Technology Selection - and Buyer’s Guide for Public Domain Handpumps for Drinking Water

Karl Erpf, HTN
November 2002
Buyer's - and technology selection Guide for

Public Domain Handpumps

for Drinking Water
Introduction

This document contains information on the Public Domain Handpumps available on the market and is intended to give assistance to all those, who are evaluating or intending to procure handpumps.

Included is condensed information on the different handpump types as there are:

a) Extracts of the specifications
b) Existing options
c) Information on supporting documents

Included in this document are the following handpump types:

**Suction Pumps** for Shallow Wells,
   No.6 Handpump, India

**Direct Action Pumps** for Shallow and Medium Wells,
   Malda Pump, Malawi
   Maya-Yaku Pump, Bolivia
   Tara Pump, India

**Rotary Pumps** for Shallow, Medium and Deep Wells,
   Rope Pump, Madagascar
   Rope Pump, Nicaragua

**Lever operated Pumps** for Medium and Deep Wells,
   Jibon Pump, Bangladesh
   Walimi Pump, Tanzania
   India Mark II Pump
   India Mark III Pump
   U3M Pump, Uganda
   Afridev Handpump
   Bush Pump, Zimbabwe

**Lever operated Pumps** for Extra Deep Wells,
   India Mark II Extra Deep Well
   Afridev Deep Well Pump with Bottom Support

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</table>
1.) Suction Pumps for Shallow Wells

No. 6 Handpump, India

India Standard Document IS ..... recommended use between depths of 0 to 6 m.

Supporting documents:
   Handpump Specification, available from BIS (see address in Appendix II)
No. 6 Pump, India

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>Pump head type</td>
<td>Cast-iron Pump head cover and Handle</td>
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<td>Pump stand type</td>
<td>Cast-iron Pump body with Base plate</td>
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<tr>
<td>Rising main arrangement</td>
<td>GI pipe (1.5 m long) Rising main and Robo-screen of PVC-U</td>
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<td>Cylinder arrangement</td>
<td>Inside Pump body (suction pump)</td>
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<td>Pumprod arrangement</td>
<td>MS- Pumprod with PVC-U Cup seal</td>
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**Abbreviations:**
- GI: Galvanized Iron
- MS: Mild Steel
- PVC-U: Polyvinyl Chloride (unplastcized)
2.) Direct Action Pumps for Shallow and Medium Wells

Malda Pump, Malawi

SKAT-HTN Document (Revision 1-2000)

recommended use between depths of 0 to 14 m.

Supporting documents:
  Handpump Specification
  Installation and Maintenance Manual
## Malda Pump, Malawi

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
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<tr>
<td><strong>Pump stand type</strong></td>
<td>Pump stand with Handle &amp; Pedestal:</td>
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<td><strong>Rising main arrangement</strong></td>
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<td>Cylinder with Plunger &amp; Footvalve in HDPE drawing No. A5004</td>
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<td><strong>Pumprod arrangement</strong></td>
<td>Threaded Pumprod pipes in HDPE drawing No. A5006</td>
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**Abbreviations:**

ISO  International Standards Organisation
HDPE  High Density Poly Ethylene

**Example:**

Possible composition of a selected Malda Pump:

- Pump stand type: B
- Rising main arrangement: A
- Cylinder arrangement: A
- Pumprod arrangement: A

For more clarification see the following 2 pages!
Pump stand assembly
(approx. scale = 1 : 6)

Handle assembly
(approx. scale = 1 : 6)

Pedestal assemblies
(approx. scale = 1 : 6)

A

Options:

B

For use on Dugwells and Boreholes

* If Option B is choosen, a different Standing plate is required
Rising main arrangement
(approx. scale = 1 : 5)

HDPE Riser pipes are available in
1 m length
2 m length
3 m length

Cylinder arrangement
(approx. scale = 1 : 5)

Pumprod arrangement
(approx. scale = 1 : 5)

HDPE Pumprods are available in
0.5 m length
2 m length
3 m length
Maya-Yaku Pump, Bolivia


recommended use between depths of 0 to 14 m.

