



# icountLaserCM20

Portable Particle Monitor





# A 2-minute contamination test procedure:

A portable particle monitor 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, NAS, AS4059E and GOST 17216 cleanliness reporting, data entry, data graphing and integral printing are all standard on this world proven contamination monitor.

## Product Features:

- icountLCM20 is a proven answer to fluid system contamination monitoring.
- 2-minute test procedure.
- Multi-standard ISO, NAS, AS4059E and GOST 17216 cleanliness reporting.
- Data entry, data graphing and integral printer.
- 420 bar rated maximum pressure.
- Supported by the offline UBS and online SPS accessories.



## Technical specifications – LCM 20

| Feature                              | Specification   |
|--------------------------------------|---|
| Principle of operation               | Optical scanning analysis and measurement of actual particulates  |
| Fluid compatibility                  | Mineral oil and petroleum-based fluids. For other fluids consult Parker   |
| Test time                            | 2 minutes; repeat test time every 2 minutes   |
| Particle counts                      | <b>MTD</b> >4, >6, >14, >21, >38 and >70e <sup>i</sup> µm<br><b>ACFTD</b> >2, >5, >10 <sup>ii</sup> , >15, >25, >50 and >100e <sup>i</sup> µm   |
| Analysis range <sup>iii</sup>        | ISO 4406: 7 to 22 inclusive; NAS 1638: 0 to 12 inclusive; AS4059E[cum]: 000 to 12 inclusive; AS4059E[diff]: 00 to 12 inclusive; GOST 17216: 00-17 inclusive;  |
| Repeatability <sup>iv</sup>          | ≤7% of measured counts for MTD Particle Sizes: 4, 6, 14µm   |
| Coincidence Error Limit <sup>v</sup> | 23,000 particles / mL   |
| Data entry                           | 32-character two-line dot-matrix LCD. Full alphanumeric entry facility on keypad  |
| Calibration                          | 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.<br><br><b>MTD</b> – instrument calibrated using MTD reference material.<br><b>ACFTD</b> – instrument calibrated using ACFTD reference material.<br>Consult Parker for recalibration. |
| Certification                        | This product complies with all relevant EU declarations of conformity   |
| Working Viscosity                    | 2–100 centistokes (500 cSt with Single Point Sampler)   |
| CMP Max. Viscosity Range             | 200 Centistokes (100 cSt when reporting in GOST standard and using Heated Bath)   |
| Oil temp. range                      | +5°C to +80°C   |
| Operating temp. range                | +5°C to +40°C   |
| Max. working pressure                | 2.5 bar when using Case Mounted Pump; up to 420 bar when CMP not used   |
| Max. flow rate                       | 30ml/min when using Case Mounted Pump.<br>System 20 Sensors flow up to 400 l/min.<br>Single Point Sampler can be used for high flow. (Consult Parker)   |
| System connection                    | Via System 20 In-line Sensors or the Single Point Sampler   |
| Memory store                         | 300 test (scrolling memory) capacity  |
| Integral printer                     | 16-column printer for hard copy data  |
| Computer compatibility               | Interface via RS232 connection at 9600 baud rate  |
| Power                                | Replaceable battery pack: Requires 6 x 1.5V D cells.<br>Rechargeable battery pack: Supply voltage of 12V DC 1A max, 9mm jack plug with positive centre contact.<br>Unit: Supply voltage 12V DC 3A max, 9mm jack plug with positive centre contact.  |
| Battery performance                  | Replaceable battery pack: maximum 25 tests before replacement<br>Rechargeable battery pack: maximum 40 tests before recharging  |
| Fuse                                 | 1.25A fast blow fuse included for overload protection (spare supplied)  |
| icountLCM20 cover                    | Weatherproof cover  |
| Construction                         | Case: ABS<br>Hand-held display: ABS<br>Keypad: Fluorosilicone rubber<br>Carrying case: Astraboard<br>Mechanical components: Brass, plated steel, stainless steel and aluminium<br>Seals: FKM (Viton). Other materials available - consult Parker<br>Hoses: Nylon (Kevlar braided microbore). Stainless steel armoured ends                              |
| Hose length                          | Fluid connection hose: 1.2 metres (1 metre extensions can be used)<br>Hand-held display cable length: 1 metre. CMP standard hose length: 0.26 metre   |
| Portability                          | icountLCM20, 8kg; LCM with CMP 8.15kg. Carrying case 5kg approx.  |
| Commissioning kit                    | 6-off D cell batteries; 1-off print rolls (shrink wrapped); 2-off printer ribbons;<br>'ParSmart Downloader' software plus cable; weather protector cover; 12V DC power supply; Rechargeable battery pack  |

