TeleVue® Visionary WARRANTY REGISTRATION FORM

We sincerely thank you for your purchase and wish you years of pleasure using it!

Tele Vue Warranty Summary

Eyepieces, Barlows, Powermates, & Paracorr have a “Lifetime Limited” warranty, telescopes & accessories are warranted for 5 years. Electronic parts are warranted for 1 year. Warranty is against defects in material or workmanship. No other warranty is expressed or implied. No returns without prior authorization.

Lifetime Limited Warranty details online: http://bit.ly/TVOPTLIFE
5-Year/1-Year Warranty details online: http://bit.ly/TVOPTLIMITED
Subscribe to our Blog for the latest Tele Vue news: https://bit.ly/TeleVueBlog

Keep For Your Records

Dealer: _____ City/State/Country: _____

Date (day/month/yr): _____/_____/_____ **22.0 Nagler Type 4 (EN4-22.0)**

Tele Vue®
32 Elkay Drive
Chester, NY 10918-3001
U.S.A.

Please fill out, cut out, and mail form below within 2-weeks of product purchase. **Please include copy of sales receipt that has your name, the dealer name, and product name.**

Cut out mailing address at left, tape to envelope, insert form & sales receipt in envelope and apply sufficient postage to envelope.

22.0 Nagler Type 4 (EN4-22.0)

_____
Name Last First

_____
Street Address

_____
City State/Province

_____
Postal Code Country

Email*: _____

Phone: _____

Astro Club: _____

How did you learn about this product?

☐ Dealer ☐ Friend ☐ Tele Vue Blog
☐ CloudyNights.com ☐ TeleVue.com
☐ Social Media/Magazine/Other(s):

What made you decide to buy this and your comments after using the product?

Purchase Information

Dealer: _____

City/State/Country: _____

Date (day/month/yr): _____/_____/_____

NAGLER TYPE 4 EYEPIECE INSTRUCTIONS

WARNING: Be alert that the weight of the Nagler Type 4 is enough to extend the eyeguard if you pick up your eyepiece by the black barrel. The eyepiece cannot fall out of the Instadjust housing so do not be alarmed!

Thank you for purchasing a Tele Vue Nagler Type 4 eyepiece. Each features long eye relief along with an 82 degree apparent field. By using new glass technology, we were able to improve eye-relief, contrast and ghost suppression, and linearity (freedom from pincushion distortion) for any speed (f/#) telescope, while keeping size and weight down.

Our unique new "Instadjust" eyeguard housing allows maximum eye relief for eyeglass wearers in the down position. Pulling the housing up will permit click-stop setting of the eyeguard height allowing for an ideal match between your eye and telescope pupils. With this much eye relief available, it is important to learn your own optimum "click stop" position.

If you don't wear eyeglasses, start with the eyeguard housing pulled out all the way. You can fold the soft rubber eyeguard up or down, whichever is most comfortable for you. You may not see the full field with the eyeguard housing fully extended; just keep "clicking down" until you find the most comfortable position where you still see the entire field (this is much easier to do than to explain how, thank goodness). You will also find that this system minimizes extraneous outside light, giving you the highest contrast for those "faint fuzzies". The generous eye- relief also minimizes eye lens fogging due to eye moisture in cold weather.

Following is a table of all Nagler Type 4 focal lengths and their corresponding effective field stop diameters. To determine the true field in degrees for an eyepiece on any given telescope, simply divide the field stop diameter of the eyepiece by the focal length of the telescope (in mm) and multiply the result by 57.3 degrees (a radian).

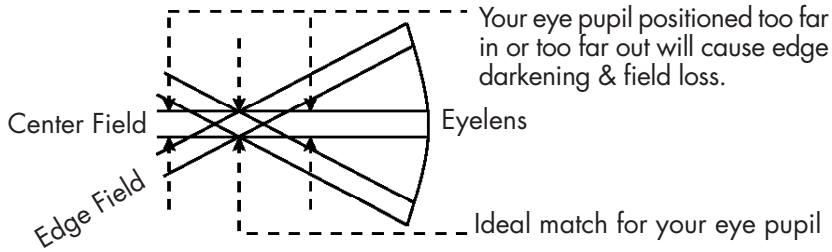


Nagler Type 4 F.L.	Field Stop Dia.	Eye Relief	Elements	Barrel Size	Weight (lbs.)
22mm	31.1mm	19mm	7	2"	1.5
17mm	24.3mm	17mm	7	2"	1.6
12mm	17.1mm	17mm	6	1¼"/2"	1.1

WARNING: To avoid getting dust and dirt into the eyepiece, do not unscrew the chrome barrel. Also, do not unscrew the identifying ring; this ring prevents removal of the "instadjust" housing. Re-assembly requires a special tool, so don't try it no matter how curious you are. The eyepiece might have to be returned to us, with a service charge required.

