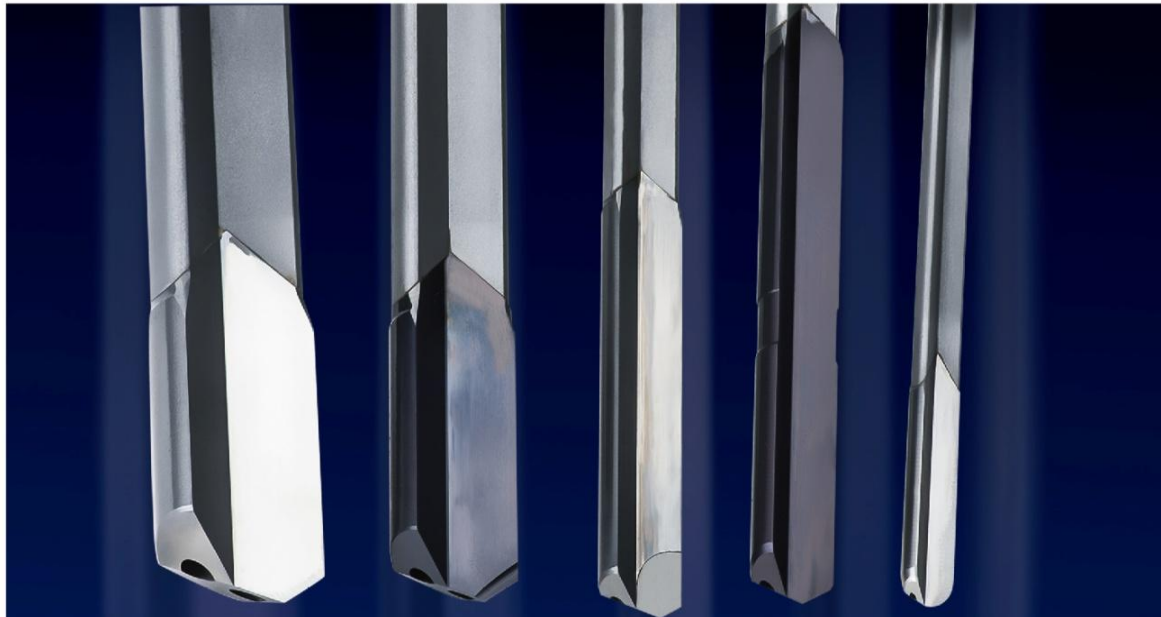




Totime Tools Co.,Ltd



DEEP HOLE DRILLING SYSTEM

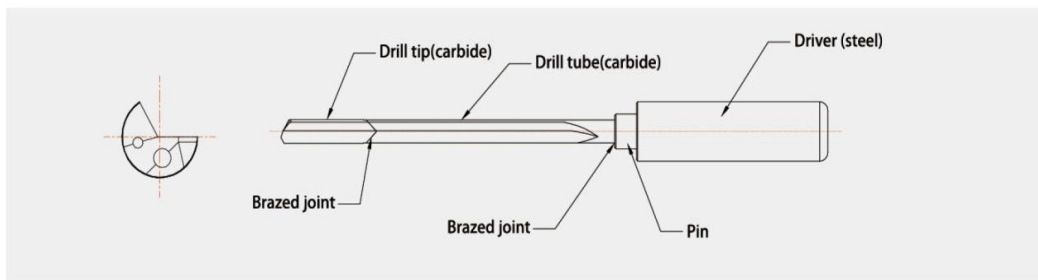


Single flute gun drill (brazed type)

Brazed type gun drill can be based on the different materials to choose different grades of cemented carbide material for reasonable tool design for special materials can also be used to deal with different types of coating.

Brazed type gun drill

Brazed type gun drill was made by welding three parts of drill tip, drill tube and driver. The drill tip is usually made of a carbide material and is connected to the heat treated drill tube by brazing, and then brazed with a precisely ground driver.

