innoVision® OPTICS

HD Probe Lens System

Manual and Depth of Field Charts

For additional technical support, please call 310-453-4866

www.innovision-optics.com

This manual is available for download from the website.

HD Probe Lens System

Hints, Tips and Notes

Tighten the taking lens fully against the module so that the O-Ring properly seals.
Failure to fully tighten the lenses will cause a loss of infinity focus.

When used underwater, it is important that all O-Rings are installed and they should be lightly greased to prevent them from “bunching up” while the modules are tightened together.
The lens system is waterproof with all modules to within 1” of the focus ring. Newer Probe models have a red ring around the relay at this point and are marked “Do not submerge beyond this point”
Do not let water into the focus and aperature rings. There are no seals there so water can enter the relay and damage the whole lens system.

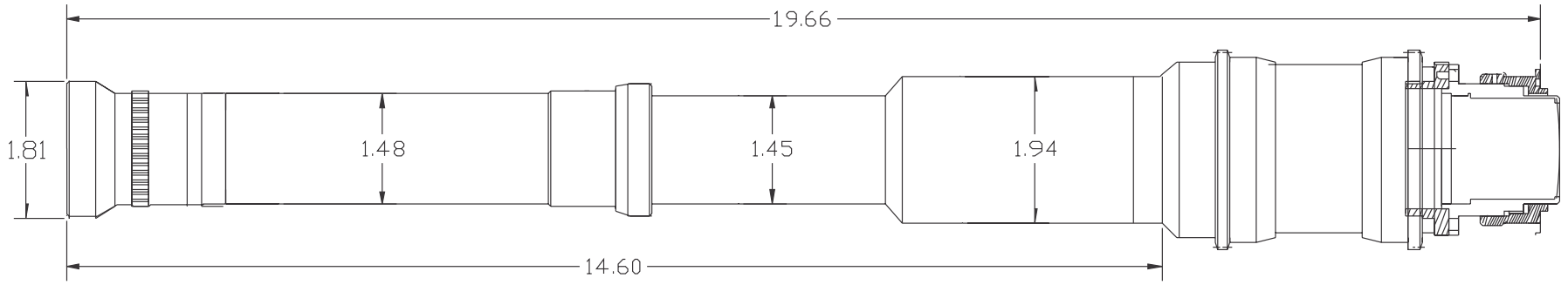
When using the Close Focus Shims, the following instructions apply:
1. Remove the O-Ring and replace it with the close focus shim of your choice.
2. Caution: The lens system will not be waterproof when using close focus shims
3. The use of shims will cause infinity focus to be lost to a varying degree.
4. The use of shims wil cause depth of field to be narrowed. (this can be used for dramatic effect as well)
5. The thicker shims have more close focus effect and narrow DOF effect than the thinner shims.
6. Start testing with the thinnest shim and work up to the thicker shims.
7. The engraved numbers correlate to the shim thickness, for example, the shim marked 30 is 0.030” thick.
8. Only use 1 shim at a time, it is possible to have a lens fall off the barrel if you stack 2 or more shims.

The thickest shim available is the maximum amount you can extend the lens while still having enough threads to hold the lens in place.

