Gas / Liquid sampling tool
Hydraulic operated
Vortex gas sample tool manual version 1.0

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1. INTRODUCTION

The vortex Hydraulic Mini Gas Sampling tool is designed to capture gas and liquid samples in a subsea environment and recover said samples to the surface in a low pressure state of no more than 14psi (0.96bar) by means of an hydraulic mechanical operated syringe to ingest sample then purge sample into a sample bottle after recovery to surface.

This tool is designed to be deployed from the surface with the syringe bled of air immediately upon entering the water. Sample filling relies on the suck and blow pumping motion created by the syringe and associated relief valves. Sample taken can be discharged or cycled out of the syringe whilst under water if necessary.

1.1 Reference Documents

See Appendix and references section at the end of this document for certificates and manufacturers data.

1.2 Abbreviations

PSI: Pounds per Square Inch
PPE: Personnel protective equipment
JHA: Job Hazard Analysis
VST: Vortex Sample Tool
LP: Low Pressure

1.3 Contacts

For Technical queries, Comments and Feedback contact Vortex Dredge: goodinjoe@gmail.com
2. SAFETY

2.1 Overview
All local HSE procedures must be followed. Use of PPE should follow guidelines outlined with handling of potential sample. For example hazardous gas samples should have PPE appropriate to mitigate dangers associated with that gas. Safety glasses should be considered minimum requirement irrespective of potential sample. Your safety is your responsibility. Think and plan ahead accordingly.

2.2 Risk Assessment
Consult with local HSE and installation operators to identify best practice steps needed for safe operations. Identify if the task been done and implement lessons learned. JHA, permitting and toolbox talks should preclude all operations.

2.4 Mechanical
Ensure all fittings and fasteners are secure. Check general condition of tool against images in manual for anything which may indicate potential operational issues.

•Remember, your safety is your responsibility. Think and plan ahead accordingly. If in doubt, please ask.
3. TECHNICAL SPECIFICATIONS

3.1 Description

To “Suck” the sample into the syringe the operator will function the hydraulic cylinder to draw the piston away from the check valves and draw a vacuum.

To “Blow” the sample out of the tool or into the sample bottle the operator will function the hydraulic cylinder towards the check valves – pushing the sample over the check valve and to atmosphere or into the sample bottle.
3. TECHNICAL SPECIFICATIONS

3.1 Description: Schematic

Port A: From ROV

Port B: From ROV

Inlet relief valve cracks at 10 in/Hg

Exhaust relief valve cracks at 12 to 14 psi

- 30 in/Hg to 30 psi gauge

Adjust flow controls to move syringe SLOWLY

Hydraulic input Maximum 206 bar (3000 psi)

Funnel width = 300mm (12 inch)
Volume = 4 litre (1 gallon)
3. TECHNICAL SPECIFICATIONS

3.2 Hydraulic connections

Supplied with tool are two -4 jic female swivel, 3000mm long  344bar (5000psi) rated hoses with flow control on each hose.

NOTE: Any questions on hydraulic power supply capabilities from your ROV, please consult the ROV manufacturer.

• Function A = Push or Blow product from syringe.

• Function B = Suck or ingest product into syringe.
3. TECHNICAL SPECIFICATIONS

3.3 Component particulars

- Complete tool Weight empty in air = 22lb (10kg)
- Syringe cylinder volume = 0.153 gallon (580 cc)
- Sample bottle volume = 0.264 gallon (1.0 litre)
- Main relief valve setting on syringe = 12psi (0.8 bar)
- Complete tool dimensions = 940 mm (37 inch) overall height / tall × 460 mm (18 inch) overall width.
- Discharging syringe into sample bottle typically captures 0.268 liter fresh water by volume with exhaust relief set at 12psi.
- Discharging syringe into sample bottle typically captures 0.523 liter of fresh air by volume with exhaust relief set at 12psi.
- Syringe body and end caps material: Acrylic
- Piston material: Acetal
- Piston rings / seals material: Nitrile 50 x 60 x 4
- Piston cap o-rings material: Nitrile N70
- Shipping box dimensions and weight = 88 lb (40kg) L100cm × W50cm × H 50cm.
- Depth rating = 3000 mtr. 9842 foot seawater
## 4. OPERATION PROCEDURES

