



Instrument Styli

FOR TAYLOR HOBSON PRODUCTS

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Investment in quality

Taylor Hobson has focused their efforts on continually improving their technical capability, through investment in machinery and processes, cementing their position as world leaders in metrology solutions. At the forefront of technical innovation, styli are fundamental to achieving the accuracy and repeatability that our instruments are renowned for. This is why it is essential to only use Taylor Hobson endorsed styli and accessories for optimum performance.

All instruments are available with a range of standard styli, however we are also able to offer complete bespoke styli through our custom stylus design service. We are able to create solutions to problems or simply enhance the performance of existing applications.

Each stylus starts life in the Taylor Hobson Stylus Manufacturing Cell. The first stage of the process is to manufacture the carbon fibre components using our 5 axis CNC machining centre, which ensures high accuracy, repeatability and quality. Our dedicated machining centre is capable of producing components to a degree of accuracy unobtainable by conventional machining methods.

The next stage is for the individual components to be assembled by our team of highly skilled technicians. Using state of the art fixturing, we are able to achieve unparalleled quality for all standard and bespoke styli.

The final stage is for each stylus to undergo a comprehensive list of quality checks using a fully CNC Optical Profiler, for dimensional verification, parallelism and alignment tests. Styli bought with new instruments are always checked on the actual instrument for even greater confidence. As part of the inspection, styli are checked against calibrated standards to ensure guaranteed performance on instruments in the field.

As part of our continuing effort to improve our after sales service, Taylor Hobson now offer an express replacement service for all high volume standard styli, helping to minimise production downtime. Alternatively we offer a fixed cost repair service for all our Form Talysurf® and Talyrond® styli, further helping to reduce running costs.

Guidelines

Stylus profilometers are often used for two different requirements, surface finish measurement and form (or contour) measurement. When measuring surface finish it is advisable to use a stylus with the smallest tip radius feasible to fully penetrate all of the surface features.

The ISO standards dictate the choice of stylus based upon the expected surface finish. ISO 3274 specifies that a conisphere stylus should be used with a tip radius of 2, 5 or 10 μm and a cone angle of either 90 or 60 degrees. It should be noted that some local standards may require a different choice of stylus tip radius. For example, it is common within the automotive industry to use a 5 μm radius tip.

For measuring form or contour, in some circumstances a ball stylus can have certain benefits over a diamond equivalent. The larger radius acts as a filter, reducing some of the effects of surface finish. The larger tip radius also means that a higher tracking force can be used, ensuring that a good contact is maintained with the surface.

Types of styli

Ruby

- Doped Monocrystalline aluminium oxide.
- High hardness & Young's modulus.
- Can be polished to a good surface finish.
- Exceptionally smooth surface, good compressive strength and high resistance to mechanical corrosion.

Silicon Nitride

- Sintered Polycrystalline.
- Can be ground and polished to high diametrical, spherical and surface finish specifications.
- Ideal for soft surfaces such as optically finished aluminium and plastic, as it minimises the attraction of deposits.

Cone angle selection

Flanking occurs when the slope of the roughness exceeds the angle of the conisphere, the stylus will no longer contact on the spherical tip portion, but on the straight edge (non-measuring surface). This is most clearly evident when measuring a step. Typically the profile will exhibit a radius followed by an angle that corresponds to the stylus "flank" angle. Our styli are available with a number of different tip cone angles and radii which allow measurement of steep angles. By selecting a suitable ball stylus the possibility of flanking is reduced even further.

Chisel styli

Used to measure steep angled slopes, radii and threads where it would be impractical to use a diamond or a ball stylus.

Recess ball styli

Useful for measuring features with deep sags or where using a diamond would increase the risk of flanking or marking of delicate surfaces.

Dual tip styli

Enables measurement of squareness and perpendicularity with a single stylus, greatly reducing measurement cycle times. They are available with diamond or ruby ball.

Forward pointing styli

Particularly useful for measuring surface finish on angled slopes in bores, so that the stylus tip remains perpendicular to the measurement surface.

Miniature bore styli

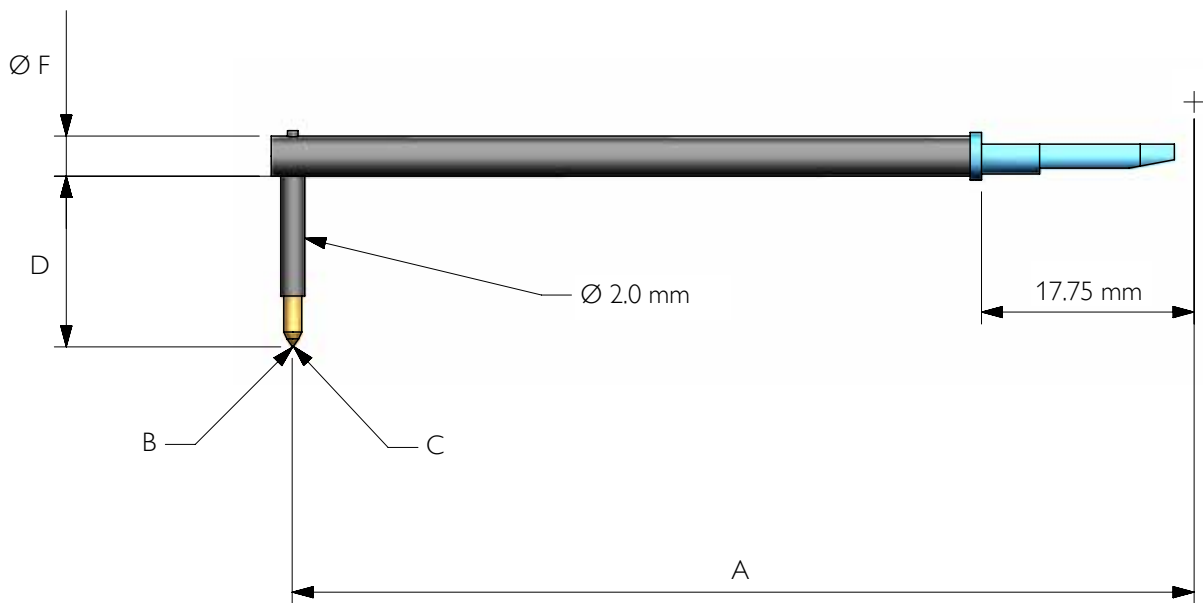
Used in applications with the smallest clearances, in particular gear profiles, small bores and valve guides.

Nozzle styli

Predominantly used for measuring small blind holes, such as injector nozzles. They have reduced diameter nose pieces to prevent fouling on internal lands.

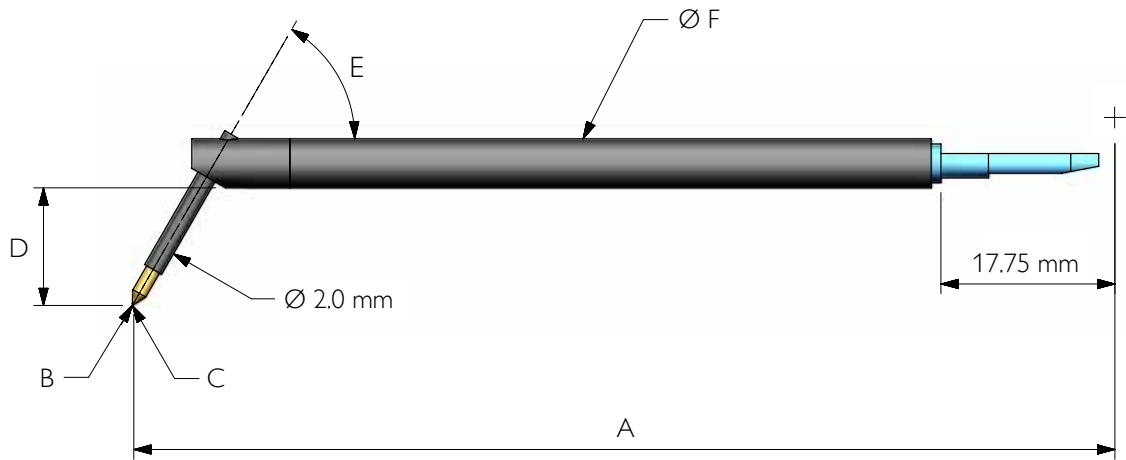
All images used are for illustrative purposes only.
Features and colours may vary.

