

aerospace  
climate control  
electromechanical  
**filtration**  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



## Fluid Condition Monitoring and Fuel Hydrocarbon Monitoring Solutions



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.



Condition Monitoring Business Unit, Thetford, UK

## 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.



# Introduction



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](mailto:commoninfo@parker.com)

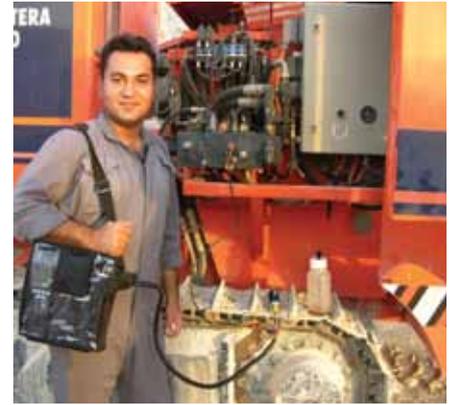
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# icountLaserCM20

## 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.



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

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



# icountLaserCM20

## Portable Particle Counter

### Features & Benefits

<b>Test time:</b>	2 minutes
<b>Particle counts:</b>	MTD 4+, 6+, 14+, 21+, 38+ and 70+ microns(c) ACFTD 2+, 5+, 15+, 25+, 50+ and 100+ microns
<b>International codes:</b>	ISO 7-22, NAS 0-12
<b>Data retrieval:</b>	Memory access gives test search facility
<b>Max. working pressure:</b>	420 bar
<b>Max. flow rate:</b>	400 l/min when used with system 20 Sensors. Higher with single point sampler (see page 386)
<b>Working conditions:</b>	LaserCM will operate with the system working normally
<b>Computer compatibility:</b>	Interface via RS232 connection @ 9600 baud rate.

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

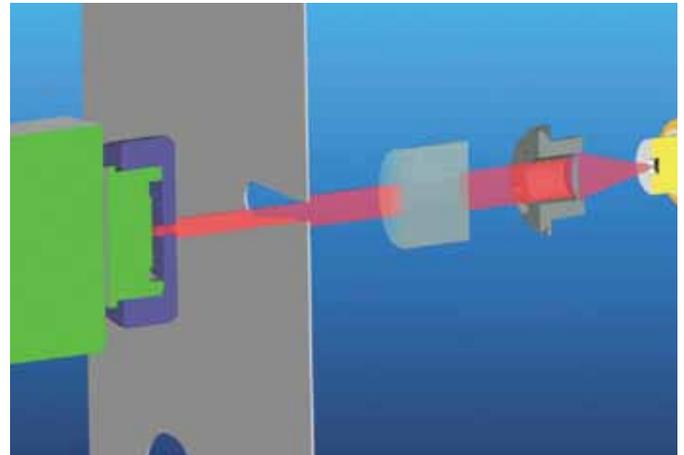
The most common monitoring technique used in APC's is that of light obscuration or light blockage. Here, a focused light source is projected through a moving column of oil, (in which the contaminants being measured are contained), causing an image of the contaminant to be projected on to a photo diode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



Laser Optical Sensing

### Core technology that proves itself in icountLaserCM

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

### How does icountLaserCM work?

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

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

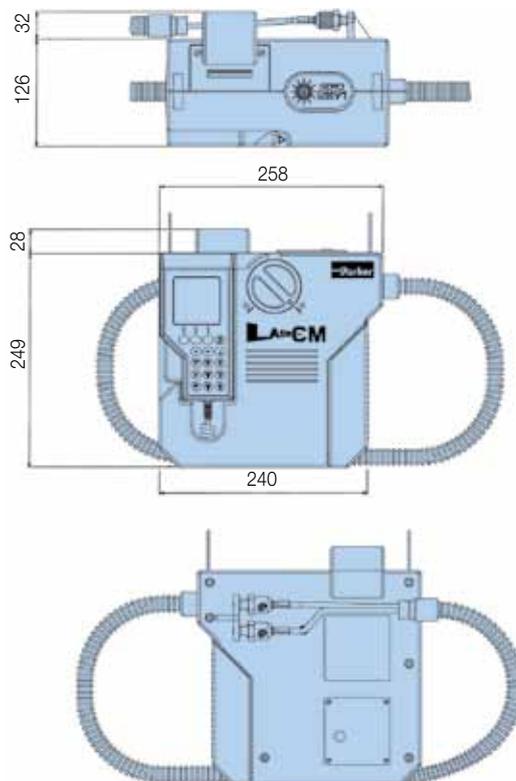
# icountLaserCM20

## Portable Particle Counter

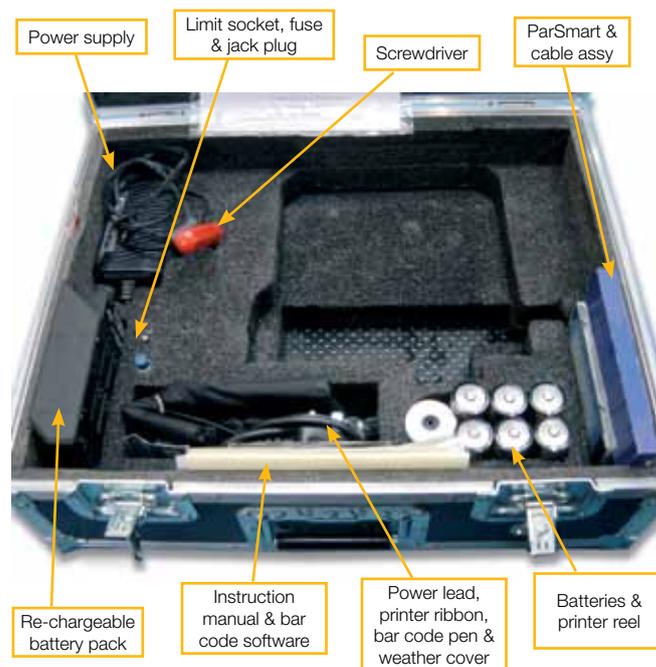
### Specification

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

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



### Commissioning Kit



## Operation



Switch On



Start Test

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

### icountLCM20 makes the difference in industry

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

### MTD calibration

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

### icountLCM20 Using SPS



### Understanding MTD

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

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

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

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

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

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

# icountLaserCM20

## Portable Particle Counter

### Why On-Site Fluid Contamination Monitoring?

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



### Data Download Management

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



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

icountLaserCM Test		icountLaserCM Test	
ON LINE TEST		ON LINE TEST	
TEST NUMBER 022		TEST NUMBER 022	
		D M Y	
Date	04-03-10	Date	04-03-10
Time	15-52	Time	15-52
ISO:	20/15/09	NAS CLASS:	7
Count / 100ml		Count / 100ml	
>4µ (c)	820721	4/6µ (c)	789157
>6µ (c)	31564	6/14µ (c)	31250
>14µ (c)	314	NAS CLASS	7
>21µ (c)	64	14/21µ (c)	250
>38µ (c)	14	NAS CLASS	3
>70µ (c)	0	21/38µ (c)	50
NOTES		NAS CLASS	3
		38/70µ (c)	14
		NAS CLASS	4
		>70µ (c)	0
		NAS CLASS	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 icountLCM, with a CD user guide, professionally and securely boxed. One thing that has not altered is the icountLCM accuracy and icountLCM reliability. Our in-house software engineers have re-configured the EPROM, removing Data programming, User ID, Automatic Testing, Data retrieval, Alarm level settings, the barcode pen and Graph printing functions to reduce costs still further without in any way reducing the efficiency of the icountLCM. The icountLCM ‘Classic’ remains an instrument to be proud of.



## Ordering Information (icontainsLaserCM and ‘Classic’ icountLaserCM)

### Standard products table

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

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

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

### Product configurator

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

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

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

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



# Universal Bottle Sampler

Simple and efficient offline oil sampling



Clean and  
contamination free  
sampling

Ideal for batch oil sampling  
and laboratory testing

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



## Contact Information: 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

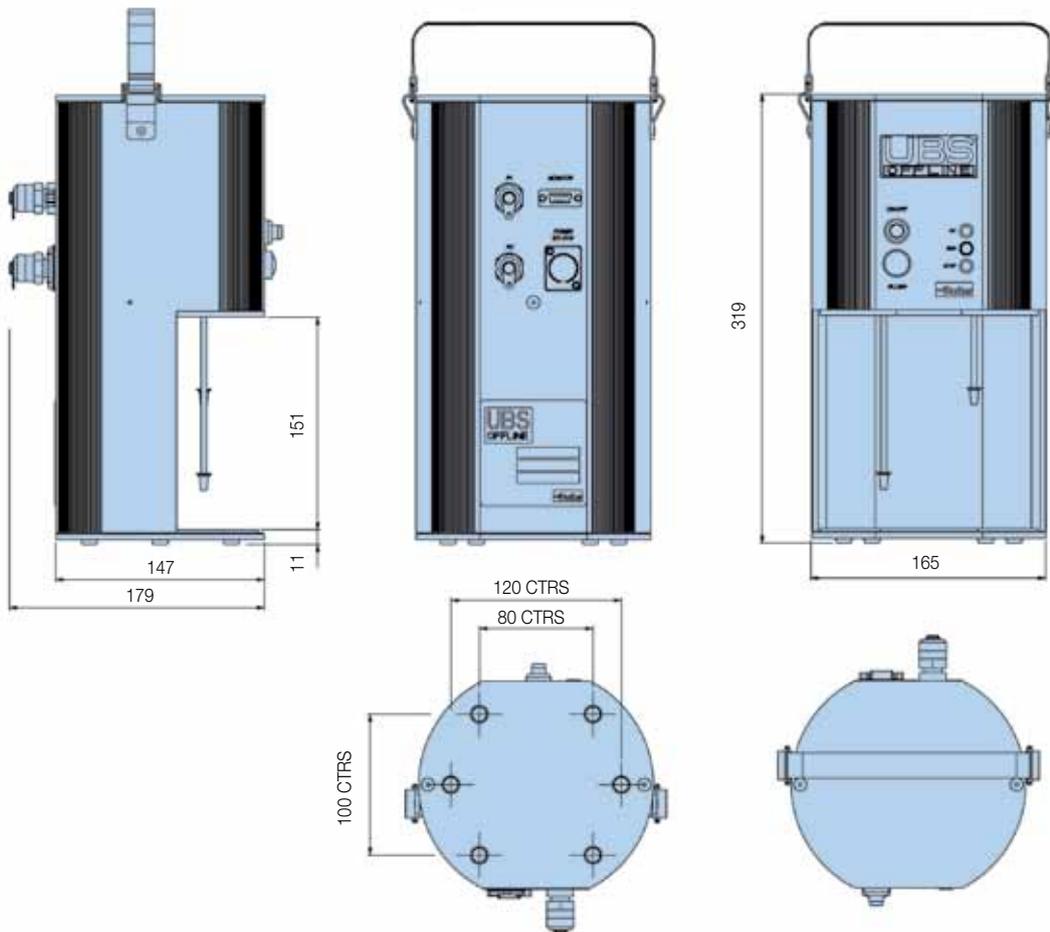
[www.parker.com/hfde](http://www.parker.com/hfde)

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

## Specification

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

## Installation Details



# Universal Bottle Sampler

Simple and efficient offline oil sampling

## System Flow Rate

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

## System Condition Changes

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

There are a number of proprietary sampling valves available which adhere to good theoretical principles. However, they do tend to generate a level of precision



and cost which is unnecessary for trend monitoring.

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

## Bottle Cleanliness

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

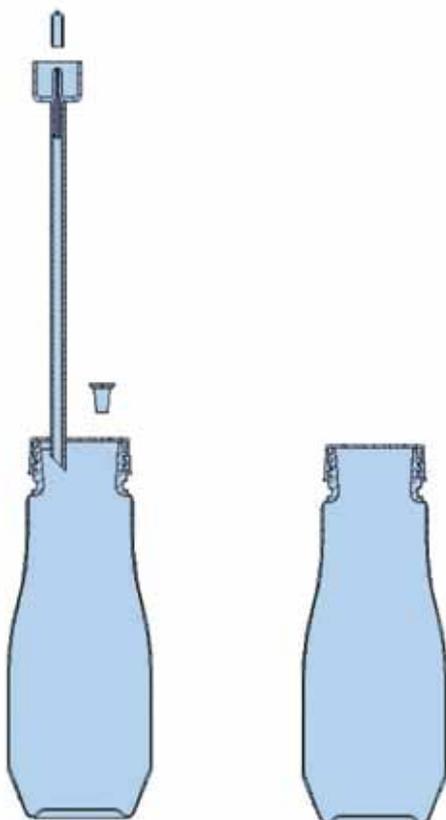
The bottle should not contain more than one tenth the number of particles per 100ml than are expected to be monitored. Standard Parker bottles are supplied clean to ISO13/11 (NAS Class 4) and should not be used to accurately count oils cleaner than ISO 15/12 (NAS Class 6) although they may be used for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

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

## Sample Mixing

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

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



ACC6NW001 x 50 = ACC6NW002

ACC6NK001

## Ordering Information

### Standard products table

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

### Accessories

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

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

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



## Typical Applications

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



## Simple To Use UBS

The oil sample is drawn into the UBS Off-line where it is secured, free from further contamination, in a bottle together with a clean waste bottle by a peristaltic, self-priming pump. Simple operation and efficient testing are assured once the UBS Off-line is connected to any of the CM monitors, and powered up using its 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](http://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.



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



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



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



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



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



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

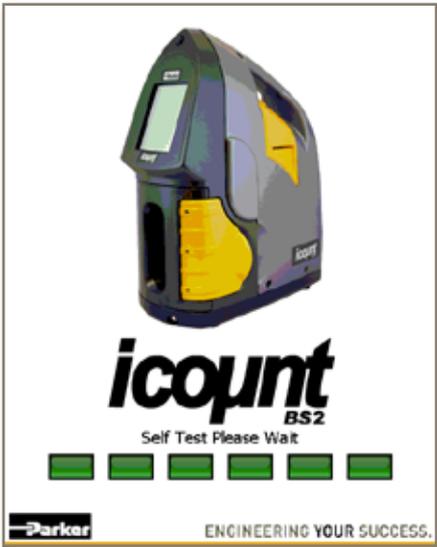


**Industrial:** Test rigs, hydraulic benches and hydraulic controlled production lines, as well as hydraulic system test laboratories, all benefit from the IBS.

# How the icountBS2 works

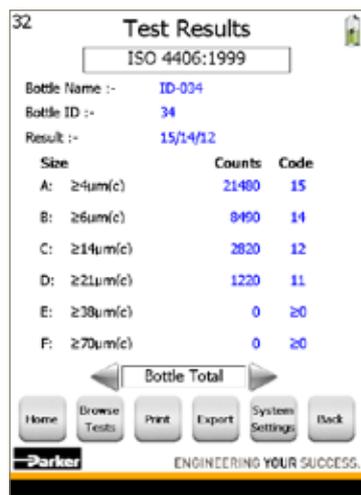
Our design, manufacturing and applications engineers have over 20 years experience working with advanced contamination and particle detection technologies. As a result, the latest version of the icountBS2 has been developed to meet the needs of customers throughout industry, both today and in the future.