### 4.1 Pre Dive Checks

<table>
<thead>
<tr>
<th>PROCEDURE DESCRIPTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check hydraulic connection between the tool and ROV. Consult ops manual for voltage figures and connections. <strong>See TECHNICAL SPECIFICATIONS in section 3. of this manual.</strong> Failure to provide correct pressures and connections as per manual can result in tool cable and motor failure.</td>
<td></td>
</tr>
<tr>
<td>2. Check the piston full stroke in both directions in clear of obstructions. Connect water hose (fresh or salt) to inlet relief valve of tool, open bleed valve CW and purge water through the bleed valve and allow water to pass over the exhaust relief valve to expel any air in the system. Close bleed valve CCW. Launch with the piston at full stroke ready to ingest (piston at rest nearest the two check valves)</td>
<td></td>
</tr>
<tr>
<td>3. Check the bleed valve is closed CCW. Failure to do so can result in insufficient syringe operation and sample being lost to ambient upon ascent.</td>
<td></td>
</tr>
<tr>
<td>4. Check mechanical connections to the ROV are secure.</td>
<td></td>
</tr>
<tr>
<td>5. Check 0 to 30 psi gauge is reading 0 and full of appropriate gauge liquid.</td>
<td></td>
</tr>
<tr>
<td>6. Fit hose and funnel to inlet relief valve – adjust length of hose to suit. Secure funnel where appropriate to view sample being taken.</td>
<td></td>
</tr>
</tbody>
</table>
4. OPERATION PROCEDURES

4.1 Pre Dive Checks (Steps 2, 3 and 5)

Bleed valve is CW to open and CCW to close.
Do not over tighten.
## 4. OPERATION PROCEDURES

### 4.2 Operation Procedure

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Launch with the piston at full stroke ready to ingest (piston at rest nearest the two check valves)</td>
</tr>
<tr>
<td>2</td>
<td>Launch ROV to just below water surface to around 20mtr depth and fully function tool to both ends of stroke in sample cylinder to bleed out any ambient surface air from the system. Stroke tool to rest at full ‘blow’ position so it is ready to “suck” first sample.</td>
</tr>
</tbody>
</table>
| 3    | Dive to depth, position funnel over liquid or gas discharge. Allow sample product to fill the funnel and disperse as much seawater from the funnel as possible before stroking piston in the ‘suck’ position.  
   - Positioning the funnel lower than the tool may assist in gas sample displacing the ambient seawater inside the funnel to tool hose thus maximizing the sample.  
   - Positioning the tool with the check valves lower than the syringe may assist in gas sample displacing the ambient seawater inside the check valves thus maximizing the sample. |
| 4    | Stroke the piston as many times as is required to flush the sample cylinder and obtain the maximum possible quantity of sample product. |
4. OPERATION PROCEDURES

4.3 Recovery to Deck

When recovering to deck, ascend as such a rate that the 0 to 30psi pressure gauge does not show over the 12 to 14psi setting of the relief valve.

The relief valve is likely to purge excess pressure as gas expands during ascending irrespective of the rate of ascent.
## 4. OPERATION PROCEDURES