Supporting documents:
Handpump Specification (Spanish version only)
## Maya-Yaku Pump, Bolivia

<table>
<thead>
<tr>
<th>Pump stand type</th>
<th>Pump stand with Handle &amp; Pedestal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising main arrangement</td>
<td>PVC-U Rising main with &quot;Bell-ends&quot;</td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>PVC-U Cylinder PVC-U / SS Plunger and Footvalve</td>
</tr>
<tr>
<td>Pumprod arrangement</td>
<td>PVC-U Pumprod pipes with union connectors</td>
</tr>
</tbody>
</table>

**Abbreviations:**

PVC-U Polyvinyl Chloride (unplastcized)

SS Stainless Steel

**Note:** The Maya-Yaku Pump should only be used in dug wells or lined boreholes.

For more clarification see the following page!
Tara Pump, India

India Standard Document, IS 14106 : 1996

recommended use between depths of 0 to 14 m.

Supporting documents:
Handpump Specification, available from BIS (see address in Appendix II)
Tara Pump, India

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump stand type</td>
<td>Pump stand with Handle &amp; Pedestal:</td>
<td>---</td>
</tr>
<tr>
<td>Rising main arrangement</td>
<td>PVC-U Rising main with lower well casing</td>
<td>PVC-U Rising main with upper and lower well casing</td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>PVC-U Cylinder</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>PVC-U / SS Plunger and Footvalve</td>
<td>---</td>
</tr>
<tr>
<td>Pumprod arrangement</td>
<td>PVC-U Pumprod pipes with union connectors</td>
<td>---</td>
</tr>
</tbody>
</table>

Abbreviations:
PVC-U Polyvinyl Chloride (unplastcized)
SS Stainless Steel

Example:
Possible composition of a selected Tara Pump:

Pump stand type A
Rising main arrangement B
Cylinder arrangement A
Pumprod arrangement A

For more clarification see the 2 following pages!
Pump stand & Pedestal
(approx. scale = 1 : 10)

Handle & Pumprod pipe
(approx. scale = 1 : 10)

Pumprod pipe
(approx. scale = 1 : 5)

Piston & Footvalve
(approx. scale = 1 : 5)

Pumprod pipes are available in 3 m lengths
Rising main, Cylinder, Upper & Lower casing
(approx. scale = 1 : 10)

Rising main, Cylinder & Lower well assembly
(approx. scale = 1 : 10)

Options:

Rising main

Upper casing

Cylinder

Lower casing

Rising main

Cylinder

Lower well assembly
3.) **Rotary Pumps** for Shallow, Medium and Deep Wells

**Rope Pump, Madagascar**

SKAT-HTN Document (Edition 2001)

recommended use between depths of 0 to 30 m.

**Supporting documents:**
- Handpump Specification
- Manufacturing Guidelines
## Rope Pump Madagascar

<table>
<thead>
<tr>
<th><strong>Pump stand</strong></th>
<th>Pump stand with Wheel, Handle &amp; Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pipe arrangement</strong></td>
<td>PVC-U pipes for Rising main, Spout, Inlet &amp; Drainage</td>
</tr>
<tr>
<td><strong>Guide box</strong></td>
<td>Concrete block with Glass bottle (deviation), PVC-U adaptors</td>
</tr>
<tr>
<td><strong>Rope &amp; Pistons</strong></td>
<td>PA or PP Rope (woven) with PVC-U Pistons</td>
</tr>
</tbody>
</table>

**Abbreviations:**
PVC-U Polyvinyl Chloride (unplastcized)
PAA Polyamide
PP Polypropylene

Note: This Rope Pump type can only be used for dug wells.

For more clarification see the following page!
Pump stand with Wheel, Handle & Cover  
(approx. scale = 1 : 11)

Inlet-, Drainage-, Spout pipe  
(approx. scale = 1 : 11)

Guide box, Rising main  
(approx. scale = 1 : 11)

All pipes are of PVC-U
Rope Pump, Nicaragua

Bombas de Mecate Documents

Information available from Bombas de Mecate (see address in Appendix II)
4.) Lever Operated Pumps for Medium and Deep Wells

Jibon Pump, Bangladesh


recommended use between depths of 0 to 20 m.