Recess



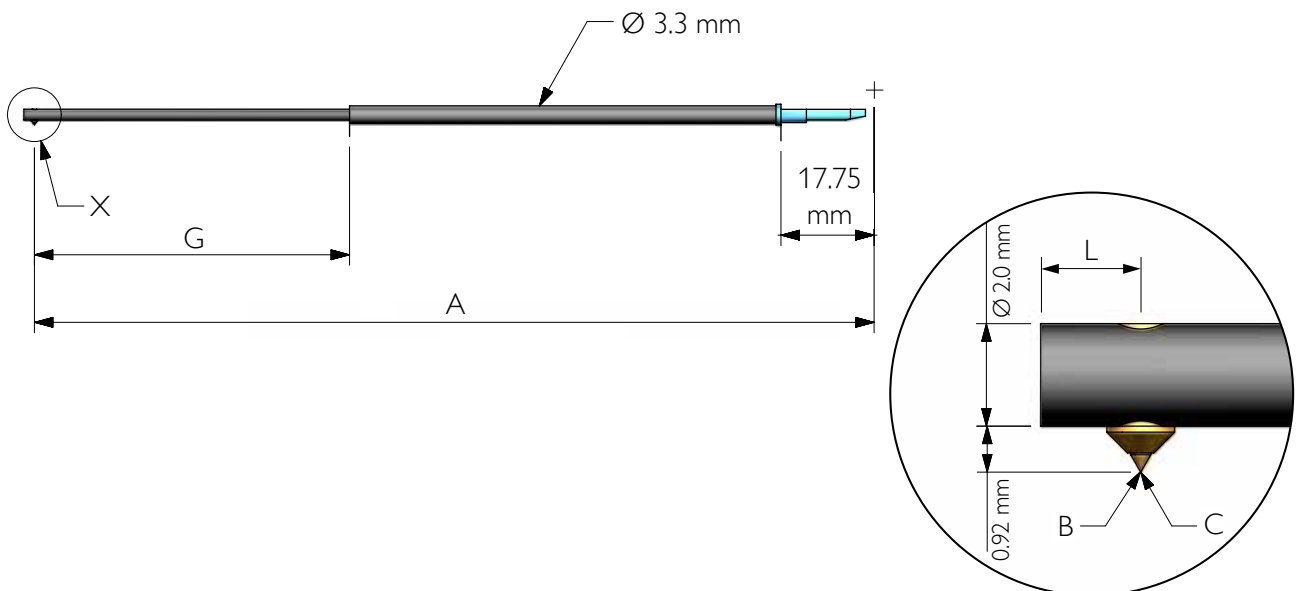
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Shank clearance D (mm)	Beam diameter F (mm)	Tip
112-3412	60	40	2	12.20	3.3	Diamond conisphere
155-P56559	60	40	5	12.20	3.3	Diamond conisphere
155-P58044	60	60	2	10.00	3.3	Diamond conisphere
112-3227	60	60	2	12.20	3.3	Diamond conisphere
112-3221	60	90	2	12.20	3.3	Diamond conisphere
155-P57540	60	90	2	15.00	3.3	Diamond conisphere
112-3224	60	90	5	24.95	3.3	Diamond conisphere
112-3410	60	-	150	12.20	5.0	Ruby ball
112-3228	60	-	500	13.05	5.0	Ruby ball
155-P54469	120	90	2	12.20	3.3	Diamond conisphere
112-3405	120	-	400	19.00	5.0	Si_3N_4 ball
155-P57136	120	-	500	12.50	3.3	Ruby ball
112-3161	120	-	500	31.00	5.0	Ruby ball
112-3162	150	-	500	31.00	5.0	Ruby ball
112-3269	180	-	500	32.00	5.0	Ruby ball

Forward pointing recess



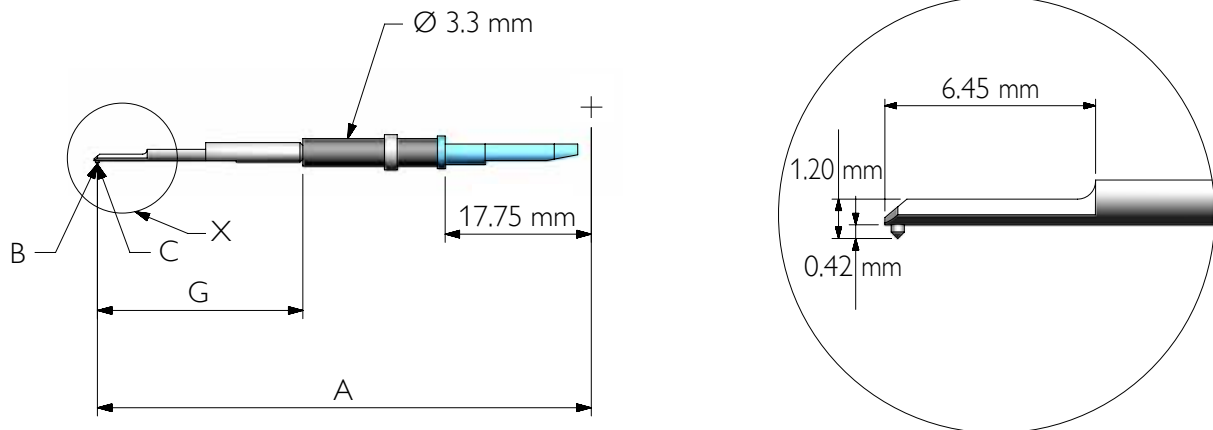
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Shank clearance D (mm)	Shank angle E (Deg)	Beam diameter F (mm)	Tip
155-P57763	60	-	150	4.93	30	3.3	Si ₃ N ₄ ball
155-P57322	120	40	2	15.00	70	3.3	Diamond conisphere

Small bore



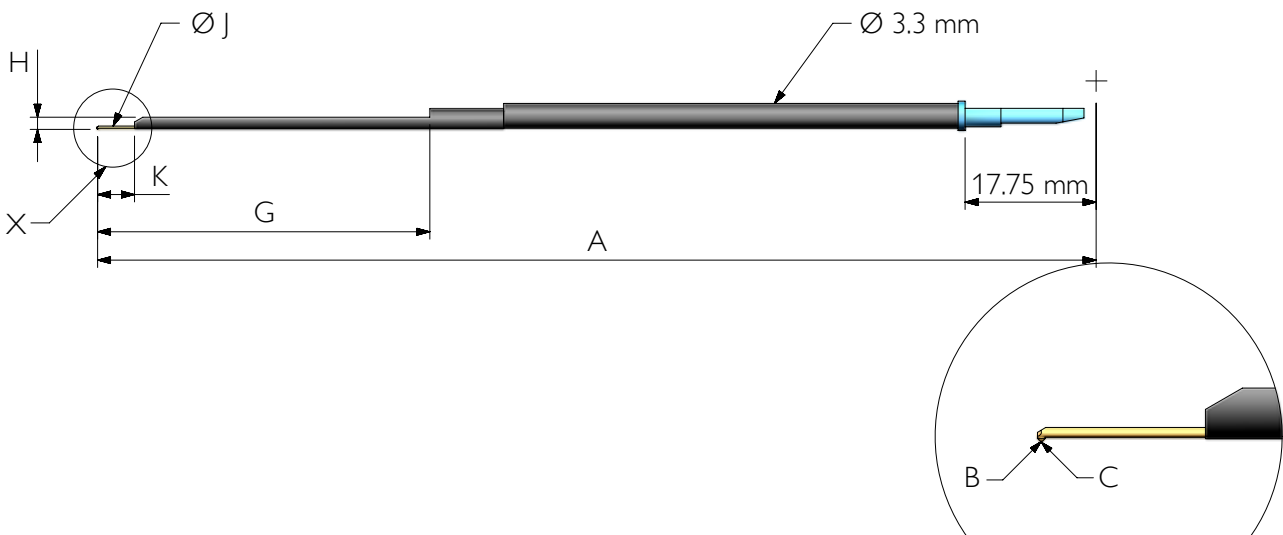
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Stem reach G (mm)	Tip distance L (mm)	Tip
155-P54307	60	60	2	15	1.5	Diamond conisphere
112-3222	60	90	2	15	1.5	Diamond conisphere

Miniature bore



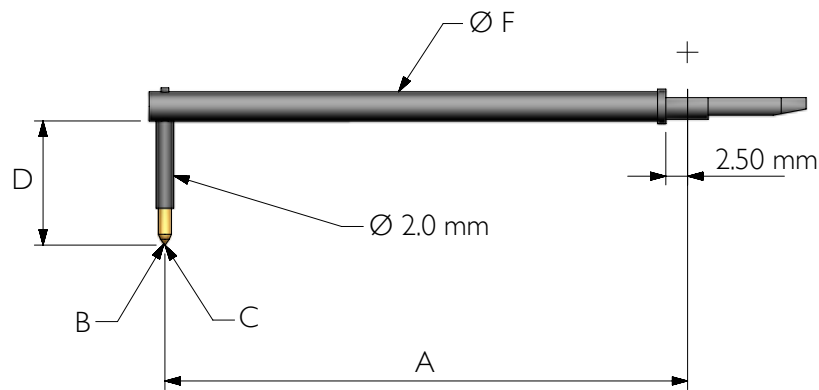
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Stem reach G (mm)	Tip
155-P54957	60	60	2	25.00	Diamond conisphere
155-P58057	120	90	2	25.00	Diamond conisphere

