Fluid Condition Monitoring
and Fuel Hydrocarbon Monitoring Solutions

Parker

ENGINEERING YOUR SUCCESS.
Together, we can provide reliable, reactive product and technical support - when you need it and wherever you need it

With ever growing competition for online particle counting, one of the major advantages of the Parker Fluid Condition Monitoring portfolio is the capability to service products in dedicated Service Centres.

Each Service Centre offers a full service and recalibration, with a network of helpful, specialised professionals trained to support your engineering or service team.

Our experience and expertise in fluid condition monitoring and analysis ensure we are THE authority within our industry.

Service Centre Facilities

Parker Service Centres in 12 locations around the world.

The Parker Service Centre located in South Africa is the latest addition to the service network. Officially opening mid-2012, this facility is the first of its kind in Africa and will benefit the growing need for local calibration of particle counters in this continent.
HFDE’s Fluid Condition Monitoring range of products provide a comprehensive solution to system sampling, monitoring and detection of hydraulic oil and fuel contamination to International Standards. For any additional information or support regarding these products, please email: commoninfo@parker.com

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<td>89-92</td>
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</tbody>
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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.

Product Features:

- 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.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
Features & Benefits

Test time: 2 minutes

Particle counts: MTD 4+, 6+, 14+, 21+, 38+ and 70+ microns(c)
ACFTD 2+, 5+, 15+, 25+, 50+ and 100+ microns

International codes: ISO 7-22, NAS 0-12

Data retrieval: Memory access gives test search facility

Max. working pressure: 420 bar

Max. flow rate: 400 l/min when used with system 20 Sensors. Higher with single point sampler (see page 386)

Working conditions: LaserCM will operate with the system working normally

Computer compatibility: 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.

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.

Laser Optical Sensing
## icountLaserCM20

### Portable Particle Counter

#### Specification

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

**Note:** In compliance with international standards, all Parker portable particle counters can meet the ISO Medium test dust standards. The icountLaserCMs, 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

- Power supply
- Limit socket, fuse & jack plug
- Screwdriver
- ParSmart & cable assy
- Re-chargable battery pack
- Instruction manual & bar code software
- Power lead, printer ribbon, bar code pen & weather cover
- Batteries & printer reel
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:

<table>
<thead>
<tr>
<th>ACFTD</th>
<th>MTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2µ</td>
<td>4µ (c)</td>
</tr>
<tr>
<td>5µ</td>
<td>6µ (c)</td>
</tr>
<tr>
<td>15µ</td>
<td>14µ (c)</td>
</tr>
<tr>
<td>25µ</td>
<td>21µ (c)</td>
</tr>
<tr>
<td>50µ</td>
<td>38µ (c)</td>
</tr>
<tr>
<td>100µ</td>
<td>70µ (c)</td>
</tr>
</tbody>
</table>

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.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

Date 04-03-10
Time 15:52
ISO: 20/15/09

>4µ (c) 820721
>6µ (c) 31564
>10µ (c) 64
>21µ (c) 14
>38µ (c) 0
>70µ (c) 0

NOTES

ISO 4406 - 1999
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 icountLM, 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 icountLM. The icountLCM ‘Classic’ remains an instrument to be proud of.

Ordering Information (icountLaserCM and ‘Classic’ icountLaserCM)

Standard products table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCM202022</td>
<td>LCM20.2022</td>
<td>icountLCM20 (MTD calibrated)</td>
</tr>
<tr>
<td>LCM202026</td>
<td>LCM20.2026</td>
<td>icountLCM ‘classic’ (MTD calibrated)</td>
</tr>
<tr>
<td>ACC6NE015</td>
<td>884702</td>
<td>Printer roll x 5</td>
</tr>
<tr>
<td>ACC6NE014</td>
<td>P843702</td>
<td>Printer station</td>
</tr>
<tr>
<td>ACC6NE013</td>
<td>884609</td>
<td>Re-chargeable battery pack</td>
</tr>
<tr>
<td>ACC6ND002</td>
<td>P840603</td>
<td>Weather protector cover</td>
</tr>
<tr>
<td>ACC6ND000</td>
<td>884703</td>
<td>USB to RS232 Download Cable</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Fluid type</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCM2020</td>
<td>Hydraulic mineral</td>
<td>1 icountLCM20 (ACFTD calibrated)</td>
</tr>
<tr>
<td></td>
<td>Skydrol</td>
<td>1 icountLCM20 (ACFTD calibrated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 icountLCM20 (MTD calibrated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 icountLCM ‘classic’ (ACFTD calibrated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 icountLCM ‘classic’ (MTD calibrated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 icountLCM20 with CMP (ACFTD calibrated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 icountLCM20 with CMP (MTD calibrated)</td>
</tr>
</tbody>
</table>

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, Oil water in oil monitor.

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

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
### Specification

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

**Installation Details**

![Installation diagrams]
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.
Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBS9002</td>
<td>Universal bottle sampler (includes aluminium case and accessories)</td>
</tr>
<tr>
<td>UBS9003</td>
<td>Universal bottle sampler</td>
</tr>
<tr>
<td>UBS9004</td>
<td>Aggressive universal bottle sampler</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Part number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC8NK001</td>
<td>B89907</td>
<td>Sample bottle pair with cap, without tube</td>
</tr>
<tr>
<td>ACC8NW001</td>
<td>B89911</td>
<td>Sample bottle pair with extraction hose</td>
</tr>
<tr>
<td>ACC8NW002</td>
<td>B89910</td>
<td>100 sample bottle pack (50 x ACC8NW001)</td>
</tr>
<tr>
<td>ACC8NK002</td>
<td>S840054</td>
<td>UBS Power supply</td>
</tr>
<tr>
<td>ACC8NK003</td>
<td>B890005</td>
<td>UBS De-gassing chamber and pump</td>
</tr>
<tr>
<td>ACC8NK004</td>
<td>B896003</td>
<td>UBS De-gassing chamber only</td>
</tr>
<tr>
<td>ACC8NK005</td>
<td>B89902</td>
<td>Cable and adaptor</td>
</tr>
</tbody>
</table>

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)
icountBS2
Bottle Sampler

In the lab or in the field monitoring

Parker Filtration’s icountBS2 is a unique and complete solution providing customers with laboratory fluid bottle sampling using proven on-board, laser based technology. icountBS2 is a next generation product from Parker’s fluid particle analysis and monitoring programme and provides an effective alternative to external laboratory services.

Contact Information: Product Features:

Parker Hannifin
Hydraulic Filtration

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

- Quick sample bottle analysis with variable test time options from 15 seconds and volume capacities from 10ml.
- Repeatable and re-producible result performance to ISO4406:1999, NAS1638 and AS4509E (Differential and Cumulative) particle count distributions.
- On-board compressor and ‘shop’ air capability.
- Environmentally controlled front-loading bottle chamber.
- Design concept allowing for portability. DC and rechargeable battery pack power option built in.
- CE compliant
- Fluid resistant touch type screen panel.
- On-board thermal printer.
- 500 test memory (fully downloadable).
icount Bottle Sampler: Advanced contamination testing

The revolutionary icountBS2 is an advanced, fully contained bottle sampling system that ensures fast, accurate and repeatable detection of contamination in hydraulic oils and hydrocarbon fuels.

Compact and portable, the icountBS2 is ideal for use in the laboratory and in on-line and off-line applications.

The system is fully accredited to all particle counting standards - ISO, NAS, AS and GOST - including the latest ISO medium dust certification and is backed by Parker Hannifin’s global customer support network.

The icountBS2 uses proven laser particle detection technology, with intuitive touch screen control, integrated long life rechargeable battery and a robust easy to clean enclosure, to deliver exceptional product quality and performance.

The icountBS2 is quick to setup and use, delivers rapid test results and offers a wide range of features to help you improve the reliability, productivity and profitability of your production equipment.

The icountBS2 features a backlit 256 colour, high resolution touch screen and uses Windows® CE based menus.
Wherever, whenever you need to be 100% sure of oil and fuel quality

The icountBS2 has been developed using the latest industrial design and manufacturing techniques, creating a system that integrates state of the art technology with dependable and precise measurement and analysis processes. Built by engineers, for engineers, the icountBS2 gives you a valuable and extremely effective tool for use in many different applications.

**Agriculture**: Designed for a wide range of agricultural machinery monitoring and testing procedures to ensure reduced downtime.

**Aerospace**: Monitoring of hydraulic ground support equipment, airframe laboratories and aerospace testing facilities.

**Construction**: Ideal for use in construction machinery development and test laboratories.

**Power Generation**: Suitable for monitoring hydraulic gearbox (wind energy pitch and braking systems) quality as part of a planned maintenance programme.

**Defence**: Designed for use in defence airfield fuel supply and storage points, military laboratories and equipment maintenance zones.

**Oil and Gas**: Ideal for use in fuel refineries (DEF STAN 9191), fuel farm storage, fuel laboratories and airport fuel transfer.

**Marine**: Suitable for shipyard and dockyard diagnostic centres and marine service environments.

**Industrial**: Test rigs, hydraulic benches and hydraulic controlled production lines, as well as hydraulic system test laboratories, all benefit from the IBS.
How the icountBS2 works

Our design, manufacturing and applications engineers have over 20 years experience working with advanced contamination and particle detection technologies. As a result, the latest version of the icountBS2 has been developed to meet the needs of customers throughout industry, both today and in the future.

Precision and repeatability

The icountBS2 is capable of entrapped gas suppression and automatically ensures that each oil sample is carefully regulated prior to test.

Every sample is degassed using suppressed, cleaned air and then delivered to the measurement cell through a fixed displacement pumping system.

This eliminates many of the variables associated with traditional methods of contamination monitoring. Control and accuracy is further enhanced with an easy to use interactive touch screen display.

The backlight 256 colour high resolution screen uses intuitive Windows® CE based menus for quick and simple stylus operation, with the stylus being stored neatly in the base of the icountBS2.

Laser power

At the heart of the system is a sophisticated laser detector, using a light obscuration flow cell, providing continuous measurement of fluid flow passing through a sample tube.

Fig 1. A controlled column of contaminated fluid enters the laser optical scanning chamber, which is designed to ensure balanced flow and fluid distribution for consistent results.

Fig 2. The laser is projected through the oil column onto a highly sensitive photo diode cell.

Fig 3. The shadow cast on the photo diode by contaminants in the oil creates a measurable change in the light intensity.

Fig 4. icountBS test procedure schematic
Tough and reliable

The icountBS2 is built to ensure a long and trouble free operating life. Its robust moulded enclosure will withstand constant use and is easy to clean.

For optimum operational flexibility the icountBS2 can be powered either via an internal rechargeable lithium ion battery, or direct from a mains supply.

Internally, a high filtration air line filter removes impurities from air supply, while vane-type deflectors and drain valves improve efficiency still further.

The integrated 12VDC compressor pressurises the sampling and measurement chambers quickly, with a compact syringe pump providing consistent oil or fuel samples.

Benefits

- Low cost solution for monitoring fluid life and reducing machine downtime
- Easy to set up and use
- Powerful analysis options
- Proven, reliable technology
- Independent monitoring of contamination
- Calibration to ISO procedures

Contamination Standards Table

<table>
<thead>
<tr>
<th>MTD</th>
<th>ACFTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS 1638</td>
<td>NAS 1638</td>
</tr>
<tr>
<td>AS4059E (Differential)</td>
<td>AS4059E (Differential)</td>
</tr>
<tr>
<td>AS4059E (Cumulative)</td>
<td>AS4059E (Cumulative)</td>
</tr>
<tr>
<td>Jet Fuel (contact Parker)</td>
<td>AS4059E (Cumulative)</td>
</tr>
<tr>
<td></td>
<td>GOST 17216 : 2001</td>
</tr>
</tbody>
</table>

- Selectable number of samples taken in one time: 1, 2, 3, 4 or 5 tests
- Mineral fluid/fuel compatible construction
- Percentage saturation reporting (for the moisture sensor option)
- Testing capability of up to 500 continuous tests (override auto warning option available)
- Data exporting method to USB (in XML format)
- Modular design for easy servicing
- On-board high quality pump and motor configuration
- High resolution colour touch-screen panel and the IBS2 comes complete with its own stylus
- Integrated printer (selectable on/off feature)
- Self-diagnostic software
- Power-saving sleep mode with integrated wake up/power button
- On- and off-line pressure capability: see Ordering Information for options
- Integration package into the Parker MiniLab Environment: see Ordering Information for options

Fig 4. The IBS2 oil sampling probe automatically lowers into the bottle once the test begins.

Fig 5. IBS’ high filtration air filter.

Fig 6. IBS’ integrated 12VDC compressor.
Features that boost your productivity

1. Wake up switch
   Power button wake up switch: momentary LED illuminated switch, battery charger indicator.

2. Printer access
   Internal thermal printer which uses a thermal printer paper reel.

3. Stylus holder
   Plastic stylus in holder.

4. Pressure chamber
   Front door with polycarbonate window.

5. High resolution touch screen
   Intuitive touch screen display backlight 256 colour STN transmissive resolution – 302x3 (R.G.B) (H) X 240 (W) dots with active display area 115 (H) X 86 (W) mm. IBS2 operates on Windows® CE system.

6. Power supply
   Long life regulated 12 VDC power supply, with an M12, 4 pin connector, plus a rechargeable Lithium ion battery unit for use onsite or in remote locations.

7. Body panels
   Body panels are made of resin composite.
Control Panel

**KEY**

1. Emergency air release
2. 4mm vapour release port
3. 6mm oil drain port
4. External air supply
5. External on-line oil supply (if fitted)
6. Long life Lithium Ion battery
7. USB connections A and B
8. Mains on/off and power socket
9. Ventilation fan (DO NOT BLOCK)

**Product Specification**

Dimensions are given in mm (inches)
Sample handling and preparation

Bottle cleanliness

Bottles should have sealing screw caps, with both parts cleaned to a suitable level in accordance with ISO3722. Standard Parker Hannifin bottles (supplied in pairs as part number ACC6NW001) are supplied clean to ISO 13/11 or better in a Class 10,000 Clean Room. The bottle should remain capped until the time of sample filling and be re-capped immediately afterwards.

Sample mixing

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

Other methods of sample agitation have not been provided, as they are likely inconsistently to distort the analysis of results. Where facilities are available, mixing can be achieved using paint shakers and/or an ultrasonic bath. Take care when using ultrasonic baths to avoid distortion of the result by prolonged use, which could cause the breakdown of contaminants.

Bottle samples can be sufficiently stirred by swirling and tumbling by hand, end-over-end. Samples should be analysed, without delay, once agitated.

Results

The first result from a bottle sample should be disregarded, as it could be distorted by fluid from a previous sample. Samples from different parts of a system will give different results.

Consideration should be given to what monitoring is desired and where to extract samples from for suitable trend monitoring to be performed.

It is important that whatever practices you adopt, you must perform them consistently.

CMC Service Centres: Global Support for CMC products

Parker’s fluid Condition Monitoring Service Centres can be found in ten locations around the globe, on almost every continent. Our experience and expertise in fluid condition monitoring and analysis ensure we are the authority within our industry.

Each location offers first class aftermarket support for condition monitoring products giving:

- Direct contact for end users.
- Quick and confident technical support to help you maintain an efficient and trouble free monitoring process.
- Faster turn around for annual calibration verification, eliminating the need for product to be returned to the country of manufacture.

Important Information

WARNING/USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through their own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the applications are met.
- The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker or its subsidiaries or authorised distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems. The operation of the products described herein is subject to the operating and safety procedures detailed in which are available upon request.

Sales conditions

The items described in this document are available for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any sale contract entered into by Parker will be governed by the provisions stated in Parker’s standard terms and conditions of sale (copy available upon request).
Viewing/Exporting test results

Select **Browse Tests** from the main **Test Set-up** screen.

List of **Saved Tests** is shown.

Select individual results and show date. You can double-click the test name to view that test result.

Click **Browse Tests** to view more test results.

Export results: Highlight the test result(s) you would like to export using the stylus.

Plug in USB in the back of the icountBS2.

Press Export. The **Export Complete** message confirms a successful export.

Test results (Importing data)

You can import the test results from the bottle sampler into a spreadsheet.

Please Note: The example shown is for Microsoft Excel®. Other spreadsheet software is available. Please contact Parker Hannifin for advice.

Plug USB drive from IBS2 into your PC.

Open your PC spreadsheet programme (for example Microsoft Excel®).
## Technical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle of operation</td>
<td>Laser diode optical detection of actual particulates</td>
</tr>
<tr>
<td>Dimensions</td>
<td>H 530mm x W 210mm x D 410mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx 18kg</td>
</tr>
<tr>
<td>Operating temperature and humidity</td>
<td>+5°C to +60°C (-4°F to +140°F) 20-85% RH (tested at 30°C (86°F), non-condensing)</td>
</tr>
<tr>
<td>Storage temperature and humidity</td>
<td>-40°C to +90°C (-40°F to +194°F) 10-90% RH (tested at 30°C (86°F), non-condensing)</td>
</tr>
<tr>
<td>Moisture sensor calibration</td>
<td>±5% RH (over a compensated temperature range of +10°C to +80°C (+50°F to +176°F))</td>
</tr>
<tr>
<td>Moisture sensor stability</td>
<td>±2% RH typical at 50% RH in one year</td>
</tr>
<tr>
<td>International codes</td>
<td>ISO 7 to 21, NAS 0 to 12, AS 0 to 12</td>
</tr>
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</table>

### Channel sizes

#### Channel Sizes: MTD μm(c)

<table>
<thead>
<tr>
<th>ISO 4406:1999</th>
<th>NAS 1638</th>
<th>AS4059E (Diff)</th>
<th>AS4059E (Cum)</th>
<th>Jet Fuel</th>
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<tr>
<td>&gt;4</td>
<td>4-6</td>
<td>4-6</td>
<td>&gt;6</td>
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</tr>
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<td>&gt;14</td>
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<td>&gt;30</td>
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#### Channel Sizes: ACFTD μm(c)

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<td>&gt;2</td>
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</tr>
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<td>&gt;100</td>
<td>&gt;100-200</td>
<td>&gt;100-200</td>
</tr>
</tbody>
</table>

### Calibration

**MTD**: via a certified primary ISO 11171 automatic particle detector using ISO 11943 principles, with particle distribution reporting to ISO 4406:1996  
**ACFTD**: fully traceable to gravimetric first principles

### Recalibration

Contact Parker Hannifin for advice

### Fluid compatibility

Mineral-based oils and petroleum-based fuel - Contact Parker Hannifin for advice

### Fluid management

Selectable on screen between 10 to 100ml

### Viscosity range

1 to 3000cSt

### Working pressure

3 bar maximum input pressure, if used on-line. Contact Parker Hannifin for further advice

### Flow range through icountBS2

Test: 60ml/min

### Connection interface (On Line)

INLET: 6mm push-fit, DRAIN: 4mm push-fit

### Fluid operating temperature (Oil)

+5°C to +80°C (-41°F to 176°F)

### Fluid operating temperature (Fuel)

+20°C to +70°C (-4°F to 158°F)

### Sample bottle size

See Parker ACC Spares list. Contact Parker Hannifin for advice

### Flush sample size

Selectable option within the icountBS Software: 10ml to 100ml

### Memory storage

500 tests (Integrated Warning Level)

### Printer

Thermal dot line printer - see ACC spares list for replacement paper

### Battery type

Polymer Lithium Ion Battery pack (ACC6NW032)

### Power requirements

Integrated supply into the icountBS2 unit

### Certification

CE Certified. Supplied with EC Declaration of Conformity Certificate
Ordering Information

The icountBS2 is supplied with the following components:

- 250ml Bottle Kit (x2)
- Vapour/Waste Bottle (1000ml)
- 4mm and 6mm Blanking Plug
- CD manual
- Either UK, US or EUR Power Lead
- Spare Printer Roll
- Stylus Pen
- Battery with battery compartment panel
- Drip Tray

### Accessory Part Numbers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power pack (UK 2m cable)</td>
<td>ACC6NW023</td>
</tr>
<tr>
<td>Power pack (US 2m cable)</td>
<td>ACC6NW024</td>
</tr>
<tr>
<td>Power pack (EUR 2m cable)</td>
<td>ACC6NW025</td>
</tr>
<tr>
<td>250ml Sample bottle kit (x2)</td>
<td>ACC6NW001</td>
</tr>
<tr>
<td>250ml Sample bottle kit (x50)</td>
<td>ACC6NW002</td>
</tr>
<tr>
<td>Vapour / waste bottle</td>
<td>ACC6NW003</td>
</tr>
<tr>
<td>Printer paper reel</td>
<td>ACC6NW005</td>
</tr>
<tr>
<td>On-line adaptor kit</td>
<td>ACC6NW022</td>
</tr>
</tbody>
</table>

If the On-Line facility is not selected when the unit is initially purchased, it is available as an aftermarket upgrade. For details, please contact Parker.