## Precision and repeatability



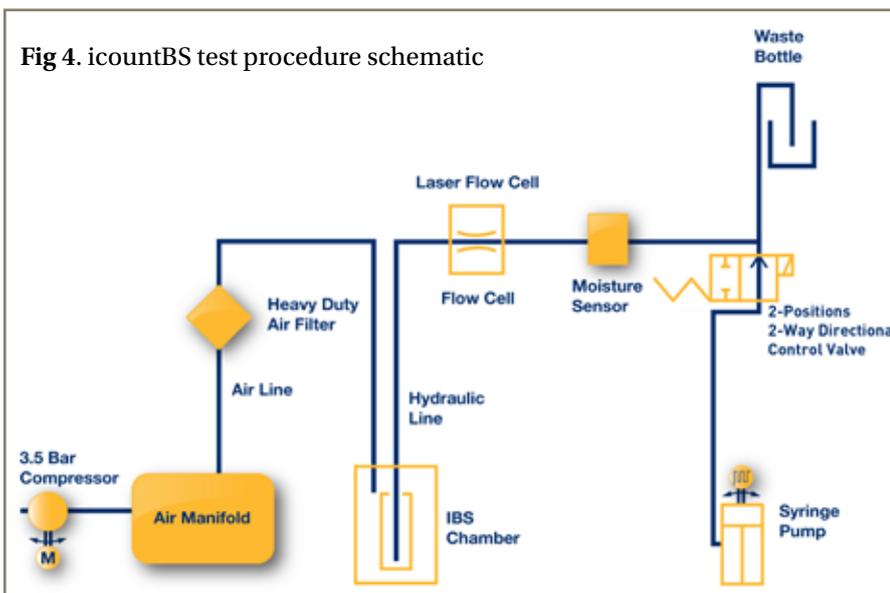
This eliminates many of the variables associated with traditional methods of contamination monitoring. Control and accuracy is further enhanced with an easy to use interactive touch screen display.

The backlit 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.



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.



## 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.

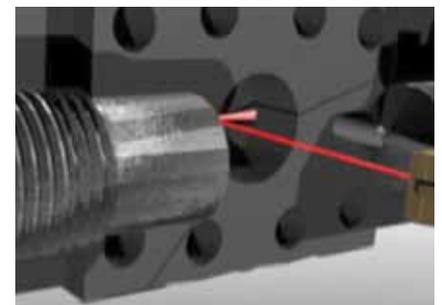


Fig 2. The laser is projected through the oil column onto a highly sensitive photo diode cell.

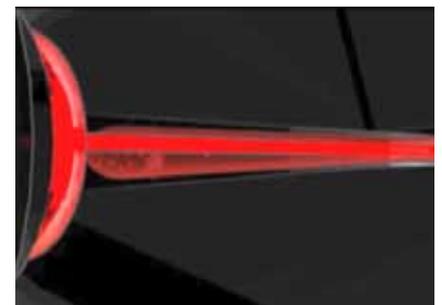


Fig 3. The shadow cast on the photo diode by contaminants in the oil creates a measurable change in the light intensity.

## 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.



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

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.



**Fig 5.** IBS' high filtration air filter.

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



**Fig 6.** IBS' integrated 12VDC compressor.

## 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
- 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

### Contamination Standards Table

MTD	ACFTD
ISO 4406 : 1999	ISO 4406 : 1987
NAS 1638	ISO 4406 : 1991
AS4059E (Differential)	NAS 1638
AS4059E (Cumulative)	AS4059E (Differential)
Jet Fuel (contact Parker)	AS4059E (Cumulative)
	GOST 17216 : 2001

- 8 fixed channel size analysis
- Integrated relative humidity moisture sensor
- Selectable test sample sizes: 10, 20, 30, 40, 50, 60, 80 and 100ml
- Selectable flush sample sizes: 10, 15, 20, 25, 50 and 100ml

# 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.

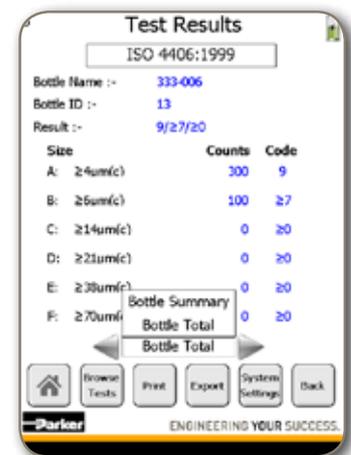
It is important that whatever practices you adopt, you must perform them consistently.

## 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 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).



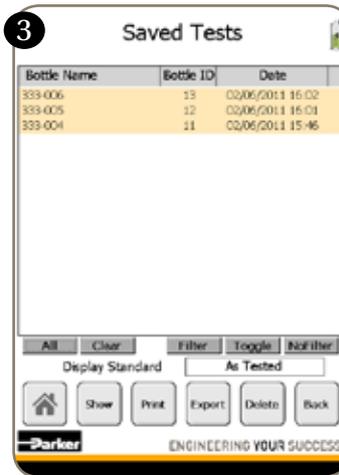
# Viewing/Exporting test results



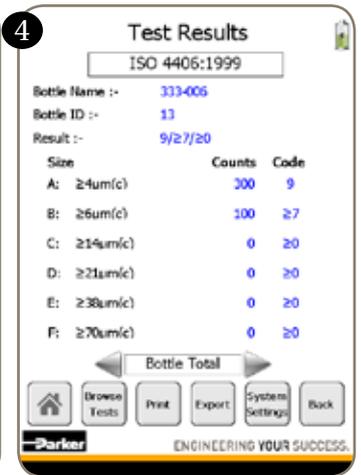
Select **Browse Tests** from the main **Test Set-up** screen.



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 icoountBS2.



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

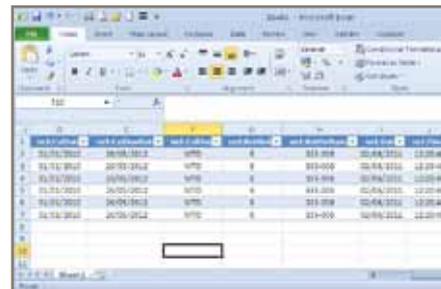
# Test results (Importing data)

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

Feature	Specification																																																																																
Principle of operation	Laser diode optical detection of actual particulates																																																																																
Dimensions	H 530mm x W 210mm x D 410mm																																																																																
Weight	Approx 18kg																																																																																
Operating temperature and humidity	+5°C to +60°C (-41°F to +140°F) 20-85% RH (tested at 30°C (86°F), non-condensing)																																																																																
Storage temperature and humidity	-40°C to +90°C (-40°F to +194°F) 10-90% RH (tested at 30°C (86°F), non-condensing)																																																																																
Moisture sensor calibration	±5% RH (over a compensated temperature range of +10°C to +80°C (+50°F to +176°F))																																																																																
Moisture sensor stability	±2% RH typical at 50% RH in one year																																																																																
International codes	ISO 7 to 21, NAS 0 to 12, AS 0 to 12																																																																																
Contamination standards	Refer to Parker 'Guide to Contamination Standards' (DD0000015) on CD <b>MTD</b> : ISO 4406:1999; NAS 1638; AS4059E (Differential); AS4509E (Cumulative) <b>ACFTD</b> : ISO 4406:1987; ISO4406:1991; NAS 1638; AS4509E (Differential); AS4509E (Cumulative); GOST 17216 : 2001																																																																																
Channel sizes	<table border="1"> <thead> <tr> <th colspan="5">Channel Sizes: MTD µm(c)</th> </tr> <tr> <th>ISO 4406:1999</th> <th>NAS 1638</th> <th>AS4059E (Diff)</th> <th>AS4059E (Cum)</th> <th>Jet Fuel</th> </tr> </thead> <tbody> <tr> <td>&gt;4</td> <td>4-6</td> <td>4-6</td> <td>&gt;6</td> <td>&gt;4</td> </tr> <tr> <td>&gt;6</td> <td>6-14</td> <td>6-14</td> <td>&gt;21</td> <td>&gt;6</td> </tr> <tr> <td>&gt;14</td> <td>14-21</td> <td>14-21</td> <td>&gt;70</td> <td>&gt;14</td> </tr> <tr> <td>&gt;21</td> <td>21-38</td> <td>21-38</td> <td>-</td> <td>&gt;21</td> </tr> <tr> <td>&gt;38</td> <td>38-70</td> <td>38-70</td> <td>-</td> <td>&gt;25</td> </tr> <tr> <td>&gt;70</td> <td>&gt;70</td> <td>&gt;70</td> <td>-</td> <td>&gt;30</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="5">Channel Sizes: ACFTD µm(c)</th> </tr> <tr> <th>ISO 4406:1987</th> <th>NAS 1638</th> <th>AS4059E (Diff)</th> <th>AS4059E (Cum)</th> <th>GOST 17216:2001</th> </tr> </thead> <tbody> <tr> <td>&gt;2</td> <td>2-5</td> <td>2-5</td> <td>&gt;5</td> <td>&gt;2-5</td> </tr> <tr> <td>&gt;5</td> <td>5-15</td> <td>5-15</td> <td>&gt;15</td> <td>&gt;5-10</td> </tr> <tr> <td>&gt;15</td> <td>15-25</td> <td>15-25</td> <td>&gt;25</td> <td>&gt;10-25</td> </tr> <tr> <td>&gt;25</td> <td>25-50</td> <td>25-50</td> <td>&gt;100</td> <td>&gt;25-50</td> </tr> <tr> <td>&gt;50</td> <td>50-100</td> <td>50-100</td> <td>-</td> <td>&gt;50-100</td> </tr> <tr> <td>&gt;100</td> <td>&gt;100</td> <td>&gt;100</td> <td>-</td> <td>&gt;100-200</td> </tr> </tbody> </table>	Channel Sizes: MTD µm(c)					ISO 4406:1999	NAS 1638	AS4059E (Diff)	AS4059E (Cum)	Jet Fuel	>4	4-6	4-6	>6	>4	>6	6-14	6-14	>21	>6	>14	14-21	14-21	>70	>14	>21	21-38	21-38	-	>21	>38	38-70	38-70	-	>25	>70	>70	>70	-	>30	Channel Sizes: ACFTD µm(c)					ISO 4406:1987	NAS 1638	AS4059E (Diff)	AS4059E (Cum)	GOST 17216:2001	>2	2-5	2-5	>5	>2-5	>5	5-15	5-15	>15	>5-10	>15	15-25	15-25	>25	>10-25	>25	25-50	25-50	>100	>25-50	>50	50-100	50-100	-	>50-100	>100	>100	>100	-	>100-200
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>100	>100	>100	-	>100-200																																																																													
Calibration	<b>MTD</b> : via a certified primary ISO 11171 automatic particle detector using ISO 11943 principles, with particle distribution reporting to ISO 4406:1996 <b>ACFTD</b> : 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 300cSt																																																																																
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

Key	Version		Options		Region	Part number
IBS	2	3	MS/Online	000	EUR	IBS3000EUR*
IBS	2	3	MS/Online	000	UK	IBS3000UK*
IBS	2	3	MS/Online	000	USA	IBS3000USA*
IBS	2	3	MS	100	EUR	IBS3100EUR
IBS	2	3	MS	100	UK	IBS3100UK
IBS	2	3	MS	100	USA	IBS3100USA
IBS (contact Parker)	2	3	Fuel	100F	EUR	IBS3000FEUR*

Note: Transit Case Option.

\*Please contact Parker for lead times

Transportation packaging specialists have been utilised to create a tailor-made shipping carton for the icountBS2.

If a plastic storage/presentation case is required, please see the accessory section below.

## Accessory Part Numbers

Description	Part number
Power pack (UK 2m cable)	ACC6NW023
Power pack (US 2m cable)	ACC6NW024
Power pack (EUR 2m cable)	ACC6NW025



250ml Sample bottle kit (x2)	ACC6NW001
250ml Sample bottle kit (x50)	ACC6NW002



Vapour / waste bottle ACC6NW003



Printer paper reel ACC6NW005



On-line adaptor kit ACC6NW022

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

A robust plastic storage/presentation case is available to order as an optional accessory.



# 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 H<sub>2</sub>Oil 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.

mineral based fluids



aggressive/phosphate Ester fluids

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

- Lightweight, compact and easy to use online sampling unit.
- Connects an icountLCM20 or H<sub>2</sub>Oil 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

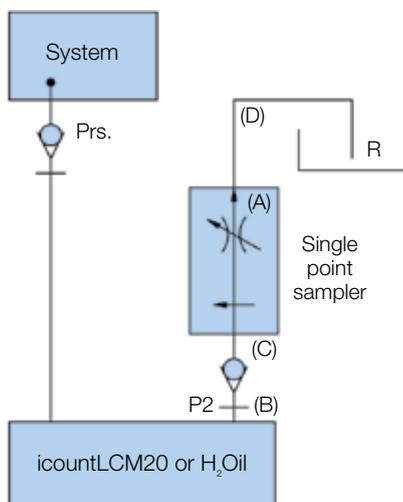
### Features & Benefits

The Single Point Sampler provides a means to connect an icountLCM20 or H<sub>2</sub>Oil 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 H<sub>2</sub>Oil 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 H<sub>2</sub>Oil 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 H<sub>2</sub>Oil)



### Connection Instructions



1. Ensure valve is closed (A).
2. Connect P2 on icountLCM20 or H<sub>2</sub>Oil (B) to P2 on Single Point Sampler (SPS) (C).
3. Connect drain line on SPS (D).
4. Connect P1 of icountLCM20 or H<sub>2</sub>Oil (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  $\Delta t$  3.6°C then carry out test as normal. If, however, test is above  $\Delta t$  3.6°C then increase oil flow by turning valve (A) anticlockwise and then carry out flow test. Do this until  $\Delta t$  is below 3.6°C and carry out test as normal once achieved.

**WARNING! Ensure that SPS valve is closed and icountLCM20 or H<sub>2</sub>Oil 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 (G<sup>1</sup>/<sub>4</sub>" BSP) with cap,  
Aggressive - 5/8" BSF HSP.

### Operating temp range:

+5°C to +80°C (+41°F to +176°F).

### Storage temperature range:

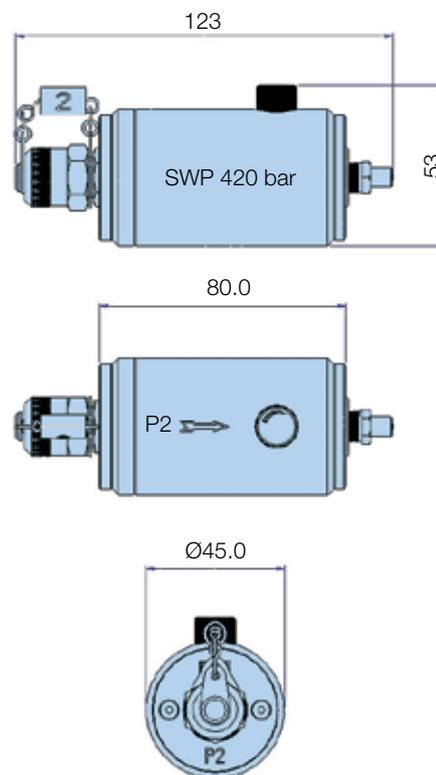
-26°C to +80°C (-15°F to +176°F).

