

ECOFLO II UNITS

The ECOFLO II is the latest, state-of-the-art UV treatment system. Our objective for the product was simple – to be the best on the market, no compromise. The ECOFLO II offers the flexibility of a horizontal or vertical installation application

Utilizing our proven medium pressure lamp technology, the ECOFLO II type UV systems offer a high quality 'high specifications' product at a very competitive price. The powerful two lamp units are designed to provide protection and extended life from that of single lamp systems. Suitable for all pools and whirlpools with flows from 560 – 7000 gpm and flange sizes from 6" – 14'.

Treatment Chamber

The new ECOFLO II UV treatment chambers are designed for installation into the piping after the filters and heaters, but before any chemical dosing. Please refer to the ECOFLO II Units Technical Specifications document for dimensions and clearance requirements.

The UV chamber is manufactured from polished 316L stainless steel, with ANSI 150 RF flanges for easy installation. Temperature probes, UV monitor probes, and automatic quartz wipers are included.

A pressure rating for the unit is 150 psi, and pressure drop through the chamber is minimal.

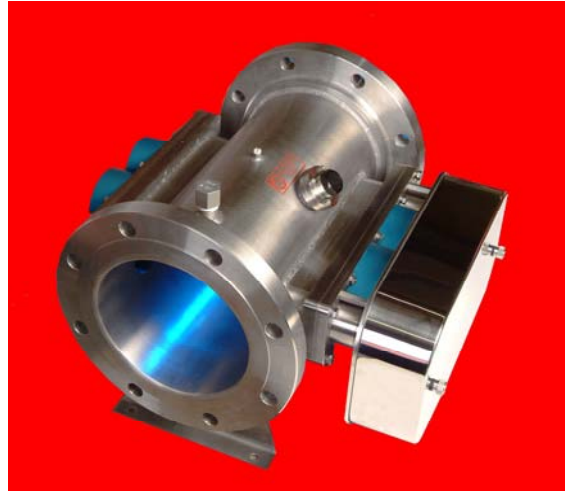
Control System

The control system is located in a NEMA 12 (IP54) rated cabinet.

As a standard, it is supplied with a 15' cables for connection to the treatment chamber.

The power supply (PSU) and control cabinet is powered with the latest SPECTRA microprocessor control unit. Three levels of operation (simple control, full parameter display, and operator configuration) allow easy, uncomplicated operation of the unit by an operator. Included is a sophisticated password protected engineering section for integrating the unit with other system devices.

Auto power restart, pump and valve interfaces, process interrupt and low power overnight operation are all features specifically designed for use on swimming pools and waterparks.



The treatment chamber has been designed for the simplest installation into any pipe work system. They can be mounted vertically or horizontally. The compact design allows existing facilities to be easily upgraded with minimum site work.