### Description | Part number
---|---
icountBS2 manual on CD | ACC6NW012
Verification Fluid | SERMISC049
Battery Pack | ACC6NW032
VTC Pen Drive | ACC6NW033
Transit Case | ACC6NW020

*Please contact Parker for lead times

Note: Transit Case Option.

Transportation packaging specialists have been utilised to create a tailormade shipping carton for the icountBS2. If a plastic storage/presentation case is required, please see the accessory section below.

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Introducing the icount ‘Mini-lab’ – The effective way of utilising your icountBS2

How clean is your hydraulic system?
Contamination Control is only an oil sample away with our easy, 3-Step fluid analysis service.

Step 1
Obtain your sample of hydraulic oil.

Step 2
Take the 2 minute off-line oil sample test.

Step 3
View your results and run a report immediately.

Kit comprises: icountBS2, Flat-pack trolley, 30 sample bottles. Optional Laptop/software/printer and cables
CMC Service Centres
Global Support for CMC products

Improving aftermarket support for condition monitoring products.

Parker’s fluid Condition Monitoring Service Centres can be found currently in 12 locations around the globe, on almost every continent. Our experience and expertise in fluid condition monitoring and analysis ensure we are THE authority within our industry.

Each location offers first class aftermarket support for Condition Monitoring products, giving:

- Direct Contact for End Users.
- Quick and confident technical support to assist you in maintaining an efficient and trouble free monitoring process.
- Faster turn around for annual calibration verification, resulting in the product not having to come back to the country of manufacture.

**Parker also offers on the icountACM20 laboratory unit:**

- A six monthly field use verification sample for confident product performance.
- An extended two year warranty, giving confidence in product readiness.

Visit [www.parkerhfde.com/condition/service/](http://www.parkerhfde.com/condition/service/) to find your nearest location and contact details.

---

**Parker returns policy and calibration procedure**

Each product returned to an approved Parker Service Centre will have the following:

- **A visual inspection of all case components.**
  If any components from the support case require replacing, please notify the Service Centre at the time of return.
  Parker holds no responsibility for case contents and will only replace parts if required or deemed necessary.

- **An external inspection of the complete assembly.**
  The particle counter will be thoroughly checked for signs of damage or misuse and if necessary an estimate of the cost of repair will be provided.

- **Full functionality test.**
  This includes visual inspection of internal parts and their operation.

- **Replacement of any defective or damaged parts.**
  No corrective work will be carried out on the product returned without the authorization from the end user.

- **Recalibration (with a Certificate valid for 12 months).**
  Each unit is calibrated to the relevant ISO standards.
  The recalibration procedure does not include the replacement of any damaged components that have been deemed defective through negligence or misuse.
Single Point Sampler
Online Sampling

Lightweight and compact connection

The effective link to ensure accurate contamination monitoring

The SPS (Single Point Sampler) is a lightweight, compact and easy to use online sampling unit that connects an icountLCM20 or H₂Oil to a single pressure test point in a fluid system. Suitable for use with mineral and biodegradable oils, petroleum based and phosphate ester fluids, the SPS offers fingertip operated control even at high pressures - 420 bar (6000 PSI) rated maximum pressure.

Contact Information:
Parker Hannifin
Hydraulic Filtration

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

Product Features:
- Lightweight, compact and easy to use online sampling unit.
- Connects an icountLCM20 or H₂Oil to a single pressure test point in a fluid system.
- Suitable for use with mineral and biodegradable oils, petroleum based and phosphate ester fluids.
- 420 bar (6000 PSI) rated maximum pressure
Single Point Sampler
Online Sampling

Features & Benefits

The Single Point Sampler provides a means to connect an icountLCM20 or H2Oil to a single pressure test point and balance the differential pressure across the system, to provide a controlled flow of oil into the icountLCM20 or H2Oil and away into a waste oil receptacle.

- Lightweight, compact and easy to use design
- Fingertip operated control valve even at high pressures
- 420 bar (6,000PSI) rated
- Facilitates testing from large diameter pipework
- Capability to test up to 500cSt viscosity oils (pressure permitting)
- Pressure compensated flow control mechanism
- Possible to control the valve with the same level of accuracy whether the device is operating at high or low pressure
- Capable of allowing a flow rate in excess of 10ml/min when operating at any viscosity within the product specification
- Suitable for fluid temperatures from +5°C to +80°C (+41°F to +176°F)
- High quality polished finish. (Stainless steel/ aircraft grade aluminium)

- Capable of working with an icountLCM20 or H2Oil connected into a system via the standard one metre extension hose kit
- Suitable for use with mineral and biodegradable oils, petroleum based and phosphate ester fluids
- Phosphate ester version utilises the 5/8” BSF HSP style fitting
- Designed so that it meets the lowest possible level of magnetic permeability
- Supplied with accessories kit
- It will maintain the set flow rate between upper and lower limits within a 100 bar inline pressure change
- Clear product identification to ensure that it is connected correctly. (i.e. downstream of the icountLCM20 or H2Oil)

Connection Instructions

1. Ensure valve is closed (A).
2. Connect P2 on icountLCM20 or H2Oil (B) to P2 on Single Point Sampler (SPS) (C).
3. Connect drain line on SPS (D).
4. Connect P1 of icountLCM20 or H2Oil (E) to the system (F).
5. The SPS is ready to operate.
6. Open valve (A) slowly until the oil flows continuously from the drainline (D) into a reservoir or receptacle (R).
7. Switch on monitor and begin testing.

icountLCM20 Only

Carry out flow test as shown in the manual. If test is showing below Δt 3.6°C then carry out test as normal. If, however, test is above Δt 3.6°C then increase oil flow by turning valve (A) anticlockwise and then carry out flow test. Do this until Δt is below 3.6°C and carry out test as normal once achieved.

WARNING! Ensure that SPS valve is closed and icountLCM20 or H2Oil is connected to the SPS BEFORE connection to system.
Specification

Fluid compatibility:
Mineral oil and petroleum based fluids (standard version).
Aggressive fluid (dual seal version) for other fluids consult Parker Hannifin.

Seals:
Fluorocarbon or Perfluoroelastomer.

Maximum working pressure:
420 bar (6000 psi).

Weight:
500 grams max. (Not including hoses).

Packaging standard:
Cardboard carton (military usage - plastic carry case).

Unit size:
45mm dia x 123mm long. (1.77in dia x 4.8in long).

System connection:
Standard - M16 (G1/4” BSP) with cap,
Aggressive - 5/8” BSF HSP.

Operating temp range:
+5°C to +80°C (+41°F to +176°F).

Storage temperature range:
-26°C to +80°C (-15°F to +176°F).

Construction:
Body: Aluminium BS 1470 – pressurised end stainless steel.
Finish: Anodised blue (standard version) - Mineral Oil.
Anodised red (dual seal version) - Aggressive Oil.

Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPS2021</td>
<td>SPS.2021</td>
<td>Single point sampler (Mineral Oil fluids)</td>
</tr>
<tr>
<td>SPS2061</td>
<td>SPS.2061</td>
<td>Single point sampler (Aggressive/phosphate ester fluids)</td>
</tr>
<tr>
<td>ACCNH0023</td>
<td>884184</td>
<td>Waste bottle (Universal)</td>
</tr>
<tr>
<td>ACCNH0081</td>
<td>884224</td>
<td>Extension hose/coupling (Mineral fluids)</td>
</tr>
<tr>
<td>ACCNH0082</td>
<td>884225</td>
<td>Extension hose/coupling (Aggressive/phosphate ester fluids)</td>
</tr>
<tr>
<td>ACCNH0083</td>
<td>884178</td>
<td>Waste hose (Mineral Oil)</td>
</tr>
<tr>
<td>ACCNH0084</td>
<td>884177</td>
<td>Waste hose (Aggressive/phosphate ester fluids)</td>
</tr>
</tbody>
</table>

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.
A proven method of accurate condition monitoring of a system

Effective inline sensors and monitors for fluid condition monitoring

Inline System20 sensors and hand-held monitors designed to give accurate and instant fluid system readings of flow, pressure and temperature. 3 sizes of inline System20 sensor for pressures up to 420 bar, an analogue monitor that utilizes 3 day-glow gauges with protective cover. EM20 electronic monitor with full digital display and 300 test memory.

Contact Information: Parker Hannifin
Hydraulic Filtration

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

Product Features:

• 2 types of System20 sensor are available. STI=industrial with reverse flow capability. STS=Mobile without reverse flow capability.
• 3 sizes of industrial inline System20 sensor for pressures up to 420 bar. 2 sizes of Mobile System20 sensor.
• Analogue monitor utilizes 3 day-glow gauges with protective cover.
• EM20 electronic monitor with full digital display and 300 test memory.
• For use with all mineral oils, water and oil/water emulsions.
System20
Inline Sensors & Monitors

Features & Benefits

Covering a wide range of flow rates, fluid types and applications, Parker’s System 20 sensors are designed to be used with System 20 electronic or analogue monitors, icountLCM, icountPD and the H2Oil. Specially developed System20 sensors are available for use with aggressive fluids. (EPDM Seals)

- System20 monitors, combined with the inline sensor, give the user accurate and instant readings of flow, pressure and temperature without the need for costly system downtime.
- For use with all mineral oils, water and water/oil emulsions.

**Analogue Monitor**

- Utilises 3 Day-Glo dial gauges with a protective hinged cover.
- Calibrated up to 380 l/min with dual scale bar/PSI & °C/°F. (USGPM also available)

**EM20 Electronic Monitor**

- Gives a full digital display.
- Automatically calibrated for all 3 sizes of sensor.
- Indicates line, differential and rising peak pressure.
- Easily scrolled from metric to US.
- 300 test memory.
- Capable of downloading saved data to download software.

Typical Applications

- Drilling equipment
- Mining
- Grinding and conveying
- Industrial hydraulics
- Mobile applications

Hydraulic system users need to ensure that lost production is kept to the absolute minimum. To ensure this, predictive maintenance utilising routine condition monitoring of hydraulic systems is essential.

System20 inline sensors remain at the heart of condition and contamination monitoring. Whether you’re mining the coal, building the new bypass, harvesting the crops, crossing the oceans or drilling offshore – whatever your industry, System20 represents the premier system monitoring available today.
System20
Inline Sensors & Monitors

Specification: Sensors

Construction:
Industrial: (STI)
Body: S/Steel 303
Internal components: S/Steel and Brass
Mobile: (STS)
Body: S/Steel 303
Internal components: Cast Aluminium and S/Steel

Flow capacities:
All suitable for use with oil, water and oil/water emulsion
Size 0: 6-25 l/min (1.58 - 6.6 US GPM)
Size 1: 20-100 l/min (5.28 - 26.41 US GPM)
Size 2: 80-380 l/min (21.13 - 100.38 US GPM)

Max. working pressure:
420 bar (6000PSI)

Capability:
Reverse flow (STI only)

Pressure drop:
At max. rated flow, Δp is 1.1 bar (mineral oil fluid at 30 cSt 140 SSU).

Ports:
Size 0: G 3/8
Size 1: G 3/4
Size 2: G 1¼

Repeatability:
±1% FSD

Accuracy:
Flow ±2.5% full scale deflection*

Weight:
Size 0: 0.5kg (1.2lbs)
Size 1: 3.5kg (8.4lbs)
Size 2: 4.4kg (9lbs)

Aggressive Fluid Applications:
EPDM internal/external seals

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: Mobile Sensors are also available - Contact Parker
Note 4: *Accuracy 5.5% > 95 L/min. (Applies to STI1144100 and STI1148100 only)

<table>
<thead>
<tr>
<th>Size</th>
<th>Model</th>
<th>AØ</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>STI</td>
<td>30</td>
<td>96</td>
<td>56</td>
</tr>
<tr>
<td>1</td>
<td>STI</td>
<td>41</td>
<td>137</td>
<td>66.5</td>
</tr>
<tr>
<td>2</td>
<td>STI</td>
<td>66.5</td>
<td>231.3</td>
<td>73.5</td>
</tr>
<tr>
<td>1</td>
<td>STS</td>
<td>41</td>
<td>105</td>
<td>79</td>
</tr>
<tr>
<td>2</td>
<td>STS</td>
<td>60</td>
<td>165</td>
<td>97</td>
</tr>
</tbody>
</table>

Dimensions (mm)

System20 Saving £50,000 Pump Damage

Installing System 20 was part of a major restructuring plan to improve mining effectiveness and profitability. Machine operator training and oil storage operative training were essential elements of the plan. Prior to this investment, pump terminal damage could cost £10,000 for a replacement, over £1000 service costs and up to £39,000 in lost production. Add to this the difficulties of the mine’s geography and it’s easy to see the problems that have now been overcome.

Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Size</th>
<th>Flow range l/min</th>
<th>Fluid type</th>
<th>Port threads</th>
<th>Reverse Flow capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>STI1144100</td>
<td>STI1144.100</td>
<td>0</td>
<td>6-25</td>
<td>Mineral</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI1148100</td>
<td>STI1148.100</td>
<td>1</td>
<td>20-100</td>
<td>Mineral</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI2144100</td>
<td>STI2144.100</td>
<td>0</td>
<td>6-25</td>
<td>Aggressive</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI2148100</td>
<td>STI2148.100</td>
<td>1</td>
<td>20-100</td>
<td>Aggressive</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI1144100</td>
<td>STI1144.100</td>
<td>2</td>
<td>80-380</td>
<td>Mineral</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI1148100</td>
<td>STI1148.100</td>
<td>2</td>
<td>80-380</td>
<td>Aggressive</td>
<td>⅝</td>
<td>Yes</td>
</tr>
<tr>
<td>STI5117210</td>
<td>STI5.117.210</td>
<td>1</td>
<td>20-100</td>
<td>Mineral</td>
<td>⅝</td>
<td>No</td>
</tr>
<tr>
<td>STI3217210</td>
<td>STI3.217.210</td>
<td>2</td>
<td>80-380</td>
<td>Mineral</td>
<td>⅝</td>
<td>No</td>
</tr>
</tbody>
</table>

Note 1: Port 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: Mobile Sensors are also available - Contact Parker
Note 4: *Accuracy 5.5% > 95 L/min. (Applies to STI1144100 and STI1148100 only)

System20 reduces the cost of lost Production

The mining industry puts a considerable demand on hydraulics and there are others such as agricultural machinery, harvesters or tractors and, for example, cement manufacturing plants that are equally demanding of hydraulic efficiency.

A grinding and conveying plant processes in excess of 1000 tons of ore per day in the manufacture of cement products. A days lost production costs £000’s. After one year of operation the Plant Engineers decided to invest in System20 equipment, strategically placed to allow the Engineers to “fault-find” the major components quickly and easily. The result is that downtime and loss of production have been reduced by 80%.
System20
EM20 Electronic Monitor

Electronic Monitor Specification

Construction:
A sealed assembly requiring no routine maintenance or adjustment. Body moulding in Acrylonitrile Butadene Styrene (ABS). Key pad moulded in silicon rubber. The monitor is suitable for use with all mineral oils, water and oil/water emulsions.

LCD details
Flow section:
The analogue flow scale has reverse flow and overflow indication and provides a percentage reading of the digital full scale display automatically calibrated for all sizes of System 20 Sensor.

Pressure section:
Designed to indicate line pressure, differential pressure and rising peak pressure. Connected to a System 20 Sensor it will monitor pressure up to 420 bar (6000 psi) with an accuracy of ±1% FSD.

Temperature section:
Temperature reading between -10°C and +110°C (14°F to 230°F).

Weight:
1.4kg (3lbs).

Data logging:
Each test logs the following data:
Test number; time & date; sensor size; media tested; flow rate, pressure & temperature.

Data download:
The System 20 electronic monitor is capable of downloading saved test data to a compatible PC via an RS232 connection using datum.

Batteries:
6 x AA batteries.

Re-calibration:
Annual certification by an approved Parker Service Centre.

Dimensions (mm)

Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM209000</td>
<td>EM20.9000</td>
<td>System 20 electronic monitor</td>
</tr>
<tr>
<td>ACC28N0000</td>
<td>PS56507</td>
<td>Transit case</td>
</tr>
<tr>
<td>ACC28N001</td>
<td>E85617</td>
<td>Dongle and cable assembly</td>
</tr>
</tbody>
</table>

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.
System20
Analogue Monitor

Analogue Monitor Specification

Construction:
A sealed assembly requiring no routine maintenance or adjustment. Body moulding in Acrylonitrile Butadene Styrene (ABS). The monitor is suitable for use with all mineral oils, water and oil-water emulsions. The monitor has 3 dayglo dial gauges and features a protective hinged cover.

Gauge details
Flow section:
The flow scale has double scales for size 1 and 2 sensors only. Calibrated up to 100 l/min (26 US GPM) and 380 l/min (100 US GPM). The flow dial has excess-flow indication.

When the system is in reverse flow or when the high pressure lines to the sensor have been transposed, a ‘below zero’ indication is given.

Pressure section:
Dial readings in both bar and psi up to 420 bar (6000psi).

Temperature section:
The temperature dial gives readings between -10°C and +110°C (14°F to 230°F).

Weight:
1.4kg (3lbs).

A viscosity chart is provided for mineral oil applications where monitoring is required at variable viscosities (cSt).

