



# Angle Drill Attachments & Accessories



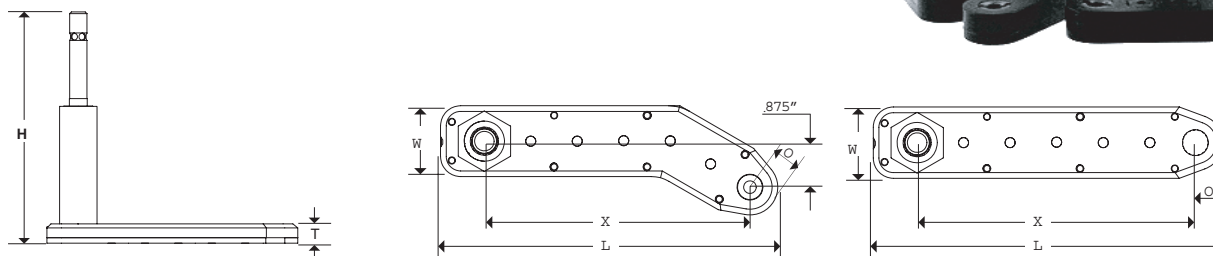


## ZT556/ZT557/ZT558 Angle Drill Attachment

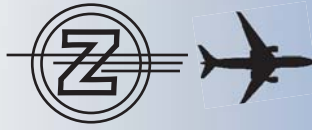
The ZT556/ZT557/ZT558 series flat offset angle drill attachments have been designed to run at any speed up to 3,000 rpm in the tightest and most demanding applications. This angle drill is well suited for all metallic, graphite and composite materials used in the aircraft industry today.

Features include:

- Standard duty.
- Drive shaft and idler gear shafts are all supported by ball bearings.
- Drive shafts are available with 1/4" round (no suffix), 1/4" round with three flats (TF) and quick change (QC) drive shafts.
- Spindle gears are available with standard 10-32 (D) and 1/4-28 (C) internal threads.
- These angle drills feature a 1:1.5 drive shaft to spindle gear ratio. This means you will net more spindle gear speed from your existing drill motors.



Model Number	Spindle Thread	Spindle Offset O	Drill Offset X	Overall Length L	Overall Height H	Body Thickness T	Body Width W	Angle	Drill Capacity
ZT556-D	10-32	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT556-D-QC	10-32	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT556-D-TF	10-32	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT556-C	1/4-28	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT556-C-QC	1/4-28	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT556-C-TF	1/4-28	.250	3.125	3.812	5.75	.312	.562	Straight	1/4" Alum.
ZT557-D	10-32	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT557-D-QC	10-32	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT557-D-TF	10-32	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT557-C	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT557-C-QC	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT557-C-TF	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° L.H.	1/4" Alum.
ZT558-D	10-32	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.
ZT558-D-QC	10-32	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.
ZT558-D-TF	10-32	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.
ZT558-C	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.
ZT558-C-QC	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.
ZT558-C-TF	1/4-28	.250	2.750	3.312	5.75	.312	.562	30° R.H.	1/4" Alum.

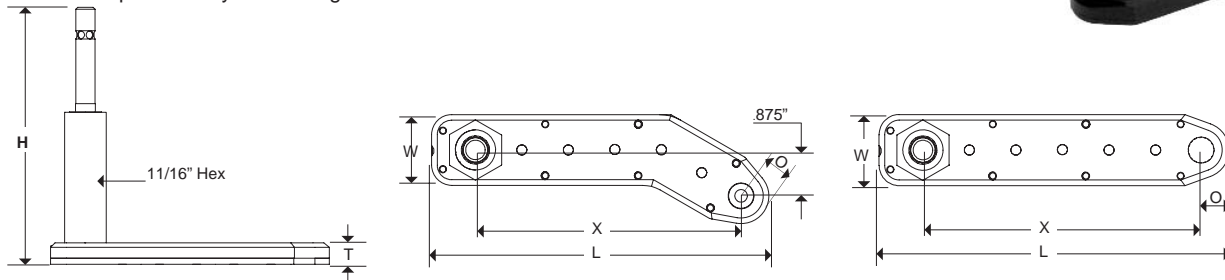


## ZT627/ZT628/ZT629 High Speed Angle Drill Attachments

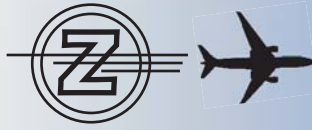
The ZT627/ZT628/ZT629 series flat offset angle drill attachments have been designed run at any speed up to 6,000 rpm in the tightest and most demanding applications. This full bearing angle drill is well suited for all metallic, graphite and composite materials used in the airframe industry today.

Features include:

- Standard duty-Full Bearing Design.
- Spindle gear is supported by both radial and thrust ball bearings designed to run at speeds up to 6,000 rpm.
- Improved spindle gear ball bearing system, significantly reduces spindle run out, run temperature and extends the product life.
- Drive shaft and idler gear shafts are all supported by ball bearings.
- Spindle gears are available with standard 10-32 (D) and 1/4-28 (C) internal threads.
- Drive shafts are available with 1/4" round (no suffix), 1/4" round with three flats (TF) and quick change (QC) drive shafts.
- These angle drills feature a 1:1.5 drive shaft to spindle gear ratio. This means you will net more speed from your existing drill motors.



Model Number	Spindle Thread	Spindle Offset O	Drill Offset X	Overall Length L	Overall Height H	Body Thickness T	Body Width W	Angle	Drill Capacity
ZT627-D	10-32	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT627-D-QC	10-32	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT627-D-TF	10-32	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT627-C	1/4-28	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT627-C-QC	1/4-28	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT627-C-TF	1/4-28	.345	3.381	4.227	4.00	.335	.880	Straight	1/4" Alum.
ZT628-D	10-32	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT628-D-QC	10-32	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT628-D-TF	10-32	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT628-C	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT628-C-QC	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT628-C-TF	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° L.H.	1/4" Alum.
ZT629-D	10-32	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.
ZT629-D-QC	10-32	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.
ZT629-D-TF	10-32	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.
ZT629-C	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.
ZT629-C-QC	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.
ZT629-C-TF	1/4-28	.345	3.239	4.083	4.00	.335	.880	30° R.H.	1/4" Alum.

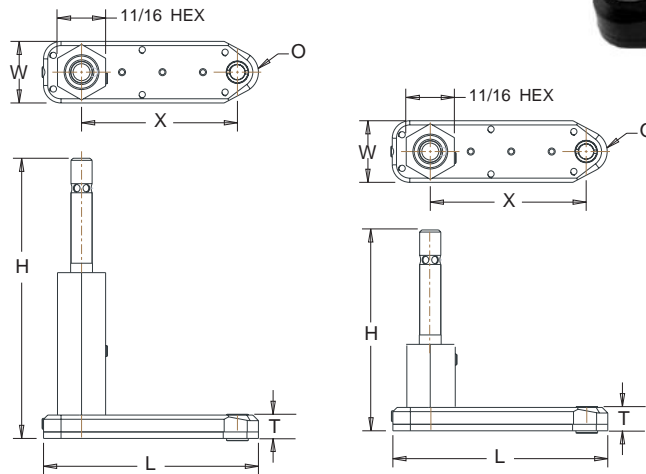


## ZT677/ZT777 High Speed Angle Drill Attachments

The ZT677/ZT777 series flat offset angle drill attachments have been designed to run at any speed up to 6,000 rpm in the tightest and most demanding applications. This full bearing angle drill is well suited for all metallic, graphite and composite materials used in the airframe industry today.

Features include:

- Standard duty-Full Bearing Design.
- Spindle gear is supported by both radial and thrust ball bearings designed to run at speeds up to 6,000 rpm.
- Improved spindle gear ball bearing system, significantly reduces spindle run out, run temperature and extends the product life.
- Drive shaft and idler gear shafts are all supported by ball bearings.
- Spindle gears are available with standard 10-32 (D) and 1/4-28 (C) internal threads.
- Drive shafts are available with 1/4" round (no suffix), 1/4" round with three flats (TF) and quick change (QC) drive shafts.
- These angle drills feature a 1:1.5 drive shaft to spindle gear ratio. This means you will net more spindle gear speed from your existing drill motors.



Model Number	Spindle Thread	Spindle Offset O	Drill Offset X	Overall Length L	Overall Height H	Body Thickness T	Body Width W	Angle	Drill Capacity
ZT677-D	10-32	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT677-D-QC	10-32	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT677-D-TF	10-32	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT677-C	1/4-28	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT677-C-QC	1/4-28	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT677-C-TF	1/4-28	.300	2.230	3.07	4.00	.335	.880	Straight	1/4" Alum.
ZT777-D	10-32	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.
ZT777-D-QC	10-32	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.
ZT777-D-TF	10-32	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.
ZT777-C	1/4-28	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.
ZT777-C-QC	1/4-28	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.
ZT777-C-TF	1/4-28	.300	2.230	3.07	2.34	.335	.880	Straight	1/4" Alum.

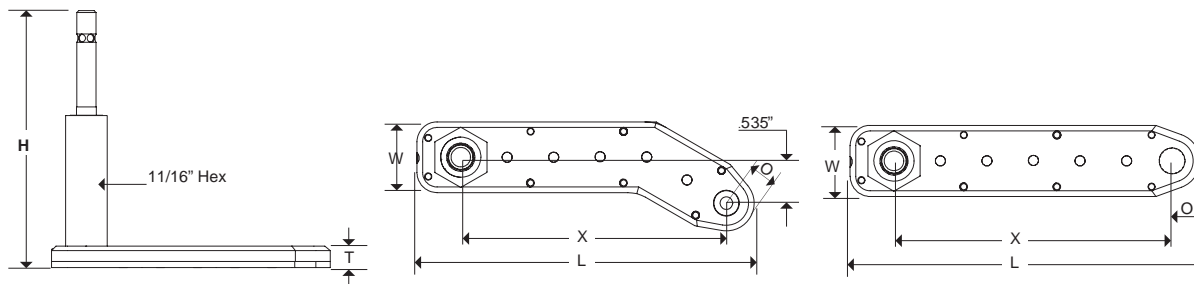


## ZT727/ZT728/ZT729 High Speed Angle Drill Attachments

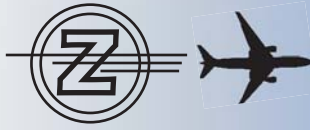
The ZT727/ZT728/ZT729 series flat offset angle drill attachments have been designed to run at any speed up to 6,000 rpm in the tightest and most demanding applications. This full bearing angle drill is well suited for all metallic, graphite and composite materials used in the airframe industry today.

Features include:

- Standard duty-Full Bearing Design.
- Spindle gear is supported by both radial and thrust ball bearings designed to run at speeds up to 6,000 rpm.
- Improved spindle gear ball bearing system, significantly reduces spindle run out, run temperature and extends the product life.
- Drive shaft and idler gear shafts are all supported by ball bearings.
- Spindle gears are available with standard 10-32 (D) and 1/4-28 (C) internal threads.
- Drive shafts are available with 1/4" round (no suffix), 1/4" round with three flats (TF) and quick change (QC) drive shafts.
- These angle drills feature a 1:1.5 drive shaft to spindle gear ratio. This means you will net more spindle gear speed from your existing drill motors.