### 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

Part number	Supersedes	Description
<b>SPS2021</b>	SPS.2021	Single point sampler (Mineral Oil fluids)
SPS2061	SPS.2061	Single point sampler (Aggressive/phosphate ester fluids)
ACC6NW003	B84784	Waste bottle (Universal)
ACC6NH001	B84224	Extension hose/coupling (Mineral fluids)
ACC6NH002	B84225	Extension hose/coupling (Aggressive/phosphate ester fluids)
ACC6NH003	B84788	Waste hose (Mineral Oil)
ACC6NH004	B84787	Waste hose (Aggressive/phosphate ester fluids)

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

Inline Sensors & Monitors



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

- 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 H<sub>2</sub>Oil. 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.



2 sizes of System20 Inline Mobile Sensors are available

# 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,  $\Delta p$  is 1.1 bar (mineral oil fluid at 30 cSt 140 SSU).

#### Ports:

Size 0: G<sup>3</sup>/<sub>8</sub>  
 Size 1: G<sup>3</sup>/<sub>4</sub>  
 Size 2: G1<sup>1</sup>/<sub>4</sub>

#### 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



Dimensions (mm)

	Size	Model	AØ	B	C
Industrial	0	STI	30	95	56
	1	STI	41	137	66.5
	2	STI	66.7	231.3	73.5
Mobile	1	STS	41	105	79
	2	STS	60	165	97

### 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

Product number	Supersedes	Size	Flow range l/min	Fluid type	Port threads	Reverse Flow capability
<b>STI0144100</b>	STI.0144.100	0	6-25	Mineral	<sup>3</sup> / <sub>8</sub>	Yes
<b>STI1144100</b>	STI.1144.100	1	20-100	Mineral	<sup>3</sup> / <sub>4</sub>	Yes
<b>STI2144100</b>	STI.2144.100	2	80-380	Mineral	1 <sup>1</sup> / <sub>4</sub>	Yes
STI0148100	STI.0148.100	0	6-25	Aggressive	<sup>3</sup> / <sub>8</sub>	Yes
STI1148100	STI.1148.100	1	20-100	Aggressive	<sup>3</sup> / <sub>4</sub>	Yes
STI2148100	STI.2148.100	2	80-380	Aggressive	1 <sup>1</sup> / <sub>4</sub>	Yes
STS5117210	STS.5117.210	1	20-100	Mineral	<sup>3</sup> / <sub>4</sub>	No
STS5217210	STS.5217.210	2	80-380	Mineral	1 <sup>1</sup> / <sub>4</sub>	No

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)

### 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  $\pm 1\%$  FSD.

**Temperature section:**

Temperature reading between  $-10^{\circ}\text{C}$  and  $+110^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $230^{\circ}\text{F}$ ).

**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.

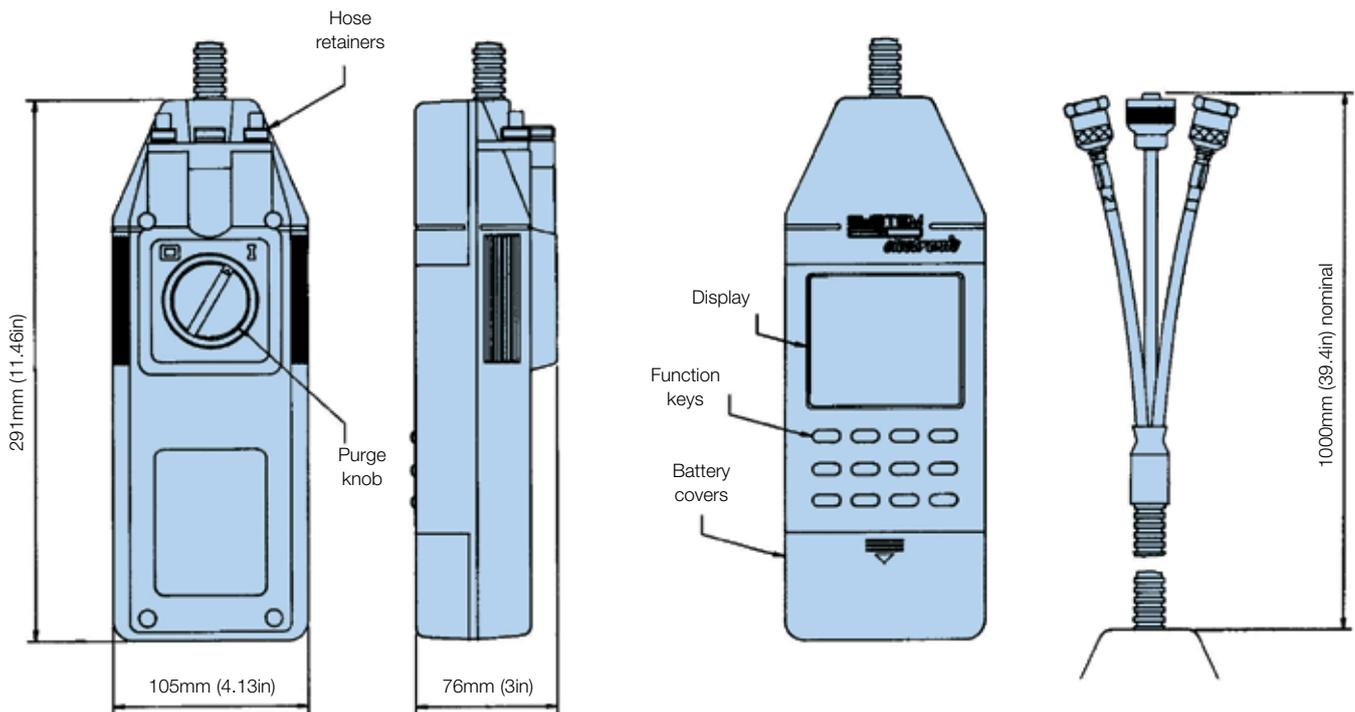
**Batteries:**

6 x AA batteries.

**Re-calibration:**

Annual certification by an approved Parker Service Centre.

Dimensions (mm)



### Ordering Information

**Standard products table**

Product number	Supersedes	Description
<b>EM209000</b>	EM20.9000	System 20 electronic monitor
ACC6NJ000	P653607	Transit case
ACC6NJ001	B85617	Dongle and cable assembly

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).

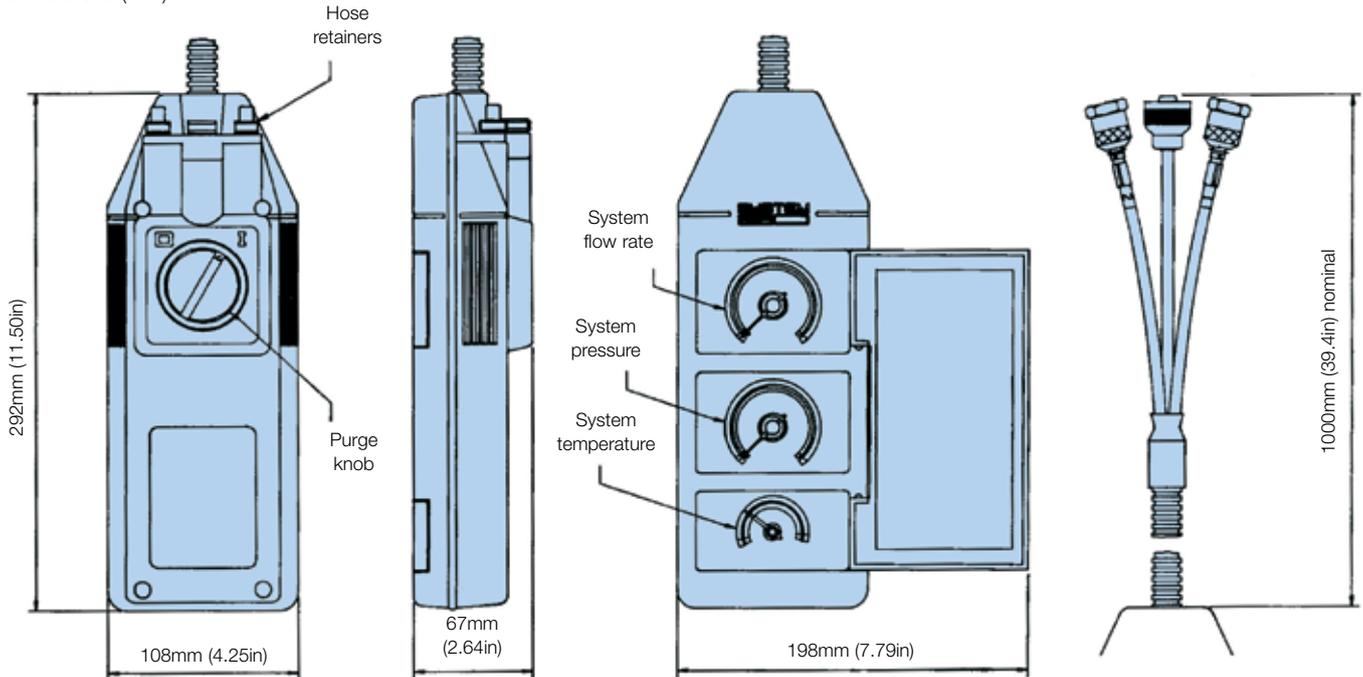
##### Weight:

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

Dimensions (mm)



### Ordering Information

#### Standard products table

Product number	Supersedes	Media type	Flow readings	Pressure readings	Temperature readings
<b>STM6211110</b>	STM.6211.110	Oil	l/min	Dual scale bar/PSI	Dual scale °C/°F
STM6611110	STM.6611.110	Oil	US GPM	Dual scale bar/PSI	Dual scale °C/°F
STM6211120	STM.6211.120	Water	l/min	Dual scale bar/PSI	Dual scale °C/°F
STM6611120	STM.6611.120	Water	US GPM	Dual scale bar/PSI	Dual scale °C/°F

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.

#### Accessories

Product number	Supersedes	Description
ACC6NJ000	P653607	Transit case
ACC6NJ002	P653106	Metal sensor protective cap

# MCM20

## Autoremove 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.



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

- 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.

# MCM20

## Autoremove 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.

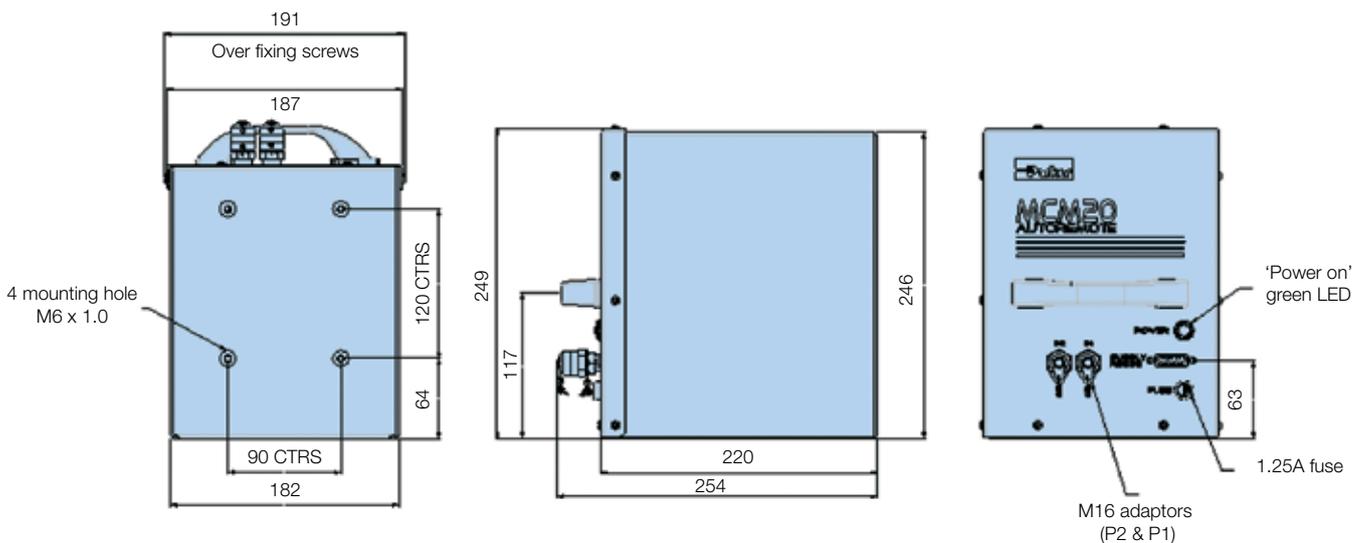
**Installation:**

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

**Software:**

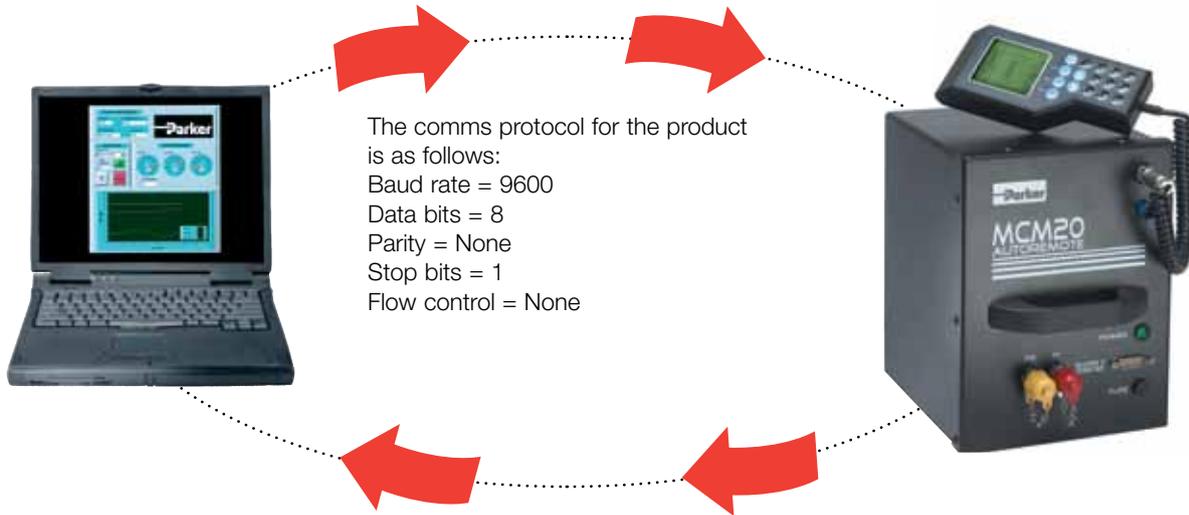
LabView demonstration software.