Note: For measuring size Ø sensors - contact Parker

Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Media type</th>
<th>Flow readings</th>
<th>Pressure readings</th>
<th>Temperature readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM6211110</td>
<td>STM6211110</td>
<td>Oil</td>
<td>l/min</td>
<td>Dual scale bar/PSI</td>
<td>Dual scale °C/°F</td>
</tr>
<tr>
<td>STM6611110</td>
<td>STM6611110</td>
<td>Oil</td>
<td>US GPM</td>
<td>Dual scale bar/PSI</td>
<td>Dual scale °C/°F</td>
</tr>
<tr>
<td>STM6211120</td>
<td>STM6211120</td>
<td>Water</td>
<td>l/min</td>
<td>Dual scale bar/PSI</td>
<td>Dual scale °C/°F</td>
</tr>
<tr>
<td>STM6611120</td>
<td>STM6611120</td>
<td>Water</td>
<td>US GPM</td>
<td>Dual scale bar/PSI</td>
<td>Dual scale °C/°F</td>
</tr>
</tbody>
</table>

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Accessories

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC6NJ000</td>
<td>P653601</td>
<td>Transit case</td>
</tr>
<tr>
<td>ACC6NJ002</td>
<td>P653105</td>
<td>Metal sensor protective cap</td>
</tr>
</tbody>
</table>
MCM20
Autoremote Particle Counter

Permanent installation ensures 24/7 monitoring of systems

Online continuous particle counting to protect fluid systems

MCM20 online continuous particle counting ensures constant system monitoring within defined parameters. PC/PLC controlled, it can be pre-set to carry out tests at specific intervals and connects permanently to a System20 sensor via a 2-metre hose assembly.

Product Features:

- MCM20 online continuous particle counting ensures constant system monitoring within defined parameters.
- Calibration carried out to ISO11171 via ISO11943 principles. Multi-standard ISO and NAS reporting including full count/100 ml. detection at size ranges.
- Interactive handset options available for direct test sequencing, change test parameters and last test results.
- PC/PLC controlled.
- Can be pre-set to carry out tests at specific intervals.
- Connects permanently to System20 sensors via 2 metre hose assembly.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
MCM20
Autoremote Particle Counter

Features & Benefits

- The MCM20 is an online continuous particle counter ensuring constant system monitoring within defined parameters.
- PC/PLC controlled
- Ensures constant system monitoring.
- Can be pre-set to carry out tests at specific intervals.
- Can be set up via optional detachable Handset.
- Enclosed in a metal casing, with internal workings on a removable chassis for ease of service and calibration.
- Connects permanently to System20 sensors via 2 metre hose assembly (supplied).
- Simple data formatting programme for trend analysis.

Typical Applications

- Test rigs
- Construction machinery
- Industrial plant
- Hydraulic equipment & system manufacturers
- Paper processing
- Steel rolling mills
- Military equipment application

The Parker MCM20

Using proven portable particle counting technology (icountLCM20), the MCM20 and its principles are available to users where continuous, permanent installed monitoring is required.

The MCM20 utilises the latest laser diode method of particle counting. The unit is enclosed in a metal casing with access to the hydraulic connection, DC input power, fuse holder and PC/PLC connection ports located on the front panel.

The internal workings are manufactured onto a removable chassis for ease of service and calibration.
**Test cycle time:**
Variable between 30 seconds and 3 minutes.

**Repeat test time:**
Continuous Mode or between 30 seconds and 1440 minutes (24 Hours).

**Principle of operation:**
Optical scanning analysis and measurement of actual particles.

**Particle counts:**
6 channels either ACFTD or MTD calibrated.

**International codes:**
ISO 7-22, NAS 0-12.

**Storage temperature:**
-40°C to +80°C (104°F to 176°F).

**Operating temperature:**
+5°C to +60°C (41°F to 140°F) (hydraulic oil temperature).

**Unit control connection:**
Terminal protocol via RS 232 or optional handset.

**Data retrieval:**
Local PC / PLC program or by optional handset.

**Calibration:**
By accepted on-line methods confirmed by relevant International Standard Organisation procedures.

**Re-calibration:**
Annual certification by an approved Parker Service Centre.

**Max. working pressure:**
420 bar (6000 PSI).

**Minimum working pressure:**
2 bar (29 PSI).

**Fluid compatibility:**
Mineral oil or petroleum based fluids; Aggressive fluid version also available.

**Sample requirements:**
0.3 – 1.5 DP bar (differential pressure) via approved inline sampling concept.

**System connection:**
Via System 20 inline sensors / single point sampler

**Computer compatibility:**
Interface via RS 232 connection @ 9600 baud rate.

**Weight:**
8.75kg.

**Power requirement:**
12 Vdc input. (1.25A (T) fuse). Regulated.

**Installation:**
Back/base M6x1.0 mounting inserts (see annotated diagrams).

**Software:**
LabView demonstration software.

---

**Dimensions (mm)**

![Dimensions Diagram]
**MCM20**

**Autoremote Particle Counter**

The comms protocol for the product is as follows:
Baud rate = 9600
Data bits = 8
Parity = None
Stop bits = 1
Flow control = None

- Customised demonstration/software for MCM operation.
- Full graphic display.
- Visual indication of limit parameters.

**Standard products table**

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM202022</td>
<td>MCM20.2022</td>
<td>A remote particle counter for mineral fluids (MTD calibrated)</td>
</tr>
<tr>
<td>MCM202022HS</td>
<td>MCM20.2022 HS</td>
<td>A remote particle counter for mineral fluids (MTD calibrated) with Handset</td>
</tr>
<tr>
<td>MCM202021</td>
<td>MCM20.2021</td>
<td>A remote particle counter for mineral fluids (ACFTD calibrated)</td>
</tr>
<tr>
<td>MCM202021HS</td>
<td>MCM20.2021 HS</td>
<td>A remote particle counter for mineral fluids (ACFTD calibrated) with Handset</td>
</tr>
<tr>
<td>MCM202061</td>
<td>MCM20.2061</td>
<td>A remote particle counter for aggressive fluids (ACFTD calibrated)</td>
</tr>
<tr>
<td>MCM202061HS</td>
<td>MCM20.2061 HS</td>
<td>A remote particle counter for aggressive fluids (ACFTD calibrated) with Handset</td>
</tr>
<tr>
<td>MCM202062</td>
<td>MCM20.2062</td>
<td>A remote particle counter for mineral fluids (MTD calibrated)</td>
</tr>
<tr>
<td>MCM202062HS</td>
<td>MCM20.2062 HS</td>
<td>A remote particle counter for mineral fluids (MTD calibrated) with Handset</td>
</tr>
<tr>
<td>ACC6NB001</td>
<td>B94106</td>
<td>Handset (blue keypad) mineral fluids</td>
</tr>
<tr>
<td>ACC6NB002</td>
<td>B94107</td>
<td>Handset (red keypad) aggressive fluids</td>
</tr>
<tr>
<td>ACC6NN003</td>
<td>B94802</td>
<td>2 meter mineral hose assembly</td>
</tr>
<tr>
<td>ACC6NN004</td>
<td>B94801</td>
<td>2 meter aggressive hose assembly</td>
</tr>
</tbody>
</table>

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.
icountPD
Online Particle Detector
For mineral oil, aggressive fluids or fuels

(ATEX approved versions available)

Independent monitoring of system contamination trends

The icountPD Particle Detector from Parker represents the most up to date technology in particle detection. The design dynamics, attention to detail and moulding compactness of the permanently mounted, on-line particle detector module, combined with on-board, laser based, leading-edge technology, brings to all industries a truly revolutionary, particle detector as a remarkable cost effective market solution to fluid management and contamination control.

Product Features:

- Independent monitoring of system contamination trends.
- Warning LED or digital display indicators for Low, Medium and High contamination levels.
- Visual indicators with power and alarm output warnings.
- Moisture %RH indicator (optional).
- Cost effective solution to prolong fluid life and reduce machine downtime.
- M12 8 pin or Deutsch Connector options.
- Continuous performance for prolonged analysis.
- Fuel, Hydraulic and phosphate Ester fluid compatible construction.
- Self diagnostic software.
- Full PC/PLC integration technology such as:- RS232 and 0-5Volt, 4-20mA, CAN(J1939) (Contact Parker for other options).
- Set up and Data logging support software included.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
icountPD
Online Particle Detector

Features & Benefits

Diagnostic Self Check Start-up Time:
Customer selectable 5-900 seconds

Measurement Period:
5 to 180 seconds

Reporting interval through RS232:
0 to 3600 seconds

Digital -/LED display update time:
Every second

Limit Relay Output:
Changes occur +/- 1 ISO code at set limit (Hysteresis ON) or customer set (Hysteresis OFF)

Particle / % RH Output Signal:
Continuous

Principle of operation:
Laser diode optical detection of actual particulates

International Codes:
ISO 7 – 22, NAS 0 – 12

Calibration:
By recognised online methods confirmed by the relevant ISO procedures

MTD – Via a certified primary ISO 11171 automatic particle detector using ISO 11943 principles, with particle distribution reporting to ISO 4406:1996

ACFTD – Conforming to ISO 4402 principles with particle distribution reporting to ISO 4406:1996

Recalibration:
Contact Parker Hannifin

Performance:
+/– 1 ISO Code (Dependant on stability of flow)

Reproducibility / Repeatability:
Better than 1 ISO Code

Power Requirement:
Regulated 9 to 40Vdc

Current Rating:
Typically 120mA

Hydraulic Connection:
Mineral M16x2 test Points
Aggressive: 5/8” BSF test Points
Fuel: No test Points 1/8 BSP (Female) Ports (Plugged)

Required Flow Range through the icountPD:
40 to 140 ml/min (Optimum Flow = 60ml/min)

Online Flow Range via System 20 Inline Sensors (Hydraulic systems only):
Size 0 = 6 to 25 l/min - (Optimum Flow = 15 l/min)
Size 1 = 24 to 100 l/min - (Optimum Flow = 70 l/min)
Size 2 = 170 to 380 l/min - (Optimum Flow = 250 l/min)

Required Differential Pressure across Inline Sensors:
0.4 bar (Minimum)

Viscosity Range:
1-500 cSt

Temperature:
Ambient storage temperature -20°C to +40°C (-4°F to +104°F)
Environment operating temperature +5°C to +60°C (+41°F to +140°F)
Fluid operating temperature +5°C to +80°C (+41°F to +176°F)

Working pressure:
2 to 420 bar (30-6000 PSI)

Moisture sensor calibration (Not offered with the fuel version):
±5% RH (over compensated temperature range of +10°C to +80°C)
(+50°F to +176°F)

Operating humidity range:
5% RH to 100% RH

Moisture sensor stability:
±0.2% RH typical at 50% RH in one year

Certification:
IP66 rated. Refer to the EC Declaration of Conformity.

EMC/RFI – EN61000-6-2:2001
EN61000-6-3:2001

Materials:
User friendly Abs construction.
Stainless Steel hydraulic block.

Dimensions:
182mm x 155mm x 86mm (7.2” x 6.1” x 3.4”)

Weight:
1.3kg (2.9lb)

Seals:

Computer Compatibility:
Parker recommends the use of a 9-way D-type connector. This can be connected to a USB port using a USB-serial adaptor. Note that these connectors/adaptors are NOT supplied with icountPD units: contact Parker Hannifin for advice.

icountPD for use with aviation fuels

Field Data - Major International Airport

First 3 measurements represent fuel from a previous cargo followed by a regular clean delivery, thus demonstrating the range of fuel cleanliness being experienced at this particular location.
Dimensions / Installation Details

Typical Applications

- Mobile Equipment
  - Earth Moving Machinery
  - Harvesting
  - Forestry
  - Agriculture
Monitoring of the hydraulics, enabling the vehicles to function to their best capability under load conditions through pistons, servo valves, control rams and gear pumps.

- Industrial Equipment
  - Production Plants
  - Fluid Transfers
  - Pulp & Paper
  - Refineries
To monitor the cleanliness of the equipment throughout the production line, from the machine tool controlled hydraulics through to contamination of fluid transfer. Ensuring the integrity of the fluid is maintained throughout the refining process.

- Power Generation
  - Wind Turbines
  - Gearboxes
  - Lubrication Systems
With continuous monitoring the optimum level is achieved in the least amount of time.

- Maintenance
  - Test Rigs
  - Flushing Stands
To increase efficiency of your equipment by continuously monitoring the cleanliness level of the hydraulic fluid.

- Fuel Contamination Detection
  - Fuel Storage Tanks
  - Vehicle fuel tanks
  - Uploading fuel into an aircraft
24/7 detection of particulate levels in most fuels including aviation fuel - Jet A-1 fuel specification.

Maximum Torque 5Nm
**M12 Communication cable: wiring configuration**

<table>
<thead>
<tr>
<th>Pin</th>
<th>4-20mA option connections</th>
<th>0-5v/0-3v option connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NOT USED</td>
<td>NOT USED</td>
</tr>
<tr>
<td>2</td>
<td>RS232 Ground (Pin 5**))</td>
<td>RS232 Ground (Pin 5**))</td>
</tr>
<tr>
<td>3</td>
<td>Channel A, ISO 4µm (c)*</td>
<td>Channel A, ISO 4µm (c)*</td>
</tr>
<tr>
<td>4</td>
<td>Channel B, ISO 6µm (c)* or NAS (if selected)</td>
<td>Channel B, ISO 6µm (c)* or NAS (if selected)</td>
</tr>
<tr>
<td>5</td>
<td>RX232 Receive (Pin 3**)</td>
<td>RX232 Receive (Pin 3**)</td>
</tr>
<tr>
<td>6</td>
<td>RS232 Transmit (Pin 2**)</td>
<td>RS232 Transmit (Pin 2**)</td>
</tr>
<tr>
<td>7</td>
<td>Moisture sensor channel (if fitted)</td>
<td>Moisture sensor channel (if fitted)</td>
</tr>
<tr>
<td>8</td>
<td>Channel C, ISO 14µm (c)*</td>
<td>Channel C, ISO 14µm (c)*</td>
</tr>
</tbody>
</table>

**Important Note:** It is the responsibility of the end user to ensure that the cable's braided screen is terminated to a suitable earth bonding point.

* Optional – refer to the ‘icountPD part number specifier’ section in this manual.

** A standard USB serial adaptor can be used with the recommended 9-way D-type connector to convert RS232 to USB.

**Limit relay alarm levels**

The icountPD can be specified with a built-in limit switch relay which can be triggered when a preset alarm level is reached. The relay contacts can be used to switch on or off an external device.

**M12 Supply and Relay (if fitted) cable**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Current loop options connections</th>
<th>0-5v/0-3v option connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product supply 9-40Vdc</td>
<td>Product supply 9-40Vdc</td>
</tr>
<tr>
<td>2</td>
<td>4-20mA Supply 12-20Vdc</td>
<td>0-5 / 0-3V Supply 12-24Vdc</td>
</tr>
<tr>
<td>3</td>
<td>Relay (Normally Closed)*** (if fitted)</td>
<td>Relay ( Normally Closed)*** (if fitted)</td>
</tr>
<tr>
<td>4</td>
<td>Relay (Normally Open)*** (if fitted)</td>
<td>Relay (Normally Open)*** (if fitted)</td>
</tr>
<tr>
<td>5</td>
<td>NOT USED</td>
<td>NOT USED</td>
</tr>
<tr>
<td>6</td>
<td>NOT USED</td>
<td>0-5V / 0-3V Supply 0 Vdc</td>
</tr>
<tr>
<td>7</td>
<td>Main supply 0Vdc</td>
<td>Product supply 0Vdc</td>
</tr>
<tr>
<td>8</td>
<td>Relay (Common)*** (if fitted)</td>
<td>Relay (Common)*** (if fitted)</td>
</tr>
</tbody>
</table>

**Note:** If the moisture sensor is fitted without either option then the output is RS232. Parker Hannifin recommend that the mating M12 connector cables are screened. These cables are available from Parker Hannifin – ordering information section.

*** Optional – refer to ordering information section.

**(Limit Relay Wiring Instructions)**

**NORMALLY OPEN**

**NORMALLY CLOSED**

**COMMON**

---

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Variable mA output settings

The following table can be used to equate the analogue output to an ISO or NAS Code.

Example ISO code 12 is equal to 10mA

<table>
<thead>
<tr>
<th>mA</th>
<th>ISO</th>
<th>mA</th>
<th>NAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>4</td>
<td>00</td>
</tr>
<tr>
<td>4.5</td>
<td>1</td>
<td>4.5</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>5.5</td>
<td>3</td>
<td>5.5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>6.5</td>
<td>5</td>
<td>6.5</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>7.5</td>
<td>7</td>
<td>7.5</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>8.5</td>
<td>9</td>
<td>8.5</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>9.5</td>
<td>11</td>
<td>9.5</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>10.5</td>
<td>13</td>
<td>10.5</td>
<td>13</td>
</tr>
<tr>
<td>11</td>
<td>14</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>11.5</td>
<td>15</td>
<td>11.5</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>16</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>12.5</td>
<td>17</td>
<td>12.5</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>18</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>13.5</td>
<td>19</td>
<td>13.5</td>
<td>19</td>
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<tr>
<td>14</td>
<td>20</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>14.5</td>
<td>21</td>
<td>14.5</td>
<td>21</td>
</tr>
<tr>
<td>15</td>
<td>22</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>15.5</td>
<td>22</td>
<td>15.5</td>
<td>22</td>
</tr>
<tr>
<td>16</td>
<td>22</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>16.5</td>
<td>22</td>
<td>16.5</td>
<td>22</td>
</tr>
<tr>
<td>17</td>
<td>22</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>17.5</td>
<td>22</td>
<td>17.5</td>
<td>22</td>
</tr>
<tr>
<td>18</td>
<td>22</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>18.5</td>
<td>22</td>
<td>18.5</td>
<td>22</td>
</tr>
<tr>
<td>19</td>
<td>22</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>19.5</td>
<td>22</td>
<td>19.5</td>
<td>22</td>
</tr>
<tr>
<td>20</td>
<td>22</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>20.5</td>
<td>22</td>
<td>20.5</td>
<td>22</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
<td>21</td>
<td>22</td>
</tr>
</tbody>
</table>

Variable voltage output settings

The variable voltage output option has the capability of two different voltage ranges: a 0–5Vdc range as standard, and a user-selectable 0–3Vdc range. The ‘Full list of commands’ on how to change the voltage output, are available from Parker.

The following tables can be used to relate the analogue output to an ISO or NAS code.

For example, in a 0–5Vdc range, ISO code 16 is equal to an output of 3.5Vdc. In a 0–3Vdc range, ISO code 8 is equal to an output of 1.0Vdc.

Table relating ISO codes to Voltage output

<table>
<thead>
<tr>
<th>ISO</th>
<th>Err</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5Vdc</td>
<td>&lt;0.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.9</td>
<td>2.1</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>0–3Vdc</td>
<td>&lt;0.15</td>
<td>0.2</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>1.2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

cont.