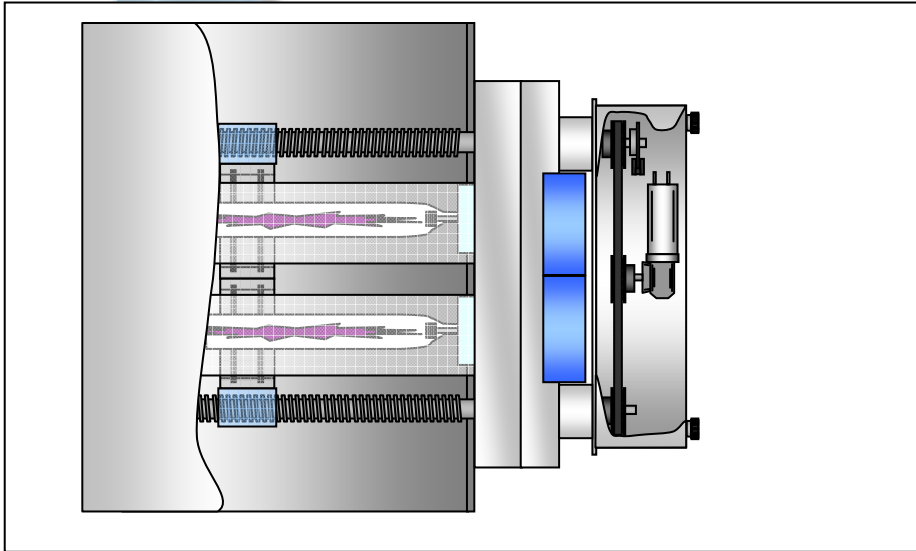
ECOFLO II

CONTROL UNIT TECHNICAL SPECIFICATIONS



| TYPE | SUPPLY | WEIGHT | DIMENSIONS | | |
|---|---------------|--------|--|--------|-------|
| | | | Width | Height | Depth |
| ECF – A-XX | 480/460v 60hz | 250lbs | 24" | 40" | 12" |
| ECF – C-XX | 480/460v 60hz | 350lbs | 32" | 48" | 12" |
| MATERIAL | Carbon Steel | | IP Rating | IP54 | |
| COMPLETE WITH | | | | | |
| RCD protection | | | Overtemperature Protection | | |
| UV Monitoring | | | Automatic Wiper | | |
| SPECTRA Microprocessor Control | | | | | |
| Simple START STOP and RESET buttons | | | Full fault screen display and help screens | | |
| Dose, Flow, Current and Temperature display | | | Remote operation and control function | | |
| Auto restart on power failure | | | Valve and Pump interface contacts | | |
| Half power operation for low pool use periods | | | Separate password protected engineer functions | | |

ECOFLO II UNITS INTELLIGENT WIPER – THE RQWE RANGE



Designed for the ETS ECOFLO II units, the new wiper system includes many unique features, making it a state-of-the-art wiper.

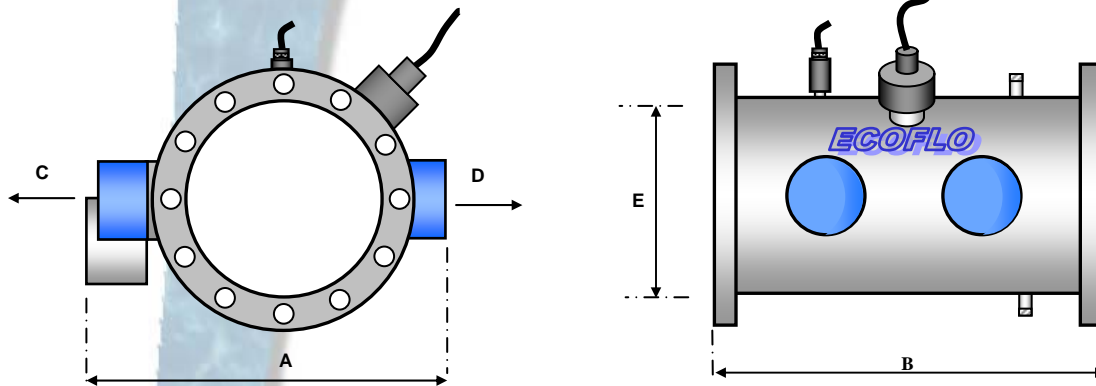
- Unique double seal and bearing housing for longer life, including food-grade-approved seal materials.
- A single wiper shaft
- Fully enclosed housing to maintain NEMA (IP) ratings.
- Wiper power supply @ 24 Volt DC for improved safety.
- Belt drive with all pulleys and shafts square-machined to prevent slippage and pin shearing.
- Direct shaft encoding for positional location; no need for external proximity switches and internally located magnets. No complex transfer gear boxes for limit switches.
- Wiper interval operator selectable, with an optional override switch.
- Ability to upgrade most systems with a retrofit wiper.

INTELLIGENT OPERATION

The new electronic control system features an automatic start-up/commissioning application. Operators do not need to position the wiper carriage. A very simple commissioning procedure records the wiper position at both ends of the chamber and establishes its travel run without the need to check stop positions and adjust limits accordingly. There is no risk of proxy faults causing wiper failure.

The system also fully recovers from power dips and interruptions, with a permanent memory of wiper location and travel direction stored in its processor. The wiper can also report directly into the new SPECTRA control panel for fault reporting and data logging.

