



## icountLaserCM20

Portable Particle Monitor



ENGINEERING YOUR SUCCESS.

## 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 µm <b>ACFTD</b> >2, >5, >10 <sup>i</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. <b>MTD</b> – instrument calibrated using MTD reference material. <b>ACFTD</b> – instrument calibrated using ACFTD reference material. 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. System 20 Sensors flow up to 400 l/min. 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. Rechargeable battery pack: Supply voltage of 12V DC 1A max, 9mm jack plug with positive centre contact. Unit: Supply voltage 12V DC 3A max, 9mm jack plug with positive centre contact.
Battery performance	Replaceable battery pack: maximum 25 tests before replacement 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 Hand-held display: ABS Keypad: Fluorosilicone rubber Carrying case: Astraboard Mechanical components: Brass, plated steel, stainless steel and aluminium Seals: FKM (Viton). Other materials available - consult Parker Hoses: Nylon (Kevlar braided microbore). Stainless steel armoured ends
Hose length	Fluid connection hose: 1.2 metres (1 metre extensions can be used) 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; ‘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.

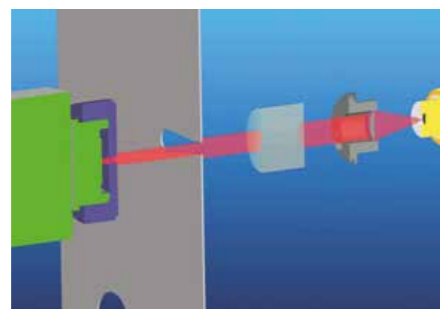
By careful design and window sizing, an ISO code 22 at >4 micron per 100 ml, (equivalent to up to 2.3 million particles >4 micron per 100 ml), can be achieved without making the instrument susceptible to counter saturation or coincidence error.

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?

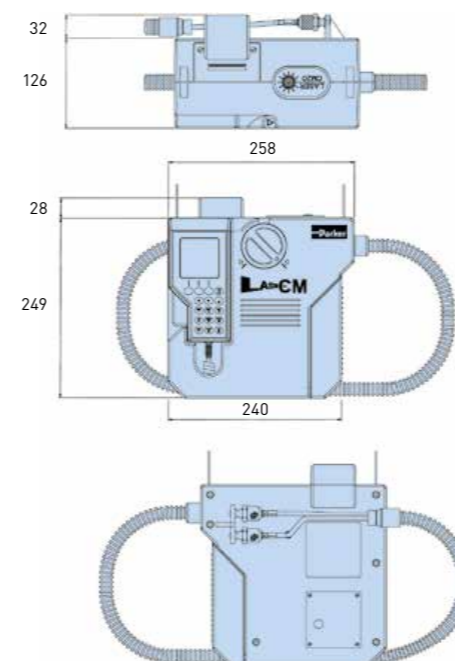
The icountLaserCM portable particle counter features microprocessor controlled optical scanning for accurate contaminant measurement with a calibration range from ISO 7 to ISO 22 with no counter saturation.

- 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.

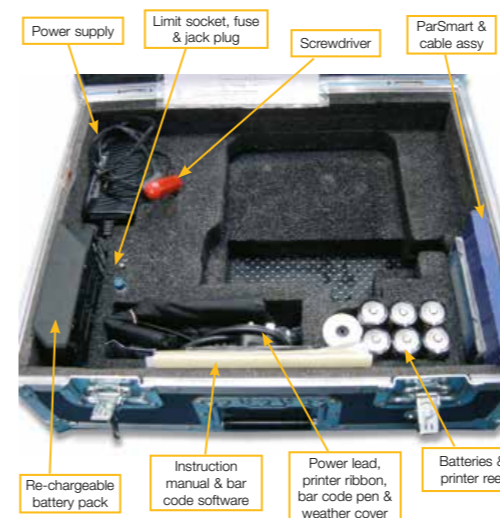


Core technology that proves itself in icountLaserCM

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.



### Ordering Information icountLaserCM and 'Classic' icountLaserCM



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.

ISO 4406 reporting		Correlation to NAS 1638	
<pre> Parker LCM20 On Line Test Number 016 Date 16/01/20 Time 12:44 ISO: 20/19/15  Counts/100ml 34µ 797835 36µ 326371 314µ 31357 221µ 11664 335µ 364 370µ 22 Notes                     </pre>		<pre> Parker LCM20 On Line Test Number 016 Date 16/01/20 Time 12:44 NAS Class 11  Counts/100ml 4-6µ 471464 NAS Class 11 6-14µ 295014 NAS Class 11 14-21µ 19693 NAS Class 9 21-38µ 11300 NAS Class 11 38-70µ 342 NAS Class 8 70µ 22 NAS Class 7 Notes                     </pre>	

#### Standard products table

Part Number	Supersedes	Description
<b>LCM202022</b>	LCM20.2022	icountLCM20 (MTD calibrated)
<b>ACC6NE015</b>	B84702	Printer roll x 5
<b>ACC6NE014</b>	P.843702	Printer ribbon
<b>ACC6NE013</b>	B84609	Re-chargeable battery pack
<b>ACC6ND002</b>	P849603	Weather protector cover
<b>ACC6ND000</b>	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)
		2 icountLCM20 (MTD calibrated)
	6 Aggressive fluids	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).

