

# icountLCM20

## Fluid Condition Monitoring Portable Particle Monitor

### Typical Applications

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



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

Automatic Particle Counters (APC), have been widely used for many years in condition monitoring of hydraulic fluids. However, it is only recently that APCs 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 APCs 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 APCs 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, 40,000 particles per ml can be achieved without making the instrument susceptible to counter saturation.

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## 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>	6000 psi (420 bar)
<b>Max. flow rate</b>	106 gpm (400 lpm) when used with system 20 Sensors. Higher with single point sampler
<b>Working conditions</b>	LCM will operate with the system working normally
<b>Computer compatibility</b>	Interface via RS232 connection @ 9600 baud rate.

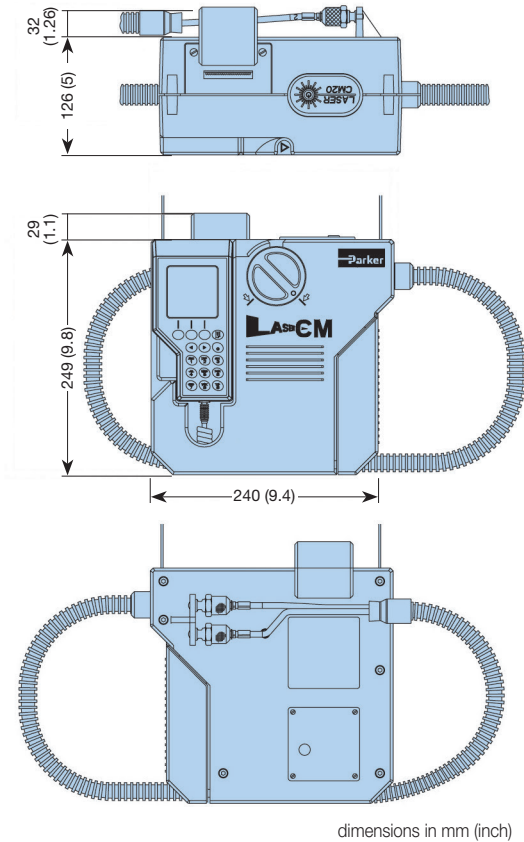
- Special 'diagnostics' are incorporated into the icountLCM microprocessor control to ensure effective testing.
  - Routine contamination monitoring of oil systems with icountLCM saves time and saves money.
  - Contamination monitoring is now possible during application operation - icountLCM saves on 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.
  - Memory access gives search facility.
  - Worldwide service and technical support.
  - Re-calibration - Annual certification by an approved Parker Service Center.



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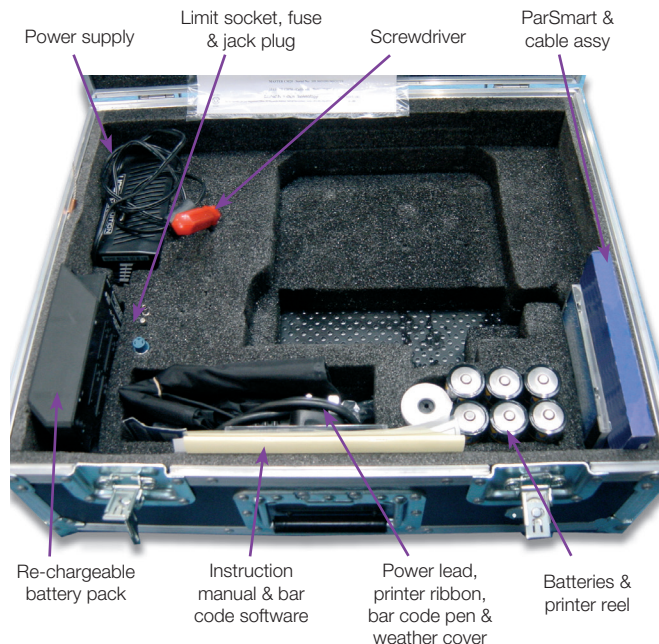
## Specifications

