



HYQUEST SOLUTIONS OSS-PC1 Miniature Current Meter User Manual

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HYQUEST SOLUTIONS OSS-PC1 Miniature Current Meter



Disclaimer

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred.

This manual does not include all of the details of design, production, or variation of the equipment nor does it cover every possible situation which may arise during installation, operation or maintenance. HyQuest Solutions shall not be liable for any incidental, indirect, special or consequential damages whatsoever arising out of or related to this documentation and the information contained in it, even if HyQuest Solutions has been advised of the possibility of such damages.

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Scope of Delivery

Contents of the basic kit

- Propeller types 1 and 3 (additional propellers available, see ch. Technical Data 20)
- 2.5 m connecting lead, tools, oil, spare bearings, spare reed switch assembly
- Carry case (durable waterproof pelican case)
- Rod: 1.5 m (3 × 0.5 m), 9 mm diameter, in canvas carry bag, with point and base plate

Safety Instructions

- Read the user manual including all operating instructions prior to installing, connecting and powering up the HyQuest Solutions OSS-PC1. The manual provides information on how to operate the product. The manual is intended to be used by qualified personnel, i.e. personnel that have been adequately trained, are sufficiently familiar with installation, mounting, wiring, powering up and operation of the product.
- Keep the user manual on hand for later reference!
- If you encounter problems understanding the information in the manual (or part thereof), please consult the manufacturer or its appointed reseller for further support.
- HyQuest Solutions OSS-PC1 is intended to be used in hydro meteorological or environmental monitoring applications.
- Before starting to work, you have to check the functioning and integrity of the system.
- Check for visible defects on the OSS-PC1, this may or may not include any or all of the following mounting facilities, connectors and connections, mechanical parts, internal or external communication devices, power supplies or power supply lines, etc.
- If defects are found that jeopardize the operational safety, work must be stopped. This is true for defects found before starting to work as well as for defects found while working.
- Do not use the HyQuest Solutions OSS-PC1 in areas where there is a danger of explosion.
- The present user manual specifies environmental/climatic operating conditions as well as mechanical and electrical conditions. Installation, wiring, powering up and operating the HyQuest Solutions OSS-PC1 must strictly comply with these specifications.
- Perform maintenance only when tools or machinery are not in operation.
- If guards are removed to perform maintenance, replace them immediately after servicing.
- Never make any electrical or mechanical diagnostics, inspections or repairs under any circumstances. Return the sensor to the manufacturer's named repair **centre**. You can find information on how to return items for repair in the relevant section of the HyQuest Solutions web site.

Disposal instructions: After taking the HyQuest Solutions OSS-PC1 out of service, it must be disposed of in compliance with local waste and environmental regulations. The HyQuest Solutions OSS-PC1 is never to be disposed in household waste!

Inputs and outputs of the device are protected against electric discharges and surges (so-called ESD). Do not touch any part of the electronic components! If you need to touch any part, please discharge yourself, i.e. by touching grounded metal parts.

Introduction

Thank you for choosing our product. We hope you will enjoy using the device.

HyQuest Solutions manufactures, sells, installs and operates quality instrumentation, data loggers and communication technology. Products are designed with passion for environmental monitoring and with a deep understanding of the quality, accuracy and robustness needed to fulfil the requirements of measurement practitioners in the field.

The present User Manual will help you understand, install and deploy the device. If, however, you feel that a particular information is missing, incomplete or confusing, please do not hesitate to contact us for further support! The OSS-PC1 miniature current meter is a field-proven instrument for measuring the velocity of water in shallow open and closed channels. It is used for point measurements of flow velocities on the water surface or in vertical profiles down to the riverbed at flow speeds of 0.025 m/s to 6 m/s.

One of the great features of the OSS-PC1 is the ability to sense water flow at a speed as low as 0.025 m/s. Also, its miniature size, makes it suitable for flow measurement in shallow/narrow watercourses, small pipes and canals.

The OSS-PC1 comes with accessories which enable the user to obtain water flow measurement easily and

accurately.

All current meters manufactured by Hydrological Services are calibrated in our purpose built high velocity rating tank prior to shipment. This rating tank is considered as best in the world since it can run at a velocity of 0.005 ms/s minimum and 8 m/s maximum with a velocity resolution of +/- 0.001mm

As part of our service we are able to recondition and recalibrate current meters of any make, including electromagnetic and other solid state meters. Calibration is directly traceable to International Standards.

