LARGE DIAMETER PIPE ASSESSMENT – Pre- and Post-Rehabilitation Leak Location

Up to 74 inch (2000mm) Diameter Pipes
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Chuck Hansen

Holly Tonner
Aqua Assets Pty Ltd.

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INTERNATIONAL PATENTS & PATENTS PENDING
CA 2864503, EP 2748576, JP 6062541, 6193893, US Patents 9143740, 9304055, 9933329, 10451515, 10557772
<table>
<thead>
<tr>
<th>Product</th>
<th>Number</th>
<th>Selected Application</th>
<th>Sales / Licensing¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Sensor</td>
<td>ES-600 CCTV</td>
<td>Small-to-Medium Pressured Water Mains or Sewer Rising Mains, up to 60 inches, 1500mm.</td>
<td>Only available for service-related projects. Not available for sale to utility customers or contractors. Contractor licensing subject to training, qualifications, and annual support agreement.</td>
</tr>
<tr>
<td>DELTA Probe</td>
<td>ES-600 Portable</td>
<td>Medium-to-Large Diameter sewer or stormwater pipes, or gravity water mains 6-72 inches, 150-1800mm. Rack mounted onto an existing CCTV truck or van.</td>
<td>Available for sale directly to municipal or investor-owned utilities. Available for licensing to contractor on a daily or per meter basis.</td>
</tr>
<tr>
<td></td>
<td>ES-400 Push Rod</td>
<td>Small-to-Medium Diameter sewer or stormwater pipes 6-24 inches, 150-600mm. Push rod system is limited to approximately 150m length.</td>
<td>Available for sale directly to municipal or investor-owned utilities. Available for licensing to contractor on a daily or per meter basis.</td>
</tr>
<tr>
<td></td>
<td>ES-200 Push Rod</td>
<td>Small Diameter sewer or stormwater pipes 3-8 inches, 76-150mm. Best for private laterals. Push rod system is limited to approximately 150m length.</td>
<td>Available for sale directly to municipal or investor-owned utilities. Available for licensing to contractor on a daily or per meter basis.</td>
</tr>
<tr>
<td></td>
<td>CriticalH₂O Cloud App</td>
<td>Web-based data management &amp; storage, including SQL database containing life-to-date inspection results for Low Voltage Conductivity, Acoustic, and CCTV results.</td>
<td>Requires set-up fee, per seat licensing, and minimum 2-year software support agreement.</td>
</tr>
<tr>
<td></td>
<td>CriticalSewers® Cloud</td>
<td>Web-based data management &amp; storage, including SQL database containing life-to-date inspection results.</td>
<td>Requires set-up fee, per seat licensing, and minimum 2-year software support agreement.</td>
</tr>
</tbody>
</table>

1. All product configurations available for international projects, requiring detail digital or paper-based maps, traffic control, permitting, access, and subject to detail project plan.
### Multi-Sensor DELTA Probe

<table>
<thead>
<tr>
<th>Condition</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Low Voltage Conductivity FELL, CCTV, Acoustic Hydrophone, Pressure Sensor</td>
</tr>
<tr>
<td>Pipe Diameters</td>
<td>3-60 inches, 76-1500 mm</td>
</tr>
<tr>
<td>Pressure</td>
<td>Range from ZERO to 12 bar (174 psi)</td>
</tr>
<tr>
<td>Temperatures</td>
<td>41-86°F, 5-30°C</td>
</tr>
<tr>
<td>Common Launch Points</td>
<td>Air Release Valves, Blow Off Valves, Gate Valves, Hot Taps, Hydrants, and Meters</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>Min. Flow Rate for Hydrochute Propulsion is .3m/sec. Push rods able to handle NO FLOW conditions.</td>
</tr>
<tr>
<td>Pricing</td>
<td>Per Day or Per Meter Based on Total Project Size, Difficult Access, Openings, Diameter, and Traffic Control.</td>
</tr>
<tr>
<td>Pipe Lengths Per Survey</td>
<td>1km Recommended for CCTV Up to 2km with specialised equipment.</td>
</tr>
<tr>
<td>Average Production</td>
<td>1-2 Pipe Sections per Day</td>
</tr>
</tbody>
</table>
Multi-Sensor DELTA Probe Continued
Available as a Technology Service Only By Authorized Contractors