Description	LCM20.2022	LCM20.2062
ABS structural foam and injection molded 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	•	•
4 ft (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 to 5 measured channels and the sixth channel is calculated. Analysis range ISO 7 to 22 incl. (NAS 0 to 12)	•	•
32 character dot matrix LCD. Alpha numeric keypad	•	•
Data retrieval	•	•
Calibration - see note below	•	•
Viscosity range 2 to 100 cSt. 500 cSt.with SPS	•	•
Operating temp. 41°F to 176°F (+5°C to +80°C)	•	•
Ambient temp. 41°F to 104°F (+5°C 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 6000 psi (420 bar)	•	•
Integral 16 column printer	•	•
RS232 to USB computer interface		•
Astra board case weight – lb (Kg)	11 (5)	11 (5)
Unit weight – lb (Kg)	17.6 (8)	17.6 (8)
ParSmart software and cable link pack	•	•
Weather protector cover	•	
CE certified	•	•
Auto logging	•	•
<p>The LCM and calibration master sample the same particle distribution suspension. The LCM is calibrated to the master to meet specification at the measured points. MTD – instrument calibrated using MTD reference material. ACFTD – instrument calibrated using ACFTD reference material. Consult Parker for recalibration.</p>		



dimensions in mm (inch)

### Accessory Kit - icountLCM Classic



# icountLCM20

## icountLCM Proven Core technology

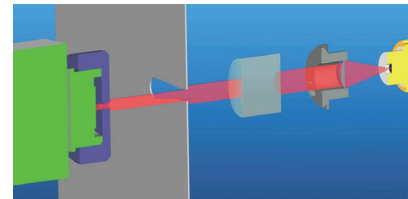
The icountLCM portable particle monitor features microprocessor controlled optical scanning for accurate contaminant measurement with a calibration range from ISO 7 to ISO 22 with no counter saturation.

## How does icountLCM 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 reduction in voltage relates directly to the area of the particle measured.
- This value is counted and stored in the icountLCM computer in one of 5 measured 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.

## 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.



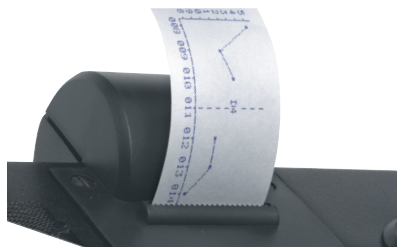
Laser Optical Sensing



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

## Data Download Management

Dedicated software, provides the link between an icountLCM20 and your computer management system.



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

icountLCM 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

icountLCM 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

# icountLCM20

## Ordering Information

Model	Fluid Type		Options	
LCM2020	2	Hydraulic Mineral	1	icountLCM20 (ACFTD calibrated)
	6	Skydrol	2	icountLCM20 (MTD calibrated)

Part Number	Supersedes	Description
ACC6NE015	B84702	Printer roll x 5
ACC6NE014	P.843702	Printer Ribbon
ACC6NE013	B84609	Re-chargeable battery pack
ACC6ND002	P849603	Weather protector cover
ACC6ND000	B84703	USB to RS232 download cable

# icountACM20

## Aviation/Diesel Fuel Condition Monitoring Lab Unit State-of-the-Art Fuel Contamination Monitoring

The icountACM20 Portable Particle Counter was developed from existing technology for monitoring contamination in AVTur and other hydrocarbon fuels, in accordance with Energy Institute (EI) Method IP 564.

In addition, the ACM can also be used to monitor fuels from existing sampling points in locations from refineries, pipelines, distribution terminals, fuel supply storage.

### Features and Benefits

- 2 minutes test time
- Optical scanning analysis and measurement of actual particles and inference to water presence
- Primary outputs: 4, 6, 14, 21, 25, 30 $\mu$  counts per ml
- % Volume distribution, via graphical display on handset and printout
- ISO 7-22 in accordance with ISO 4406-1999
- 32 Character two line dot matrix LCD. Full alphanumeric entry facility on keypad
- Access up to 300 saved test
- The instrument shall be certified as being calibrated with a working standard test dust suspension verified against an ISO 11171 secondary calibrated master APC.
- Re-calibration every 12 months by a dedicated Parker Service Center
- 420 bar Max. Working Pressure
- +5° C to +80° C
- Interface via RS232 (USB serial cable to RS232 option available)
- On-board rear mounted pump for lab sampling
- On-board battery and carry case with wheels (13 kg total weight)
- 12v DC input, 6 “D” cell batteries or rechargeable battery pack
- Integrated 16 column printer for hard copy data
- Complies with all relevant EC declarations of conformity
- Integrated Mounted Pump:
  - Powered directly from ACM20
  - Direct sampling from fuel sample bottles or tank via 3 meter inlet suction tube
  - Incorporated double speed flush and test sequence
  - Managed flow rate/correct volume sample as per IP 564 test method



