

# icountLaserCM20

## Fluid Condition Monitoring

### Portable Particle Counter



### A 2-minute contamination test procedure:

**A portable particle counter designed to be used in the field**

icountLCM20 is a proven answer to fluid system contamination monitoring offering a 2-minute test procedure. Multi-standard ISO and NAS cleanliness reporting, data entry, data graphing and integral printing are all standard on this world proven contamination monitor.



### Contact Information: Product Features:

Parker Hannifin  
**Hydraulic Filter Division Europe**

**European Product  
Information Centre**  
**Freephone: 00800 27 27 5374**  
(from AT, BE, CH, CZ, DE, EE, ES,  
FI, FR, IE, IT, PT, SE, SK, UK)  
**filtrationinfo@parker.com**

[www.parker.com/hfde](http://www.parker.com/hfde)

- icountLCM20 is a proven answer to fluid system contamination monitoring.
- 2-minute test procedure.
- Multi-standard ISO, NAS and AS4059 cleanliness reporting.
- Data entry, data graphing and integral printer.
- 420 bar rated maximum pressure.
- Supported by the offline UBS and online SPS accessories.

# icountLaserCM20

## Portable Particle Counter

### Features & Benefits

<b>Test time:</b>	2 minutes
<b>Particle counts:</b>	MTD 4+, 6+, 14+, 21+, 38+ and 70+ microns(c) ACFTD 2+, 5+, 15+, 25+, 50+ and 100+ microns
<b>International codes:</b>	ISO 7-22, NAS 0-12
<b>Data retrieval:</b>	Memory access gives test search facility
<b>Max. working pressure:</b>	420 bar
<b>Max. flow rate:</b>	400 l/min when used with system 20 Sensors. Higher with single point sampler (see page 404)
<b>Working conditions:</b>	LaserCM will operate with the system working normally
<b>Computer compatibility:</b>	Interface via RS232 connection @ 9600 baud rate.

- Special 'diagnostics' are incorporated into the icountLaserCM microprocessor control to ensure effective testing.
- Routine contamination monitoring of oil systems with icountLaserCM saves time and saves money.
- Contamination monitoring is now possible during application operation - icountLaserCM saves on production downtime.

- Data entry allows individual equipment test log details to be recorded.
- Data retrieval of test results from memory via hand set display.
- Automatic test cycle logging of up to 300 tests can be selected via hand set display.
- Totally portable, can be used as easily in the field as in the laboratory.
- Automatic calibration reminder.
- Instant, accurate results achieved with a 2 minute test cycle.
- Data entry allows individual equipment footprint record.
- Data graphing selectable via the integral printer.
- Auto 300-test cycle logging via LCD handset input.
- RS232 to USB computer interface.
- Limit level output to control peripheral equipment such as off-line filtration via internal relay limit switches.
- Auto-testing allows for the conducting of automatic sequencing tests on flushing systems for example.
- Optional bar code swipe wand to allow handset data loading.
- Worldwide service and technical support.
- Re-calibration - Annual certification by an approved Parker Service Centre.

### Typical Applications

- Construction machinery
- Industrial plant
- Hydraulic equipment & system manufacturers
- Research & testing institutes
- Offshore & power generation
- Marine
- Military equipment applications

### Parker LaserCM Portable Particle Counter.

With 20 years experience in manufacturing the world's best selling 'white light' portable particle counter – CM20, the progression to the icountLaserCM with its opto-mechanical, continuous wave single point source laser (SPSL) is both a natural and customer driven development.



## Specification

Automatic Particle Counters (APC's), have been widely used for many years in condition monitoring of hydraulic fluids. However, it is only recently that APC's have become flexible enough to enable the instruments to be taken out of the laboratory and used on-line in order to obtain the most credible form of results.

Unusually, the move from fixed laboratory use, to portable field use has not been at the expense of accuracy or user flexibility, but has actually enabled the instruments to be used over a wider range of applications and situations.

