



Flygt Hydroturbines

SMART AND COMPACT HYDROPOWER

60 Hz

FLYGT
a xylem brand

Why submersible?

Easy to install and service

Flygt submersible hydroturbines can be installed in minutes, no assembly or shaft alignment needed. Flygt smart installation concepts allow easy removal for servicing.

Reliable and efficient

Submersible hydroturbines offer high operational efficiency and great reliability, no transmission shaft, couplings or intermediate bearings.

Invisible and quiet

Submerged operation and below ground installation make Flygt turbines virtually silent and invisible.



The first Flygt submersible hydroturbine was installed in Sweden in 1983. Since then, we have delivered hundreds of units around the world, most of these units are still in operation today. Installed in new structures or existing mills, submersible hydroturbines are extremely adaptable and can be made to work in almost any site location. With low initial investment cost and long lifetime, the return on investment in small scale hydro is short, which leads to good profitability.



1947

World's first submersible drainage pump



1956

First submersible wastewater pump



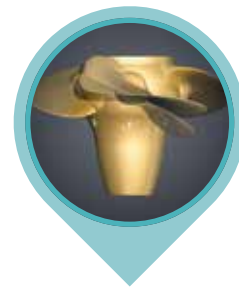
1977

Launch of first submersible propeller pump



1983

Launch of Flygt submersible turbines



1985

Introduction of automatic adjusting runners

Most common Flygt hydroturbines installations

Penstock

Intake siphon

Open or covered flume with cylindergate

Traditional open or covered flume

Submerged underwater chamber



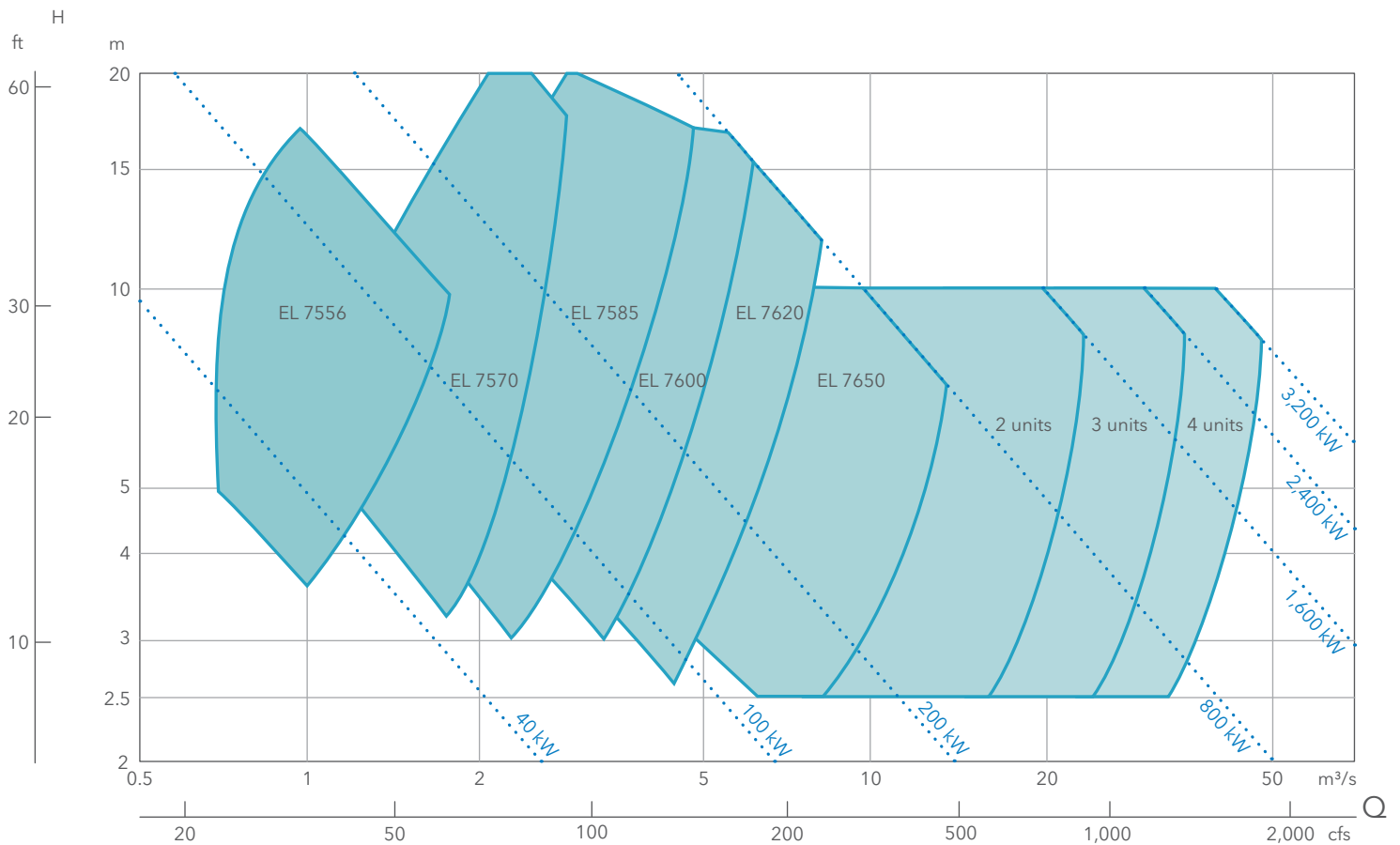
Designed to run and adapt

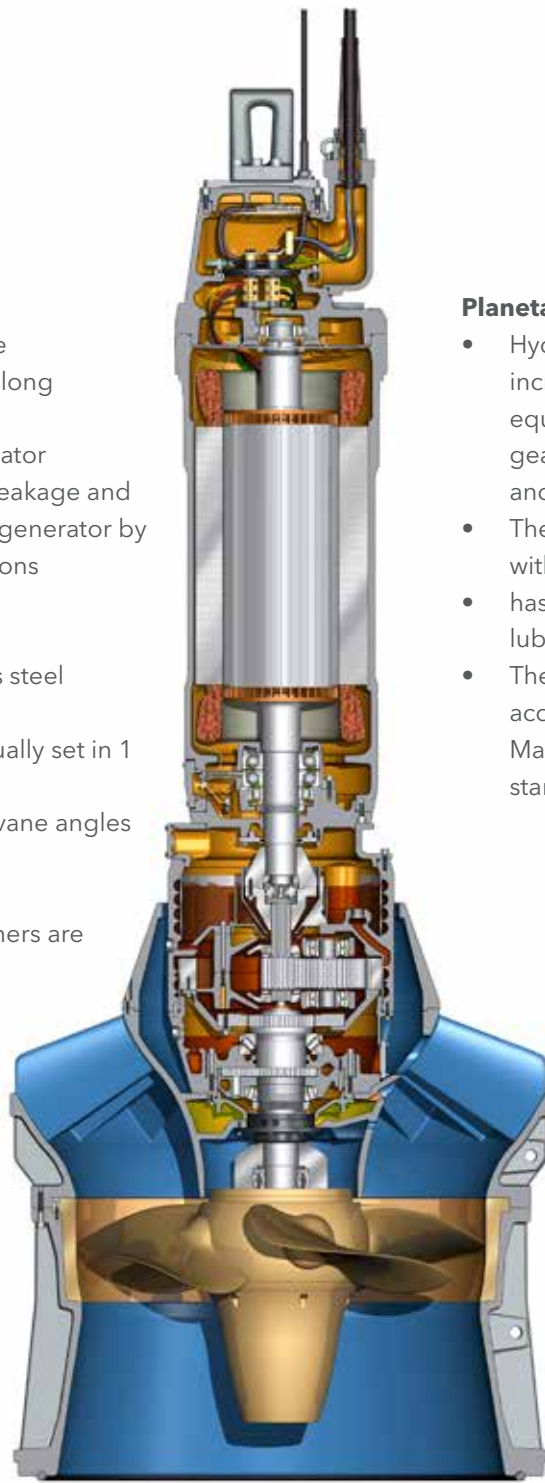


In applications with heads up to 65 feet (20 m) and flows up to 350 cfs (10 m³/s) per unit, the Flygt family of hydroturbines will adapt to a wide variety of site conditions.

Auto-adjusts to varying flow

The four largest available turbines offer an option with automatically adjustable runners (semi-Kaplan turbines) for use in run-of-the-river conditions with varying flows optimizing power generation.