All current meters are calibrated in accordance with AS 3778.6.3-1992. This standard is identical to ISO 3455:2007.

The purpose of this manual is to make the user familiar with the OSS-PC1 current meter. It is a sensitive and reliable precision instrument. It is advisable to read this manual carefully and fully understand its use. After reading this manual if you are not sure about any details, please do not hesitate to contact our office (contact details are on the cover of this manual).

Installation

This chapter contains the following subsection:

- Unpacking your OSS-PC1 Current Meter 7

Unpacking your OSS-PC1 Current Meter

This package should contain:

- Pygmy Body
- Pygmy Lead
- Body Key
- Fan type 1 and Fan type 3, (Fan 5 is an accessory).
- 3 wading rods
- 2 spare bearings
- 2 clips
- 2 tightening bars
- 2 fan O-rings
- 1 pygmy leads
- 1 oil bottle
- Rating Tables

Configuration

This chapter contains the following subsection:

- Adjustment of Reed Switch 8

Adjustment of Reed Switch

The position of the contact assembly determines the angle of closure of the switch, that is with locknut (item 8, figure) loosened, the contact assemble (item 9, figure 4 switch closure.

Due to the sensitivity of the reed, one quarter turn adjustments are recommended.

An anti-clockwise rotation of the switch increased the angle of closure.

A faulty reed switch is indicated when a continuous contact occurs with the contact assembly adjusted fully

clockwise into the meter body.

Closures should be checked with an ohm meter or integrating current meter counter.

Operation

Each propeller rotation produces one pulse signal. This signal is generated by an encapsulated reed switch and a permanent magnet set into the rotating shaft assembly. (See figure 4 17)

The voltage must not exceed 9V DC. Provided the pulse counters have spark-suppression circuits, the meter can be loaded with up to 1.6 watts. All our counters meet these requirements (refer to specification).

Three types of propellers can be used with this meter, all these propellers are anodized aluminum and are supported on an axle with bearings, which run in an oil filled chamber inside the meter body. Surface tension of the oil in the passage between the stainless steel axle and axle nut, is the only seal to retain the oil.

Maintenance

The maintenance of the OSS-PC1 current meter can be divided in three sections as stated below.

Section 1: Prior to discharge measurements

Initial set up

- Open the case and pick up the current meter body.
- Undo the axle nut using the body key.
- Remove the shaft assembly with the tip of your fingers (do not put it down anywhere where it may attract dirt particles).
- Add oil to the meter body.
- Hold the body upright and $\frac{3}{4}$ fill as shown in figure 1 ,11
- Replace the oil bottle cap.
- Insert axle into body, excess oil will be forced up through the capillary gap around the axle, ensure nut is tightened.
- Wipe the excess oil of the meter using lint free paper towel.
- Do not forget to close the oil bottle straight after usage to avoid contamination of the oil.
- Attach the desired fan to the shaft.
- For to spin test, hold the current meter in the horizontal position with the fan facing your mouth and blow air forcefully (do not flick by hand you may bend the shaft). Let the fan spin for about a minute to get rid of any hydraulic pressure.

For 4.0 Dia Shaft	
Fan No.	Time (sec)
1	Minimum 36 sec
3	Minimum 13 sec
5	Minimum 11 sec

For 2.5 Dia Shaft	
Fan No.	Time (sec)
1	Minimum 40 sec
3	Minimum 15 sec
5	Minimum 13 sec

- Spin test the meter against time using a stop watch. This is done to ensure the meter is operating satisfactorily
- Spin test results are dependent on the fan type, axle size, and temperature (see table below)
- After the spin test connect your current meter to the counter with the lead, and check its operation

