

# Upgrade to Particle Monitor optical module in: AQM 65, Dust Sentry, AQS1

The optical module in the Particle Monitor (nephelometer) in the AQM 65, Dust Sentry and AQS1 has been upgraded. The original part number was 80180, this has been replaced with the 82850. This part is unique to Aeroqual products. This change also includes a change in the Particle Monitor IO module (electronics module), the Particle Monitor pump module remains the same.

These changes will begin to take effect after September 2018, and provide several significant improvements:

## 1. The measurement range is greatly increased

The measurement range has increased from 0 – 2000  $\mu\text{g}\text{m}^{-3}$  up to 0 – 60,000  $\mu\text{g}\text{m}^{-3}$ . This allows the particle monitor to be used in applications where very high particulate loading might occur such as in confined work space applications.

## 2. Improved diagnostics for laser and detector health remove the need for field fibre span.

The optical fibre span has been replaced with an internal diagnostic check on the laser current and detector, this makes field service simpler as it removed the need to perform a fibre span check and removes the risk the fibre span switch gets left on.

## 3. The auto-internal zero calibration feature is improved, significantly reducing the occurrence of negative values.

The automatic zero calibration algorithm is controlled on board the 82850 optical module and includes error checking which reduces measurement errors caused by aging filters or zero calibration pumps.

A detailed comparison between the performance and features of the 80180 optical module to the 82850 optical module is listed in Table 1. The new parts are the same size and form factor as the original so are easily backwards compatible (retrofitable) with existing instruments. Some consideration needs to be given to order replacement parts to existing systems, see Table 2 below.

A video comparison between the original 80180 and the new 82850 can be found here:



Figure 1 Watch a video comparing the 80180 optical module to the 82850 optical module Aeroqual YouTube Channel: <https://youtu.be/2ZoK9lQftGU>

The 82850 is the same size, shape and has the same power consumption as the 80180 engine. There is no change to the service activities or service and calibration frequencies, and no change the filter part code or the tools required to perform the service.

<b>Performance / Feature</b>	<b>80180</b>	<b>80250</b>
<i>Field performance:</i>		
Measurement range	0 – 2000 µgm <sup>-3</sup>	0 – 60,000 µgm <sup>-3</sup>
Detection limit	< 1 µgm <sup>-3</sup>	< 1 µgm <sup>-3</sup>
Measurement accuracy	<±(2 µgm <sup>-3</sup> ) + 5% of reading	<±(2 µgm <sup>-3</sup> ) + 5% of reading
Heated inlet	Yes	Yes
Barometric Pressure measurement	No	Yes mBar
Flow rate	2 LPM	2 LPM
Filters part number	AQM R31	AQM R31
Field service interval	Per user guide	No change
Internal auto zero calibration	Every 12 hours	Every 24 hours
Fibre span for laser and detector check	Yes	No
Factory calibration interval	2 Years	2 Years

**Table 1 Feature and performance comparison**

**Part codes:**

You will use the same part codes when ordering new Particle Monitor systems with AQM 65, Dust Sentry and AQS1, there are no part code changes for new systems.

There are some part code changes when ordering replacement parts for existing Particle Monitor systems.

Customers with existing 80180 optical modules who require a replacement optical module will need to order the new 82850 optical module and a new IO module.

<b>Part</b>	<b>80180</b>	<b>82850</b>
Replacement part number for optical module	AIC PM80180	AIC 82850
Replacement part number for IO module	AQM PM_IO	AQM M1IO
Replacement part number for pump module	AQM PMP01	AQM PMP01