

# OPERATING AND MAINTENANCE INSTRUCTIONS

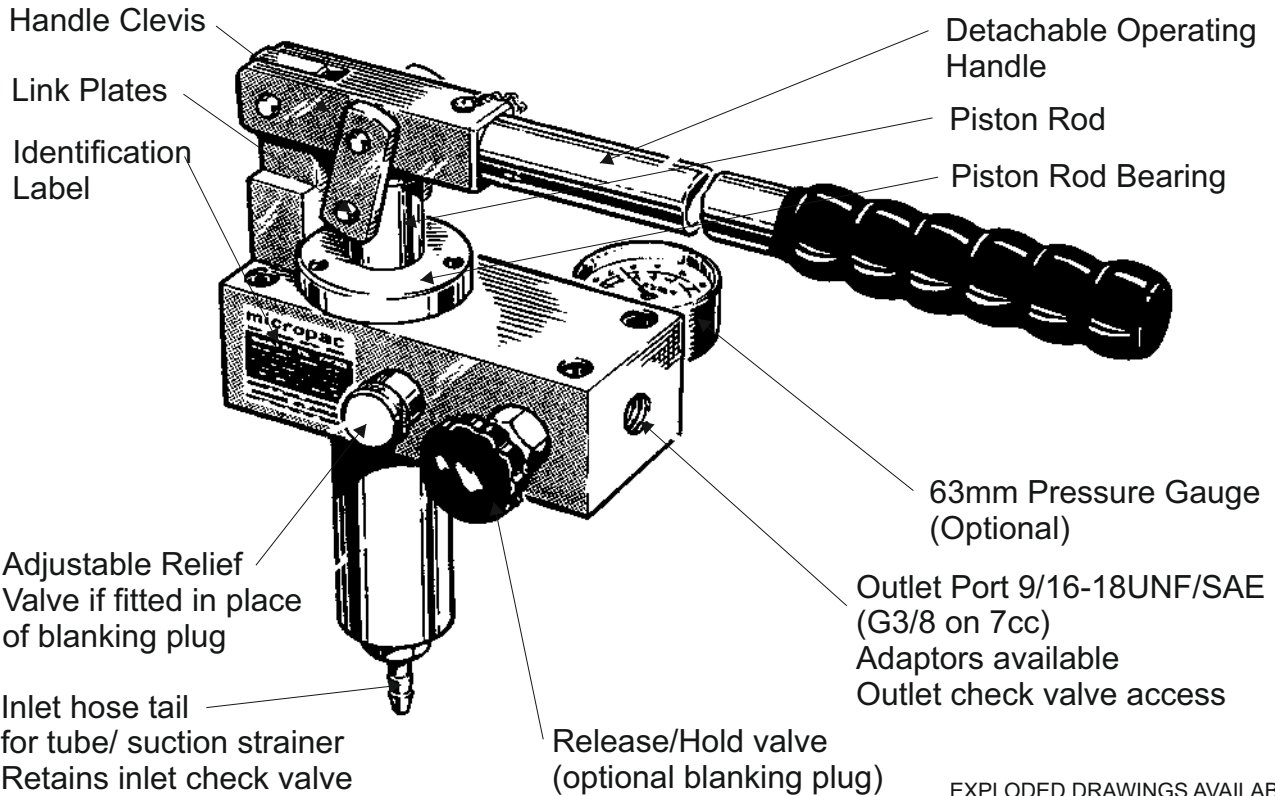
## on Micropac Single speed, double acting Hand Pumps

### MW-A & MW-3 MICROPAC HAND PUMP UNITS

### MP-A & MP-3 MICROPAC PRESSURE TEST UNITS

### MS SERIES MICROPAC PUMP UNITS

#### PARTS



EXPLODED DRAWINGS AVAILABLE UPON REQUEST

#### APPLICATION

The unit is suitable for any application requiring manual generation of hydraulic power eg operating hydraulic cylinders or actuators, hydrostatic testing, etc. Because of our use of soft seat inlet check and release valves, together with the poppet outlet check valve, the unit is suitable for hydraulic fluids including low viscosity types such as water- in-oil emulsions and offshore control fluids (subject to seal and material compatibility). Consult the factory if in doubt.

#### MOUNTING

Fit inlet hose (see CONNECTIONS) Suitable for mounting on to a flat surface using 4 off M8 cap screws (supplied). The mounting orientation is universal subject to ergonomic considerations in using the operating handle. Sealing between pump and mounting surface is effected using the cork gasket (supplied). Align relief/release drain holes. when fitting.