Supporting documents:
Handpump Specification
**Jibon Pump, Bangladesh**

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Cast-iron Pump head cover and Handle</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pump stand type</strong></td>
<td>Cast-iron Pump body with welded Flange assembly</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>PVC-U Rising main for 2&quot; cylinder &amp; Lower well assy.</td>
<td>(1 ½&quot; version in preparation)</td>
<td>(3&quot; version in preparation)</td>
</tr>
<tr>
<td><strong>Cylinder arrangement</strong></td>
<td>Upper well assy. with: Piston &amp; Footvalve drawing No. A5820</td>
<td>(1 ½&quot; version in preparation)</td>
<td>(3&quot; version in preparation)</td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>MS- Pumprods with threaded connectors: drawing No. A5804</td>
<td>FRP- Pumprods with Brass connectors: drawing No. A5889</td>
<td>---</td>
</tr>
</tbody>
</table>

**Explanations:**

* not recommended when PH value is < 6.5

**Abbreviations:**

PVC-U Polyvinyl Chloride (unplasticized)
MS Mild Steel
FRP Fibre Reinforced Plastic

For more clarification see the following page!
Pump stand, Handle & Pedestal
(approx. scale = 1 : 10)

Piston & Footvalve
(approx. scale = 1 : 5)

Pumprod arrangements
(approx. scale = 1 : 5)

Options:
A
B

(FRP)
(MS)

Both Pumprod types are available in 3 m lengths

Cylinder, Rising main & Lower well assembly
(approx. scale = 1 : 5)
Walimi Handpump, Tanzania


Ø3” cylinder to be used between depths of 5 to 25 m,
Ø2” cylinder to be used between depths of 20 to 40 m.

Supporting documents:
- Handpump Specification
- Installation and Maintenance Manual
- Quality Control Guidelines
- Other documents: - Manufacturing Guidelines
## Walimi Handpump, Tanzania

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Pump head assy. with Handle drawing No. A3002</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>PVC-HI Rising main with &quot;Sockets&quot;: drawing No. A3079</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Cylinder arrangement</strong></td>
<td>PVC-HI Cylinder (3&quot;) &amp; Plunger/Footvalve drawing No. A3050</td>
<td>PVC-HI Cylinder (2&quot;) &amp; Plunger/Footvalve drawing No. A3095</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>SS- Pumprods with threaded connectors: drawing No. A3040</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**Abbreviations:**
- PVC-HI Polyvinyl Chloride (High Impact)
- SS Stainless Steel

**Example:**
Possible composition of a selected Walimi Handpump:

- Pump head type: A
- Pump stand type: D
- Rising main arrangement: A
- Cylinder arrangement: B
- Pumprod arrangement: A

For more clarification see the following 2 pages!
Pump head & Handle
(approx. scale = 1 : 10)

Pump stand types
(approx. scale = 1 : 10)

Long stands are used on flat platforms (boreholes and dug wells)

Short stands are mainly used on rised dug wells with cover

Options:

A

B

C

D

500 mm

300 mm

500 mm

300 mm
Pumprod arrangement
(approx. scale = 1 : 10)

SS Pumprods and LDPE Rod covers are available in
0.75 m lengths
1.5 m lengths
2.0 m lengths

Rising main arrangement
(approx. scale = 1 : 10)

PVC-HI Riser pipes are available in
0.75 m lengths
1.5 m lengths
2.0 m lengths

IMPORTANT
Select applicable Centraliser size for Casing used
4"
5"
6"

Cylinder arrangements
(approx. scale = 1 : 10)

Options:

A

3" Cylinder (PVC-HI)

B

2" Cylinder (PVC-HI)
India Mark II Pump

India Standard Document, IS 9301: 1990

recommended use between depths of 20 to 50 m.

Supporting documents:
   Handpump Specification, available from BIS (see address in Appendix II),
## India Mark II Pump

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Pump head with standard Handle and Water tank</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pump stand type</strong></td>
<td>Pump stand with 3 legs (NB 150 mm) drawing No. B2348</td>
<td>Pump stand with 3 legs (NB 150/175) drawing No. B2347</td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>Galvanized GI pipe with Sockets (1 ¼” medium)</td>
<td>---</td>
</tr>
<tr>
<td><strong>Cylinder arrangement</strong></td>
<td>Castiron cylinder, Brass plunger &amp; footvalve: drawing No. A2350</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>MS- Pumprods with threaded connectors: drawing No. A2370</td>
<td>---</td>
</tr>
</tbody>
</table>