We wish you years of exciting viewing with these eyepieces, and welcome comments on your experiences with them.

Proper Eyeguard Positioning



This Eyepiece Accepts DIOPTRX™



Your telescope's focuser is used to compensate for your near- or far-sightedness; DIOPTRX™ compensates for your astigmatism. These units attach and lock onto the tops of over twenty long eye-relief Tele Vue eyepieces to achieve the sharpest full-field viewing possible. DIOPTRX™ models are available in ¼ to 3½ diopter and are rotatable for tuning to the best orientation. Simply choose the DIOPTRX™ model that matches your eyeglass prescription for astigmatism. All lenses are multi-coated glass in anodized aluminum housings with rubber eyeguards.

Benefits of using Dioptrx over eyeglasses

1. You're more likely to see a sharper, higher contrast image, because:
   A. The Dioptrx is always completely aligned to the eyepiece optics, eliminating aberrations from a decentered mismatch of eyeglass power and astigmatic axis.
   B. Dioptrx can be rotated to exactly compensate for the astigmatic axis angle in real time, since both head angle and age can vary your eyesight astigmatic angle.
   C. Dioptrx likely has better multi-coatings than eyeglasses, and certainly is better in transmission and reflection reduction than uncoated eyeglass.
   D. Dioptrx is more likely to be cleaner than eyeglasses, which may have scratches and smudges from constant use and wear and tear.
   E. Dioptrx allows seeing your normal maximum contrast that eyeglasses can diminish (remove your eyeglasses and see how contrast improves in normal vision).
2. You're more likely to see the full field in 100° Ethos eyepieces because your eyeglasses are more limiting in "effective eye-relief".

Enter bit.ly/TVOPTDXM in browser URL bar for more info.

SFA-0001 This Eyepiece Accepts FONEMATE

If you need a convenient way to take still, video, or timelapse images through an eyepiece, use our FoneMate™ smartphone adapter. It securely clamps to compatible Tele Vue eyepieces. Smartphones as big as the Galaxy Note 4 can be fitted to the FoneMate™.



Enter bit.ly/TVOPTFM in browser URL bar for more info.

EBX-2120 2" EYEPIECE BARREL EXTENDER

Some of our eyepieces have dual 2" / 1¼" barrels which make it impossible to use 2" filters due to the 1¼" barrel extending below the 2" barrel. The 2" Eyepiece Barrel Extender adds 1.2-inches to the 2" barrel to provide a mounting location for 2" (48mm) eyepiece filters. It also increases backfocus distance and an also help parfocalize eyepiece sets.



Enter bit.ly/TVOPEBX in browser URL bar for more info.

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V09/22/20
BV-DX-PC-EBX-EGE-BM

VIP-2010 VISUAL-IMAGING PARACORR TYPE-2

Newtonian/Dobsonian telescopes can benefit from using a Tele Vue Paracorr (Parabola Corrector) to eliminate coma in the image. Coma is the effect that makes off-center stars appear like little comets (it becomes more apparent as stars move closer to the edge of the field). While a Newtonian/Dobsonian telescope will benefit from the use of Paracorr, those faster than f/5.0 will see the greatest results. Stars at the edge of the field will improve so dramatically, that when using top-notch Tele Vue eyepieces an object will be equally sharp anywhere in the field. It also prevents faint stars from disappearing at the edge of the eyepiece field. This is not only aesthetically pleasing, but it also greatly reduces the need to constantly nudge the scope to keep the object centered in the "sweet spot." Just insert Paracorr into your 2" focuser like a 2" Barlow (it has a 15% [1.15x] magnification factor) and add Tele Vue eyepieces to suit your needs. It's a recipe for perfection when combined with Tele Vue eyepieces.



The Paracorr Type-2 allows an f/3 parabolic mirror to perform like an f/12 without it. This permits development of a new generation of larger ladderless Dobs, with bigger, sharper fields than ever before. Indeed, it's already been successfully applied by Mike Lockwood to his 20" f/3 and 14.5" f/2.55!

This model Paracorr is dual function: the tunable top permits positioning all Tele Vue eyepieces for optimum performance (see eyepiece position chart on the other side), and the optical assembly can be removed for use in an imaging system with DSLR or CCD cameras along with Tele Vue Imaging System accessories.