#### PRESERVATION & STORAGE

We recommend that fluid is pumped out of units prior to storage and dust caps and plugs fitted. Units should be heat-sealed into labelled plastic bags

#### Sarum Hydraulics Limited

Unit 1 Danebury Court, Old Sarum Salisbury, Wiltshire SP4 6EB, UK

Tel: 44(0)1722 328388 Fax: 44(0)1722 414307

email:pumpsales@sarum-hydraulics.co.uk

[www.sarum-hydraulics.co.uk](http://www.sarum-hydraulics.co.uk)

©Micropac is a Registered Trade Mark of Sarum Hydraulics

#### CONNECTIONS

Cut inlet hose (supplied) to length (maximum 600mm)and push on to inlet hose tail. The strainer must be fitted to the free end of the inlet hose.

Make connection to the outlet port with appropriate adaptor or fitting. Where applicable, plug unused auxilliary port or fit pressure gauge.

The gauge port is G1/4(BS2779) flat bottom.

#### MAINTENANCE

The inlet strainer is easily accessible for cleaning. The inlet and outlet check valves are also easily serviced and use replaceable seats. Seals are replaced using standard tools. Service kits are available. We also supply a list of recommended spares for two years operation. Our service kit supplies all balls, springs, seals and seats, so is comprehensive. A piston rod and piston rod bearing both fitted with seals are the additional spares for remote sites.

#### SAFETY

This pump is a component forming part of a hydraulic pressure system. The system should be designed , operated and maintained in accordance with statutory requirements and other relevant instructions.



**SARUM**  
HYDRAULICS  
Designers & Manufacturers of Micropac® Hydraulics

# FAULT FINDING AND MAINTENANCE on Micropac Single speed, double acting Hand Pumps

## Basic Operation of a Single Speed, Double Acting Hand Pump.

A double acting hand pump will pump fluid on the up stroke as well as the down stroke. The "down stroke" is the stroke during which the piston rod is pushed into the piston rod bearing and corresponds to the pressure stroke on a single acting hand pump. Note that the terminology "double acting" is also sometimes used to describe a hand pump which is fitted with a four way directional control valve. We manufacture both types of pump, but this use of the term is in respect of the basic generation of pressure.

A single acting hand pump simply has an inlet check (or non return) valve and an outlet check valve. As the piston is moved out of the pump on its up stroke, fluid is drawn into the pump chamber or barrel through the inlet check, as the outlet check prevents flow back. On the down stroke, the fluid is displaced through the outlet check valve, as the inlet check stops flow out. The double acting hand pump adds a piston with a seal on it and a third check valve to allow flow through the piston. Two chambers are thus formed, one on the full area side of the piston and connected to the inlet check valve and the other on the annular or rod side of the piston connected to the outlet check valve. On the piston down stroke, fluid flows through the piston check valve and effectively just the volume of the piston rod is displaced through the outlet check valve. On the up stroke, the piston check valve now shuts and the volume of fluid trapped in the annular or rod side of the piston is displaced through the outlet check valve, whilst a fresh charge of fluid is sucked into the full diameter side of the piston. Because the area of the piston rod is normally approximately the same area as the annulus on the other side of the piston, the displacement is the same on the up and down strokes.

## FAULT FINDING. Contact factory if in doubt

FAULT	CAUSE	REMEDIAL ACTION
No delivery at all	Fluid level below inlet Filter blocked Release valve open Air leak on pump inlet	Refill Clean Close release valve Check inlet tube or fittings
Delivery on up stroke, no delivery on down stroke	Inlet check valve not seating	Check ball, seat and seal in inlet check valve
Delivery on down stroke but none on up stroke	Piston check valve not seating	Inspect ball and seat of piston check valve
Pump will not reach operating pressure	Relief valve setting too low	Reset relief valve
Pressure leaks away, handle rises or falls of its own accord.	Outlet check valve leaking.	Inspect for seal damage or contamination
Pressure leaks away, handle static.	Release valve leaking Leak on pressure gauge or system	Replace seat and seal. Check release needle point for damage. Ensure not overtightened in use. Inspect carefully for leaks and tighten.
Spongey action	Some air in system	Bleed system. Check no small air leaks on pump inlet hose or fittings

## Servicing and Repair. Please consult the relevant exploded drawing to identify parts.

**Regular maintenance.** Annually, we suggest re-lubricating the three pivot pins with general purpose grease. Also check that the inlet strainer is not blocked. Wash it off if it appears dirty. If an external high pressure filter is fitted, change the element.