**Explanations:**

* should not be used in aggressive waters

**Abbreviations:**

- **NB** Nominal Bore
- **GI** Galvanized Iron
- **MS** Mild Steel

**Example:**

Possible composition of a selected India Mark II Pump:

- Pump head type: A
- Pump stand type: B
- Rising main arrangement: A
- Cylinder arrangement: A
- Pumprod arrangement: A

For more clarification see the following 2 pages!
Pump head, Handle and Water tank
(approx. scale = 1 : 10)

Pump stand types
(approx. scale = 1 : 10)

A

For casing pipes 4", 4.5" and 5"

B

For casing pipes 6"

Options:
Rising main arrangement
(approx. scale = 1:5)

GI Riser pipes are available in 3 m lengths

Cylinder arrangement
(approx. scale = 1:5)

Pumprod arrangement
(approx. scale = 1:5)
Pumprods are available in 3 m lengths
India Mark III Pump

India Standard Document, IS 13056 : 1991

recommended use between depths of 10 to 30 m.

Supporting documents:
   Handpump Specification, available from BIS (see address in Appendix II)
   Installation and Maintenance Manual (English and French version), available from the manufacturers.
### India Mark III Pump

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Pump head with Handle and Water tank for 2&quot; Risers pipes</td>
<td>Pump head with Handle and Water tank for 2 ½&quot; Risers pipes</td>
</tr>
<tr>
<td><strong>Pump stand type</strong></td>
<td>Pump stand with 3 legs (NB 150 mm) drawing No. B2348</td>
<td>Pump stand with 3 legs (NB 150/175) drawing No. B2347</td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>Galvanized GI pipe with Sockets for 2&quot; Risers pipes</td>
<td>Galvanized GI pipe with Sockets for 2 ½&quot; Risers pipes</td>
</tr>
<tr>
<td><strong>Cylinder arrangement</strong></td>
<td>Castiron cylinder with Brass liner for Ø50 mm, Plunger &amp; Footvalve: drawing No. A2651</td>
<td>Castiron cylinder with Brass liner for Ø63.5 mm, Plunger &amp; Footvalve: drawing No. A2751</td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>MS- Pumprods with threaded connectors: drawing No. A2206</td>
<td>--</td>
</tr>
</tbody>
</table>

**Explanations:**

* should not be used in aggressive waters

**Abbreviations:**

<table>
<thead>
<tr>
<th>NB</th>
<th>Nominal Bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI</td>
<td>Galvanized Iron</td>
</tr>
<tr>
<td>MS</td>
<td>Mild Steel</td>
</tr>
</tbody>
</table>

**Example:**

Possible composition of a selected India Mark III Pump:

- Pump head type B
- Pump stand type A
- Rising main arrangement B
- Cylinder arrangement B
- Pumprod arrangement A

For more clarification see the following 2 pages!
Pump head, Handle and Water tank
(approx. scale = 1:10)

Note:
Socket of Water tank & Compression cone have different sizes (2" Socket for Ø50 mm Cylinder, 2 1/2" Socket for Ø63.5 mm Cylinder)

Pump stand types
(approx. scale = 1:10)

Options:

A
- For casing pipes 4", 4.5" and 5"

B
- For casing pipes 6"
Cylinder arrangements
(approx. scale = 1:5)

A

Options:

B

Rising main arrangements
(approx. scale = 1:5)

A

Options:

B

GL Riser pipes are available in 3 m lengths

2"

2 1/2"

Pumprod arrangement
(approx. scale = 1:5)

Pumprods are available in 3 m lengths
U3M Handpump, Uganda

SKAT-HTN Document (Edition 2001)

recommended use between depths of 10 to 45 m.