# Parker Worldwide

## Europe, Middle East, Africa

**AE – United Arab Emirates,**  
Dubai  
Tel: +971 4 8127100  
parker.me@parker.com

**AT – Austria,** St. Florian  
Tel: +43 (0)7224 66201  
parker.austria@parker.com

**AZ – Azerbaijan,** Baku  
Tel: +994 50 2233 458  
parker.azerbaijan@parker.com

**BE/NL/LU – Benelux,**  
Hendrik Ido Ambacht  
Tel: +31 (0)541 585 000  
parker.nl@parker.com

**BG – Bulgaria,** Sofia  
Tel: +359 2 980 1344  
parker.bulgaria@parker.com

**BY – Belarus,** Minsk  
Tel: +48 (0)22 573 24 00  
parker.poland@parker.com

**CH – Switzerland,** Etoy  
Tel: +41 (0)21 821 87 00  
parker.switzerland@parker.com

**CZ – Czech Republic,** Klecany  
Tel: +420 284 083 111  
parker.czechrepublic@parker.com

**DE – Germany,** Kaarst  
Tel: +49 (0)2131 4016 0  
parker.germany@parker.com

**DK – Denmark,** Ballerup  
Tel: +45 43 56 04 00  
parker.denmark@parker.com

**ES – Spain,** Madrid  
Tel: +34 902 330 001  
parker.spain@parker.com

**FI – Finland,** Vantaa  
Tel: +358 (0)20 753 2500  
parker.finland@parker.com

**FR – France,** Contamine s/Arve  
Tel: +33 (0)4 50 25 80 25  
parker.france@parker.com

**GR – Greece,** Piraeus  
Tel: +30 210 933 6450  
parker.greece@parker.com

**HU – Hungary,** Budaörs  
Tel: +36 23 885 470  
parker.hungary@parker.com

**IE – Ireland,** Dublin  
Tel: +353 (0)1 466 6370  
parker.ireland@parker.com

**IL – Israel**  
Tel: +39 02 45 19 21  
parker.israel@parker.com

**IT – Italy,** Corsico (MI)  
Tel: +39 02 45 19 21  
parker.italy@parker.com

**KZ – Kazakhstan,** Almaty  
Tel: +7 7273 561 000  
parker.easteurope@parker.com

**NO – Norway,** Asker  
Tel: +47 66 75 34 00  
parker.norway@parker.com

**PL – Poland,** Warsaw  
Tel: +48 (0)22 573 24 00  
parker.poland@parker.com

**PT – Portugal**  
Tel: +351 22 999 7360  
parker.portugal@parker.com

**RO – Romania,** Bucharest  
Tel: +40 21 252 1382  
parker.romania@parker.com

**RU – Russia,** Moscow  
Tel: +7 495 645-2156  
parker.russia@parker.com

**SE – Sweden,** Borås  
Tel: +46 (0)8 59 79 50 00  
parker.sweden@parker.com

**SK – Slovakia,** Banská Bystrica  
Tel: +421 484 162 252  
parker.slovakia@parker.com

**SL – Slovenia,** Novo Mesto  
Tel: +386 7 337 6650  
parker.slovenia@parker.com

**TR – Turkey,** Istanbul  
Tel: +90 216 4997081  
parker.turkey@parker.com

**UA – Ukraine,** Kiev  
Tel: +48 (0)22 573 24 00  
parker.poland@parker.com

**UK – United Kingdom,** Warwick  
Tel: +44 (0)1926 317 878  
parker.uk@parker.com

**ZA – South Africa,** Kempton Park  
Tel: +27 (0)11 961 0700  
parker.southafrica@parker.com

## North America

**CA – Canada,** Milton, Ontario  
Tel: +1 905 693 3000

**US – USA,** Cleveland  
Tel: +1 216 896 3000

## Asia Pacific

**AU – Australia,** Castle Hill  
Tel: +61 (0)2-9634 7777

**CN – China,** Shanghai  
Tel: +86 21 2899 5000

**HK – Hong Kong**  
Tel: +852 2428 8008

**IN – India,** Mumbai  
Tel: +91 22 6513 7081-85

**JP – Japan,** Tokyo  
Tel: +81 (0)3 6408 3901

**KR – South Korea,** Seoul  
Tel: +82 2 559 0400

**MY – Malaysia,** Shah Alam  
Tel: +60 3 7849 0800

**NZ – New Zealand,** Mt Wellington  
Tel: +64 9 574 1744

**SG – Singapore**  
Tel: +65 6887 6300

**TH – Thailand,** Bangkok  
Tel: +662 186 7000

**TW – Taiwan,** Taipei  
Tel: +886 2 2298 8987

## South America

**AR – Argentina,** Buenos Aires  
Tel: +54 3327 44 4129

**BR – Brazil,** Sao Jose dos Campos  
Tel: +55 800 727 5374

**CL – Chile,** Santiago  
Tel: +56 2 623 1216

**MX – Mexico,** Toluca  
Tel: +52 72 2275 4200

### EMEA Product Information Centre

Free phone: 00 800 27 27 5374

(from AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PL, PT, RU, SE, SK, UK, ZA)

### US Product Information Centre

Toll-free number: 1-800-27 27 537

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

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