<table>
<thead>
<tr>
<th>ISO</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>Err</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5Vdc</td>
<td>2.7</td>
<td>2.9</td>
<td>3.1</td>
<td>3.3</td>
<td>3.5</td>
<td>3.7</td>
<td>3.9</td>
<td>4.1</td>
<td>4.3</td>
<td>4.5</td>
<td>4.7</td>
<td>&gt;4.8</td>
</tr>
<tr>
<td>0–3Vdc</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>&gt;2.45</td>
</tr>
</tbody>
</table>

Table relating NAS codes to Voltage output

<table>
<thead>
<tr>
<th>NAS</th>
<th>Err</th>
<th>00</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>Err</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5Vdc</td>
<td>&lt;0.4</td>
<td>0.6</td>
<td>0.9</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.7</td>
<td>3.0</td>
<td>3.3</td>
<td>3.6</td>
<td>3.9</td>
<td>4.2</td>
<td>4.5</td>
<td>&gt;4.6</td>
</tr>
<tr>
<td>0–3Vdc</td>
<td>&lt;0.2</td>
<td>N.S.</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.9</td>
<td>2.1</td>
<td>2.3</td>
<td>2.5</td>
<td>2.7</td>
<td>&gt;2.8</td>
</tr>
</tbody>
</table>
Digital display parameters (ISO 4406/NAS 1638)

Start up
1. Once the icountPD has been connected to a regulated power supply, the product logo is displayed for approximately five seconds as the icountPD performs a self system diagnostic check.
2. The icountPD then automatically starts monitoring using factory default test parameters.

Digital display indication
The digital display will show the actual measured codes, the channel (µ) size and the user definable limits. Note that the channel size and limits are displayed alternately.
The Moisture Sensor reading (%RH) will also be shown – if the Moisture Sensor option is fitted.
The order of trigger for both the codes and Moisture Sensor option is:
- Solid digit(s) = code(s) that are at or below the set point (limit)
- Flashing digit(s) = code(s) that are above the set point (limit)
The display for ISO4406 and NAS1638 are identical.

Error detection:
In the unlikely event of an error occurring, the digital display on the icountPD will simply display the actual error code only – i.e. ERROR 13 (A full list of error codes are detailed in the IcountPD User Manual).

Moisture sensor output settings
The Moisture Sensor is an option that can be included when ordering the icountPD.
The Moisture Sensor reports on the saturation levels of the fluid passing through the icountPD sensing cell. The output is a linear scale, reporting within the range of 5% saturation to 100% saturation.

Table relating Saturation levels in the sensing cell to icountPD outputs
<table>
<thead>
<tr>
<th>Saturation</th>
<th>4–20mA</th>
<th>0–3Vdc</th>
<th>0–5Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>4.8</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>25%</td>
<td>8</td>
<td>0.75</td>
<td>1.25</td>
</tr>
<tr>
<td>50%</td>
<td>12</td>
<td>1.50</td>
<td>2.50</td>
</tr>
<tr>
<td>75%</td>
<td>16</td>
<td>2.25</td>
<td>3.75</td>
</tr>
<tr>
<td>100%</td>
<td>20</td>
<td>3.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>
Flow control ACC6NN019

A pressure compensated, flow control device (Parker Hannifin part number ACC6NN019) has been develop to give the icount PD greater flexibility.

The flow control device enables testing where flow ranges are out side the icountPD specification i.e. (40 – 140 ml/min), or where pipe diameters do not allow the icountPD to be installed.

The flow control device fits onto the downstream (outlet) side of the icountPD. A 06L EO 24 deg cone and hydraulic adaptor is supplied which enables connection directly to the icountPD. Alternatively the flow control device can be fitted further down stream.

The compact design requires no setting up or further user intervention as long as the system conditions remain within the recommended pressure and viscosity ranges as below.

<table>
<thead>
<tr>
<th>Working pressure range</th>
<th>10 to 300 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential pressure range</td>
<td>10 to 300 bar</td>
</tr>
<tr>
<td>Working viscosity range</td>
<td>10 to 150 Cst</td>
</tr>
</tbody>
</table>

icountOS – Oil Sampler (IOS)

- New and under development in the detection of contamination distribution in various Aviation fuels*. 
- Portable monitoring tool providing fluid qualification to ISO 4406:1999 standards.
- Supplements the icount LCM20 and ACM20 product portfolio.
- Quick, simple to use monitoring tool for sampling fluids from containers, fuel bunkers and holding tanks.
- Field solution to Laboratory methods for the detection of solid contamination and free water inference.

see page 54

*To be announced
icountPD
Online Particle Detector

Hydraulic Connection Diagram

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Manual flow rate adjustable via control knob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting Type</td>
<td>4 off mounting holes to suit M6 screws (not supplied)</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td>Weight</td>
<td>1.7kg (3.7lb)</td>
</tr>
<tr>
<td>Fluid Temperature</td>
<td>5°C to +80°C (+41°F to 176°F)</td>
</tr>
<tr>
<td>Ambient storage temperature</td>
<td>-20°C to +40°C (-4°F to +104°F)</td>
</tr>
<tr>
<td>Viscosity range</td>
<td>20cSt to 500cSt (If lower than 20cSt contact Parker)</td>
</tr>
<tr>
<td>Differential pressure range</td>
<td>5 to 315 bar</td>
</tr>
<tr>
<td>Maximum pressure</td>
<td>315 bar</td>
</tr>
<tr>
<td>Flow direction</td>
<td>‘IN’ to ‘OUT’ flow control function</td>
</tr>
<tr>
<td>Port thread detail</td>
<td>1/8” BSPP (test points not supplied)</td>
</tr>
<tr>
<td>Internal Seals</td>
<td>Fluoroelastomer</td>
</tr>
</tbody>
</table>

This application shows uploading fuel into an aircraft with the icountPD in use to monitor as a ‘go/no go’ device.
Communication Options

The icountPD may be configured using the icountPD Setup Utility. For more direct control of the device using its communications protocol, you may also use the Microsoft Windows® HyperTerminal program, but note that this program is not currently supplied with the Windows Vista™ operating system. These two ways of communicating with icountPD are described in the following section.

icountPD Setup Utility software (supplied)

Communication Protocol

The Communication protocol for the serial communication link is to be used with Microsoft Windows HyperTerminal. The settings are as follows:

- Baud rate: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

The commands used with this product are made up of Read, Set and Start / Stop commands.

- Set commands allow the value or values of parameters to be set
- Read commands allow the value or values of parameters to be read
- Start/Stop allows the user to start and stop tests.

Example:

[SDF dd/mm/yy] - sets the date format.
[RDF] - reads the product date format.

All commands are sent in ASCII characters, and the protocol accepts both upper and lower case characters as the examples below:

SDF
SdF

Note: A full list of commands are detailed in the user manual.
## Ordering Information

### Standard Products Table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit relay</th>
<th>Communication</th>
<th>Moisture</th>
<th>Cable connector kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPD1222130</td>
<td>Mineral</td>
<td>MTD</td>
<td>LED</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1222230</td>
<td>Mineral</td>
<td>MTD</td>
<td>LED</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>YES</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1223130</td>
<td>Mineral</td>
<td>MTD</td>
<td>LED</td>
<td>YES</td>
<td>RS232 / 0 - 5V</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1223230</td>
<td>Mineral</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1232230</td>
<td>Mineral</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 0 - 5V</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1233130</td>
<td>Mineral</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPD1233230</td>
<td>Mineral</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 0 - 5V</td>
<td>YES</td>
<td>M12, 8 pin plug connector</td>
</tr>
</tbody>
</table>

### Product Configurator

<table>
<thead>
<tr>
<th>Key</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit relay</th>
<th>Communication</th>
<th>Moisture</th>
<th>Cable connector kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mineral</td>
<td>MTD</td>
<td>LED</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>2</td>
<td>Phosphate ester</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 0 - 5V</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>3</td>
<td>Aviation fuel (4 channel)</td>
<td>MTD</td>
<td>Digital</td>
<td>YES</td>
<td>RS232 / 0 - 5V</td>
<td>YES</td>
<td>M12, 8 pin plug connector</td>
</tr>
</tbody>
</table>

**Note**:
- Aviation Fuel option can also be used for Diesel fluids
- Note - RS485 option - communication up to 5000 Meters - Contact Parker
- Note - Wireless communication (GPRS - LAN - Wi-Fi - Sat) - Contact Parker

### Accessories

<table>
<thead>
<tr>
<th>Part number</th>
<th>Fluid type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC6NN002</td>
<td>Mineral</td>
<td>1 metre hose length</td>
</tr>
<tr>
<td>ACC6NN003</td>
<td>Aggressive</td>
<td>2 metre hose length</td>
</tr>
<tr>
<td>ACC6NN004</td>
<td>Aggressive</td>
<td>3 metre hose length</td>
</tr>
<tr>
<td>ACC6NN005</td>
<td>Aggressive</td>
<td>4 metre hose length</td>
</tr>
<tr>
<td>ACC6NN006</td>
<td>Aggressive</td>
<td>5 metre hose length</td>
</tr>
<tr>
<td>ACC6NN007</td>
<td>Aggressive</td>
<td>1/4 BSP fitting</td>
</tr>
<tr>
<td>ACC6NN008</td>
<td>Aggressive</td>
<td>3/8 BSP fitting</td>
</tr>
<tr>
<td>ACC6NN009</td>
<td>Aggressive</td>
<td>1/2 BSP fitting</td>
</tr>
<tr>
<td>ACC6NN010</td>
<td>Aggressive</td>
<td>3/4 BSP fitting</td>
</tr>
<tr>
<td>ACC6NN011</td>
<td>Aggressive</td>
<td>11/4 BSP fitting</td>
</tr>
<tr>
<td>ACC6NN012</td>
<td>Aggressive</td>
<td>3/8 BP5 fitting</td>
</tr>
<tr>
<td>SPS2001</td>
<td></td>
<td>Single point sampler</td>
</tr>
<tr>
<td>SPS2002</td>
<td></td>
<td>Contact Parker</td>
</tr>
<tr>
<td>SPS2074</td>
<td></td>
<td>Flow control valve</td>
</tr>
<tr>
<td>ACC6NN019</td>
<td>Contact</td>
<td>Contact Parker</td>
</tr>
<tr>
<td>ACC6NN013</td>
<td>Contact</td>
<td>12 volt regulated power supply</td>
</tr>
<tr>
<td>ACC6NN014</td>
<td>Contact</td>
<td>2 x 5 metre M12 - 8 pin cable kit</td>
</tr>
<tr>
<td>ACC6NN015</td>
<td>Deutsch</td>
<td>Deutsch Connector Kit</td>
</tr>
<tr>
<td>ACC6NN016</td>
<td>Deutsch</td>
<td>Deutsch Connector Kit</td>
</tr>
<tr>
<td>ACC6NN017</td>
<td>RS232</td>
<td>RS232 to USB cable kit</td>
</tr>
<tr>
<td>ACC6NN018</td>
<td>M12</td>
<td>M12 - 8 pin to RS232 engineers tool</td>
</tr>
</tbody>
</table>

* M12 Cable kit consists of two 5 mete cables to enable all output options

### Part number Table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Supersedes</th>
<th>Size</th>
<th>Flow range l/min</th>
<th>Fluid type</th>
<th>Port threads</th>
<th>Reverse Flow capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>STI0144100</td>
<td>STI.0144.100</td>
<td>0</td>
<td>6-25</td>
<td>Mineral</td>
<td>3/8</td>
<td>Yes</td>
</tr>
<tr>
<td>STI1144100</td>
<td>STI.1144.100</td>
<td>1</td>
<td>20-100</td>
<td>Mineral</td>
<td>3/4</td>
<td>Yes</td>
</tr>
<tr>
<td>STI2144100</td>
<td>STI.2144.100</td>
<td>2</td>
<td>80-380</td>
<td>Mineral</td>
<td>11/4</td>
<td>Yes</td>
</tr>
<tr>
<td>STI0148100</td>
<td>STI.0148.100</td>
<td>0</td>
<td>6-25</td>
<td>Aggressive</td>
<td>3/8</td>
<td>Yes</td>
</tr>
<tr>
<td>STI1148100</td>
<td>STI.1148.100</td>
<td>1</td>
<td>20-100</td>
<td>Aggressive</td>
<td>3/4</td>
<td>Yes</td>
</tr>
<tr>
<td>STI2148100</td>
<td>STI.2148.100</td>
<td>2</td>
<td>80-380</td>
<td>Aggressive</td>
<td>11/4</td>
<td>Yes</td>
</tr>
<tr>
<td>STS5117210</td>
<td>STS.5117.210</td>
<td>1</td>
<td>20-100</td>
<td>Mineral</td>
<td>3/4</td>
<td>No</td>
</tr>
<tr>
<td>STS5217210</td>
<td>STS.5217.210</td>
<td>2</td>
<td>80-380</td>
<td>Mineral</td>
<td>11/4</td>
<td>No</td>
</tr>
</tbody>
</table>
icountPDR
Robust Online Particle Detector

Customer Value Proposition

The icountPDR Robust Particle Detector from Parker represents the most up to date technology in particle detection. The design dynamics, attention to detail and moulding compactness of the permanently mounted, on-line particle detector module, combined with on-board, laser based, leading-edge technology, brings to all industries a truly revolutionary, particle detector as a remarkable cost effective market solution to fluid management and contamination control.

Product Features:

- Independent monitoring of system contamination trends.
- Rugged design ensures protection against environmental exposure.
- Small and compact device constructed in SS.
- Moisture %RH indicator (optional).
- Cost effective solution to prolong fluid life and reduce machine downtime.
- Continuous performance for prolonged analysis.
- Fuel, Hydraulic and phosphate Ester fluid compatible construction.
- Self diagnostic software.
- Full PC/PLC integration technology such as:- RS232 and 0-5Volt, 4-20mA, CAN(J1939) (Contact Parker for other options).
- Set up and Data logging support software included.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
icountPDR
Robust Online Particle Detector

Feature
Product start-up time
Measurement Period
Reporting interval
Principle of operation
International Codes
Calibration

Recalibration
Working pressure
Flow Range through the icountPDR

Online Flow Range via System 20 Sensors
Ambient storage temperature
Environment operating temperature
Fluid operating temperature
Computer Compatibility

Moisture sensor calibration
Operating humidity range
Moisture sensor stability
Power Requirement
Current Rating
Certification

Analogue output options (specified when ordering)
Variable current
Variable voltage
CAN-bus
Moisture sensor

Flow control

LOW TO MEDIUM VISCOSITY FLOW CONTROL OPTION
A pressure compensated, flow control device (Parker Hannifin part number ACC6NN023) has been developed to give the icountPDR user greater flexibility. The flow control device enables testing where flow ranges are outside the icountPDR specifications (i.e. 40–140 ml/min), or where pipe diameters do not allow the icountPDR to be installed.

The flow control device fits onto the downstream (outlet) side of the icountPDR. A 06L EO 24deg cone end hydraulic adaptor is supplied which enables connection directly to the icountPDR. Alternatively the flow control device can be fitted further down stream.

The compact design requires no setting up or further user intervention as long as the system conditions remain within the recommended pressure and viscosity ranges as below.

<table>
<thead>
<tr>
<th>Working pressure range</th>
<th>10 to 300bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential pressure range</td>
<td>10 to 300bar</td>
</tr>
<tr>
<td>Working viscosity range</td>
<td>10 to 150 Cst</td>
</tr>
</tbody>
</table>
Typical Applications

- **Mobile Equipment**
  - Earth Moving Machinery
  - Harvesting
  - Forestry
  - Agriculture

  Monitoring of the hydraulics, enabling the vehicles to function to their best capability under load conditions through pistons, servo valves, control rams and gear pumps.

- **Industrial Equipment**
  - Production Plants
  - Fluid Transfers
  - Pulp & Paper
  - Refineries

  To monitor the cleanliness of the equipment throughout the production line, from the machine tool controlled hydraulics through to contamination of fluid transfer. Ensuring the integrity of the fluid is maintained throughout the refining process.

- **Power Generation**
  - Wind Turbines
  - Gearboxes
  - Lubrication Systems

  With continuous monitoring the optimum level is achieved in the least amount of time.

- **Maintenance**
  - Test Rigs
  - Flushing Stands

  To increase efficiency of your equipment by continuously monitoring the cleanliness level of the hydraulic fluid.

- **Fuel Contamination Detection**
  - Fuel Storage Tanks
  - Vehicle fuel tanks
  - Uploading fuel into an aircraft

  24/7 detection of particulate levels in most fuels including aviation fuel - Jet A-1 fuel specification.
icountPDR
Robust Online Particle Detector

Connections

Variable current output settings
See page 44 (icountP) for tables and graphs that can be used to relate an analogue output (in mA) to an ISO and NAS code.

Variable voltage output settings
See page 44 (icountP) for tables that can be used to relate the analogue output to an ISO and NAS code.

Ordering Information

Product Configurator

<table>
<thead>
<tr>
<th>Key</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit Relay</th>
<th>Communication</th>
<th>Moisture sensor</th>
<th>Cable connector kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPDR</td>
<td>Mineral</td>
<td>MTD</td>
<td>1</td>
<td>1</td>
<td>No</td>
<td>No</td>
<td>2 MTD / 4-20mA</td>
</tr>
<tr>
<td></td>
<td>Aviation fuel (4 channel)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M12, 12 pin plug connector</td>
</tr>
</tbody>
</table>

IPDR Options (Non-configurable. Planned as a future option. Consult Parker Filtration.)

<table>
<thead>
<tr>
<th>Key</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit Relay</th>
<th>Communication</th>
<th>Moisture sensor</th>
<th>Cable connector kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPDR</td>
<td>Phosphate ester</td>
<td>1 ACFTD</td>
<td>2 LED</td>
<td>2 Relay</td>
<td>4 RS232 / RS485</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 AS4059</td>
<td>3 Digital</td>
<td></td>
<td></td>
<td></td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 GOST</td>
<td>4 GSM</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

Standard Products Table

<table>
<thead>
<tr>
<th>Part number</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit relay</th>
<th>Communication</th>
<th>Moisture</th>
<th>Cable connector kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPDR12112140</td>
<td>Mineral</td>
<td>MTD</td>
<td>None</td>
<td>No</td>
<td>RS232 / 4 - 20mA</td>
<td>No</td>
<td>M12, 12 pin plug connector</td>
</tr>
<tr>
<td>IPDR12112240</td>
<td>Mineral</td>
<td>MTD</td>
<td>None</td>
<td>No</td>
<td>RS232 / 4 - 20mA</td>
<td>Yes</td>
<td>M12, 12 pin plug connector</td>
</tr>
<tr>
<td>IPDR12113140</td>
<td>Mineral</td>
<td>MTD</td>
<td>None</td>
<td>No</td>
<td>RS232 / 0 - 5V</td>
<td>No</td>
<td>M12, 12 pin plug connector</td>
</tr>
<tr>
<td>IPDR12113240</td>
<td>Mineral</td>
<td>MTD</td>
<td>None</td>
<td>No</td>
<td>RS232 / 0 - 5V</td>
<td>Yes</td>
<td>M12, 12 pin plug connector</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC000074</td>
<td>Contact Parker</td>
</tr>
<tr>
<td>ACC000075</td>
<td>Flow control valve</td>
</tr>
<tr>
<td>ACC000076</td>
<td>Deutsch tool kit</td>
</tr>
<tr>
<td>ACC000077</td>
<td>Deutsch 8 pin to USB cable kit</td>
</tr>
<tr>
<td>ACC000078</td>
<td>Deutsch 8 pin to M12 4 pin cable kit</td>
</tr>
<tr>
<td>ACC000079</td>
<td>Deutsch 8 pin to M12 12 pin cable kit</td>
</tr>
</tbody>
</table>
icountOS
Oil Sampler

Portable condition monitoring for hydraulic oil and fuel systems

The icountOS (Oil Sampler) from Parker offers users a compact, lightweight, robust and truly portable oil and fuel sampling and analysis solution that is both quick to use and accurate in its results. Utilising on-board, laser based, leading-edge technology, the IOS brings to all industries a truly innovative portable oil sampler as a remarkable, cost effective market solution to fluid management and contamination control.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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

Product Features:

• Fluid viscosity as high as 300cSt (usable range) will be able to pass through the detector at the proper flow rate.
• Quick connections for testing hydraulic fluid online and offline.
• Reporting Standards ISO4406:1999, NAS1638 and RH% moisture sensor display in high intensity OLED format.
• Data Storage up to 250,000 test points of information.
• Compact, lightweight and robust, truly portable IOS makes field analysis simple, quick and easy.
• Able to sample directly from a hydraulic reservoir, barrel and vehicle fuel tank or from a high pressure, online hydraulic system with the addition of a pressure reducing adaptor.
• Completely self contained, with laser detection particle counter (icountPD), rechargeable battery and flow management pump.
• No special software needed. Embedded web page generator for data download onto any PC or laptop via a universal RJ45 connection interface.
• Fast detection of the presence of contamination with a sampling period from 5 seconds to 999 seconds.
Accurate condition monitoring made quick, simple and cost effective

The icountOS (IOS) is an innovative solution to the challenge of measuring the quality of hydraulic oils and hydrocarbon fuels in many different applications: from renewable energy, marine and offshore, to manufacturing, mobile, agriculture, military and aerospace.