Supporting documents:
- Handpump Specification
- Installation and Maintenance Manual
- Quality Control Guidelines
# U3M Handpump, Uganda

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Pump head with lightweight handle</td>
<td>Pump head with heavy handle</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>drawing No. B2276</td>
<td>drawing No. B2279</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pump stand type</strong></td>
<td>Pump stand with bottom flange:</td>
<td>Pump stand with 3 legs (NB 150 mm)</td>
<td>Pump stand with 3 legs</td>
<td>Pump stand with bottom</td>
</tr>
<tr>
<td></td>
<td>drawing No. B2287</td>
<td>drawing No. B2281</td>
<td>(NB 150/175) drawing No.</td>
<td>flange: drawing No. B2055</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B2284</td>
<td></td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>PVC-U Rising main with &quot;Sockets&quot;:</td>
<td>PVC-U Rising main with “Bell ends”:</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>drawing No. A2119</td>
<td>drawing No. A2099</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cylinder arrangement</strong></td>
<td>Brass plunger with Brass footvalve:</td>
<td>Brass plunger with Plastic footvalve:</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>drawing No. A2296</td>
<td>drawing No. A2257</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>SS- Pumprods with threaded connectors:</td>
<td>FRP- Pumprods with Brass connectors:</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>drawing No. A2224</td>
<td>drawing No. A5889</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:**
- PVC-U Polyvinyl Chloride (unplasticized)
- SS Stainless Steel
- FRP Fibre Reinforced Plastic

**Example:**
Possible composition of a selected U3M Handpump:

- Pump head type: A
- Pump stand type: C
- Rising main arrangement: B
- Cylinder arrangement: B
- Pumprod arrangement: A

For more clarification see the following 3 pages!
Pump head types
(approx. scale = 1:10)

Option: A
light handle (MS pipe)

Option: B
heavy handle (full MS bar)
Pump stand types
(approx. scale = 1 : 10)

* For casing pipes 4", 4.5" and 5"

** For casing pipes 6"

Rising main arrangements
(approx. scale = 1 : 10)

**IMPORTANT**
State applicable Centraliser size for Casing used

4"
4.5"
5"
6"
8"

PVC-U Riser pipes (pipes / sockets) are available in 3 m lengths

**IMPORTANT**
State applicable Centraliser size for Casing used

4"
4.5"
5"
6"
8"

PVC-U Riser pipes (with bell-ends) are available in 2.9 m lengths
Cylinder arrangements
(approx. scale = 1 : 5)

A

Brass Plunger

Brass Footvalve

B

Options:

Brass Plunger

Plastic Footvalve

Pumprod arrangements
(approx. scale = 1 : 5)

A

Options:

SS Pumprods are available in 3 m lengths

B

FRP Pumprods are available in 3 or 6 m lengths
**Afridev Handpump**

SKAT-HTN Document (Revision 4-2002)

recommended use between depths of 10 to 45 m.

**Supporting documents:**
- Handpump Specification
- Installation and Maintenance Manual (English and French version)
- Quality Control Guidelines
- Other supporting documents: - Injection Moulding Guidelines
  - Rubber Moulding Guidelines
**Afridev Handpump**
List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump head type</strong></td>
<td>Pump head with short spout: (30 cm) drawing No. B2003</td>
<td>Pump head with long spout: (58 cm) drawing No. B2003</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Rising main arrangement</strong></td>
<td>PVC-U Rising main with “Sockets”: drawing No. A2119</td>
<td>PVC-U Rising main with “Bell ends”: drawing No. A2099</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pumprod arrangement</strong></td>
<td>MS- Pumprods with threaded connectors: drawing No. A2206</td>
<td>SS- Pumprods with threaded connectors: drawing No. A2209</td>
<td>FRP- Pumprods with Brass connectors: drawing No. A5889</td>
<td>SS- Pumprods with “Hook &amp; Eye” conn. drawing No. A2110</td>
</tr>
</tbody>
</table>

**Explanations:**

* not any longer recommended

** not recommended when PH value is < 6.5

**Abbreviations:**

ISO  International Standard Organisation
PVC-U  Polyvinyl Chloride (unplasticized)
MS  Mild Steel
SS  Stainless Steel
FRP  Fibre Reinforced Plastic

**Example:**
Possible composition of a selected Afridev Handpump:

- Pump head type: **B**
- Pump stand type: **C**
- Rising main arrangement: **A**
- Cylinder arrangement: **A**
- Pumprod arrangement: **C**

For more clarification see the following 3 pages!
Pump head types
(approx. scale = 1:10)

Option: A

300 mm

Option: B

580 mm
Pump stand types
(approx. scale = 1:10)

A

Options:

B

Options:

C

All stand types can be used for casing pipes up to 6".

