



# System Upgrades

- Stay Ahead with Forward Compatibility



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Bruker appreciates the significant investment you have made in your equipment. All our systems are designed to allow and facilitate upgrades for a fraction of the cost of a new system. Typically, all our upgrades can be installed by our field service engineers.

Install the latest software, the newest X-ray source, or detector and become more productive than ever before. Upgrade your instrumentation today for tomorrow's research needs.

Best of all, most of these upgrades are fully transferable in case you decide to replace the unaltered part of your current system. For example, if you upgrade a SMART APEX II or KAPPA APEX II with a new state-of-the-art PHOTON II detector, that new detector could be transferred to a new D8 QUEST or D8 VENTURE in a couple of years. Many of our users are taking advantage of this forward compatibility to upgrade their laboratory in steps.

Protect the value of your system while enjoying the power and ease of use of the latest state-of-the-art technology.

# PHOTON II: the Future of Detection is Now

## PHOTON II bring Fourth-generation FEL Detector Technology into your Home Laboratory.

Upgrade to the new PHOTON II and collect better data, faster than you ever imagined possible.

The unique PHOTON II is the only Charge-Integrating Pixel Array Detector (CPAD) available for the home laboratory. This new technology—pioneered at the latest free-electron laser beamlines—features all benefits of pixel array detectors including speed, single-photon sensitivity, and superb spatial resolution but avoids all the weaknesses of others. CPADs do not suffer from count rate saturation, parallax smearing, or dead time seen with HPADs or HPCs.

Best of all, the PHOTON II features the largest active area of any home-laboratory detector currently available.



Specification	Value	Benefit
Active area	140 × 100 mm	Largest home-lab detector
Sensitivity (single-photon detection efficiency)	0.99	Every photon contributes to data
Speed	70 frames per second	Ultrafine slicing for the best data quality, smart data processing to reduce data storage requirements
DQE	> 90% for Cu, Mo, Ag	The best detection over a wide range of wavelengths
Spatial resolution	1 pixel (135 μm)	Best data for large unit cells
Count rate saturation	None	Better accuracy for strong reflections
Parallax	< 1 pixel	No smearing of reflections at high angle
Readout dead time	0 μsec	No loss of data quality due to “gaps” in data

Available for: SMART APEX, SMART APEX II, KAPPA APEX II, D8 QUEST and D8 VENTURE.

# µS 3.0: Even more X-rays, the Same Reliability

In less than ten years, the µS has become synonymous with high performance, reliability, and long lifetimes. Compared to a conventional 3 kW sealed tube with graphite monochromator, the latest µS 3.0 now delivers up to 60 times the intensity for Cu and up to 20 times the intensity for Mo.

Despite this tremendous increase in intensity, the µS 3.0 is still completely air-cooled—the only air-cooled microfocus source on the market! Better yet, it is also the only source to carry a unique 3-year warranty.