### 4.4 Removal of gas sample on surface

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE DESCRIPTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Recover to deck. Ascend the tool and ROV at such a rate that the 0 to 30psi pressure gauge does not show over the 12 to 14psi setting of the relief valve. The relief valve is likely to purge excess pressure as gas expands during ascending irrespective of the rate of ascent. <strong>See 4.3 Recover to deck</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>Exhaust relief valve is tasked with venting any excess pressure build up in the piston due to expanding gasses on recovery to a maximum of 12 to 14psi (0.96bar)</td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>Pull a vacuum on the sample bottle using supplied vacuum pump. Connect bottle to vacuum pump, open bottle isolation valve, pull maximum vacuum, close bottle isolation valve to seal in vacuum. <strong>See 4.4 Removal of gas sample on surface</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **4** | Connect sample bottle to tool as per instructions on **4.4 Removal of gas sample on surface**  
**NOTE:** Ensure area is adequately ventilated to account for any gas going over the exhaust relief valve when filling bottle. Similarly, have appropriate containment under exhaust relief valve to catch any liquids.  
**ALWAYS wear appropriate PPE and consult client for information on sample product and any appropriate safeguards.** | |
| **5** | Flush the system with fresh water as per step below to resume sampling. Flush system with hot soapy water then fresh water between sample dives if required. Stroke piston “suck” and “Blow” 4 or 5 times to flush system.  
Check the piston full stroke in both directions in clear of obstructions.  
Connect water hose (fresh or salt) to inlet relief valve of tool, open bleed valve CW and purge water through the bleed valve and allow water to pass over the exhaust relief valve to expel any air in the system. Close bleed valve CCW. Launch with tool stroked to rest at full ‘blow’ position so it is ready to “suck” first sample. | |
4. OPERATION PROCEDURES

4.4 Removal of gas sample on surface

Shown bottle and sample take off port.

Pull a vacuum on the sample bottle using supplied vacuum pump.

1. Connect bottle to vacuum pump.
2. Open bottle isolation valve.
3. Pull maximum vacuum
4. Close bottle isolation valve to seal in vacuum.
5. Observe and note pressure gauge reading.
6. Connect sample bottle to sample bleed off connector
7. Open bottle isolation valve.
8. Function tool to ‘blow’ and discharge sample product into sample bottle.

NOTE: Ensure area is adequately ventilated to account for any gas going over the exhaust relief valve when filling bottle. Similarly, have appropriate containment under exhaust relief valve to catch any liquids.

ALWAYS wear appropriate PPE and consult client for information on sample product and any appropriate safeguards.
# 4. OPERATION PROCEDURES

## 4.5 Post – Dive Checks

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE DESCRIPTION</th>
<th>CHECK</th>
</tr>
</thead>
</table>
| 1    | Check the piston full stroke in both directions in clear of obstructions.  
      | Open bleed valve slightly CW to allow hot soapy water to flush through bleed valve. |       |
| 2    | Connect hose from container of hot soapy water to inlet relief valve of tool and purge soapy water through the bleed valve and allow water to pass over the exhaust relief valve to flush salt water and traces of sample from the system.  
      | Stroke piston “suck” and “Blow” 4 or 5 times to flush system. Complete flushing with tool stroked to rest at full ‘blow’ position so it is ready to “suck” first sample. |       |
| 3    | Check the bleed valve is closed CCW. |       |
| 4    | Check mechanical connections on the tool are secure. |       |
| 5    | |       |
4. OPERATION PROCEDURES

4.5 Post – Dive Checks

<table>
<thead>
<tr>
<th>POST DIVE COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINT NAME</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. MAINTENANCE & STORAGE

5.1 Standard Procedures

• Tool should be flushed with hot soapy water as per post dive checks.
• Allow to dry fully.
• Check operational condition of hoses.
• Visual check of tool for anything which could prohibit future operation of the tool.

5.2 Replacement Procedures

• Contact Ashtead Technology representatives with reports of any damaged or unserviceable items
6. APPENDIX AND REFERENCES

6.1: Tool dimensions and weights

Complete tool Weight empty in air = 10kg (22lb)

Complete tool dimensions = 940 mm (37inch) overall height / tall x 460mm (18 inch) overall width.

.

Vortex Dredge - Mini Gas Sampling Tool - Version 1
### 6. APPENDIX AND REFERENCES

**Appendix III**  
**Bottle Certificates**

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**CERTIFICATE OF COMPLIANCE & TEST REPORT — SEAMLESS CYLINDERS**

Manufactured by:  
ARROWHEAD INDUSTRIAL SERVICES USA, INC.  
537 S. NC 119, P.O. Box 1000  
Grantsville, NC 27255-1000

Location at:  
State Incorporated  
405 Greensboro Court,  
Spartanburg, SC 29307

Location at:  
State Incorporated  
3050 Kansas Ave,  
Kennesaw, CA 30144

Location at:  
State Incorporated  
405 Greensboro Court,  
Spartanburg, SC 29307