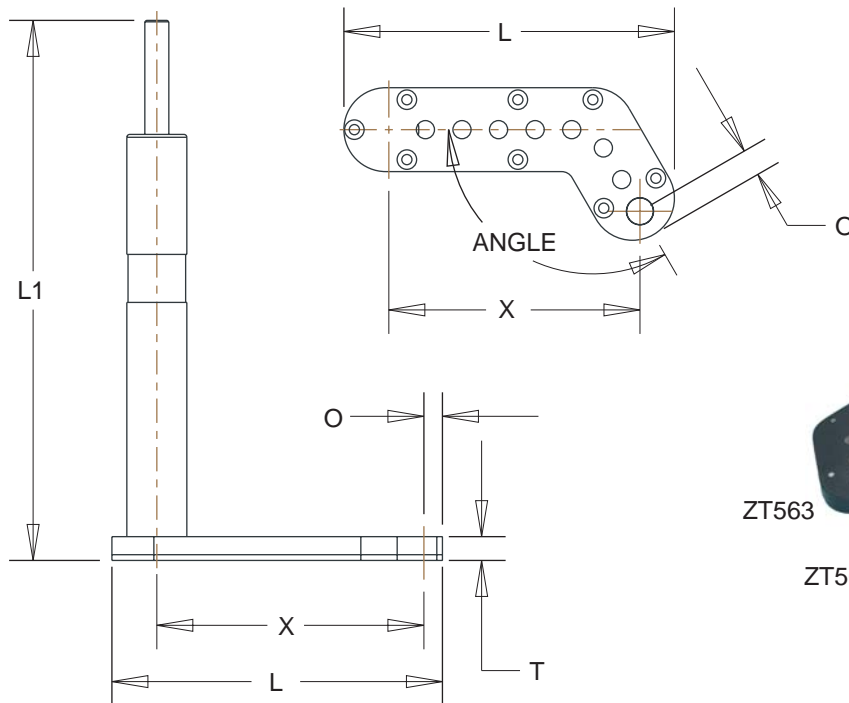


Model Number	Spindle Thread	Spindle Offset	Drill Offset		Overall Length	Overall Height	Body Thickness	Body Width	Angle	Drill Capacity
			O	X						
ZT727-D	10-32	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT727-D-QC	10-32	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT727-D-TF	10-32	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT727-C	1/4-28	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT727-C-QC	1/4-28	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT727-C-TF	1/4-28	.300	3.383	4.227	2.34	.335	.880	Straight	1/4" Alum.	
ZT728-D	10-32	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT728-D-QC	10-32	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT728-D-TF	10-32	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT728-C	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT728-C-QC	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT728-C-TF	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° L.H.	1/4" Alum.	
ZT729-D	10-32	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	
ZT729-D-QC	10-32	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	
ZT729-D-TF	10-32	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	
ZT729-C	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	
ZT729-C-QC	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	
ZT729-C-TF	1/4-28	.300	3.230	4.170	2.34	.335	.880	30° R.H.	1/4" Alum.	



**ZT561/ZT562/ZT563**  
**Flat Offset Angle Drill**

The ZT561/ZT562/ZT563 series flat offset angle drills. Extra thin drills which allow access into tight areas. All steel housings, heat treated gears, hardened and precision ground shafts tackle the toughest of tasks with ease.



MODEL	SPINDLE THREAD	SPINDLE OFFSET O	DRILL OFFSET X	OVERALL LENGTH L	LENGTH L <sub>1</sub>	BODY THICKNESS T	BODY WIDTH W	ANGLE	DRILL CAP	PREVIOUS MODEL		
ZT562	10-32	9/32"	2-5/8"	3-7/16"	5-11/16"	1/4"	7/8"	30° R.H.	1/8"	ZT513		
	1/4"-28							30° L.H.		ZT514		
ZT563	10-32		3-3/64"	3-13/16"				STRAIGHT		ZT515		
	1/4"-28		2-5/8"	3-7/16"				30° R.H.		ZT713		
ZT561	10-32							3-3/64"		3-13/16"	30° L.H.	ZT714
	1/4"-28		STRAIGHT	ZT715								
ZT762	10-32		1-13/16"	2-5/8"	3-7/16"			1-13/16"	1/4"	7/8"	1/8"	
ZT763	1/4"-28											
ZT761	10-32											
	1/4"-28											

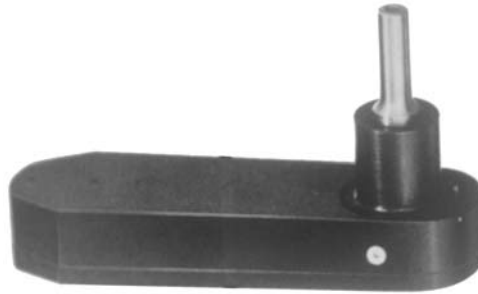
ZT561, ZT562 & ZT563 Angle drill illustrated, are also available as ZT761, ZT762 & ZT763 see reference L1 dimension for difference.

For 1/4-28 Spindle thread add -C to the part numbers above



**ZT528**  
**180° Flat Offset Angle Drill**  
**Heavy Duty**

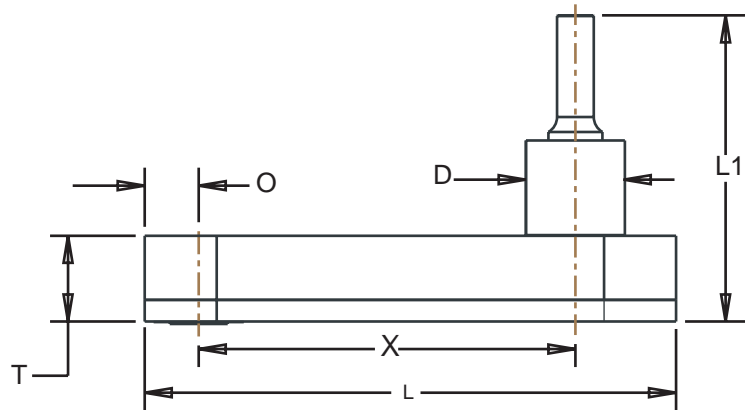
Drills offset for those places inaccessible for ordinary drills. Housings encase heat treated gears, with shafts hardened and precision ground to take the toughest task with ease.



ZT528



MOUNTING ADAPTER  
 FOR  
 ZT528



MODEL	SPINDLE THREAD	SPINDLE OFFSET O	DRILL OFFSET X	OVERALL LENGTH L	LENGTH SHORT END L1	BODY THICKNESS T	MOUNT DIAMETER D	MAX.REC. CAP.
ZT528-B	5/16"-24	3/8"	2-5/8"	3-11/16"	2-1/8"	5/8"	11/16"	5/16"
ZT528-C	1/4"-28							

MOUNTING ADAPTER FOR MODEL ZT528 SEE PAGE C2



## ZT535/ZT622/ZT721/ZT733 180° Flat Offset Angle Drill

Offset drills for those "hard to get at" areas. Heat treated gears, Hardened and precision ground shafts, make this tool acceptable for the toughest jobs,



ZT622  
REVERSE SPINDLE TYPE

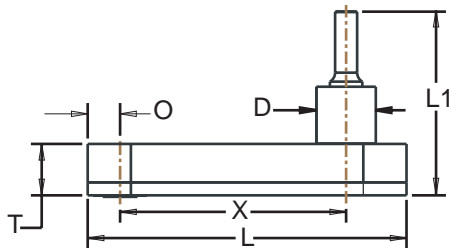
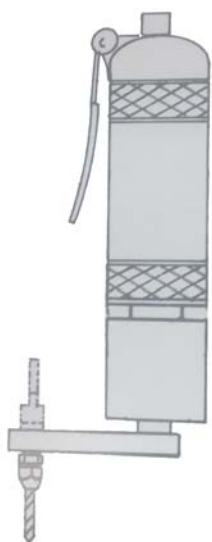


ZT535



ZT721

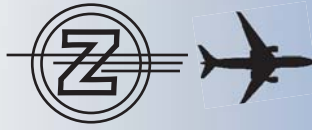
ZT733



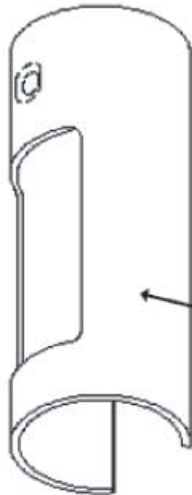
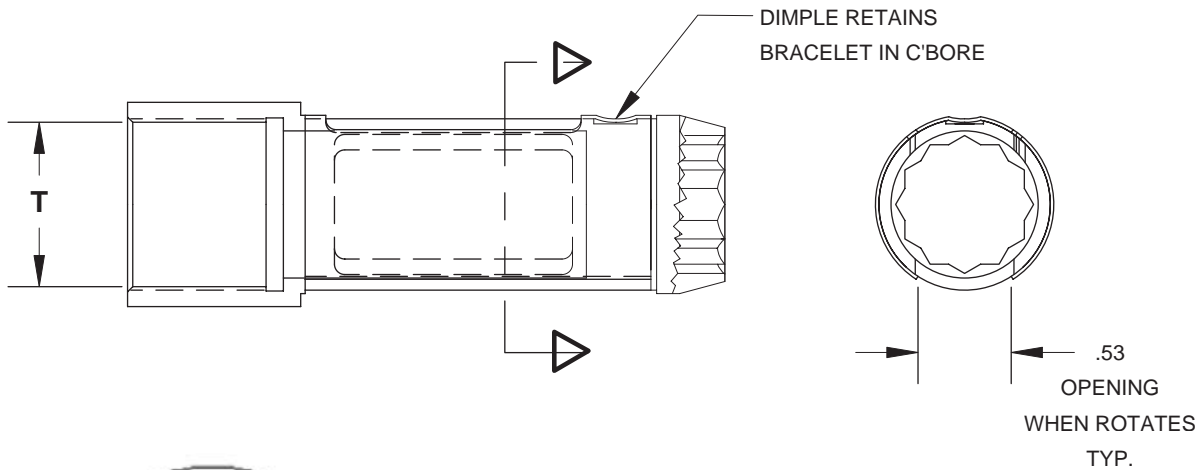
MODEL	SPINDLE THREAD	SPINDLE OFFSET O	DRILL OFFSET X	OVERALL LENGTH L	LENGTH SHORT END L <sub>1</sub>	BODY THICKNESS T	MOUNT DIAMETER D	MAX.REC. CAP.
ZT535-C	1/4-28"	5/16"	3-13/16"	4-35/64"	1-61/64"	17/32"	11/16"	1/4"
ZT535-D	#10-32							
ZT535-G	#5-40							
ZT622-C	1/4-28"	5/16"	3-1/8"	3-7/8"	1-61/64"	17/32"	11/16"	1/4"
ZT622-D	#10-32							
ZT622-G	#5-40							
ZT721-C	1/4-28"	5/16"	2-29/64"	3-13/64"	1-15/16"	1/2"	11/16"	1/4"
ZT721-D	#10-32							
ZT721-G	#5-40							
ZT733-C	1/4-28"	5/16"	2-15/32"	3-7/32"	1-13/16"	3/8"	11/16"	3/16"
ZT733-D	#10-32							
ZT733-G	#5-40							

DRILL ADAPTERS FOR THESE ANGLE DRILLS SEE PAGE A17





## ZT627AD Motor Adapters High Speed Angle Drill Attachments



The ZT627AD Motor Adapters are designed to be used in conjunction with ZEPHYR's hex body flat offset angle drill attachments and the BOEING quick change chuck.

Features include:

- Threads directly onto your pneumatic drill.
- 11/16" 12 point hex.
- Safely Sleeve that protects the user from the rotating drive shaft and quick change chuck.