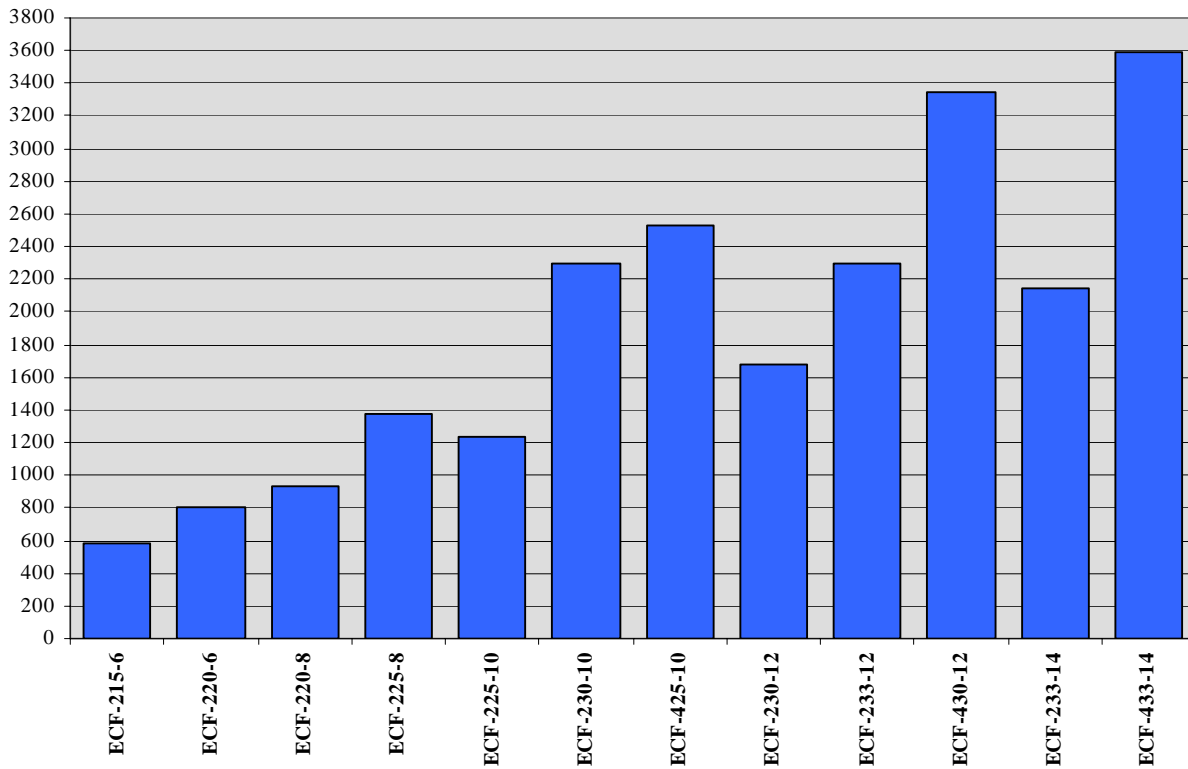
ECOFLO II TECHNICAL SPECIFICATIONS



| TYPE | LAMPS & POWER | FLOW (US GPM) | WEIGHT (Dry/Wet) | DIMENSIONS & ACCESS | | | | | CONTROL PANEL TYPE |
|------------------------|---------------------|---------------|-------------------------|---------------------|-----|-----|----|-----|--------------------|
| | | | | A | B | C | D | E | |
| ECF-215-6 | 2 * 1.5kW | 580 | 125/145lbs | 19" | 20" | 16" | 6" | 6" | ECF - A-15 |
| ECF-220-6 | 2 * 2.0kW | 800 | 140/185lbs | 21" | 24" | 16" | 6" | 6" | ECF - A-20 |
| ECF-220-8 | 2 * 2.0kW | 930 | 140/180lbs | 21" | 20" | 16" | 6" | 8" | ECF - A-20 |
| ECF-225-8 | 2 * 2.5kW | 1,370 | 150/225lbs | 23" | 26" | 16" | 6" | 8" | ECF - A-25 |
| ECF-225-10 | 2 * 2.5kW | 1,230 | 150/210lbs | 23" | 20" | 18" | 6" | 10" | ECF - A-25 |
| ECF-230-10 | 2 * 3.0kW | 2,300 | 160/275lbs | 24" | 28" | 18" | 6" | 10" | ECF - A-30 |
| ECF-425-10 | 4 * 2.5kW | 2,525 | 190/270lbs | 23" | 28" | 18" | 6" | 10" | ECF - C-25 |
| ECF-230-12 | 2 * 3.0kW | 1,680 | 160/245lbs | 24" | 20" | 20" | 6" | 12" | ECF - A-30 |
| ECF-233-12 | 2 * 3.0kW | 2,300 | 170/320lbs | 26" | 28" | 22" | 6" | 12" | ECF - A-33 |
| ECF-430-12 | 4 * 3.0kW | 3,350 | 200/315lbs | 24" | 28" | 20" | 6" | 12" | ECF - C-30 |
| ECF-233-14 | 2 * 3.0kW | 2,150 | 170/320lbs | 26" | 24" | 22" | 6" | 14" | ECF - A-33 |
| ECF-433-14 | 4 * 3.0kW | 3,590 | 220/375lbs | 26" | 28" | 22" | 6" | 14" | ECF - C-33 |
| MATERIAL | 316 Stainless steel | | FLANGE TYPE | ANSI 150 RF | | | | | |
| PRESSURE DROP | Less than 0.6 PSI | | DRAIN & VENT | 3/4" NPT & 1/4" NPT | | | | | |
| PRESSURE RATING | 150PSI | | STRAINER | Supplied loose | | | | | |