**Certificate No:** 219  
**Report No.:** 771  
**Exempt:** none

**Specifications:**

- **Material:** Stainless Steel  
- **Diameter:** 4.080 inches  
- **Length:** 8.560 inches

**Identification Code:**  
DOT-6A800B

**Serial Number:** 677 through 673

**Test Data:**

- **Dimensional:** 4.080 inches  
- **Weight:** 55.0 pounds

---

**RECORD OF PHYSICAL TESTS OF MATERIAL FOR CYLINDERS**

Manufactured by:  
ARROWHEAD INDUSTRIAL SERVICES USA, INC.  
537 S. NC 119, P.O. Box 1000  
Grantsville, NC 27255-1000

**Serial Number:** 677 through 673

**Exempt:** none

**Material:** Stainless Steel  
**Diameter:** 4.080 inches  
**Length:** 8.560 inches

**Test Data:**

- **Wall Thickness:** 0.063 inches  
- **Weight:** 55.0 pounds

---

**RECORD OF CHEMICAL ANALYSIS OF MATERIAL FOR CYLINDERS**

**Chemical Analysis:**  
DOT-6A800B

<table>
<thead>
<tr>
<th>Element</th>
<th>Analysis Range</th>
<th>Test Value</th>
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<tbody>
<tr>
<td>C</td>
<td>0.43 - 1.89</td>
<td>0.43</td>
</tr>
<tr>
<td>F</td>
<td>0.29 - 0.52</td>
<td>0.29</td>
</tr>
<tr>
<td>Mo</td>
<td>0.17 - 0.47</td>
<td>0.17</td>
</tr>
<tr>
<td>Cu</td>
<td>0.11 - 0.20</td>
<td>0.11</td>
</tr>
<tr>
<td>Ni</td>
<td>0.02 - 0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Cr</td>
<td>0.21 - 0.45</td>
<td>0.21</td>
</tr>
</tbody>
</table>

**Material Manufacturer:**  
Tijera Metals Ltd., Long Beach, CA 90807, USA

---

**Note:**

- **Hydraulic Tests:** 4,000 pounds  
- **Axial Tests:** 8,000 pounds

---

**Inspected by:**

- **ARROWHEAD INDUSTRIAL SERVICES USA, INC.**
6. APPENDIX AND REFERENCES

Appendix III
Acrylic Tube Pressure Calculations

<table>
<thead>
<tr>
<th>Diametro esterno mm.</th>
<th>Diametro interno mm.</th>
<th>Spessore di parete mm.</th>
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<tbody>
<tr>
<td>50</td>
<td>40-42-44</td>
<td>5-4-3</td>
</tr>
<tr>
<td>60</td>
<td>50-52-54</td>
<td>5-4-3</td>
</tr>
<tr>
<td>64</td>
<td>54-56-58</td>
<td>5-4-3</td>
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<td>70</td>
<td>60-62-64</td>
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<td>66-68-70</td>
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<td>220</td>
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<td>240</td>
<td>230-232-234</td>
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<td>300</td>
<td>284-286-290-292</td>
<td>8-6-5-4</td>
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<td>350</td>
<td>334-336-340-342</td>
<td>8-6-5-4</td>
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<td>400</td>
<td>384-386-390-392</td>
<td>8-6-5-4</td>
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<td>457</td>
<td>437-441-445-447</td>
<td>10-8-6-5</td>
</tr>
<tr>
<td>500</td>
<td>480-484-488-490</td>
<td>10-8-6-5</td>
</tr>
</tbody>
</table>
### 6. APPENDIX AND REFERENCES

Appendix III

**Acrylic Tube Pressure Calculations Continued**

#### Condizioni tecniche di fornitura

<table>
<thead>
<tr>
<th>Lunghezze standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>fino al Ø esterno 250 mm.</td>
</tr>
<tr>
<td>Ø est. 300 mm.</td>
</tr>
<tr>
<td>Ø est. 400 mm.</td>
</tr>
<tr>
<td>Ø est. 500 mm.</td>
</tr>
</tbody>
</table>

*At richiesta per Ø 200-220-240-250 è disponibile la lunghezza 3.030 mm.*

#### Tolleranze sui diametri esterni

| dal Ø 50 mm. al Ø 100 mm. | +1 / -1,5% |
| dal Ø 110 mm. al Ø 500 mm. | +1 / -1,5% |

#### Tolleranze sullo spessore di parete

| spessore 3 mm. | +/- 20% |
| spessore 4 mm. | +/- 15% |
| dallo spessore 5 mm. allo spessore 15 mm. | +/- 10% |

#### Tolleranze sulle lunghezze

+/- 1 mm.