Nozzle



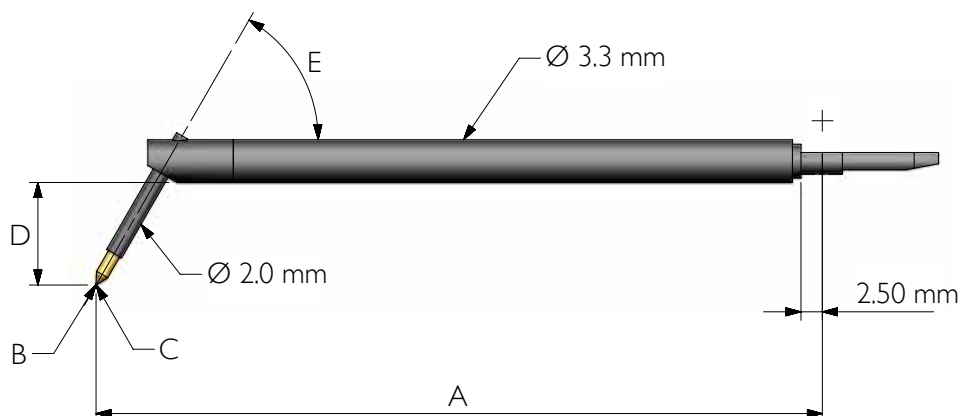
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Tip reach K (mm)	Total clearance H (mm)	Stem reach G (mm)	Tip diameter J (mm)	Tip
155-P56232	60	90	2	10.00	2.60	25	0.65	Diamond conisphere
155-P57185	90	60	2	5.00	1.75	45	0.45	Diamond conisphere
155-P58426	90	60	2	5.00	1.95	45	0.45	Diamond conisphere
155-P56519	105	60	2	5.00	1.75	45	0.65	Diamond conisphere

Recess



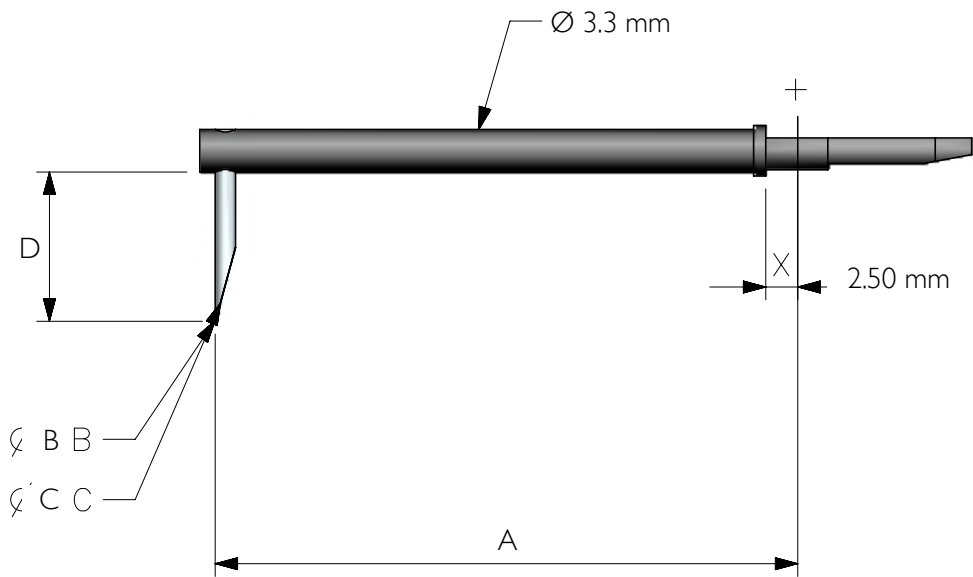
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Shank clearance D (mm)	Beam diameter F (mm)	Tip
155-P52356	60	60	2	10.70	3.3	Diamond conisphere
112-2009	60	90	2	5.30	3.3	Diamond conisphere
112-2011	60	90	2	11.30	3.3	Diamond conisphere
155-P21215	60	90	5	4.25	3.3	Diamond conisphere
112-2010	120	-	500	11.50	5.0	Ruby ball
155-P56247	120	60	2	12.00	3.3	Diamond conisphere
155-P37279	120	90	2	5.30	3.3	Diamond conisphere
155-P28268	120	90	2	11.30	3.3	Diamond conisphere
155-P54321	120	90	2	20.00	3.3	Diamond conisphere

Forward pointing recess



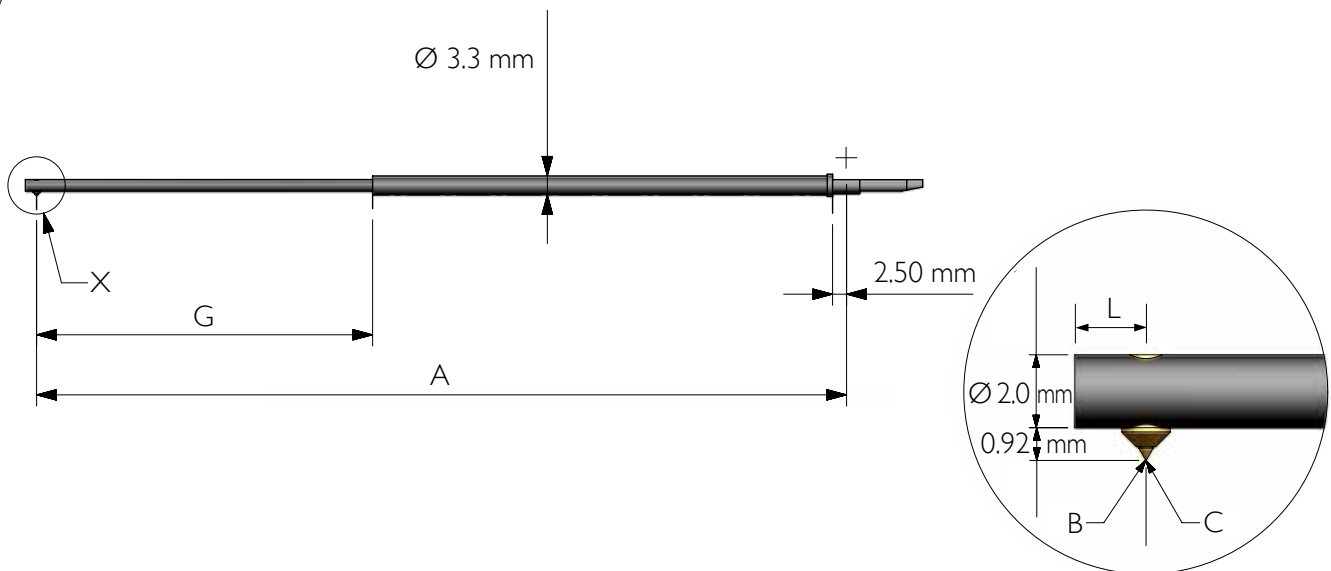
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Shank clearance D (mm)	Shank angle E (Deg)	Tip
155-P58452	120	60	2	0.80	60	Diamond conisphere
155-P58679	120	60	2	12.00	60	Diamond conisphere

Recess chisel



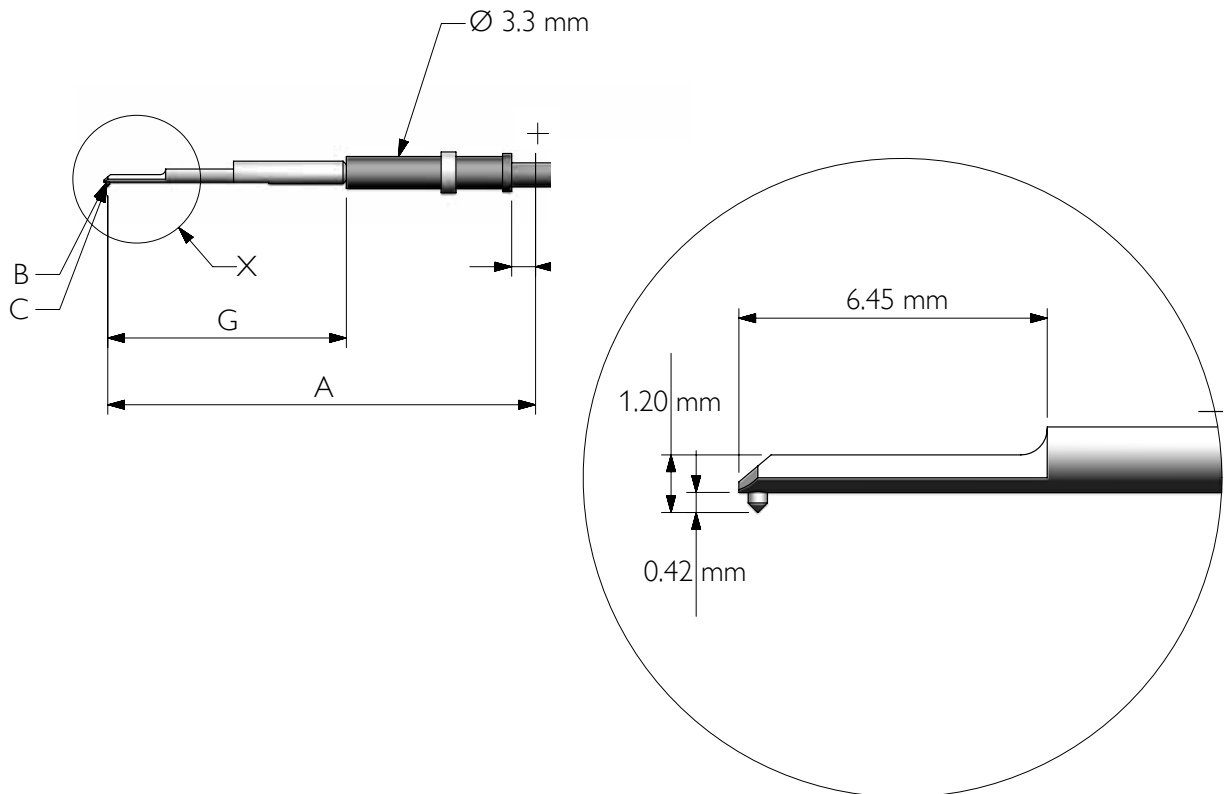
Part no.	Effective length A (mm)	Chisel angle B (Deg)	Tip radius C (μm)	Shank clearance D (mm)	Tip
112-2013	60	90	2	5.30	Diamond chisel
155-P56924	120	15	20	17.00	Tungsten carbide chisel