The most common monitoring technique used in APC's is that of light obscuration or light blockage. Here, a focused light source is projected through a moving column of oil, (in which the contaminants being measured are contained), causing an image of the contaminant to be projected on to a photo diode cell, (changing light intensity to an electrical output).

The electrical output of the photo diode cell will vary in accordance with the size of the particles contained in the column of oil; the larger the particle, the bigger the change in the photo diode electrical output.

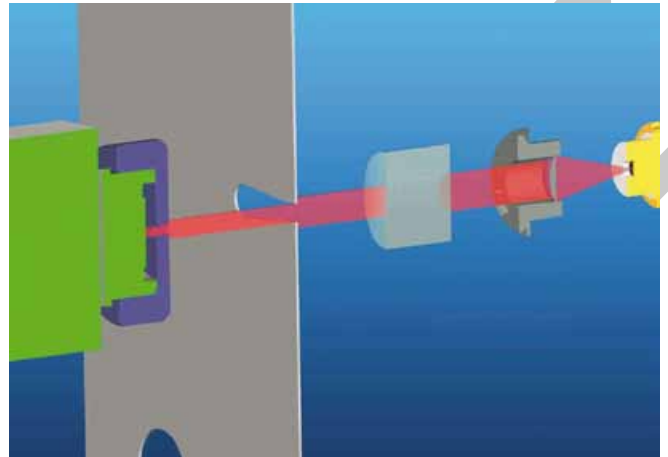
On-line APC's must be able to test the oil sample at whatever cleanliness it is delivered to the machine. Parker therefore had to develop technology to ensure the on-line APC was able to test a sample without the conventional laboratory technique which requires dilution - a practice that would have been simply impossible with a portable unit.

By careful design and window sizing, gravimetric levels as high as 310mg of dirt per litre, (equivalent to up to 4 million particles >6 micron per 100 ml), can be achieved without making the instrument susceptible to counter saturation.

These high saturation point on-line APC's, whilst losing none of the accuracy of their laboratory counterparts, enable particle counting to be carried out quickly and accurately.



A focused light source is projected through a moving column of oil.



Laser Optical Sensing

### Core technology that proves itself in icountLaserCM

The icountLaserCM portable particle counter features microprocessor controlled optical scanning for accurate contaminant measurement with a calibration range from ISO 7 to ISO 22 with no counter saturation.

### How does icountLaserCM work?

- The particles are measured by a photo diode that converts light intensity to a voltage output which is recorded against time.
- As the particle moves across the window the amount of light lost is proportional to the size of the particle. This reduction in voltage is measured and recorded.
- This "voltage" lost relates directly to the area of the particle measured, is changed into a "positive" voltage and then in turn changed into a capacitance value.
- This value is counted and stored in the icountLaserCM computer in one of 6 channels according to particle size.
- Readouts are displayed on the hand-held LCD in the accepted ISO and NAS standards ready for hard copy printing or RS232 computer download.
- The on-board computer allows storage of up to 300 test results.

