

21 Series Automatic Nozzles for Active Vapour Recovery Systems

Important Safeguards

- For your protection, please read these safety instructions completely before installing and operating this equipment.
- Keep this manual on file for future reference.
- This manual contains material that may be required by authorities having jurisdiction to be on site at all times.
- Carefully observe all warnings, precautions and instructions for this equipment and in the operating instructions and adhere to them.



THIS MANUAL MUST BE LEFT WITH FACILITY MANAGEMENT

21 series ATEX approved nozzle is marked with the following information:

Standard Number and Type: EN 13012:2021 Type I (Models: 21AG, 21AGV, 21BG and 21BGV)

Other marking: 2813  II 1G

Certificate number: Sira 19ATEX9106U

Serial number with date code: XXPLN DDDYY

Company name: OPW FC / Fibrelite Composites Ltd.

Ambient temperature range: -20°C to +55°C (Normal) or -40°C to +55°C (Extreme)

Please visit
www.opwglobal.com
to view a copy of the
examination certificate.

SITE NAME:	
ADDRESS:	
NOZZLE SERIAL NUMBER:	
DATE INSTALLED:	
INSTALLATION CONTRACTOR:	

RESPONSIBILITIES

- Employees must enforce compliance with the safety warnings and all other instructions contained in this manual and all federal, state and local warnings/instructions.
- Keep this manual available for use by all employees and/or customers.
- For personal safety and proper operation of this equipment, read and follow all these instructions carefully.



GENERAL REQUIREMENTS

- This nozzle is designed for use only at facilities dispensing motor fuels.
- High flow rates in excess of the regulatory allowable may result in splash-back or spillage. Damage and/or injury may result.
- Nozzles shall be used in accordance with local and national safety codes.
- OPW products should be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the materials to be handled. OPW makes no warranty of fitness for a particular use.

BEFORE AND DURING FUELING

- OPW recommends posting the following warnings in a visible location for the fueling public. Additional warnings may be required. Please contact authorities having local jurisdiction for requirements.

! WARNING

Static electricity, fire hazard, and chemical exposure hazard. Failure to comply to the following warning could result in property damage, injury or death.

- Turn off your engine before refueling. Vehicle must remain off during the entire fueling procedure.
- Discharge your static electricity before refueling.
- Before using the dispenser, touch any grounded metal on the car or dispenser away from the nozzle and your vehicle's fuel pipe with bare hands. This will discharge static electricity on your body. Failure to discharge may ignite petrol vapours.
- DO NOT re-enter your vehicle while refueling. This can re-charge your body with static electricity. If you must re-enter your vehicle, discharge static again before touching the nozzle.
- DO NOT fill containers in or on the vehicle. Static electricity can ignite petrol vapours and cause a fire. Fill approved portable containers on the ground. It is dangerous to put petrol into an unapproved container.
- Keep nozzle in contact with the container until finished filling to discharge any static generated during fueling.

- When filling an approved portable container, flow fuel at low flow rate to prevent static build-up. DO NOT put trigger in rack position; manually hold open.
- Turn off cell phones and other electronic devices to avoid distractions.
- DO NOT smoke or allow open flame/sparking devices near the product dispensers.
- Extinguish all pilot lights and open flames. For example, the pilot light in a motorhome or caravan must be extinguished.
- If a fire starts, **DO NOT REMOVE THE NOZZLE FROM THE FILL PIPE**. Back away immediately and tell the attendant. If no attendant is on site, use the emergency shut-off button to stop the pump.
- DO NOT start engine during refueling. Vehicle must remain off during the entire fueling procedure.
- DO NOT leave nozzle unattended. Nozzle performance and the automatic shut-off feature are influenced by many factors. If nozzle does not shut off during refueling, stop pump immediately.
- DO NOT use foreign objects to hold open automatic nozzles. Use of foreign objects could result in failure to shut off.
- Fuels can be harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer in laboratory animals.
 - Avoid prolonged breathing of vapors.
 - Keep away from eyes and skin.
 - Failure to use caution may cause serious injury, illness or death.
- DO NOT allow children to dispense fuel. Only persons of license age (of legal driving age) should use dispenser. Keep children away from the dispenser area.