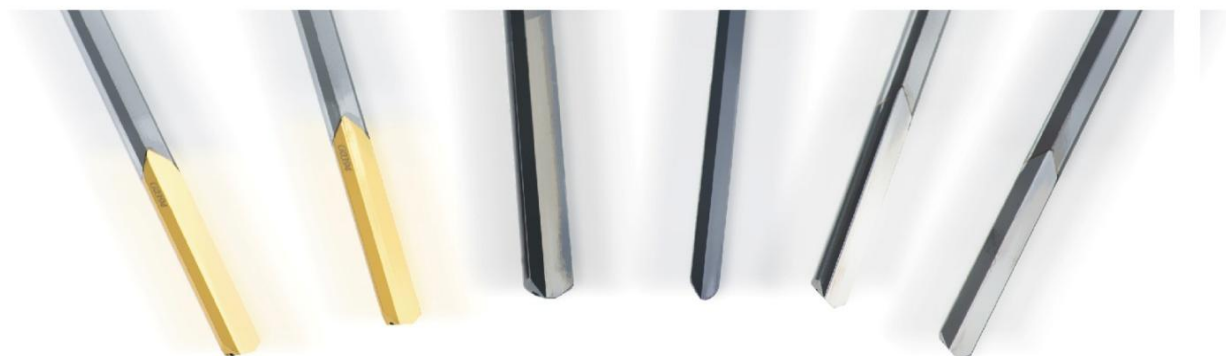


Peripheral contours

Important: Contour EA,G are non-micable	G (Standard) - All materials - Suitable for nearly all drilling requirements - Close drilling tolerance - Minimal drift	C - Stainless steel, wood - Not easily machinable materials - Preferred for water soluble (emulsion) coolants	A - Aluminium - Close drilling tolerance
	D - Cast iron and graphite - Close drilling tolerance in cast iron	EM - Steel, cast iron - Soft materials	EA - Steel and aluminium - Crosshole drilling operations - Unfavourable drilling conditions

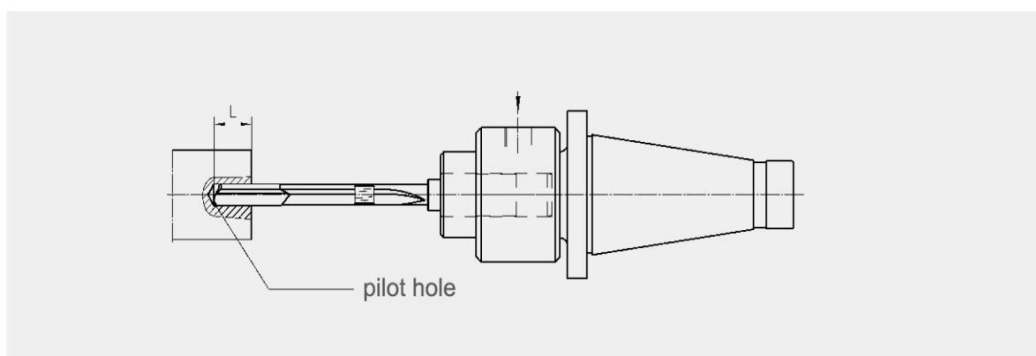
Advantages of brazed Type gun drill

- Good machinability and economical, high cutting performance and safety.
- Superior drilling quality (straightness, roughness), Easy to resharping.
- Tool length can be made according to customer's requirement, up to maximum length 5000mm.
- Can also be used for ordinary lathes or CNC machining centers.

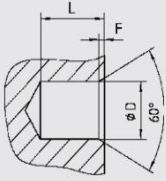


Application of brazed type gun drill for cnc machining center (Lathe, boring)

The gun drill is a single-edged cutting tool without self-centering. When positioning the drill, the tool must be guided through a drill guide bush or a pilot hole. The quality of the pilot hole affects the drilling performance (tool life, centerline deviation, etc.).