**Inlet check valve.** Uses a spring and ball retained in place by the plastic seat. Inspect the valve to ensure there is nothing obvious stopping it from seating. The seat can be removed with care, although will need to be replaced if it is damaged.

**Outlet check valve.** Remove the threaded retainer using an allen key. This retainer holds both the seat against a flat bottom port in the pump body by means of a larger diameter spring and also holds the poppet in place by means of a smaller spring. Lift out the two springs using tweezers, then the poppet. Finally, lift out the valve seat, being careful not to damage the sealing face of the cone. We lap the poppet and seat together, with the O ring on the poppet providing secondary sealing. Upon assembly, ensure the seat O ring is central in the flat bottomed port. Normally, the outlet check valve is easiest re-assembled vertically to ensure that the springs and poppet go together axially. Do not overtighten the plastic retainer as this simply preloads the springs to hold the whole assembly together.

**Piston check valve.** On standard units this is a spring forcing a ball onto a seat, which is machined into a plug to retain the assembly. Some OEM variants of the pump use a sliding seal arrangement to replace a ball type check valve.

**Release valve.** Unscrew the 22.2 A/F release body and lift out the stainless steel retainer which clamps the release seat. The seat should lift out, although may be more difficult if the valve has been overtightened. Unlike some hand pumps, the Micropac release valve uses a soft seat which gives excellent sealing with minimal torque. It is not necessary to over-tighten the valve. Upon re-assembly, the seat may need to be centred before finally tightening the release body. Engage the release needle in the seat and then slacken just before finally tightening the hexagon.

**Relief Valve.** Depending on the fluid, the relief valve will either have a separate seat, or a seat in the bottom of the relief body. The relief plunger needs to have a good finish on its tip and to seat on a sharp edge. Any damage will cause the performance of the valve to be poor. The plunger is loaded by a compression spring which is retained within a counterbore in an adjusting screw, turned using an allen key. A dust cap and O ring seal the tank line. Upon reassembling the valve, ensure plunger engages in the seat orifice and gently turn the adjuster clockwise whilst pumping. Don't overtighten as the seat may become damaged.

**Piston and bearing seals.** We use a filled PTFE capped O ring composite seal on the standard MS series to give extended life on poor lubricants. The seals require care in replacement. We have specific instructions on separate sheets upon request.

**Changing the Pressure Gauge.** The gauge (where fitted) seals on copper washers on the nose of the stem of the gauge in a flat bottom G1/4 gauge port. Unscrew the four M8 mounting screws to lift the body enough to unscrew the gauge using a 14mm a/f spanner. Orientate the face as required using copper washers. Check that there is no weep.

## Sarum Hydraulics Limited

Unit 1 Danebury Court, Salisbury, Wiltshire SP4 6EB, England

Tel: 44(0)1722 328388 Fax: 44(0)1722 414307

email: [pumpsales@sarum-hydraulics.co.uk](mailto:pumpsales@sarum-hydraulics.co.uk)