#### Formula per il calcolo della pressione massima interna ammissibile

\[ P_i = \frac{50 \times S}{D'} \]

*dove:*

- \( P_i \) = pressione interna del tubo
- \( S \) = spessore del tubo in mm.
- \( D' \) = diametro interno del tubo in mm.

*Questa formula è valida in condizioni di test standard, cioè ad una temperatura ambiente di 20 °C ed umidità relativa del 50%.*

#### Technical delivery terms

<table>
<thead>
<tr>
<th>Standard lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to the external Ø 250 mm.</td>
</tr>
<tr>
<td>Ø ext. 300 mm.</td>
</tr>
<tr>
<td>Ø ext. 400 mm.</td>
</tr>
<tr>
<td>Ø ext. 500 mm.</td>
</tr>
</tbody>
</table>

*On demand for Ø 200-220-240-250 is available the length 3.030 mm.*

#### Tolerances on the external diameter

| from Ø 50 mm. up to Ø 100 mm. | +/- 1,5% |
| from Ø 110 mm. up to Ø 500 mm. | +/- 1,5% |

#### Tolerances on wall thickness

| thickness 3 mm. | +/- 20% |
| thickness 4 mm. | +/- 15% |
| from thickness 5 mm. up to thickness 15 mm. | +/- 10% |

#### Lengths tolerance

+/- 1 mm.

#### Formula for the calculation of the maximum internal allowable pressure

\[ P_i = \frac{50 \times S}{D'} \]

*where:*

- \( P_i \) = internal pressure of the tube in atmospheres or bar (1 bar=0.1 N/mm²)
- \( S \) = thickness of the tube in mm.
- \( D' \) = internal diameter of the tube in mm.

*This formula is valid for standard test conditions, and it means with 20 °C room temperature and 50% of relative humidity.*
6. APPENDIX AND REFERENCES

Appendix III
Acrylic Tube Pressure Calculations Continued

**Technical delivery terms**

- **Standard lengths**
  - up to the external ø 40 mm.
  - over 40 mm.
- **Tolerances on the external diameter**
  - from ø 7 mm. up to ø 150 mm.
  - from ø 160 mm. up to ø 300 mm.
- **Tolerances on the internal diameter**
  - from ø 7 mm. up to ø 150 mm.
  - from ø 160 mm. up to ø 300 mm.
- **Tolerances on wall thickness**
  - from ø 7 mm. up to ø 64 mm.
  - from ø 70 mm. up to ø 100 mm.
  - from ø 110 mm. up to ø 200 mm.
  - from ø 220 mm. up to ø 300 mm.
- **Lengths tolerance**
  - +/- 1 mm.

**Formula for the calculation of the maximum internal allowable pressure**

\[
P^i = \frac{50 \times S}{D^i} \quad \text{valida per} \quad \frac{D^o}{D^i} \leq 1.2
\]

where:
- \( P^i \) = internal pressure of the tube in atmospheres or bar (1 bar = 0.1 N/mm²)
- \( S \) = thickness of the tube in mm.
- \( D^o \) = external diameter of the tube in mm.
- \( D^i \) = internal diameter of the tube in mm.