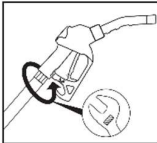
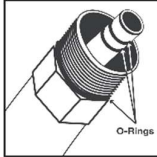
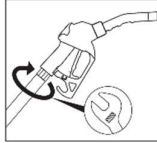
INSTALLATION INSTRUCTIONS

- Before beginning installation of the product, please carefully read all warnings.
- Failure to comply with warnings could result in property damage, injury or death.
- Do not use power tools (Hazardous location: Zone 1 and/or Zone 2) during installation process and maintenance of equipment.
- Always wear appropriate safety equipment during installation or maintenance of equipment.
- Do not install unlisted ad/billboard or other unlisted after-market device on any automatic nozzle. Doing so may change the sensitivity of the shut-off mechanism. Nozzle may not shut off, causing a fuel spill.
- Follow all manufacturers' instructions.
- Use safety cones to mark-off work area.



Please visit OPW's website:
www.opwglobal.com for further
information or contact OPW Customer
Service at **+44 (0) 1756 799 773** (EU)
or **1-800-422-2525** (US)

- Shut off power to the dispenser and close the emergency shut-off valves under the dispenser. Relieve system pressure before servicing or replacing dispensing products, such as nozzles, swivels, or breakaways.
- Refer to the most recent edition of National Safety Standard.
- If nozzle replacement, secure retractor before removing the nozzle.
- If nozzle replacement, remove old nozzle with a wrench. Carefully drain fuel from hose & nozzle into approved container.
- For a new facility installation, purge/flush hose point before installing nozzles. If nozzles are used to purge/flush system, this could result in foreign material in nozzle's main valve and cause a nozzle not to shut off.
- Verify selection of nozzle for application.
- Do not use pipe sealant or PTFE tape on the inlet threads of the nozzle.
- Verify that O-rings are present on hose and not torn or damaged. Coat O-rings with light oil for installation to prevent damage.
- Engage the external thread into the nozzle or breakaway and tighten the hose nut per hose instructions.
- Flow test nozzles before putting nozzles in service. See testing instructions.
- Check continuity. See testing instructions.
- Check for leaks between all connections of hanging hardware. Repair or replace, as required, if any leaks are found.
- Dispenser modifications may be necessary for proper nozzle storage. Always comply with the dispenser instructions and local codes.
- Register your OPW product at www.opwglobal.com
- After installation, each nozzle should be tested for proper operation prior to being put into service.



EQUIPMENT REQUIRED

- Stopwatch, approved 20 L grounded, vented, metal test container, and megohmmeter.

CONTINUITY TEST

- After installation of hanging hardware and prior to flow test, check continuity following EN 60204-1 for proper test equipment and method of testing.

WARNING

Fueling equipment is designed to operate in a pressure range of 0,5 to 3,5 bar. If the pressure exceeds 6 bar, the nozzle will open regardless of lever position. Exceeding maximum pressure may result in property damage, injury, or death.

FLOW TEST

- Start stopwatch, initiate flow into an approved test container, with the nozzle lever held in the fully open position.
- Check each hose point to verify a minimum flow rate* and maximum flow rate**:

Model(s)	Maximum Flow Rate	Minimum Flow Rate
21AG, 21BG, 21AGV, 21BGV	45 L/min	8 L/min

If hose point does not comply, check system and repair prior to putting into service.

*Minimum flow rate must be met in lowest hold-open clip position. If hold-open clip is not present, minimum must be met in fully open position.

**Maximum flow rate must not exceed when nozzle is in highest clip position or in the fully open position.

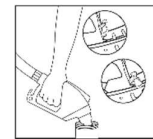
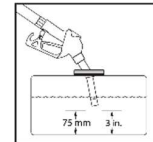
WARNING

STATIC ELECTRICITY/FIRE HAZARD

Maintain contact between the nozzle spout and approved test container during flow test.

SHUT-OFF TEST

- Start flow into approved test container; place nozzle in low clip position.
- Immerse nozzle spout tip in the dispensed fluid in the approved test container. The nozzle tip must be at least 75 mm from the bottom of the container to prevent back-pressure in the spout.
- Nozzle must shut off.
- Repeat procedure for all clip positions. Nozzle must always shut off in all clip positions.
- Test each nozzle a minimum of five (5) times in each clip position.
- For models without hold-open racks, test at fully open position only.
- For Type I nozzles: If no shut off occurs, check to ensure flow rate is greater than 8 L/min.
- If flow rate is above minimum flow rate and there is no shut-off, replace the nozzle.
- Verify that the pump switches off when the nozzle is returned to the dispenser nozzle boot.