<sup>i</sup> The number of particles >70 µm (MTD), >100 µm (ACFTD) and in the ranges 50–100 µm and 100–200 µm (GOST) are not measured by this device. However, estimated values (indicated by the letter e on the display) have been calculated using the following formulae: MTD: >70e µm = >38 µm × 0.06816; ACFTD: >100e µm = >50 µm × 0.06816; GOST: 50–100e µm = >50 µm (ACFTD) × 0.93184; GOST: 100–200e µm = >50 µm (ACFTD) × 0.06816

<sup>ii</sup> Special versions only - consult Parker.

<sup>iii</sup> The instrument only uses the shorthand in these standards for reporting contamination levels.

<sup>iv</sup> 95% confidence level using an MTD distribution with a concentration of 6mg/L.

<sup>v</sup> ISO 11171:2016 Annex B methodologies followed to determine Coincidence Error Limits



## Features & Benefits

- 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.
- Memory access gives test search facility
- 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 Monitor

With 35 years' experience in manufacturing the world's best-selling portable contamination monitor - the progression to the icountLaserCM with its opto-mechanical, continuous wave single point source laser (SPSL) is both a natural and a customer driven development.



## Specification

Particle Contamination Monitors, have been widely used for many years in condition monitoring of hydraulic fluids.

However, it is only recently that PCM'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 PCM'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 PCM'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 PCM 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, an ISO code 22 at >4 micron per 100 ml, (equivalent to up to 2.3 million particles >4 micron per 100 ml), can be achieved without making the instrument susceptible to counter saturation or coincidence error.

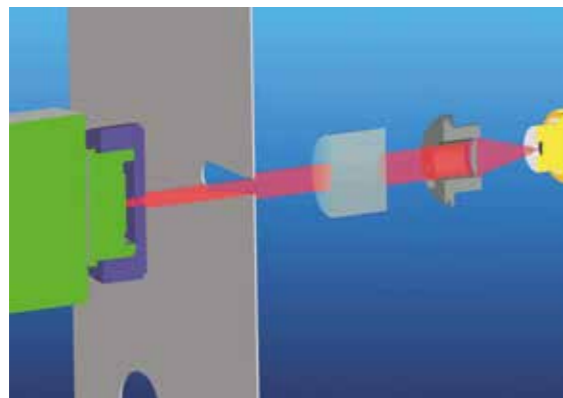
These high saturation point on-line PCM's, whilst losing none of the accuracy of their laboratory counterparts, enable particle counting to be carried out quickly and accurately.



## How does icountLaserCM work?

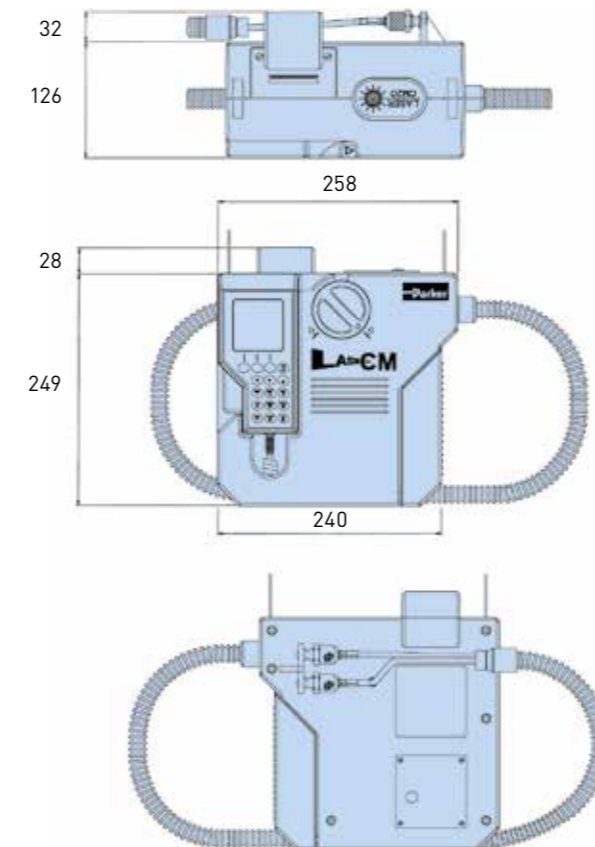
The icountLaserCM portable particle counter features microprocessor controlled optical scanning for accurate contaminant measurement with a calibration range from ISO 7 to ISO 22 with no counter saturation.