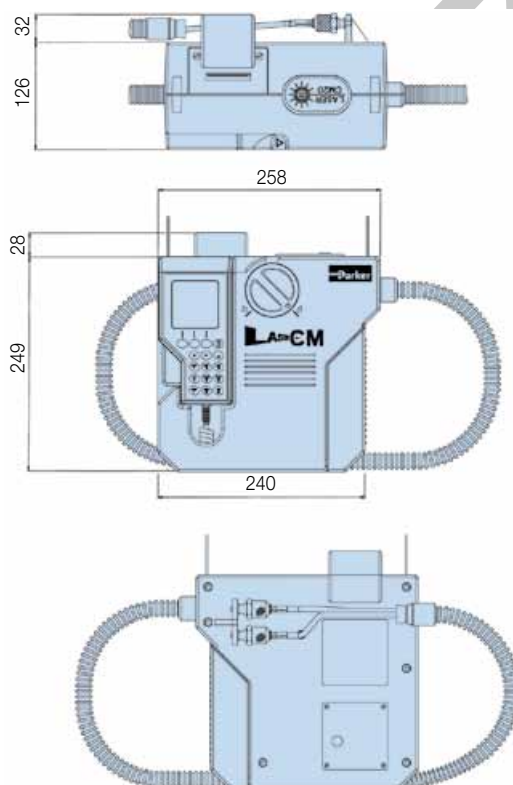
# icountLaserCM20

## Portable Particle Counter

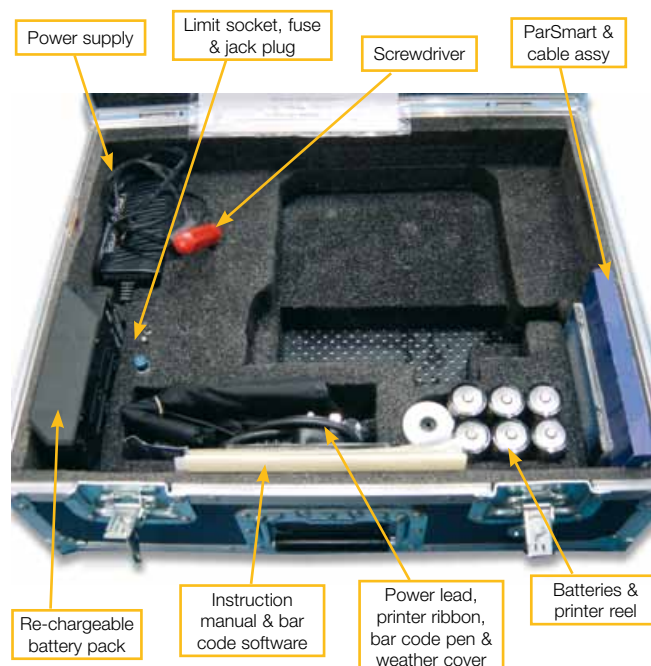
### Specification

Description	LaserCM (LCM20 20 22)	LaserCM (LCM20 20 62)
ABS structural foam and injection moulded case	•	•
ABS handheld display	•	•
Mechanical composition – Brass, plated steel, stainless steel and aluminium	•	•
Fluorocarbon seals	•	•
Perfluoroelastomer seals	•	•
Nylon hoses (kevlar braided microbore)	•	•
Stainless steel armoured hose ends	•	•
1.2m fluid connection hose	•	•
Rechargeable battery pack	•	•
12Vdc power supply	•	•
Fast blow fuse	•	•
Unique optical scanning system	•	•
Bonded glass optical window enclosed in SS plate	•	•
Micron channels analysis (Six)	•	•
Analysis range ISO 7 to 22 incl. (NAS 0 to 12)	•	•
32 character dot matrix LCD. Alpha numeric keypad	•	•
Data retrieval	•	•
Calibration to ISO standards*	•	•
Viscosity range 2 to 100 cSt. 500 cSt.with SPS	•	•
Operating temp.+5 to +80°C	•	•
Ambient temp.+5 to +40°C	•	•
2 minute test completion time	•	•
Memory store – 300 test memory	•	•
Battery operated 6 x 1.5 D cells	•	•
Phosphate Ester group compatibility	•	•
Mineral oil & petroleum based fluid compatibility	•	•
Up to 420 bar (6000 psi)	•	•
Integral 16 column printer	•	•
RS232 to USB computer interface	•	•
Astra board case weight – (Kg)	5	5
Unit weight – (Kg)	8	8
ParSmart software and cable link pack	•	•
Weather protector cover	•	•
CE certified	•	•
Auto logging	•	•

\*Note: In compliance with international standards, all Parker portable particle counters can meet the ISO Medium test dust standards. The icountLaserCM's, in addition to the complete range of Condition Monitoring products, are capable of achieving certification to ISO 4406:1999 and with traceability to ISO 11171 for SRM 2806, via ISO 11943.