Dimensions for the pilot hole

	Drill diameter	Pilot hole diameter	Pilot hole depth matched to the tool length (without driver)							
			Drilling deep	Pilot hole depth						
				φ1.850~4.000	φ4.001~8.500	φ8.501~12.000	φ12.001~20.999	φ12.000~30.999	φ31.000~40.999	
	1.85mm~4.00mm	+0.005 to +0.010	ap.10°D	2.0°D	1.0°D	1.0°D	1.0°D	1°D	1°D	1°D
	4.01mm~12.00mm	+0.010 to +0.020	ap.20°D	3.0°D	1.5°D	1.5°D	1.5°D			
	12.01~50.00mm	+0.015 to +0.040	ap.25°D	4.0°D	2.0°D	2.0°D	1.5°D			
			ap.30°D	6.0°D	3.0°D	3.0°D	1.5°D			
			ap.35°D	30mm	35mm	3.0°D	1.5°D			
			ap.40°D	30mm	35mm	3.0°D	1.5°D			

Nose grind geometry

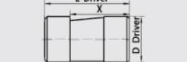
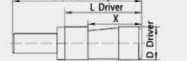
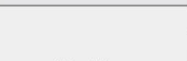
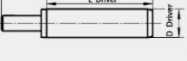
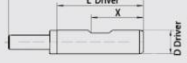
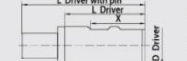
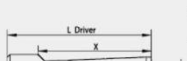
The nose grind geometry affect the following, hole tolerance, chip formation, coolant pressure and flow, tool life, centerline deviation and surface quality. Over the years, Stark has successfully tested a number of different nose grinds for drilling various materials.

Standard nose grinds	
for drill range 1.850 - 4.000 mm	
for drill range 4.001 - 20.000 mm	
for drill range 20.001 - ... mm	
We are pleased to provide you with regrinding instructions on request.	

Driver

Standard drivers for single flute gundrills

Driver no.	Designation		Drawing	for tool length calculation			X = Notch location	M = Thread size
	ø dia. (mm)	Type		Drill dia. range (mm) from - to	L Driver	L Driver with pin		
SH 10-00	10			1.850-7.299	40		24.0	
SH 16-03	16			1.850-12.399	45	53	31.0	
SH 25-00	25			7.300-19.509	70	78	34.0	
SH10-01	10	with pin		7.300-12.399	40	57	24.0	
SH16-04	16			12.400-20.500	45	72	31.0	
SH25-01	25	with pin and drive key		19.510 ->	70	105	34.0	
SH16-02	16			1.850-12.399	50	58	47.5	
SH16-33	16	with pin		12.400-20.500	50	77	47.5	
SH10-06	10	GKT with metr. thread		1.850-7.299	60			M6x0.5
SH16-15	16			1.850-12.399	80			M10x1
SH25-08	25			6.000-20.509	100			M16x1.5
SH10-28	10	GKT with metr. thread with pin		7.300-12.390	60	77		M6x0.5
SH16-22	16			12.400-20.500	80	105		M10x1
SH25-10	25			20.510->	100	140		M16x1.5
SH12.7-00	12.7	1/2 "		1.850-9.699	38.1		25.3	
SH19.05-01	19.05	3/4 "		3.960-14.899	70		45.0	
SH25.4-00	25.4	1 "		6.000-19.509	70		57.5	
SH31.7-00	31.7	1 1/4 "		9.700-25.609	70		57.5	
SH38.1-00	38.1	1 1/2 "		9.700-32.609	70		57.5	
SH19.05-11	19.05	3/4 "		14.900-24.609	70	97	45.0	
SH25.4-01	25.4	1 "		19.510->	70	100	57.5	
SH31.7-01	31.7	1 1/4 "		25.610->	70	110	57.5	
SH38.1-01	38.1	1 1/2 " inch dia. with pin		32.610->	70	110	57.5	
SH10-44	10	VDI 3208		1.850-6.749	60	68	35	M6x0.5
SH16-31	16			1.850-10.799	80	90	37	M10x1
SH25-34	25			6.000-19.509	100	112	45	M16x1.5
SH16-66	16	VDI 3208 with pin		10.800-16.399	80	110	37	M10x1
SH25-40	25			19.510-42.699	100	142	45	M16x1.5
SH10-30	10	DIN 6535-HE with pin		7.300 - 12.399	40	57	28.0	
SH12-14	12			9.000 - 12.399	45	62	33.0	
SH16-70	16			12.400 - 20.500	48	75	36.0	
SH20-56	20			15.900 - 29.609	50	77	38.0	