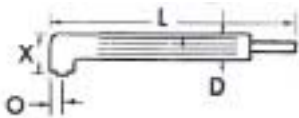
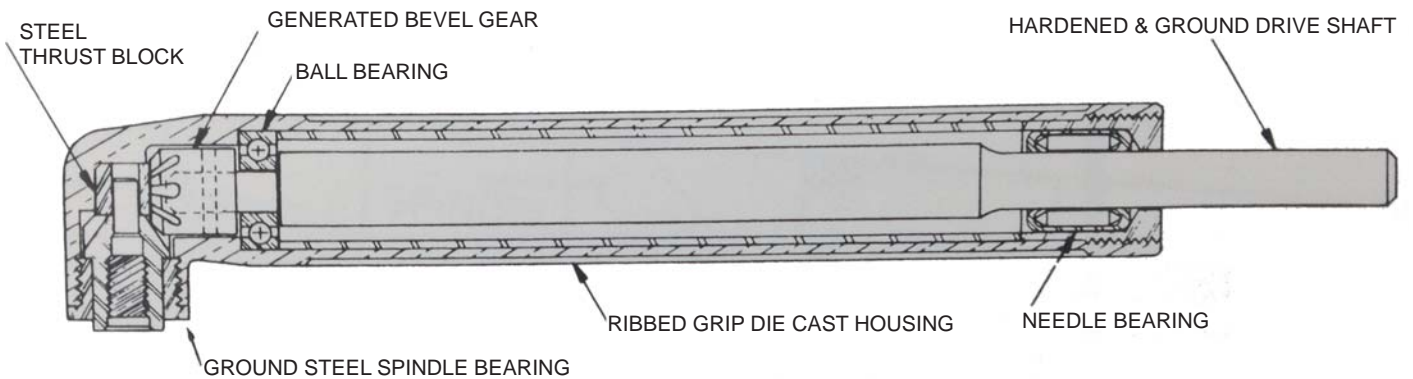
Model Number	Motor Thread	Overall Length	Adapter Hex	Body Diameter	Motor Model
ZT627AD	1"-20 LH	3.450"	11/16" 12 Point	1.030"	Dotco
ZT627AD-1.25	1-1/4-18- LH	3.165"	11/16" 12 Point	1.030"	Ingersoll-Rand
ZT627AD-M36	M36X1.5 LH	3.340"	11/16" 12 Point	1.030"	Atlas Copco LBB36



**ZT417**  
**Angle Drills**  
**90° Light Duty**



These small, compact drills are designed for extra "Tight" spots. They are similar in construction to the larger models except that, because of mechanical limitations, a ground steel spindle bearing is used instead of a radial thrust ball bearing.

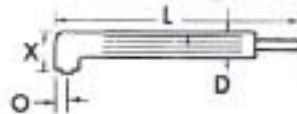
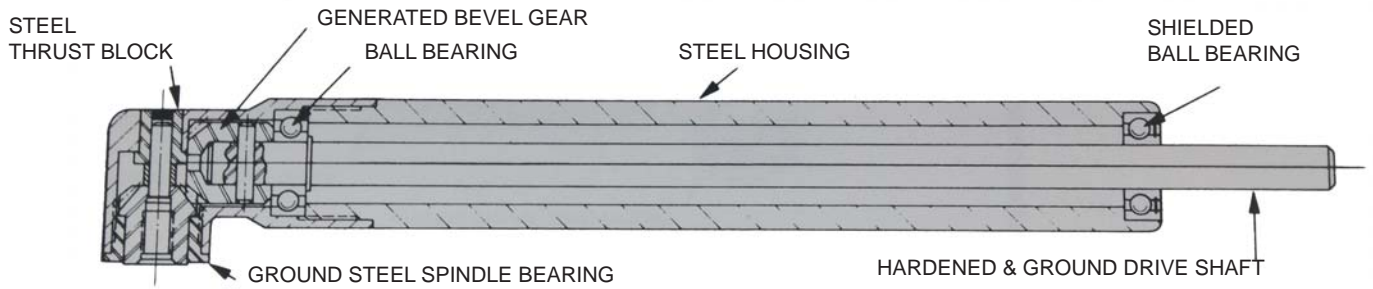


MODEL	SPINDLE THREAD	SPINDEL OFFSET O	LENGTH SHORT END X	LENGTH OVERALL L	BODY DIAMETER D	MAXIMUM DRILL CAPACITY
ZT417-C	1/4-28	17/64"	27/32"	5-5/8"	5/8"	1/8"
ZT417-C-QC	1/4-28	17/64"	27/32"	5-15/16"	5/8"	1/8"
ZT417-D	10-32	17/64"	27/32"	5-5/8"	5/8"	1/8"
ZT417-D-QC	10-32	17/64"	27/32"	5-15/16"	5/8"	1/8"



**ZT613**  
**Angle Drills**  
**90° Light Duty**

Constructed with an all steel housing to permit the use of larger, stronger gears and increased drill capacity, without sacrificing the overall size as offered in other Zephyr light duty drills.



MODEL	SPINDLE THREAD	SPINDLE OFFSET O	DRILL OFFSET X	OVERALL LENGTH L	BODY DIAMETER D	MAX.DILL. CAP.
ZT613-C	1/4"-28"	5/16"	29/32"	7-3/16"	1-61/64"	3/16"
ZT613-D	#10-32					
ZT613-F	9/32"-40					

OTHER SPINDLE SIZES ON REQUEST

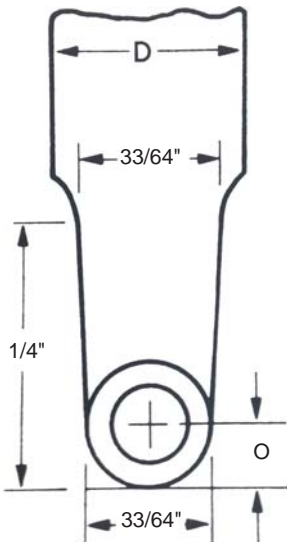
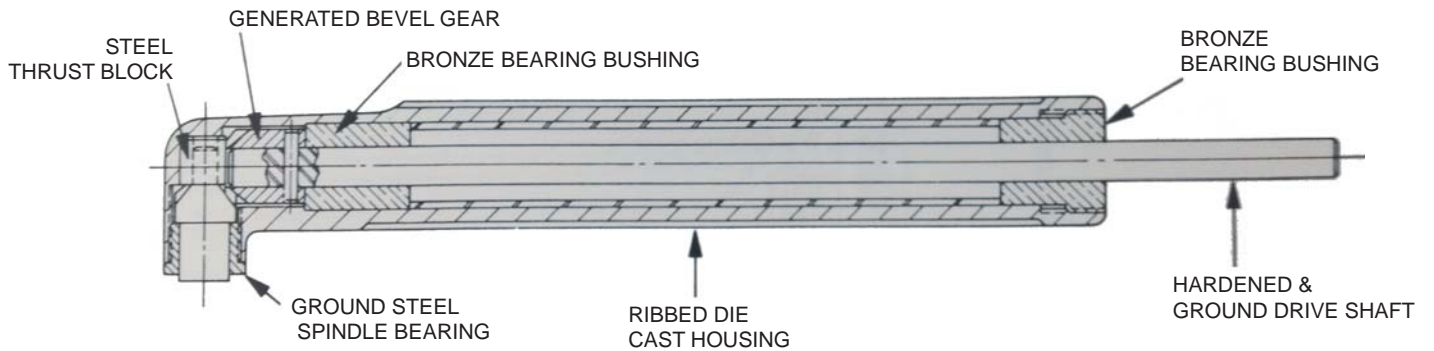


**ZT616**  
**Angle Drills**  
**90 Light Duty**

THE MIDGET DRILL THAT DOES A "BIG" JOB!

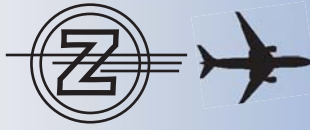


Designed primarily for use in limited spaces... this unit features a greatly reduced 90 degree end section plus all the advantages of other Zephyr light duty drills.



MODEL	SPINDLE THREAD	SPINDEL OFFSET O	LENGTH SHORT END X	LENGTH OVERALL L	BODY DIAMETER D	MAXIMUM DRILL CAPACITY
ZT616D	10-32	13/64"	25/32"	5-5/8"	5/8"	1/8"



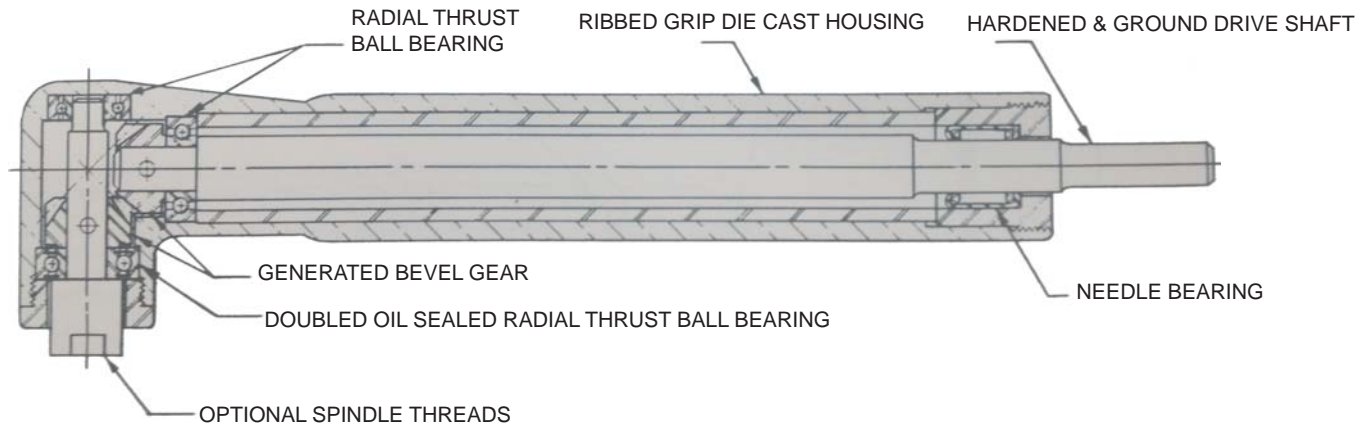


**ZT219**  
**Angle Drills**  
**90° Standard Duty**

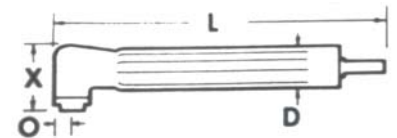


ZT219

These tools are considered as the "Standard Duty" size by most users. They incorporate the finest of mechanical design and construction that it is possible to pack into their physical dimensions.



MODEL	SPINDLE THREAD	SPINDLE OFFSET O	DRILL OFFSET X	OVERALL LENGTH L	BODY DIAMETER D	MAX.DILL. CAP.
ZT219-B	5/16"-24					
ZT219-C	1/4"-28	13/32"	1-11/16"	7-3/8"	7/8"	3/8"
ZT219-D	10-32					



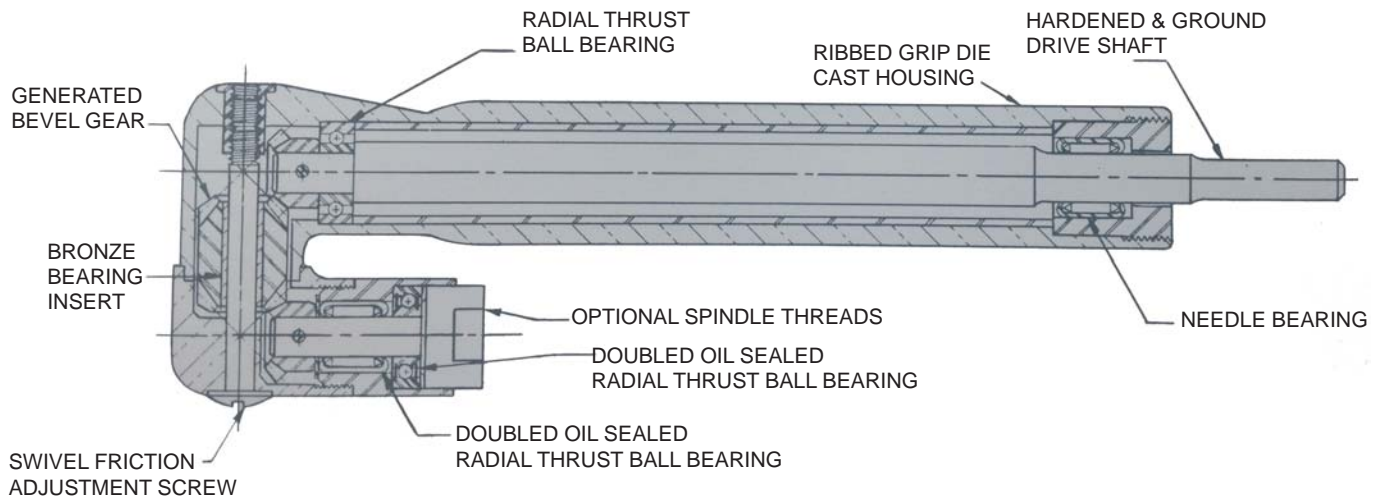


**ZT246**  
**Angle Drills**  
**360° Standard Duty**

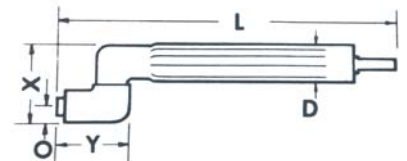


ZT246

A truly "all angle" 360° swivel heat type of tool designed for all standard duty drilling operations. Incorporates the same fine workmanship and design features as other Zephyr Tools.