OTHER TEST(S)

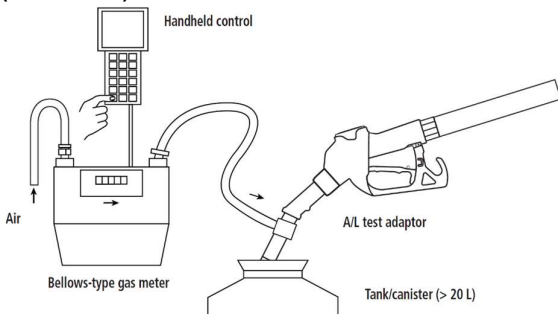
- Perform other test(s) as required by authorities having jurisdiction.

WARNING

Replace the nozzle if the nozzle fails any of the above tests. Failure to comply could result in property damage, injury or death.

See OPW's website at www.opwglobal.com or contact an OPW Distributor for troubleshooting guides and/or how to use the OPW nozzle.

A/L TESTING WITH A GAS FLOW METER (WET TEST):



1. Vent the UST system to atmosphere before starting the A/L Testing procedure.
2. You will need to purchase/obtain an A/L Test Adaptor.
3. Securely attach the tubing from the gas flow meter to the hose-barb fitting on the A/L Test Adaptor.
4. Slide the A/L Test Adaptor over the nozzle spout so that the adaptor covers the vapor return path.
5. Initialize the gas flow meter to begin to measure the volume of vapor collected.
6. The dispenser must be turned on and authorized to be able to open the nozzle and dispense fuel.

WARNING

Static electric spark could ignite fuel, causing a fire. Place a container approved for fuel on the ground prior to and during test. Nozzle must be in contact with the container until the testing is complete to discharge any static generated during the test.

7. Dispense approximately 20 litres of fuel into an approved test container with the nozzle lever held in the full open position.
8. Calculate A/L ratio by dividing the volume of vapour collected by the volume of fuel dispensed.
9. If the A/L ratio is between the desired range, then no further adjustments are necessary.
10. If the A/L ratio is outside the desired range, then follow the vacuum system manufacturer's instructions for adjusting vapour flow rates. Retest and verify that adjustments now bring the A/L ratio into compliance.

11. Reseal the UST vapour system after the A/L ratios are set for all fueling points.

Correction Factor 'K':

As ambient air is sucked in during the wet test, the calculated air volumetric flow must be divided by the correction factor. If this is not already done automatically by the handheld control, the vapor recovery rate is calculated using one of the following equations:

$$(1) \quad R = \frac{V_a}{V_K \cdot K} \cdot 100$$

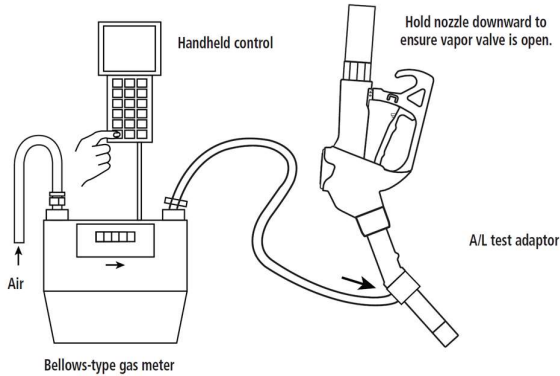
$$(2) \quad R = \frac{V_a}{V_K \cdot K} \cdot \frac{t}{60} \cdot 100$$

For further details, please refer to prEN 16321-2

R	Vapor recovery rate, in %
V_a	Measured air volume in litres
V_K	Simulated petrol volume in litres
Q_a	Measured air volume flow rate in L/min (mean value)
K	Correction factor (as specified in the certificate)
t	Measuring time in seconds

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SIMULATED A/L TESTING (DRY TEST)



R	Vapor recovery rate, in %
V_a	Measured air volume in litres
V_k	Simulated petrol volume in litres
Q_a	Measured air volume flow rate in L/min (mean value)
Q_K	Simulated petrol volume flow rate in 1/min.
K	Correction factor (as specified in the certificate)
t	Measuring time in seconds

1. Vent the UST system to atmosphere before starting the A/L Testing procedure.
2. You will need to purchase/obtain an A/L Test Adaptor.
3. Push the A/L adapter over the vapour return path on the nozzle spout.
4. To open the vapour valve, point downward as shown in the figure above.
NOTE: Use caution when relieving system pressure.
5. Follow the instructions included with the hand-held control for proper operation with the vapour recovery system being testing.
6. If the A/L ratio is between the desired range, then no further adjustments are necessary.
7. If the A/L ratio is outside of the desired range, then follow the vacuum system manufacturer's instructions for adjusting vapour flow rates. Retest and verify that adjustments now bring the A/L ratio into compliance.
8. Reseal the UST vapour system after the A/L ratios are set for all fueling points.