Hydochute Set-Up

Both Set-Ups
1km Distance
or 3,280 feet

Pull Through Set-Up

Over 3,000 Pressurized Pipe Insertions
ES-600 CCTV Truck Integration ES-670, ES-660, ES-650, ES-400

CCTV Van Integration

Electro Scan Probe
CCTV Camera
Plug & Play
Winch Slip Rings
Grounding Calibration
Adaptive Terminal
Real-Time Controller
Joy Stick

Aries  Cues  IBAK  Ipek  Rausch  Custom

ES-670
ES-660
ES-650
ES-400 for Standard CCTV Reel
ES-400 for Push Rod Reel

ES-600
WiFi
## ES-600 Standard Specifications and Features

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Flow</td>
<td>None. Dry, Partially, or Fully-Surcharged Flow. Aided by Jet Truck.</td>
</tr>
</tbody>
</table>
| Pipe Diameters                          | - ES-670 Up to 74 inch (2000mm) Fully Surcharged  
- ES-660 6 to 60 inch (150 to 1500mm) Partially Surcharged  
- ES-650 6 to 60 inch (150 to 1800mm) Partially Surcharged  
- ES-400 4 to 16 inch (100 to 400mm) Partially Surcharged |
| Pipe Shape                              | Any, including Circular, Box, Egg-shaped, Oval, and Trapezoidal.                                                            |
| Pipe Materials                          | Any Electrically Non-Conductive Pipe Walls, including Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay Pipe, etc. |
| Dimensions                              | ES-660 & ES-670 Length: 32 in (812mm); Diameter: 2.875 in (73mm) |
| Scan Recording                          | Critical Sewers® Field Laptop PC, Wifi Connection to Critical Sewers® Cloud Application.                                      |
| Speed                                   | 45-60 ft/minute (15-20 meters/minute)                                                                                       |
| Operating Temperature                   | 20°F to 120°F (-7°C to 50°C)                                                                                               |
| Power Supply                            | 120VAC / 60Hz - or - 220VAC / 50Hz                                                                                          |
| Range                                   | 1,500 ft (460m) range from single point of access. Dependent on jet truck hose length.                                      |
| Current (max)                           | 40 mA                                                                                                                        |
| Electrical Array                        | Focused tri-electrode array                                                                                               |
| Defect Flow Calculation                  | ± 30% Accuracy measured in Gallons Per Minute (GPM) or Liters Per Second (LPS).                                              |
| Defect Location                         | ES-650 & ES-660 ±3/8 inches (1cm) ES-670 ±1 inch (2.5cm)                                                                       |
| Advantages                              | 1. No manual coding required.  
2. Finds 90-100% defects missed by CCTV inspection  
3. Finds & measures leaks in GPM (LPS).  
4. No bypass pumping required for inspection.  
5. Use in field, rain or shine.  
6. Recommended for all Pre- and Post-Rehabilitation.  
7. Finds defects inside joints not seen by CCTV.  
8. Differentiates superficial cracks from cracks through pipe.  
9. Repeatable test results, verified by US, UK, German, Japanese, and Australian testing.  
10. Find & measure defects hidden by grease, silt, & encrustation.  
11. Automatically evaluates 360° of pipe wall.  
13. Robust design with no moving parts.  
14. Recommended by WRc, developers of NASSCO CCTV Codes.  
15. Reports available in minutes, not hours, days, or weeks. |
| Limitations                             | 1. Does not provide a clock position of defect location inside the pipe, but location is accurate to within 0.4 inches (1cm).  
2. Does not scan metallic pipes, unless there is a coating or liner (minimum of 1-2mm). |
ES-600 Portable ES-670, ES-660, ES-650, & ES-400

Portable Systems utilize CUES K2 Portable Reel or equivalent.

Generator and laptop PC sold separately.