Small bore



Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip distance L (mm)	Tip
155-P36892	60	90	2	30	2.5	Diamond conisphere
155-P53341	90	90	2	58	2.5	Diamond conisphere

Miniature bore



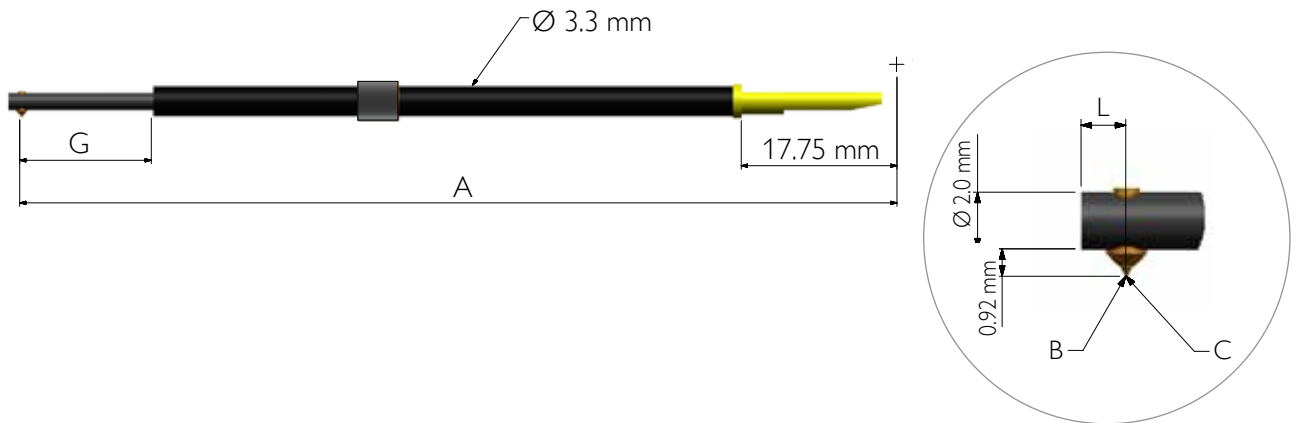
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Stem reach G (mm)	Tip
112-2012	60	90	2	25	Diamond conisphere
155-P58134	60	90	2	33	Diamond conisphere
155-P33670	120	90	2	25	Diamond conisphere

Recess



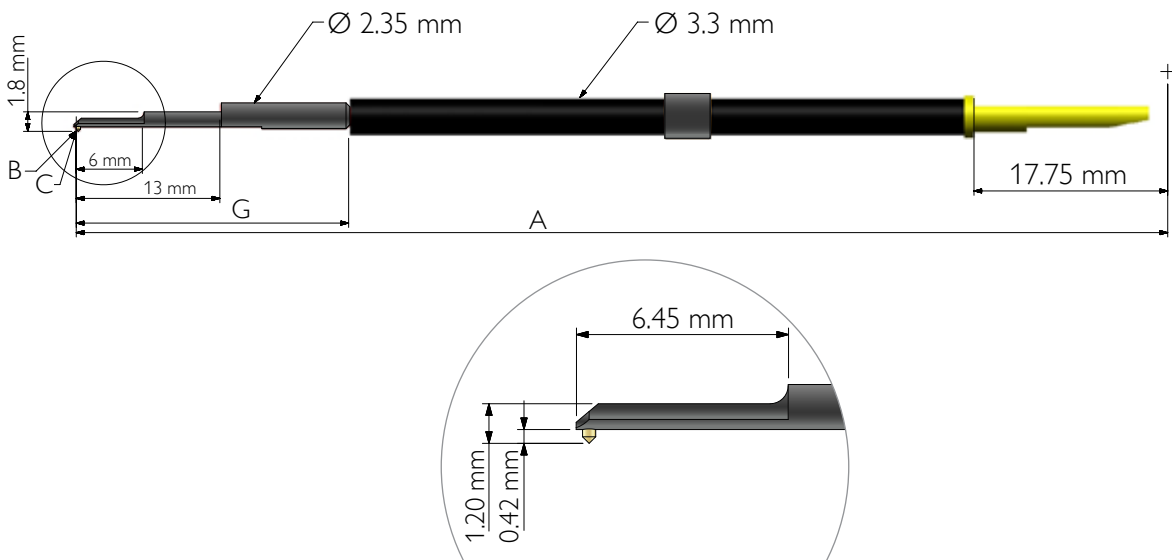
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Shank clearance D (mm)	Beam diameter F (mm)	Tip
112-5099	100	90	2	15.75	3.3	Diamond conisphere
112-5205	100	60	2	15,75	3.3	Diamond conisphere
112-5206	100	40	5	15.75	3.3	Diamond conisphere
112-5207	100	90	5	15.75	3.3	Diamond conisphere
112-5210	100	90	5	24.95	3.3	Diamond conisphere
112-5214	100	40	2	15.75	3.3	Diamond conisphere
112-5215	100	-	500	13.05	5	Ruby ball
112-5216	100	-	150	15.75	5	Ruby ball
112-5217	100	-	400	12.2	5	Ruby ball
112-5495	120	-	150	19	5	Ruby ball
112-5496	120	-	400	19	5	Ruby ball
112-5497	150	-	500	31.5	5	Ruby ball
112-5498	180	-	500	34.5	5	Ruby ball

Small bore



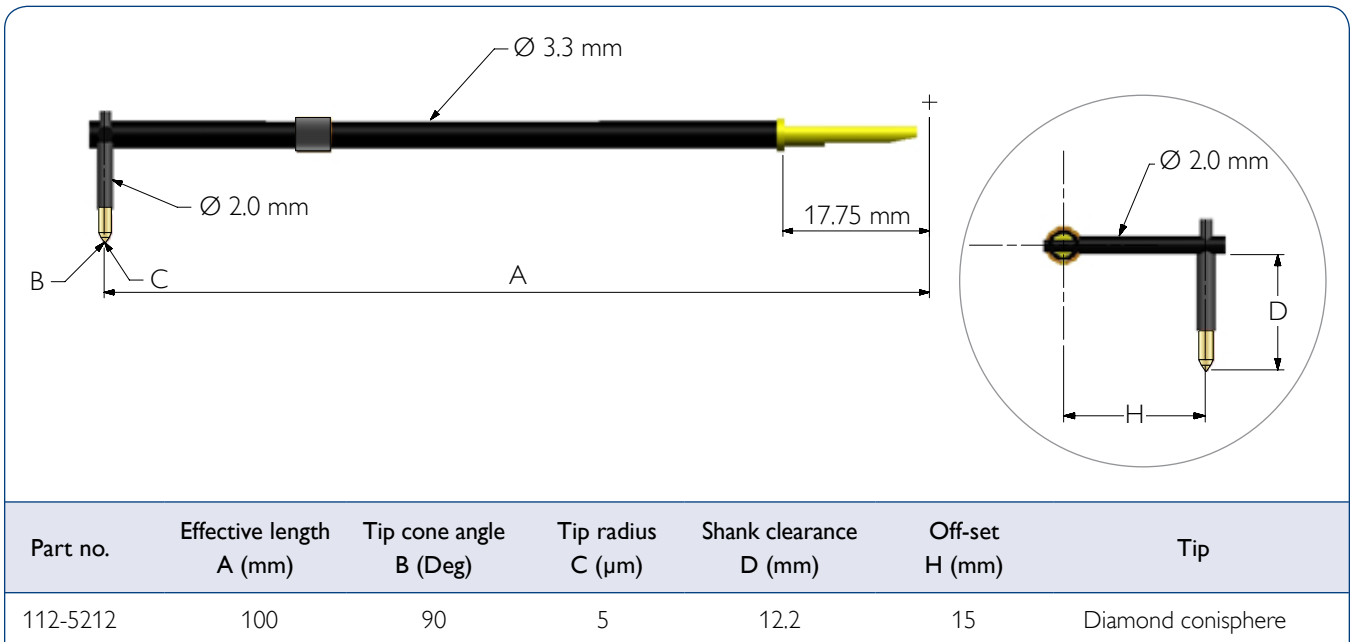
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip
112-5208	100	90	2	15	Diamond conisphere