Compact, lightweight and robust, the truly portable IOS makes field analysis simple, quick and easy.

Able to sample directly from a hydraulic reservoir, barrel, vehicle fuel tank or from a high pressure online hydraulic system with the addition of a pressure reducing adaptor; the IOS is undoubtedly the most adaptable contamination service tool available today.

The system is completely self contained, with laser detection particle counter, battery and pump plus memory with web page generator for data download onto any PC or laptop - combined into a single unit.

The IOS uses Parker’s proven laser detection technology, which delivers precise, repeatable, reproduceable results, in real time detection of both particulates, down to 4 microns (c) and dissolved water.

Just as importantly, the IOS has been developed to offer a wealth of features, combined with simplicity and ease of use, at a cost that is far lower than competing systems, and which fits within most maintenance budgets.
Wherever, whenever you need to be 100% sure of oil and fuel quality

With its robust carrying case, sealed to IP67, and proven laser and diagnostics technologies, the IOS is the perfect tool for maintenance and plant engineers to use with all fixed and mobile plant and machinery.

IOS technology is proven in many different applications, under the most demanding conditions, and is used by leading companies around the world.

In the construction and mining sector, IOS is ideally suited to service and fluid monitoring of essential equipment and services.

In the defence industry, IOS provides essential condition monitoring support for mission critical front line battle tanks and military vehicles.

The IOS is the primary diagnostic instrument to help automotive manufacturers develop predictive monitoring programmes.

Ease of on-site use, light weight and portability are key IOS features for monitoring fuel quality in military bulk fuel installations in theatre.

Accuracy and speed of use make the IOS ideal for wind turbine engineers, for both routine maintenance and emergency repairs, flushing and commissioning.

In the aviation sector, the ability to meet strict quality controls makes the IOS the ideal choice for ground handling support companies, ensuring clean and dry fuel deliverance.
How the IOS works

The IOS quality condition monitor for hydraulic oils and hydrocarbon fuels uses advanced technology to produce extremely repeatable results.

At the heart of the system is a sophisticated laser detector, using a light obscuration flow cell, providing continuous measurement of fluid flow passing through a sample tube.

Measurements are taken every second as standard, although measurement intervals and test period can be defined by the user, with results being reported immediately and updated in real time.

Data is displayed on a built-in OLED digital display and can also be stored for subsequent upload via the embedded icount’s web page interface connecting through an RJ45 cable.

Proven laser detection technology

Parker’s experience in developing laser light obscuration or blockage and applying that technology in portable particle counting and detection is what makes Parker’s range of contamination analysers so very special.

Hydraulic circuit

In simple terms a controlled column of contaminated fluid enters the laser optical scanner chamber. This design maintains contamination distribution within the fluid.

On reaching the photo diode cell, the highly accurate laser light is applied and projected through that oil column. The laser diode projects an image of the sample onto a photo diode cell.

A cast image or shadow created by the contaminant in the oil creates a measurable change in the light intensity.
Features that boost your productivity
Proven laser detection technology

The IOS uses light obscuration, light blockage technology. A light source is projected through a moving column of oil or fuel. Contaminants in the fluid interrupt the light beam, casting images on a photo diode cell, where the resulting change in light intensity produces a directly proportional change in electrical output.

High onboard test data storage capacity

Class leading onboard memory provides storage capacity for up to 250,000 sets of test results. Data is displayed instantly, stored or downloaded to a PC or laptop for analysis via a standard IP68 RJ 45 patch cord connection; a 2m cable is supplied as standard. (File types - text/CSV or XMI)

Tough storm casing

The robust waterproof IP54 (When open) case and fully sealed impact resistant brushed stainless steel front panel provide excellent protection in the most demanding of applications. The combined unit weighs under 5.5kg, making it an ideal ‘first use’ diagnostic service tool.

Fast contamination detection

The IOS provides fast detection of the presence of contaminants, with the results being shown on the front panel mounted, high visibility OLED digital display. This provides easy identification of fluid condition, showing measured codes, the sizes per channel in microns (c), the user definable limits and moisture sensor readings as a % of relative humidity.

Quick connection

Connecting the IOS is quick and reliable. The fluid connectors are on the front panel, with two secure push fittings: 6mm diameter inlet and 4mm diameter outlet/drain. Parker can supply dedicated hoses and fittings for use with most hydraulic and hydrocarbon fluids.

Long life remote operation

The IOS uses a long life regulated 12 Vdc power supply, with an M12, 4 pin connector, plus a rechargeable NiMH detector battery unit for use onsite or in remote locations.

Complies with the latest standards

The IOS is designed in accordance with the latest global standards including:

- CE marking
- EC Declaration of Conformity
- Machinery Directive
- EMC EN61000-6-3:2001
- EMC EN61000-6-2:2001
- EN 61010-1:2001

Fluid and pressure control

The IOS automatically adjusts flow rates, to an optimum level of 60ml/min. Total flow range is between 40 and 140ml/min, with maximum online operating pressure being 2.5Bar (36psi). An optional inlet reduction valve is also available for high pressure applications.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working pressure range</td>
<td>0 to 2.5 bar</td>
</tr>
<tr>
<td>Working pressure with PRV</td>
<td>2.5 to 350 bar</td>
</tr>
<tr>
<td>Working viscosity</td>
<td>1 to 300 cSt</td>
</tr>
</tbody>
</table>

Pressure reducing valve (PRV)

A pressure compensated PRV device (Parker Hannifin part number ACC6NN027) has been developed to enable testing where flow pressures in the hose exceeds 2.5 bar, up to a maximum of 350 bar.
**IOS Technical Specifications**

**Dimensions**

Dimensions are given in mm (inches)

To remove the PRV, press down on the removal tool at the same time as lifting PRV off.

Attach OUTLET (Ø 4mm) hose

Low pressure connection setup

We recommend that the IOS is positioned in a safe, stable area, as close as possible to the system output and only the hose fittings provided are used.

High pressure connection setup (Optional equipment needed)

(High pressure is defined for this unit as more than 2.5 bar, with a maximum of 350 bar)

We recommend that the IOS is positioned in a safe, stable area, as close as possible to the system output and only the hose fittings provided are used. For pressure systems (more than 2.5 bar) one high pressure hose assemblies: ACC6NN034, and a Pressure Reducing Valve (PRV) ACC6NN027 are required.

To remove the PRV, press down on the removal tool at the same time as lifting PRV off.
The IOS web interface

The IOS is a unique product in that it has its own web page generator which means that the stored data can be downloaded or viewed on any PC or laptop.

Utilising a computer’s Internet Explorer utility, simply plug in the supplied network cable, open Explorer and enter the IOS’s unique IP/MAC address.

Home page

**KEY**

1. Product description
2. Key features
3. Register the product at www.parker.com/unlock

Data log page

**KEY**

1. Start and Stop data logging
2. Save data in one of three date formats:
   - TXT format
   - CSV (Comma Separated Variables)
   - XML (eXtended Markup Language)
3. Clear data logging memory
4. List of the five last samples taken
5. Memory usage
Unit status page

KEY

1. The Unit Status page is a list of current values for various parameters for the connected IOS unit.

Configuration page

KEY

1. Alarm limit settings for:
   - 4μm channel (c)
   - 6μm channel (c)
   - 14μm channel (c)

2. Alarm limit setting for Relative Humidity

3. Measurement period

4. Data logging interval

5. Unit name

6. Unit location

Configuration: set report standard page

KEY

1. Select either the ISO4406:1999 or NAS1638 standard

2. Confirm the selected standard
## Technical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product start-up time</td>
<td>10 seconds minimum</td>
</tr>
<tr>
<td>Measurement period</td>
<td>Default 30 seconds run time; 15 seconds data logging time</td>
</tr>
<tr>
<td>Reporting interval</td>
<td>Onboard data storage every second. Output via RJ45 connection</td>
</tr>
<tr>
<td>Principle of operation</td>
<td>Laser diode optical detection of actual particulates</td>
</tr>
<tr>
<td>International codes range</td>
<td>Up to ISO 22 (+/- 1 ISO code) NAS 0-12</td>
</tr>
<tr>
<td>Calibration</td>
<td>Calibration by recognised online methods confirmed by the relevant ISO procedures. MTD – via a certified primary ISO 11171 automatic particle detector using ISO 11943 principles. Particle distribution reporting to ISO 4406:1999</td>
</tr>
<tr>
<td>Recalibration and Servicing</td>
<td>Recommended every 12 months</td>
</tr>
<tr>
<td>Working pressure</td>
<td>2.5–350 bar (35–5000psi) Pressures above 2.5 bar require the use of a Parker Pressure Reducing Valve (PRV) – ACC6NN027</td>
</tr>
<tr>
<td>Working viscosity</td>
<td>1-300 cSt</td>
</tr>
<tr>
<td>Flow range through IOS</td>
<td>40–140ml/minute; controlled at 60ml/min by IOS’s internal pump</td>
</tr>
<tr>
<td>Fluid connection interface</td>
<td>INLET: 6mm push-fit. DRAIN: 4mm push-fit</td>
</tr>
<tr>
<td>Ambient storage temperature</td>
<td>−40°C to +80°C; −40°F to +176°F</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>−30°C to +80°C; −22°F to +176°F</td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>5%RH to 100%RH</td>
</tr>
<tr>
<td>Fluid operating temperature</td>
<td>+5°C to +80°C; +41°F to +176°F</td>
</tr>
<tr>
<td>Fluid operating temperature</td>
<td>−20°C to +70°C; −4°F to +158°F</td>
</tr>
<tr>
<td>Moisture sensor</td>
<td>Linear scale within the range 5%RH to 100%RH</td>
</tr>
<tr>
<td>Computer compatibility</td>
<td>IP68-rated RJ45 connection that may be connected to a laptop computer’s RJ45 LAN port using the 2m cable supplied</td>
</tr>
<tr>
<td>Power requirement</td>
<td>Regulated power supply supplied with the unit</td>
</tr>
<tr>
<td>Certification</td>
<td>IP54 rating (unit open)</td>
</tr>
<tr>
<td></td>
<td>IP67 rating (unit closed)</td>
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<td></td>
<td>EC Declaration of Conformity</td>
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<td>Machinery Directive</td>
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<td>EMC EN61000-6-3:2001</td>
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<td></td>
<td>EMC EN61000-6-2:2001</td>
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<tr>
<td></td>
<td>EMC EN61010-1:2001</td>
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<tr>
<td></td>
<td>CE Certified</td>
</tr>
</tbody>
</table>

### What is included?

<table>
<thead>
<tr>
<th>Offline IOS 1210 EUR/UK/US</th>
<th>Online IOS 1220 EUR/UK/US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x IOS Oil Sampler Unit</td>
<td>1x IOS Oil Sampler Unit</td>
</tr>
<tr>
<td>+ 1x Power Supply</td>
<td>+ 1x Power Supply</td>
</tr>
<tr>
<td>+ 1x RJ45 LAN Cable</td>
<td>+ 1x RJ45 LAN Cable</td>
</tr>
<tr>
<td>+ Low Pressure Hoses</td>
<td>+ 1x Low Pressure Hose</td>
</tr>
<tr>
<td></td>
<td>+ 1x PRV</td>
</tr>
<tr>
<td></td>
<td>+ 1x High Pressure Hose</td>
</tr>
</tbody>
</table>

### Important Information

**WARNING-USER RESPONSIBILITY**

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through their own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the applications are met.
- The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker or its subsidiaries or authorised distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems. The operation of the products described here in is subject to the operating and safety procedures details of which are available upon request.

**Sales conditions**

The items described in this document are available for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any sale contract entered into by Parker will be governed by the provisions stated in Parker’s standard terms and conditions of sale (copy available upon request).
## Ordering Information

<table>
<thead>
<tr>
<th>Key</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Connection</th>
<th>Options</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOS1220EUR</td>
<td>Mineral</td>
<td>MTD</td>
<td>Online</td>
<td>No options</td>
<td></td>
</tr>
<tr>
<td>IOS1210EUR</td>
<td>Mineral</td>
<td>MTD</td>
<td>Offline</td>
<td>No options</td>
<td></td>
</tr>
</tbody>
</table>

### Accessory Part Numbers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose Kit Bag (includes one power pack, RJ45 patch cable and low pressure hose connectors)</td>
<td>ACC6NN029UK&lt;br&gt;ACC6NN029EUR&lt;br&gt;ACC6NN029US</td>
</tr>
<tr>
<td>Pressure Reducing Valve (PRV) (Standard with IOS 1220)</td>
<td>ACC6NN027</td>
</tr>
<tr>
<td>Power Pack (UK 2m cable)</td>
<td>ACC6NE023</td>
</tr>
<tr>
<td>Power Pack (EUR 2m cable)</td>
<td>ACC6NE024</td>
</tr>
<tr>
<td>Power Pack (US 2m cable)</td>
<td>ACC6NE025</td>
</tr>
</tbody>
</table>

### Description

- **RJ45 LAN Connector Cable**: ACC6NE028
- **Carry Strap**: ACC6NN030
  - The Carry Strap option MUST be selected at the time of placing the IOS order.
- **Low Pressure Hoses (4mm and 6mm)**: ACC6NN031
- **High Pressure Hose Assembly**: ACC6NN034
  - (Standard with IOS 1220)
- **Verification Fluid**: SER.MISC.067

*Fluid Type 3: Contact Parker Hannifin*
Early Warning
icount Lubrication and Hydraulic Oil Monitoring system

An all-in-one particle detection system

Developed around the proven Parker icountPD particle detector

Particle detection is the best known way to determine whether oil is contaminated or not and the best way to detect particles online or offline is by using Parker’s icountPD. To make results even easier to obtain we added some extra equipment.

Contact Information:  Product Features:

Parker Hannifin  
Hydraulic Filtration

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

http://www.parker.com/hfde

Wind turbines  
• Gear boxes  
• Hydraulic systems in pitch, yaw and brake

Shipping and shipbuilding industry  
• Propulsion systems  
• Thrusters  
• Deck machinery

Steel and pulp & paper industry  
• Lubrication oil systems  
• Hydraulic system control of presses and winders

Power generation  
• Lubrication oil systems  
• Hydraulic system control for fuel feeding
**Proactive maintenance with icount**

With the icount System, the early bird stands every chance of catching the worm.

Be that early bird and schedule oil changes through predictive maintenance of the system and plan service times. Parker’s icount system provides early warning of any unwanted changes in hydraulic or lubrication oil quality. Thus increasing the availability of the machinery by reducing the need for unnecessary downtime.

Insurance companies are able to lower fees as the icount System warns of possible component failure. It also reduces the warranty costs thanks to an integrated pump unit that enables a cost effective solution to monitor oil from different points of a system.

### icount SYSTEM

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric motor</td>
<td>230VAC</td>
<td>110VAC, 24 VDC</td>
</tr>
<tr>
<td>Pump</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Flow control unit</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pressure control valve</td>
<td></td>
<td>for pressurized systems</td>
</tr>
<tr>
<td>Particle detector</td>
<td>icountPD</td>
<td></td>
</tr>
<tr>
<td>Local display</td>
<td>led</td>
<td>none, digital, GSM</td>
</tr>
<tr>
<td>Communications</td>
<td>RS232</td>
<td>RS232/4-20mA, RS232/0-5V, RS232/Canbus</td>
</tr>
<tr>
<td>Moisture sensor</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Limit Relay</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cable connector kit</td>
<td>M12 - 8 pin</td>
<td></td>
</tr>
<tr>
<td>Short start module</td>
<td>M12 - 8 pin</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>bracket</td>
<td>sealed box</td>
</tr>
</tbody>
</table>

Parker’s icount System housing can include several options to guarantee uniform sample handling and measuring any required aspect of oil quality.

**You can trust icount accuracy**

Parker icount Lubrication and Hydraulic Oil Monitoring System is available today. It features Parker’s laser technology and all necessary components for reliable monitoring up to 1000 cSt oil viscosities. The unit allows system monitoring and accurate particle detection from any available source.

A moisture sensor as an option to measure the relative humidity of the oil and other add-on sensors like viscosity measurement are also available.

Several power versions for easy installation and worldwide operation are available. The system is capable of data transmission in multiple forms and central control can collect information and manage easily for example large marine wind farms offshore and on land.

A special design for wind turbine applications with pressurized connection is available. Correct oil pressure and steady flow ensure consistent measuring.

**For more information contact Parker.**

The icountPD Particle Detector from Parker represents the most up-to-date laser based technology in particle detection. Standard in every icount Monitoring System.
icountMS Range
Fluid Condition Monitoring – Moisture Sensors

An essential component of any predictive maintenance programme

Fast, reliable and accurate inline detection of moisture in fluids

MS moisture sensors provide fast, reliable and accurate inline detection of moisture in fluids. Technology developed for preventative maintenance programmes. MS150 is the ‘low pressure’ option for suction line/reservoir applications. MS200 is the ‘Programmable’ sensor monitoring and reporting relative humidity (RH), moisture content in oils. MS300 ‘Intrinsically safe’ sensor ATEX certified for use in hazardous Zone 0 environments.