WARNING

Static electric spark could ignite fuel, causing a fire. Place a container approved for fuel on the ground prior to and during test. Nozzle must be in contact with the container until the testing is complete to discharge any static generated during the test.

Correction Factor 'K':

As ambient air is sucked in during the dry test, the calculated air volumetric flow must be divided by the correction factor. If this is not already done automatically by the handheld control, the vapor recovery rate is calculated using one of the following equations:

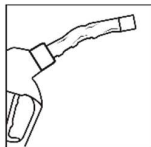
$$(3) \quad R = \frac{V_a}{V_K \cdot K} \cdot 100$$

$$(4) \quad R = \frac{Q_a}{Q_K \cdot K} \cdot 100$$

For further details, please refer to prEN 16321-2

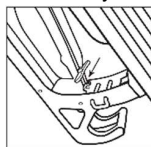
DAILY INSPECTION

- Visually inspect the dispensing equipment for excessively worn, abused, mistreated or leaking equipment. Replace equipment immediately.



MONTHLY INSPECTIONS

- Inspect the nozzle spout for wear and deformation. Replace the spout assembly as necessary.
- If the nozzle spout is bent, the shut-off hole is blocked, or the end of the spout is rolled over, the nozzle spout or the entire nozzle should be replaced immediately. Failure to replace the spout may result in a hazardous spill.
- Replace spout if tip is worn. Do not cut off spout tip. This will lead to nuisance shut offs, or non-shut off, which could lead to a hazardous spill and/or injury or death.
- Inspect nozzle for evidence of leakage; confirm that nozzle is leaking and replace nozzle if necessary.
- Check for broken attendant clip spring and replace nozzle if necessary.
- Verify that the minimum flow rate greater than specified. See testing instructions.
- Perform shut-off test. See testing instructions.
- All maintenance and inspection activity on the nozzle must be documented. This includes replacement parts, drive-off or other testing.



ANNUAL INSPECTIONS

- Perform continuity test. See testing instructions.

WARNING

FIRE HAZARD/SPILL HAZARD/ CHEMICAL EXPOSURE

Replace the nozzle if the nozzle fails any of the above tests or inspections. Failure to comply could result in property damage, injury or death.

REPLACEMENT PARTS

- DO NOT reuse O-rings or screws when replacing components.
- Only use authorized OPW replacement kits from the distributor. All other modifications may result in nozzle failure and create a hazardous condition, resulting in personal injury, property damage, or death, and will void the warranty.

IN CASE OF DRIVE-OFF OR SUSPECTED CUSTOMER ABUSE

- Immediately lock hose point out of service until a thorough inspection by a qualified service technician can be made. Inspect the nozzle, hose, breakaway, dispenser outlet casting, and piping.
- Even if there is no separation of the breakaway or breakage of the nozzle spout, damage can be done that may cause leaks. Inspect and replace any damaged components, as necessary, prior to returning the hose point to service.
- Check for leaks and other damage.
- Check nozzle for liquid shut-off. See shut-off test instructions.
- Check for continuity. See continuity test instructions.
- DO NOT replace spout without OPW replacement kits and instructions. (See OPW's website for replacement kits). Improper parts or assembly may result in leakage or a hazardous condition. If the spout is removed or replaced for any reason, the nozzle must be retested in accordance with this manual.
- Make sure to comply with any requirements of authorities having jurisdiction.



WARRANTY POLICY & RETURN PROCEDURE

If a nozzle must be replaced during the warranty period, please contact an authorized OPW distributor

Warranty does not cover:

- Evidence of misuse or abuse.
Damaged nozzles are not warrantable
- Wear items such as spouts, splash guards or hand insulators are not covered under warranty
- Nozzles with missing parts or components are not warrantable
- Evidence of repair or rebuild by others are not warrantable

The following information will need to be provided to your OPW distributor:

- Serial number of the nozzle being returned
- Serial number and model number of the replacement nozzle
- OPW prorates all warranty returns. The replacement nozzle only takes on the remaining warranty of the original nozzle

OPW STANDARD PRODUCT WARRANTY / OPW TERMS & POLICIES

Notice: NOTICE: FlexWorks by OPW, Inc., VAPORSAVER™ and all other OPW products must be used in compliance with all applicable federal, state, provincial and local laws, rules and regulations. Product selection is the sole responsibility of the customer and/or its agents and must be based on physical specifications and limitations, compatibility with the Environment and material to be handled. All illustrations and specifications in this literature are based on the latest production information available at the time of publication. Prices, materials and specifications are subject to change at any time, and models may be discontinued at any time, in either case, without notice or obligation.