This formula is valid for standard test conditions, and it means with 30 °C room temperature and 50% of relative humidity.
Appendix III
Sample Bottle Details
Appendix III
Sample Bottle Details

_6. APPENDIX AND REFERENCES_
6. APPENDIX AND REFERENCES

Appendix III
Sample Bottle Details

Bottle is:
LUXFER HSSC3K40-2BA

¾ inch NPT blanking plug.
¾ inch NPT male / male union

Parker B-QC4-S-4MT
PARKER 4F-B6LJ2-SSP-H

Bottle shown is part of Vortex gas and oil sampling kit serial number VST-02
Please use these number's when ordering parts.
1 September 2014
### 6. APPENDIX AND REFERENCES

Appendix III
Sample Bottle Details

<table>
<thead>
<tr>
<th>Specification</th>
<th>DOT-3A1800 (NACE MR0175)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>1000cc (0.264 gallon)</td>
</tr>
<tr>
<td>Test date</td>
<td>March 2013</td>
</tr>
<tr>
<td>Material</td>
<td>SS 316 L</td>
</tr>
<tr>
<td>Surface coating</td>
<td>N/A. Bare 316 stainless steel</td>
</tr>
<tr>
<td>Test pressure</td>
<td>Design test pressure of 3000 psi</td>
</tr>
<tr>
<td>Working pressure</td>
<td>Marked service pressure 1800 psi</td>
</tr>
</tbody>
</table>

It is YOUR responsibility to ensure transportation of equipment containing product and or samples complies with all relevant authorities.
# 6. APPENDIX AND REFERENCES

## Appendix III

### Sample Bottle Details

<table>
<thead>
<tr>
<th>Part number</th>
<th>Service pressure</th>
<th>Diameter</th>
<th>Length</th>
<th>Weight</th>
<th>Internal Volume</th>
<th>Threads</th>
<th>Specification</th>
<th>Included Accessories</th>
<th>Material</th>
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<tbody>
<tr>
<td>HSSC3K1 5-3BA</td>
<td>207 bar</td>
<td>38 mm</td>
<td>221 mm</td>
<td>0.6 kg</td>
<td>150 ml</td>
<td>.250-18 NPT</td>
<td>DOT-3A</td>
<td>-</td>
<td>316L Stainless</td>
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<tr>
<td>HSSC3K1 5-4BA</td>
<td>207 bar</td>
<td>38 mm</td>
<td>221 mm</td>
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<td>150 ml</td>
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<td>DOT-3A</td>
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<td>76 mm</td>
<td>173 mm</td>
<td>2.3 kg</td>
<td>300 ml</td>
<td>.500-14 NPT</td>
<td>DOT-3A</td>
<td>-</td>
<td>316L Stainless</td>
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<td>HSSC30-2BA</td>
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<td>239 mm</td>
<td>3.0 kg</td>
<td>500 ml</td>
<td>.500-14 NPT</td>
<td>DOT-3A</td>
<td>-</td>
<td>316L Stainless</td>
</tr>
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<td>HSSC30-3BA</td>
<td>207 bar</td>
<td>76 mm</td>
<td>417 mm</td>
<td>5.6 kg</td>
<td>1000 ml</td>
<td>.750-14 NPT</td>
<td>DOT-3A</td>
<td>-</td>
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<td>102 mm</td>
<td>260 mm</td>
<td>5.2 kg</td>
<td>900 ml</td>
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<td>Threaded cap &amp; collar</td>
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<tr>
<td>HSSC3K4 0-2BA</td>
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<td>102 mm</td>
<td>279 mm</td>
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<td>DOT-3A</td>
<td>Threaded cap &amp; collar</td>
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6. APPENDIX AND REFERENCES

Appendix III
Check Valve Details

Product Data Sheet

<table>
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<tr>
<th>Sizes</th>
<th>Part No</th>
<th>Max Pressure</th>
<th>Cracking Pressure</th>
<th>A</th>
<th>B</th>
<th>Weight</th>
<th>CV (Max)</th>
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<td>¼&quot;</td>
<td>CV25S</td>
<td>6,000 PSI</td>
<td>7 PSI</td>
<td>0.87&quot;</td>
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<td>6,000 PSI</td>
<td>7 PSI</td>
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<td>6,000 PSI</td>
<td>4 PSI</td>
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<td>1&quot;</td>
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<td>2.05&quot;</td>
<td>4.19&quot;</td>
<td>0.9kg</td>
<td>7.2</td>
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</tbody>
</table>
6. Contacts

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