Generator

- Generator is fully submersible
- Heavy duty bearings provide long operational lifetime
- Temperature sensors in the stator windings and main bearing, leakage and vibration sensors protect the generator by warning for abnormal conditions

Hydraulics

- Aluminum bronze or stainless steel runners
- The blade angle can be manually set in 1 degree increments
- Several different fixed guide vane angles available to provide optimal performance
- Automatically adjustable runners are available in some of the units
- Easily replaceable wear ring helps maintain high efficiency

Planetary Gearbox

- Hydroturbines that require a speed increaser for use with a generator are equipped with a heavy duty planetary gear box designed for both long life and high efficiency
- The gearbox is lubricated and cooled with gear oil and
- has a pressurization system for lubrication, filtration and cooling
- The gears are designed for infinite life according to the American Gear Manufacturers' Association (AGMA) standards

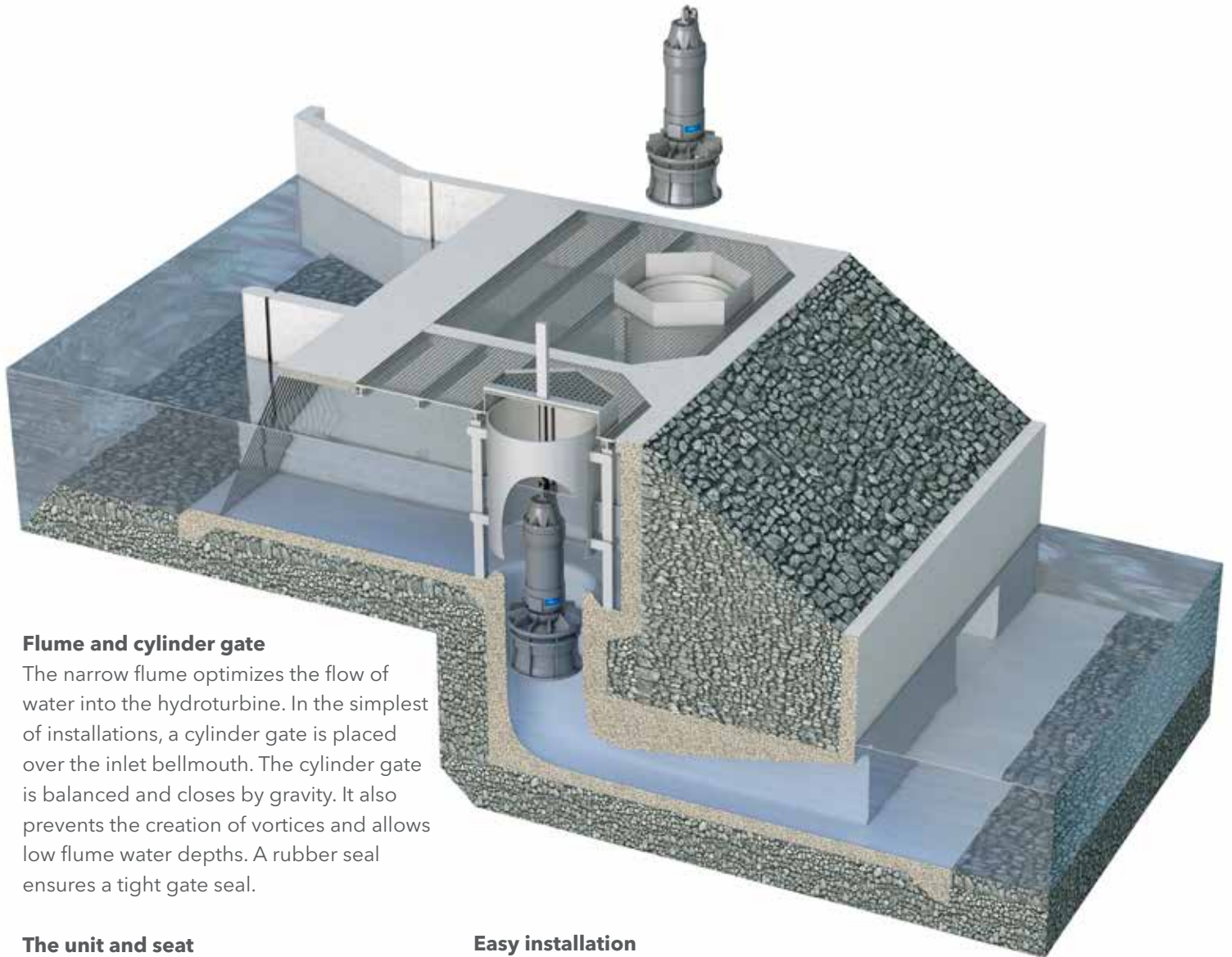
Unique seals - adding to reliability

- Flygt mechanical seal systems minimize shaft overhang, maximize cooling and lubrication
- Two pairs of mechanical shaft seals work independently for double safety
- An extra level of safety is provided by a double-grommet cable sealing

