

# CONSALLEN

Handpumps for wells and boreholes  
made in the UK for reliable use throughout the World



*our hand pumps have been in  
reliable use in Africa for over  
33 years*

## FEATURES

Proof against Corrosion

True VLOM - installed & maintained by hand at village level

Training and after-sales services

Long lived for best value

Very low spares consumption

Mail Order spares service

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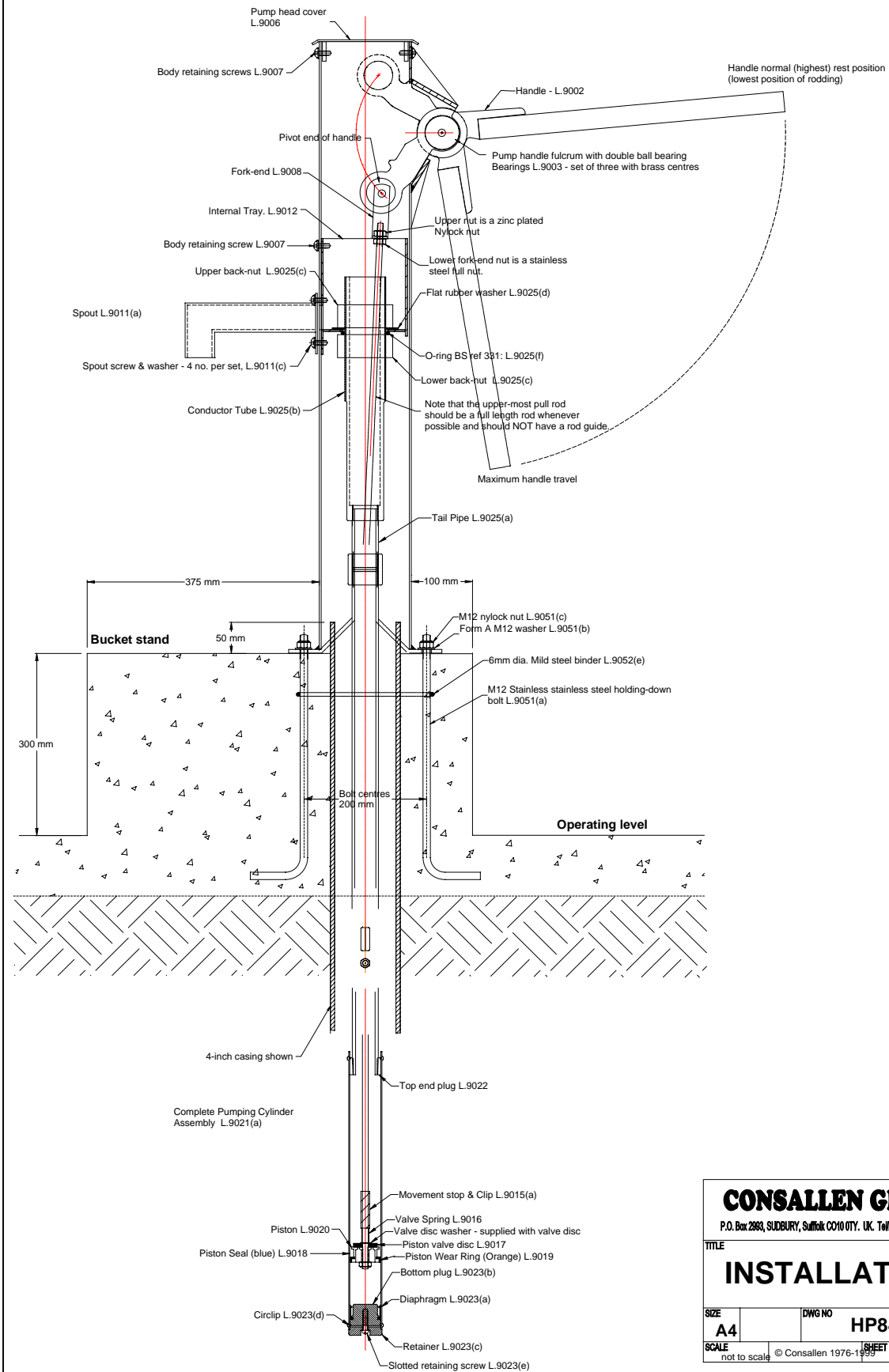
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# The INSTALLATION drawing



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**INSTALLATION**

SIZE	DWG NO	REV
A4	HP849	
SCALE	SHEET 1 of 1	
not to scale © Consallen 1976-1999		

## SPECIFICATION

of

### The CONSALLEN hand pump

**The Consallen Hand Pump will raise water from up to 60 metres from wells and boreholes**

**Designed for Corrosion Resistance, Long Life and GOOD VALUE!**

Stainless steel rods and a plastic drop pipe connect the cylinder to the surface pump head. The working parts are totally enclosed and manufactured in stainless steel, brass, bronze and ABS to avoid corrosion. Bearings are sealed and lubricated for a long and maintenance-free life and the pump head is of robust welded steel construction designed to withstand continuous use in arduous conditions.