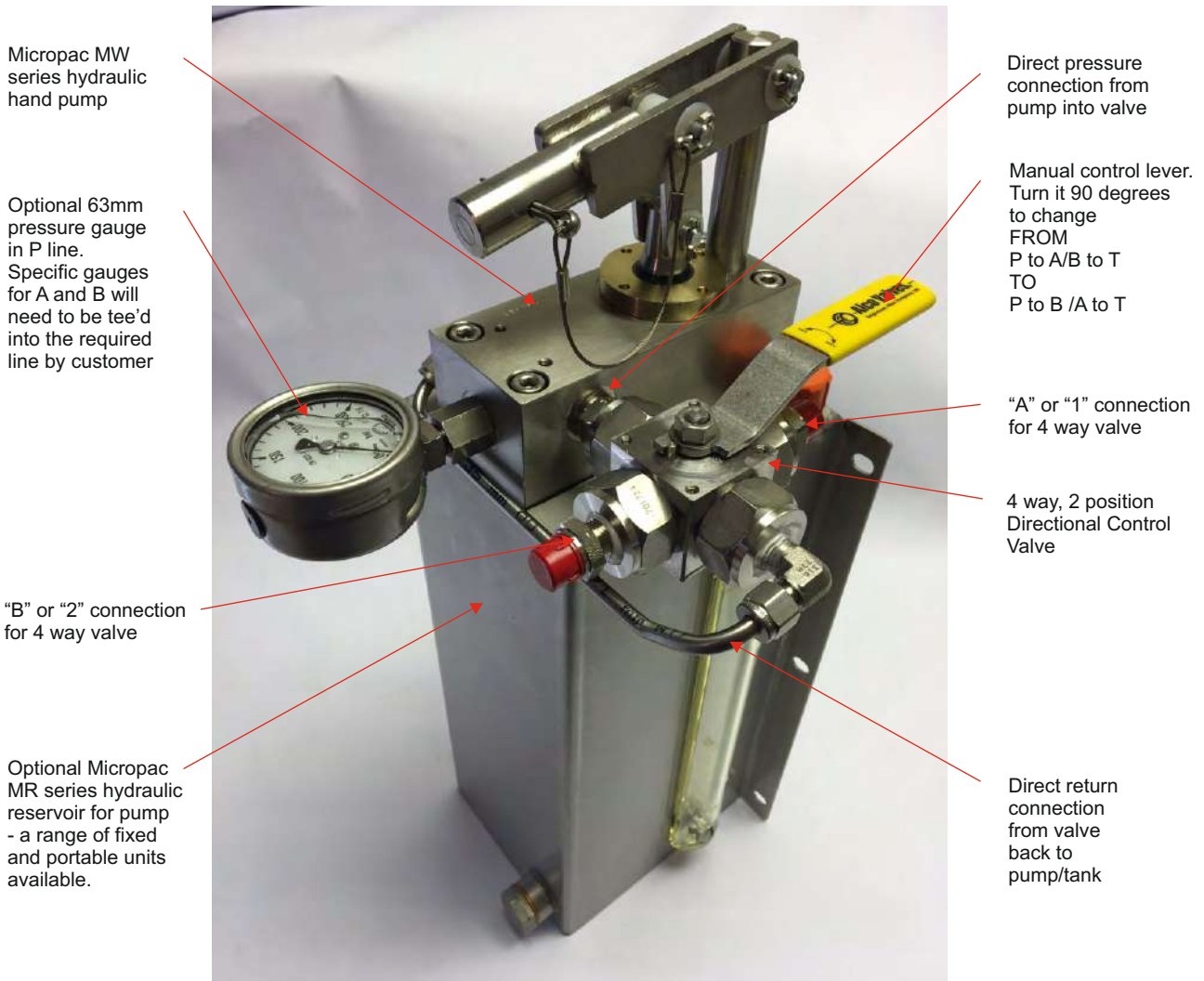
[www.sarum-hydraulics.co.uk](http://www.sarum-hydraulics.co.uk)

©Micropac is a Registered Trade Mark of Sarum Hydraulics



**SARUM**  
HYDRAULICS  
Designers & Manufacturers of Micropac® Hydraulics

# micropac<sup>®</sup> HAND OPERATED PUMPS SUPPLEMENTARY INSTRUCTIONS FOR CONNECTION AND APPLICATION 4 WAY DIRECTIONAL UNITS.



## DESCRIPTION AND OPERATION

The Micropac MW series pump can be fitted with a low leakage, four way directional control valve. This is a two position unit. In one position the pump pressure P is connected to valve outlet "A" and the valve return port "B" is connected to the pump return back to reservoir. Move the manual lever through 90 degrees and the pump outlet is connected to valve outlet "B" with the valve return port "A" now connected back to the reservoir. The A and B ports are not stamped or marked as every installation is different and customers will normally label the unit for the specific application.

The four way directional control valve can be used to control double acting actuators and cylinders.

The return to tank is connected on the pump unit and the customer will not need to make this connection.

## INSTALLATION.

The two valve ports need connecting to either side of your actuator using flexible hoses or rigid pipework. Support the valve fitting whilst tightening the hose swivels or compression fittings. There is no need to touch the pressure or return fittings into the valve that Sarum Hydraulics have connected at our factory.

Read these instructions in conjunction with the full product manual.  
Please consult factory for advice or in case of query.