ES-670

ES-650

ES-660

ES-400 for Mechanical Reel

ES-400 for Push Rod Reel

<table>
<thead>
<tr>
<th>ES-600 Series Portable*</th>
<th>Pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Diameters</td>
<td>ES-650 6 to 60 inch (150 to 1500mm) Partially Surcharged</td>
</tr>
<tr>
<td>Pipe Shape</td>
<td>Any, including Circular, Box, Egg-shaped, Oval, and Trapezoidal.</td>
</tr>
<tr>
<td>Pipe Materials</td>
<td>Electrically Non-Conductive Pipe Walls, including Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay Pipe, etc.</td>
</tr>
</tbody>
</table>

*For difficult to access locations and equipment portability.
## ES-400 Push Rod

### Pipes
- **Pipe Diameters**: 4 to 16 inch (100 to 400mm)
- **Pipe Shape**: Any, including Circular, Box, Egg-shaped, Oval, and Trapezoidal.
- **Pipe Materials**: Electrically Non-Conductive Pipe Walls, including Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay Pipe, etc.

### System Specification
- **Dimensions**: Length: 8 in (203.2mm); Diameter: 2.2 in (55.8mm)
- **Scan Recording**: Critical Sewers® Field Laptop PC, Wifi Connection to Critical Sewers® Cloud Application.
- **Speed**: 30 ft/minute (10m/minute)
- **Environmental**: IP 67. Able to withstand rain and low pressure wash down. 20°F to 120°F (-7°C to 50°C)
- **Power Supply**: 12V Rechargeable External Battery Pack -or- 12V DC External Power Supply.
- **Reel**: Spool Diameter 39 inches, L32 inches, W20 inches, H38 inches L81cm, W51cm, H96cm
- **Current (max)**: 40 mA
- **Electrical Array**: Focused tri-electrode array
- **Defect Flow Calculation**: ±30% Accuracy measured in Gallons Per Minute (GPM) or Liters Per Second (LPS)
- **Defect Location**: ±3/8 or 0.4 inches (1cm)
- **Weight**: 2.95 lb (1.34kg)
### ES-200 Push Rod

#### Pipes
- **Pipe Diameters**: 3 to 8 inch (76 to 200mm)
- **Pipe Shape**: Any, including Circular, Box, Egg-shaped, Oval, and Trapezoidal.
- **Pipe Materials**: Electrically Non-Conductive Pipe Walls, including Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay Pipe, etc.

#### System Specification
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>6.5 inches (165mm)</td>
</tr>
<tr>
<td>Diameter</td>
<td>1.57 inches (39.88mm)</td>
</tr>
</tbody>
</table>

- **Scan Recording**: Critical Sewers® Field Laptop PC, Wifi Connection to Critical Sewers® Cloud Application.
- **Speed**: 30 ft/minute (10m/minute)
- **Environmental**: IP 67. Able to withstand rain and low pressure wash down. 20°F to 120°F (-7°C to 50°C)
- **Power Supply**: 12V Rechargeable External Battery Pack -or- 12V DC External Power Supply.
- **Reel**: Spool Diameter 26 inches, L26 inches, W12 inches, H32 inches L66cm, W30cm, H81cm
- **Current (max)**: 40 mA
- **Electrical Array**: Focused tri-electrode array
- **Defect Flow Calculation**: ±30% Accuracy measured in Gallons Per Minute (GPM) or Liters Per Second (LPS)
- **Defect Location**: ±3/8 or 0.4 inches (1cm)
- **Probe Weight**: 1.1 lb (.50kg)
**ES-50 Push Rod**

Scheduled for Release 2021

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**Pipe Diameter**
2 inch (51mm) to 4 inch (102mm)

**Application**
Leak Detection for Residential & Commercial Plumbing, and Industrial Plant, Hydrant Entry, Highly Tuberculated Water Mains to minimize disruption, Assessment of Vertical Pipes, including CIPP watertightness testing.

**Probe Length**
3.5 inches (89mm); Diameter: 0.75 inches (19mm)

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**ES-50 Probe**
Critical H₂O Cloud Application

Defect Count

Total Defect Flow LPS, LPD, LPD/IDM

 Pipe Defects

Graphical Display By Footage

FIELD

Field Data 5-Minutes or Less.

