MPCC Mark III – Manual

Photographic version (for CCD & DSLR):

#2458400A

V-1 – Visual Multi Purpose Coma Corrector Mark III
for visual and photographic use

#2458403

The only coma-corrector for Newtonian telescopes which does not increase the focal length. An f/4 Newton stays an f/4 Newton!



MPCC base element #2458400A

With T-2 and M 48 thread or photography with all Newtonian telescopes



MPCC V-1-Set #2458403

For visual use and photography with large sensors at all Newtonian telescopes (contains additional adapters)

Properties of the MPCC:

- no change in focal length or field size, an f4 Newtonian remains f4
- newly calculated lens system – designed for an unvignetted field down to f3.5
- maximum sharpness across the field – without center soft spot (as reported of other correctors)
- accepts T-2 (M 42 × 0.75) and/or 2" (M 48 × 0.75) threaded photographic- or visual-adapters
- 2" stopping collar removable for increase in backfocus
- easy to use
- very variable, can be used for photographic and visual use
- 2" filter thread on the telescope side
- exceptional price/performance ratio
- Phantom Group™ multicoated for maximum transmission and freedom from reflections from UV to NIR
- optional adapter for direct coupling of the MPCC III directly onto the Baader CANON EOS Protective T-ring
- 44 mm clear aperture when using the M 48 (2") filter-tread or, with optional adapter, the Protective T-ring

„The Multipurpose Coma Corrector has turned a rarely used f/4 Newtonian RFT into a well-corrected wide field photographic instrument. The star images across the frame are excellent." (Stephen J. Edberg)

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The MPCC Mark III

Large parabolic mirrors are perfectly apt for Deep Sky imaging since they deliver a very large field and enable very short exposure times. However this comes at the price of off axis coma and some residual astigmatism. Coma will distort off axis stars into "comets" which effectively reduces the usable field considerably. Many companies offer various lens systems as solution to counteract coma, most at the downside of increasing the original focal length and reducing the field of view. An f4 optics may become an f4.5.

The Multi Purpose Coma Corrector Mark III eliminates coma across the full photographic field *without manipulating the focal length*. The proprietory lens design has our Phantom Group™ wideband multicoating on all air to glass lens surfaces. This treatment delivers highest transmission combined with lowest amount of scatter and reflections across a very wide spectral range from UV to NIR. The original MPCC had been designed for an f/ratio of f4.5 to f6. The new Mark III however works exceptionally well even down to f3.5. Stars remain pinpoints across the field and the visual use likewise is made much easier – with the help of the 2" (M 48) male filter thread at the eyepiece facing side.

The MPCC III is designed to be the most variable coma corrector in the market today. It mounts into every 2" focuser and fits CCD-filter wheels and off axis guiders of various manufacturers.

To make use of the larger free aperture which is offered by MARK III and Canon EOS Protective T-Ring, you need to use the M 48 thread of the MPCC (and remove the T-2 thread). The mounting surface of the M 48 thread is 3 mm farther to the back.

To compensate this additional space and keep the necessary distance of 55 mm between adapter and sensor, we offer – optionally – the special spacer ring #2458405. With it, you can attach the Mark III directly at the Baader Protective Canon DSLR T-rings – with or without a filter mounted inside of the T-ring.

Of course, if you don't need the full aperture, you can still attach the MPCC directly at the Baader Protective Ring (with or without filter) with the T-2-thread, without any spacer rings.



MPCC base element with mounted Stop-Ring: 38 mm clear aperture with T-2-thread



MPCC base element without Stop-Ring and T-2-Adapter: 44 mm clear aperture with M48-thread



The M48-thread provides a free aperture of 44 mm diameter, which is sufficient even for full-frame DSLRs. The free aperture of 38 mm provided by the common T-2-thread is sufficient for APS-C-cameras.

Scope of delivery of the V-1 Set for visual and photographic use (#2458403)



The photographic version #245 8400A contains only the base element ❶.