- 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.
- 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.
- This value is counted and stored in the icountLaserCM 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.

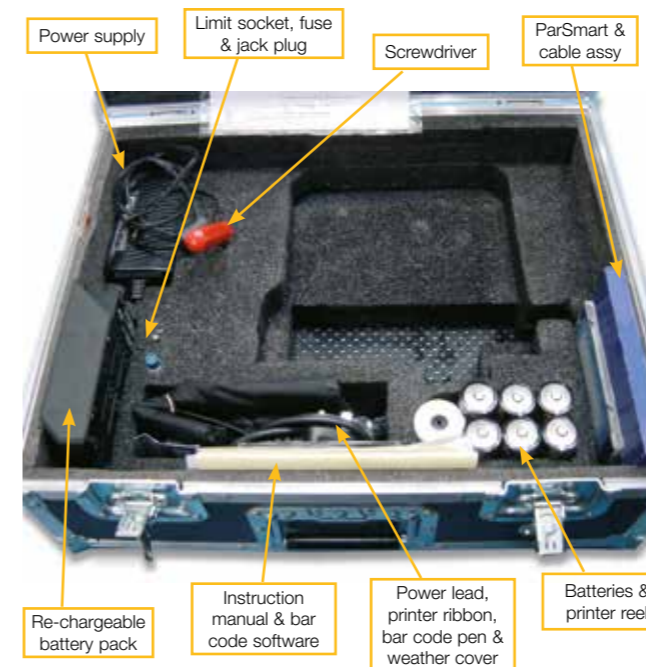


### Core technology that proves itself in icountLaserCM

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



### Commissioning Kit



## Specifications

| 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 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                                      | •                     | •                     |
| Fluid 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   | •                     | •                     |

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.



## 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

The LCM20 is CE marked. 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

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.

Consult Parker for recalibration.

Switch On



Start Test



## icountLaserCM20 Portable Particle Monitor

### 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 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.

| Parker LCM20    |          | Parker LCM20    |          |
|-----------------|----------|-----------------|----------|
| On Line         |          | On Line         |          |
| Test Number 016 |          | Test Number 016 |          |
| Date            | D M Y    | Date            | D M Y    |
| 16/01/20        | 16/01/20 | 16/01/20        | 16/01/20 |
| Time            | 12:44    | Time            | 12:44    |
| 12:44           | 12:44    | 12:44           | 12:44    |
| ISO:            | 20/19/15 | ISO:            | 20/19/15 |
| 20/19/15        | 20/19/15 | 20/19/15        | 20/19/15 |
| Counts/100ml    |          | Counts/100ml    |          |
| 4-6µ            | 471464   | 4-6µ            | 471464   |
| NAS Class       | ---      | NAS Class       | ---      |
| 6-14µ           | 295014   | 6-14µ           | 295014   |
| NAS Class       | 11       | NAS Class       | 11       |
| 14-21µ          | 19693    | 14-21µ          | 19693    |
| NAS Class       | 9        | NAS Class       | 9        |
| 21-38µ          | 11300    | 21-38µ          | 11300    |
| NAS Class       | 11       | NAS Class       | 11       |
| 38-70µ          | 342      | 38-70µ          | 342      |
| NAS Class       | 8        | NAS Class       | 8        |
| >70µ            | 22       | >70µ            | 22       |
| NAS Class       | 7        | NAS Class       | 7        |

ISO 4406 reporting

Correlation to NAS 1638

## Ordering Information icountLaserCM and 'Classic' icountLaserCM



### Standard products table

| Part Number | Supersedes | Description                  |
|-------------|------------|------------------------------|
| LCM202022   | LCM20.2022 | icountLCM20 (MTD calibrated) |
| 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  |

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                                   |
|---------|---------------------|---|
| LCM2020 | 2 Hydraulic mineral | 1 icountLCM20 (ACFTD calibrated)          |
|         | 6 Aggressive fluids | 2 icountLCM20 (MTD calibrated)            |
|         |                     | 7 icountLCM20 with CMP (ACFTD calibrated) |
|         |                     | 8 icountLCM20 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).



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### US Product Information Centre

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