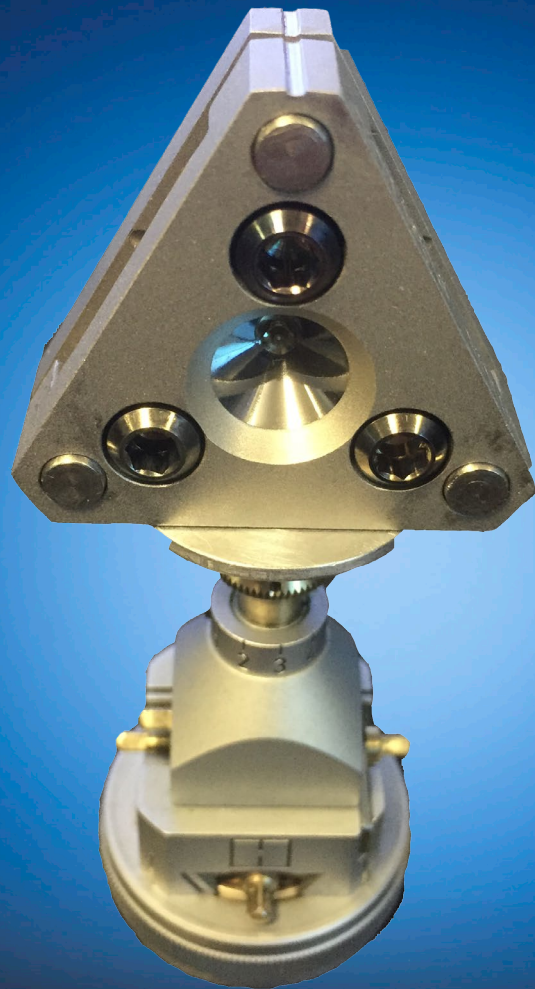
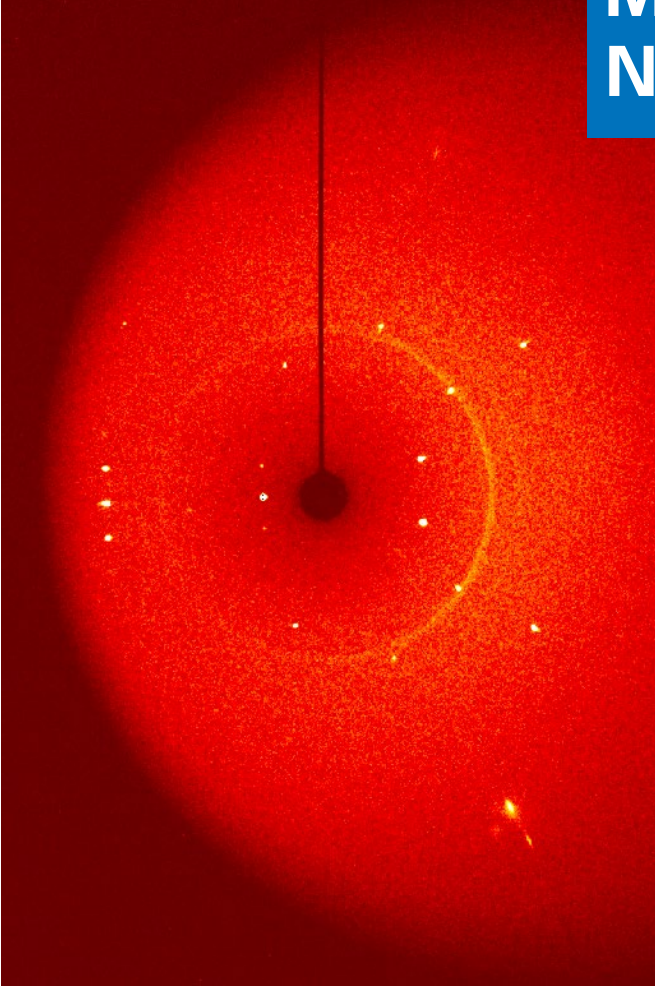
The µS 3.0 is available for Cu, Mo, or Ag radiation



Specification	Value	Benefit
Beam intensity (HELIOS optics) ( $10^9$ photons / s·mm <sup>2</sup> )		
Cu	24	High-intensity X-ray source for point-focus applications
Mo	2.5	
Ag	1.2	
Beam size at the sample position (µm)		
Cu	100	Ideal for small, weakly-diffracting samples
Mo	110	
Ag	80	
Cooling	Air-cooled	No trouble with cooling water
Power load	Up to 80 W, single-phase power	Minimal installation requirements

Available for: D8 QUEST and D8 VENTURE.

## Diamond Anvil Cell: More Pressure, but No Stress!



Adding a diamond anvil cell to your system allows access to the exciting field of high-pressure materials.

Bruker now offers DACs which are completely integrated into the D8 system. This means that full collision protection is provided and optimal strategy generation is supported.

Available for: KAPPA APEX, SMART APEX, SMART APEX II, KAPPA APEX II, D8 QUEST and D8 VENTURE.