Driver no.	Designation		Drawing	for tool length calculation			X = Notch location	M = Thread size
	ø dia. (mm)	Type		Drill dia. range (mm)from - to	L Driver	L Driver with pin		
SH16-00	16	Adjustable driver with acme thread		1.850 - 12.899	112		73.0	TR16x1.5
SH20-00	20			1.850 - 14.899	126		82.0	TR20x2
SH28-00	28			6.000 - 21.509	126		82.0	TR28x2
SH36-00	36			8.700 - 28.609	162		109.0	TR36x2
SH16-21	16	Speedbit		1.850 - 12.399	40		28.0	
SH25-16	25			6.750 - 19.509	50		35.0	
SH35-00	35			9.700 - 28.609	60		40.0	
SH16-30	16	Speedbit with pin		12.400 - 20.509	40	67	28.0	
SH25-20	25			19.510 - 30.609	50	77	35.0	
SH35-01	35			28.610 - >	60	100	40.0	
SH10-40	10	DIN 6535-HA		1.850 - 7.299	40			
SH12-18	12			1.850 - 8.999	45			
SH16-11	16			1.850 - 12.399	48			
SH20-01	20			5.000 - 15.899	50			
SH25-11	25			6.000 - 19.509	56			
SH32-24	32	DIN 1835-A40		9.700 - 25.609	60			
SH40-03	40			9.700 - 32.609	70			
SH10-41	10	DIN 6535-HA or 1835-A with pin		7.300 - 12.399	40	57		
SH12-19	12			9.000 - 15.899	45	62		
SH16-20	16			12.400 - 20.509	48	75		
SH20-60	20			15.900 - 25.603	50	77		
SH25-21	25			19.510 - 34.699	56	86		
SH32-23	32	DIN 6535-HB		25.610 - 45.699	60	100		
SH40-04	40			32.610 - >	70	110		
SH10-11	10			1.850 - 7.299	40		23.5	
SH12-07	12			1.850 - 8.999	45		26.5	
SH16-32	16			1.850 - 12.399	48		29.0	
SH20-29	20	DIN 6535-HB		1.850 - 15.899	50		30.5	
SH25-22	25	DIN 6535-HB		6.000 - 19.509	56		38.0	
SH32-10	32	DIN 1835-B32		9.700 - 25.609	60		43.0	
SH40-13	40	DIN 1835-B40		9.700 - 32.609	70		47.0	
SH10-23	10	DIN 6535-HB or 1835-B with pin		7.300 - 12.399	40	57	23.5	
SH12-02	12			9.000 - 15.899	45	62	26.5	
SH16-53	16			12.400 - 20.500	48	75	29.0	
SH20-34	20			15.900 - 25.609	50	77	30.5	
SH25-31	25			19.510 - >	56	86	38.0	
SH32-11	32	DIN 1835-E		25.610 - >	60	100	43.0	
SH40-14	40			32.610 - >	70	110	47.0	
SH10-20	10			1.850 - 7.299	40		28.0	
SH12-08	12			1.850 - 8.999	45		33.0	
SH16-47	16			1.850 - 12.399	48		36.0	
SH20-40	20	DIN 1835-E		1.850 - 15.899	50		38.0	
SH25-36	25			6.000 - 19.509	56		44.0	
SH32-12	32			9.700 - 25.609	60		48.0	
SH40-18	40			9.700 - 32.609	70		66.0	
SH10-24	10			7.300 - 12.399	40	57	28.0	
SH12-05	12	DIN 1835-E with pin		9.000 - 15.899	45	62	33.0	
SH16-51	16			12.400 - 20.500	48	75	36.0	
SH20-43	20			15.900 - 29.609	50	77	38.0	
SH25-37	25			19.510 - >	56	86	44.0	
SH32-13	32			25.610 - >	60	100	48.0	
SH40-17	40	DIN 6535-HE		32.610 - >	70	110	66.0	
SH10-29	10			1.850 - 7.299	40		28.0	
SH12-13	12			1.850 - 8.999	45		33.0	
SH16-62	16			1.850 - 12.390	48		36.0	
SH20-55	20			1.850 - 15.899	50		38.0	