### Commissioning Kit





# Operation



Operating the Parker icountLaserCM is as simple as pressing the start button and turning the dial. The test procedure is automatic and in the case of the icountLaserCM takes no more than 2 minutes to complete.

## icountLCM20 makes the difference in industry

Fully accredited to BS EN 60825:1992 and IEC 60825-1 (safety of laser products) Standards, accredited to USA Standards and achieving full ISO certification. icountLaserCM offers users advanced laser technology, a fast, dynamic and on-line 2 minute system test cycle. An icountLaserCM Aggressive Fluids model is also available, suitable for monitoring corrosive fluids such as phosphate ester based lubricants used in commercial aviation.

## MTD calibration

icountLaserCM MTD Calibration variants are certified via a primary ISO 11171 calibrated automatic particle counter. All MTD Laser CM20's achieve ISO 4406:1999 criteria, via ISO 11943.

## icountLCM20 Using SPS



## Understanding MTD

ACFTD (Air Cleaner Fine Test Dust) was formatted in the 1960's, but is no longer being produced. The obsolescence of this dust has led to the adoption of a new dust MTD.

MTD (Medium Test Dust) having a particle size distribution close to ACFTD was selected as a replacement. However, MTD produced results somewhat different to ACFTD, so the NIST (National Institute of Standards & Technology) undertook a project to certify the particle size distribution of ISO MTD.

The result was particle sizes below 10µm were greater than previously measured.

Particles sizes reported based on NIST would be represented as µm (c), with "c" referring to "certified". Therefore the icountLCM20 reported sizes are as follows:

ACFTD	MTD
2µ	4µ (c)
5µ	6µ (c)
15µ	14µ (c)
25µ	21µ (c)
50µ	38µ (c)
100µ	70µ (c)

MTD offers true traceability, improved particle size accuracy and better batch to batch reproduction.

# icountLaserCM20

## Portable Particle Counter

### Why On-Site Fluid Contamination Monitoring?

- Certification of fluid cleanliness levels.
- Early warning instrument to help prevent catastrophic failure in critical systems.
- Immediate results with laboratory accuracy.
- To comply with customer cleanliness requirements and specifications.
- New equipment warranty compliance.
- New oil cleanliness testing.



### Data Download Management

Dedicated software, provides the link between an icountLaserCM20 and the H<sub>2</sub>Oil - Water in Oil monitor and your computer management system.



16-column printer for hard copy data. A feature of the icountLaserCM is the on-board printout data graphing option developed to support predictive maintenance procedures.

icountLaserCM Test	
ON LINE TEST	
TEST NUMBER 022	
	D M Y
Date	04-03-10
Time	15-52
ISO:	20/15/09
Count / 100ml	
>4µ (c)	820721
>6µ (c)	31564
>14µ (c)	314
>21µ (c)	64
>38µ (c)	14
>70µ (c)	0
NOTES	

ISO 4406 - 1999

icountLaserCM Test	
ON LINE TEST	
TEST NUMBER 022	
	D M Y
Date	04-03-10
Time	15-52
NAS CLASS:	7
Count / 100ml	
4/6µ (c)	789157
6/14µ (c)	31250
NAS CLASS	7
14/21µ (c)	250
NAS CLASS	3
21/38µ (c)	50
NAS CLASS	3
38/70µ (c)	14
NAS CLASS	4
>70µ (c)	0
NAS CLASS	0
NOTES	

Correlation to NAS 1638

## Introducing the new icountLCM 'Classic'

There is a new addition to the proven range – the icountLCM 'Classic'. Only available from Parker, the 'Classic' retains all the technology that made the icountLaserCM one of the most accurate, reliable and popular portable particle counters available.

Our design engineers have re-configured the icountLaserCM specification in a way that has reduced our manufacturing costs. These savings have been passed onto icountLCM 'Classic' customers.

### How have we done this?

Parker listened to our existing customers and then to the engineers and maintenance operatives to find out the features that make the icountLaserCM a unique predictive maintenance instrument.