Figure 1

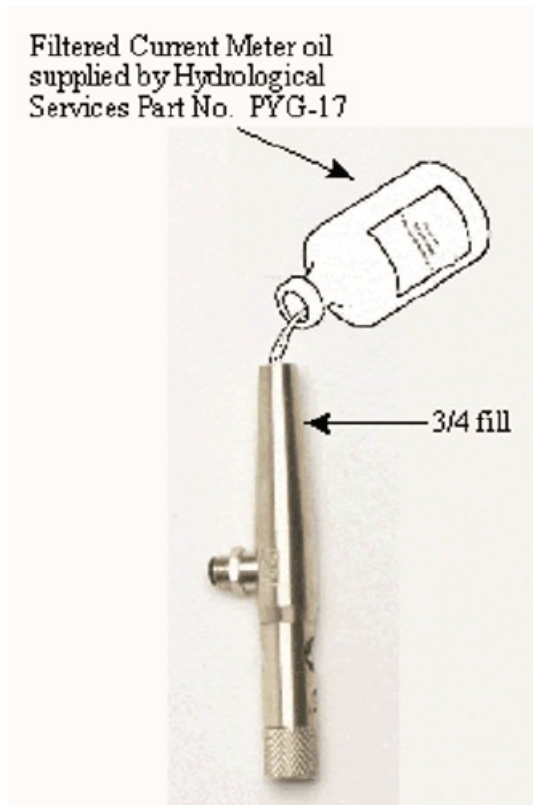
- **STEP 1:** To refill oil undo the axle nut using the body key.



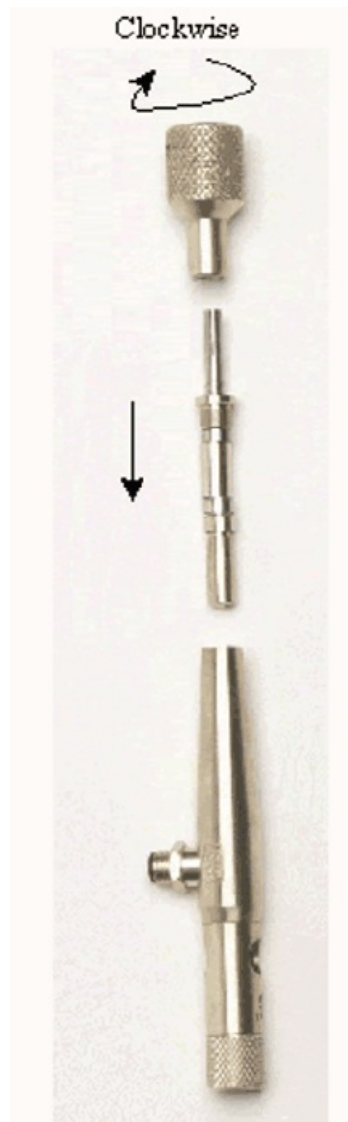
- **STEP 2:** Remove the shaft assembly with the tip of your fingers. (Do not put it anywhere it may attract dirt particles)



- **STEP 3:** Hold the body up right and 3/4 fill as shown above.



- **STEP 4:** Replace axle, excess oil will be forced up through the capillary gap around the axle, ensure nut is tightened



Note: After every discharge measurements, or one hour of use the current meter should be cleaned with white spirit and refilled with oil, if continuing a discharge measurement. For more information please read the maintenance section of this manual.

Section 2: During and after Discharge Measurements

After every discharge measurement, or one hour of use the current meter should be cleaned and refilled with oil, if continuing a discharge measurement.

- Undo the jar the cleaning jar cap and $\frac{3}{4}$ fill with white spirit
- Undo the axle nut of the current meter body using the body key
- Remove the shaft assembly with the tip of your fingers (do not put it down as it may attract dirt particles)
- Empty the old oil in a recycling container (do not tip oil on the ground this will pollute the environment)
- Put the shaft inside the cleaning jar.
- Agitate the shaft assembly flushing out the oil.
- Fill up the body with white spirit put your thumb in place of axle nut and shake it for a few seconds.
- Blow dry the shaft assembly and the body
- Refill with oil if continuing a discharge or assemble dry for storage
- Tip the white spirit in a spare bottle
- Wipe box clean and return the meter to the case

Note: Both oil and white spirit can be recycled using filter papers

Section 3: Tips for Easy Maintenance

It is advisable that the OSS-PC1 current meter is properly maintained.