Enter bit.ly/TVOPTPC in browser URL bar for more info.

This Eyepiece Accepts BANDMATE™ Filters

Adding Bandmate filters to your eyepiece make nebulae "pop-out" in the field. Bandmate does this by passing select wavelengths of light and blocking other to darken the sky and increase contrast. Several filters are available for 2" and 1¼" barrel eyepieces.



- Bandmate Nebustar is a a unique narrowband filter design specifically for Tele Vue as a general-purpose nebula filter for scopes of any size. Unlike other ultra-high constrast (UHC) designs, Nebustar blocks red wavelengths normally passed by typical UHC filters. The design eliminates star bloat to produce sharper, more natural looking stars along with enhanced nebulosity.
- Bandmate OIII filter enhances planetary nebulae and supernovae remnants.
- Bandmate Hβ brings out the hydrogen-beta emission lines found in hydrogen emitting nebulae.

Enter bit.ly/TVOPBM2 in browser URL bar for more info.

Choosing Your Eyepieces

by Al Nagler
CEO, Tele Vue Optics, Inc

MAGNIFICATION

Eyepieces determine your telescope's magnification.

Magnification = telescope focal length ÷ eyepiece focal length

TRUE FIELD OF VIEW

Eyepieces also determine the true field you see in the sky. To calculate the true field of view that you will see (in degrees):

True field of view = (eyepiece field stop diameter ÷ telescope focal length) x 57.3

THE FIELD STOP AND APPARENT FIELD OF VIEW

The field stop is the metal ring inside the eyepiece barrel that limits the field size. It's projected by the eyepiece so that it appears as a circle out in space when you look through the eyepiece. The angular diameter of this circle is called the apparent field of view (AFOV) and is a fixed property for each eyepiece design. For example, Plössl and Nagler Zoom eyepieces have an AFOV of 50º, Panoptics have 68º, Delos have 72º, Naglers have 82º, Ethos have 100º and the Ethos-SX eyepiece has 110º.

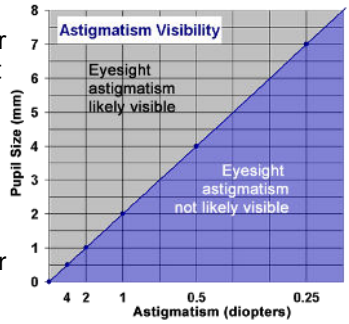
LOW-TO-MEDIUM POWER VIEWING

For low-power viewing of large objects, or to use your telescope as a low-power finder, use an eyepiece that delivers close to the maximum possible true field of view (note that for 1.25" eyepieces, the maximum field stop diameter is 27mm; for 2" eyepieces, it's 46mm). Then add eyepieces covering uniform increments in smaller field stops. For example, if your widest field eyepiece has a 40mm diameter field stop and you choose a decreasing increment diameter factor of 2 (which results in a 4x decrease in area size), you'll end up with eyepieces having field stop diameters of approximately 40mm, 20mm and 10mm. To further fill in with incremental steps, add eyepieces with approximate field stop diameters of 28mm and 14mm. Of course, avoid duplicating focal lengths. For example, if you use a 31mm Nagler (with a 42mm field stop diameter), you would not need a 32mm Plössl (with a 27mm field stop diameter).

In general, for each field stop size, choosing eyepieces with shorter focal lengths and larger apparent fields of view will allow you to see more detail and fainter stars. In addition, you'll have a smaller exit pupil to better match your eyesight.

EYEGLASSES AND EYE RELIEF

If you do not need eyeglasses to correct astigmatism, don't use them when observing. If you wear glasses to correct astigmatism, make sure they're multi-coated, and try to choose eyepieces that have at least 15mm to 20mm of eye relief, to minimize any field reduction (vignetting). However, you will find that with small exit pupils such as 1mm or less, you probably will not need eyeglasses, and can therefore use eyepieces with less eye relief. You can use DIOPTRX instead of eyeglasses for best performance, with Tele Vue eyepieces that accept this accessory.



EXIT PUPIL

The exit pupil is the image of the objective that is formed by the eyepiece. It's where you place your eye to see the full field of view.

Exit pupil = eyepiece focal length ÷ telescope *f*/#

For reflecting telescopes, it's best to avoid exit pupils larger than 7mm or smaller than 0.5mm. Refracting telescopes have no upper limits on exit pupil sizes.