Then, we removed peripheral items such as the aluminium case and all the accessories, so a customer receives the icountLCM, with a CD user guide, professionally and securely boxed. One thing that has not altered is the icountLCM accuracy and icountLCM reliability. Our in-house software engineers have re-configured the EPROM, removing Data programming, User ID, Automatic Testing, Data retrieval, Alarm level settings, the barcode pen and Graph printing functions to reduce costs still further without in any way reducing the efficiency of the icountLCM. The icountLCM 'Classic' remains an instrument to be proud of.



## Ordering Information (icontainsLaserCM and 'Classic' icountLaserCM)

### Standard products table

Part number	Supersedes	Description
<b>LCM202022</b>	LCM20.2022	icontainsLCM20 (MTD calibrated)
<b>LCM202026</b>	LCM20.2026	icontainsLCM20 'classic' (MTD calibrated)
<b>ACC6NE015</b>	B84702	Printer roll x 5
<b>ACC6NE014</b>	P.843702	Printer ribbon
ACC6NE013	B84609	Re-chargeable battery pack
ACC6ND002	P849603	Weather protector cover
ACC6ND000	B84703	USB to RS232 Download Cable

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.

Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

### Product configurator

Model	Fluid type		Options	
<b>LCM2020</b>	<b>2</b>	Hydraulic mineral	<b>1</b>	icontainsLCM20 (ACFTD calibrated)
			<b>2</b>	icontainsLCM20 (MTD calibrated)
	<b>6</b>	Skydrol	<b>5</b>	icontainsLCM20 'classic' (ACFTD calibrated)
			<b>6</b>	icontainsLCM20 'classic' (MTD calibrated)
			<b>7</b>	icontainsLCM20 with CMP (ACFTD calibrated)
			<b>8</b>	icontainsLCM20 with CMP (MTD calibrated)

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.

Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Note 3: Option 7 and 8 with CMP (Case mounted pump).



# Universal Bottle Sampler

Simple and efficient offline oil sampling



**Clean and  
contamination free  
sampling**

**Ideal for batch oil sampling  
and laboratory testing**

The UBS provides the dynamic link to portable particle and water counters. The UBS off-line sampler has microprocessor technology to recognise and adjust to the connecting monitor including the icountLCM20 and H<sub>2</sub>Oil water in oil monitor.



## Contact Information:

Parker Hannifin  
**Hydraulic Filter Division Europe**

**European Product  
Information Centre**  
**Freephone: 00800 27 27 5374**  
(from AT, BE, CH, CZ, DE, EE, ES,  
FI, FR, IE, IT, PT, SE, SK, UK)  
**filtrationinfo@parker.com**

[www.parker.com/hfde](http://www.parker.com/hfde)