Caution: The lens system is not waterproof when using close focus shims

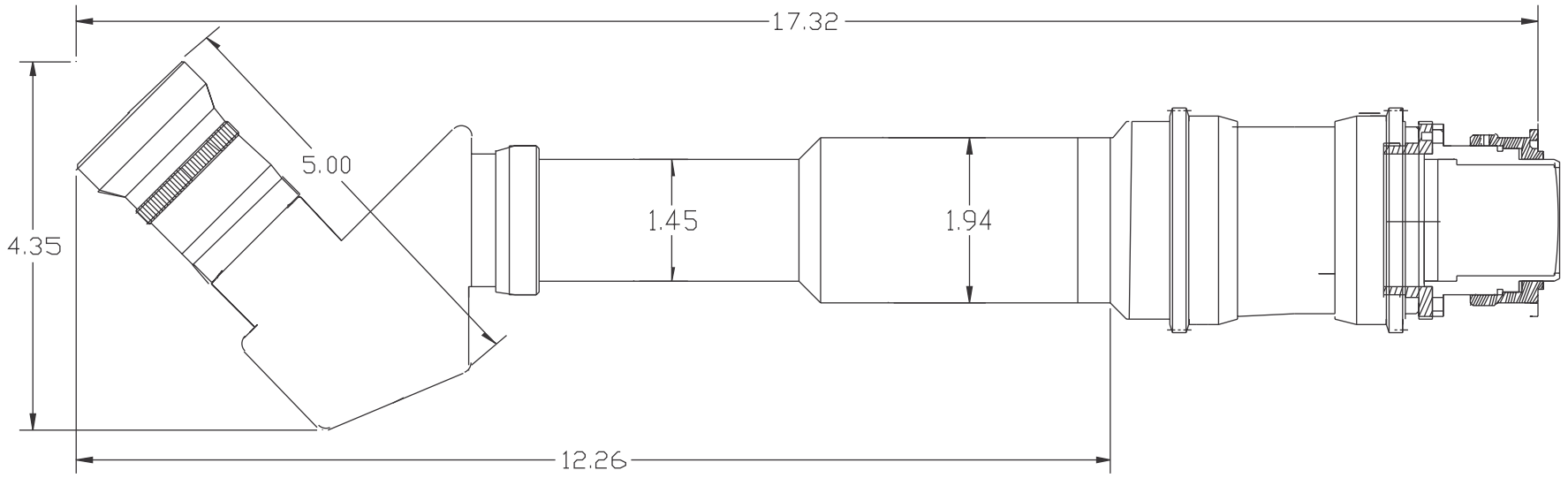
HD Probe Lens System

Direct View Configuration



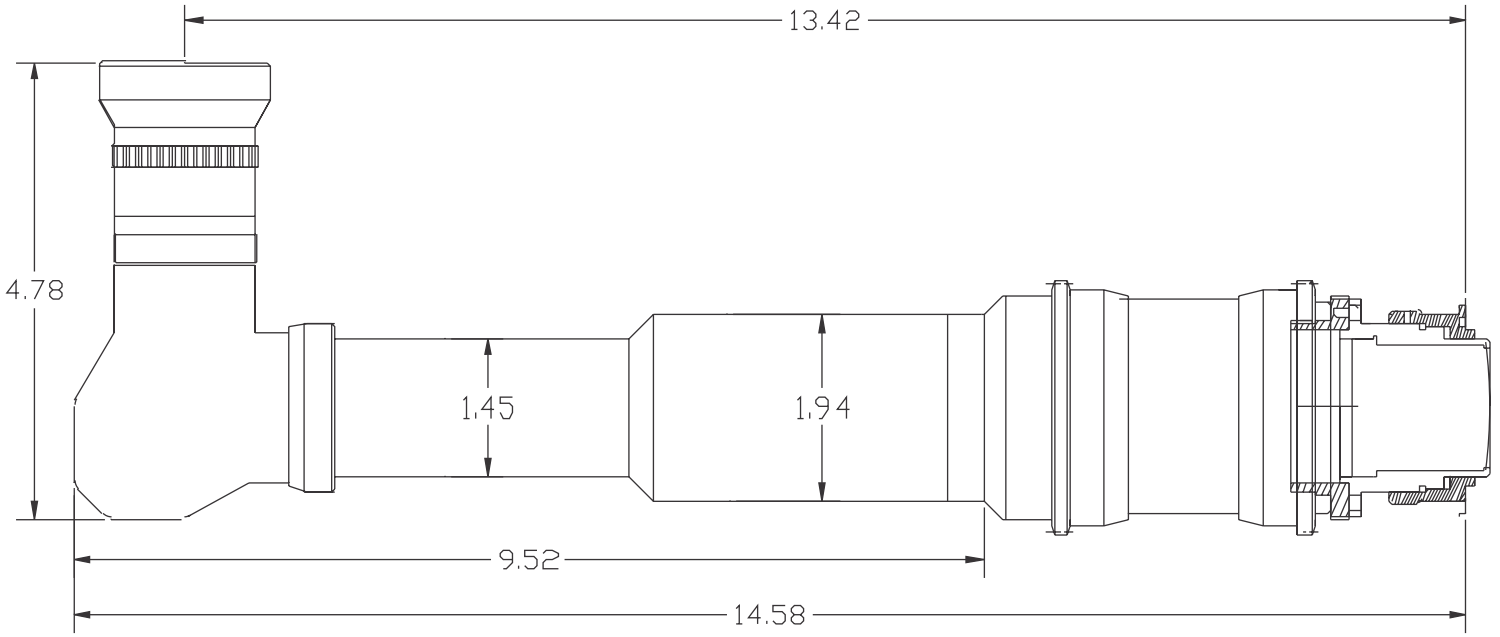
HD Probe Lens System

45 Degree View Configuration



HD Probe Lens System

90 Degree View Configuration



HD Probe Lens Minimum Focus Chart

Lens	Minimum Focus		T-Stop
5mm	0.5	Inch	@ T2.8
8mm	1.50	Inch	@ T2.8
12mm	4.0	Inches	@ T2.8
17mm	8.0	Inches	@ T2.8
23mm	13.0	Inches	@ T2.8

HD Probe Lens Coverage Chart

Lens	Coverage	T-Stop
5mm	All HD & Video Formats	@ T22
8mm	All HD & Video Formats	@ T22
12mm	All HD & Video Formats	@ T22
17mm	All HD & Video Formats	@ T22

	HD Probe			LENS:	5	mm				
							Circle of Confusion:		0.000398	
	Distance(in)	1	2	3	4	5	6	7	8	9
T-Stop										
4	Near	0.961	1.848	2.671	3.435	4.148	4.813	5.437	6.021	6.571
	Far	1.043	2.179	3.422	4.787	6.293	7.963	9.826	11.917	14.280
5.6	Near	0.946	1.794	2.559	3.252	3.883	4.461	4.991	5.479	5.930
	Far	1.061	2.260	3.626	5.195	7.018	9.162	11.718	14.819	18.659
8	Near	0.924	1.718	2.407	3.011	3.544	4.019	4.444	4.827	5.174