MODEL	SPINDLE THREAD	SPINDLE OFFSET O	LENGTH SHORT END X	OVERALL LENGTH L	BODY DIAMETER D	OFFSET LENGTH Y	MAX.DILL. CAP.
ZT246-B	5/16"-24	3/8"	2.00"	8-9/16"	7/8"	2.00"	3/8"
ZT246-C	1/4"-28						
ZT246-D'	#10-32						



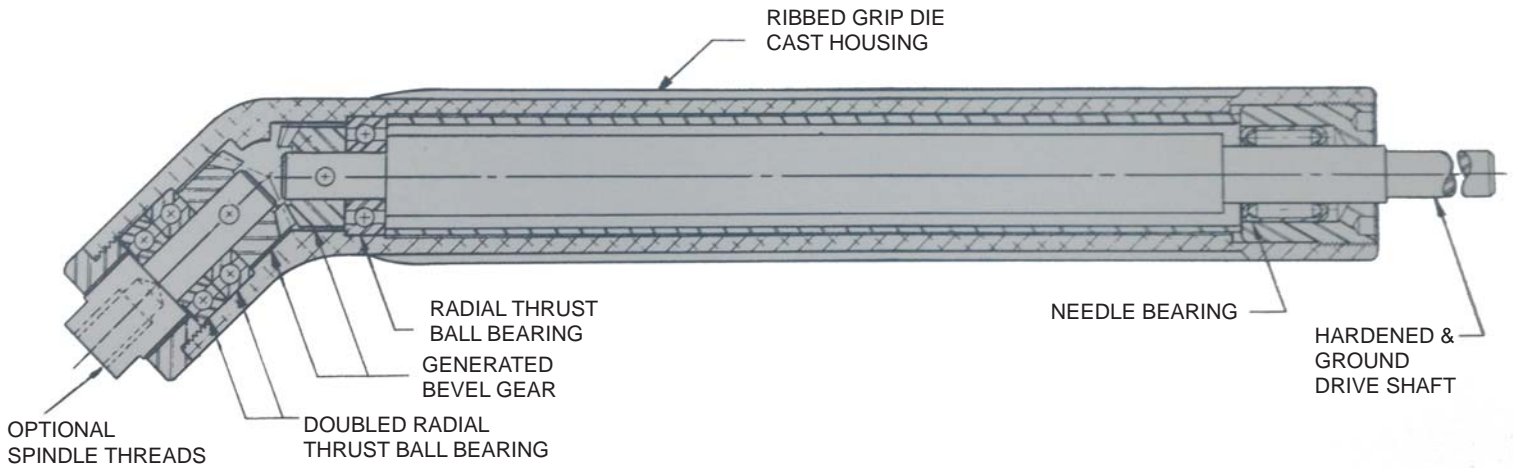


**ZT220**  
**Angle Drills**  
**45° Standard Duty**

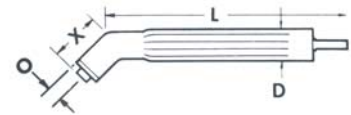


ZT220

This 45° angle head is the accepted "Standard Duty" size. Its conservative design and precision workmanship assure long and satisfactory service.

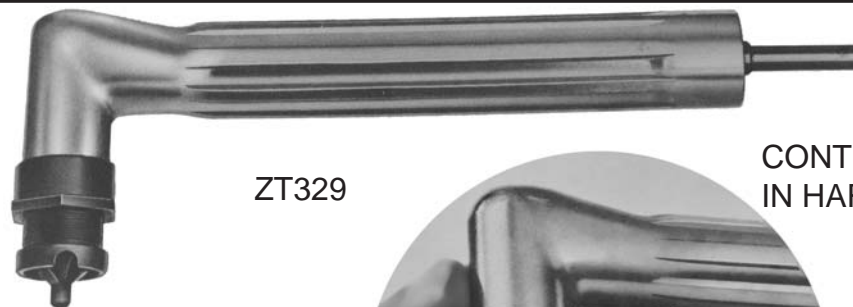


MODEL	SPINDLE THREAD	SPINDLE OFFSET O	LENGTH SHORT END X	OVERALL LENGTH L	BODY DIAMETER D	MAX.DILL. CAP.
ZT220-B	5/16"-24					
ZT220-C	1/4"-28	13/32"	1-3/8"	7-7/8"	7/8"	3/8"
ZT220-D	#10-32					



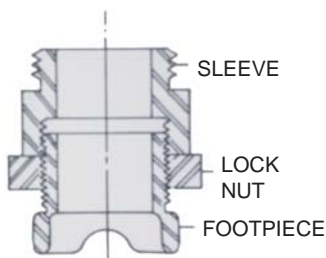
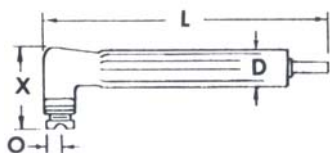


## ZT329 Angle Drills 90° Standard Duty



ZT329

CONTROLS CUTTING DEPTH  
IN HARD TO REACH PLACES



MODEL	ATTACHMENT	FITS ANGLE DRILL	SPINDLE THREAD	O	MIN. X	MAX. X	L	D
ZT329-A*	ZT329042	ZT219C	1/4"-28	15/32"	2-3/32"	2-1/4"	7-3/8"	7/8"
ZT329-B*	ZT329041							
ZT329-C*	ZT329043							
ZT329-D*	ZT329044							
ZT418-D*	ZT418040	ZT417	#10-32	5/16"	1-1/4"	1-7/16"	5-5/8"	5/8"

(\*COMPLETE TOOL # (INCLUDES ANGLE HEAD))



USE ON MODEL #	CUTTER DIAMETER	When ordering these integral pilot cutters, specify, dash number and pilot diameter required: Example: ZT264-26-5/32	CUTTER THREAD	CUTTER NUMBER					No. OF FLUTES	USED ON
				78°	82°	100°	110°	115°		
ZT329-A	7/16"		1/4"-28	ZT264-24	ZT264-25	ZT264-26	ZT264-27	ZT264-45	3	STAINLESS
ZT329-B	1/2"			ZT264-28	ZT264-29	ZT264-30	ZT264-31	ZT264-46		
ZT329-C	7/16"			ZT170-24	ZT170-25	ZT170-26	ZT170-27	ZT170-45		
ZT329-D	1/2"			ZT170-28	ZT170-29	ZT170-30	ZT170-31	ZT170-46		
ZT418-D	9/32"		#10-32	ZT297-10	ZT297-11	ZT297-12	ZT297-13	ZT297-14		
		Pilot Hole								
ZT418-D	9/32"	5/64" - (.078)**	#10-32	ZT290-10	ZT290-11	ZT290-12	ZT290-13	ZT290-14	2	ALUMINUM
				ZT291-10	ZT291-11	ZT291-12	ZT291-13	ZT291-14	3	STAINLESS

USE PILOT #ZT292 (SPECIFY HEAD DIAMETER) USED ON ZT290, ZT291, CUTTERS

EXAMPLE: ZT290-12-5/32

ALSO AVAILABLE: RIVET SHAVING CARBIDE CUTTERS, FOR USE WITH ZT329

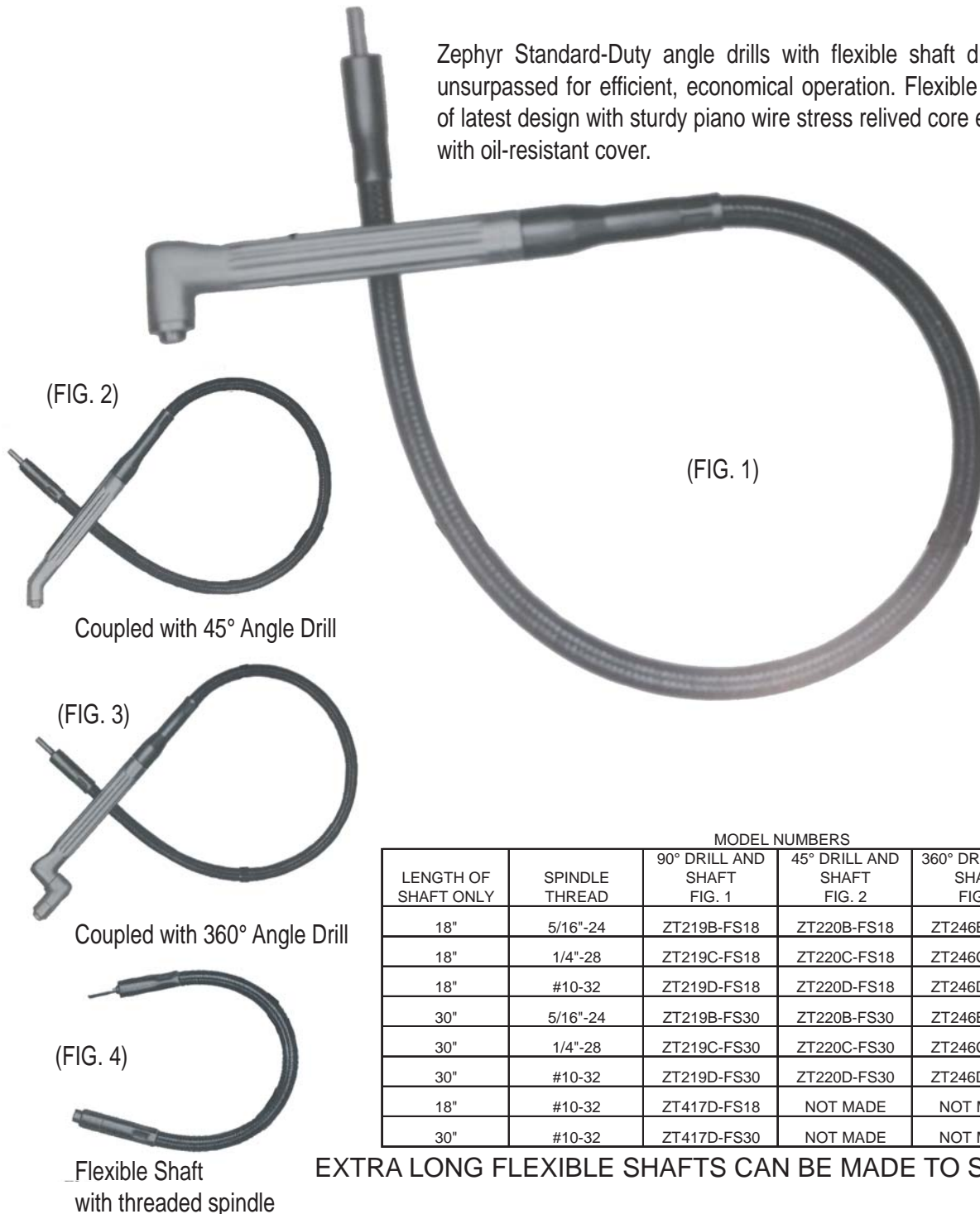
TO ORDER, SPECIFY ZT270 7/16" OR 1/2" DIAMETER





## Flexible Shaft Angle Drills

Zephyr Standard-Duty angle drills with flexible shaft drive are unsurpassed for efficient, economical operation. Flexible shaft is of latest design with sturdy piano wire stress relieved core encased with oil-resistant cover.



