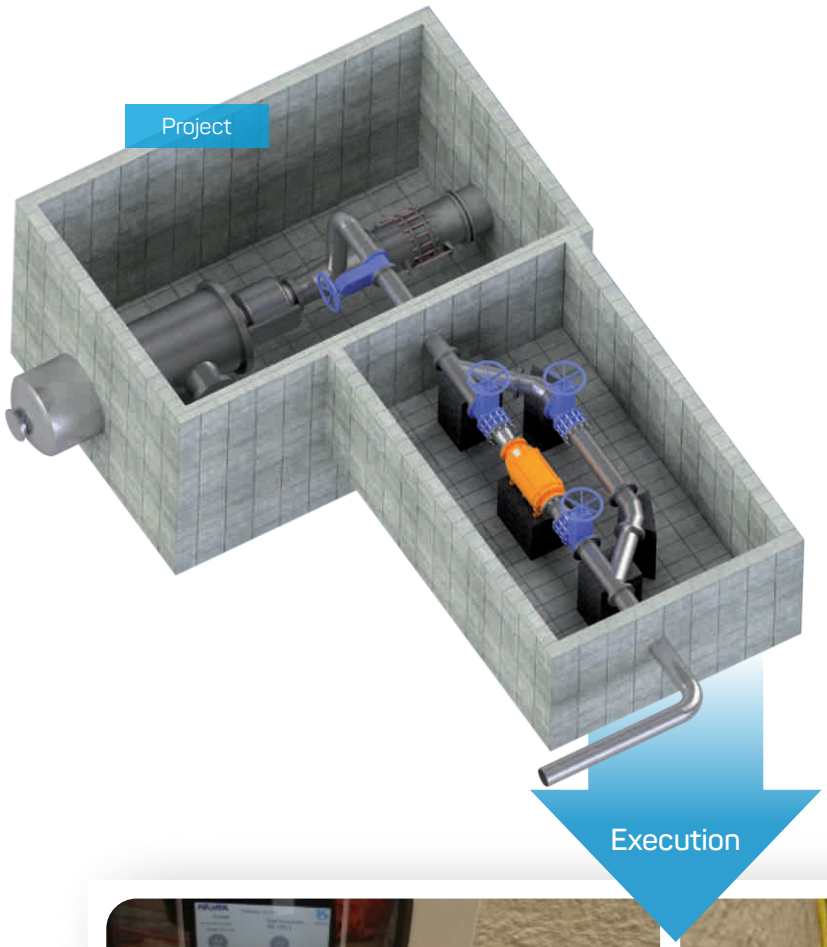


UCHA – Adutora Agreste Project

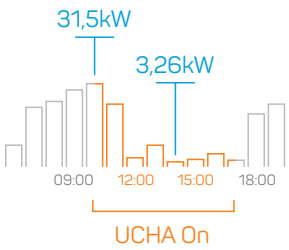


Cases

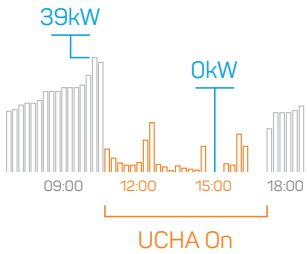
SABESP



Consumption



Demand



SEMAE

Project

Execution

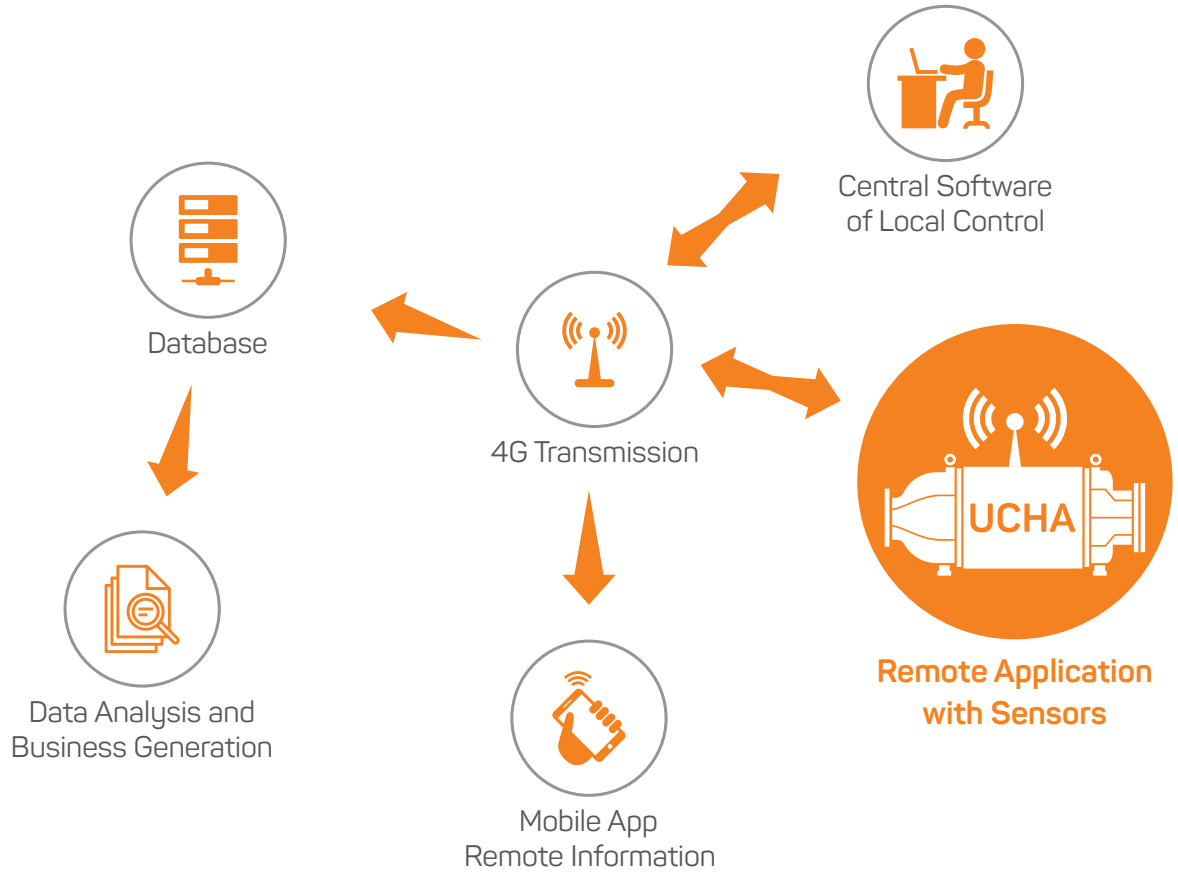
Historical Consumption

		kWh	Days
UCHA ON	JUL	140	31
	JUN	264	28
UCHA OFF	MAI	5191	33
	ABR	4783	28
	MAR	5220	30
	FEV	6377	28
	JAN	7017	33
	DEZ	5768	29
	NOV	6262	32
	OUT	5894	31
	SET	5853	32
	AGO	5465	30
	JUL	7385	29

Connecting the UCHA

IOT (Internet of Things)

The UCHA is aligned to the IOT (Internet of Things) and Industry 4.0 concepts. Through sensors installed on the TGA and other components of the unit, the UCHA might be connected to a local control center that establishes remote connection to the mobile technology (tablets, smartphones, supervision systems and others), making possible the remote and continuous operation and monitoring of the power generating system. The use of a database enables thorough management of the operations and maintenance of the UCHA's equipment.