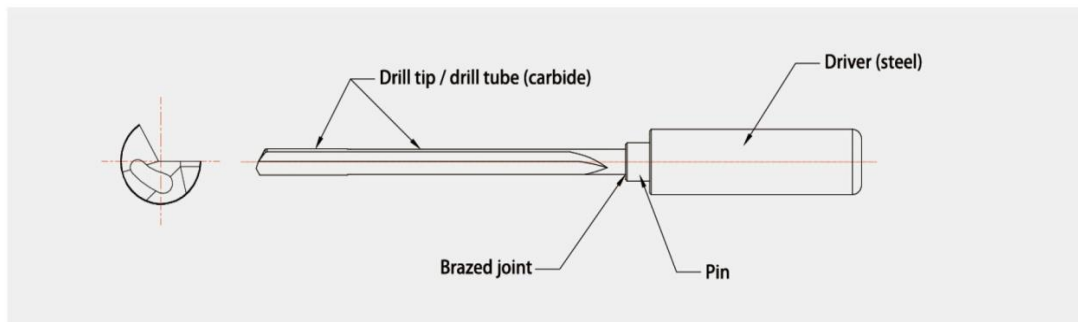


Single flute gun drill (solid type)

Drill tip and drill tube are manufactured from a single piece of carbide blank. The advantage of this tool is high process reliability and performance. Longer tool life is possible because of reduced torsional vibrations and higher rigidity.

Solid carbide gun drill

Drill tip and drill tube are manufactured from a single piece of carbide blank. The advantage of this tool is high process reliability and performance. Longer tool life is possible because of higher rigidity and reduced torsional vibrations. There is also a type in which the driver is welded through brazing.



Peripheral contours

Important: Contour EA and G are non-micable!	 G (Standard) - All materials - Suitable for most drilling requirements - Close hole tolerance - Minimum drift	 C - Steel, stainless steel - Not easily machinable materials - Preferred for water soluble (emulsion) coolant
	 EA - Cast iron, malleable materials - Crosshole drilling - Angular entrance and exit bores	 A - Aluminium, copper - Close hole tolerance

Advantages of solid carbide gun drill

- Very small deep holes can be processed
- The high rigidity of the solid type gun drill can minimize the eccentricity of the hole.
- Kidney shape of cooling hole is advantageous for supply of cutting oil.
- Cutting speed is faster than brazed type gun drill.