Product Features:

- MS moisture sensors provide fast, reliable and accurate inline detection of moisture in fluids.
- Technology developed for preventative maintenance programmes.
- MS150 ‘low pressure’ suction/Return line applications. 10 bar maximum operating pressure.
- MS200 ‘Programmable’ sensor monitoring and reporting relative humidity (RH), moisture content in oils. 420 bar MAOP.
- MS300 ‘Intrinsically safe’ sensor ATEX certificated for use in hazardous Zone 0 environments. 420 bar MAOP.
- Temperature Outputs on all versions.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
icountMS Range
Cost Effective Moisture Detection

Features & Benefits

- Continuous, online moisture indication, for hydraulic and lubricating systems.
- Reporting of % relative humidity of water content, giving the user information on how close to the fluids real saturation point.
- Reliable data on the rate of water absorption.
- Sensing cell technology using a laser trimmed thermoset polymer, for capacitive sensing that is capable of absorbing water molecules due to its micro porous structure.
- Uses a thermistor for temperature compensation correction. Offering total confidence in reporting the %RH relative humidity over the sensors temperature range.
- A purpose designed tee adaptor allows for easy installation into an existing fluid system.
- The MS200 can also be specified with a bench top wand offering the end user greater flexibility.
- Not available on MS150

Typical Applications

- Ground support vehicles
- Pulp and paper plants
- Marine hydraulics
- Power transmission & distribution
- Forestry
- Industrial hydraulics
- Earth moving applications
- Agricultural
- Hazardous Areas (Zone 2)
- Theme parks (Ride hydraulics)

In-Line Moisture Measurement of Hydraulic & Lubricating Oils.

Parkers Moisture Sensor Range offers fast, reliable and accurate in-line detection of moisture in fluids. The MS transducer type technology has been especially designed with the preventative maintenance programme environment in mind.

The industry accepted sensing cell device will monitor and report Relative Humidity (RH), moisture content in oils. The water content measurement technique offers the end user benefits over the current standard form of water content reporting (PPM).

This allows for real time preventative maintenance to be undertaken and corrective actions to be made. By knowing that the water contamination is still within the oils absorbing range, less than 100%, reclaiming fluid properties before additive damage occurs can initiate calculable cost savings.
MS150 Moisture Sensor

Specification

Pressure:
Maximum allowable operating pressure. (MAOP): 10 bar (145 PSI).

Operating temperature:
Minimum: -20°C (-4°F).
Maximum: +85°C (+185°F).

Flow through sensor cell:
Installed in active flowstream.

Fluid compatibility:
Mineral oils, petroleum-based and Phosphate ester.

Viscosity range:
Unlimited.

Port connections:
1/4” BSPT or 1/4” NPT.

Connector Details:
M12x1 - 5 way

Supply voltage:
+8 to +30 Vdc.

Sensor size/weight/material:
80mm x 43mm/0.1kg/Aluminium

IP ratings:
IP68 % (When mated with moulded connector)

RH Outputs:
(+1 to +5 Vdc) or (4 to 20mA)

Temperature Outputs:
0 to +5 Vdc

Sensor Outputs

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>I/O</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply</td>
<td>Input</td>
<td>Supply voltage (+8 to +30 Vdc)</td>
</tr>
<tr>
<td>2</td>
<td>%RH</td>
<td>Output</td>
<td>% Saturation out (+1 to +5Vdc)</td>
</tr>
<tr>
<td>3</td>
<td>%RH</td>
<td>Output</td>
<td>% Saturation out (+4 to +20mA)</td>
</tr>
<tr>
<td>4</td>
<td>Temperature</td>
<td>Output</td>
<td>Temperature out (0 to +5Vdc)</td>
</tr>
<tr>
<td>5</td>
<td>Common</td>
<td>Input</td>
<td>Common (0Vdc) ground from power supply (not chassis ground)</td>
</tr>
</tbody>
</table>

Interpreting the data

Oil type: Texaco Rando 46.
Saturation point: 400ppm @ 65ºC (150ºF).
At the above operating condition, the meter displays 100% saturation. As the meters scale indicates a reduction in the saturation percentage, there is also a corresponding reduction in PPM at a constant temperature. In the example above, a meter reading of 50% saturation could be interpreted as 200ppm at 65ºC (150ºF).
MS200 ‘Programmable’

Specification

% Saturation Calibration Accuracy: +3% RH
Temperature Calibration Accuracy: ±1°C
Thermal Stability: ±1% RH (over compensated temperature range +10 to +80°C)
Stability: ±0.2% RH typical at 50% RH in 1 year
Linearity: ±0.5% RH typical
Analogue Output Hysteresis: ±0.5% RH Full Scale
Switched Output Hysteresis: 2% RH
Operating Temperature Range: -40°C to +85°C (-40 to +185°F)
Operating Humidity Range: 5 to 100% RH (non condensing)
Response Time: 60 sec in slow moving air at 25°C
Maximum rated pressure: 420 Bar (6000 PSI)
Maximum torque on spanner flats: 30 Nm (ONLY USE SPANNER FLATS TO INSTALL AND REMOVE THE MOISTURE SENSOR)
Seal Material (depending on MS): Fluorocarbon, EPDM, Perfluoroelastomer
Material: Stainless Steel 303
Connector Details: M12x1, 8 Way, IP67 Connector (IP68 when mated with moulded cable)
Maximum Cable Length: 10 Metres with Voltage Output
Output: 100 Metres with Current Output

Installation Details

Thread Form Options and Hand-Held Unit (See MS Ordering Information)

Thread Form Option 5
Hand Held Unit/Extended Probe Option 6
Thread Form Option 7

All dimensions in millimetres (mm)
Dimensions are for reference only
The MS300 has been certified as Intrinsically Safe Electrical Apparatus and offers fast, reliable and accurate in-line detection of moisture in fluids for use in hazardous areas.

ATEX Certification allows the MS300 into areas of a potentially explosive atmosphere, that have previously not been allowed without permits, it is intended for use in Zone 0 hazardous areas requiring the use of category 1G equipment and has been designed for use with galvanic isolators to the specified values stated below:

The electrical parameters:
- \( U_i \): 28V
- \( I_i \): 93mA
- \( P_i \): 0.65W
- \( C_i \): 380nF
- \( L_i \): 0

The following instructions apply to MS300 - 4-20mA Current Loop Moisture Sensor covered by certificate number Sira 07ATEX2255:

1. The equipment may be located where flammable gases of Group I may be present. The equipment is only certified for use in ambient temperatures in the range \(-20°C \text{ to } +40°C\) and should not be used outside this range.
2. The equipment has not been assessed as a safety-related device (as referred to by Directive 94/9/EC Annex II, clause 1.5).
3. Installation of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice.
4. Repair of this equipment shall be carried out by the manufacturer or in accordance with the applicable code of practice (IEC 60079-19).

Calibration Accuracy:
- ±5% RH

Thermal Stability:
- ±1% RH (over compensated temperature range +10°C to +80°C)

Stability:
- ±0.2% RH typical at 50% RH in 1 year

Linearity:
- ±0.5% RH typical

Analogue Output Hysteresis:
- ±0.5% RH Full Scale

Switched Output Hysteresis:
- 2% RH

Operating Temperature Range:
- -40°C to +85°C (-40°F to +185°F)

Operating Humidity Range:
- 0 to 100% RH (non condensing)

Response Time:
- 15 sec in slow moving air at 25°C

Maximum Rated Pressure:
- 420 bar (6000 psi)

Maximum torque on spanner flats:
- 30 Nm

Material:
- Stainless Steel

Connector Details:
- M12x1, 5 Way, IP68 Connector

Maximum Cable Length:
- 100M

MS200 ‘Programmable’

Moisture Sensor Wiring and Pin Designations

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Colour</th>
<th>Designation</th>
<th>I/O</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Analogue</td>
<td>Output</td>
<td>Temperature - Degi Celsius. User Select Output (0-3Vdc, 0-5Vdc, 1-6Vdc and 4-20mA).</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
<td>Alarm Limit</td>
<td>Output</td>
<td>Alarm Limit. Output that directly corresponds to the alarm set point. User Select Output (0-3Vdc, 0-5Vdc, 1-6Vdc and 4-20mA).</td>
</tr>
<tr>
<td>3</td>
<td>Yellow</td>
<td>Analogue</td>
<td>Output</td>
<td>% Saturation. User Select Output (0-3Vdc, 0-5Vdc, 1-6Vdc and 4-20mA). RS232 Communication.</td>
</tr>
<tr>
<td>4</td>
<td>Grey</td>
<td>Receive</td>
<td>Input</td>
<td>RS232 Communication. Ground from power supply.</td>
</tr>
<tr>
<td>5</td>
<td>Pink</td>
<td>Send</td>
<td>Output</td>
<td>RS232 Communication.</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
<td>Common</td>
<td>Input</td>
<td>RS232 Communication.</td>
</tr>
<tr>
<td>7</td>
<td>White</td>
<td>Alarm Switch</td>
<td>Output</td>
<td>Alarm Switch. Constant 5Vdc when in normal operation. Switch to 0Vdc when in alarm condition. Red LED illuminates when Sensor is in an alarm condition.</td>
</tr>
<tr>
<td>8</td>
<td>Red</td>
<td>Supply</td>
<td>Input</td>
<td>Supply Voltage (+8 to +30Vdc). Green LED illuminates when power is properly applied.</td>
</tr>
</tbody>
</table>

MS300 Intrinsically Safe

Specification

Pressure:
- Maximum allowable operating pressure. (MAOP): 420 bar (6000 PSI).

Operating temperature:
- Minimum: -40°C (-40°F) - dependent on seal material. Maximum: +85°C (+185°F).

Flow through sensor cell:
- Installed in active flowstream.

Fluid compatibility:
- Mineral oils, petroleum-based and Phosphate ester-Skydrol option available.

Viscosity range:
- Unlimited.

Thread form connections:
- See ordering information.

Outputs:
- 4-20mA (current loop).

Calibration accuracy:
- ±5% RH

Compensated thermal stability:
- ±1% RH (+10°C to +80°C)

Materials:
- Stainless steel 303.

Sensor size/weight:
- 107mm x ø50mm/0.3Kg.

IP ratings:
- IP68 (with specified moulded cable)

Developed in association with Triteq Ltd.

Installation Details – See MS300 Manual

Moisture Sensor Connection Diagram

1. Supply (4-20 mA - IN) - Brown
2. Signal (4-20 mA - OUT) - White
3. Not Used - Blue
4. Not Used - Black
5. Not Used - Grey
The MS300 has been certified as Intrinsically Safe Electrical Apparatus and offers fast, reliable and accurate in-line detection of moisture in fluids for use in hazardous areas.

ATEX Certification (See page 71) allows the MS300 into areas of a potentially explosive atmosphere, that have previously not been allowed without permits, it is intended for use in Zone 0 hazardous areas requiring the use of category 1G equipment and has been designed for use with galvanic isolators to the specified values stated below:

The electrical parameters:  
Ui: 28V  
Ii: 93mA  
P: 0.65W  
C: 380nF  
Li: 0

The following instructions apply to MS300 - 4-20mA Current Loop Moisture Sensor covered by certificate number Sira 07ATEX2255:

1. The equipment may be located where flammable gases of Group I may be present. The equipment is only certified for use in ambient temperatures in the range -20°C to +40°C and should not be used outside this range.
2. The equipment has not been assessed as a safety-related device (as referred to by Directive 94/9/EC Annex II, clause 1.5).
3. Installation of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice.
4. Repair of this equipment shall be carried out by the manufacturer or in accordance with the applicable code of practice (IEC 60079-19).

### Visual Indicators Specifications

#### Bar Graph Indicator (PBG8341A)

**Construction:**

**Power supply:**
11 – 30 Vdc.

**Signal input:** (By dipswitch configuration)
- Off – differential up to 5V.
- A – single signal (Ref. 0V) up to 5V.
- B – single signal (Ref. 1V) up to 6V.

**Cut out size:**
45.6mm x 45.6mm.

**Fixing:**
Push fit panel thickness 0.9mm to 3.2mm.

**Sealing:**
Designed to IP50 standard.
(Front face may be silicon sealed after LED configuration).

**Scale:**
Supplied 0 to 100% in horizontal.
Other scales, in volume, consult Parker Hannifin.

**Scaling factors:**
10% to 100% range. Fully adjustable.

**Lamp intensity:**
4mcd each.

**Front viewing:**
Polarised.

**Weight:**
29gms.

#### Alternative Indicator

<table>
<thead>
<tr>
<th>Description</th>
<th>DDU1001</th>
<th>DDU1002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>11 - 30 Vdc</td>
<td>110 - 240 Vdc</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.1% typical</td>
<td>± 0.1% typical</td>
</tr>
<tr>
<td>Sample rate</td>
<td>2.5 per second</td>
<td>2.5 per second</td>
</tr>
<tr>
<td>Operating temp (°C)</td>
<td>0 - 50</td>
<td>0 - 50</td>
</tr>
<tr>
<td>Storage temp (°C)</td>
<td>-10 to +70</td>
<td>-10 to +70</td>
</tr>
<tr>
<td>Display</td>
<td>3.5 digit LED</td>
<td>3½ digit LED</td>
</tr>
<tr>
<td>Power output (Vdc)</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>Panel cutout (mm)</td>
<td>93x45 ± 0.5</td>
<td>93x45 ± 0.5</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>46x60x63</td>
<td>46x60x63</td>
</tr>
</tbody>
</table>

---

Parker Hannifin Hydraulic Filtration FDCB810UK

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Product accessories part numbers

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Supersedes</th>
<th>Description</th>
<th>For MS type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDU1001</td>
<td>NA</td>
<td>Digital display unit 22-55 Vdc</td>
<td>MS150, 200 + 300</td>
</tr>
<tr>
<td>DDU1022</td>
<td>NA</td>
<td>Digital display unit 110-240 Vdc</td>
<td>MS150, 200 + 300</td>
</tr>
<tr>
<td>PBGB341A</td>
<td>PBGB341A</td>
<td>Bar Graph Indicator (+11 to +30 Vdc)</td>
<td>MS150, 200 + 300</td>
</tr>
<tr>
<td>ACC284003</td>
<td>NA</td>
<td>5 meter M12 X 1 - 5 pin moulded cable (IP68) Connector andlying leads</td>
<td>MS150 + 300</td>
</tr>
<tr>
<td>ACC284020</td>
<td>897200</td>
<td>5 meter M12 X 1 - 8 pin moulded cable (IP68) Connector andlying leads</td>
<td>MS200</td>
</tr>
<tr>
<td>ACC285001</td>
<td>897200</td>
<td>M12, 5 pin rewritable connector (IP65) connector only. No cable</td>
<td>MS150 + 300</td>
</tr>
<tr>
<td>996108</td>
<td>897400</td>
<td>UK 12 volt power supply</td>
<td>MS150, 200 + 300</td>
</tr>
<tr>
<td>996109</td>
<td>897400</td>
<td>European 12 volt power supply</td>
<td>MS150, 200 + 300</td>
</tr>
<tr>
<td>9961010</td>
<td>897400</td>
<td>US 12 volt power supply</td>
<td>MS150, 200 + 300</td>
</tr>
</tbody>
</table>

Moisture sensor output setting
The Moisture sensor reports on the saturation levels of the fluid passing through the sensing cell. The output is a linear scale, reporting within the range of 5% saturation to 100% saturation.

<table>
<thead>
<tr>
<th>Saturation</th>
<th>4–20mA</th>
<th>0–3Vdc</th>
<th>0–5Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>4.8</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>25%</td>
<td>8</td>
<td>0.75</td>
<td>1.25</td>
</tr>
<tr>
<td>50%</td>
<td>12</td>
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</tr>
<tr>
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<td>100%</td>
<td>20</td>
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Ordering Information
MS150 - Standard Product Table

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Supersedes</th>
<th>Fluid type</th>
<th>Thread Forms</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS1503</td>
<td>MS150-3</td>
<td>Mineral</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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<tr>
<td>MS1504</td>
<td>MS150-4</td>
<td>Mineral</td>
<td>1/4&quot; NPT Taper</td>
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</table>

MS200 - Product Configurator

Key | Model | Fluid type | Output Options | Thread Forms | Connector | Future option |
--- | --- | --- | --- | --- | --- | --- |
MS | 2 | Programmable | 0 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |
| MS | 2 | 2 | 02 | G 1/4" BSPT Taper | M12 5 WAY | 0 |

MS200 - Standard Product Table

<table>
<thead>
<tr>
<th>Key</th>
<th>Model</th>
<th>Fluid type</th>
<th>Output Options</th>
<th>Thread Forms</th>
<th>Connector</th>
<th>Future option</th>
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<tbody>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>0</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>0</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>0</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>0</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>0</td>
</tr>
<tr>
<td>MS</td>
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<td>2</td>
<td>02</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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MS300 - Product Configurator

Key | Model | Fluid type | Output Options | Thread Forms | Connector | Future option |
--- | --- | --- | --- | --- | --- | --- |
MS | 3 | Programmable | 04 | G 1/4" BSPT Taper | M12 5 WAY | 1 |
| MS | 3 | 2 | 04 | G 1/4" BSPT Taper | M12 5 WAY | 1 |
| MS | 3 | 2 | 04 | G 1/4" BSPT Taper | M12 5 WAY | 1 |
| MS | 3 | 2 | 04 | G 1/4" BSPT Taper | M12 5 WAY | 1 |
| MS | 3 | 2 | 04 | G 1/4" BSPT Taper | M12 5 WAY | 1 |

MS300 - Standard Product Table

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<tr>
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<th>Future option</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
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<td>2</td>
<td>04</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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</tr>
<tr>
<td>MS</td>
<td>3</td>
<td>2</td>
<td>04</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>1</td>
</tr>
<tr>
<td>MS</td>
<td>3</td>
<td>2</td>
<td>04</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
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<tr>
<td>MS</td>
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<tr>
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<td>04</td>
<td>G 1/4&quot; BSPT Taper</td>
<td>M12 5 WAY</td>
<td>1</td>
</tr>
</tbody>
</table>
Oilcheck
Hand-held Oil Condition Monitor

Portable and battery powered for ‘go-anywhere’ monitoring

Hand-held condition monitor provides a visual comparison between new and used oils

Parker’s Oilcheck is completely portable and battery powered with a numerical display that indicates positive or negative increase in dielectrics. Oilcheck gives an early warning of impending engine failure and the simplistic hand-held design makes it easy to use.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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

Product Features:

- Oilcheck hand-held condition monitor provides a visual comparison between new and used oils.
- The Oilcheck, once calibrated with clean oil, will store the calibration units memory when the unit is switched off, until such time that a re-calibration is required by the user.
- Completely portable and battery powered.
- Numerical display shows positive or negative increase in dielectrics.
- Gives early warning of impending engine failure.
- Optional protective rubberized sleeve.
Oilcheck
Hand-held Oil Condition Monitor

Features & Benefits

- A comparator between new and used oils.
- Oilcheck gives early warning of impending engine failure.
- Cost effective solution to save money and help increase engine life.
- Completely portable, battery powered.
- Ideal for fleet owners, garages and DIY mechanics.
- Numerical display to show positive or negative increase in dielectrics.

Using Oilcheck

Following the simple sampling procedure, Parker’s Oilcheck will ensure effective and highly repeatable results. Once a clean oil sample has been placed in the ‘Sensor Well’ and the ‘TEST’ button has been pressed, the instrument will ‘zero’ on the sample.

Once cleaned out with a degreaser and replaced by a contaminated sample, a new reading is obtained on the LCD, which can be easily compared against the green/amber/red efficiency scale.