Dimensions (mm)



# MCM20

## Autoremove 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

### Labview

### Optional Remote Handset



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



Optional remote handset for direct interface control. Please consult Parker for more information.

### Standard products table

Product number	Supersedes	Description
<b>MCM202022</b>	MCM20.2022	A/remote particle counter for mineral fluids (MTD calibrated)
<b>MCM202022HS</b>	MCM20.2022.HS	A/remote particle counter for mineral fluids (MTD calibrated) with Handset
<b>MCM202021</b>	MCM202021	A/remote particle counter for mineral fluids (ACFTD calibrated)
<b>MCM202021HS</b>	MCM202021HS	A/remote particle counter for mineral fluids (ACFTD calibrated) with handset
<b>MCM202061</b>	MCM202061	A/remote particle counter for mineral fluids (ACFTD calibrated)
<b>MCM202061HS</b>	MCM202062	A/remote particle counter for mineral fluids (ACFTD calibrated) with handset
<b>MCM202062</b>	MCM202061HS	A/remote particle counter for mineral fluids (MTD calibrated)
<b>MCM202062HS</b>	MCM202062HS	A/remote particle counter for mineral fluids (MTD calibrated) with handset
<b>ACC6NB001</b>	B94106	Handset (Blue keypad) mineral fluids
<b>ACC6NB002</b>	B94107	Handset (Red keypad) aggressive fluids
<b>ACC6NN003</b>	B94802	2 meter mineral hose assembly
<b>ACC6NN004</b>	B94801	2 meter aggressive hose assembly

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.



icountPD for mineral oil 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](http://www.parker.com/hfde)

## 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.
- MI2 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.



# 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:**

Mineral: Fluorocarbon. Aggressive: EPDM. Fuel: Fluorocarbon.

**Computer Compatibility:**

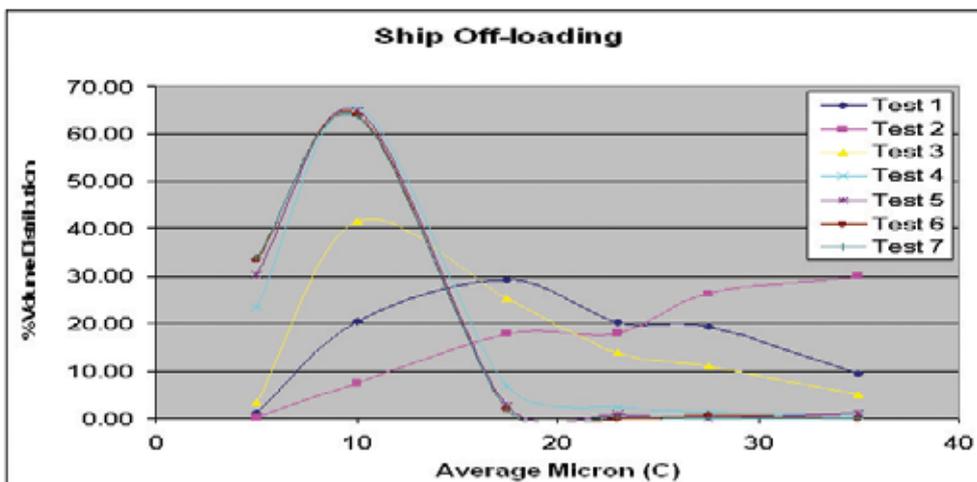
Parker recommends the use of a 9-way D-type connector. This can be connected to a USB port using a USB-serial adaptor. Note that these connectors/adaptors are **NOT** supplied with icountPD units: contact Parker Hannifin for advice.

### 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.

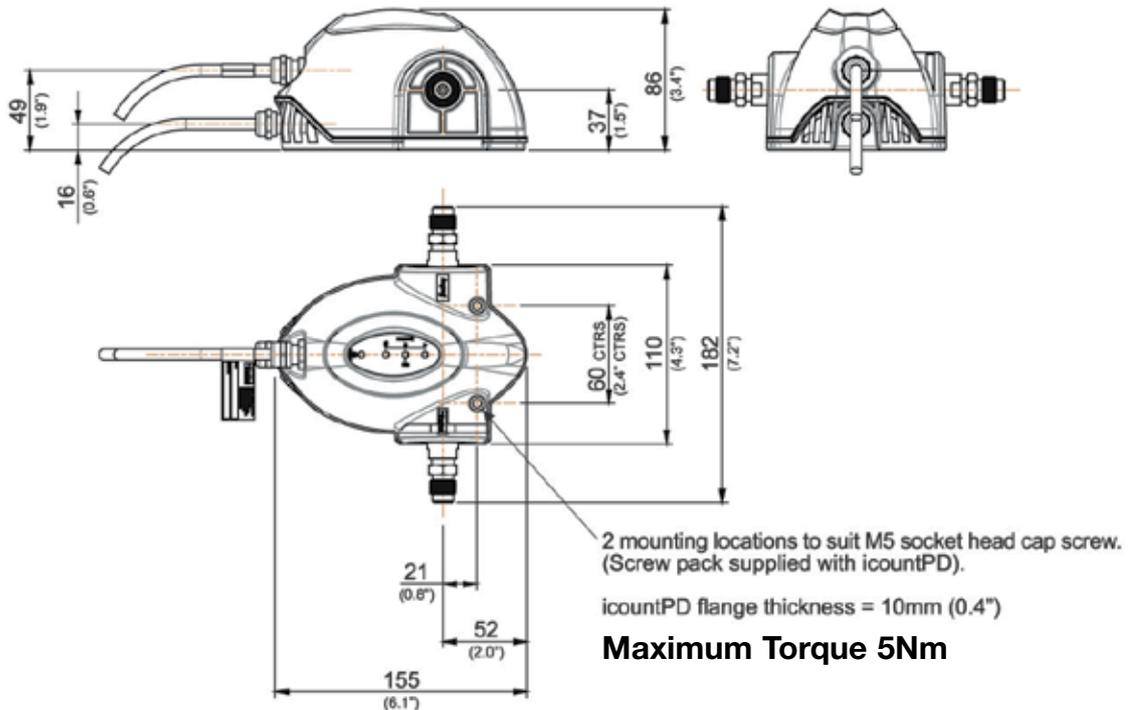
	>4µ	>6µ	>14µ	>21µ	>4µ	>6µ	>14µ	>21µ
Test 1	81058.3	62126.1	17817.6	6066.2	Test 5	1226.1	261.5	2.4
Test 2	87834.5	74763.0	35454.1	18044.4	Test 6	1085.7	210.9	1.3
Test 3	51383.4	32796.9	4424.8	213.4	Test 7	1037.9	198.7	1.3
Test 4	1593.3	422.7	9.6	1.7				



icountPD for use with aviation fuels

## Dimensions / Installation Details

mm  
(inches)



## 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.

# icountPD

## Online Particle Detector

### M12 Communication cable: wiring configuration

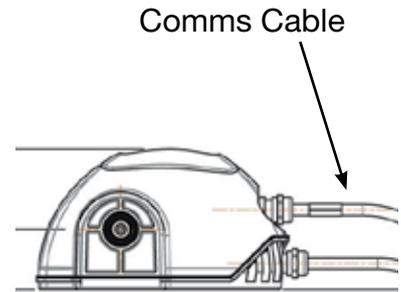
M12 Communication cable

Pin	4-20mA option connections	0-5v/0-3v option connections
1	NOT USED	NOT USED
2	RS232 Ground (Pin 5 <sup>**</sup> )	RS232 Ground (Pin 5 <sup>**</sup> )
3	Channel A, ISO 4µm(c) <sup>*</sup>	Channel A, ISO 4µm(c) <sup>*</sup>
4	Channel B, ISO 6µm (c) <sup>*</sup> or NAS (if selected)	Channel B, ISO 6µm (c) <sup>*</sup> or NAS (if selected)
5	RS232 Receive (Pin 3 <sup>**</sup> )	RX232 Receive (Pin3 <sup>**</sup> )
6	RS232 Transmit (Pin 2 <sup>**</sup> )	RS232 Transmit (Pin 2 <sup>**</sup> )
7	Moisture sensor channel (if fitted)	Moisture sensor channel (if fitted)
8	Channel C, ISO 14µm (c) <sup>*</sup>	Channel C, ISO 14µm (c) <sup>*</sup>

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.

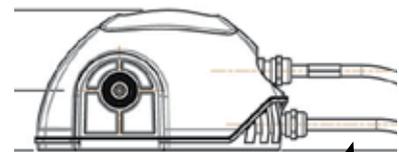
M12 Supply and Relay (if fitted) cable

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

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.



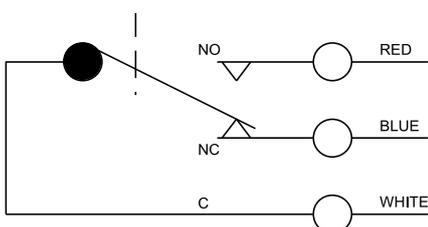
Supply & limit Relay Cable

### (Limit Relay Wiring Instructions)

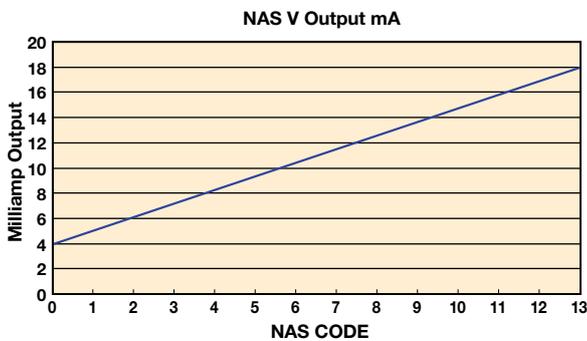
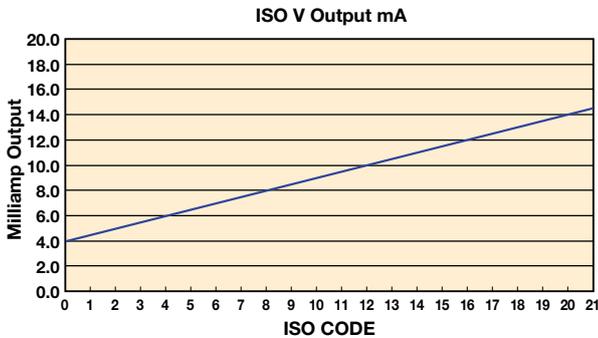
NORMALLY OPEN

NORMALLY CLOSED

COMMON



## 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

mA	ISO	mA	NAS
4.0	0	4	00
4.5	1	5	0
5.0	2	6	1
5.5	3	7	2
6.0	4	8	3
6.5	5	9	4
7.0	6	10	5
7.5	7	11	6
8.0	8	12	7
8.5	9	13	8
9.0	10	14	9
9.5	11	15	10
10.0	12	16	11
10.5	13	17	12
11.0	14	18	**
11.5	15	19	**
12.0	16	20	ERROR
12.5	17		
13.0	18		
13.5	19		
14.0	20		
14.5	21		
15.0	**		
15.5	**		
16.0	**		
16.5	**		
17.0	**		
17.5	**		
18.0	**		
18.5	**		
19.0	OVERRANGE		
19.5	OVERRANGE		
20.0	ERROR		

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

### 4-20mA output settings

#### ISO Setting

mA current = (ISO Code / 2) + 4 eg. 10mA = (ISO 12 / 2) + 4

or

ISO Code = (mA current - 4) \* 2 eg. ISO 12 = (10mA - 4) \* 2

#### NAS Setting

mA current = NAS Code + 5 eg. 15mA = NAS 10 + 5

or

NAS Code = mA current - 5 eg. NAS 10 = 15mA - 5

## 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

ISO	Err	0	1	2	3	4	5	6	7	8	9	10	11
0–5Vdc	<0.2	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5
0–3Vdc	<0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3

cont.

ISO	12	13	14	15	16	17	18	19	20	21	22	Err
0–5Vdc	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	>4.8
0–3Vdc	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	>2.45

Table relating NAS codes to Voltage output

NAS	Err	00	0	1	2	3	4	5	6	7	8	9	10	11	12	Err
0–5Vdc	<0.4	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	>4.6
0–3Vdc	<0.2	N.S.	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	>2.8



# icountPD

## Online Particle Detector

### 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 ( $\mu$ ) 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 a 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

Saturation	4–20mA	0–3Vdc	0–5Vdc
5%	4.8	0.15	0.25
25%	8	0.75	1.25
50%	12	1.50	2.50
75%	16	2.25	3.75
100%	20	3.00	5.00

## Flow control ACC6NN019

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

The flow control device enables testing where flow ranges are outside 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 downstream.

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.



P/N ACC6NN019

Working pressure range	10 to 300 bar
Differential pressure range	10 to 300 bar
Working viscosity range	10 to 150 Cst

## icontains – 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

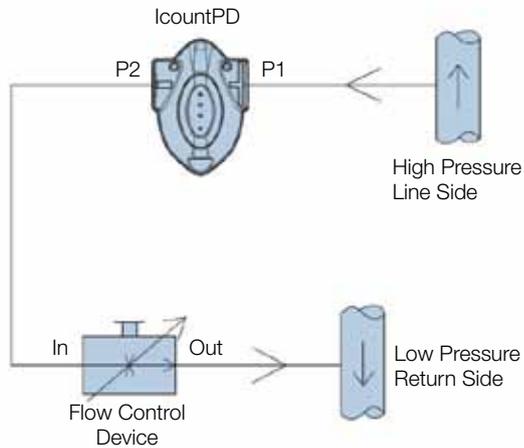
\*To be announced



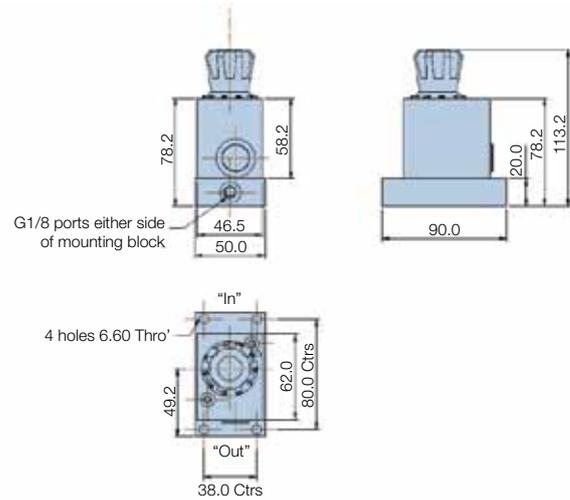
# icountPD

## Online Particle Detector

### Hydraulic Connection Diagram



### Dimensions



#### Actuator

#### Mounting Type

#### Mounting position

#### Weight

#### Fluid Temperature

#### Ambient storage temperature

#### Viscosity range

#### Differential pressure range

#### Maximum pressure

#### Flow direction

#### Port thread detail

#### Internal Seals

Manual flow rate adjustable via control knob

4 off mounting holes to suit M6 screws (not supplied)

Any

1.7kg (3.7lb)

5°C to +80°C (+41°F to 176°F)

-20°C to +40°C (-4°F to +104°F)

20cSt to 500cSt (If lower than 20cSt contact Parker)

5 to 315 bar

315 bar

'IN' to 'OUT' flow control function

1/8" BSPP (test points not supplied)

Fluoroelastomer

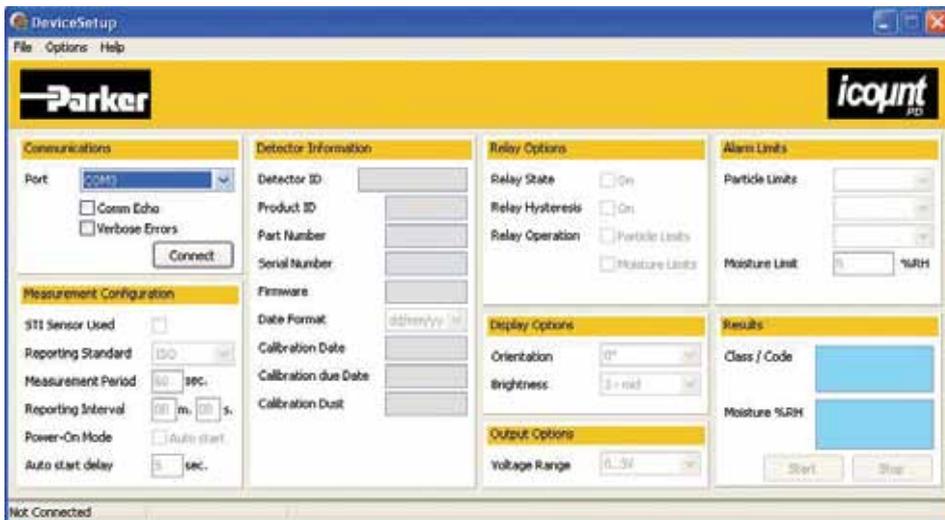


This application shows uploading fuel into an aircraft with the icountPD in use to monitor as a 'go/no go' device.