Rising main arrangements
(approx. scale = 1:10)

A

Options:

B

IMPORTANT
State applicable Centraliser size for Casing used

4"
4.5"
5"
6"
8"

PVC-U Riser pipes (pipes / sockets) are available in 3m lengths

IMPORTANT
State applicable Centraliser size for Casing used

4"
4.5"
5"
6"
8"

PVC-U Riser pipes (with bell-ends) are available in 2.9m lengths
Cylinder arrangements
(approx. scale = 1:5)

A
Options:
Brass Plunger
Brass Footvalve

B
Options:
Plastic Plunger
Plastic Footvalve

C

Pumprod arrangements
(approx. scale = 1:5)

A
Options:
(MS)

B
Options:
(SS)

C
Options:
(FRP)

D
Options:
(MS)

Options A, B and C are available in 3 m lengths - Option C in 3 or 6 m lengths
Bush Pump, Zimbabwe


Ø75 mm cylinder to be used between depths of 3 to 25 m,
Ø63.5 mm cylinder to be used between depths of 20 to 45 m.
Ø50 mm cylinder to be used between depths of 40 to 80 m.

Supporting documents:
- Handpump Specification
- Installation and Maintenance Manual
# Bush Pump, Zimbabwe

List of options available for this pump type.

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump stand type</td>
<td>Pump stand, Handle &amp; Discharge assembly: drawing No. A3202</td>
<td>same as “A”</td>
<td>same as “A”</td>
<td>same as “A”</td>
</tr>
<tr>
<td>Rising main pipe</td>
<td>GI Riser pipe (2”) and “Sockets”: drawing No. C3309/04</td>
<td>GI Riser pipe (2 1/2”) and “Sockets”: drawing No. C3274/73</td>
<td>GI Riser pipe (3”) and “Sockets”: drawing No. C3349/37</td>
<td>GI Riser pipe (2”) and “Sockets”: drawing No. C3309/04</td>
</tr>
<tr>
<td>Pumprod arrangement</td>
<td>Pumprods, with Hook &amp; Eye connectors: drawing No. A3247</td>
<td>same as “A” or “D”</td>
<td>same as “A” or “D”</td>
<td>Pumprods with threaded connectors: drawing No. A3350</td>
</tr>
</tbody>
</table>

Explanations:

* The Ø50 mm Cylinder is mostly used for deep or extra deep wells.

Note: This pump type is not recommended for aggressive waters.

Abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI</td>
<td>Galvanized Iron</td>
</tr>
<tr>
<td>ES</td>
<td>Extractable System</td>
</tr>
<tr>
<td>NES</td>
<td>Non Extractable System</td>
</tr>
</tbody>
</table>

Example:

Possible composition of a selected Bush Pump:

- Pump stand type: A
- Discharge type: B
- Rising main pipe: B
- Cylinder arrangement: B
- Pumprod arrangement: D

For more clarification see the following 2 pages!
Pump head, Pump stand & Handle
(approx. scale = 1:10)

** A longer Handle pipe (filled with concrete) is used for extra deep well applications.

* Directly bolted to the Steel casing (mostly casings of 6" diameter)

Discharge arrangements
(approx. scale = 1:10)

- Options: A
  - Ø50 ES / Ø75 NES
- Options: B
  - Ø63.5 ES
- Options: C
  - Ø75 ES

Rising main types
(approx. scale = 1:10)

- Options: A
- Options: B
- Options: C

GI Riser pipes are available in 3 m lengths
Cylinder arrangements
(approx. scale = 1 : 5)

A Options: B Options: C Options: D Options:
Ø50 mm ES Ø63.5 mm ES Ø75 mm ES Ø75 mm NES

Cylinder A is used for extra deep well applications.

Pumprod arrangements
(approx. scale = 1 : 5)

A Options: B Options:

All Pumprods are available in 3 m lengths.
5.) Lever operated Pumps for Extra Deep Wells

India Mark II Extra Deep Well Handpump

IS Document IS 13287 : 1992

recommended use between depths of 40 to 90 m.