## Product Features:

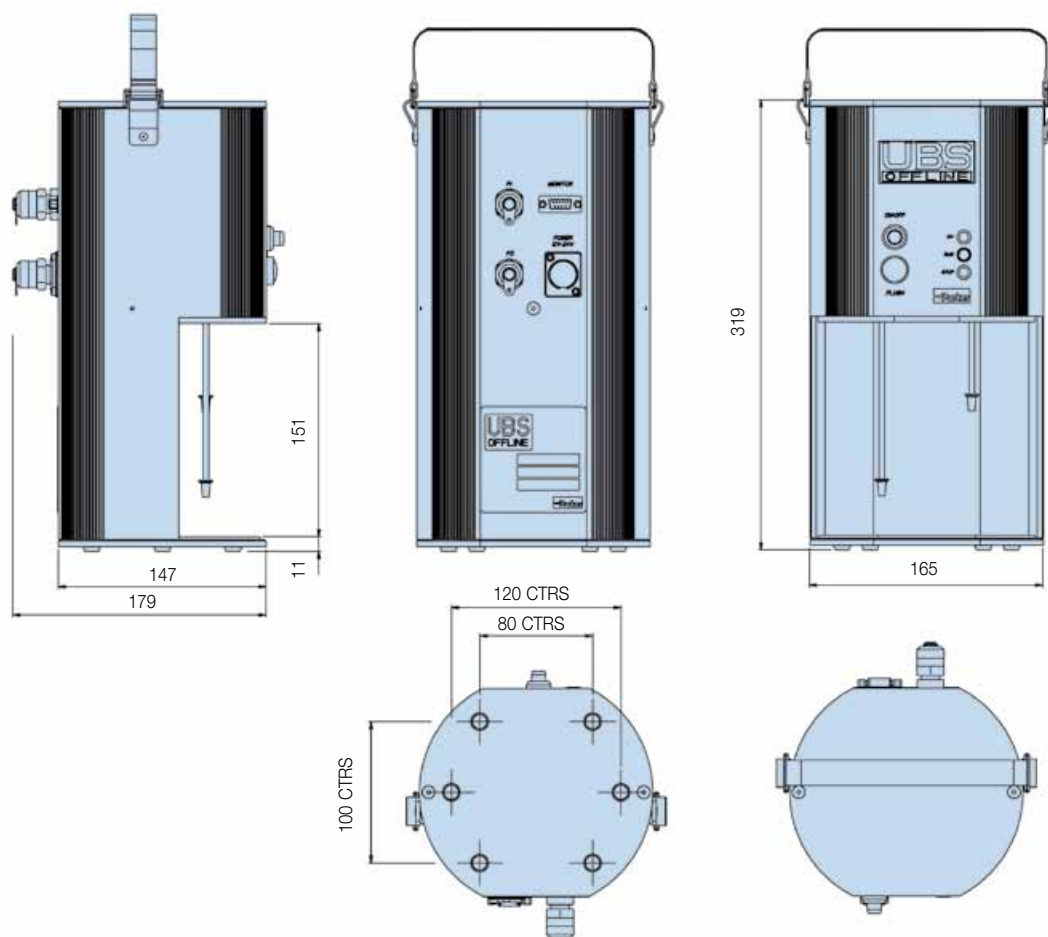
- Simple operation
- Efficient testing procedure
- Clean and contamination free sampling
- Available for both mineral based and aggressive fluids
- Further advances the LCM20's flexibility into laboratory bottle sampling environments
- Can accept various different sized bottles
- Minimal working parts
- Internal auto setting fuse for overload protection
- Simple maintenance procedures



## Specification

Description	UBS offline
Viscosity range 2 to 250 cSt	•
Operating temp +5 to +80°C	•
Test time 2m15s / 4m15s (Flush 2m)	•
12 Vdc power supply	•
Extruded aluminium construction	•
Unit weight - (Kg)	4
Mineral oil and petroleum based compatibility	Fluorocarbon seal
Phosphate Ester group compatibility	EPDM seals
CE certified	•
Military approved	•
Manual operation	•
Bottle pack	•
De-gassing chamber	•
Manual	•
Sample tube pack	•
Interface cable to LCM20, H <sub>2</sub> Oil etc.	•

## Installation Details



# Universal Bottle Sampler

Simple and efficient offline oil sampling

## System Flow Rate

Samples are best taken from a point in the system where the flow is TURBULENT (Reynolds No. greater than 4000). The turbulent flow creates a mixing action. Where flow is streamline or LAMINAR, larger particulate may tend to settle toward the lower pipe surface and not be sampled.

## System Condition Changes

Changes in the system operating condition, flow, temperature, pressure or vibration, can result in previously sedimented contaminant being retrained into the flowing oil. It is also possible that these changes may cause partially contaminated filter elements to shed particulate into the system. Samples should, therefore, be extracted when the system is in a steady state condition and the result less likely to be distorted by contaminant peaks.

There are a number of proprietary sampling valves available which adhere to good theoretical principles. However, they do tend to generate a level of precision and cost which is unnecessary for trend monitoring.