1. MPCC coma corrector – base element, with stopping collar
2. Varilock 29mm (T-2 part #25V; item number #2956929), with:
   3. T-2-dovetail ring
   4. Allen key to replace T-2-thread with T-2-dovetail
   5. Locking tool for preloading ring
6. Focusing eyepiece holder 1¼" / T-2 (T-2 part #8A; item number #2458125)

Example images

In January 2014 we got some first images from a customer which were taken through a Baader MPCC Mark III coma correktor. The telescope was a TS Standard Newton 200mm f/4 with Carbon tube. A full-frame Canon EOS 5D Mark II was attached to the MPCC with a standard T-2-adapter. The following image shows the full image (24 x 36 mm), the insets show the APS-C format (yellow) and the sensor size of the KAF 8300, which is used in many CCD cameras (blue).

The image is a combination of thirteen 30-second-exposures, no guiding, no darks, no flats.

The rather strong vignetting is caused by the direct-adaptaion of the camera to the MPCC with a standard T-2-adapter. The vignetting is highly reduced when you use the M48 thread and the Baader CANON EOS Protective T-Ring.

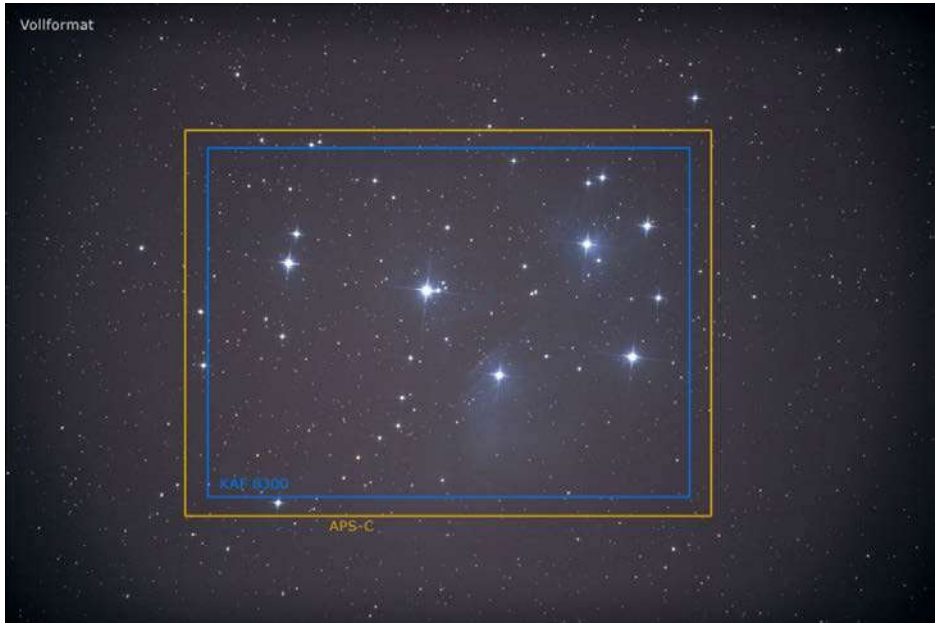
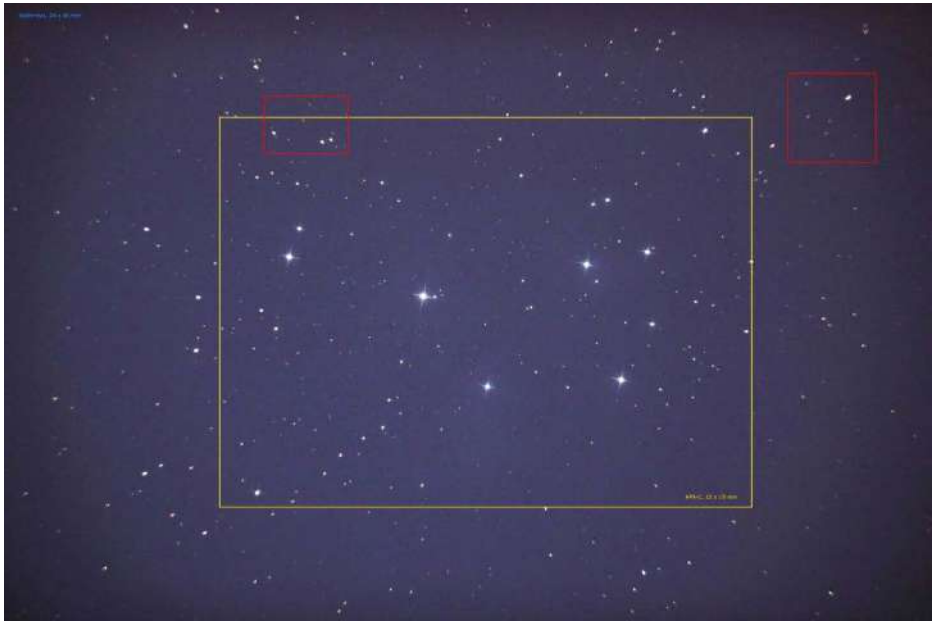