Supporting documents:
Handpump Specification, available from BIS (see address in Appendix II)
Additional or different components for the India Mark II Extra Deep Well Pump, compared to the “Standard version”:

Extra strong handle with T-bar and holes provided, for fixing additional “Counter weight plates” for balancing of the Pump handle (see pictures below).
Afridev Deep Well Pump with Bottom Support

SKAT-HTN Document

recommended use between depths of 40 to 80 m.

Supporting documents:
  Handpump Specification
Additional or different components for the “Deep Well” Afridev Handpump, compared to the “Standard version”:

1.) Adjustable handle bar (solid) is acting as a counter weight (balancing the Pump handle).

2.) Ball bearings for Fulcrum- and Rodhanger assembly.

3.) The use of the FRP Pumprod arrangement (A2209) is recommended.

4.) For deep well applications exceeding 45 m, the **Bottom Support System** is required (see following drawings).
Pedestal pipe assembly

- Hook assembly
- Hexagonal bolt
- Plate assembly
- Cable binder
- Pedestal pipe (top)
- Pedestal pipe
- Fins (4)
- Socket
- Rope
- Pedestal pipe (bottom)
- Plug assembly
- Casing pipe (4" min.)
- Gravel / small stones
- Casing seal (cement)
Appendix I

Order Form for Publications
### Specifications

- Afridev Handpump Specification - Revision 4-2002  
  - (US$ 50.-/CHF 75.-)
- Bomba de acción directa (Maya-Yaku) Especificaciones 0-1993  
  - (free)
- MALDA Handpump Specification Revision 1-2000  
  - (US$ 30.-/CHF 45.-)
- Bush Pump Specification Revision 0-1997  
  - (US$ 50.-/CHF 75.-)
- Jibon Deepset Pump Specification Revision 0-1999  
  - (US$ 30.-/CHF 45.-)
- Walimi Deepwell Handpump Specification  
  - (US$ 50.-/CHF 75.-)
- Revision 0-2002, former SWN-80 Pump (Registration)  
  - (US$ 50.-/CHF 75.-)
- Uganda U3 Modified Deepwell Handpump Specification Revision 0-2001  
  - (US$ 50.-/CHF 75.-)
- Madagascar Rope Pump Specification  
  - in preparation

### Manuals

- Moulding Guidelines for Rubber Components, Rev. 1-1999  
  - (US$ 30.-/CHF 45.-)
- Afridev Injection Moulding Manual, Revision 1-1999  
  - (US$ 30.-/CHF 45.-)
- Quality Control Guidelines for Afridev Handpump, Rev. 1-2000  
  - (US$ 30.-/CHF 45.-)
- Packaging Guidelines For Afridev, 1992  
  - (free)
- Afridev Handpump Installation and Maintenance Manual, 1995  
  - (free)
- Pompe manuelle Afridev - manuel d’installation et d’entretien, 1997  
  - (free)
- Plastic Laminated Maintenance Card, 1995  
  - (free)
- Installation and Maintenance Manual for Malda Handpump  
  - in preparation
- Installation and Maintenance Manual for Walimi Handpump  
  - in preparation
- Installation and Maintenance Manual for U3M Handpump  
  - in preparation

### Working Papers

- Choice of technology, 1997  
  - (free)
- Uganda’s Water Sector Development: Towards Sustainable Systems, 1996  
  - (free)
- India Handpump Revolution, 1997  
  - (free)

### Case Studies

  - (free)
  - (free)
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Phone: +41 71 228 54 54, Fax: +41 71 228 54 55, E-mail: claudia.schmid@skat.ch
Appendix II

Addresses for ordering Publications
Address for ordering Indian Standards:

BIS Bureau of Indian Standards
Manak Bhavan
9 Bahadur Shah Zafar Marg
New Delhi 110 002
India

Phone: +91 11 323 0131
Fax: +91 11 323 4062
E-mail: bis@vsnl.com
Homepage: wwwdel.vsnl.net.in/bis.org

Address for ordering Rope Pump information from Nicaragua:

Bombas de Mecate
P.O. Box 3352
Los Cedros
Nicaragua

Phone: +505 882 39 88
Fax: +505 278 40 45
E-mail: ropepump@ibw.com.ni

Address for ordering SKAT-HTN Documents:

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Resource Centre for Development
Vadianstr. 42
CH-9000 St.Gallen
Switzerland

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or claudia.schmid@skat.ch
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