(FIG. 2)

Coupled with 45° Angle Drill

(FIG. 3)

Coupled with 360° Angle Drill

(FIG. 4)

Flexible Shaft  
with threaded spindle

(FIG. 1)

MODEL NUMBERS

LENGTH OF SHAFT ONLY	SPINDLE THREAD	90° DRILL AND SHAFT FIG. 1	45° DRILL AND SHAFT FIG. 2	360° DRILL AND SHAFT FIG. 3	SHAFT ONLY WITH THREADED FIG. 4
18"	5/16"-24	ZT219B-FS18	ZT220B-FS18	ZT246B-FS18	ZT195B-FS18
18"	1/4"-28	ZT219C-FS18	ZT220C-FS18	ZT246C-FS18	ZT195C-FS18
18"	#10-32	ZT219D-FS18	ZT220D-FS18	ZT246D-FS18	ZT195D-FS18
30"	5/16"-24	ZT219B-FS30	ZT220B-FS30	ZT246B-FS30	ZT195B-FS30
30"	1/4"-28	ZT219C-FS30	ZT220C-FS30	ZT246C-FS30	ZT195C-FS30
30"	#10-32	ZT219D-FS30	ZT220D-FS30	ZT246D-FS30	ZT195D-FS30
18"	#10-32	ZT417D-FS18	NOT MADE	NOT MADE	NOT MADE
30"	#10-32	ZT417D-FS30	NOT MADE	NOT MADE	NOT MADE

EXTRA LONG FLEXIBLE SHAFTS CAN BE MADE TO SPECIAL ORDER



**Collet Chuck & Drill Adapters**



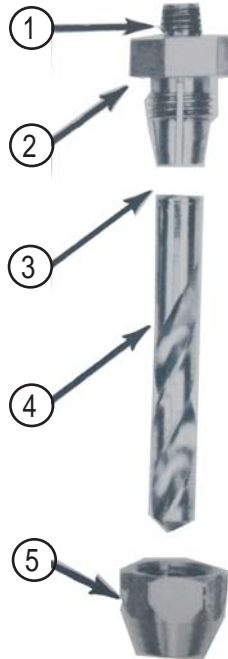
Optional thread sizes for most Angle Drills.

Hexagon nut for quick spindle tightening.

Accurately bored collet assures drill concentricity.

Precision collet design provides for firm grip on broken drills.

Collet nut tightly and securely locks collet.



**This amazing tool solves several drill problems:**  
 Saves time and is easy to use does not gall drill shank  
 Increases life of drills two or three times  
 Nothing to wear out  
 Reduce costs  
 In some plants the savings on drill costs alone have paid for these adaptors the first day

DRILL CAPACITY	SPINDLE THREAD	COLLET CHUCK MODEL NUMBER
#50- 9/32"	#10-32	ZT41D (SPECIFY DRILL DIA.)
#50- 3/8"	1/4"-28	ZT41C (SPECIFY DRILL DIA.)
#50- 1/2"	5/16"-24	ZT41B (SPECIFY DRILL DIA.)

EXAMPLE FOR ORDERING: ZT41D-1/8  
 LARGER SIZES MADE TO ORDER

# Microstop Countersink Cages, Countersink Cutters, and Accessories





## **ZT680 HEAVY DUTY HIGH SPEED MICROSTOP COUNTERSINK CAGES**

### **SIMPLICITY - ACCURACY - DEPENDABILITY**

**ZEPHYR's** new ZT680 Series Microstop Cage has been designed for continuous operation at any speed up to 10,000 rpm in the most demanding applications. This makes them well suited for all metallic, graphite and composite materials used in the airframe industry today. The ZT680 series cage offers .0005 inch depth adjustment and is available with a full range of footpieces and standard 1/4" round, three-flats or quick change shafts. Quality standards have been held to insure the highest levels of accuracy and performance.



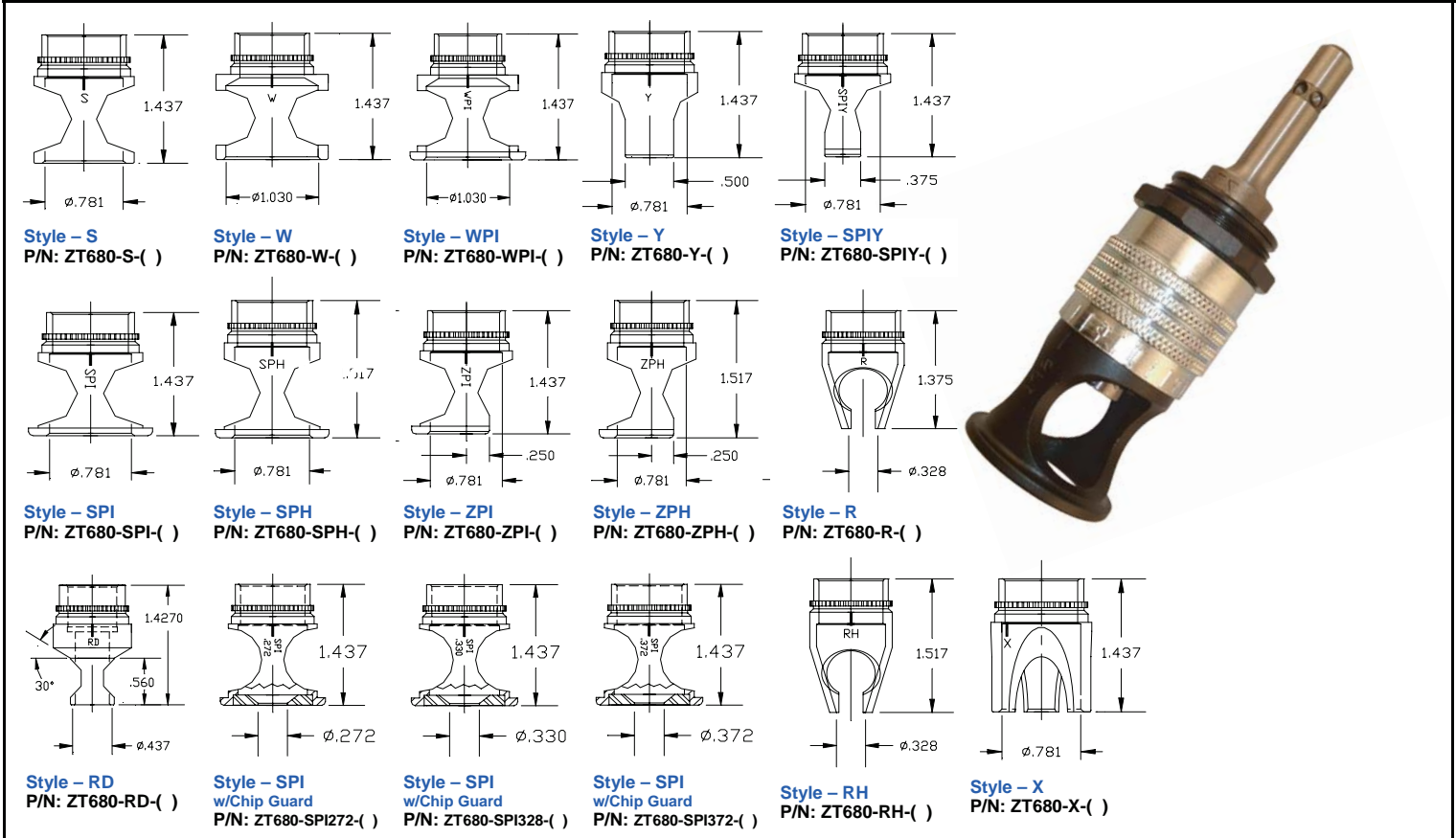
#### **Features Include:**

- Heavy duty - Compact size.
- Full ball bearing design supports all radial and thrust loads at speeds up to 10,000 rpm.
- .0005 inch incremental depth adjustment.
- Fail safe positive stop design insures accurate repeatability and eliminates any possibility of work piece damage.
- Built-in felt dust shield eliminates composite/graphite dust contamination of the radial ball bearings, significantly extending product life.
- 1/4" shaft travel
- Improved thrust system, significantly increases the run time between adjustments and product life.
- Left hand threaded hex lock ring eliminates any possibility of inadvertent resetting of primary adjustment.
- Available with standard 1/4-28 and on request 6mm internally threaded shafts.
- 3/4" diameter cutter capacity with standard "S" footpieces and 1" cutter capacity with wide "W" footpieces.

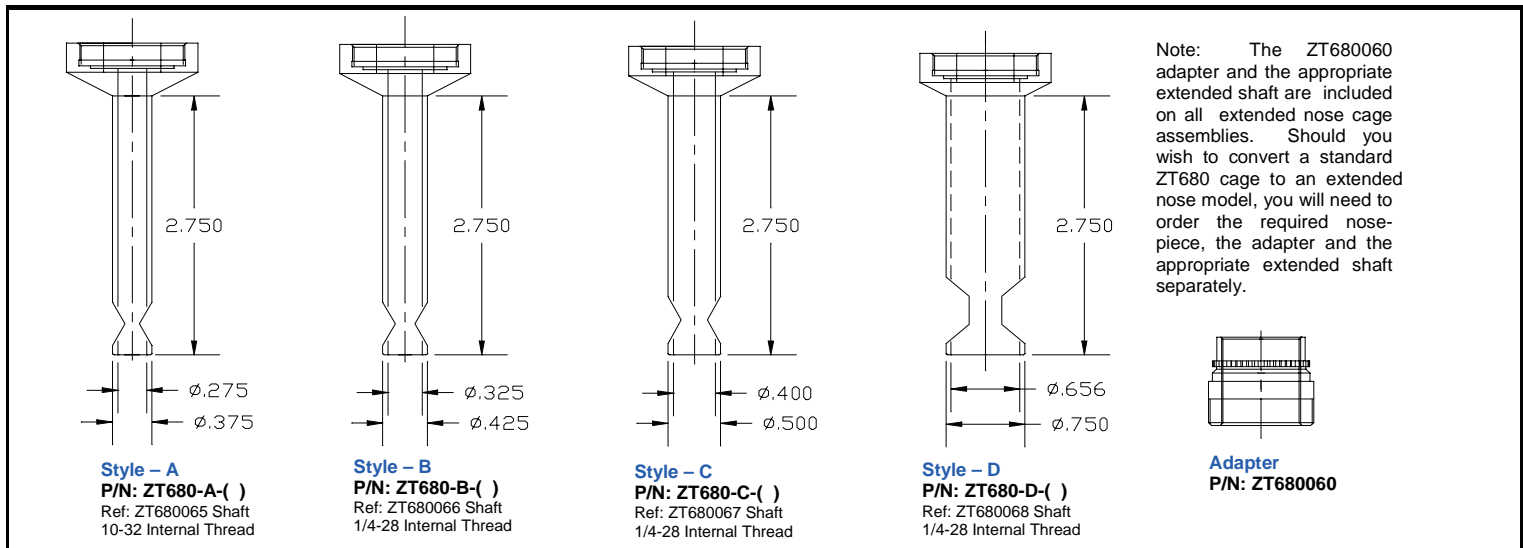


## ZT680 Series Microstop Countersink Cage Product Data Sheet

ZT680 Footpiece Style Chart (To the part numbers below add the shaft syle, QC=Quick Change, TF=1/4" Round w/Three Flats, no suffix =1/4" Round)



### ZT680 Extended Nose Footpiece Style Chart

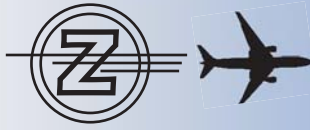




## ZT680 Features and Benefits

### Compared to Standard Competitors

ZT680	Competition	ZT680 Benefit
Depth adjustment: 0.0005" increments	Depth adjustment: 0.001" increments	Increased accuracy of cut depth
Heavy-duty design and construction	Medium-duty design and construction	Stronger, longer lasting tool
Maximum cutter diameter: 1.0"	Maximum cutter diameter: 0.75"	More cutter versatility
Available shafts: Round, 3-Flat and Quick-Change	Available shafts: Round	Greater adaptability
Available internal cutter threads: 1/4-28 & 6mm	Available internal cutter threads: 1/4-28	Greater adaptability
Matched ball-bearing design	Brass bushing	Improved radial support, and less heat generation
Rotation speed up to 10,000 RPM	Rotation speed up to 3,000	Better match to standard 6,000 RPM tool motors, and is ideally suited for PCD cutting tools
Integral bearing composite dust shield	No barrier	Excellent for composite applications
Footpiece heat treated and polished	Footpiece polished	Scratch-resistant foot surface
Tested to 360K cycles with no depth of cut variation	Up to 20K cycles with no depth of cut variation	Excellent in high production environment where 100% perfect countersink cuts are required
Hex lock ring	Knurled lock ring	Improved mechanical tightening capability
Proprietary thrust-bearing	Standard thrust-bearing	Ensures accurate cut repeatability, reducing time consuming adjustments, and increasing tool life
Fail-safe positive stop design	Fail-safe positive stop design	Eliminates damage to workpiece



**ZT680-V**  
**VACUUM ATTACHMENT**

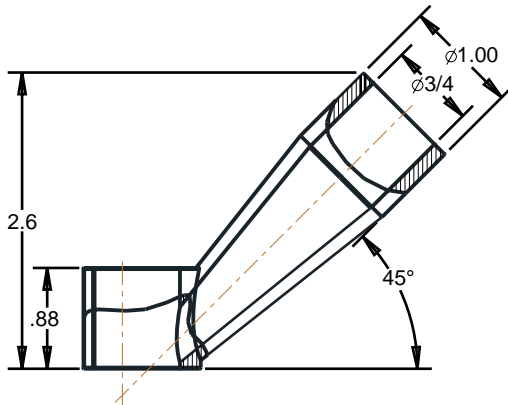
**NEW**



**Fits our**  
**ZT680**  
**Microstops**  
**also fits "ANY" cage**  
**of 1.00" Diameter**



ZEPHYR is pleased to offer its new ZT680-V Vacuum Attachment for use on its high speed, close tolerance, series Microstops. Specifically designed for ease of use when vacuum of composite dust or chips is required. The new ZT680-V offers durability, efficiency and lower cost when compared to other metal fabricated attachments.



