

## CASE STUDY

# KELTIE WATER, Drummond Estate, Callander, Scotland



### KEY STATISTICS

**Customer:** Drummond Estate  
**Turbine type:** HCTI Twin Jet Turgo  
**Number of Turbines:** 1  
**Power Output:** 1MW  
**Net Head:** 78m  
**Flow:** 1626 l/s  
**Runner Dia:** 25"  
**Speed:** 600 rpm

### SCOPE OF SUPPLY

25" Twin Jet Impulse Turbine  
Main Inlet Valve  
Synchronous Generator  
Lube Oil System  
Control & Switchgear Panel  
Hydraulic Control Module  
Head Level Sensor  
Control & Power Cabling

Building Services  
Transformer  
Installation & Commissioning  
Servicing for duration of Warranty

At over 1,800 sq km and as one of the UK's largest National Nature Reserves, the Trossachs National Park attracts over 4 million visitors each year. There are currently 38 operational, run-of-river hydro schemes within the Park, of which Keltie Water is one of the larger, privately developed examples.

The 1MW Keltie Water hydro scheme, which is Gilkes second machine for the Drummond Estate, was granted planning permission in 2014 and construction started the following year. Gilkes worked closely with consultants, Allt Energy, and civil engineers, Campbell of Doune Ltd, throughout the early stages of the project - ultimately selecting a 25" twin-jet Turgo as the most suitable machine for the scheme.

The faster running nature of the Turgo, along with its broad efficiency characteristics and low profile, all fitted well with the scheme's hydrology and planning constraints. The scheme has two intakes, the main intake being located on a dam formerly owned by Scottish Water, from which the scheme only abstracts when the dam spills. The second intake is a conventional run of river intake which highlights the importance of the Turgo's flat efficiency curve.

The Turgo is particularly suited to this site with its ability to operate across a flow range of  $\sim 1.63\text{m}^3/\text{s}$  to  $0.15\text{m}^3/\text{s}$  with a nett head of 78m, and while running at 600rpm. In contrast to a slower running vertical machine (which would require a considerably taller building) the simplicity, high speed and lower cost of the Turgo also allowed a lower profile stone built Powerhouse to be sited. Sensitive, resulting in a scheme that is nicely absorbed by the surrounding landscape.

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Although large by UK standards, the Turgo turbine at Keltie Water shares its advantages with considerably higher output machines abroad. Gilkes has supplied over 1000 Turgos to over 40 countries, with some examples generating in excess of 7.5MW from a single machine.

Gilkes provide a comprehensive service and maintenance package not only to the Keltie scheme but also schemes across the Trossachs from our recently opened Scottish service centre in Callander, dedicated to serving the Trossachs and surrounding areas.

Gilkes continues to make substantial investments in advancing the Turgo design today - more than 100 years after the company patented the design in 1919.