OPW warrants solely to its customer that the following products sold by OPW will be free from defects in materials and workmanship under normal use and conditions for the periods indicated:

Product	Warranty Period
FlexWorks Primary Pipe	10 years from date of manufacture
All Products Certified to California 2001 Standards*	1 year from date of manufacture or from date of installation registration (not to exceed 15 months from date of manufacture)
All other Products	1 year from date of manufacture
*Products certified to California 2001 Standards will have an OPW registration card enclosed/attached to the product.	

OPW's exclusive obligation under this limited warranty is, at its option, to repair, replace or issue credit (in an amount not to exceed the list price for the product) for future orders for any product that may prove defective within the applicable warranty period (repairs or replacements are subject to prorated warranty coverage for remainder of the original warranty period). Complete and proper warranty claim documentation and proof of purchase required. All warranty claims must be made in writing and delivered during the applicable warranty period to OPW at OPW 9393 Princeton-Glendale Road Hamilton, Ohio, USA 45011, Attention: Customer Service Manager. No products may be returned to OPW without its prior written authority.

This limited warranty shall not apply to any FlexWorks or VAPORSAVER™ product unless it is installed by an OPW attested installer. This limited warranty also shall not apply to any FlexWorks, VAPORSAVER™ or other OPW product: unless all required site and warranty registration forms are completed and received by OPW within 60 days of installation; unless all piping connections are installed with a nationally-recognized or state-approved leak detection device in each tank and dispenser sump (which are not for storage and from which all discharge hydrocarbons must be removed, and the systems completely cleaned, within 24 hours); unless testable sumps utilize FlexWorks pipe and access fittings; unless a sump inspection log or an EPA recommended/required checklist is maintained and the results are furnished to OPW upon request; and unless OPW is notified within 24 hours of any known or suspected product failure and is provided with unrestricted access to the product and the site. This limited warranty also shall not apply to any product which has been altered in any way, which has been repaired by anyone other than a service representative authorized by OPW, or when failure or defect is due to: improper installation or maintenance (including, without limitation, failure to follow FlexWorks Quick Reference Manual Installation Guide and all product warning labels); abuse or misuse; violation of health or safety requirements; use of another manufacturer's, or otherwise unauthorized, substances or components; soil or other surface or subsurface conditions; or fire, flood, storm, lightning, earthquake, accident or any other conditions, events or circumstances beyond OPW's control.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED. OPW shall have no other liability whatsoever, whether based on breach of contract, negligence, gross negligence, strict liability or any other claim, including, without limitation, for special, incidental, consequential or exemplary damages or for the cost of labor, freight, excavation, clean-up, downtime, removal, reinstallation, loss of profit, or any other cost or charges. No person or entity is authorized to assume on behalf of OPW any liability beyond this limited warranty. This limited warranty is not assignable.

Please see OPW's website for instructions in other languages, troubleshooting guides,
how to use the nozzle and the Do's and Don't's At The Gas Pump video: www.opwglobal.com

OPW EMEA Headquarters: Snaygill Industrial Estate, Keighley Road, Skipton, BD23 2QR, UK
Phone: +44 (0) 1756 799 773 ♦ Email: enquire@opwglobal.com

Fill out this information and return this sheet with the nozzle when submitting a warranty claim.

 OPW NOZZLE WARRANTY TAG	
SITE:	Phone Number:
City:	Contact:
Country:	Distributor:
Branch:	Customer #:
RGA Number:	
Nozzle Model:	
Serial Number:	Replacement Serial Number:
WARRANTABLE DEFECTS (CHECK ONLY ONE) ☐ Leaks Fuel Around Spout (200) ☐ Leaks Fuel in Trigger Area (200) ☐ Leaks Fuel at Hose Inlet (200) ☐ Does Not Dispense (400) ☐ Continues to Shut-off During Use (400) ☐ Does Not Shut Off (500) ☐ Dispenses Fuel Without Pulling Lever (200) ☐ Fails Pressure Decay Test (300) ☐ Fails Air-to-Liquid Test (300) Note: _____ _____ _____	