## 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.

## icontainsPD 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  
 Flowcontrol   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 or 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

# icountPD

## Online Particle Detector

### Ordering Information

Standard Products Table

Part number	Fluid type	Calibration	Display	Limit relay	Communication	Moisture	Cable connector kit
IPD12222130	Mineral	MTD	LED	YES	RS232 / 4 - 20mA	NO	M12, 8 pin plug connector
IPD12222230	Mineral	MTD	LED	YES	RS232 / 4 - 20mA	YES	M12, 8 pin plug connector
IPD12223130	Mineral	MTD	LED	YES	RS232 / 0 - 5V	NO	M12, 8 pin plug connector
IPD12223230	Mineral	MTD	LED	YES	RS232 / 0 - 5V	YES	M12, 8 pin plug connector
IPD12322130	Mineral	MTD	Digital	YES	RS232 / 4 - 20mA	NO	M12, 8 pin plug connector
IPD12322230	Mineral	MTD	Digital	YES	RS232 / 4 - 20mA	YES	M12, 8 pin plug connector
IPD12323130	Mineral	MTD	Digital	YES	RS232 / 0 - 5V	NO	M12, 8 pin plug connector
IPD12323230	Mineral	MTD	Digital	YES	RS232 / 0 - 5V	YES	M12, 8 pin plug connector

Product Configurator

Key	Fluid type	Calibration	Display	Limit relay	Communication	Moisture	Cable connector kit
IPD	1 Mineral	2 MTD	2 LED	2 Yes	2 RS232 / 4-20mA	1 No	10 Deutsch 12-pin DT Series connector
	2 Phosphate ester		3 Digital		3 RS232 / 0-5V	2 Yes	30 M12, 8 pin plug connector
	3 Aviation fuel (4 channel)				5 RS232/CAN-bus (J1939)		

Fluid type		
3	Aviation fuel (4 channel)	This version can not come with a Moisture sensor option
3	Aviation fuel (4 channel)	This version can not come with a Moisture sensor option

Note - Aviation Fuel option can also be used for Diesel fluids  
 Note - RS485 option - communication upto 5000 Meters - Contact Parker  
 Note - Wireless communication (GPRS - LAN - WiFi - Sat) - Contact Parker

### Accessories

Part number		Description
Mineral fluids	Aggressive fluids	
ACC6NE003	ACC6NN002	1 metre hose length
ACC6NN003	ACC6NN004	2 metre hose length
ACC6NN005	ACC6NN006	5 metre hose length
ACC6NN007	ACC6NN008	1/4" BSP fitting
ACC6NN009	ACC6NN010	1/8" BSP fitting
ACC6NN011	ACC6NN012	1/8" BNPT fitting
SPS2021	SPS2061	Single point sampler
S840074	Contact Parker	Flow control device
ACC6NN019	Contact Parker	Flow control valve
	ACC6NN013	12 volt regulated power supply
ACC6NN014	Contact Parker	2 x 5 metre M12 - 8 pin cable kit*
	ACC6NN016	Deutsch Connector Kit
	ACC6NN017	RS232 To USB cable kit
	ACC6NN018	M12 - 8 pin to RS232 engineers tool

\* M12 Cable kit consists of two 5 metre cables to enable all output options (Communications cable and Relay/Power Supply cable)  
 \*\* Note that the aggressive fluid hoses are provided as a single hose, not in pairs.  
 Note: For details on the icountPD Z2 ATEX approved particle detector see page 428.

Part number	Supersedes	Size	Flow range l/min	Fluid type	Port threads	Reverse Flow capability
STI0144100	STI.0144.100	0	6-25	Mineral	3/8	Yes
STI1144100	STI.1144.100	1	20-100	Mineral	3/4	Yes
STI2144100	STI.2144.100	2	80-380	Mineral	1 1/4	Yes
STI0148100	STI.0148.100	0	6-25	Aggressive	3/8	Yes
STI1148100	STI.1148.100	1	20-100	Aggressive	3/4	Yes
STI2148100	STI.2148.100	2	80-380	Aggressive	1 1/4	Yes
STS5117210	STS.5117.210	1	20-100	Mineral	3/4	No
STS5217210	STS.5217.210	2	80-380	Mineral	1 1/4	No

# 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.



icountPDR for mineral oil applications

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

- 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.



# 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

### Specification

5 seconds minimum  
5 to 180 seconds  
0 to 3600 seconds via RS232 communication  
Laser diode optical detection of actual particulates  
ISO 7 – 22, NAS 0 – 12  
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  
Contact Parker Hannifin  
2 to 420 bar (30-6000 PSI)  
**Note:** Flow may be bi-directional  
40 to 140 ml/min (Optimum Flow 60ml/min)  
(0.01 – 0.04 USGPM (optimum flow 0.016 USGPM))  
Size 0 = 6 to 25 l/min (2-7 USGPM)  
Size 1 = 24 to 100 l/min (6-26 USGPM)  
Size 2 = 170 to 380 l/min (45-100 USGPM)  
-40°C to +80°C (-40°F to +176°F)  
-30°C to +60°C (-22°F to +140°F)  
+5°C to +80°C (+41°F to +176°F)  
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 icountPDR units: contact Parker Hannifin for advice.  
±5% RH (over compensated temperature range of +10°C to +80°C; +50°F to +176°F)  
5% RH to 100% RH  
±0.2% RH typical at 50% RH in one year  
Regulated 9 to 40Vdc  
Typically 120mA  
IP69K rating.  
EC Declaration of Conformity

4–20mA  
0–5Vdc, 0–3Vdc (user selectable)  
to SAE J1939 (e.g. Parker IQAN)  
Linear scale within the range 5% RH to 100% RH

### 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.

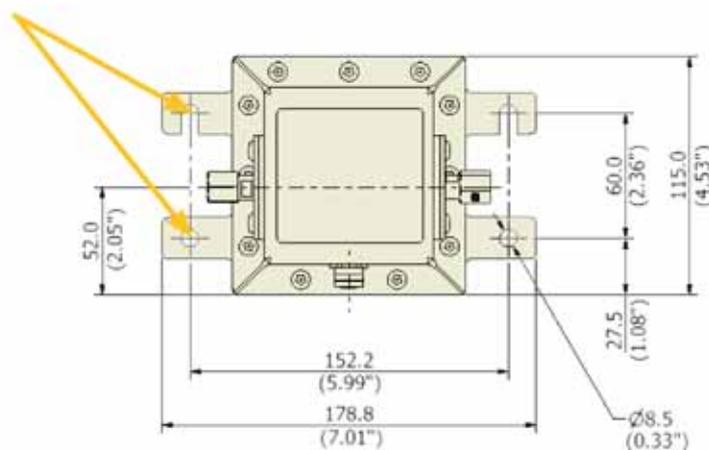
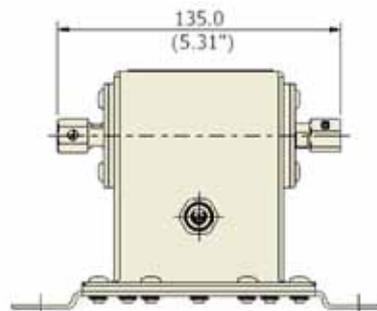
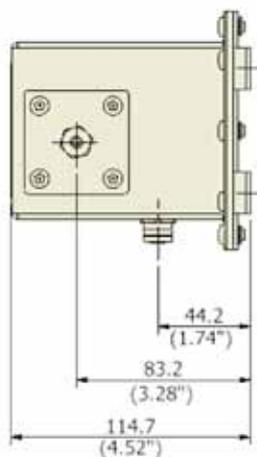


Working pressure range	10 to 300bar
Differential pressure range	10 to 300bar
Working viscosity range	10 to 150 Cst

## Dimensions / Installation Details

Dimensions are given in mm (inches)

Four mounting locations (two each side) to suit M8 (5/16 inch) fixings, supplied. Flange thickness is 2mm (5/64 inch)



## Typical Applications

### • Mobile Equipment

- o Earth Moving Machinery
- o Harvesting
- o Forestry
- o 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

- o Production Plants
- o Fluid Transfers
- o Pulp & Paper
- o 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

- o Wind Turbines
- o Gearboxes
- o Lubrication Systems

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

### • Maintenance

- o Test Rigs
- o Flushing Stands

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

### • Fuel Contamination Detection

- o Fuel Storage Tanks
- o Vehicle fuel tanks
- o 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 (icountPD) 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 (icountPD) for tables that can be used to relate the analogue output to an ISO and NAS code.

### Ordering Information

Product Configurator

Key	Fluid type		Calibration		Display		Limit Relay		Communication		Moisture sensor		Cable connector kit	
IPDR	1	Mineral	2	MTD	1	None	1	No	2	RS232 / 4-20mA	1	No	40	M12, 12 pin plug connector
	3	Aviation fuel (4 channel)							3	RS232 / 0-5V	2	Yes	10	Deutsch 12-pin DT series connector
									5	RS232/CAN-bus				

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

Key	Fluid type		Calibration		Display		Limit Relay		Communication		Moisture sensor		Cable connector kit	
IPDR	2	Phosphate ester	1	ACFTD	2	LED	2	Relay	4	RS232 / RS485			00	No
			3	AS4059	3	Digital							40	M12, 8 pin plug connector
			4	GOST	4	GSM								

Standard Products Table

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

Accessories

Part number		Description
Mineral fluids	Aggressive fluids	
ACC6NE003	ACC6NN002	1 metre hose length
ACC6NN003	ACC6NN004	2 metre hose length
ACC6NN005	ACC6NN006	5 metre hose length
ACC6NN007	ACC6NN008	1/4" BSP fitting
ACC6NN009	ACC6NN010	1/8" BSP fitting
ACC6NN011	ACC6NN012	1/8" BNPT fitting
SPS2021	SPS2061	Single point sampler
S840074	Contact Parker	Flow control device
ACC6NN023	Contact Parker	Flow control valve
	ACC6NN013	12 volt regulated power supply
ACC6NN014	Contact Parker	2 x 5 metre M12 - 8 pin cable kit*
	ACC6NN016	Deutsch Connector Kit
	ACC6NN017	RS232 To USB cable kit
	ACC6NN018	M12 - 8 pin to RS232 engineers tool
	ACC6NN035	M12 - 12 pin. 12 pin Deutsch Cable

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

- 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.



Powerful and easy to use



Lightweight and portable

# 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

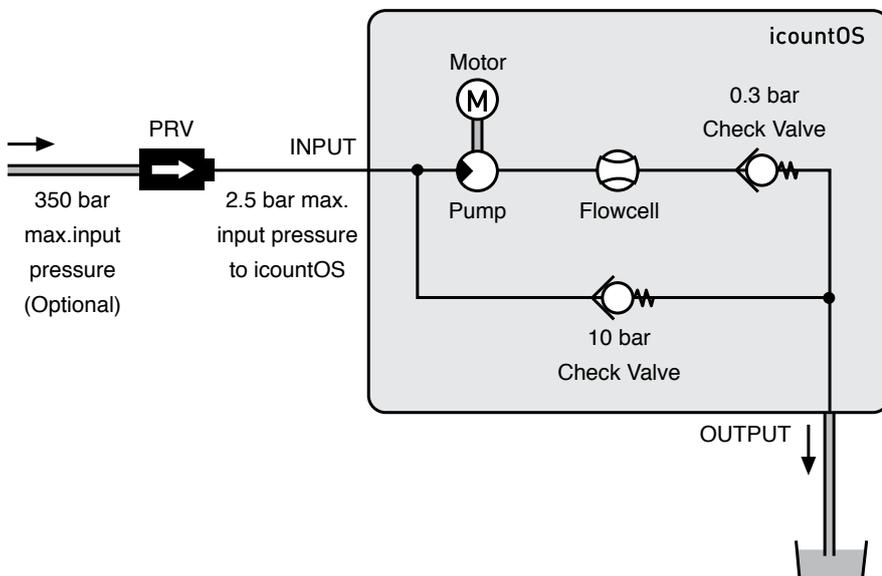


Fig 1. In simple terms a controlled column of contaminated fluid enters the laser optical scanner chamber. This design maintains contamination distribution within the fluid.

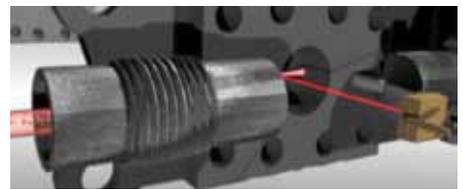


Fig 2. On reaching the photo diode cell, the highly accurate laser light is applied and projected through that oil column. The laser diode projects an image of the sample onto a photo diode cell.



Fig 3. 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 detecton 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.