Ecoflo II Sizing Chart

| Pipe | Model | Lamps | Total KW | Flow (GPM) |
|------|------------|----------|----------|------------|
| 6" | ECF-215-6 | 2*1.5kW | 3 | 580 |
| | ECF-220-6 | 2*2.0kW | 4 | 800 |
| 8" | ECF-220-8 | 2*2.0kW | 4 | 930 |
| | ECF-225-8 | 2*2.5kW | 5 | 1370 |
| 10" | ECF-225-10 | 2*2.5 kW | 5 | 1230 |
| | ECF-230-10 | 2*3.0kW | 6 | 2300 |
| | ECF-425-10 | 4*2.5kW | 10 | 2525 |
| 12" | ECF-230-12 | 2*3.0kW | 6 | 1680 |
| | ECF-233-12 | 2*3.0kW | 6 | 2300 |
| | ECF-430-12 | 4*3.0kW | 12 | 3350 |
| 14" | ECF-233-14 | 2*3.0kW | 6 | 2150 |
| | ECF-433-14 | 4*3.0kW | 13 | 3590 |



THE ECOFLO II UV WATER TREATMENT UNIT

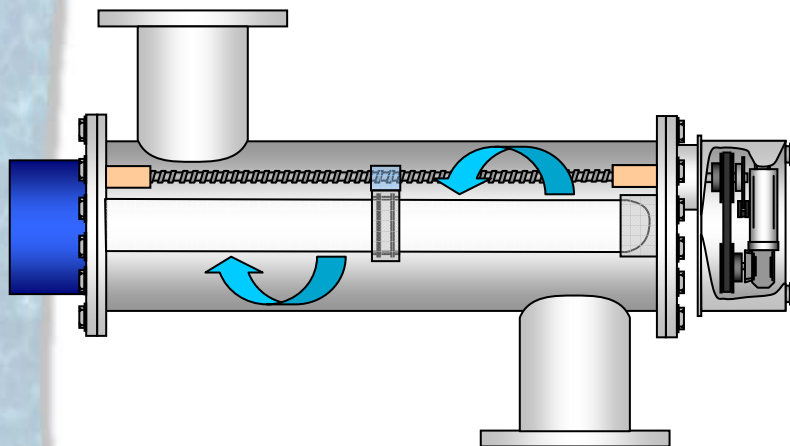
Background

ATG Willand has been manufacturing UV water treatment products for a quarter century.

UV treatment works by exposing water borne bacteria to intense UV light which alters the DNA of the bacteria, preventing replication and thus effectively killing the bacteria. With no chemical additives and very efficient disinfection with short contact times it has many diverse applications including drinking water, bottled drinks, pharmaceutical plants, aquaculture and many others. When applied to swimming pools a more significant benefit is the additional breakdown of combined chlorine - significantly improving the water quality for pool users

Traditional Design

The traditional configuration for a UV system is shown below.



Water enters the chamber, travels around a lamp or lamps mounted axially along the centre and then exits the chamber. The flow is assumed to swirl evenly through the chamber at the same speed, allowing all the water to receive the proper contact time.

Pressure drops are not excessive, in the region of 1.0/1.2 psi. The chamber shown above is more often supplied with the inlets and outlets mounted on the top.