Typical Applications

- Fleet owners
- Construction equipment maintenance
- Vehicle service garages
- Plant hire maintenance

The Oilcheck from Parker Filtration’s Condition Monitoring Centre detects and measures the dielectric constant of oil, by comparing the measurements obtained from used and unused oils of the same brand.

Used as a regular service monitoring instrument, the Oilcheck will give the engineer warning of an impending engine failure and promote increased engine life. Oilcheck is the low-cost solution that will take the guesswork out of oil changes, saving money and time.
Specification

Case construction: ABS.
Circuitry: Microprocessor control.
Battery: 1 x 9V alkaline (supplied).
Display: LCD.
Suitable oil types: Mineral and synthetic based oils.
Repeatability: Better than 5%.
Readout: Green/amber/red grading, Numerical value (0-100%).
Battery lifetime: >150 hours or 3,000 tests.
Dimensions: 250mm x 95mm x 34mm (9.8” x 3.7” x 1.3”).
Weight: 0.4kg.
Memory capacity: Remembers the last calibration.

Using Oilcheck

The Oilcheck can remove the need for costly and time consuming laboratory analysis of mineral and synthetic oils used in engines, gearboxes and bearing lubrication systems. It detects mechanical wear and any loss of lubricating properties in the oil with a repeat accuracy of less than 5%.

The Oilcheck is able to show changes in the oil condition brought about by the ingress of water content, fuel contamination, metallic content and oxidation.

Installation Details

Standard products table

<table>
<thead>
<tr>
<th>Product number</th>
<th>Description</th>
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<tbody>
<tr>
<td>OLK605</td>
<td>Oilcheck kit with numerical readout</td>
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<tr>
<td>OLK611</td>
<td>Oilcheck cleaner</td>
</tr>
<tr>
<td>ACL2960001</td>
<td>Rubberized protective sleeve</td>
</tr>
</tbody>
</table>

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.
A unique product with pedigree

DEFSTAN 91-91 Issue 6 Jet A-1 Fuel Specification, adopts particle counting. Development work carried out by the CMC engineers, in conjunction with Exxon Mobil Aviation, highlighted the need for an alternative test method to determine the levels of dispersed contamination in Jet fuel. 5 years of field testing and development of the already established and successful icountLCM20 Hydraulic Laser Particle Counter saw the introduction of the Parker icountACM20 with enhanced software providing the user with a better understanding of the contamination present in a sample. As the benchmark particle counter for use in measuring the levels of contamination in fuels, the icountACM20, as per the UK’s Energy Institute Test Method IP564, has now been included in the DEFSTAN 91-91 Issue 6 Jet Fuel Specification as a report only test alongside the current Gravimetric test method (IP423 or ASTM D5452) and Clear & Bright Visual test method (IP216 or ASTM D2276).

Contact Information:  Product Features:

Parker Hannifin
Hydraulic Filtration

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

- Energy Institute Test Method IP 564.
- 2-minute test procedure.
- Fully manufactured by Parker with 20 years experience in the Particle Counter Measuring market.
- Laser optical scanning analysis.
- Multi-standard ISO cleanliness reporting.
- On-board, rear-mounted pump enables monitoring possibilities. For example: Fuel storage/vehicle tanks and fuel storage drums.
- Latest averaging software as standard.
- Downloader software.
icountACM20 Lab Unit
Aviation Fuel Contamination Monitoring

Features & Benefits

Test Time:
2 minutes

Repeat Test Time:
Every 2 minutes (Manual testing), every 6 minutes (automatic)

Principle of Operation:
Optical scanning analysis and measurement of actual particles and inference to water presence

Primary Output:
≥4µ(c), ≥8µ(c), ≥14µ(c), ≥21µ(c), ≥25µ(c), ≥30µ(c) counts per ml

Secondary Diagnostic Output:
% Volume Distribution, via graphical display on handset and printout

International codes:
ISO 7-22 in accordance with ISO 4406-1999

Data entry:
32 character two line dot matrix LCD. Full alpha numeric entry facility on keypad

Data retrieval:
Memory access gives test search facility for up to 300 saved tests

Calibration:
In accordance with Parker Calibration Procedure CM20-N, which complies to ISO11171:1999, Clause 6 (Omitting Annex F)

Re-calibration:
Every 12 months by a dedicated Parker Service Centre (Consult Parker) as required under strict EI methods

Max. working pressure:
420 bar

Operating Temperature:
+5°C to +80°C

Memory store:
300 test capacity

Computer compatibility:
Interface via RS 232 connection @ 9600 baud rate (USB serial cable to RS232 option available)

Laboratory sampling:
Utilizes on-board rear mounted pump

Portability:
Only 8 kg. icount ACM20 has its own battery pack and carry case with wheels 13kg total weight

Power requirement:
12vDC input, 6 x ‘D’ Cell batteries or rechargeable battery pack

Printer facility:
Integral 16 column printer for hard copy data

Certification:
Complies with all relevant EC declarations of conformity

icount ACM20 Case Mounted Pump
• Integrated Pump assembly incorporated onto the ACM20 unit.
• Powered directly from ACM20 unit, LED power indication with no additional power supplies required.
• Direct sampling from fuel sample bottles or tank via 3 metre inlet suction tube.
• Incorporated double speed flush and test sequence.
• Managed flow rate/correct volume sample as per IP 564 test method.

FACT: icountACM20 is fully compliant with the EI (Energy Institute) test method

Applications

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

In addition, the ACM can also be used to monitor various fuels from existing sampling points in locations from refineries, pipelines, distribution terminals, airport fuel supply systems all the way through to the point of uplift into aircraft.

• Fuel Testing Laboratories – DEFSTAN 91-91 Issue 6
  In order to better understand dispersed contamination in jet fuel, particle counting is now included alongside existing laboratory techniques

• Bottle Sampling - Energy Institute (EI) - IP 564
  Laboratory determination of the level of dispersed contamination in aviation kerosine using an Automatic Particle Counter (APC)

• Replace Clear & Bright and Gravimetric
  With the introduction of the icount ACM20, all subjectivity surrounding Clear & Bright and Gravimetric methods can be removed

• Also for use on petroleum based hydraulic applications (Skydrol compatible available)
  Suitable for use with mineral oil and petroleum based fluid as per standard hydraulic particle counter, reporting fluid cleanliness to ISO 4406.1999
### Specification

**Construction:**
ABS structural foam and injection moulded case  
Hand-held display - ABS  
Keypad flurosilicone rubber

**Mechanical Components:**
Brass, plated steel, stainless steel and aluminium

**Seals:**
Fluorocarbon

**Hoses:**
Nylon (Kevlar braided microbore). St. 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 (pare supplied)

**icountACM20 Technology:**
Flow cell, light obscuration

**Repeatability/Accuracy:**
As per or better than ISO 11171

**Coincidence:**
40,000 particles per ml

**Viscosity Range:**
1 - 100 centistokes

**icountACM20 Weight:**
8 kg

**Monitor Carrying Case:**
Astra Board case

**Carrying Case Weight:**
5 kg

### Ordering Information

#### Standard products table - icount ACM20

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<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Description</th>
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<td>ACM202022UK</td>
<td>N/A</td>
<td>icountACM20 (UK)</td>
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<tr>
<td>ACM202022US</td>
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<td>icountACM20 (US)</td>
</tr>
<tr>
<td>ACM202022EUR</td>
<td>N/A</td>
<td>icountACM20 (EURO)</td>
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<tr>
<td>ACM202024UK</td>
<td>N/A</td>
<td>icountACM20 with lab kit - UK (DEFSTAN 9191)</td>
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<tr>
<td>ACM202024US</td>
<td>N/A</td>
<td>icountACM20 with lab kit - US (DEFSTAN 9191)</td>
</tr>
<tr>
<td>ACM202024EUR</td>
<td>N/A</td>
<td>icountACM20 with lab kit - EURO (DEFSTAN 9191)</td>
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<tr>
<td>ACC6ND000</td>
<td>B84794</td>
<td>1 meter process cable</td>
</tr>
<tr>
<td>ACC6NE006</td>
<td>B844818</td>
<td>ParSmart downloader software</td>
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<td>ACC6NE019</td>
<td>P843855</td>
<td>icountACM20 transit Case</td>
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<td>ACC6NE002</td>
<td>B84746</td>
<td>Vapour/waste bottle assembly</td>
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<td>ACC6NE029</td>
<td>B84745</td>
<td>Throttle kit</td>
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<td>B84645</td>
<td>Millipore adaptor kit</td>
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<td>ACC6NE013</td>
<td>B84629</td>
<td>Re-chargeable battery pack</td>
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<td>ARMK2803</td>
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<td>Printer reel (x5)</td>
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<tr>
<td>ARMK28014</td>
<td>B8442702</td>
<td>Printer ribbon (x1)</td>
</tr>
</tbody>
</table>

**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:** Selected spare parts - for a full list contact Parker.  
* Hot works permit required for online sampling.

### Field Monitoring - icountACM202022

For use in non-hazardous areas, the icountACM202022 is designed for online sampling of hydrocarbon fuels and hydraulic systems, utilising existing “quick connect” sampling points such as the Millipore Adaptor.
DEFSTAN 91-91 Issue 6
Defence Standard 91-91 is the specification for aviation turbine fuel, which the United Kingdom Civil Aviation Authority (CAA) has agreed is under the technical authority of the Director of the Defence Fuels Group.

IP 564
Laboratory determination of the level of dispersed contamination in aviation kerosene using an Automatic Particle Counter (APC). This standard describes a method for determining the level of dispersed contamination in aviation kerosene fuels, specifically dirt particles and water droplets in the range from $\geq 4\mu(c)$ to $\geq 30\mu(c)$. This method relates specifically to Aviation fuels but the equipment can be used on all fuels, petroleum and mineral based fluids.

Note:
The mandatory implementation date for IP 564 test method “Determination of the level of cleanliness of aviation turbine fuel - laboratory automatic particle counter” was July 1st 2009. It is the specification authorities intention to replace current test methods with particle counting at the earliest opportunity.

IP 564 Procedure
Step 1
The apparatus shall be set up in accordance with Parker’s operating instructions.

Step 2
Test Portion Preparation:
Decant a minimum of 450ml of the field sample into a clean test portion container.

Step 3
Prior to starting a test, tumble the test portion end over end for 60 seconds to ensure any settled particles are redistributed.

Step 4
Turn on the Case Mounted Pump and flush for 60 seconds. Do not press the fast flush button. While flushing, enter the test identifier (see manual).

Step 5
Following the flush, start a test by turning the blue valve in the direction indicated. Perform a further 3 tests. (4 in total).
icountPD Z2
ATEX Approved Online Particle Detector

For use in explosive and hazardous areas

The icountPD Particle Detector from Parker represents the most up to date technology in solid particle contamination analysis. This compact, permanently mounted laser-based ATEX approved particle detector module is designed for use in Zone 2 areas and is housed in a robust Stainless Steel IP69K approved enclosure that provides a cost effective solution to fluid management and contamination control.

Product Features:

- Independent monitoring of system contamination trends.
- Assembled in an approved and certified Stainless Steel enclosure to comply with ATEX Directive 94/9/EC.
- Can be used in explosive and hazardous areas.
- ATEX Zone 2.
- Certified to CE Ex II 3GD,Ex nA IIC T4 Gc,Ex tc IIIC Dc SIRA 09ATEX4340X and IECEx SIR 09.0137X (-30°C<Ta<+60°C).
- Moisture & %RH indicator (optional).
- Warning limit relay outputs for low, medium and high contamination levels.
- Continuous performance for prolonged analysis.
- Self diagnostic software.
- Full PC/PLC integration technology such as:- RS232 and 0-5Volt, 4-20mA, CAN(J1939) (Contact Parker for other options.
- Set up and Data logging support software included.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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
icountPD Z2
ATEX Approved Online Particle Detector

Features & Benefits

Diagnostic Self Check Start-up Time:
Customer selectable 5-900 seconds
Measurement Period:
5 to 180 seconds
Reporting interval through RS232:
0 to 3600 seconds
Limit Relay Output:
Changes occur +/- 1 ISO code at set limit (Hysterisis ON) or customer set (Hysterisis OFF)
Particle / % RH Output Signal:
Continuous
Principle of operation:
Laser diode optical detection of actual particulates.
Reporting Codes:
ISO 7 – 21, NAS 0 – 12, (AS 00 – 12 Contact Parker)
icount will also report less than ISO 7, subject to the statistical uncertainty defined in ISO4406:1999, which is shown in the RS232, reporting results as appropriate e.g “<6"
Calibration:
By recognised on-line methods, confirmed by the relevant International Standard Organisation procedures.
Calibration Recommendation:
24 months
Performance:
+/– 1 ISO Code (Dependant on stability of flow)
Reproducibility / Repeatability:
Better than 1 ISO Code
Power Requirement:
Regulated 9 to 40Vdc
Maximum Current Draw:
150mA
Hydraulic Connection:
Size: 066
Connection: EO 24 cone end

Required Flow Range through the icountPD:
40 to 140 ml/min (Optimum Flow = 60ml/min)
Online Flow Range via System 20 Inline Sensors (Hydraulic systems only):
Size 0 = 6 to 25 l/min - (Optimum Flow = 15 l/min)
Size 1 = 24 to 100 l/min - (Optimum Flow = 70 l/min)
Size 2 = 170 to 380 l/min - (Optimum Flow = 250 l/min)
Required Differential Pressure across Inline Sensors:
0.4 bar (Minimum)
Viscosity Range:
1-500 cSt
Temperature:
Operating Environment -30°C to +60°C (-22°F to +140°F)
Storage -40°C to +80°C (-40°F to +176°F)
Operating Fluid +5°C to +80°C (+41°F to +176°F)
Working pressure:
2 to 420 bar (30-6000 PSI)
Moisture sensor calibration (Not offered with the fuel version):
±0.5% RH (over compensated temperature range of +10°C to +80°C)
(+50°F to +176°F)
Operating humidity range:
5% RH to 100% RH
Moisture sensor stability:
±0.2% RH typical at 50% RH in one year
Certification:
IP69K rating
EMC/RFI – EN61000-6-3:2007
EN61000-6-2:2005
Materials:
Stainless Steel case construction.
Stainless Steel hydraulic block.
Dimensions:
260mm x 114mm x 110mm
Weight:
2.6kg
Seals:
Fluorocarbon seals.

Ordering Information

Product Configurator

<table>
<thead>
<tr>
<th>Key</th>
<th>Fluid type</th>
<th>Calibration</th>
<th>Display</th>
<th>Limit relay</th>
<th>Communication</th>
<th>Moisture</th>
<th>Cable connector kit</th>
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<tbody>
<tr>
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<td>Mineral</td>
<td>MTD</td>
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<td>3</td>
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Standard Products Table

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Fluid type</th>
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<th>Display</th>
<th>Limit relay</th>
<th>Communication</th>
<th>Moisture</th>
<th>Cable connector kit</th>
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</thead>
<tbody>
<tr>
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<td>Mineral</td>
<td>MTD</td>
<td>None</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>YES</td>
<td>M12, 8 pin plug connector</td>
</tr>
<tr>
<td>IPDZ32122130</td>
<td>Aviation Fuel (4 channel)</td>
<td>MTD</td>
<td>None</td>
<td>YES</td>
<td>RS232 / 4 - 20mA</td>
<td>NO</td>
<td>M12, 8 pin plug connector</td>
</tr>
</tbody>
</table>

Accessory Part Numbers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Point Sampler</td>
<td>SP50021</td>
</tr>
<tr>
<td>Internal flow device</td>
<td>SH50074</td>
</tr>
<tr>
<td>Power supply</td>
<td>ACC599N13</td>
</tr>
<tr>
<td>2 x 10 metre M12, 8 pin plug and socket Ultrat cable kit</td>
<td>ACC599N021</td>
</tr>
<tr>
<td>Serial to USB converter</td>
<td>ACC599N117</td>
</tr>
</tbody>
</table>
icountACM20 Z2
ATEX Approved Portable Particle Counter

For use in explosive and hazardous areas

icountACM20 Z2 is designed to be used to monitor various fuels from existing sampling points in hazardous locations such as refineries, pipelines, distribution terminals, airport fuel supply systems all the way through to the point of uplift into aircraft. With Zone 2 classification, the icount ACM20 Z2 is the world’s only ATEX approved particle counter.

Contact Information: Product Features:

Parker Hannifin
Hydraulic Filtration

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

• Assembled in an approved and certified stainless steel enclosure to comply with ATEX Directive 94/9/EC.
• Can be used in explosive and hazardous areas, including offshore and mining applications.
• ATEX Zone II
• Certified to CE Ex II 3 G Ex nR/nL IIC T6
• “A” Class product defined for the Aviation market.
• ATEX approved Handset and keypad.
• Suitable for use with mineral oil and petroleum based fluid as per ACM20/LCM20 particle counters.
icountACM20 Z2
ATEX Approved Portable Particle Counter

Features & Benefits

**Test Time:**
2 minutes.

**Repeat Test Time:**
Every 2 minutes (Manual testing) Every 6 minutes (Automatic).

**Principle of Operation:**
Optical scanning analysis and measurement of actual particles and inference to water presence.

**Primary Output:**
≥4µ(c), ≥6µ(c), ≥14µ(c), ≥21µ(c), ≥25µ(c), ≥30µ(c) counts per ml.

**Secondary Diagnostic Output:**
% Volume Distribution, via graphical display on handset.

**International codes:**
ISO 7-22 in accordance with ISO 4406-1999

**Data entry:**
32 character two line dot matrix LCD. Full alpha numeric entry facility on keypad.

**Data retrieval:**
Memory access gives test search facility for up to 300 saved tests.

**Calibration:**
In accordance with Parker Calibration Procedure CM20-N, which complies to ISO11171:1999, Clause 6 (Omitting Annex F).

**Re-calibration:**
Every 12 months by a dedicated Parker Service Centre (Consult Parker).

**Max. working pressure:**
420 bar.

**Operating Temperature:**
+5°C to +80°C

**Memory store:**
300 test (scrolling memory) capacity.

**Computer compatibility:**
Interface via RS 232 connection @ 9600 baud rate.

**Portability:**
15 kg. ACM20 has its own battery pack and carry case with wheels.

**Power requirement:**
Rechargeable battery powered or via the 12vDC input.

**System connection:**
Via Millipore adaptor with flow restriction through supplied needle valve.

**Certification:**
Complies with all relevant EC declarations of conformity.

**Printer facility:**
No printer. Data download only.

Online Commission Kit

- icountACM20 Zone II Particle Counter
- Battery Charger
- Process Cable
- User Manual
- Downloader Software
- Throttle Kit
- Millipore Adaptor Assembly
- Aluminium Case
- Bottle Assembly
Specification

Construction:
Unit: Stainless Steel
Carrying case: ABS
Hand-held display: ABS
Keypad: polyester membrane
Mechanical components: Brass, plated steel, stainless steel and aluminium
Seals: Fluorocarbon
Hoses: Nylon (Kevlar braided microbore)
Fluid compatibility:
All fuels. For other fluids consult Parker
Internal rechargeable battery:
Note: ONLY to be charged outside of the hazardous area, with the unit switched off
Fuse:
1.25A fast blow fuse included for overload protection
Return to Parker Hannifin if fuse is blown
icountACM20 2032 technology:
Unique optical scanning system

Using icountACM20 Z2

icountACM20 Z2 is designed to be used to monitor various fuels from existing sampling points in hazardous locations from refineries, pipelines, distribution terminals, airport fuel supply systems all the way through to the point of uplift into aircraft. With Zone II classification, the icountACM20 Z2 is the world's only ATEX approved particle counter.