©Micropac is a Registered Trade Mark of Sarum Hydraulics

**Sarum Hydraulics Limited**  
Salisbury, Wiltshire SP4 6EB, United Kingdom

www.sarum-hydraulics.co.uk Tel: 01722 328388

We invest heavily and continuously in product development.  
Specifications are therefore liable to change without prior notification.  
Data Sheet Ref. 4 way instructions 007062700 iss. 1



**UK Declaration of Conformity**  
**in accordance with The Pressure Equipment Regulations 2016**

**We, the undersigned:**

Sarum Hydraulics Limited of Unit 1 Danebury Court, Old Sarum Park, Salisbury, Wiltshire, SP4 6EB, UK

**Declare under our sole responsibility that the following apparatus:**

Product description: hydraulic pumps and accessories

Model ranges:

MB low pressure drum hand pump

MC sub-miniature hand pump

MD two speed hand pump

MFP lube pump

MG single speed hand pump

MI dispenser hand pump

MP single speed pressure test set

MQ CETOP manifold hand pump

MS single speed hand pump

MT cartridge hand pump

MW single speed hand pump

DUO air/ hand operated pressure test set

PMP hand pump & reservoir

PPS system builder hand pump

PSP two speed hand pump

Brand name: Micropac

**Is in conformity with the following relevant UK legislation:**

The Pressure Equipment Regulations 2016

**Based on the following conformity assessment:**

Article 4 paragraph 3 of the Pressure Equipment Directive (PED) 2014/68/EU applies; pump and relief valve (where supplied) manufactured under sound engineering practice. Relief valve must not be used as a "safety accessory" as defined in article 1, paragraph 2.1.3.

**And therefore complies with all of the relevant essential requirements of this legislation.**

**Name and position of person binding the manufacturer:**

Name: J G Foster

Function: Managing Director

Location: Sarum Hydraulics Limited of Unit 1 Danebury Court, Old Sarum Park, Salisbury, Wiltshire, SP4 6EB, UK.

Date of issue: 10th September 2021

**WARRANTY**

Sarum Hydraulics Limited offers a 15 month warranty on all items if found to be faulty.

Our liability is limited to parts and labour. Please note that the warranty does not cover improper use or application.

We provide a User Manual with all of our pumps therefore we advise that this is read prior to use.

Please notify us of any faults or damage within 7 working days following receipt of the goods.

The unit must be returned to the factory at the buyer's expense. Please return items to: Sarum Hydraulics Ltd., Unit 1, Danebury Court, Old Sarum Business Park, Salisbury SP4 6EB, UK. Following repair the items will be returned to the buyer at no additional cost.



---

**EU Declaration of Conformity**  
**in accordance with Directive 2014/68/EU**

**We, the undersigned:**

Micropac Ireland Limited, Finance House, 46 Prussia Street, Dublin 7, Ireland

**Declare under our sole responsibility that the following apparatus:**

Product description: hydraulic pumps and accessories

Model ranges:

MB low pressure drum hand pump

MC sub-miniature hand pump

MD two speed hand pump

MFP lube pump

MG single speed hand pump

MI dispenser hand pump

MP single speed pressure test set

MQ CETOP manifold hand pump

MS single speed hand pump

MT cartridge hand pump

MW single speed hand pump

DUO air/ hand operated pressure test set

PMP hand pump & reservoir

PPS system builder hand pump

PSP two speed hand pump

Brand name: Micropac

**Is in conformity with the following relevant EC legislation:**

Pressure Equipment Directive (PED) 2014/68/EU

**Based on the following conformity assessment:**

Article 4 paragraph 3 of the Pressure Equipment Directive (PED) 2014/68/EU applies; pump and relief valve (where supplied) manufactured under sound engineering practice. Relief valve must not be used as a "safety accessory" as defined in article 1, paragraph 2.1.3.

**And therefore complies with all of the relevant essential requirements of this directive.**

**Name and position of person binding the manufacturer:**

Name: J G Foster

Function: Authorised Representative

Location: Micropac Ireland Limited, Finance House, 46 Prussia Street, Dublin 7, Ireland.

E-mail certification@micropacireland.com

Date of issue: 10th September 2021

**WARRANTY**

Sarum Hydraulics Limited offers a 15 month warranty on all items if found to be faulty.

Our liability is limited to parts and labour. Please note that the warranty does not cover improper use or application.

We provide a User Manual with all of our pumps therefore we advise that this is read prior to use.

Please notify us of any faults or damage within 7 working days following receipt of the goods.

The unit must be returned to the factory at the buyer's expense. Please return items to: Sarum Hydraulics Ltd., Unit 1, Danebury Court, Old Sarum Business Park, Salisbury SP4 6EB, UK. Following repair the items will be returned to the buyer at no additional cost.