Results are viewed in the OLED digital display window

## 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.



Parameter	Value
Working pressure range	0 to 2.5 bar
Working pressure with PRV	2.5 to 350 bar
Working viscosity	1 to 300 cSt



## High Pressure Connection

Manual Connection: Press the Pressure Reducing Valve firmly into the **INLET** port



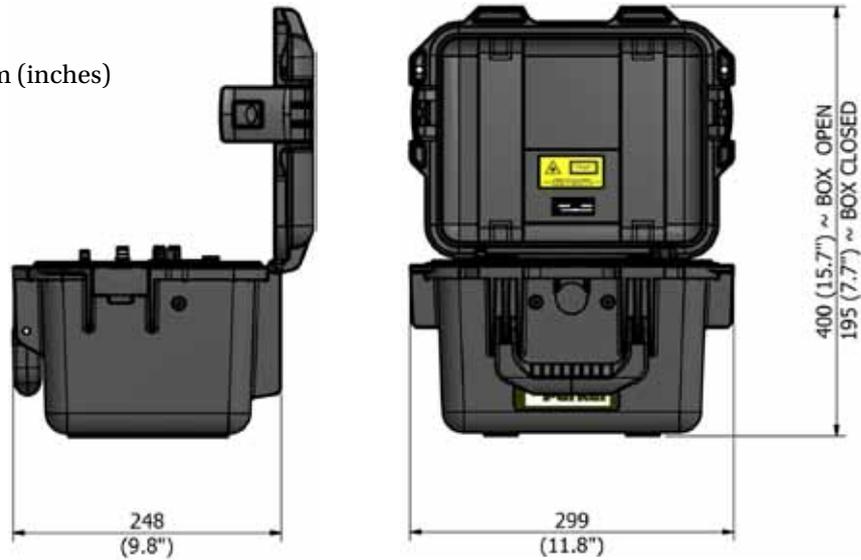
## Low Pressure Connection

Connect **INLET** (Ø 6mm) hose

# IOS Technical Specifications

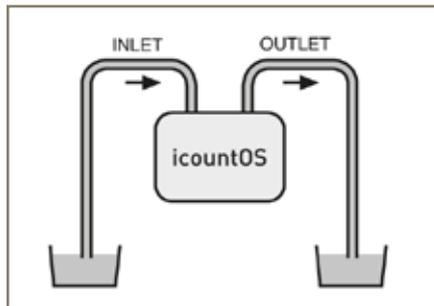
## Dimensions

Dimensions are given in mm (inches)

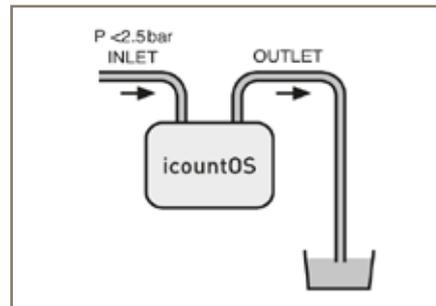


## Low pressure connection setup

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.



Option 1

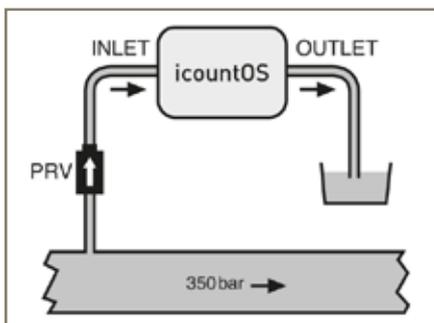


Option 2

## 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.



Attach **OUTLET** (Ø 4mm) hose



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

# The IOS web interface

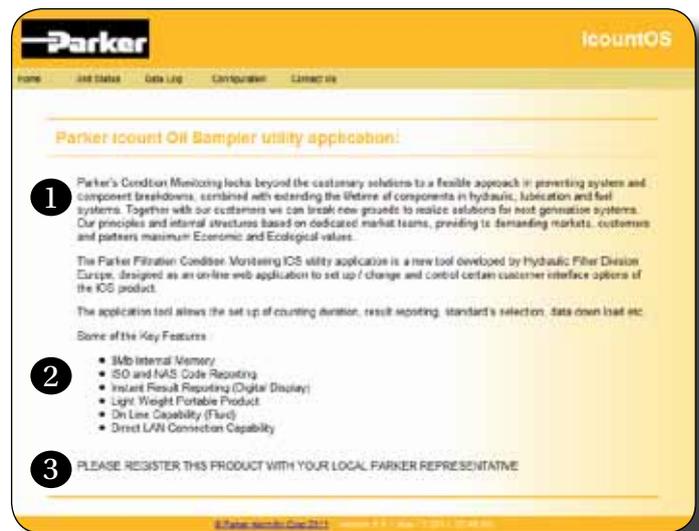
The IOS is a unique product in that it has its own web page generator which means that the stored data can be downloaded or viewed on any PC or laptop.

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



## Data log page

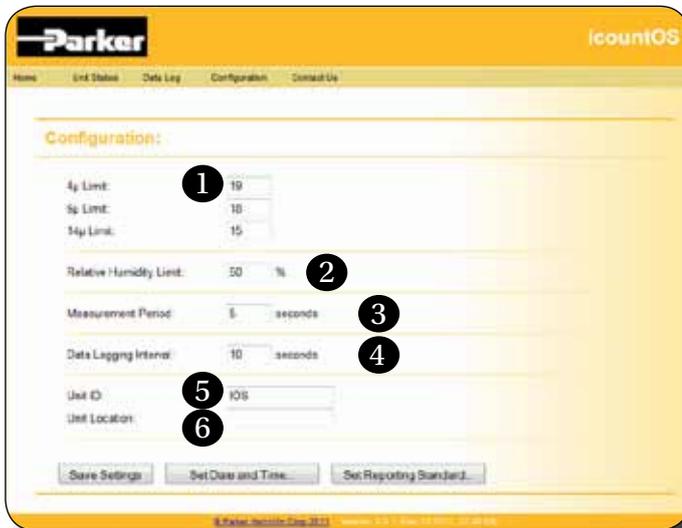
### KEY

- 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.



### KEY

## Configuration page

- 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

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

## What is included?

Offline IOS 1210 EUR/UK/US	Online IOS 1220 EUR/UK/US
1x IOS Oil Sampler Unit	1x IOS Oil Sampler Unit
+ 1x Power Supply	+ 1x Power Supply
+ 1x RJ45 LAN Cable	+ 1x RJ45 LAN Cable
+ Low Pressure Hoses	+ 1x Low Pressure Hose
	+ 1x PRV
	+ 1x High Pressure Hose

### 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 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

Key	Fluid type	Calibration	Connection	Options
IOS1220EUR	Mineral	MTD	Online	No options
IOS1210EUR	Mineral	MTD	Offline	No options

Key	Fluid type	Calibration	Connection	Options	Region
IOS	1 Mineral	2 MTD	1 Offline	0 No options	UK
	3 Aviation fuel (4 channels*)		2 Online		EUR
					USA

\*Fluid Type 3: Contact Parker Hannifin

## Accessory Part Numbers

Description	Part number
Hose Kit Bag (includes one power pack, RJ45 patch cable and low pressure hose connectors)	ACC6NN029UK ACC6NN029EUR ACC6NN029US



Description	Part number
RJ45 LAN Connector Cable	ACC6NE028



Pressure Reducing Valve (PRV)	ACC6NN027 (Standard with IOS 1220)
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Carry Strap	ACC6NN030 The Carry Strap option MUST be selected at the time of placing the IOS order.
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Power Pack (UK 2m cable)	ACC6NE023
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Low Pressure Hoses (4mm and 6mm)	ACC6NN031
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Power Pack (EUR 2m cable)	ACC6NE024
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High Pressure Hose Assembly	ACC6NN034 (Standard with IOS 1220)
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Power Pack (US 2m cable)	ACC6NE025
--------------------------	-----------



Verification Fluid	SER.MISC.067
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# 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

[www.parker.com/hfde](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		
	Standard	Options
Electric motor	230VAC	110VAC, 24 VDC
Pump	X	
Flow control unit	X	
Pressure control valve		for pressurized systems
Particle detector	icountPD	
Local display	led	none, digital, GSM
Communications	RS232	RS232/4-20mA, RS232/0-5V, RS232/Canbus
Moisture sensor		X
Limit Relay		X
Cable connector kit	M12 - 8 pin	
Short start module		X
Mounting	bracket	sealed box

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 off shore 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.



icountPD

# 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.



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

## 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.

# 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/Aluminiumz

### IP ratings:

IP68 % (When mated with moulded connector)

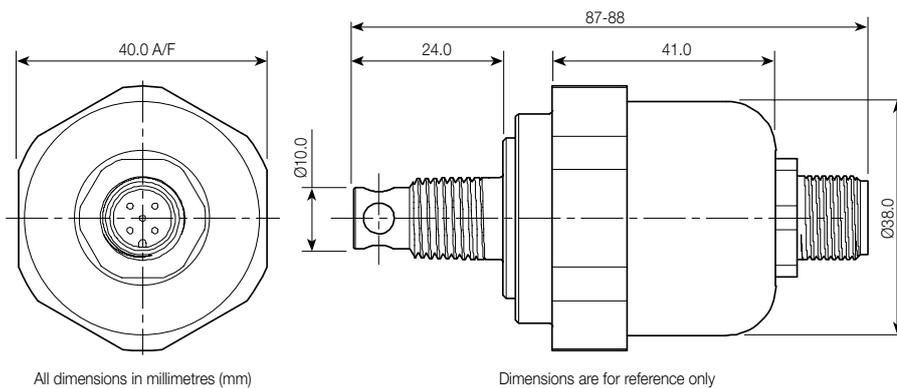
### RH Outputs:

(+1 to +5 Vdc) or (4 to 20mA)

### Temperature Outputs:

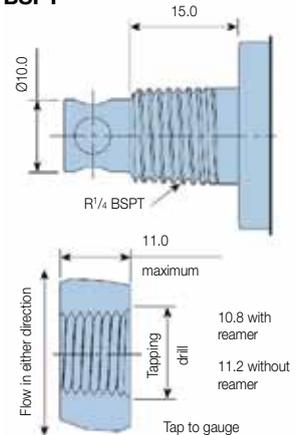
0 to +5 Vdc

## Installation Details



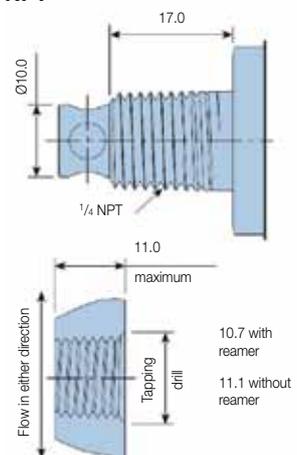
## Thread Form Options (MS150 + MS200)

### BSPT



Installation details for R/4 BSPT taper

### NPT



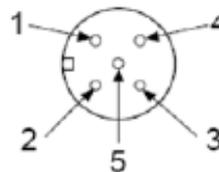
Installation details for 1/4 NPT

## Sensor Outputs

### MS150 moisture sensor pin designations

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

## MS150 Pin Designations



## Interpreting the data

Oil type: Texaco Rando 46.

Saturation point: 400ppm @ 65°C (150°F).

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 65°C (150°F).

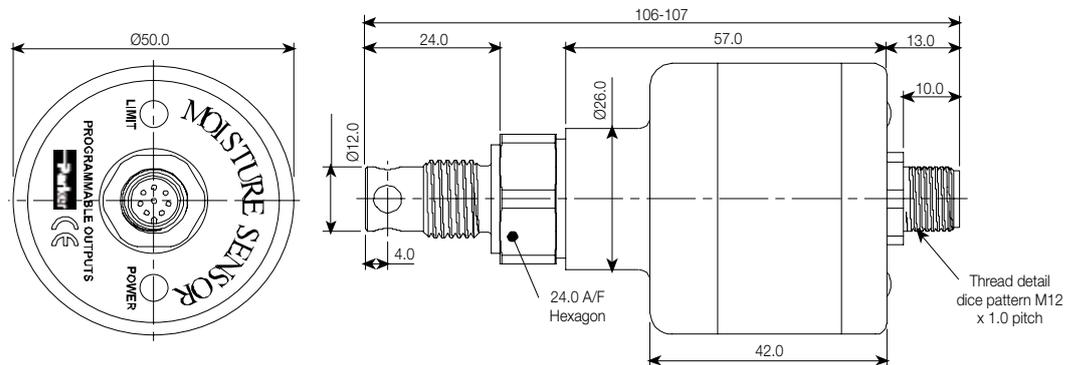
# MS200 'Programmable'

## 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 100 Metres with Current Output
Output:	SEE ORDERING INFORMATION

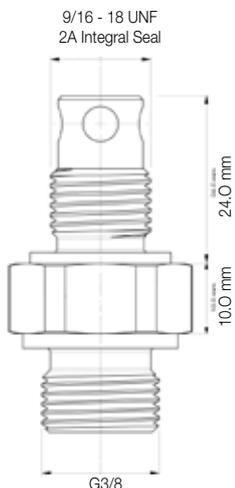
## Installation Details

All dimensions in millimetres (mm)  
Dimensions are for reference only

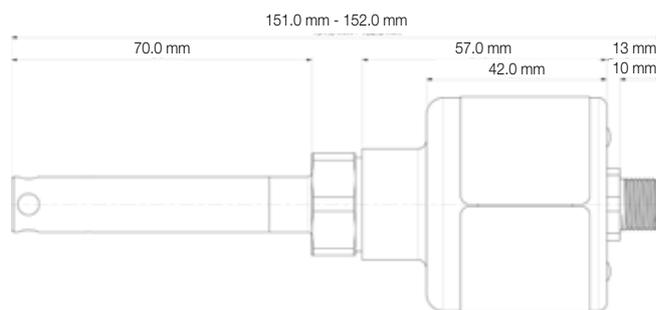


## Thread Form Options and Hand-Held Unit (See MS Ordering Information)

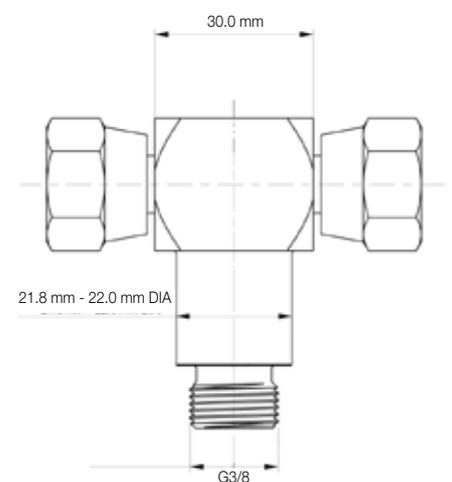
Thread Form Option 5



Hand Held Unit/Extended Probe Option 6



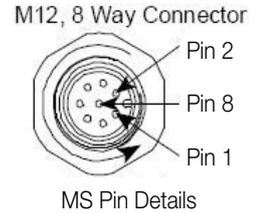
Thread Form Option 7



# MS200 'Programmable'

## Moisture Sensor Wiring and Pin Designations

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



# 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:

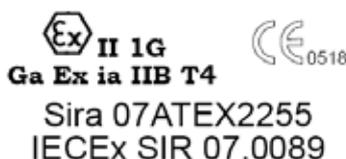
107mm x ø50mm/0.3Kg.