Fits the following styles:

Microstops Series	Footpiece Style	Shaft Style
ZT680	- S -	- TF, QC, ( )PLAIN
	- SPH -	
	- SPI -	
	- SP-S -	
	- SP-N -	
	- Y -	
	- Z -	
	- ZPH -	
- ZPI -		



## ZT691/ZT692 High Speed Precision Microstop Cage

The ZT691/ZT692 series microstop cages have been designed for continuous operation at any speed up to 6,000 rpm in the most demanding applications. This makes them well suited for metallic, graphite and composite materials used in the airframe industry today. The ZT691/ZT692 series cages offer .0005" depth adjustment and are available with a full range of footpieces. Quality standards have been held to insure the highest levels of accuracy and performance.

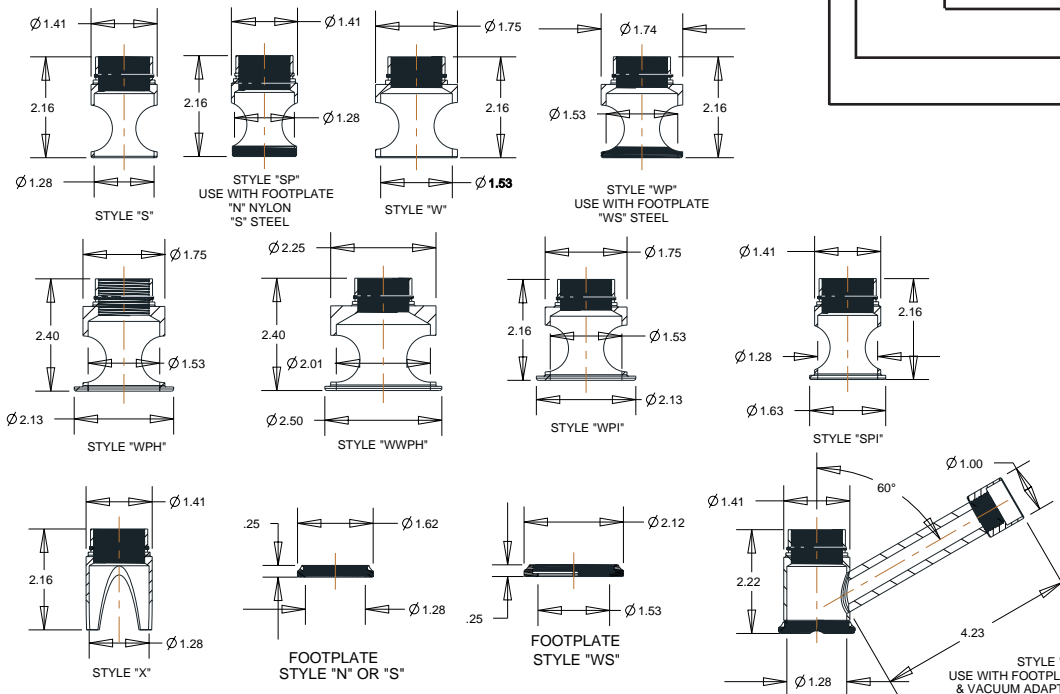
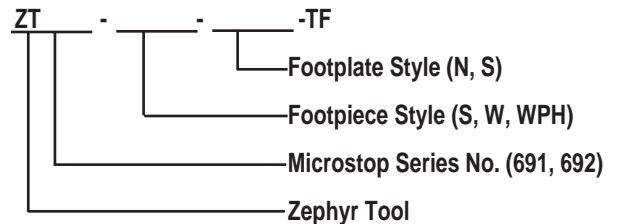
### Features Include:

- Heavy duty construction.
- Full ball bearing design supports all radial and thrust loads at speeds up to 6,000 rpm.
- Improved thrust system significantly increase the run time between adjustments and product life,
- .0005" incremental depth adjustment
- Fail safe positive stop design insures accurate repeatability and eliminates any possibility of work piece damage.
- 1" to 2" cutter capacity,
- Drive shafts are available with 3/8" round (no suffix), 3/8" round with three flats (-TF) recommended.
- 7/16" shaft travel.
- The internal thread for the ZT691 series is 3/8"-24 and for the ZT692 series it is 7/16"-20.



Sample shown:  
ZT692-SPI-TF

### ORDERING INFORMATION:



Model Number	Shaft Thread	Cutter Capacity
ZT691-S-TF	3/8"-24	1.25
ZT691-SPI-TF	3/8"-24	1.25
ZT691-W-TF	3/8"-24	1.50
ZT691-WPI-TF	3/8"-24	1.50
ZT691-WPH-TF	3/8"-24	1.50

Model Number	Shaft Thread	Cutter Capacity
ZT692-S-TF	7/16"-20	1.25
ZT692-SPI-TF	7/16"-20	1.25
ZT692-W-TF	7/16"-20	1.50
ZT692-WPI-TF	7/16"-20	1.50
ZT692-WWPH-TF	7/16"-20	2.00
ZT692-WPH-TF	7/16"-20	1.50
ZT692-WWPH-TF	7/16"-20	2.00





## ZT691/ZT692 Features and Benefits

### Compared to Standard ZT673/ZT334

ZT691/ZT692	ZT673/673	ZT691 / ZT692 Benefits
Improved ball bearing design for greater support	Ball bearing design for better radial support	Improved run time at high spindle speeds
Integral bearing composite dust shield	No barrier	Excellent for composite applications
Proprietary thrust-bearings	Standard thrust-bearings	Ensures accurate countersink cut repeatability reducing time consuming re-adjustments, and increasing tool life
Superior repeatability minimizes variations in depth of cut	Good repeatability with no depth of cut variation	Excellent in high production environments where 100% perfect countersinks cuts are required
Footpiece heat treated and polished	Footpiece polished	Scratch-resistant foot surface
Fail-safe positive stop design	Fail-safe positive stop design	Eliminates damage to workpiece
Depth adjustment: 0.0005" increments Same	Depth adjustment: 0.0005" increments	Accuracy required for today's assemblies
1" to 2" cutter capacity	1" to 1 1/2" cutter capacity	Great cutter versatility
Same capacity and travel in a short over all length	No comparison	Easier to handle and control
Available internal cutter threads: 3/8-24 & 7/16-20	Available internal cutter threads: 3/8-24 & 7/16-20	Same versatile holding method
Available Shafts: Round with 3-Flats	Available Shafts: Round with 3-Flats	Same great holding method



## ZT355, ZT357, ZT358 Series Long Travel Microstop Countersink Cages

**Zephyr** specially designed long travel microstops for use with Taper Lock drill reamers.

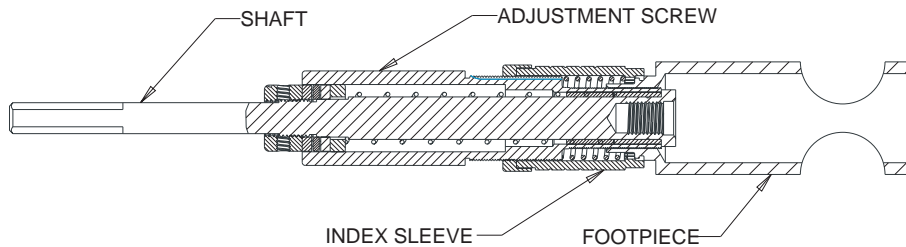
### Features

- Positive non-slip lock ring adjusts without tools.
- Specific types and sizes for every purpose.
- Micrometer dial type adjustment sleeve.
- Spring loaded retractable type shaft.
- Heavy duty enclosed ball thrust bearing.
- Microstop depth adjustment .001.

**ZT355** series for use with 1/8" & 5/32" diameter standard taper-  
 lok drill-reamers.

**ZT357** series for use with 3/16" diameter standard taper-  
 lok drill-reamers.

**ZT358** series for use with the larger diameter standard taper-  
 lok drill-reamers.



MICRO-STOP C'SINK	SHAFT THREAD	OVERALL LENGTH	INCHES OF TRAVEL	ADJUSTMENT	CROSS REFERENCE	
					BRILES	NSN
ZT355	1/4"-28	5-3/8"	3/4"	1/4	TLA4900-12	N/A
ZT357	1/4"-28	7-7/16"	1-1/2"	1/4	TLA4900-24	5133-00-838-2500
ZT358	7/16"-20	12-1/4"	2-3/8"	1/2	TLA4900-38	5133-00-838-2503



## ZT663 Series

# High Speed Microstop Countersink Cage

**Zephyr's** new High Speed Microstop has been precision machined and designed for continuous operation at speeds up to 10,000 rpm without overheating. For use in countersinking various metals and the latest graphite and composite materials, this new cage is available with a full range of footpieces and either standard 1/4", three-flat or quick-change shafts. Design requirements have been held to exacting standards for the most demanding requirements.

**Features include:**

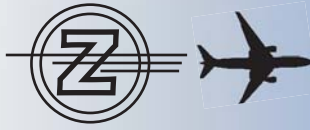
- Full ball bearings for continuous high speed use.
- Compact size.
- Internal spline design to eliminate chip clogging.
- .0005 inch incremental depth adjustment.
- Positive stop to connect shaft to eliminate work piece damage.
- Left hand threaded knurled lock ring to eliminate any possibility of inadvertent resetting of primary adjustment.
- Available with 1/4 - 28 and 6mm threaded shaft.
- 9/32" shaft travel.
- 5/8" diameter cutter capacity with standard foot pieces. 7/8" with "W" footpiece.
- Micrometer dial type adjustment sleeve.



ZT663

**Ordering Information:**

ZT663 - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
 FOOTPIECE      FOOTPLATE      SHAFT  
 STYLE      (IF APPLICABLE)      STYLE



## Microstop Countersinks

type for every use  
**SIMPLICITY**  
**ACCURACY**  
**DEPENDABILITY**

All **Zephyr** Microstop Countersinks have the same basic design and adjustment features. All are precision machined and designed for continuous high speed, heavy duty operation without overheating.