IMAGE AMPLIFIERS (Barlows and Powermates)

You can also choose a long focal length eyepiece with comfortable eye relief and use image amplifying lenses to increase power. Tele Vue makes Barlows and Powermates (an improvement to the Barlow-type design) in magnification factors of 2x, 2.5x, 3x, 4x and 5x.

PARACORR Type-2 (Parabola Corrector)

If you have a Newtonian or Dobsonian reflector that's *f*/5.0 or faster, you should seriously consider using the Paracorr to eliminate coma, so your full field eyepiece sharpness is not compromised. Paracorr also acts like a 1.15x image amplifier, so, for example, a 1000mm *f*/4.5 scope becomes an 1150mm *f*/5.2 scope. Adjust your eyepiece focal length choices accordingly. Paracorr Type-2 is for scopes as fast as f/3.0.

HIGH-POWER VIEWING

Once you've selected an eyepiece set based on field stop sizes, calculate the magnifications produced with your scope. For planetary or double star observing, you'll want an eyepiece in at least the 150x range. For determining maximum power, a good rule of thumb is to use no more than 60x per inch of aperture for scopes with apertures up to 6". Higher magnifications may still be pleasing but will not likely reveal any additional detail. Realistically, the atmosphere will usually limit your planetary observing to a maximum magnification of about 300x, no matter how large your telescope aperture.

Basically, you'll be choosing low and medium power eyepieces by field stop increments to "frame" the subject, and high power eyepieces by magnification increments (based on your scope's aperture), to reach the optimum contrast and resolution for viewing planets and double stars.

Check out ***www.televue.com*** for the following related articles: "Choosing Your Telescope's Magnification", "Eyepieces for Small Dobs" and "Determining When To Use Eyeglasses".

For more individual advice on specific applications, you can always call Tele Vue at 845-469-4551

TELE VUE EYEPIECE SPECIFICATIONS

Tele Vue recommends choosing low and medium power eyepieces in ratios of field stop diameters. For example, factors of 1.4 or 2.0. When choosing higher power eyepieces, use ratios of magnification.