Miniature bore

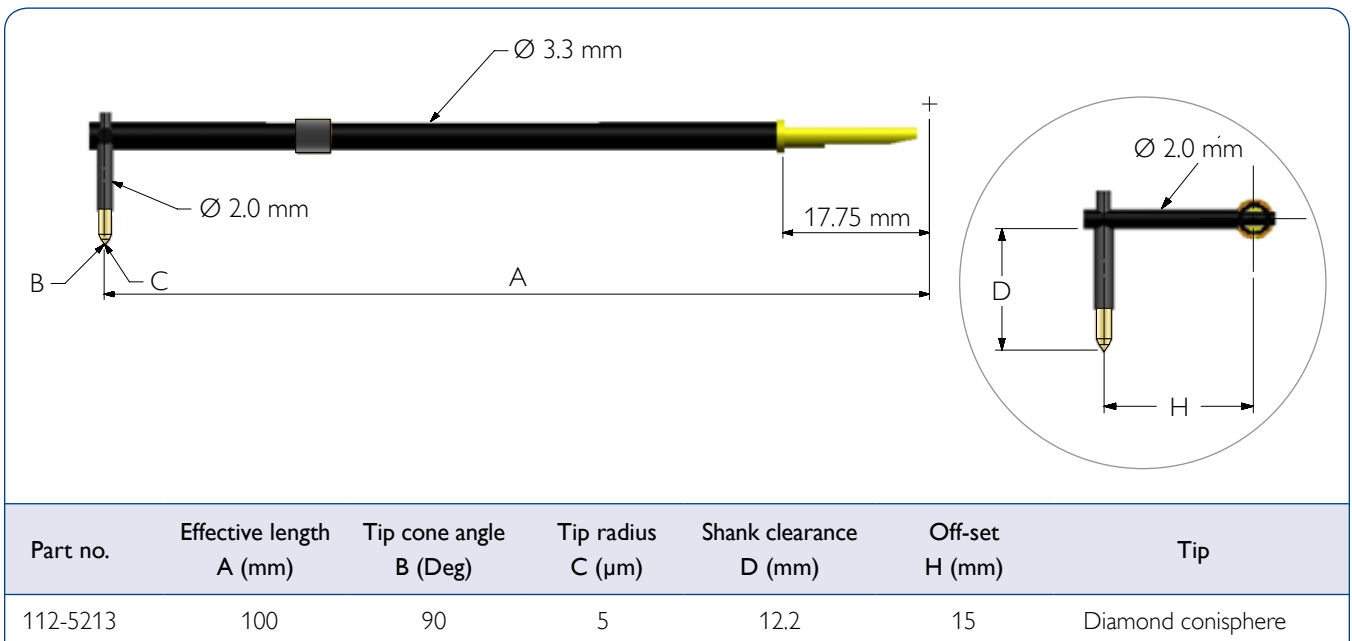


Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip
112-5209	100	90	2	25	Diamond conisphere

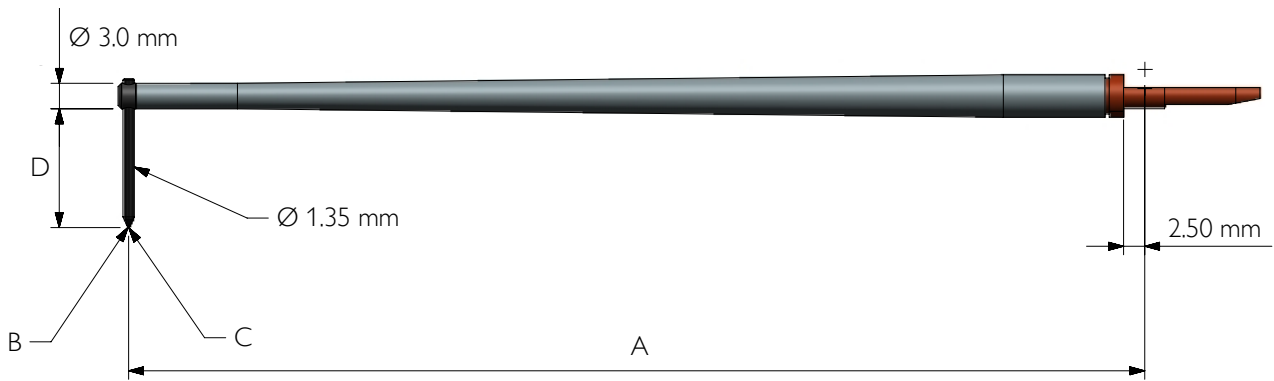
Front facing



Rear facing

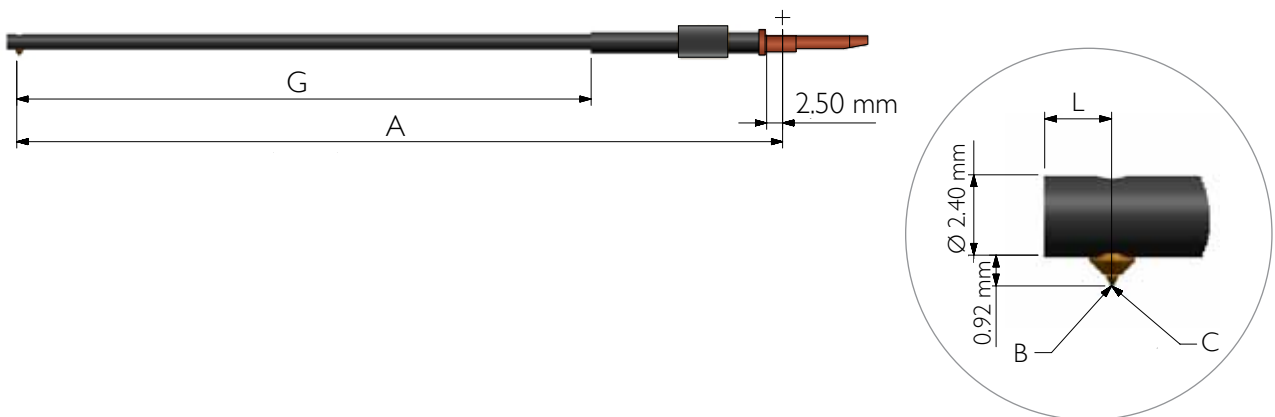


Recess



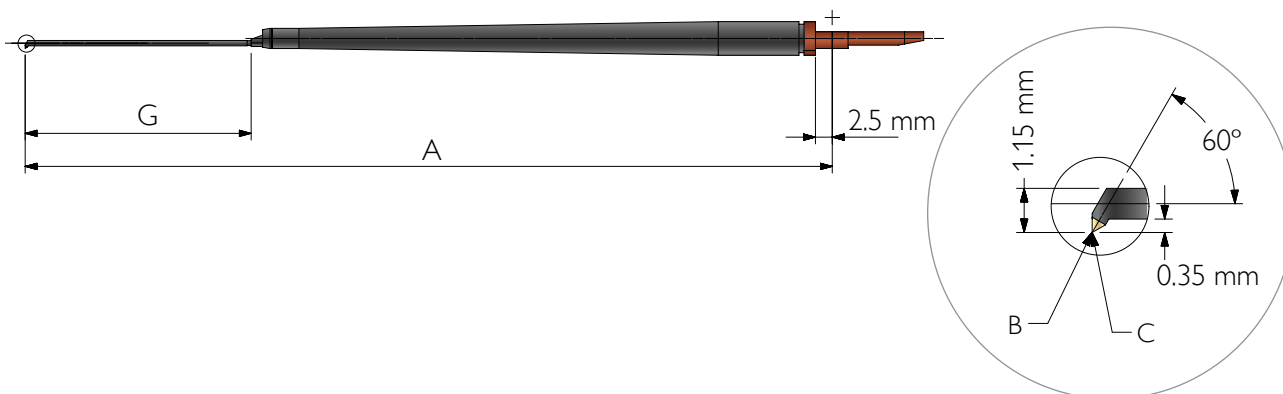
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Shank clearance D (mm)	Tip
112-4575	120	90	2	14	Diamond conisphere
112-4576	120	90	2	5.3	Diamond conisphere
112-4908	120	90	5	5.3	Diamond conisphere
112-4593	120	60	2	14	Diamond conisphere
112-4921	120	60	5	14	Diamond conisphere
112-4594	120	60	2	5.3	Diamond conisphere
155-P60328	120	90	2	25	Diamond conisphere
112-4579	120	-	500	14	Ruby ball
112-4578	120	90	2	14	Diamond chisel