Image of the Plejades through a 200 mm f/4 Newton with full-frame camera Canon EOS 5D Mark II, 13 × 30 seconds. The yellow box indicates the field of view of an APS-C-camera, the blue one that of the common KAF 8300 sensors used in many CCD-cameras. The vignetting is caused by the T-2-adaptation and can be reduced very much by using the Canon EOS Protective T-Ring with M48-thread.

The image on the next page shows a single frame shot (30 seconds), taken *without* the MPCC Mark III. Marked are the APS-C-format (yellow) and two selected regions of interest (red). The both red regions are magnified in the images below, each with and without the MPCC.



30-seconds single frame shot taken without MPCC.



Picture detail at the edge to full frame format with and without Baader MPCC



Picture detail at the edge to APS-C format with and without Baader MPCC

MPCC Base element #2458400
for photographic use (with a DSLR)

The MPCC is designed for a working distance of 55 mm between the lower end of the T-2-thread and the camera sensor. This way, it works "out of the box" with all standard T-rings for DSLR which provide the standard flange back of 55 mm.



Canon DSLR with Protective Canon DSLR T-Ring, M48 Spacer Ring and MPCC for maximum aperture

Canon DSLR with standard T-adapter (#2408319) and MPCC with stopping collar and T-2-thread

More free aperture with M48 thread

The T-thread (M42×0,75) causes vignetting when used with full-frame cameras. That's why the T-2-reducer can be removed to reveal an M48-thread with the largest possible free aperture. This is recommend for large CCDs as well as for DSLRs; additional spacer rings are needed for the correct working distance of 55±1 mm.

This can be achieved for Canon-DSLRs with the Protective Canon DSLR T-Ring #2958550, which provides both M48- and T-2-threads. The separately available M48 Spacer Ring for MPCC III / Protective EOS T-Ring #2458405 keeps the MPCC in the correct distance to the Canon-adapter.

You can also permanently mount 50.4 mm filters inside of the Protective DSLR T-Ring.



The M48 Spacer Ring #2458405 provides a larger free aperture by removing the T-2-thread (cf. image on page 2)

V-1 MPCC #2454803
Parts for use with 1¼" eyepieces (or 1¼" video modules)

The base element of the MPCC can be equipped with the following parts to use accessories with 1¼" nosepieces like eyepieces or many video modules. You can set it to every working distance between 49 and 64 mm. This way, you can achieve the correct working distance of 55 mm (±1 mm) between T-2-thread and the field stop of the eyepiece or the camera sensor.

These parts are included in the set ***V-1 MPCC for visual and photographic use #2454803***; the base element can always be equipped with these parts which are also available seperately.

1.) Focusing Eyepiece Holder 1¼" / T-2 (T-2 part #8A) #2458125



The 1¼"/T-2 eyepiece clamp with fine-focuser (6,5 mm focus travel) has got three eyepiece clamping screws for fine centering as well as a rotation locking screw to secure the exact focus position. The optical length is 29 - 35,5 mm.

Note: For eyepiece projection, you can alternatively use the Reducer 2"/ 1 ¼" (T-2 part #15) #2408190 with brass locking ring and a fixed optical length of 37 mm. It has got a removable T-2-collar. Underneath is a male T-2-thread for attaching a DSLR or a T-ring. With the matching T-2 extension tubes, this seperatley available adapter can also be used for eyepiece projection with suitable eyepieces (field stop, eyepiece diameter).

2.) Baader VariLock 29, lockable T-2 ExtensionTube 20-29 mm with spanner tool (T-2 part #25Y) #2956929



The Baader VariLock T-2 Extension is a continuously adjustable extension ring in the T-2 System™. By releasing or tightening the locking ring, every desired length can be set with the help of the millimeter scale. A spanner tool for the locking ring is included.