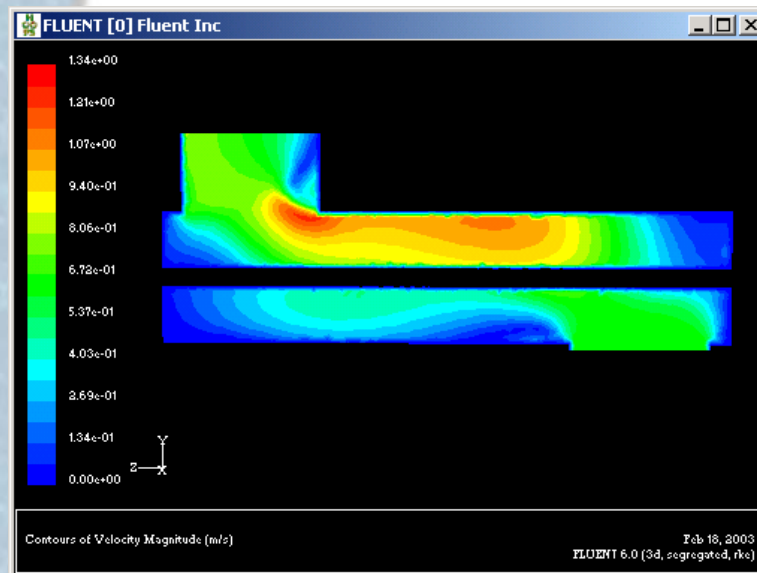
THE ECOFLO II UV WATER TREATMENT UNIT CONTD.

Using CFD (computational fluid dynamics) to assess hydraulic performance

The advent of more powerful desktop computers and the increasing use of CFD modelling have allowed the assumptions behind the standard UV systems to be reviewed.

The use of CFD modelling has shown that these basic assumptions are not correct. In practice the 90 degree direction changes create secondary back flows, dead zones and zones in which the water particles are accelerated.

A CFD plot illustrating the velocity contours is show below.



The water does not evenly swirl around the chamber but accelerates quickly through the chamber. Some particles receive less than 50% of the theoretical contact time. The ratio (percentage) of the fastest particles divided by the theoretical contact time is referred to as the hydraulic efficiency.

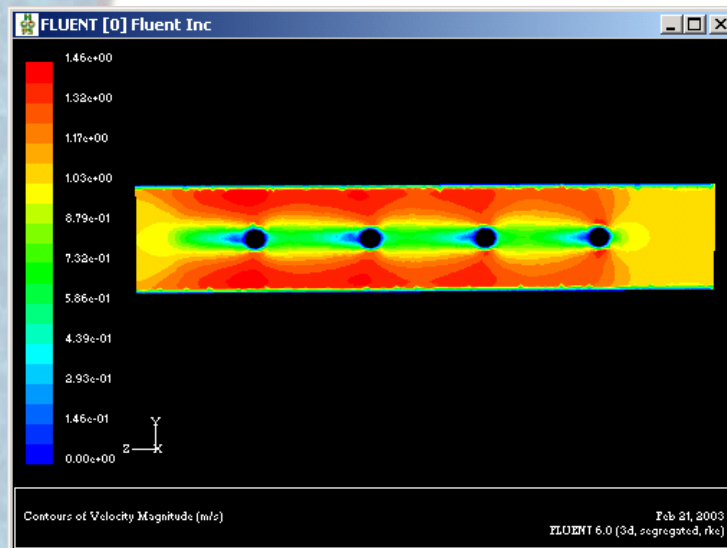
Placing the inlet and outlet in the same plane (i.e. both on top) improves the hydraulic efficiency but this is still below 60%

ATG Willand has carried out an extensive R & D programme to investigate alternative configurations.

The final result was the development of the ECOFLO II range

THE ECOFLO II UV WATER TREATMENT UNIT CONTD.

ECOFLO II CFD Design



The new ECOFLO II design utilises a number of lamps mounted axially across the UV chamber. This results in a more homogenous flow distribution. For most models the hydraulic efficiency is >85%.

The improved application of the UV energy in the ECF units gives an increased treatment per energy applied. This varies depending on the model selected and the flow rate but is on average 15% improved for the ECOFLO II range.

The improvement in hydraulic efficiency also results in a much reduced pressure drop (typically half that of a standard unit) and a more compact and simpler installation.