	Far	1.090	2.393	3.981	5.958	8.487	11.834	16.477	23.347	34.550
11	Near	0.898	1.631	2.241	2.755	3.195	3.576	3.909	4.202	4.462
	Far	1.127	2.584	4.538	7.298	11.492	18.627	33.471	83.198	INFINITY
16	Near	0.859	1.505	2.009	2.414	2.745	3.021	3.255	3.456	3.630
	Far	1.197	2.979	5.917	11.673	28.039	428.906	INFINITY	INFINITY	INFINITY
	Distance(in)	10	11	12	15	18	21	24	30	36
T-Stop										
4	Near	7.088	7.576	8.037	9.281	10.348	11.274	12.085	13.438	14.522
	Far	16.973	20.070	23.669	39.089	69.100	153.016	1715.625	INFINITY	INFINITY
5.6	Near	6.349	6.737	7.100	8.053	8.844	9.511	10.082	11.007	11.724
	Far	23.539	29.947	38.736	109.297	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY
8	Near	5.489	5.778	6.042	6.719	7.261	7.705	8.075	8.658	9.095
	Far	56.078	114.397	857.813	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY
11	Near	4.695	4.905	5.094	5.566	5.933	6.227	6.466	6.835	7.104
	Far	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY
16	Near	3.783	3.918	4.038	4.329	4.548	4.718	4.854	5.059	5.205
	Far	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY

	HD Probe			LENS:	8 mm				
						Circle of Confusion:		0.000398	
	Distance(in)	1	2	3	4	5	6	7	8	9
T-Stop										
4	Near	0.984	1.938	2.862	3.759	4.629	5.473	6.293	7.090	7.864
	Far	1.016	2.066	3.152	4.274	5.436	6.639	7.886	9.178	10.519
5.6	Near	0.978	1.914	2.811	3.670	4.495	5.287	6.049	6.781	7.486
	Far	1.023	2.094	3.217	4.395	5.633	6.935	8.306	9.753	11.281
8	Near	0.969	1.879	2.737	3.545	4.309	5.031	5.716	6.366	6.983
	Far	1.033	2.137	3.320	4.589	5.956	7.431	9.028	10.764	12.656
11	Near	0.958	1.838	2.649	3.400	4.096	4.744	5.348	5.913	6.441
	Far	1.046	2.194	3.458	4.858	6.416	8.161	10.129	12.366	14.930
16	Near	0.940	1.772	2.516	3.183	3.785	4.332	4.830	5.286	5.704
	Far	1.069	2.295	3.716	5.382	7.363	9.759	12.712	16.446	21.314
	Distance(in)	10	11	12	15	18	21	24	30	36
T-Stop										
4	Near	8.617	9.350	10.062	12.090	13.966	15.707	17.327	20.250	22.817
	Far	11.912	13.358	14.862	19.756	25.312	31.675	39.035	57.854	85.256
5.6	Near	8.165	8.820	9.452	11.219	12.817	14.268	15.592	17.921	19.902
	Far	12.898	14.611	16.430	22.625	30.223	39.759	52.086	92.033	188.321
8	Near	7.570	8.130	8.663	10.125	11.409	12.545	13.557	15.283	16.702
	Far	14.727	17.003	19.517	28.927	42.628	64.423	104.494	808.654	INFINITY
11	Near	6.938	7.405	7.845	9.025	10.031	10.899	11.655	12.909	13.906
	Far	17.900	21.378	25.510	44.378	87.546	286.856	INFINITY	INFINITY	INFINITY
16	Near	6.090	6.447	6.778	7.642	8.351	8.944	9.446	10.254	10.873
	Far	27.928	37.431	52.247	404.327	INFINITY	INFINITY	INFINITY	INFINITY	INFINITY

	HD Probe			LENS:	12 mm				
						Circle of Confusion:		0.000398	
	Distance(in)	1	2	3	4	5	6	7	8	9
T-Stop										
4	Near	0.993	1.972	2.937	3.889	4.828	5.754	6.667	7.568	8.457
	Far	1.007	2.029	3.066	4.117	5.185	6.268	7.368	8.484	9.617
5.6	Near	0.990	1.961	2.913	3.846	4.762	5.661	6.543	7.408	8.258
	Far	1.010	2.041	3.093	4.166	5.263	6.382	7.526	8.695	9.889
8	Near	0.986	1.945	2.877	3.784	4.667	5.527	6.364	7.181	7.976
	Far	1.014	2.059	3.134	4.242	5.384	6.562	7.777	9.031	10.326
11	Near	0.981	1.925	2.833	3.709	4.553	5.368	6.155	6.915	7.650
	Far	1.020	2.082	3.188	4.341	5.544	6.800	8.114	9.489	10.929
16	Near	0.972	1.892	2.763	3.590	4.376	5.123	5.835	6.513	7.161
	Far	1.029	2.121	3.281	4.515	5.832	7.239	8.747	10.366	12.109
	Distance(in)	10	11	12	15	18	21	24	30	36
T-Stop										
4	Near	9.334	10.200	11.054	13.550	15.952	18.264	20.492	24.712	28.645
	Far	10.768	11.937	13.123	16.797	20.651	24.700	28.957	38.167	48.437
5.6	Near	9.092	9.911	10.716	13.046	15.258	17.360	19.360	23.085	26.481
	Far	11.109	12.357	13.634	17.643	21.944	26.572	31.565	42.831	56.205
8	Near	8.752	9.508	10.246	12.356	14.322	16.159	17.879	21.009	23.785
	Far	11.664	13.047	14.478	19.083	24.219	29.982	36.494	52.444	74.005
11	Near	8.360	9.048	9.714	11.590	13.303	14.873	16.318	18.886	21.100
	Far	12.440	14.026	15.694	21.253	27.823	35.709	45.347	72.893	122.502
16	Near	7.780	8.372	8.939	10.505	11.893	13.132	14.246	16.165	17.759
	Far	13.992	16.031	18.247	26.222	37.003	52.387	76.125	208.206	INFINITY