Model	Power kW	Guide vane angles	Column Ø in (m)	Propeller Ø in (m)	No. of blades	Blade angles	Blade adjustment	Max weight lbs (kg)
EL 7556	40–185	50°, 57°, 63°, 70°	32 (0.8)	22 (0.55)	4 or 5	8° ~ 28°	Fixed	3,800 (1,700)
EL 7570	40–420	50°, 57°, 63°, 70°, 77°	48 (1.2)	28 (0.7)	4 or 5	8° ~ 28°	Fixed	8,900 (4,000)
EL 7585	110–800	50°, 57°, 63°, 70°	48 (1.2)	34 (0.85)	4 or 5	8° ~ 28° 4° ~ 32°	Fixed Automatic*	15,900 (7,200)
EL 7600	110–800	50°, 57°, 63°, 70°	56 (1.4)	40 (1.0)	4 or 5	8° ~ 28° 4° ~ 32°	Fixed Automatic*	17,200 (7,800)
EL 7620	110–800	50°, 57°, 63°, 70°	64 (1.6)	48 (1.2)	4 or 5	8° ~ 28° 4° ~ 32°	Fixed Automatic*	19,400 (8,800)
EL 7650	170–800	57°, 63°, 70°, 77°	80 (2.0)	60 (1.5)	4	8° ~ 28° 4° ~ 32°	Fixed Automatic*	25,200 (11,400)

*) Automatic propeller blade adjustment is only available on 4 Bladed Propellers.

Engineering made easy



Flume and cylinder gate

The narrow flume optimizes the flow of water into the hydro turbine. In the simplest of installations, a cylinder gate is placed over the inlet bellmouth. The cylinder gate is balanced and closes by gravity. It also prevents the creation of vortices and allows low flume water depths. A rubber seal ensures a tight gate seal.

The unit and seat

The submersible hydro turbine is a completely integrated machine, including gearbox if required. As the hydro turbine is submerged, it is cooled by the water flowing around it. This allows for efficient and reliable operation. The hydro turbine rests on and seals against a bottom seat and is held in place by its own weight and the water pressure while running. An anti-rotation device prevents the hydro turbine from rotation if a shockload should occur.

Easy installation

The hydro turbine is not bolted into the structure. It is simply lowered down into the seat for installation. It can easily be raised for inspection and service.

Draft tubes

Prefabricated elbow or straight conical draft tubes recover dynamic energy downstream of the runner. Each hydro turbine size has a matched draft tube to maximize the energy recovery.

Smooth operation ensured

Xylem TotalCare is a comprehensive, integrated portfolio of services designed to ensure that your water and submersible turbine equipment keeps running at its best. Our knowledgeable and skilled engineers are experts in turbine applications.



Aftermarket support

Flygt provides complete installation, operation and maintenance manuals for every product, including submersible turbines. Regular maintenance contracts can help ensure that the maximum power is generated by the turbine. They can be setup to ensure that the turbine is installed at the times when it will generate the most power.

Engineering support

Flygt offers detailed drawings for each size of draft tube required. This reduces design time and eases construction. Available in CAD format, they can be placed into construction drawings or given to local fabrication shops to allow construction near the project site, reducing costly shipping charges.

Hydroturbine optimization

Each hydroturbine site is unique. Flygt tools help optimize the selection of hydroturbine based upon the information for your specific site. Using the flow duration curves as well as the site layout, Flygt recommends the number, size, and type of hydroturbine that should be used. This helps ensure optimal power generation. Flygt also offer CFD (Computational Fluid Dynamics) to ensure proper hydraulic conditions are present for the hydroturbine, and recommends solutions to correct for any adverse conditions.

Generator monitoring

The hydroturbine can be monitored remotely with the use of Flygt MAS (Monitoring And Status) system. A regular maintenance and monitoring program allows for scheduled maintenance during flow season. Using Modbus serial communication, the MAS can send data to almost any SCADA system used at your site.

With a service network spanning 150 countries, we might have a workshop close to your site that can support you with maintenance, repair, spare parts and more.

We take pride in our ability to help customers overcome challenges and optimize operations by providing the right solution to every specific application.

Find out more about our TotalCare concept at xyleminc.com/totalcare



Xylem ['zīləm]

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to www.xyleminc.com



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