Applications in Fuels

- Oil Refinery
  - To count and verify the levels of dispersed contamination in accordance with specification limits. (Consult Parker CMC).
- Distribution Terminals/Hubs
  - For use on receipt and outbound supply. Also to provide filtration performance, tank cleanliness and product quality checks.
- Storage
  - Settling times can be reduced by monitoring with the ACM by ensuring that levels of dispersed contamination are below acceptable levels.
- Airport Fuel Farm
  - Monitoring of fuels into storage, through the fuel farm, hydrant system and during uplift into wing.
- Pipeline Commissioning
  - Fast real time monitoring of pipelines following pigging and cleaning processes.
- Oil and Gas Platforms
  - Used to monitor the filtration performance, system cleanliness and quality of delivered product.
icountACM20 Z2
ATEX Approved Portable Particle Counter

Installation Details

Ordering Information

Standard products table - icountACM20 Z2

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supersedes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACM202020UK</td>
<td>N/A</td>
<td>icountACM20 Z2 + online kit &amp; UK battery charger</td>
</tr>
<tr>
<td>ACM202020US</td>
<td>N/A</td>
<td>icountACM20 Z2 + online kit &amp; US battery charger</td>
</tr>
<tr>
<td>ACM202020EUR</td>
<td>N/A</td>
<td>icountACM20 Z2 + online kit &amp; Euro battery charger</td>
</tr>
<tr>
<td>ACC6NE023</td>
<td>BB4647</td>
<td>UK battery charger</td>
</tr>
<tr>
<td>ACC6NE025</td>
<td>BB4652</td>
<td>US battery charger</td>
</tr>
<tr>
<td>ACC6NE024</td>
<td>BB4653</td>
<td>Euro battery charger</td>
</tr>
<tr>
<td>ACC6NE027</td>
<td>BB4650</td>
<td>2m process cable assembly</td>
</tr>
<tr>
<td>ACC6NE006</td>
<td>BB4816</td>
<td>Parsmart downloader software</td>
</tr>
<tr>
<td>ACC6NE008</td>
<td>BB43066</td>
<td>Carry case</td>
</tr>
<tr>
<td>ACC6NW003</td>
<td>BB4746</td>
<td>Bottle assembly</td>
</tr>
<tr>
<td>ACC6NE029</td>
<td>BB4745</td>
<td>Throttle kit</td>
</tr>
<tr>
<td>ACC6NE001</td>
<td>BB4645</td>
<td>Millipore adaptor assy</td>
</tr>
</tbody>
</table>
Applications in hydraulics

Solutions in the offshore industry.

In addition, the icountACM20 Z2 can be used in many hydraulic system applications as detailed below.

In many industries, worker awareness needs to be maintained at a high level to ensure the safety of their operation. This is particularly relevant to offshore oil-drilling and gas-drilling crews, given the interactive and hazardous nature of their work. The Zone II ACM portable particle analyser is a tried and tested technology designed, proven and approved as a fluid contamination monitor that crews are using and trusting in such hazardous and demanding environments.

- Certified to CE Ex II 3 G Ex nR/nL IIC T6
- Can be used in explosive and hazardous areas, including Offshore and Mining.
- Primary Output. Six cumulative particle size channels ranging from ≥4µm(c) to ≥30µm(c) and numbers per ml in accordance with ISO4406-1999.

icountACM20 Z2 – operational in oil refineries and fuel fields.

Already operational in oil refineries and designed to be used inside commercial airfield fuel locations and at the point of upload of fuel into the aircraft, icountACM20 Z2 has an impressive success record in this approval sensitive area of operation.

With a number of safety features designed in as operational standards, the icountACM20Z2 can be taken to the point of use, connected in moments and reporting in little more than 2 minutes to ISO approved standards.

- Assembled in an approved and certified stainless steel enclosure to comply with ATEX Directive 94/9/EC and EN50 021 requirements.
- ‘A’ Class product defined for the aviation market.
- Designed for on-line operation, connecting to the process line via existing Millipore™ fittings, already in use for other industry equipment.

Applications in other hazardous environments.

- Railroad equipment manufacturer - Warranty protection.
- Power generation stations - Preventative maintenance.
- Mobile equipment - Roll-off cleanliness testing.
- Mining operations - Service tool.
- Steel mills - Preventative maintenance.
icountACM20 Z2
ATEX Approved Portable Particle Counter

Average Particle Counts in AV System

The table below gives estimated counts found in a typical aviation fuel distribution system, and is given as guidance, in which API/EI filtration equipment is installed.

<table>
<thead>
<tr>
<th>Location</th>
<th>High Count</th>
<th>ISO Code - 4406 1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipt into Microfilter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expect 2,500 counts per ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FWS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipt into FWS (After MF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expect 500 counts per ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipt into Storage (After FWS/MF)</td>
<td>100</td>
<td>14</td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>FWS</td>
<td>500</td>
<td>16</td>
</tr>
<tr>
<td>FWS out of storage</td>
<td>100</td>
<td>14</td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>After FWS into Hydrant</td>
<td>500</td>
<td>16</td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>After Monitor Into Aircraft</td>
<td>100</td>
<td>14</td>
</tr>
<tr>
<td>or cleaner @ 4µ(c)</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
| Note: Figures will vary from location to location. Key: MF=Microfilter (API/EI 1590) FWS=Filter Water Separator (API/EI 1581)

© 2012 Parker Hannifin Hydraulic Filtration FDCB810UK
One product range, designed for many industry applications

All Stainless Steel Construction

A quality range of transducers and transmitters with pressure ratings - 25, 60, 100, 250, 400 and 600 bar. One-piece body and diaphragm machining ensures long-term stability and an all Stainless Steel construction ensures reliability. A cost-effective solution in many industrial applications.

Contact Information:

Parker Hannifin
Hydraulic Filtration

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

Product Features:

• A quality range of transducers and transmitters with pressure ratings - 25, 60, 100, 250, 400 and 600 bar.
• One-piece body and diaphragm machining ensures long-term stability.
• All Stainless Steel construction.
• Cost-effective solution in many industry applications.
• 0-5 Volt, 1-6 Volt Transducers.
• 4-20mA Transmitters.
• 1/4 " BSP thread.
• M12 or MicroDIN plug options.
 ASIC ‘Performer’  
Pressure Transducers and Transmitters

Applications for the ASIC Performer

- Fork lift trucks - braking and load systems.
- Truck mounted cranes - load safety systems.
- Earth moving machinery - hydraulic gearbox control.
- Racing car - gearbox, fuel, cooling and suspension systems.
- Water usage systems - pressurised systems for industrial and hi-rise usage.
- Forest Machinery - felling and logging.
- Paper mills - speed control and weighing systems.

The Complete Performer range utilises ASIC technology (Application Specific Integrated Circuit) programmable software.

The Parker Filtration ASIC Performer Pressure Transducers and Transmitters.

The ASIC Performer offers a wide range of pressure sensors for mobile or industrial applications. These sensors have been designed for the requirements of industrial instrumentation systems. Accordingly, the housings and all components in contact with the medium are made of stainless steel. Thus giving compatibility with a wide range of media. There is a choice of two plug connectors of either DIN or M12. There are six measuring ranges available and a choice of outputs in the form of either voltage or current signals. Sensors with output signals from 4...20 mA are available in two wire technology. The built-in voltage regulator allows the sensors to be operated with a supply voltage of 12-36/9-36 Vdc. All sensors are manufactured in our own production facility, typical of Parker Hannifin’s continued commitment to flexibility and quality.

A comprehensive range of Pressure Transducers and Transmitters are available from Parker Filtration.

- One-piece body and diaphragm machining ensures long-term product stability.
- All stainless steel construction.
- 6 transducer pressure ratings with 0-5Vdc and 1-6Vdc outputs.
- 6 transmitter pressure ratings with a 2-wire 4-20mA output.
- Microdin plug and M12 connector options.

AC/DC display unit (DDU10012 or DDU1002)
Specification

Pressure ranges:
25, 60, 100, 250, 400, 600 bar.

Pressure Tolerance Specifications:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Maximum Overload Pressure</th>
<th>Maximum Burst Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>x 2 (50 bar)</td>
<td>x 3 (75 Bar)</td>
</tr>
<tr>
<td>60</td>
<td>x 2 (120 Bar)</td>
<td>x 3 (180 Bar)</td>
</tr>
<tr>
<td>100</td>
<td>x 2 (200 Bar)</td>
<td>x 3 (300 Bar)</td>
</tr>
<tr>
<td>250</td>
<td>x 2 (500 Bar)</td>
<td>x 3 (750 Bar)</td>
</tr>
<tr>
<td>400</td>
<td>x 2 (800 Bar)</td>
<td>x 3 (1200 Bar)</td>
</tr>
<tr>
<td>600</td>
<td>x 2 (1200 Bar)</td>
<td>x 2.5 (1500 Bar)</td>
</tr>
</tbody>
</table>

Vibration resistance:
IEC 60068-2-6:
+/- 5mm/10Hz...32Hz
200m/s² / 32Hz...2kHz

Installation:
Spanner size 22A/F.
Max. (recommended) tightening torque = 30Nm.

Weight:
200 - 230g

Lifespan:
10 million cycles

Thread Forms

G¹/₄ (¹/₄BSP) with ED seal.
All thread forms and sensor interface are made from 1.4301 stainless steel.
Non standard threads - contact Parker CMC

Electrical

Supply voltage | Output
---|---
12 - 36Vdc | 0 - 5Vdc
12 - 36Vdc | 1 - 6Vdc
9 - 36Vdc | 4 - 20mA

Transducer current draw = <6mA
Load impedance (ohm) = >10K
Output signal noise = 0.1%FS

Product Performance

Linearity:
Typical: 0.3%FS.
Max: 0.6%FS.

Hysteresis:
Typical: 0.1%FS.
Max: 0.25%FS.

Repeatability:
Typical: 0.2%FS.
Max: 0.4%FS.

Functional temp range:
-40°C to +85°C.

Compensated temperature:
-20°C to +85°C.

Stability:
<0.1%FS/a (typ).

Response time:
= <1mS.

Wiring Information

Connector

Industrial Micro Din
9.4mm

<table>
<thead>
<tr>
<th>PIN</th>
<th>4 - 20mA</th>
<th>0 - 5Vdc</th>
<th>1 - 6Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do not connect</td>
<td>Signal output</td>
<td>Signal output</td>
</tr>
<tr>
<td>2</td>
<td>Supply +ve</td>
<td>Supply +ve</td>
<td>Supply +ve</td>
</tr>
<tr>
<td>3</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>E</td>
<td>Return</td>
<td>Supply ref. (54)</td>
<td>Supply ref. (54)</td>
</tr>
</tbody>
</table>

Connector M12

<table>
<thead>
<tr>
<th>PIN</th>
<th>4 - 20mA</th>
<th>0 - 5Vdc</th>
<th>1 - 6Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply +ve</td>
<td>Supply +ve</td>
<td>Supply +ve</td>
</tr>
<tr>
<td>2</td>
<td>Do not connect</td>
<td>Signal output</td>
<td>Signal output</td>
</tr>
<tr>
<td>3</td>
<td>Return</td>
<td>Supply ref. (54)</td>
<td>Supply ref. (54)</td>
</tr>
<tr>
<td>4</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
</tbody>
</table>

Installation Details

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ASIC ‘Performer’
Pressure Transducers and Transmitters

Ordering Information

Standard products table

<table>
<thead>
<tr>
<th>Product number</th>
<th>Description - pressure transducer</th>
<th>Model</th>
<th>Output</th>
<th>Pressure</th>
<th>Thread form</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTDVB2501B1C1</td>
<td>0 - 5 Vdc 250 bar / 1/4” BSP seal micro-din</td>
<td>PTD</td>
<td>VB</td>
<td>250</td>
<td>1</td>
<td>BC1</td>
</tr>
<tr>
<td>PTDVB4001B1C1</td>
<td>0 - 5 Vdc 400 bar / 1/4” BSP ED seal micro-din</td>
<td>PTD</td>
<td>VB</td>
<td>400</td>
<td>1</td>
<td>BC1</td>
</tr>
<tr>
<td>PTDVB2501B1C2</td>
<td>0 - 5 Vdc 250 bar / 1/4” BSP ED seal M12</td>
<td>PTD</td>
<td>VB</td>
<td>250</td>
<td>1</td>
<td>BC2</td>
</tr>
<tr>
<td>PTDVB4001B1C2</td>
<td>0 - 5 Vdc 400 bar / 1/4” BSP ED seal M12</td>
<td>PTD</td>
<td>VB</td>
<td>400</td>
<td>1</td>
<td>BC2</td>
</tr>
<tr>
<td>PTDVB0251B1C1</td>
<td>0 - 5 Vdc 25 bar / 1/4” BSP ED seal micro-din</td>
<td>PTD</td>
<td>VB</td>
<td>25</td>
<td>1</td>
<td>BC1</td>
</tr>
<tr>
<td>PTDVB0251B1C2</td>
<td>0 - 5 Vdc 25 bar / 1/4” BSP ED seal M12</td>
<td>PTD</td>
<td>VB</td>
<td>25</td>
<td>1</td>
<td>BC2</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Product number</th>
<th>Supercodes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P833PVC2M</td>
<td>P833PVC-2M</td>
<td>2 meter PVC coated 4 core cable</td>
</tr>
<tr>
<td>P833PVC5M</td>
<td>P833PVC-5M</td>
<td>5 meter PVC coated 4 core cable</td>
</tr>
<tr>
<td>P833PVC10M</td>
<td>P833PVC-10M</td>
<td>10 meter PVC coated 4 core cable</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Product number</th>
<th>Output options</th>
<th>Pressure range (bar)</th>
<th>Thread form</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTD</td>
<td>VB</td>
<td>0 - 5 Vdc</td>
<td>0 - 25</td>
<td>/ 1/4” BSP with ED seal</td>
</tr>
<tr>
<td>PTD</td>
<td>SB</td>
<td>1 - 6 Vdc</td>
<td>100</td>
<td>/ 1/4” BSP with ED seal</td>
</tr>
<tr>
<td>PTX</td>
<td>B</td>
<td>4 - 20 mA (PTX only)</td>
<td>0 - 100</td>
<td>/ 1/4” BSP with ED seal</td>
</tr>
<tr>
<td>PTX</td>
<td>R8</td>
<td>0.5 - 4.5 ratiometric</td>
<td>250</td>
<td>/ 1/4” BSP with ED seal</td>
</tr>
<tr>
<td>PTX</td>
<td>R9</td>
<td>0.1 - 4.9</td>
<td>600</td>
<td>/ 1/4” BSP with ED seal</td>
</tr>
</tbody>
</table>

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.

Examples of standard part number product ordering

PTDVB2501B1C1 0 – 5 volt output transducer 250 bar maximum pressure 1/4” BSP with ED seal Industrial micro-din 9.4mm connector
PTX0251B1C2 4 – 20mA output transmitter 25 bar maximum pressure 1/4” BSP with ED seal M12 connector (See accessories for IP68 protected cable)

PTDSB4001B1C2 1 – 6 volt output transducer 400 bar maximum pressure 1/4” BSP with ED seal M12 connector (See accessories for IP68 protected cable)
At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374.

**Aerospace**

**Key Markets**
- Commercial transports
- Engines
- General aviation
- Helicopters
- Launch vehicles
- Military aircraft
- Missiles
- Power generation
- Regional transports
- Unmanned aerial vehicles

**Climate Control**

**Key Markets**
- Agriculture
- Air conditioning
- Construction machinery
- Food & beverage
- Industrial machinery
- Life sciences
- Oil & gas
- Precision cooling
- Process
- Refrigeration
- Transportation

**Electric/mechanical**

**Key Markets**
- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastic machinery & converting
- Primary metals
- Semiconductor & electronics
- Tools
- Wire & cable

**Filtration**

**Key Markets**
- Aerospace
- Food & beverage
- Industrial plant & equipment
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation & renewable energy
- Process
- Transportation
- Water Purification

**Sealing & Shielding**

**Key Markets**
- Dynamic seals
- Electro-mechanical
- Electro-medical instrument design & assembly
- EMI shielding
- Extruded & precision cut, fabricated elastomeric seals
- High temperature metal seals
- Homogenous & layered elastomeric shapes
- Medical device fabrication & assembly
- Metal & plastic retained composite seals
- Shielded optical windows
- Silicone tubing & inserts
- Thermal management
- Vibration dampening

**Fluid & Gas Handling**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Marine
- Mining
- Mobile
- Oil & gas
- Renewable energy
- Transportation

**Key Products**
- Check valves
- Connectors for low pressure fluid conveyance
- Deep sea umbilicals
- Diagnostic equipment
- Hose couplings
- Industrial hose
- Microporous systems & power cables
- PTFE hose & tubing
- Quick connections
- Rubber & thermoplastic hose
- Tubing fittings & adapters
- Tubing & plastic fittings

**Hydraulics**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Marine
- Mining
- Mobile
- Oil & gas
- Renewable energy
- Transportation

**Key Products**
- Check valves
- Connectors for low pressure fluid conveyance
- Deep sea umbilicals
- Diagnostic equipment
- Hose couplings
- Industrial hose
- Microporous systems & power cables
- PTFE hose & tubing
- Quick connections
- Rubber & thermoplastic hose
- Tubing fittings & adapters
- Tubing & plastic fittings

**Pneumatics**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Marine
- Mining
- Mobile
- Oil & gas
- Renewable energy
- Transportation

**Key Products**
- Check valves
- Connectors for low pressure fluid conveyance
- Deep sea umbilicals
- Diagnostic equipment
- Hose couplings
- Industrial hose
- Microporous systems & power cables
- PTFE hose & tubing
- Quick connections
- Rubber & thermoplastic hose
- Tubing fittings & adapters
- Tubing & plastic fittings

**Process Control**

**Key Markets**
- Alternative fuels
- Bio-renew见面物
- Chemical & refining
- Food & beverage
- Marine & shipbuilding
- Medical & dental
- Microelectronics
- Nuclear Power
- Oil & gas
- Pharmaceuticals
- Power generation
- Pulp & paper
- Steel
- Waste/water treatment

**Key Products**
- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic actuators
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural reinforcements
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors

**Sealing**

**Key Markets**
- Aerospace
- Chemical processing
- Consumer
- Fluid power
- General industrial
- Information technology
- Life sciences
- Microelectronics
- Military
- Oil & gas
- Power generation
- Renewable energy
- Telecommunications
- Transportation

**Key Products**
- Dynamic seals
- Electrical seals
- Electro-medical instrument design & assembly
- EMI shielding
- Extruded & precision cut, fabricated elastomeric seals
- High temperature metal seals
- Homogenous & layered elastomeric shapes
- Medical device fabrication & assembly
- Metal & plastic retained composite seals
- Shielded optical windows
- Silicone tubing & inserts
- Thermal management
- Vibration dampening