# AUTOMATED XYZ GONIOMETER HEAD (AGH)

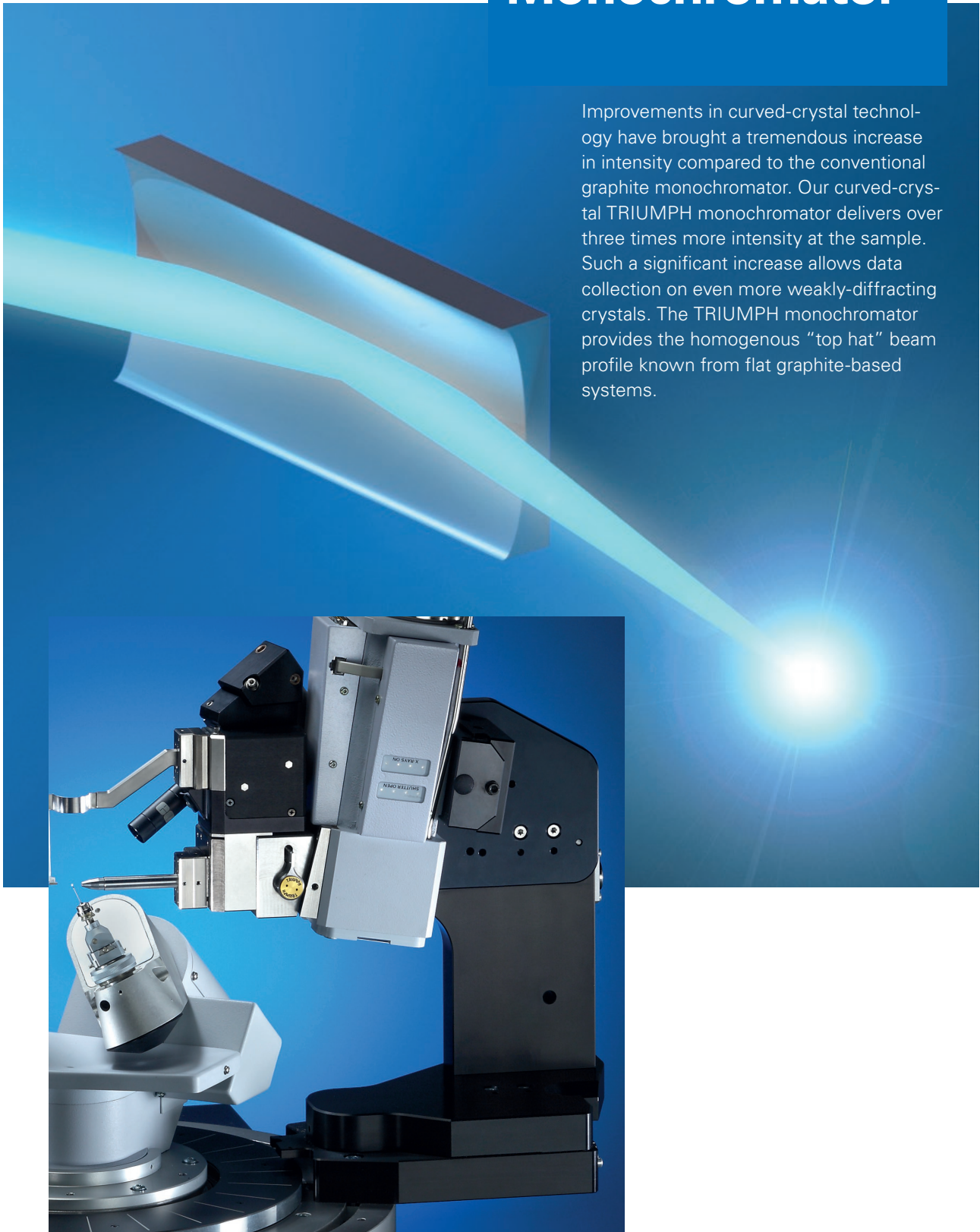
A perfectly-centered sample is paramount to successful structure determination and a high-quality final structure model. This novel Automated Goniometer Head (AGH) simplifies the optical centering of small crystals tremendously. Manual goniometer heads that are still in use today were developed for the much larger crystals at the time. They suffer from backlash and make the centering of micrometer sized crystals very tedious.

Centering with the AGH is as easy as clicking on the center of the crystal in the video image or letting the system center the sample automatically - Fast and reliable.



# TRIUMPH Monochromator

Improvements in curved-crystal technology have brought a tremendous increase in intensity compared to the conventional graphite monochromator. Our curved-crystal TRIUMPH monochromator delivers over three times more intensity at the sample. Such a significant increase allows data collection on even more weakly-diffracting crystals. The TRIUMPH monochromator provides the homogenous "top hat" beam profile known from flat graphite-based systems.



Available for: graphite monochromators in APEX II, KAPPA APEX II, D8 QUEST and D8 VENTURE.

# APEX3: Enjoy the Feeling

Software is a crucial part of the investment in a crystallographic system. The software not only provides the interface between you and your hardware, it also could make the difference between solving and not solving the structure. Our new APEX3 software is an integral part of the D8 Crystallography Solutions Second Generation. With this software suite, Bruker continues its long history of offering the most advanced software package for structure determination.



## Upgrade Matrix

	Detector	Source		Sample Handling		Software
	PHOTON II	TRIUMPH	I $\mu$ S 3.0	AGH II	DAC	APEX3
SMART APEX, KAPPA APEX	yes	yes		yes	yes	For analysis only (requires new computer)
D8 QUEST, D8 VENTURE	yes	yes	yes	yes	yes	yes

Available for: Kappa APEX, SMART APEX, SMART APEX II, KAPPA APEX II, D8 QUEST and D8 VENTURE.

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