Varilocks are the perfect tool for achieving the exact distance, e.g. for H-alpha solar filters or corrector lenses which are sensible to wrong optical distances.

You can also remove the T-2-thread on the eyepiece side by unfastening the set screws (an Allen wrench is included) and replace it with a dovetail ring, which fits directly into our T-rings for EOS, Protective for Canon and Sony NEX cameras as well as all other rings with 52mm dovetail rings.

V-1 MPCC for use with standard 1¼" eyepieces and Morpheus 76° wide-angle eyepieces

The field stop of many 1¼" eyepieces is located at the intersection of eyepiece housing and nosepiece. This is also the case with many larger eyepieces like the *Pentax XL*. In our *Morpheus-eyepieces* with both 1,25" and 2" nosepiece, the field stop is at the intersection from 1¼" to 2" nosepiece.



So, the V-1 MPCC must be set to a length of 55 mm. For this, simply set the Varilock to 20 mm (shortest overal length) and the eyepiece holder to the longest length of 35 mm.

The 2" stopping collar of the MPCC can be removed to insert the combination deeper into the focuser of a Newtonian telescope, if necessary. As it doesn't have any other protection against slipping into the focuser aside from the locking screws of the eyepiece clamp, please use the Hyperion / Morpheus 2" Finetuning Stopring (#2958027), so that the eyepiece has got a stop position as usual.







For all those eyepieces where the field stop is at the intersection of eyepiece body and nosepiece, the distance must be set to 55 mm.
The upper images show the MPCC with the standard stopping collar mounted. If necessary, it can be removed. If you want a mechanical stop at the 2" barrel, you can use the Hyperion/Morpheus 2" Finetuning Stopring #2958027, as in the downmost image.

V-1 MPCC for use with eyepieces with very large field stop, like the Baader 35mm Eudiascopic



Eyepieces where the field stop is inside of the eyepiece body, have to be placed closer to the MPCC. The field stop of the *35 mm Eudiascopic eyepiece* is located 7 mm behind the intersection; the distance to the stop collar of the eyepiece has to be set to 48 mm ± 1 mm.

If you set both VariLock and eyepiece holder to the shortest possible length, then the result will be 49 mm, which is inside of the tolerance.

Depending on your telescope, you may have to remove the stopping collar; you may want to use the optional Hyperion / Morpheus 2" Finetuning Stopring (#2958027) instead.



The 35 mm Eudiascopic eyepiece with MPCC and stopping collar (on the left), or with the stopping collar removed and with the optional Hyperion/Morpheus 2" Finetuning Stopring #2958027 (top).

V-1 MPCC for use with Baader Classic Ortho, Baader Hyperion-, TeleVue Plössl and other eyepieces where the field stop is inside of the nosepiece

Eyepieces which are also designed for use e.g. at spotting scopes have got the field stop inside of the nosepiece. So, these eyepieces require a somewhat longer distance from the MPCC. The correct distance for all *Baader Classic Ortho and Plössl eyepieces* is 57 mm.

The correct distance for the *Baader Hyperion eyepieces* depends on their focal length:

Hyperion 5 mm, 8 mm, 13 mm, 17 mm: Distance to MPCC = 55 mm, equal to Morpheus (Field stop is at 2"/1,25" intersection)

Hyperion 10 mm: Distance to MPCC = 51,6 mm

Hyperion 21 mm: Distance to MPCC = 54 mm

Hyperion 24 mm: Distance to MPCC = 56,5 mm

The *TeleVue Plössl* require a distance of 62 mm. To achieve this, you need set the eyepiece clamp to the longest length and the VariLock to 27 mm.



V-1 MPCC for use with video modules



If desired, the MPCC can be used with video modules or small CCD cameras with 1¼" nosepiece the same way as with 1¼" eyepieces. You need to know the back flange of your camera and, again, use VariLock and focusing eyepiece clamp to place the camera sensor in a distance of 55 mm away from the T-2-thread of the MPCC.