#### Simplicity

The pump is simple and economical to install and maintain. All servicing can be carried out in the field using simple hand tools and without the use of lifting tackle, threading or cutting equipment - a true VLOM system.

The ABS plastic rising main is supplied in standard 3 metre lengths complete with stainless steel pull rods and all the necessary couplings. A 30 metre assembly weighs only 40 Kgs.

The pump is delivered complete and ready to install, with no cutting or threading and nothing extra to buy.

#### Accessories

##### **Tool Kit**

- The Consallen Pump has been designed for installation and servicing with a simple basic tool kit. A pair of cranked spanners fit together to double as a lifting tool for the drop pipe.
- A pair of small open-ended spanners fit all the flats and nuts used in the rod connecting system. One Allen key fits all the socket button-head screws that secure the closure plates of the pump head.
- A stubby screw driver is used to dismantle the cylinder.

##### **Initial Spares**

- An Initial Spares Pack is recommended and is delivered in a plastic box for safe storage on site and enough spares to keep the pump going for up to about 5/7 years after installation.

##### **Bolt Cage**

A prefabricated bolt cage is offered and recommended to ensure that the pump stand is adequately fixed. The cage is supplied in knock-down form comprising 4 **stainless steel** long bolts with washers and nylock nuts, a reinforcement binder and a template to ensure the bolts cannot be cast inaccurately into the concrete. For bigger supplies a number of templates are supplied to suit site requirements.

##### **Alternatives**

- Angled or cranked spouts are available as standard (*cranked spouts illustrated herein*).
- Alternative rising main in either Type 304/316 stainless steel or heavy duty ABS plastic is available.
- Also supplied is an extractable ABS rising main system with support stabiliser for deep settings.

## PUMP HEAD (Pump Stand)

The pump head is of all welded construction in heavy gauge mild steel and hot dip galvanised after fabrication; total weight is about 35 Kg.

The handle has main fulcrum bearings and an end pivot employing, in all, three standard double sealed deep groove ball bearings of the heaviest (series 63) grade. The double bearing fulcrum has a static load bearing capacity of 1,754 Kg.. All accurate machining is contained within the handle, which is supported by stainless steel through-bolts and brass spacers. Bearing housings are push broached for consistent accuracy and the bearings are a press fit in the housings.

The standard pump head is of the bolt-down type intended for fixing to the well head concrete using 4 no. cast-in bolts. The ergonomics of the design envisage that the concrete plinth to which the head is bolted is 300mm higher than the operator's feet. Holding down bolts are required to be at 200mm centres in a square.

## BEARINGS

As mentioned above, the handle bearings are standard precision deep groove ball bearings each with two rubber seals to exclude dust and to retain the grease filling. Three bearings are employed - two at the fulcrum and one at the end pivot. The bearings are of the 63 series, the heaviest available of the type.

No other bearings as such are employed in the pump but water lubricated guides are provided for the pull rodding system.

## Design and Usage

The Consallen Hand Pump has been designed and field proven over a 20 year period for reliable use for the supply of up to about 250 people with a daily water requirement of 20 litres. Best results are obtained with a standing water level of up to 40 metres and a total daily work output of 200,000 Litre-Metres. Increases in daily work output bring increases in maintenance requirements. Conversely a smaller work-load will extend the period between maintenance requirements.

Piston seals and wear rings are designed for long life and the stainless steel cylinders are properly honed also with long life in mind. The valves and seals will pump sand if required and the standard laboratory tests show that our cylinders have a very high tolerance for wear by sand. However, there is no substitute for sand-free bore hole design, development and construction.

## RISING MAIN and RODDING

From the beginnings of our hand pumps in 1975 we have used ABS plastics as the rising main pipe and stainless steel rodding for operating the pump.

Our philosophy has always been that the below ground components of hand pumps should be both corrosion proof and light enough to be installed and withdrawn entirely by hand.