- Keep the OSS-PC1 case clean
- Clean all the tools after usage
- Use lint free paper towels and white spirit (do not use methylated)
- Office service is required for the OSS-PC1 current meter about once a month if it is used on a daily basis (i.e. using soap and then white spirit)
- Check the lead and recondition its ends once a month if it is used on a daily basis (see repair of cable end section).
- If the reed switch fails to operate refer to electrical fault finding section for details
- If the current meter fails the spin test refer to the mechanical fault finding section for details
- Test lead, counter and reed switch (see electrical fault finding section for details)

For more information, see the following subsections: 12

Service and Recalibration

- Recalibrate the current meter every 300 hours of use or once a year which ever comes first (see Hydrological Services calibration certificate for details)
- For recalibration only, send the body and the fans that require calibration (to save weight). However, if other items needs repair they can be sent with the body and fans.

Troubleshooting

Mechanical Fault Finding

Symptom	Possible Causes		Action		Remark	
Failed spin test	.	Dirty or faulty bearings	.	Clean Bearings and try to spin test again. If Problem persists replace bearings.	.	Dirty bearings can be identified towards the end of the spin test when the fan stops suddenly.
	.	Bent shaft	.	If the shaft is slightly bent return to HS for repair. If the shaft is badly bent return to HS for replacement.	.	Bent shaft can be identified by looking at the pointed center of the fan during spin test. If this point is turning off center this indicates that the shaft is bent.
Fan out of balance	.	Fan squashed or dropped	.	If the fan is slightly out of balance rectify by removing	.	Out of balance fan can be identified right at the end of
				the fan, rotating the shaft		the spin test, if the fan stops
				approx. 50° and re-fitting the		and rotate in the opposite
				fan. If problem persists return		direction this indicates that the
				the fan and body to HS for repair.		fan is out of balance.

Electrical Fault Finding

If an electrical fault has been traced to the current meter, the following conditions should be checked using a multimeter or impulse counter.

Faults will be either CLOSED CIRCUIT or OPEN CIRCUIT, and if the CMC-20A or PVD100 or CMCsp or CMC3 counter is used, set the control switches to “ON” and “INT”(ie. no time limit). Spin the propeller and if the audible signal sounds continuously, the fault is a “CLOSED CIRCUIT”. If no audible signal is heard, the fault then is an “OPEN CIRCUIT”.

Closed Circuit Fault

Symptom			Possible Cause		Action	
Fault occurs only when water	meter	in	.	Water entering contact plug receptacle and earthing between plug and body.	.	Replace damaged plug (see figure 2 15).
Circuit closed in any magnet position, but open with magnet removed			.	Reed switch failed.	Replace reed switch assembly.	
Circuit closed without position	magnet	in	.	Reed damaged.	Replace reed switch assembly.	

Open Circuit Fault

Symptom	Possible Cause	Action
Open circuit between plug (11) and insulated reed contact (6)	Faulty plug contact.	Clean contact in plug. retest
	Faulty insulated contact assembly.	Replace
No closure of reed switch contact when magnet in position.	Damaged Reed.	Replace

Repair

HyQuest Solutions precision instruments and data loggers are produced in quality-controlled processes. All HyQuest Solutions production and assembly sites in Australia, New Zealand and Europe are ISO 90001 certified. All equipment is factory tested and/or factory calibrated before it is shipped to the client. This ensures that HyQuest Solutions products perform to their fullest capacity when delivered.

Despite HyQuest Solutions most rigorous quality assurance (QA), malfunction may occur within or outside of the warranty period. In rare cases, a product may not be delivered in accordance with your order.

In such cases HyQuest Solutions' return and repair policy applies. For you as a customer, this means the following:

1. Contact HyQuest Solutions using the Repair Request Form made available online:

https://www.hyquestsolutions.eu/fileadmin/Form/Telemetry_Solution_app.jpg.pdf

In response you will receive a reference number that must be referenced on all further correspondence and on the freight documents accompanying your return shipment.

2. Please provide as much information and/or clear instructions within the return paperwork. This will assist our test engineers with their diagnosis.
3. Please do not ship the goods prior to obtaining the reference number. HyQuest Solutions will not reject any equipment that arrives without reference number; however, it may take us longer to process.

Custom requirements for items sent to HyQuest Solutions for warranty or non-warranty repairs: Check with your national customs/tax authorities for details, processes and paperwork regarding tax exempt return of products. Typically, special custom tariff codes are available (such as HS Code = 9802.00) that verify the item is being returned for repair and has no commercial value. Please note that the customs invoice / dispatch documents should also clearly state: "Goods being returned to manufacturer for repair – No Commercial value". It is mandatory to have any returned goods accompanied by a commercial invoice on headed paper. HyQuest Solutions reserves the right to charge the customer for time spent rectifying incorrect customs documents.