### Applications

- Fuel Testing Laboratories - DEFSTAN 91-91 Issue 6
- Distribution Terminals/Hubs: use on receipt and outbound supply. Also provide checks for filtration performance, tank cleanliness and product quality
- Storage: reduce settling time by monitoring to determine if dispersed contamination are below acceptable levels
- Airport Fuel Farm: monitoring of fuels into storage, through fuel farm, hydrant system and during uplift into wing
- Oil and Gas Platforms: monitor filtration performance, system cleanliness and quality of delivered product

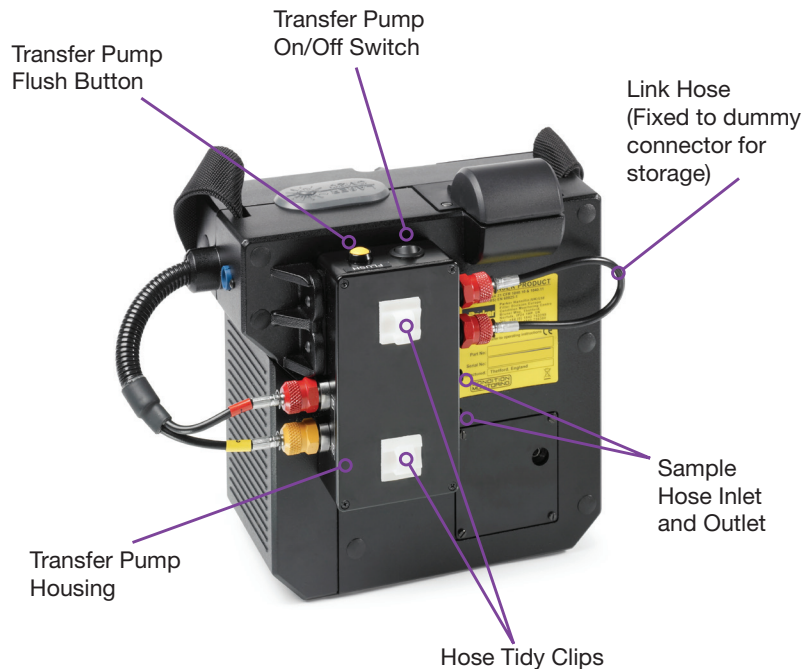


# icountACM20

## Specifications

- **Construction:** ABS structural foam and injection moulded case  
Hand-held display - ABS  
Keypad fluorosilicone rubber
- **Mechanical Components:** Brass, plated steel, stainless steel and aluminium
- **Seals:** Fluorocarbon
- **Hoses:** Nylon (Kevlar braided microbore). Stainless steel armoured ends
- **Flow Rate:** 25 - 28ml/min (dictated by CMP) 100ml/min with additional flush button
- **Fluid Compatibility:** Hydrocarbon Fuel, Mineral Oil. For other fluids consult Parker
- **Fuse:** 1.25 amp fast blow fuse included for overload protection (spare supplied)
- **icountACM20 Technology:** Patented flow cell, light obscuration
- **Coincidence:** 40,000 particles per ml
- **Viscosity Range:** 1 -100 centistokes
- **icountACM20 Weight:** 17.6 lbs.
- **Monitor Carrying Case:** Astra Board case
- **Carrying Case Weight:** 11 lbs.

## icountACM20 - Rear View



Input Power Socket (note that you will have to remove the plastic dust cap to access the 12Vdc power socket)

A fast blow 1.25A fuse and the RS232 connection are located behind the removable cover plate. The RS232 interface is provided to download all test data stored in the instrument.



## Field Monitoring

For use in non-hazardous areas, the icountACM20 is designed for online sampling of hydrocarbon fuels, utilizing existing “quick connect” sampling points such as the Millipore Adaptor.

# icountACM20

Part Number	Description		Part Number	Description	
ACM202024US ACM202024UK ACM202024EU	icountACM20 Portable Particle Counter with US,UK or EU Plug		ACC6NE023	UK Battery Charger	
ACC6NE008	UK Power Supply		ACC6NE024	EUR Battery Charger	
ACC6NE009	EUR Power Supply		ACC6NE025	US Battery Charger	
ACC6NE010	US Power Supply		ACC6NW003	Waste Bottle	
ACC6ND000	1m Process Cable Assembly		ACC6NE013	Re-Chargeable Battery Pack Assembly	
ACC6NE027	2m Process Cable Assembly		ACC6NE006	Downloadable Software	
ACC6NE029	Throttle Kit		ACC6NE019	Carrying Case for ACM202024	
ACC6NE015	Printer Paper 5 Rolls		ACC6NE028	Carrying Case for ACM202032	
SERMISC067	500ml Verification Fluid		ACC6NW003	Vapor/Waste Bottle	
			ACC6NE014	Printer Ribbon	