It is now almost 25 years since we commenced manufacture and we have more experience of the use of ABS than any other hand pump manufacturer. With our experience we are able to offer completely reliable below ground systems for all circumstances. As noted above, we offer stainless steel and a heavy duty version of our standard ABS plastic rising main where appropriate, as well as a wide bore extractable version. Our stabiliser system of support for deep set rising mains enables plastics to be used to any depth of bore hole.

Our Type 303 stainless steel pull rodding has all rolled threads, is in 3 metre standard lengths of 3/8" diameter and uniquely all rods have wrenching flats broached on each end. The wrenching flats enable the rods to be tightened and dismantled using a pair of 8mm AF open ended.....

spanners. This avoids the damage caused by gripping wrenches and preserves the smoothness, integrity and straightness of the rod system. Our rodding is screwed 3/8-in BSF as standard with brass couplings and lock nuts. Upon request we can supply rods screwed M10 for particular countries.

### CYLINDERS, PISTONS and VALVES

Our cylinders are of type 316 stainless steel and are fully honed (a rotary grinding process) in a similar manner to vehicle engine cylinders. This process is unique to us and has considerable advantages. The main reason for honing is to produce a good surface finish but one which retains sufficient water to fully lubricate the piston seal. A cylinder surface which is not machined is either too smooth to give proper water retention or so rough that the seal is compromised prematurely. A cylinder which is only bored but not honed may also compromise the seal because it is caused to cross machining marks which are effectively parallel to the lip. The honing process produces machine marks which are at 45° to the seal lip which can negotiate them without effort or wear.

Cylinder end plugs are retained by circlips in rolled grooves and are threaded to suit the rising main.

Pistons are of brass and employ a simple spring loaded flap valve sliding on the piston rod. Seals are of polyurethane and an artificial resin wear ring is employed.

Foot-valves are of the rubber diaphragm type working against a gallery of perforations in the cylinder wall. The diaphragm is supported by a nylon end plug seated on a circlip.

The cylinder may be completely dismantled and reassembled using only a screw driver. No other tools are necessary to maintain the piston valve, seal, wear ring and foot-valve.

### WELLS for CONSALLEN HAND PUMPS

Consallen pumps can be installed in small wells and boreholes finished with casings having normal plastic casings of 3 inches diameter (76mm i.d.). This may make a large difference in the cost of making bore holes, because small holes are cheaper to make. This is particularly true where hard rock aquifers are encountered. Since the Consallen cylinder will comfortably enter and operate in a bare rock hole as small as 65mm diameter, small commercial compressed air hammers can be used with commonly available contractor's compressors can be used to drill. The cost implications of this ability are very large, the savings on drilling being bigger than the cost of the pump.

**Services**

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## PROJECT and other AFTER-SALES SERVICES

### TRAINING, INSTALLATION & MAINTENANCE

Consallen will, on request, provide full on-site training in not only the installation of our pumps, but in setting up of comprehensive maintenance systems for their long term support. This support is offered as an on-going service to support long term projects, but also as a one-off permanent solution to maintenance support for Consallen pumps. Details of successful applications of our maintenance systems are available on request.

### INITIAL SPARES PACKS

We suggest that our hand pumps be supplied with an 'Initial Spares' pack and our tools kit. The boxed spares are intended to run the pump for the first 5 to 7 years of ownership. Experience shows that this is a conservative estimate of the time that the spares pack will support our pumps. However, if any additional spares are needed we offer a mail order service for any others required.

### SPARE PARTS BY MAIL ORDER

Almost all the spare parts used in owning and operating Consallen hand pumps are small and light enough to deliver by the 'small packet' or standard airmail service. This method of delivery may entirely eliminate Customs and import taxes.

### HAND DUG WELLS

We can also provide both hardware and training in the hand digging of wells in suitable areas using the Modified Chicago Method. This is a cheap technology and allows projects to maximise the amount of adequate coverage of water supplies to rural peoples.

### SEMI-MECHANISED DRILLING

Also available is advice on the use of a low technology semi-mechanised drilling system for places where conditions are suitable, and where perhaps hand dug wells may be too deep.

Several technologies are available, including cable percussion (Shell & Auger) drilling.

### BROCHURES AVAILABLE in .pdf FORMAT

- Spares & Components Manual
- Installation and Maintenance Manual
- The Modified Chicago Method - hand dug wells
- Forager-55/1250 cable percussion (Shell & Auger) drilling rig

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