Focal Length (mm)	Type	Product Code	Apparent Field (deg)	Field Stop Dia. (mm)	Eye Relief (mm)	Dioptrx Ready	Pupil size in mm for various f/ratio telescopes				
							f/4.5	f/5.2	f/7	f/10	f/14
2" Eyepieces for Wide True Fields											
55	Plössl	EPL-55.0	50	46.0	38	Y	12.2	10.6	7.9	5.5	3.9
41	Panoptic	EPN-41.0	68	46.0	27	Y	9.1	7.9	5.9	4.1	2.9
31	Nagler 5	EN5-31.0	82	42.0	19	Y	6.9	6.0	4.4	3.1	2.2
35	Panoptic	EPN-35.0	68	38.7	24	Y	7.8	6.7	5.0	3.5	2.5
21	Ethos	ETH-21.0	100	36.2	15	Y	4.7	4.0	3.0	2.1	1.5
22	Nagler 4	EN4-22.0	82	31.1	19	Y	4.9	4.2	3.1	2.2	1.6
27	Panoptic	EPN-27.0	68	30.5	19	Y	6.0	5.2	3.9	2.7	1.9
17	Ethos	ETH-17.0	100	29.6	15	Y	3.8	3.3	2.4	1.7	1.2
24	Delos	EDL-24.0	72	29.6	22	Y	5.3	4.6	3.4	2.4	1.7
19	Nagler 7	EN7-19.0	82	27.1	19	Y	4.2	3.7	2.7	1.9	1.4
14	Nagler 7	EN7-14.0	82	20.5	19	Y	3.1	2.7	2.0	1.4	1.0
1¼" Eyepieces for Wide True Fields											
40	Plössl	EPL-40.0	43	27.0	28	Y	8.9	7.7	5.7	4.0	2.9
32	Plössl	EPL-32.0	50	27.0	22	Y	7.1	6.2	4.6	3.2	2.3
24	Panoptic	EPN-24.0	68	27.0	15	Y*	5.3	4.6	3.4	2.4	1.7
13	Ethos	ETH-13.0	100	22.3	15	Y	2.9	2.5	1.9	1.3	0.9
16	Nagler 5	EN5-16.0	82	22.1	10	N	3.6	3.1	2.3	1.6	1.1
19	Panoptic	EPO-19.0	68	21.3	13	Y*	4.2	3.7	2.7	1.9	1.4
25	Plössl	EAP-25.0	50	21.2	17	N	5.6	4.8	3.6	2.5	1.8
17.3	Delos	EDL-17.3	72	21.2	20	Y	3.8	3.3	2.5	1.7	1.2
18.2	DeLite	EDE-18.2	62	19.1	20	Y	4.0	3.5	2.6	1.8	1.3
10	Ethos	ETH-10.0	100	17.7	15	Y	2.2	1.9	1.4	1.0	0.7
13	Nagler 6	EN6-13.0	82	17.6	12	Y*	2.9	2.5	1.9	1.3	0.9
14	Delos	EDL-14.0	72	17.3	20	Y	3.1	2.7	2.0	1.4	1.0
20	Plössl	EAP-20.0	50	17.1	14	N	4.4	3.8	2.9	2.0	1.4
15	DeLite	EDE-15.0	62	16.0	20	Y	3.3	2.9	2.1	1.5	1.1
1¼" Eyepieces for Medium Powers											
12	Delos	EDL-12.0	72	15.0	20	Y	2.7	2.3	1.7	1.2	0.9
13	DeLite	EDE-13.0	62	13.8	20	Y	2.9	2.5	1.9	1.3	0.9
9	Nagler 7	EN7-09.0	82	13.0	19	Y	2.0	1.7	1.3	0.9	0.6
10	Delos	EDL-10.0	72	12.7	20	Y	2.2	1.9	1.4	1.0	0.7
15	Plössl	EAP-15.0	50	12.6	10	N	3.3	2.9	2.1	1.5	1.1
9	Nagler 6	EN6-09.0	82	12.4	12	Y*	2.0	1.7	1.3	0.9	0.6
11	DeLite	EDE-11.0	62	11.7	20	Y	2.4	2.1	1.6	1.1	0.8
9	DeLite	EDE-09.0	62	9.6	20	Y	2.0	1.7	1.3	0.9	0.6
11	Plössl	EAP-11.0	50	9.1	8	N	2.4	2.1	1.6	1.1	0.8
1¼" Eyepieces for Higher Powers											
8	Ethos	ETH-08.0	100	13.9	15	Y	1.8	1.5	1.1	0.8	0.6
6	Ethos	ETH-06.0	100	10.4	15	Y	1.3	1.2	0.9	0.6	0.4
8	Delos	EDL-08.0	72	9.9	20	Y	1.8	1.5	1.1	0.8	0.6
7	Nagler 6	EN6-07.0	82	9.7	12	Y*	1.6	1.3	1.0	0.7	0.5
4.7	Ethos SX	ETH-04.7	110	8.9	15	Y	1.0	0.9	0.7	0.5	0.3
5.5	Nagler 7	EN7-05.5	82	8.1	19	Y	1.2	1.1	0.8	0.6	0.4
6	Delos	EDL-06.0	72	7.6	20	Y	1.3	1.2	0.9	0.6	0.4
7	DeLite	EDE-07.0	62	7.5	20	Y	1.6	1.3	1.0	0.7	0.5
3.7	Ethos SX	ETH-03.7	110	7.0	15	Y	0.8	0.7	0.5	0.4	0.3
5	Nagler 6	EN6-05.0	82	7.0	12	Y*	1.1	1.0	0.7	0.5	0.4
8	Plössl	EAP-08.0	50	6.5	6	N	1.8	1.5	1.1	0.8	0.6
4.5	Delos	EDL-04.5	72	5.6	20	Y	1.0	0.9	0.6	0.5	0.3
5	DeLite	EDE-05.0	62	5.3	20	Y	1.1	1.0	0.7	0.5	0.4
3.5	Nagler 6	EN6-03.5	82	4.8	12	Y*	0.8	0.7	0.5	0.4	0.3
3.5	Delos	EDL-03.5	72	4.4	20	Y	0.8	0.7	0.5	0.4	0.3
4	DeLite	EDE-04.0	62	4.3	20	Y	0.9	0.8	0.6	0.4	0.3
3	DeLite	EDE-03.0	62	3.2	20	Y	0.7	0.6	0.4	0.3	0.2
1¼" Zoom Eyepieces for Medium and Higher Powers											
6-3	Nagler Zoom	ENZ-0306	50	5.1-2.6	10	N	1.3-0.7	1.2-0.6	0.9-0.4	0.6-0.3	0.4-0.2

NOTE: True Field in degrees = (Field Stop dia./Telescope Focal Length) X 57.3° *Indicates additional Dioptrx Adapter required

As of January 2012, all Tele Vue eyepieces have a limited lifetime warranty.

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