ZT331-S



ZT330-S



ZT330-SP

ZT334-W

ZT331-SP

ZT338

ZT341

ZT339



## Microstop Countersinks

### ADJUSTMENT WITHOUT TOOLS.....



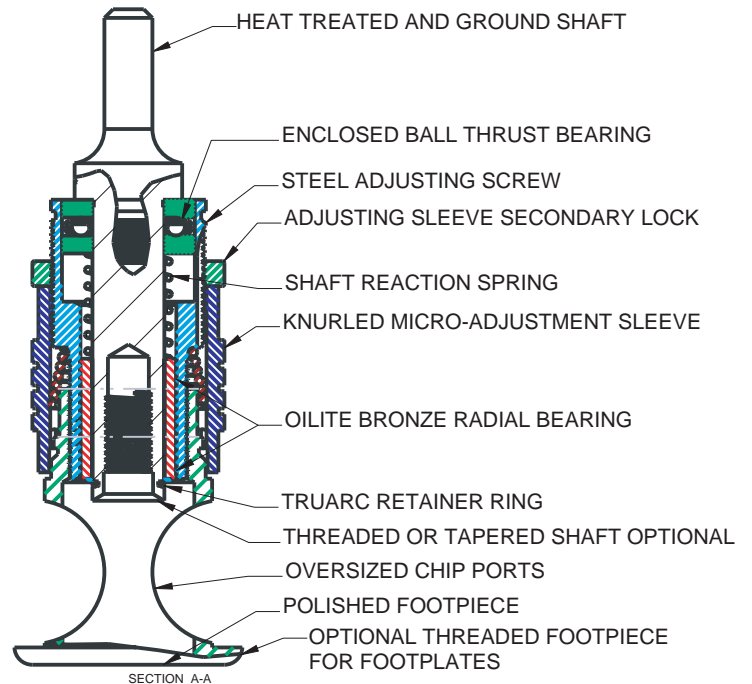
POSITIVE NON-SLIP LOCK

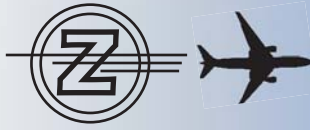
**Zephyr** Micrometer Countersinks are made in several models and styles - All incorporate the same basic adjustment features and positive lock design, plus a secondary lock protection - Footpieces for all conditions are readily interchangeable, thus making all models truly universal in their application - Enclosed ball thrust bearings plus bronze radial bearing permit sustained high speed heavy duty operation without overheating.

- 1** Knurled locking ring provides secondary locking, completely eliminating all possibility of inadvertent re-setting of primary adjustment.
- 2** Knurled adjusting sleeve with micrometer-type dial, calibrated in increments of .001" ... provides instant and positive setting to any cutter depth desired plus automatic locking.

#### DESIGN FEATURES

- Positive non-slip locking, adjusts without tools
- Specific types and sizes for every purpose
- Micrometer dial type adjustment sleeve
- Spring loaded retractable type shaft
- Polished steel footpieces or optional screw-on nylon or steel footplate
- Heavy duty enclosed ball thrust bearing
- Oversize radial bronze bearing





## Microstop Countersinks Standard Models

MODEL  
ZT330-S



SHAFT TRAVEL 9/32"  
ADJUSTMENT 5/16"

MODEL  
ZT331-S



SHAFT TRAVEL 1/2"  
ADJUSTMENT 1"

MODEL  
ZT334-W



SHAFT TRAVEL 1/2"  
ADJUSTMENT 1"



Style "S"



Style "W"



Style "Y"



Style "R"



Style "SP"



Style "WP"

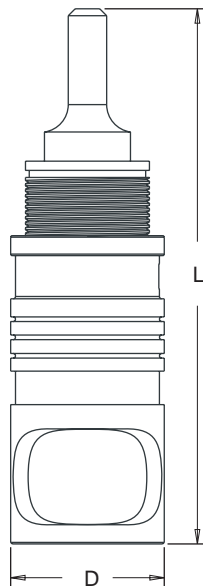


Style "X"



Style "Z"

The eight types of footpieces for each model will fill all needs. Footpieces styles "SP" and "WP" are available with either a hardened and polished steel footplate or a nylon screw on type protective footplate which helps to eliminate surface



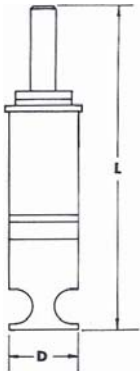
MODEL NO.	D	L	MAX. CUT DIA.	SHAFT THREAD
ZT330-S	.87	3 9/16	5/8	1/4"-28
ZT330-W	1.00	3 9/16	3/4	1/4"-28
ZT330-X	.87	3 9/16	5/8	1/4"-28
ZT330-Y	.87	3 9/16	5/8	1/4"-28
ZT330-Z	.87	3 9/16	5/8	1/4"-28
ZT330-R	.45	3 9/16	5/16	1/4"-28
ZT330-SP	1.25	3 9/16	5/8	1/4"-28
ZT330-WP	1.25	3 9/16	3/4	1/4"-28
ZT331-S	1.11	5 15/16	7/8	3/8"-24
ZT331-W	1.62	5 15/16	1 3/8	3/8"-24
ZT331-X	1.11	5 15/16	7/8	3/8"-24
ZT331-Y	1.11	5 15/16	7/8	3/8"-24
ZT331-Z	1.11	5 15/16	7/8	3/8"-24
ZT331-SP	1.13	5 15/16	7/8	3/8"-24
ZT331-WP	1.87	5 15/16	1 3/8	3/8"-24
ZT334-S	1.11	5 15/16	7/8	7/16"-20
ZT334-W	1.75	5 15/16	1 1/2	7/16"-20
ZT334-X	1.11	5 15/16	7/8	7/16"-20
ZT334-Y	1.11	5 15/16	7/8	7/16"-20
ZT334-Z	1.11	5 15/16	7/8	7/16"-20
ZT334-SP	1.37	5 15/16	7/8	7/16"-20
ZT334-WP	2.00	5 15/16	1 1/2	7/16"-20



## MICROSTOP COUNTERSINKS

### BASIC DESIGN

- Precision manufactured** for trouble-free operation.
- Complete, interchangeable** parts - low maintenance.
- Positive nonslip locking**, adjusts without tools.
- Micrometer dial type** adjustment sleeve.
- Spring loaded**, retractable type shaft.
- Hardened and polished** steel foot pieces.
- Heavy duty** enclosed ball thrust bearing.
- Oversize radial** bronze bearing.



### MODEL ZT345-S



### New Midget Model

For close quarter operations

All Zephyr Micro Stop Countersinks have the same basic design and adjustment features. All are precision machined and designed for continuous high speed, heavy duty operation without overheating.

MODEL	D	L	CUTTER THREAD	MAX CUTTER DIA.	CUTTER PART NO.
ZT345-S	.687	3-3/16"	1/4"-28	7/16"	ZT150 ZT154 ZT164 ZT170
ZT345-SP	.687	3-3/16"	1/4"-28	3/8"	ZT172 ZT184 ETC.

Also available as Model 345-SP with threaded footpiece and a hardened and polished, screw on type footplate.

SHAFT TRAVEL 7/32"

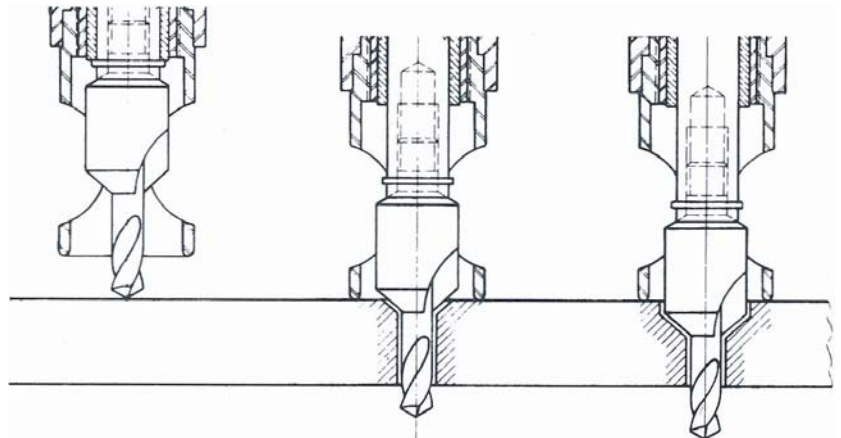
ADJUSTMENT 3/8"

### MODEL ZT338



### Special 9/16" Long Stroke Unit

For use with ZT184 and ZT185 Cutters  
Permits full retraction of Drill-Countersink cutter  
Also permits full extension for Drill-Countersink cutter



Other styles of footpieces such as illustrated on page B11 are also available for the ZT338 unit.



**MICROSTOP COUNTERSINKS**  
**Special Purpose Tools**

**BASIC DESIGN**

ALL ZEPHYR MICRO STOP COUNTERSINKS have the same basic design and adjustment features. All are precision machined and designed for continuous high speed, heavy duty operation without overheating.

**Extended Footpiece Type**  
**Model ZT284**

MODEL #:	CUTTER THREAD	MAX. CUTTER DIA.	B	C
ZT284-A	10-32	.250	.275	.375
ZT284-B	1/4-28	.300	.325	.425
ZT284-C	1/4-28	.375	.400	.500
ZT284-D	1/4-28	.562	.656	.750

INTEGRAL PILOT CUTTERS					
MODEL #	78°	82°	100°	110°	115°
ZT284-A	ZT285-15	ZT285-16	ZT285-17	ZT285-18	ZT285-19
ZT284-B	ZT286-15	ZT286-16	ZT286-17	ZT286-18	ZT286-19
ZT284-C	ZT154-20	ZT154-21	ZT154-22	ZT154-23	ZT154-24
ZT284-D	ZT154-25	ZT154-26	ZT154-28	ZT154-28	ZT154-29

When ordering Cutters please specify dash number and Pilot Diameter.  
 Example: ZT285-17-1/8

**Precision manufactured**  
 For trouble-free operation.

**Completely interchangeable**  
 parts - low maintenance.

**Positive nonslip locking**  
 adjusts without tools.

**Micrometer dial type**  
 adjustment sleeve.

**Spring loaded**, retractable  
 type shaft.

**Hardened and polished steel**  
 foot pieces.

**Heavy duty enclosed ball**  
 thrust bearing.

**Oversize radial bronze** bearing.







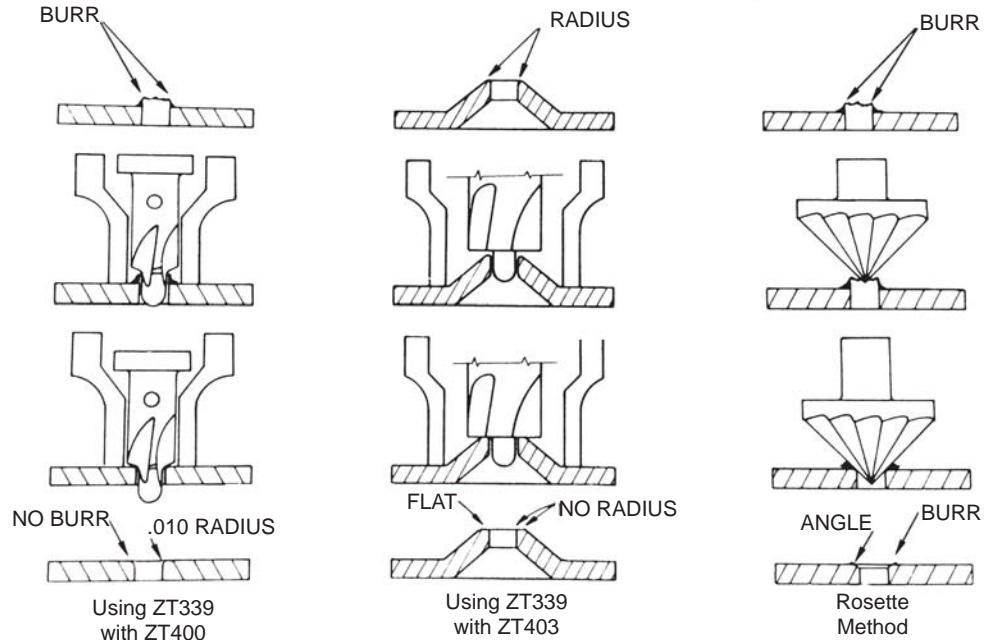
## MICRO STOP COUNTERSINKS SPECIAL PURPOSE TOOLS

MODEL  
ZT339



SHAFT TRAVEL= 3/32"  
ADJUSTMENT = 5/16"