Note: Please ensure that your goods are packed carefully and securely. Damage that occurs during transit is not covered by our warranty and may be chargeable.

For more information, see the following subsections:

- Replacement of Cable Ends 15
- Part List 17

Replacement of Cable Ends

Impulse Counter End and Complete Repair

1. Strip back 140 mm of main cable insulation (1) after shortening to new length.
2. Expose 5 mm of conductor (2) and twist strands tightly, then solder.
3. slide on heat shrink sleeve (3), red and black identifying sleeves (4) and plug covers (5).
4. Push soldered conductors into plugs (6) and lock with grubscrew (7).
5. Bring cover forward over plugs.
6. Position heat shrink sleeve centrally over grey cable insulation and fix in place

Note: Repair to either plug end individually can be made also, by only cutting away the damaged end and following steps 2, 4 & 5.

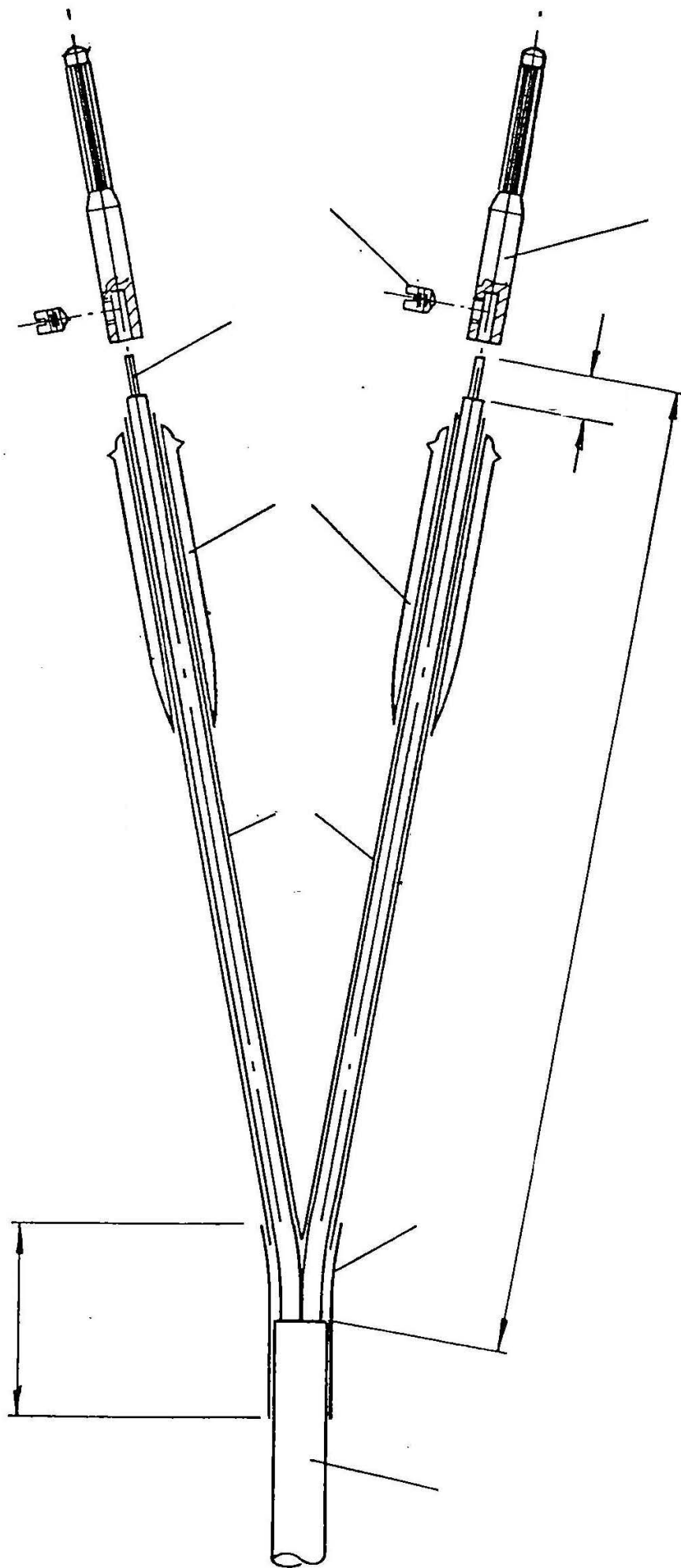


Figure 2

Current Meter Ends and Complete Repair

1. Divide 750mm of twin mains flex (1) and secure using 30mm of heats rink tubing (2).
2. Expose 5mm of conductors and twist strands tightly, then solder.
3. Slide headshrinker tubing (3) retaining nut (4), insulating bush(5) and brass contact (6) onto one of the dividing cables.
4. Solder brass contact to wire, taking care to produce a neat joint without melting the plastic insulation on the cable. Dress the contact with a file if necessary.
5. When joint has cooled, slide brass into insulating sleeve until home.
6. Place retaining nut in position on insulating sleeve, than set headshrinker tubing over insulating sleeve and cable, leaving about 4 mm of space between the nut and the headshrinker tubing.
7. Attach bunch plug to the remaining end of the cable in figure 3 .6 (a).

Repairs can be made individually to the positive (+) end with steps 2, 4, 5, and 6 and to the negative (-) end, by following steps 2 and 7. However, the shortened ends of the cable might be difficult to assemble conveniently onto the current meter, and it is usually preferable to reconstruct the cable as detailed in figure 3 16 .