V-1 MPCC for use with 2" eyepieces

The MPCC makes observations free of vignetting possibe, even with extreme 2" wide-angle eyepieces. You may need the expanding ring M48/T-2 #2458110 with an optical length of 2,5 mm to attach the VariLock to the 2"-filter-thread your eyepiece. Remove the 2"-collar from the MPCC to insert the combination deeper into the focuser, if necessary. You need to keep the distance of 55 mm ± 1 mm between MPCC and field stop.

The field stop of the *Hyperion Aspheric* is on the same height as the reference plane; the nosepiece is 27,5 mm long. So, you need to set the Varilock to 25 mm (27,5 mm for the nosepiece, 2,5 mm for the M48-adapter, 25 mm for the Varilock).



Hyperion Aspheric-eyepiece, with VariLock ❶, M48 expanding ring ❷ and optional locking ring ❸

The field stop of the *35 mm Televue Panoptic* is 10 mm inside of the nosepiece, here you can achieve the correct distance easily with the 28 mm Finetuning-ring #2958228.

For other eyepieces you may have to check the documentation of the manufacturer to find out about the position of the field stop. Its position may vary even inside of an series of eyepieces. Furthermore, the length of nosepieces is not standardized. With the *Explore Scientific 20 mm 100° eyepiece* e.g., you can screw the MPCC directly into the filterthread and do not need the M48 expanding ring.



The field stop of the Explore Scientific 20 mm 100°-Okular is deep inside of the housing. The MPCC can be attached directly with the M48-thread.

Stopping Collar and 2" Finetuning Stopring



The stopping collar of the MPCC can be removed to insert the coma corrector deeper into the focuser. As it doesn't have any other protection against slipping into the focuser aside from the locking screws of the eyepiece clamp, please use the optional Hyperion / Morpheus 2“ Finetuning Stopring (#2958027), so that the eyepiece has got a stop position as usual.



MPCC with stopping collar



MPCC with optional finetuning stopring

Please note about the given distances

The distance of 55 ±1 mm to the field stop is the standard distance which should work best. But under certain circumstances you have to vary it a little bit – maybe only because the given value for the field stop is wrong (or unknown). To do so, simply play with the distance, until the image is fine – this is easily done with the focusing eyepiece holder.

Problems, maintenance and warranty

Should you have any problems with your product, NEVER try to open it yourself and do not give it to a workshop which is not authorized by Baader Planetarium – otherwise, the warranty will be void. Should you have any problems, technical wishes or questions, please contact Baader Planetarium or your local dealer.

Optional Accessories

M 48 extension rings, to adapt the MPCC at 2" eyepieces:

- Hyperion Finetuning Ring 14 mm #2958214
- Hyperion Finetuning Ring 28 mm #2958228
- Filter cell 2" Low Profile, (6 mm) #2459252L
- Filter cell 2" classic (8 mm) #2459252
- Expanding Ring T-2 / M 48 (2,5 mm length) #2458110 – if the Varilock with T-2-thread is needed

Stopring, to insert the MPCC deeper into the focuser

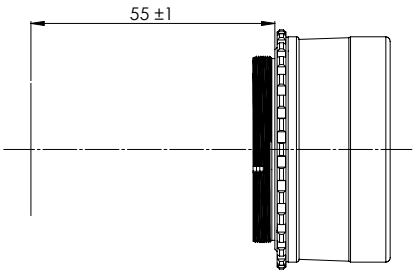
- Hyperion / Morpheus 2" Finetuning Stopring #2958027

Canon camera adapter, to make use of the M 48 thread:

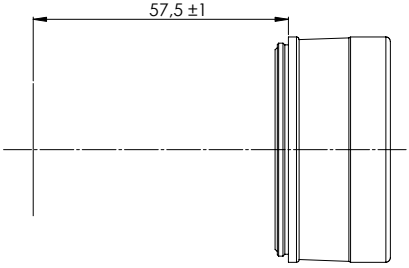
- M 48 Spacer Ring for MPCC III / Protective EOS T-Ring #2458405
- Protective CANON DSLR-T-Ring T-2/M 48 and 2"#2958550

Backfokus for T-2 and M 48

Backfokus measured from T-2-thread [mm]



Backfokus measured from M 48-thread [mm]



www.baader-planetarium.com

All technical specifications and instructions contained in this manual are given without warranty of any kind and are subject to technical changes.

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