- Full remote operational management
- Full control of the system variables
- Power control management
- Data management for preventive and predictive maintenances

Download the UCHA APP

Disponível na App Store

Disponível no Google Play

Easy information for you to calculate your system's potential for hydrogeneration.

Power in KW

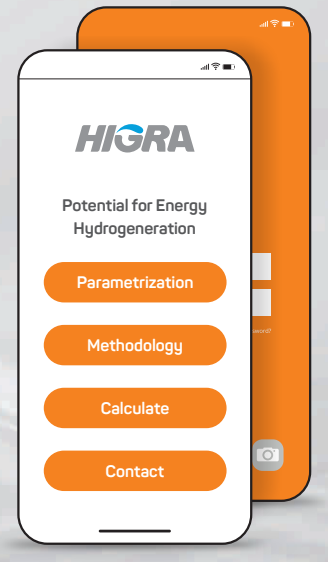
On the App you have access to the potential existing in your water lifting system.

Saving per day, month and year

Know how much electric energy you will save per day, month and year, using the UCHA technology.

Calculate as much as you want!

A figure for every application. Just use the app!



Test Laboratory

Every single pump is tested at HIGRA's Hydropower Test Laboratory y/O CFD (Computational Fluid Dynamics) in order to confirm hydraulic, electric and efficiency parameters.

* There are test limitations regarding flow rates.

HIGRA

www.higra.com.br | contato@higra.com.br

+55 51 3778-2929

Rua Dilceu Elias de Moura, 345 | Arroio da Manteiga | São Leopoldo/RS | Brazil

REV 02 - 08/2019