OFFICE

LOW VOLTAGE WATER MAIN LEAKS

Innovyze

Amazon Web Services
**FIELD OPERATIONS: COVID-19 SAFETY UPDATES**

All field operations are performed independently by Certified Electro Scan Technicians with no direct interaction with third-party personnel or customers required. The Electro Scan Operator efficiently and effectively manages all equipment, including insertion, navigation, and retrieval. The highest priority of Electro Scan staff – during all aspects of the sewer or water survey – is to safeguard and protect the environment, deliver value-for-money to utility customers, avoid vehicle hazards, and protect pedestrians.

Electro Scan technology represents a machine-intelligent, non-destructive, leak detection solution. All data is collected without delay and instantly filtered through multiple security firewalls utilizing multiple redundant data storage backups with all data transport messaged using strict data protection algorithms, standards, and stored procedures. Once a sewer or water scan is completed, data is uploaded via onboard WiFi communication via data encrypted pathways delivered to either the Company's CriticalSewers® or CriticalH₂O cloud application where data can be instantly processed and available for review or decision support.

**OUR ROUTINE SAFETY STANDARDS ALREADY PROTECT OPERATORS FROM COVID-19**

- Due to job specialization, only one (1) employee touches or uses any equipment as per their job function for that day. At the end of each day, all equipment is cleaned and disinfected.
- Required Personal Protective Equipment (PPE): steel-toed boots, hi vis and reflective apparel, gloves (chemical resistant, 9 mil thick), & hard hat.
- Additional PPE includes eye protection, disposable masks (N95), extra clothing, etc., as recommended by CDC, NIH, & OSHA.
- All PPE kits are personally assigned to an Operator, and kits have dedicated place to keep personal PPE from others. Extra PPE kits and equipment are available on all vehicles.
- Hand sanitizer is in the front door wells and also on rear of every truck.
- Hand washing stations are on every truck.
- Each day all trash and used equipment (gloves, wipes, rags, etc.) is bagged and removed from the trucks to insure each day begins clean.
- Each Field Operator has vehicle assigned for each day, and its disinfected at the end of each day.

**ADDITIONAL PRECAUTIONS IN RESPONSE TO COVID-19**

- Each Field Operator has vehicle assigned for each day, and its disinfected at the end of each day.
- Before each day begins a tail gate safety meeting takes place, with appropriate social distancing of at least 6-feet, to go over the job and reiterate the safety protocols in place and to be followed.
- Each employee has reviewed and signed off on the current guidance from the CDC, NIH on appropriate disinfection requirements, techniques, and PPE requirements for working in sewers and to protect themselves from COVID-19.
Technology

“Electro Scan’s Focused Electrode Leak Location, is a Game Changing Technology”

**HOW DO WE FIND EVERY LEAK?**

*If a pipe leaks electricity, it leaks water. And can be measured in gallons per minute or litres per second.*

**Electro Scan’s Machine-Intelligent Data Replaces Time Consuming, Often Inaccurate Acoustic & Visual Guesswork.”*
Services

Contract Services
Direct Services By Electro Scan’s International Field Teams

Technology Licensing
Licensing to 3rd Party Authorized Contractors Utilizing Electro Scan Certified Equipment

Utility Sales & Software Cloud Licensing

Specific Pricing Available Upon Request
Chuck Hansen, Founder & CEO.

Carissa Boudwin, VP, Chief Revenue Officer.
In charge of corporate wide Technology as a Service (TaaS) and Software as a Service (SaaS) licensing. B.S. George Mason University. Over 5 years with the Company managing data reporting, sales quotes & proposals, technology licensing, and revenue recognition.

Michael Condran, PE, VP, Chief Engineering Officer.
Responsible for engineered quality assurance, quality control, decision support, and reporting, with 25-years of experience with major global engineering firms. Licenses PE in Colorado, Florida, North Carolina, and Washington.

Mike App, VP, Chief Implementation Officer.
Responsible for all Project Implementations & Deliverables, worldwide, with over 10-years of experience in Cured-In-Place Pipe (CIPP) and trenchless rehabilitation industry.

Brad Weston, Director, Electro Scan (UK) Limited
Responsible for UK and EU Water & Sewer Leak Detection Projects, with Master Certificate in Advanced Low Voltage Conductivity. Prior to working with Electro Scan, Weston worked for WRc doing over 1,000 water insertions.