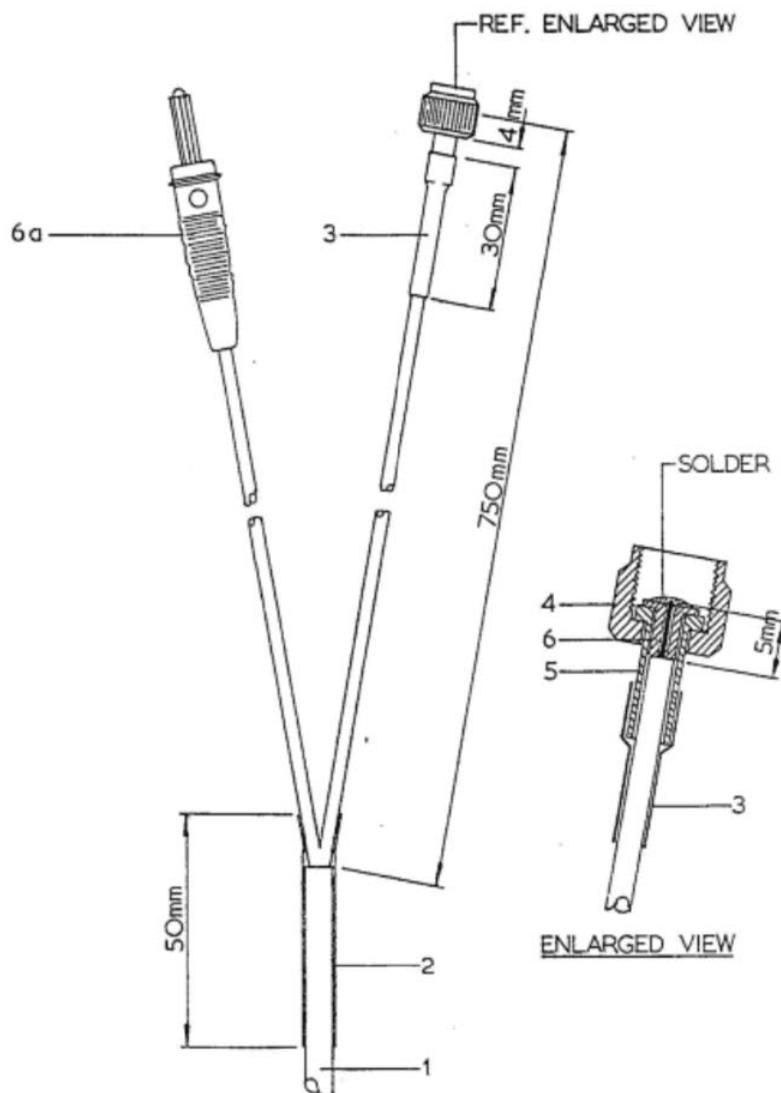


Figure 3

Part List

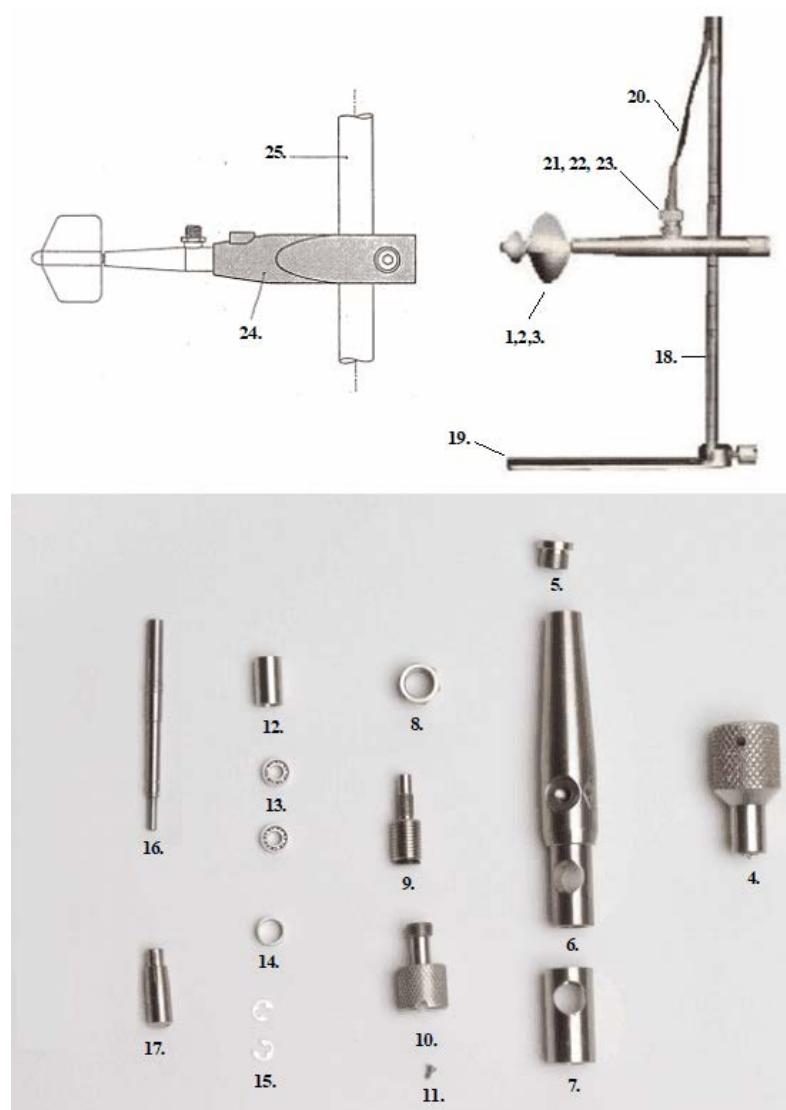


Figure 4

No.	ITEM	PART No.	QTY	REMARK
1	Fan 1 50 DIA.X0.05 P	PYG01	1	
2	Fan 3 50 DIA.X0.25 P	PYG03	1	
3	Fan 5 30 DIA.X0.25 P	PYG05	1	
4	Body Key	PYG15	1	
	Axle Nut	PYG07-02	1	For 2.5 DIA. Shaft

5				
	Axle Nut	PYG07-08	1	For 4.0 DIA. Shaft
6	Meter Body	PYG08-01	1	
7	Clamping Sleeve	PYG08-03	1	
8	Nut	PYG10-06	1	
9	Reed Switch	PYG10	1	
10	Knurled Head Screw	PYG08-02	1	
	Tightening Bar	PYG08-04	2	
11	Screw	SC016-10	1	
12	Bearing Spacer	PYG07-03	1	For 2.5 DIA. Shaft
	Bearing Spacer	PYG07-06	1	For 4.0 DIA. Shaft
13	Bearings	SC058-13	2	For 2.5 DIA. Shaft
	Bearings	SC058-17	2	For 4.0 DIA. Shaft
14	Rear Spacer	PYG07-04	1	For 2.5 DIA. Shaft
	Rear Spacer	PYG07-07	1	For 4.0 DIA. Shaft