Driver

Standard drivers for solid carbide gundrills 整体硬质合金枪钻标准钻柄规格

Driver no.	Designation		Drawing	for tool length calculation			X = Notch location	M = Thread size	
	ø dia. (mm)	Type		Drill dia. range (mm)from - to	L Driver	L Driver with pin			
SH6-03	6			0.500 - 4.649	30	45	17		
SH10-15	10	ideal for hydraulic chucks and collets		0.500 - 6.349	55	70		M6x0.5	
SH10-37	10			0.500 - 5.249	40	55	32.7	M6x0.5	
SH10-42	10			0.500 - 6.349	40	55	24		
SH12.7-01	12.7			0.500 - 6.349	38	48	25.4		
SH12.7-09	12.7	ideal for hydraulic chucks and collets		0.500 - 6.349	51	65		M6x0.5	
SH16-75	16			0.500 - 8.049	80	105	37	M10x1	
SH4-08	4	DIN 6535-HA ideal for hydraulic chucks and collets		0.500 - 5.149	34	46			
SH6-12	6			0.500 - 4.649	36	50			
SH10-51	10			0.500 - 7.249	40	55			
SH12-27	12			0.500 - 6.349	45	60			
SH16-86	16			0.500 - 8.049	48	63			
SH6-13	6	DIN 6535-HB		0.500 - 4.649	36	50	20		
SH10-47	10			0.500 - 6.349	40	55	23.5		
SH12-30	12			0.500 - 8.049	45	60	26.5		
SH16-78	16	DIN 1835-B		0.500 - 8.049	48	63	29		
SH6-01	6	DIN 6535-HE		0.500 - 4.649	36	50	25		
SH10-49	10			0.500 - 6.349	40	55	28		
SH12-28	12			0.500 - 6.349	45	60	33		
SH16-84	16	DIN 1835-E		0.500 - 8.049	48	63	36		

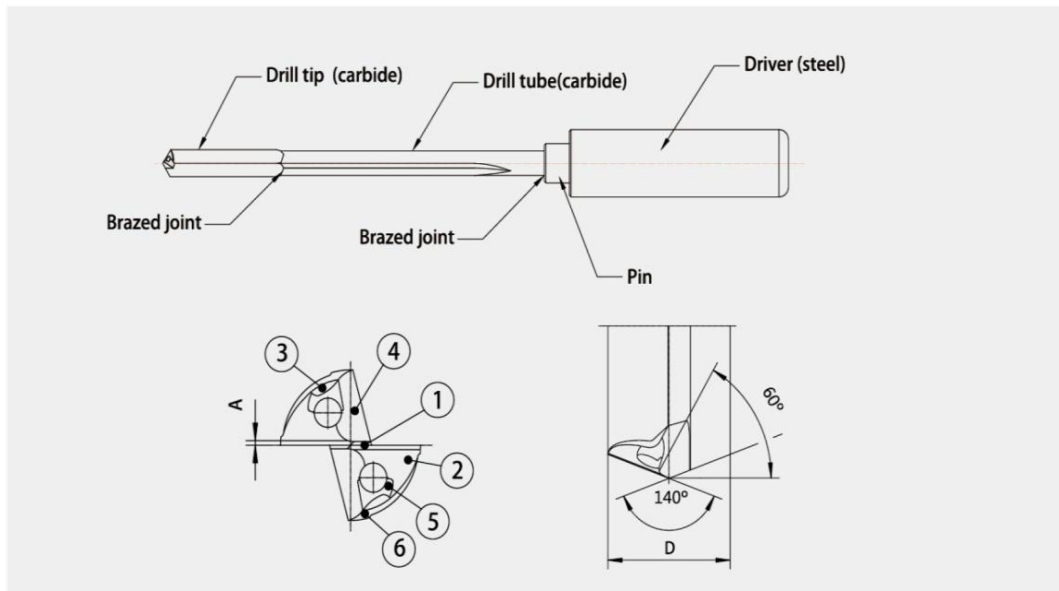


Twin fluted gun drill

Twin fluted gun drill has two symmetrical cutting blades and use the same coolant flow system as the brazed single flute gun drills. The coolant oil is supplied through coolant holes in the tool and exit along with the chips in the flutes from the drilled hole.

Twin fluted gun drill

Twin fluted gun drill is fabricated with a solid carbide drill head which is brazed to a heat treated tube (flute) then fitted and brazed to a hardened steel driver. However, the twin fluted gun drill is suitable for materials with easy chip breaking because of the small chip clearance.