Small bore



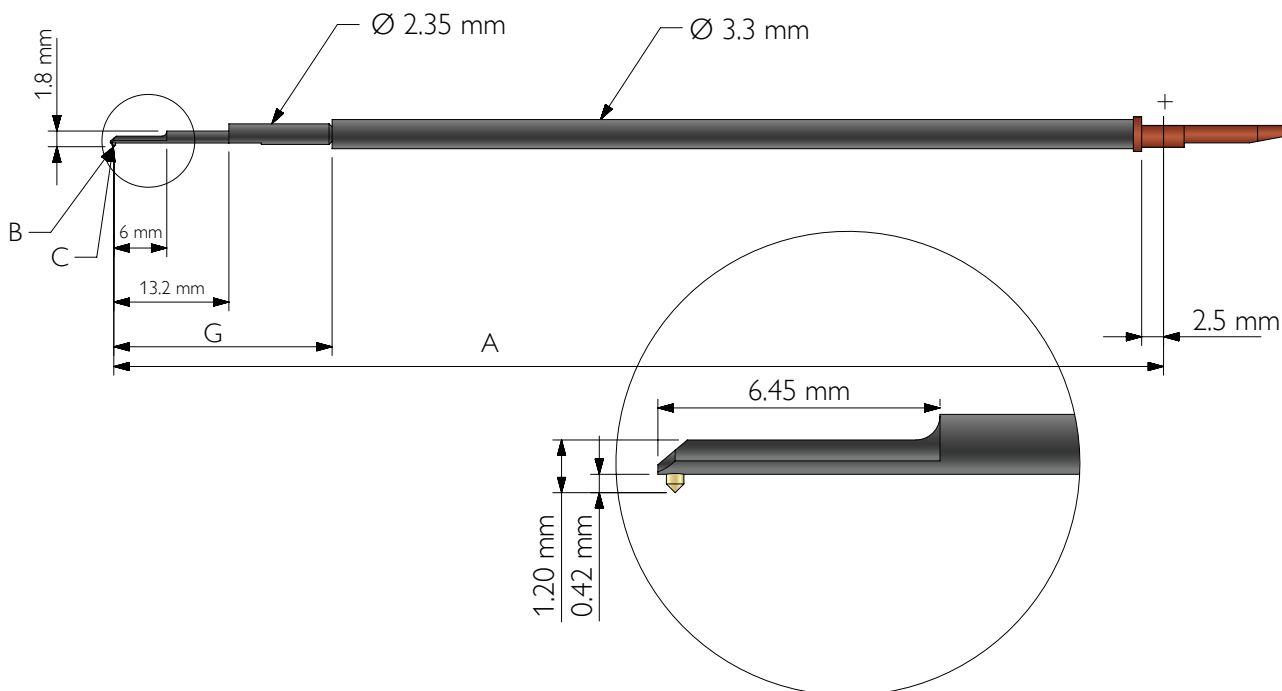
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip distance L (mm)	Tip
115-60338	120	90	2	90	2	Diamond conisphere

Small bore



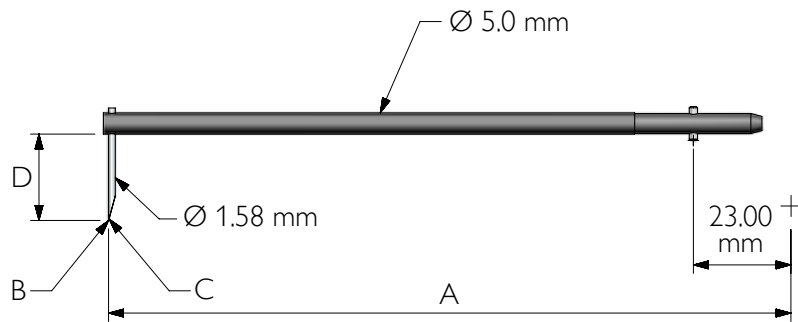
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip
112-4577	120	60	2	34	Diamond conisphere

Miniature bore



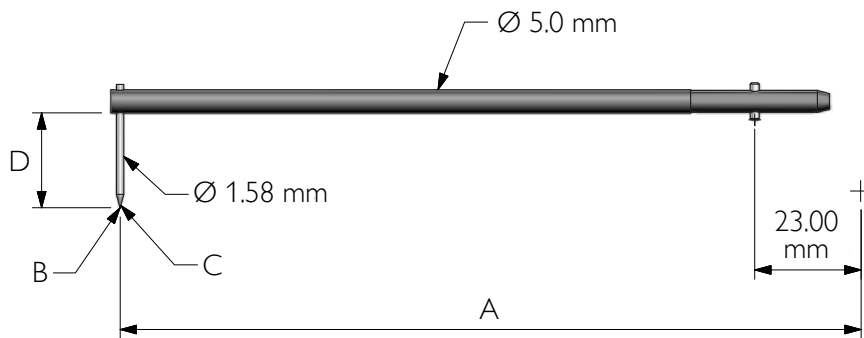
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Stem reach G (mm)	Tip
112-5434	120	90	2	25	Diamond conisphere

Recess chisel



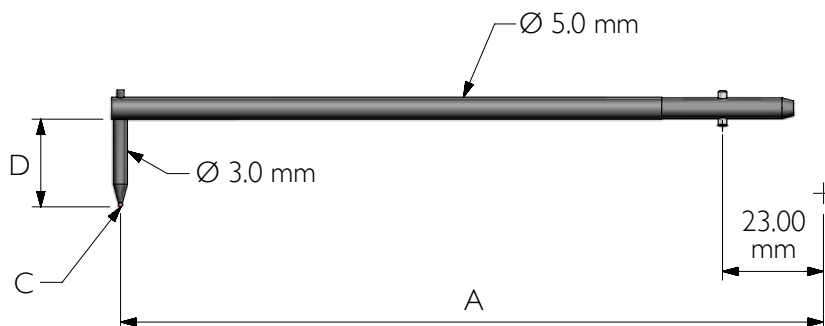
Part no.	Effective length A (mm)	Chisel angle B (Deg)	Tip radius C (μ m)	Shank clearance D (mm)	Tip
K501-1684	160	15	20	21.50	Tungsten carbide chisel

Recess conical



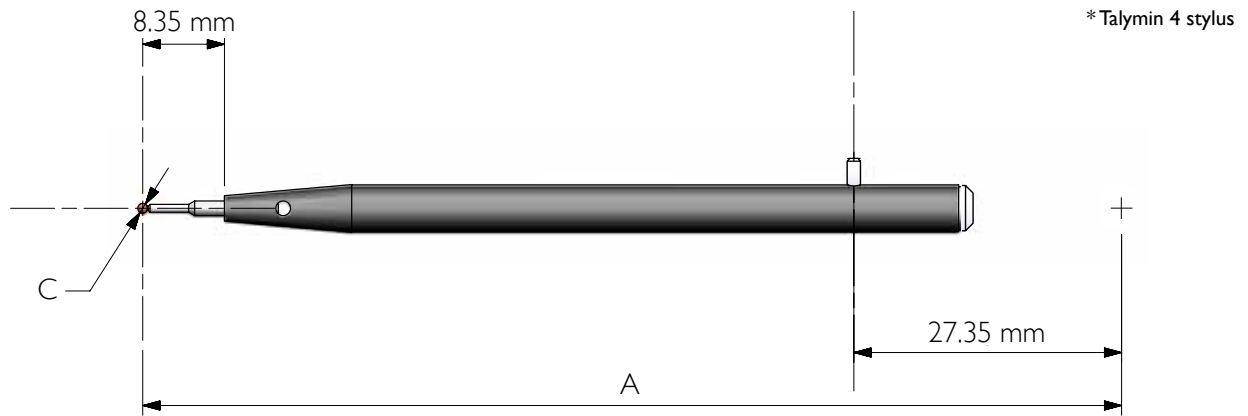
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μ m)	Shank clearance D (mm)	Tip
K501-1685	160	30	20	21.50	Tungsten carbide

Recess ball



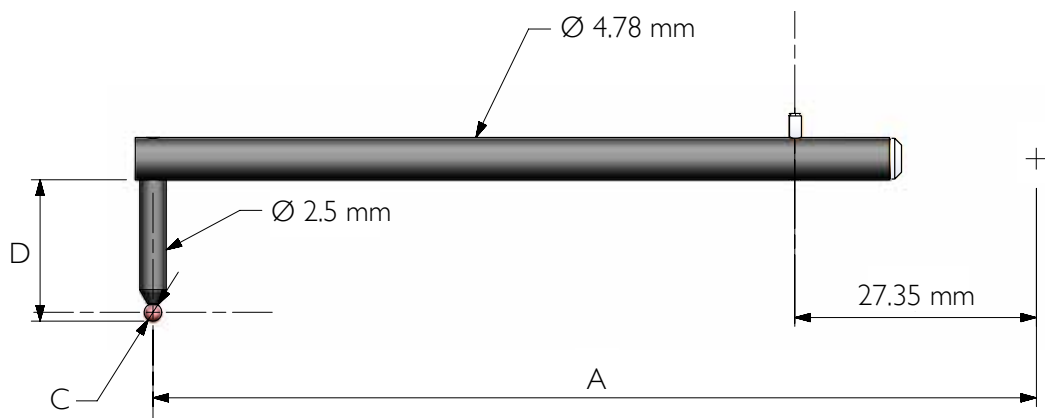
Part no.	Effective length A (mm)	Tip radius C (μ m)	Shank clearance	Tip
K501-1686	160	500	0.50 mm	Ruby ball