	HD Probe			LENS:	17 mm				
						Circle of Confusion:		0.000398	
	Distance(in)	2	3	4	5	6	7	8	9	10
T-Stop										
4	Near	1.986	2.968	3.944	4.913	5.875	6.830	7.779	8.721	9.657
	Far	2.014	3.032	4.058	5.090	6.131	7.179	8.234	9.297	10.368
5.6	Near	1.980	2.956	3.922	4.879	5.826	6.764	7.694	8.614	9.526
	Far	2.020	3.045	4.081	5.128	6.185	7.253	8.332	9.422	10.524
8	Near	1.972	2.937	3.889	4.828	5.755	6.668	7.570	8.459	9.336
	Far	2.029	3.065	4.117	5.184	6.267	7.367	8.482	9.615	10.765
11	Near	1.962	2.915	3.850	4.767	5.668	6.552	7.420	8.272	9.110
	Far	2.040	3.091	4.163	5.257	6.374	7.514	8.679	9.868	11.083
16	Near	1.945	2.877	3.785	4.668	5.528	6.366	7.183	7.979	8.755
	Far	2.059	3.134	4.241	5.383	6.559	7.774	9.027	10.320	11.657
	Distance(in)	11	12	14	16	18	21	24	30	36
T-Stop										
4	Near	10.586	11.509	13.336	15.139	16.918	19.542	22.114	27.110	31.917
	Far	11.448	12.535	14.733	16.965	19.230	22.694	26.238	33.580	41.282
5.6	Near	10.429	11.324	13.088	14.820	16.520	19.013	21.440	26.104	30.531
	Far	11.637	12.762	15.048	17.384	19.771	23.450	27.255	35.264	43.855
8	Near	10.202	11.057	12.733	14.366	15.958	18.273	20.502	24.727	28.665
	Far	11.933	13.119	15.547	18.053	20.641	24.685	28.936	38.131	48.380
11	Near	9.932	10.740	12.315	13.836	15.307	17.424	19.440	23.198	26.630
	Far	12.325	13.594	16.219	18.966	21.843	26.423	31.355	42.445	55.542
16	Near	9.512	10.251	11.676	13.035	14.333	16.172	17.895	21.031	23.813
	Far	13.039	14.468	17.479	20.711	24.190	29.937	36.429	52.308	73.736

	HD Probe			LENS:	23 mm				
						Circle of Confusion:		0.000398	
	Distance(in)	4	5	6	7	8	9	10	11	12
T-Stop										
4	Near	3.969	4.952	5.931	6.906	7.878	8.845	9.810	10.770	11.727
	Far	4.031	5.049	6.071	7.096	8.126	9.160	10.198	11.240	12.286
5.6	Near	3.957	4.933	5.904	6.869	7.830	8.785	9.735	10.681	11.621
	Far	4.044	5.069	6.099	7.136	8.178	9.226	10.279	11.339	12.405
8	Near	3.939	4.905	5.863	6.815	7.759	8.696	9.626	10.549	11.466
	Far	4.063	5.099	6.143	7.196	8.256	9.326	10.404	11.491	12.587
11	Near	3.916	4.870	5.814	6.748	7.672	8.587	9.493	10.390	11.277
	Far	4.087	5.137	6.199	7.272	8.357	9.454	10.564	11.686	12.822
16	Near	3.879	4.813	5.733	6.639	7.532	8.412	9.279	10.134	10.977
	Far	4.128	5.202	6.293	7.402	8.530	9.676	10.842	12.028	13.233
	Distance(in)	13	14	15	18	21	24	30	36	48
T-Stop										
4	Near	12.680	13.630	14.576	17.392	20.177	22.931	28.349	33.648	43.908
	Far	13.337	14.391	15.450	18.652	21.893	25.173	31.855	38.705	52.933
5.6	Near	12.556	13.487	14.412	17.160	19.866	22.530	27.738	32.791	42.460
	Far	13.476	14.554	15.638	18.926	22.271	25.675	32.664	39.905	55.202
8	Near	12.375	13.278	14.174	16.824	19.417	21.954	26.870	31.585	40.459
	Far	13.691	14.805	15.928	19.353	22.865	26.467	33.956	41.850	58.996
11	Near	12.156	13.026	13.888	16.422	18.883	21.274	25.858	30.196	38.208
	Far	13.970	15.131	16.306	19.914	23.652	27.527	35.722	44.566	64.541
16	Near	11.808	12.627	13.435	15.792	18.055	20.229	24.331	28.134	34.965
	Far	14.460	15.708	16.978	20.925	25.092	29.498	39.113	49.971	76.529