15	E clip	PYG07-05	2	For 2.5 DIA. Shaft
	E clip	SC046-21	2	For 4.0 DIA. Shaft
16	Spindle	PYG07-01	1	For 2.5 DIA. Shaft
	Spindle	PYG07-05	1	For 4.0 DIA. Shaft
17	Magnet Carrier	PYG09	1	
18	Wading Rod 0.0-0.5 m	PYG11-01	1	
	Wading Rod 0.5-1.0 m	PYG11-02	1	
	Wading Rod 1.0-1.5 m	PYG11-03	1	
19	Ground Plate	PYG11-04	1	
	Knurled Clamp Screw	PYG11-05	1	
20	Connecting Lead 2.5 m	PYG14	1	
21	Contact	PYG14-01	1	
22	Insulating Bush	PYG14-02	1	
23	Clamping Nut	PYG14-03	1	
24	Clamp 20 DIA. Rods	PYG13-01	1	

	Clamp Screw	PYG13-02	1	
25	Wading Rods 20 DIA.	WR3/1	1	ONE SET
26	Bunch Plug Red	SC043-11	1	
27	Bunch Plug Black	SC043-12	3	
28	Case	PYG20	1	
29	Oil Bottle (60 ml)	PYG23	1	
30	Oil Bottle (250 ml)	CMB23	1	Standard
31	Manual	PYG100	1	

Technical Data

Accuracy	±1 %
Calibration	<ul style="list-style-type: none"> • Each current meter individually calibrated in HyQuest Solutions' calibration tank • Compliant with ISO 3455:1976 and ISO 2537:1988 • Calibration certificate delivered with each current meter
Fan / Propeller Specifications	The choice of fan/propeller depends on the specifics of the site such as discharge and the geometry of the riverbed or channel. Please contact us for advice.
Packed Dimensions & Mass	Kit in carry case: 500 × 400 × 200 mm; 6 kg

Obligations of the Operator and Disposal

This chapter contains the following subsections:

- Obligations of the Operator 21
- Dismantling / Disposal 21

Obligations of the Operator

European Union

In the Single European Market it is the responsibility of the operator to ensure that the following legal regulations are observed and complied with: national implementation of the framework directive (89/391/EEC) and the associated individual directives, in particular 2009/104/EC, on minimum safety and health requirements for the use of work equipment by employees at work.

Worldwide

Regulations: If and where required, operating licenses must be obtained by the operator. In addition, national or regional environmental protection requirements must be complied with, regardless of local legal provisions regarding the following topics:

- Occupational safety
- Product disposal

Connections: Local regulations for electrical installation and connections must be observed.

Dismantling / Disposal

When disposing of the units and their accessories, the applicable local regulations regarding environment, disposal and occupational safety must be observed.

Before dismantling

- Electrical Devices:
- Switch off the units.
- Disconnect electrical appliances from the power supply, regardless of whether the appliances are connected to the mains or to another power source.
- Mechanical devices:
- Fix all loose components. Prevent the device from moving independently or unintentionally.
- Loosen mechanical fastenings: Please note that appliances can be heavy and that loosening the fastenings may cause them to become mechanically unstable.

Disposal

Operators of old appliances must recycle them separately from unsorted municipal waste. This applies in particular to electrical waste and old electronic equipment.

Electrical waste and electronic equipment must not be disposed of as household waste!

Instead, these old appliances must be collected separately and disposed of via the local collection and return systems.

Integrated or provided batteries and accumulators must be separated from the appliances and disposed of at the designated collection point.

EU WEEE Directive

As players in the environmental market, KISTERS AG and HyQuest Solutions are committed to supporting efforts to avoid and recycle waste. Please consider:

Avoidance before recycling!

Recycling before disposal!

This symbol indicates that the scrapping of the unit must be carried out in accordance with Directive 2012/19/EU. Please observe the local implementation of the directive and any accompanying or supplementary laws and regulations.

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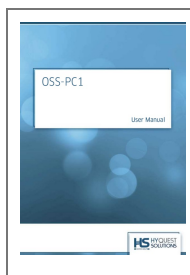
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Documents / Resources



[HYQUEST SOLUTIONS OSS-PC1 Miniature Current Meter](#) [pdf] User Manual
OSS-PC1, OSS-PC1 Miniature Current Meter, Miniature Current Meter, Current Meter, Meter