Standard ball



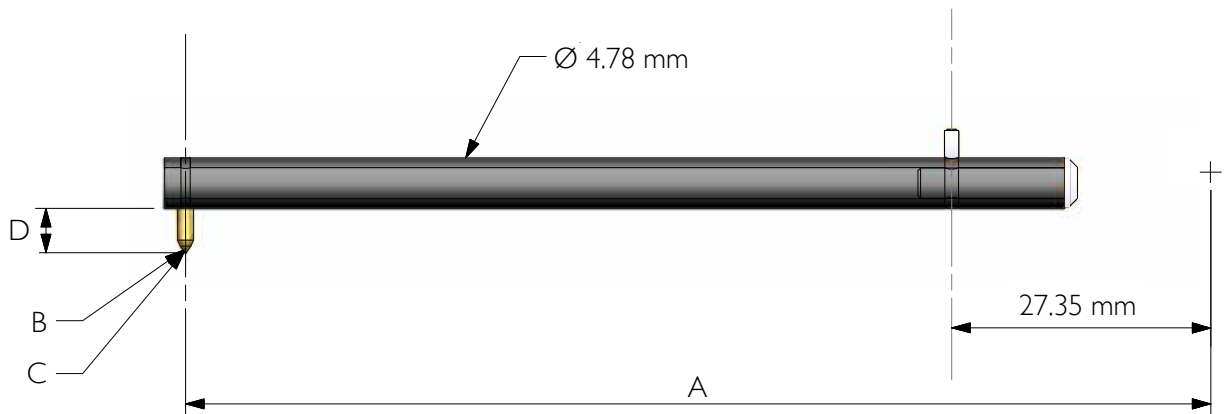
Part no.	Effective length A (mm)	Tip radius C (mm)	Tip
155-P54495	100	0.25	Ruby Ball
155-P54342	100	0.40	Ruby Ball
112-3245	100	0.50	Ruby Ball
112-3244	100	1.00	Sapphire ball
112-3243	100	2.00	Ruby ball
155-P54248	150	1.00	Sapphire ball
155-P30358 *	152.5	1.00	Sapphire ball
155-P54851	200	1.00	Sapphire ball
155-P37074 *	200	1.00	Sapphire ball

Ball recess



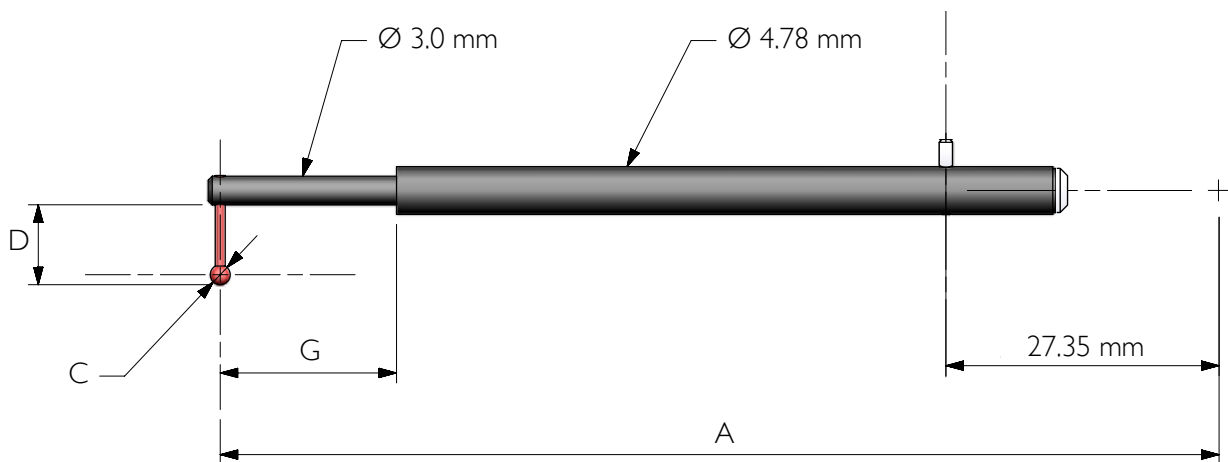
Part no.	Effective length A (mm)	Tip radius C (mm)	Shank clearance D (mm)	Tip
155-P56176	100	0.50	10.00	Ruby ball
155-P56500	100	1.00	5.00	Ruby ball
155-P56217	200	1.00	2.00	Ruby ball

Diamond recess



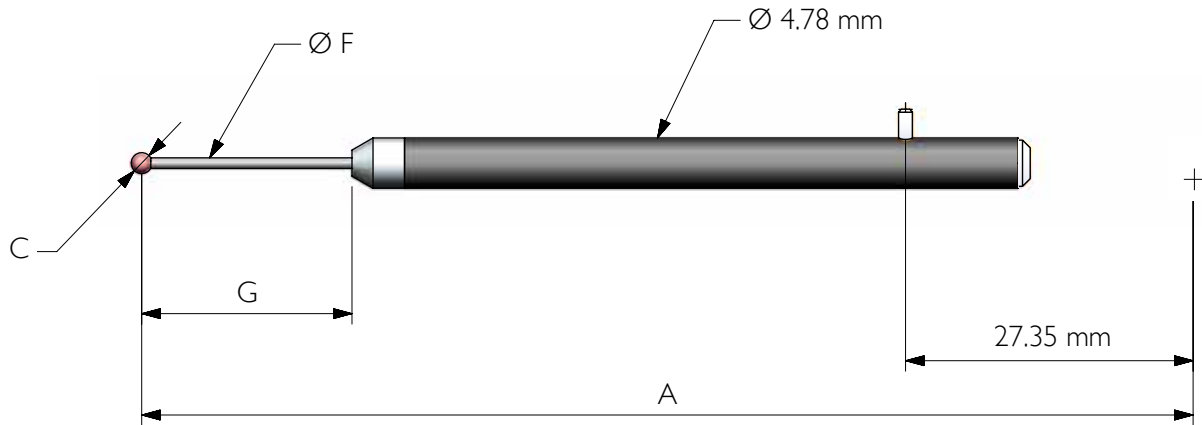
Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (µm)	Shank clearance D (mm)	Tip
112-3806	100	90	5	4.25	Diamond conisphere
112-3807	100	90	10	4.25	Diamond conisphere

Reach recess



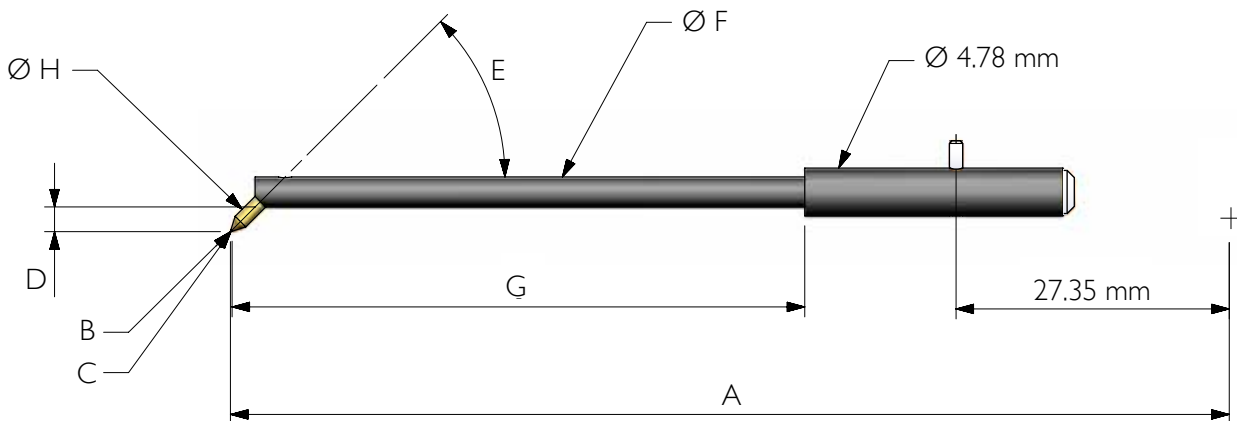
Part no.	Effective length A (mm)	Tip radius C (mm)	Shank clearance D (mm)	Stem reach G (mm)	Tip
155-P56376	100	0.50	5.00	21.5	Ruby ball
155-P54207	100	0.50	8.00	21.5	Ruby ball
155-P57644	100	1.00	2.00	22.0	Ruby ball
155-P56205	100	1.00	10.00	25.0	Ruby ball
155-P54420	100	1.00	15.00	25.0	Ruby ball
155-P56152	150	1.00	5.00	20.0	Ruby ball
155-P56173	200	1.00	5.00	21.5	Ruby ball