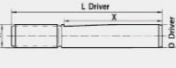
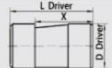
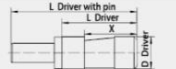
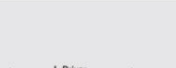
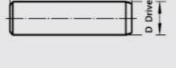
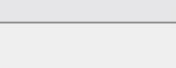
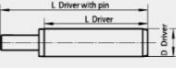
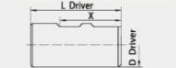
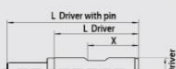
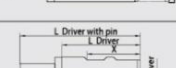
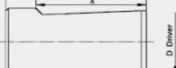
Fixture settings and grinding sequence

Operation	Swing 	Tilt 	Torsion 	Gage	Remarks
1 	20°	10°	0°	A	cutting land 2 nd edge 180°
2 	20°	Ø3.000-6.009 25° Ø6.010-25.000 20°	0°		relief angle 2 nd edge 180°
3 	10°	35°	0°		relief angle 2 nd edge 180°
4 	60°	0°	grinding wheel 15°	Q	web thinning 2 nd edge 180°
5 	15°	0°	0°		grinding into half of the coolant hole
6 	60°	0°		C	grinding land hand chamfer

Driver

Standard drivers for 2-flute gundrills

Driver no.	Designation		Drawing	for tool length calculation			X = Notch location	M = Thread size
	ø dia. (mm)	Type		Drill dia. range (mm) from - to	L Driver	L Driver with pin		
SH10-00	10			1.850-7.299	40		24.0	
SH16-03	16			1.850-12.399	45	53	31.0	
SH25-00	25			7.300-19.509	70	78	34.0	
SH10-01	10	with pin		7.300-12.399	40	57	24.0	
SH16-04	16			12.400-20.500	45	72	31.0	
SH25-01	25	with pin and drive key		19.510 ->	70	105	34.0	
SH16-02	16			1.850-12.399	50	58	47.5	
SH16-33	16	with pin		12.400-20.500	50	77	47.5	
SH10-06	10	GKT with metr. thread		1.850-7.299	60			M6x0.5
SH16-15	16			1.850-12.399	80			M10x1
SH25-08	25			6.000-20.509	100			M16x1.5
SH10-28	10	GKT with metr. thread with pin		7.300-12.399	60	77		M6x0.5
SH16-22	16			12.400-20.500	80	105		M10x1
SH25-10	25			20.510->	100	140		M16x1.5
SH12.7-00	12.7	1/2"		1.850-9.699	38.1		25.3	
SH19.05-01	19.05	3/4"		3.960-14.899	70		45.0	
SH25.4-00	25.4	1"		6.000-19.509	70		57.5	
SH31.7-00	31.7	1 1/4"		9.700-25.609	70		57.5	
SH38.1-00	38.1	1 1/2"		9.700-32.609	70		57.5	
SH19.05-11	19.05	3/4"		14.900-24.609	70	97	45.0	
SH25.4-01	25.4	1"		19.510->	70	100	57.5	
SH31.7-01	31.7	1 1/4"		25.610->	70	110	57.5	
SH38.1-01	38.1	1 1/2"		32.610->	70	110	57.5	
SH10-44	10	VDI 3208		1.850-6.749	60	68	35	M6x0.5
SH16-31	16			1.850-10.799	80	90	37	M10x1
SH25-34	25			6.000-19.509	100	112	45	M16x1.5
SH16-66	16	VDI 3208 with pin		10.800-16.399	80	110	37	M10x1
SH25-40	25			19.510-42.699	100	142	45	M16x1.5
SH10-30	10	DIN 6535-HE with pin		7.300-12.399	40	57	28.0	
SH12-14	12			9.00-12.399	45	62	33.0	
SH16-70	16			12.400-20.500	48	75	36.0	
SH20-56	20			15.900-29.609	50	77	38.0	