Sampling points should enable extraction of a sample without changing the system's condition. Fine control needle valves are not desirable, as they have a tendency to silt up under some operating conditions, causing the distribution of contaminants in the fluid to be changed. The sampling port should be protected to maintain cleanliness and thoroughly flushed before collecting the sample for analysis. Allow sufficient airspace in the bottle to enable 80% fill.

## Bottle Cleanliness

It is preferable that bottles have sealing screw caps and both parts are cleaned to a suitable level in accordance with ISO3722.

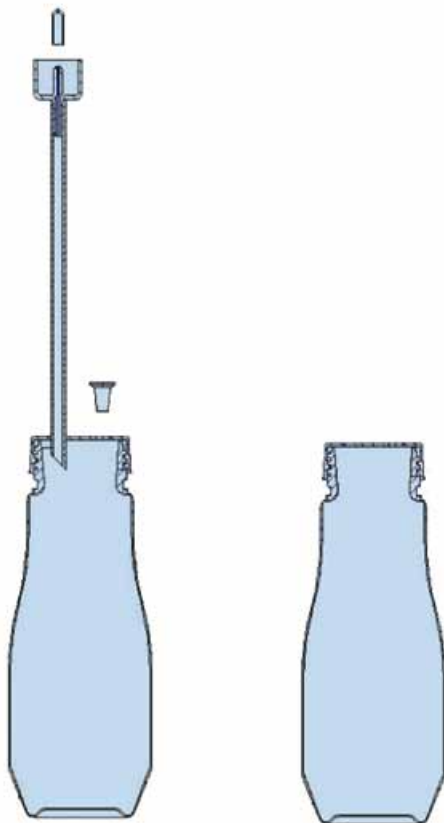
The bottle should not contain more than one tenth the number of particles per 100ml than are expected to be monitored. Standard Parker bottles are supplied clean to ISO13/11 (NAS Class 4) and should not be used to accurately count oils cleaner than ISO 15/12 (NAS Class 6) although they may be used for "trend monitoring" at lower levels.

The bottle should remain capped until time of sample filling and re-capped immediately afterwards.

## Sample Mixing

Sedimentation of contaminant in a sample will occur, the rate of which is dependent upon both fluid and particle characteristics.

Samples should be analysed, without delay, once agitated and de-glassed.



ACC6NW001 x 50 = ACC6NW002

ACC6NK001

## Ordering Information

### Standard products table

Part number	Description
<b>UBS9002</b>	Universal bottle sampler (includes aluminium case and accessories)
<b>UBS9003</b>	Universal bottle sampler
<b>UBS9004</b>	Aggressive universal bottle sampler
<b>UBS9005</b>	Aggressive universal bottle sampler (Includes aluminium case and accessories)

### Accessories

Part number	Supersedes	Description
<b>ACC6NK001</b>	B89907	Sample bottle pair with cap, without tube
<b>ACC6NW001</b>	B89911	Sample bottle pair with extraction hose
<b>ACC6NW002</b>	B89910	100 Sample bottle pack (50 x ACC6NW001)
<b>ACC6NK002</b>	S840054	UBS Power supply
<b>ACC6NK003</b>	S890005	UBS De-gassing chamber and pump
<b>ACC6NK004</b>	B89603	UBS De-gassing chamber only
<b>ACC6NK005</b>	B89902	Cable and adaptor

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.

Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.



## Typical Applications

- Batch sampling
- Aircraft rig certification
- Oil research
- Laboratory testing
- Transfer line monitoring



## Simple To Use UBS

The oil sample is drawn into the UBS Off-line where it is secured, free from further contamination, in a bottle together with a clean waste bottle by a peristaltic, self-priming pump. Simple operation and efficient testing are assured once the UBS Off-line is connected to any of the CM monitors, and powered up using it's own power source. The oil sample requires agitation and de-gassing before carrying out the contamination test. A de-gassing kit option is available and consists of a vacuum chamber and pump. (Standard with UBS9002)