Reach



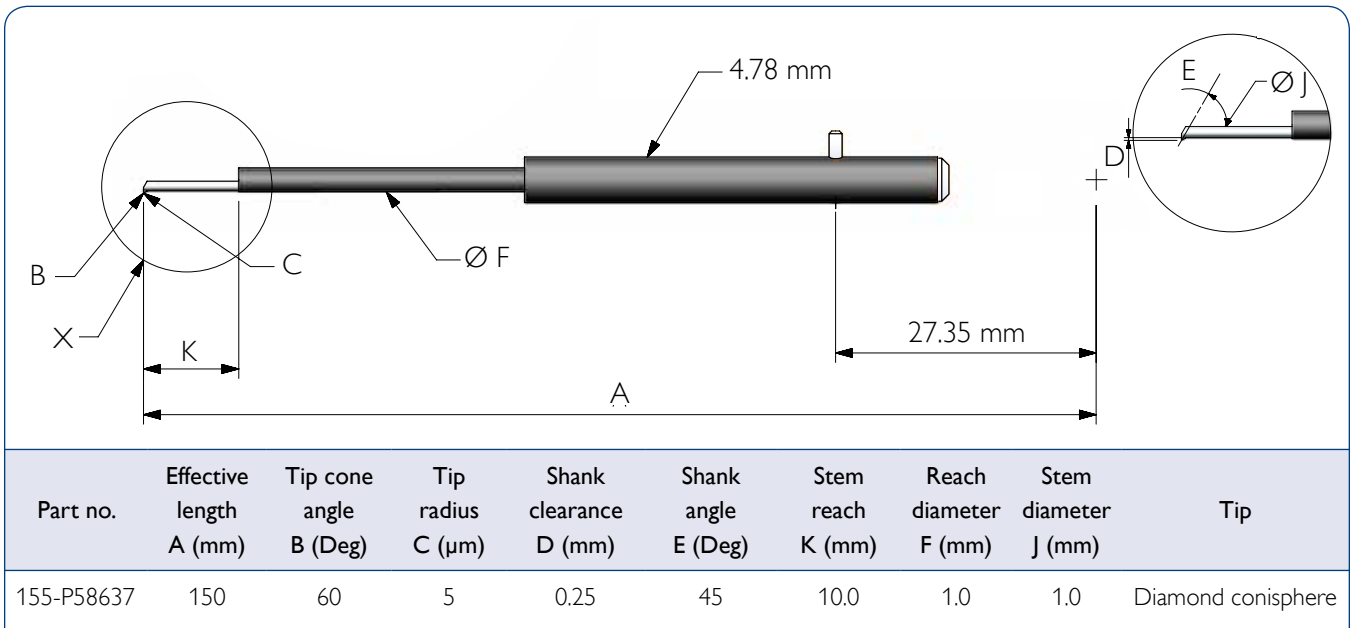
Part no.	Effective length A (mm)	Tip radius C (mm)	Reach tube diameter F (mm)	Stem reach G (mm)	Tip
155-P55179	100	0.75	1.0	40.0	Ruby ball
155-P54407	100	0.50	0.5	26.0	Ruby ball
155-P54366	100	0.40	1.5	40.0	Ruby ball
155-P17679	100	0.40	0.5	10.0	Ruby ball
155-P54554	100	0.15	1.0	10.0	Ruby ball

Forward pointing recess

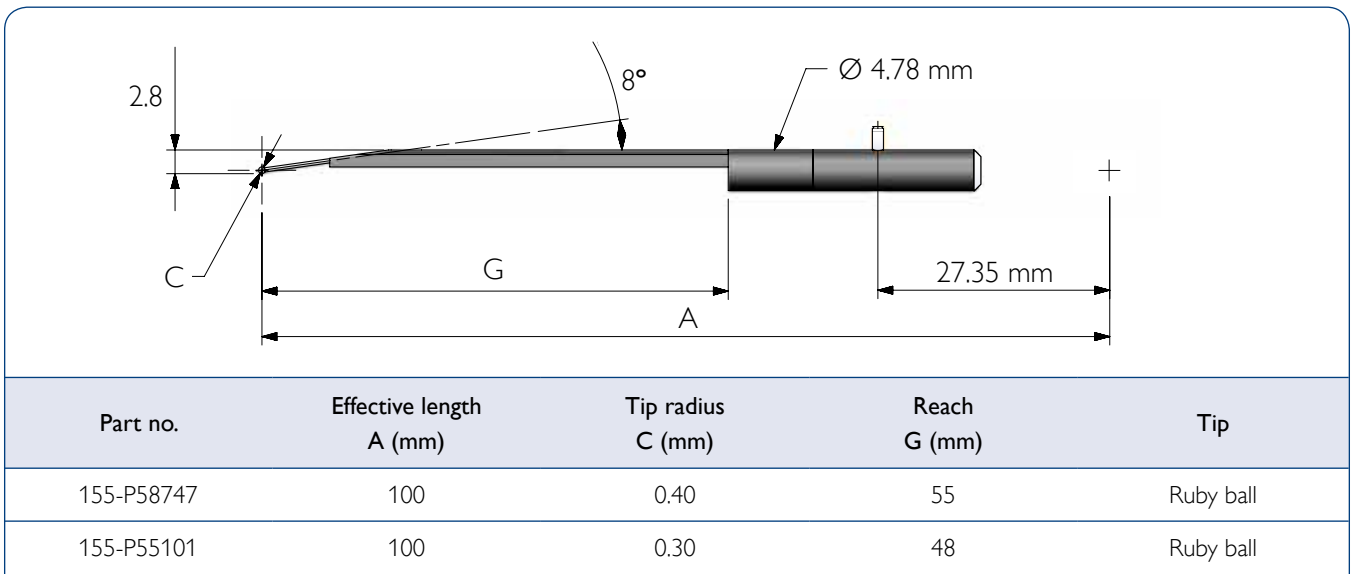


Part no.	Effective length A (mm)	Tip cone angle B (Deg)	Tip radius C (μm)	Shank clearance D (mm)	Shank angle E (Deg)	Reach tube diameter F (mm)	Stem reach G (mm)	Shank diameter H (mm)	Tip
155-P57992	100	30	100	0.40	30.00	2.0	54.0	0.40	Tungsten carbide

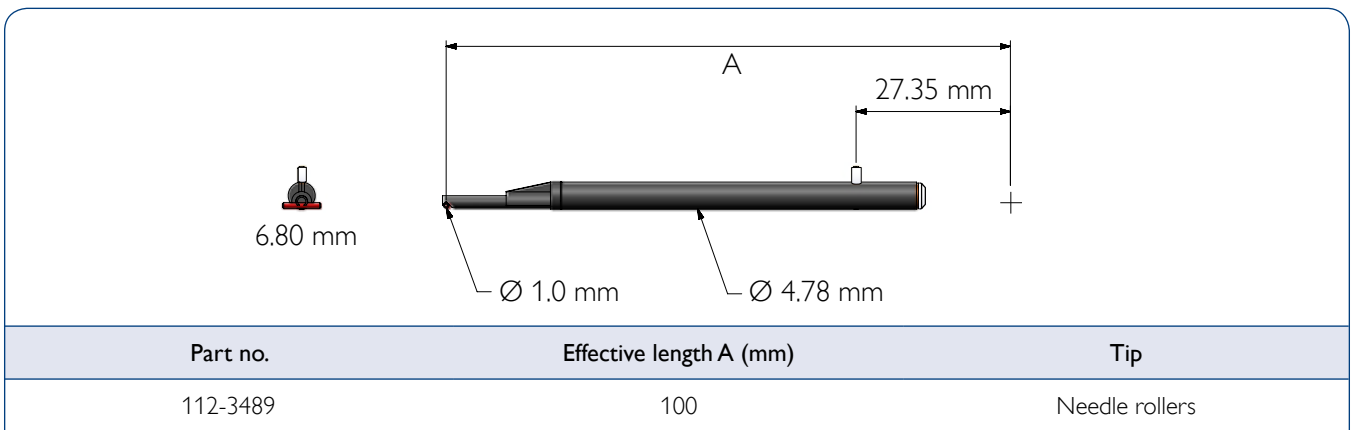
Diamond recess



Reach recess



Bar



The metrology experts

Taylor Hobson is world renowned as a manufacturer of precision measuring instruments used for inspection in research and production facilities. Our equipment performs at nanometric levels of resolution and accuracy.

To complement our precision manufacturing capability we also offer a host of metrology support services to provide our customers with complete solutions to their measuring needs and total confidence in their results.

www.taylor-hobson.com

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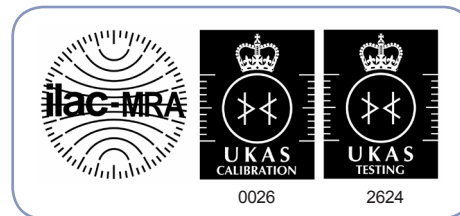
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- **UKAS calibration and testing** – certification for artifacts or instruments in our laboratory or at customer's site



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