### IP ratings:

IP68 (with specified moulded cable)

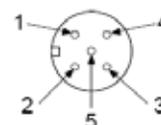
Developed in association with Triteq Ltd.

## 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



## MS300 Intrinsically Safe

### Installation details continued

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:  $U_i$ : 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  $-20^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$  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:

Housing – nylon 6/6, window – acrylic, bezel/board supports – ABS, pins – phosphor bronze.

#### 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

Description	DDU1001	DDU1002
Power supply	11 - 30 Vdc	110 - 240 Vdc
Accuracy	$\pm 0.1\%$ typical	$\pm 0.1\%$ typical
Sample rate	2.5 per second	2.5 per second
Operating temp ( $^{\circ}\text{C}$ )	0 - 50	0 - 50
Storage temp ( $^{\circ}\text{C}$ )	-10 to +70	-10 to +70
Display	3.5 digit LED	3 1/2 digit LED
Power output (Vdc)	24	24
Weight (kg)	0.30	0.30
Panel cutout (mm)	93x45 $\pm 0.5$	93x45 $\pm 0.5$
Dimensions (mm)	48x96x93	48x96x93



PBG8341A



DDU1001/DDU1002

## Product accessories part numbers

Product Number	Supersedes	Description	For MS type
DDU1001	NA	Digital display unit 22-55 Vdc	MS150, 200 + 300
DDU1002	NA	Digital display unit 110-240 Vdc	MS150, 200 + 300
PBG8341A	PBG.8341.1A	Bar Graph Indicator (+11 to +30 Vdc)	MS150, 200 + 300
ACC6NF003	NA	5 meter M12 X 1 - 5 pin moulded cable (IP68) Connector and lying leads	MS150 + 300
ACC6NF000	B97200	5 meter M12 X 1 - 8 pin moulded cable (IP68) Connector and lying leads	MS200
ACC6NF001	S970200	M12, 5 pin rewirable connector (IP65) connector only. No cable	MS150 + 300
ACC6NE008	S970400	UK 12 volt power supply	MS150, 200 + 300
ACC6NE009	S970400	European 12 volt power supply	MS150, 200 + 300
ACC6NE010	S970400	US 12 volt power supply	MS150, 200 + 300

## 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.

Saturation	4-20mA	0-3Vdc	0-5Vdc
5%	4.8	0.15	0.25
25%	8	0.75	1.25
50%	12	1.50	2.50
75%	16	2.25	3.75
100%	20	3.00	5.00

## Ordering Information

MS150 - Standard Product Table

Product Number	Supersedes	Fluid type	Thread Forms	Connector
MS1503	MS150-3	Mineral	G 1/4" BSPT Taper	M12 5 WAY
MS1504	MS150-4	Mineral	1/4" NPT Taper	M12 5 WAY

MS200 - Product Configurator

Key	Model	Fluid type	Output Options	Thread Forms	Connector	Future option
MS	2   Programmable	2   Mineral	01   0 - 3 Vdc	1   G 1/4" BSP Bonded Seal	1   M12 8 WAY	0   No
			02   0 - 5 Vdc	2   G 1/4" BSP Integral Seal		
			03   1 - 6 Vdc	3   R 1/4" Taper		
			04   4 - 20 mA	4   1/4" NPT Taper		
			5   9/16 - 18 UNF 2A Integral Seal			
			6   Hand Held Unit/extended probe			
			7   G 3/8" BSP Female Swivel Equal T adaptor			

MS200 - Standard Product Table

Key	Model	Fluid type	Output Options	Thread Forms	Connector	Future option
MS	2	2	02	1	1	0
MS	2	2	02	2	1	0
MS	2	2	02	3	1	0
MS	2	2	02	4	1	0
MS	2	2	02	5	1	0
MS	2	2	04	1	1	0
MS	2	2	04	2	1	0
MS	2	2	04	3	1	0
MS	2	2	04	4	1	0
MS	2	2	04	5	1	0

MS300 - Product Configurator

Key	Model	Fluid type	Output	Thread form	Connector	Future option
MS	3   Programmable	2   Mineral	04   4 - 20 mA	1   G 1/4" BSP Bonded Seal	2   M12 5 WAY	1   None
				2   G 1/4" BSP Integral Seal		
				3   R 1/4" Taper Thread		
				4   1/4" NPT Taper Thread		
				5   9/16 - 18 UNF 2A Integral Seal		
				6   G 3/8" BSP Female Swivel Equal Tee		

MS300 - Standard Product Table

Key	Model	Fluid type	Output	Thread Forms	Connector	Future option
MS	3	2	04	1	2	1
MS	3	2	04	2	2	1
MS	3	2	04	3	2	1
MS	3	2	04	4	2	1
MS	3	2	04	5	2	1

# 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.



Oilcheck shown with optional rubberized sleeve.

## 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](http://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



Green/amber/red  
numerical value

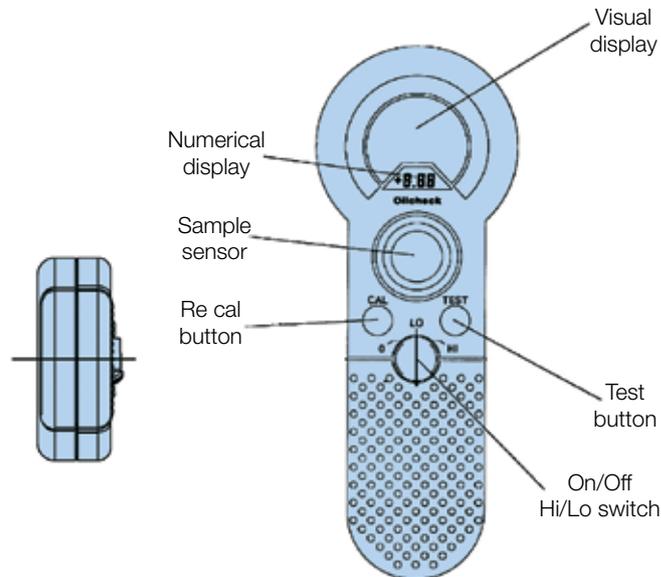
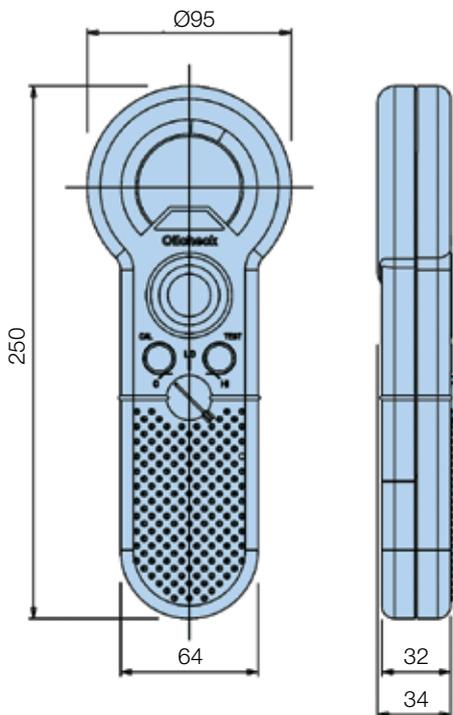


Function  
buttons

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

Product number	Description
<b>OLK605</b>	Oilcheck kit with numerical readout
<b>OLK611</b>	Oilcheck cleaner
ACC6NV001	Rubberized protective sleeve

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.

# icountACM20 Lab Unit

## Aviation Fuel Contamination Monitoring



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

- icountACM20 monitors aviation fuel contamination to DEFSTAN 91-91 Issue 6 Jet A-1 fuel specification.
- 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:**

$\geq 4\mu(c)$ ,  $\geq 6\mu(c)$ ,  $\geq 14\mu(c)$ ,  $\geq 21\mu(c)$ ,  $\geq 25\mu(c)$ ,  $\geq 30\mu(c)$  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 fluoro-silicone 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:

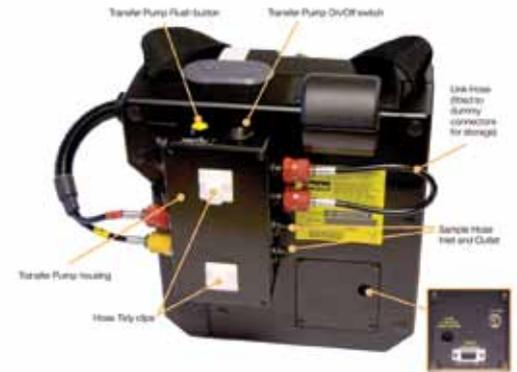
Astra Board case

### Carrying Case Weight:

5 kg

## icountACM20 - rear view

Input Power Socket (note that you will have to remove the plastic dust cap to access the 12Vdc power socket). A fast blow 1.25A fuse and the RS232 connection are located behind the removable cover plate. The RS232 interface is provided to download all test data stored in the instrument. See the **ParSmart Downloader** software for more information



## Ordering Information

### Standard products table - icount ACM20

Product number	Supersedes	Description
ACM202022UK	N/A	icountACM20 (UK)
ACM202022US	N/A	icountACM20 (US)
ACM202022EUR	N/A	icountACM20 (EURO)
<b>ACM202024UK</b>	N/A	icountACM20 with lab kit - UK (DEFSTAN 9191)
<b>ACM202024US</b>	N/A	icountACM20 with lab kit - US (DEFSTAN 9191)
<b>ACM202024EUR</b>	N/A	icountACM20 with lab kit - EURO (DEFSTAN 9191)
ACC6ND000	B84794	1 meter process cable
ACC6NE006	B84816	ParSmart downloader software
ACC6NE019	P843855	icountACM20 transit Case
ACC6NW003	B84746	Vapour/waste bottle assembly
ACC6NE029	B84745	Throttle kit
ACC6NE001	B84645	Millipore adaptor kit
ACC6NE013	B84609	Re-chargeable battery pack
ACC6NE008	B84817	UK power supply
ACC6NE010	B84830	US power supply
ACC6NE009	B84831	Euro power supply
ACC6NE020		UK Offline kit
ACC6NE021	B84832	Euro Offline kit
ACC6NE022		US Offline kit
SERMISC067	N/A	500ml verification fluid
ACC6NE015	B84702	Printer reel (x5)
ACC6NE014	P843702	Printer ribbon (x1)

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 - icountACM2022

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.

# icountACM20 Lab Unit

## Aviation Fuel Contamination Monitoring

**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.



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

- 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.

# 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 (Hysteresis ON) or customer set (Hysteresis 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):**

±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

Key	Fluid type	Calibration	Display	Limit relay	Communication	Moisture	Cable connector kit
IPDZ	1 Mineral	2 MTD	1 None	2 Yes	2 RS232 / 4 - 20mA	1 No	30 M12, 8 pin plug connector
	3 Aviation Fuel (4 channel)				5 RS232 / CANBUS (J1939)	2 Yes	

Standard Products Table

Part Number	Fluid type	Calibration	Display	Limit relay	Communication	Moisture	Cable connector kit
IPDZ12122230	Mineral	MTD	None	YES	RS232 / 4 - 20mA	YES	M12, 8 pin plug connector
IPDZ32122130	Aviation Fuel (4 channel)	MTD	None	YES	RS232 / 4 - 20mA	NO	M12, 8 pin plug connector

Accessory Part Numbers

Description	Part Number
Single Point Sampler	SPS2021
External flow device	S840074
Power supply	ACC6NN013
2 x 10 metre M12, 8-pin plug and socket Ultrat cable kit	ACC6NN021
RS232 to USB converter	ACC6NN017



# 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 worlds **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](http://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:**

$\geq 4\mu(c)$ ,  $\geq 6\mu(c)$ ,  $\geq 14\mu(c)$ ,  $\geq 21\mu(c)$ ,  $\geq 25\mu(c)$ ,  $\geq 30\mu(c)$  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

- a – icountACM20 Zone II Particle Counter
- b – Battery Charger
- c – Process Cable
- d – User Manual
- e – Downloader Software
- f – Throttle Kit
- g – Millipore Adaptor Assembly
- h – Aluminium Case
- i – 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 worlds **only** ATEX approved particle counter.



## Applications in Fuels

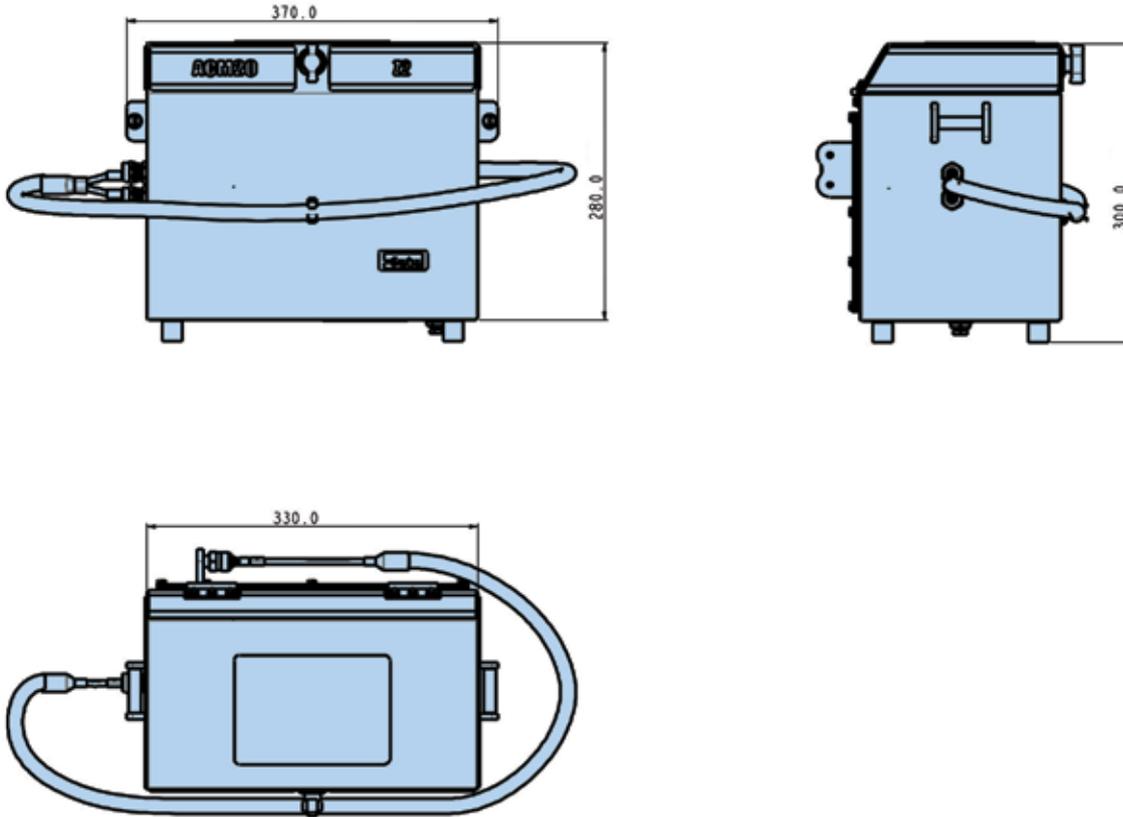
- **Oil Refinery**
  - To count and verify the levels of dispersed contamination in accordance with specification limits. (Consult Parker CMC).
- **Distribution Terminals/Hubs**
  - For use on receipt and outbound supply. Also to provide filtration performance, tank cleanliness and product quality checks.
- **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

Product number	Supersedes	Description
<b>ACM202032UK</b>	N/A	icountACM20 Z2 + online kit & UK battery charger
<b>ACM202032US</b>	N/A	icountACM20 Z2 + online kit & US battery charger
<b>ACM202032EUR</b>	N/A	icountACM20 Z2 + online kit & Euro battery charger
ACC6NE023	B84647	UK battery charger
ACC6NE025	B84652	US battery charger
ACC6NE024	B84653	Euro battery charger
ACC6NE027	B84650	2m process cable assembly
ACC6NE006	B84816	Parsmart downloader software
ACC6NE028	P843066	Carry case
ACC6NW003	B84746	Bottle assembly
ACC6NE029	B84745	Throttle kit
ACC6NE001	B84645	Millipore adaptor assy

## 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  $\geq 4\mu\text{m}(c)$  to  $\geq 30\mu\text{m}(c)$  and numbers per ml in accordance with ISO4406-1999.