Driver no.	Designation		Drawing	for tool length calculation			X = Notch location	M = Thread size
	ø dia. (mm)	Type		Drill dia. range (mm)from - to	L Driver	L Driver with pin		
SH16-00	16	Adjustable driver with acme thread		1.850 - 12.899	112		73.0	TR16x1.5
SH20-00	20			1.850 - 14.899	126		82.0	TR20x2
SH28-00	28			6.000 - 21.509	126		82.0	TR28x2
SH36-00	36			8.700 - 28.609	162		109.0	TR36x2
SH16-21	16	Speedbit		1.850 - 12.399	40		28.0	
SH25-16	25			6.750 - 19.509	50		35.0	
SH35-00	35			9.700 - 28.609	60		40.0	
SH16-30	16	Speedbit with pin		12.400 - 20.509	40	67	28.0	
SH25-20	25			19.510 - 30.609	50	77	35.0	
SH35-01	35			28.610 - >	60	100	40.0	
SH10-40	10	DIN 6535-HA		1.850 - 7.299	40			
SH12-18	12			1.850 - 8.999	45			
SH16-11	16			1.850 - 12.399	48			
SH20-01	20			5.000 - 15.899	50			
SH25-11	25			6.000 - 19.509	56			
SH32-24	32	DIN 1835-A40		9.700 - 25.609	60			
SH40-03	40			9.700 - 32.609	70			
SH10-41	10	DIN 6535-HA or 1835-A with pin		7.300 - 12.399	40	57		
SH12-19	12			9.000 - 15.899	45	62		
SH16-20	16			12.400 - 20.509	48	75		
SH20-60	20			15.900 - 25.603	50	77		
SH25-21	25			19.510 - 34.699	56	86		
SH32-23	32	DIN 6535-HB		25.610 - 45.699	60	100		
SH40-04	40			32.610 - >	70	110		
SH10-11	10			1.850 - 7.299	40		23.5	
SH12-07	12			1.850 - 8.999	45		26.5	
SH16-32	16			1.850 - 12.399	48		29.0	
SH20-29	20	DIN 6535-HB DIN 1835-B32		1.850 - 15.899	50		30.5	
SH25-22	25			6.000 - 19.509	56		38.0	
SH32-10	32			9.700 - 25.609	60		43.0	
SH40-13	40	DIN 1835-B40		9.700 - 32.609	70		47.0	
SH10-23	10	DIN 6535-HB or 1835-B with pin		7.300 - 12.399	40	57	23.5	
SH12-02	12			9.000 - 15.899	45	62	26.5	
SH16-53	16			12.400 - 20.500	48	75	29.0	
SH20-34	20			15.900 - 25.609	50	77	30.5	
SH25-31	25			19.510 - >	56	86	38.0	
SH32-11	32	DIN 1835-E		25.610 - >	60	100	43.0	
SH40-14	40			32.610 - >	70	110	47.0	
SH10-20	10			1.850 - 7.299	40		28.0	
SH12-08	12			1.850 - 8.999	45		33.0	
SH16-47	16			1.850 - 12.399	48		36.0	
SH20-40	20	DIN 1835-E with pin		1.850 - 15.899	50		38.0	
SH25-36	25			6.000 - 19.509	56		44.0	
SH32-12	32			9.700 - 25.609	60		48.0	
SH40-18	40			9.700 - 32.609	70		66.0	
SH10-24	10			7.300 - 12.399	40	57	28.0	
SH12-05	12	DIN 1835-E with pin		9.000 - 15.899	45	62	33.0	
SH16-51	16			12.400 - 20.500	48	75	36.0	
SH20-43	20			15.900 - 29.609	50	77	38.0	
SH25-37	25			19.510 - >	56	86	44.0	
SH32-13	32			25.610 - >	60	100	48.0	
SH40-17	40	DIN 6535-HE		32.610 - >	70	110	66.0	
SH10-29	10			1.850 - 7.299	40		28.0	
SH12-13	12			1.850 - 8.999	45		33.0	
SH16-62	16			1.850 - 12.390	48		36.0	
SH20-55	20			1.850 - 15.899	50		38.0	



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