### icountACM20 Z2 – operational in oil refineries and fuel fields.

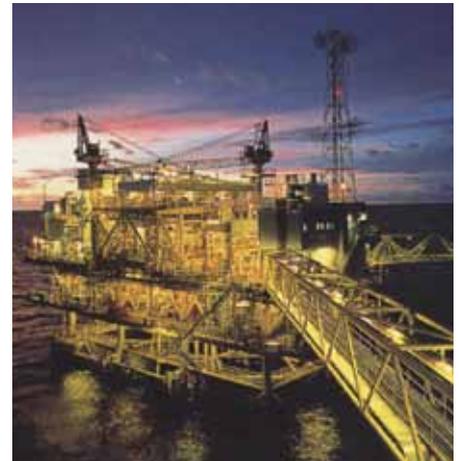
Already operational in oil refineries and designed to be used inside commercial airfield fuel locations and at the point of upload of fuel into the aircraft, icountACM20 Z2 has an impressive success record in this approval sensitive area of operation.

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.



Offshore



Refineries



Quarrying

# 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.

Receipt into Microfilter  
Expect 2,500 counts per ml or cleaner @ 4µ(c)



Receipt into FWS (After MF)  
Expect 500 counts per ml or cleaner @ 4µ(c)



Receipt into Storage (After FWS/MF)  
Expect 100 counts per ml or cleaner @ 4µ(c)



FWS out of storage  
Expect 500 counts per ml or cleaner @ 4µ(c)



After FWS into Hydrant  
Expect 100 counts per ml or cleaner @ 4µ(c)



After Monitor Into Aircraft  
Expect 100 counts per ml or cleaner @ 4µ(c)



Note: Figures will vary from location to location.  
Key: MF=Microfilter (API/EI 1590)  
FWS=Filter Water Separator (API/EI 1581)

Receipt into Microfilter		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	2,500	18
≥6µ(c)	350	15
≥14µ(c)	10	10

Receipt into FWS (After MF)		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	500	16
≥6µ(c)	50	13
≥14µ(c)	5	9

Receipt into Storage (After FWS/MF)		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	100	14
≥6µ(c)	10	10
≥14µ(c)	1	7

FWS Out of Storage		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	500	16
≥6µ(c)	50	13
≥14µ(c)	5	9

After FWS Into Hydrant		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	100	14
≥6µ(c)	10	10
≥14µ(c)	1	7

After Monitor Into Plane		ISO Code - 4406 1999
	High Count	High Count Code
≥4µ(c)	100	14
≥6µ(c)	10	10
≥14µ(c)	1	7

# ASIC 'Performer'

Pressure Transducers and Transmitters  
25, 60, 100, 250, 400 and 600 bar



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

- 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 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.



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



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:

Rating	Maximum Overload Pressure	Maximum Burst Pressure
25	x 2 (50 bar)	x 3 (75 Bar)
60	x 2 (120 Bar)	x 3 (180 Bar)
100	x 2 (200 bar)	x 3 (300 Bar)
250	x 2 (500 Bar)	x 3 (750 Bar)
400	x 2 (800 Bar)	x 3 (1200 Bar)
600	x 2 (1200 Bar)	x 2.5 (1500 Bar)

### Vibration resistance:

IEC 60068-2-6:  
+/- 5mm/10Hz...32Hz  
200m/s<sup>2</sup> / 32Hz...2kHz

### Installation:

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

### Weight:

200 - 230g

### Lifespan:

10 million cycles

## Thread Forms

G<sup>1</sup>/<sub>4</sub> (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

12 - 36Vdc

12 - 36Vdc

9 - 36Vdc

### Output

0 - 5Vdc

1 - 6Vdc

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).

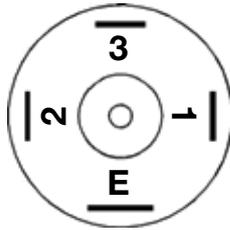
### Response time:

= <1mS.

## Wiring Information

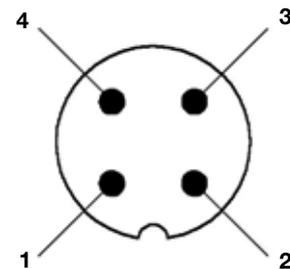
### Connector

Industrial Micro Din  
9.4mm



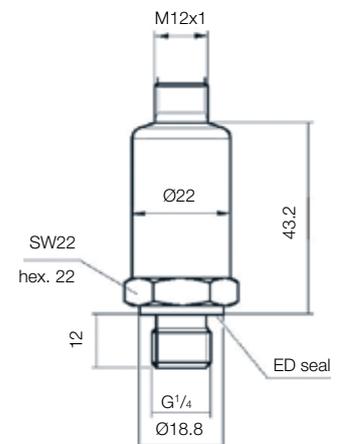
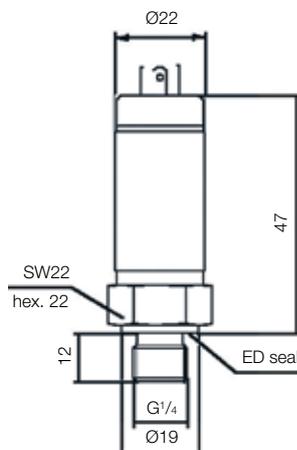
PIN	4 - 20mA	0 - 5Vdc	1 - 6Vdc
1	Do not connect	Signal output	Signal output
2	Supply +ve	Supply +ve	Supply +ve
3	Do not connect	Do not connect	Do not connect
E	Return	Supply ref. (0v)	Supply ref. (0v)

### Connector M12



PIN	4 - 20mA	0 - 5Vdc	1 - 6Vdc
1	Supply +ve	Supply +ve	Supply +ve
2	Do not connect	Signal output	Signal output
3	Return	Supply ref. (0v)	Supply ref. (0v)
4	Do not connect	Do not connect	Do not connect

## Installation Details



# ASIC 'Performer'

## Pressure Transducers and Transmitters

### Ordering Information

#### Standard products table

Product number	Description - pressure transducer	Model	Output	Pressure	Thread form	Connector
<b>PTDVB2501B1C1</b>	0 - 5 Vdc 250 bar 1/4" BSP ED seal micro-din	PTD	VB	250	1	B1C1
<b>PTDVB4001B1C1</b>	0 - 5 Vdc 400 bar 1/4" BSP ED seal micro-din	PTD	VB	400	1	B1C1
<b>PTDVB2501B1C2</b>	0 - 5 Vdc 250 bar 1/4" BSP ED seal M12	PTD	VB	250	1	B1C2
<b>PTDVB4001B1C2</b>	0 - 5 Vdc 400 bar 1/4" BSP ED seal M12	PTD	VB	400	1	B1C2
<b>PTDVB0251B1C1</b>	0 - 5 Vdc 25 bar 1/4" BSP ED seal micro-din	PTD	VB	025	1	B1C1
<b>PTDVB0251B1C2</b>	0 - 5 Vdc 25 bar 1/4" BSP ED seal M12	PTD	VB	025	1	B1C2

Product number	Description - pressure transmitter	Model	Output	Pressure	Thread form	Connector
<b>PTXB4001B1C2</b>	4 - 20 mA 400 bar 1/4" BSP ED seal M12	PTX	B	400	1	B1C2
<b>PTXB0251B1C1</b>	4 - 20 mA 25 bar 1/4" BSP ED seal micro-din	PTX	B	025	1	B1C1
<b>PTXB0251B1C2</b>	4 - 20 mA 25 bar 1/4" BSP ED seal M12	PTX	B	025	1	B1C2
<b>PTXB4001B1C1</b>	4 - 20 mA 400 bar 1/4" BSP ED seal micro-din	PTX	B	400	1	B1C1
<b>PTXB2501B1C1</b>	4 - 20 mA 250 bar 1/4" BSP ED seal micro-din	PTX	B	250	1	B1C1
<b>PTXB2501B1C2</b>	4 - 20 mA 250 bar 1/4" BSP ED seal M12	PTX	B	250	1	B1C2

#### Accessories

Product number	Supersedes	Description
<b>P833PVC2M</b>	P.833PVC-2M	2 meter PVC coated 4 core cable
<b>P833PVC5M</b>	P.833PVC-5M	5 meter PVC coated 4 core cable
<b>P833PVC10M</b>	P.833PVC-10M	10 meter PVC coated 4 core cable

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.  
 Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

#### Product configurator

Product number	Output options		Pressure range (bar)		Thread form		Connector	
<b>PTD</b>	<b>VB</b>	0 - 5 Vdc	<b>025</b>	0 - 25	<b>1</b>	1/4" BSP with ED seal	<b>B1C1</b>	Micro-din
<b>PTX</b>	<b>SB</b>	1 - 6 Vdc	060	0 - 60			<b>B1C2</b>	M12
	<b>B</b>	4 - 20mA (PTX only)	100	0 - 100				
	<b>RB</b>	0.5 - 4.5 ratiometric	<b>250</b>	0 - 250				
	<b>PB</b>	0.1 - 4.9	<b>400</b>	0 - 400				
			600	0 - 600				

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

**PTXB0251B1C2** 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)





# Parker's Motion & Control Technologies

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

Aftermarket services  
Commercial transports  
Engines  
General & business aviation  
Helicopters  
Launch vehicles  
Military aircraft  
Missiles  
Power generation  
Regional transports  
Unmanned aerial vehicles

### Key Products

Control systems & actuation products  
Engine systems & components  
Fluid conveyance systems & components  
Fluid metering, delivery & atomization devices  
Fuel systems & components  
Fuel tank inerting systems  
Hydraulic systems & components  
Thermal management  
Wheels & brakes



## Climate Control

### Key Markets

Agriculture  
Air conditioning  
Construction Machinery  
Food & beverage  
Industrial machinery  
Life sciences  
Oil & gas  
Precision cooling  
Process  
Refrigeration  
Transportation

### Key Products

Accumulators  
Advanced actuators  
CO<sub>2</sub> controls  
Electronic controllers  
Filter driers  
Hand shut-off valves  
Heat exchangers  
Hose & fittings  
Pressure regulating valves  
Refrigerant distributors  
Safety relief valves  
Smart pumps  
Solenoid valves  
Thermostatic expansion valves



## Electromechanical

### Key Markets

Aerospace  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Paper machinery  
Plastics machinery & converting  
Primary metals  
Semiconductor & electronics  
Textile  
Wire & cable

### Key Products

AC/DC drives & systems  
Electric actuators, gantry robots & slides  
Electrohydraulic actuation systems  
Electromechanical actuation systems  
Human machine interface  
Linear motors  
Stepper motors, servo motors, drives & controls  
Structural extrusions



## Filtration

### Key Markets

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

### Key Products

Analytical gas generators  
Compressed air filters & dryers  
Engine air, coolant, fuel & oil filtration systems  
Fluid condition monitoring systems  
Hydraulic & lubrication filters  
Hydrogen, nitrogen & zero air generators  
Instrumentation filters  
Membrane & fiber filters  
Microfiltration  
Sterile air filtration  
Water desalination & purification filters & systems



## 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  
Mooring systems & power cables  
PTFE hose & tubing  
Quick couplings  
Rubber & thermoplastic hose  
Tube fittings & adapters  
Tubing & plastic fittings



## Hydraulics

### Key Markets

Aerial lift  
Agriculture  
Alternative energy  
Construction machinery  
Forestry  
Industrial machinery  
Machine tools  
Marine  
Material handling  
Mining  
Oil & gas  
Power generation  
Refuse vehicles  
Renewable energy  
Truck hydraulics  
Turf equipment

### Key Products

Accumulators  
Cartridge valves  
Electrohydraulic actuators  
Human machine interfaces  
Hybrid drives  
Hydraulic cylinders  
Hydraulic motors & pumps  
Hydraulic systems  
Hydraulic valves & controls  
Hydrostatic steering  
Integrated hydraulic circuits  
Power take-offs  
Power units  
Rotary actuators  
Sensors



## Pneumatics

### Key Markets

Aerospace  
Conveyor & material handling  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Transportation & automotive

### Key Products

Air preparation  
Brass fittings & valves  
Manifolds  
Pneumatic accessories  
Pneumatic actuators & grippers  
Pneumatic valves & controls  
Quick disconnects  
Rotary actuators  
Rubber & thermoplastic hose & couplings  
Structural extrusions  
Thermoplastic tubing & fittings  
Vacuum generators, cups & sensors



## Process Control

### Key Markets

Alternative fuels  
Biopharmaceuticals  
Chemical & refining  
Food & beverage  
Marine & shipbuilding  
Medical & dental  
Microelectronics  
Nuclear Power  
Offshore oil exploration  
Oil & gas  
Pharmaceuticals  
Power generation  
Pulp & paper  
Steel  
Water/wastewater

### Key Products

Analytical Instruments  
Analytical sample conditioning products & systems  
Chemical injection fittings & valves  
Fluoropolymer chemical delivery fittings, valves & pumps  
High purity gas delivery fittings, valves, regulators & digital flow controllers  
Industrial mass flow meters/controllers  
Permanent no-weld tube fittings  
Precision industrial regulators & flow controllers  
Process control double block & bleeds  
Process control fittings, valves, regulators & manifold valves



## Sealing & Shielding

### 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  
Elastomeric o-rings  
Electro-medical instrument design & assembly  
EMI shielding  
Extruded & precision-cut, fabricated elastomeric seals  
High temperature metal seals  
Homogeneous & inserted elastomeric shapes  
Medical device fabrication & assembly  
Metal & plastic retained composite seals  
Shielded optical windows  
Silicone tubing & extrusions  
Thermal management  
Vibration dampening

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