### PRECISION DEBURRING OR SPOTFACING For us with ZT400 and ZT403 Cutters.

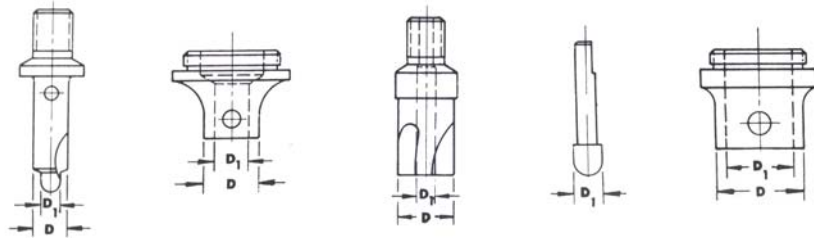


Solves the problems of sheet cracking when dimpling titanium's and other exotic materials. Accurately controls the depth of cut and radius with positive non-slip lock



ZT400

THREADS  
1/4-28 RH

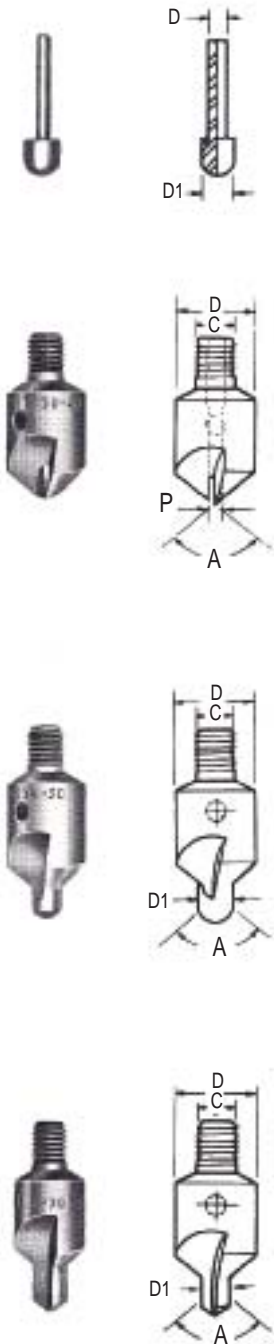


CUTTER			FOOTPIECE		CUTTER			PILOT		FOOTPIECE			
TOOL NO.	D1	D	PART NUMBER	D1	D	TOOL NO.	D1	D	PART NUMBER	D1	PART NUMBER	D1	D
ZT400-00	.054	.167	ZT339010	.173	.296	ZT403-3	.078	.160	ZT309-3/32	.092	ZT339031	.219	.335
ZT400-0	.069	.167	ZT339010	.173	.296	ZT 403-4	.078	.210	ZT309-1/8	.123	ZT339032	.266	.390
ZT400-1	.097	.167	ZTJ39010	.173	.296	ZT403-5	.125	.315	ZT309-5/32	.154	ZT339033	.375	.500
ZT400-3	.127	.198	ZT339011	.204	.327	ZT403-5	.125	.315	ZT309 #8	.164	ZT339033	.375	.500
ZT400-5	.158	.230	ZT339012	.236	.359	ZT403-6	.125	.360	ZT309-3/16	.187	ZT339034	.422	.550
ZT400-7	.172	.240	ZT339013	.246	.369	ZT403-6	.125	.360	ZT309-1/4	.248	ZT339035	.547	.672
ZT400-9	.190	.260	ZT339014	.266	.389	ZT403-6	.125	.360	ZT309-5/16	.310	ZT339035	.547	.672
ZT400-11	.227	.295	ZT339015	.301	.424								
ZT400-13	.249	.319	ZT339016	.325	.448								
ZT400-15	.280	.348	ZTJ39017	.354	.477								
ZT400-17	.311	.382	ZTJ39018	.388	.512								
ZT400-21	.135	.205	ZT339021	.211	.336								
ZT400-23	.151	.221	ZT339023	.227	.352								
ZT400-25	.204	.274	ZT339025	.280	.405								

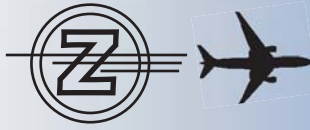


## MICRO STOP COUNTERSINKS CUTTERS AND PILOTS

For ALUMINUM AND DURAL... These two-flute cutters are precision ground with perfect cutting edges for chatterless countersinking. Easily resharpened

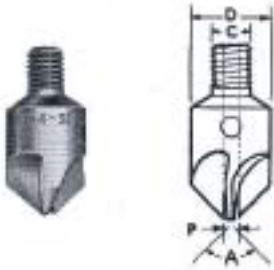


Pilot Number	Shank Diameter	Head Diameter D1 + .000 - .001	Cutter in which Used							
			Cutter Number							
Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number						
				100° A	78° A	82° A	110° A	115° A		
	D	P	C							
ZT300	5/64"	When ordering specify head diameter desired example ZT300-1/8	ZT150 with 5/64" Pilot Hole							
ZT301	1/8"		ZT150 with 1/8" Pilot Hole							
ZT302	3/16"		ZT150 with 5/64" Pilot Hole							
ZT330	1/4"	5/64"	1/4"-28	ZT150-17	ZT150-15	ZT150-16	ZT150-18	ZT150-19		
	3/8"	5/64"	1/4"-28	ZT150-22	ZT150-20	ZT150-21	ZT150-23	ZT150-44		
	5/16"	5/64"	1/4"-28	ZT150-12	ZT150-10	ZT150-11	ZT150-13	ZT150-14		
	7/16"	5/64"	1/4"-28	ZT150-26	ZT150-24	ZT150-25	ZT150-27	ZT150-45		
	1/2"	5/64"	1/4"-28	ZT150-30	ZT150-28	ZT150-29	ZT150-31	ZT150-46		
	1/2"	1/8"	1/4"-28	ZT150-42	ZT150-40	ZT150-41	ZT150-43	ZT150-49		
	9/16"	1/8"	1/4"-28	ZT150-58	ZT150-56	ZT150-57	ZT150-59	ZT150-60		
5/8"	1/8"	1/4"-28	ZT150-52	ZT150-50	ZT150-51	ZT150-53	ZT150-54			
ZT331	3/4"	3/16"	3/8"-24	ZT152-21	ZT152-19	ZT152-20	ZT152-22	ZT152-23		
	7/8"	3/16"	3/8"-24	ZT152-26	ZT152-24	ZT152-25	ZT152-27	ZT152-33		
	1"	3/16"	3/8"-24	ZT152-36	ZT152-34	ZT152-35	ZT152-37	ZT152-38		
	1-1/8"	3/16"	3/8"-24	ZT152-41	ZT152-39	ZT152-40	ZT152-42	ZT152-43		
	1-1/4"	3/16"	3/8"-24	ZT152-46	ZT152-44	ZT152-45	ZT152-47	ZT152-48		
	1-3/8"	3/16"	3/8"-24	ZT152-51	ZT152-49	ZT152-50	ZT152-52	ZT152-53		
ZT331	7/8"	3/16"	7/16"-20	ZT151-26	ZT151-24	ZT151-25	ZT151-27	ZT151-33		
	1"	3/16"	7/16"-20	ZT151-36	ZT151-34	ZT151-35	ZT151-37	ZT151-38		
	1-1/8"	3/16"	7/16"-20	ZT151-41	ZT151-39	ZT151-40	ZT151-42	ZT151-43		
	1-1/4"	3/16"	7/16"-20	ZT151-46	ZT151-44	ZT151-45	ZT151-47	ZT151-48		
	1-3/8"	3/16"	7/16"-20	ZT151-51	ZT151-49	ZT151-50	ZT151-52	ZT151-53		
	1-1/2"	3/16"	7/16"-20	ZT151-56	ZT151-54	ZT151-55	ZT151-57	ZT151-58		
ZT330	1/4"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT154-20-1/8	1/4"-28	ZT154-17	ZT154-15	ZT154-16	ZT154-18	ZT154-19		
	3/8"		1/4"-28	ZT154-22	ZT154-20	ZT154-21	ZT154-23	ZT154-44		
	5/16"		1/4"-28	ZT154-12	ZT154-10	ZT154-11	ZT154-13	ZT154-14		
	7/16"		1/4"-28	ZT154-26	ZT154-24	ZT154-25	ZT154-27	ZT154-45		
	1/2"		1/4"-28	ZT154-30	ZT154-28	ZT154-29	ZT154-31	ZT154-46		
	9/16"		1/4"-28	ZT154-58	ZT154-56	ZT154-57	ZT154-59	ZT154-60		
5/8"	1/4"-28		ZT154-49	ZT154-47	ZT154-48	ZT154-50	ZT154-51			
ZT331	3/4"		When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT155-20-1/8	3/8"-24	ZT156-21	ZT156-19	ZT156-20	ZT156-22	ZT156-23	
	7/8"			3/8"-24	ZT156-26	ZT156-24	ZT156-25	ZT156-27	ZT156-33	
	1"			3/8"-24	ZT156-36	ZT156-34	ZT156-35	ZT156-37	ZT156-38	
	1-1/8"			3/8"-24	ZT156-41	ZT156-39	ZT156-40	ZT156-42	ZT156-43	
	1-1/4"			3/8"-24	ZT156-46	ZT156-44	ZT156-45	ZT156-47	ZT156-48	
	1-3/8"	3/8"-24		ZT156-51	ZT156-49	ZT156-50	ZT156-52	ZT156-53		
ZT334	7/8"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT155-20-1/8		7/16"-20	ZT153-26	ZT153-24	ZT153-25	ZT153-27	ZT153-33	
	1"			7/16"-20	ZT153-36	ZT153-34	ZT153-35	ZT153-37	ZT153-38	
	1-1/8"			7/16"-20	ZT153-41	ZT153-39	ZT153-40	ZT153-42	ZT153-43	
	1-1/4"			7/16"-20	ZT153-46	ZT153-44	ZT153-45	ZT153-47	ZT153-48	
	1-3/8"			7/16"-20	ZT153-51	ZT153-49	ZT153-50	ZT153-52	ZT153-53	
	1-1/2"			7/16"-20	ZT153-56	ZT153-54	ZT153-55	ZT153-57	ZT153-58	
ZT330	3/8"		When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT155-20-1/8	1/4"-28	ZT155-22	ZT155-20	ZT155-21	ZT155-23	ZT155-44	
	7/16"			1/4"-28	ZT155-26	ZT155-24	ZT155-25	ZT155-27	ZT155-45	
	1/2"			1/4"-28	ZT155-30	ZT155-28	ZT155-29	ZT155-31	ZT155-46	
	5/8"			1/4"-28	ZT155-49	ZT155-47	ZT155-48	ZT155-50	ZT155-51	
ZT331	7/8"			When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT155-20-1/8	3/8"-24	ZT176-26	ZT176-24	ZT176-25	ZT176-27	ZT176-33
	1"				3/8"-24	ZT176-36	ZT176-34	ZT176-35	ZT176-37	ZT176-38
	1-1/8"	3/8"-24			ZT176-41	ZT176-39	ZT176-40	ZT176-42	ZT176-43	

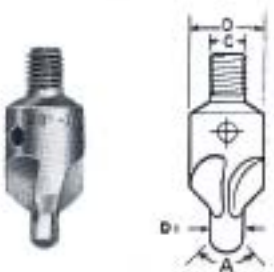


## MICRO STOP COUNTERSINKS CUTTERS AND PILOTS

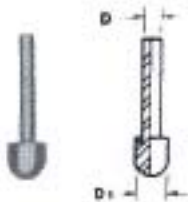
For STAINLESS STEEL AND TITANIUM...These three-flute cutters are made from special steel and are specially heat treated for efficient cutting of Stainless steel and titanium.



**Removable Pilot Type  
for Stainless Steel  
and Titanium**



**Integral Pilot Type  
for Stainless Steel  
and Titanium**



**Hardened  
Countersink Cutter Pilots**

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number				
	D	P	C	100° A	78° A	82° A	110° A	115° A
ZT330	1/4"	5/64"	1/4"-28	ZT164-17	ZT164-15	ZT164-16	ZT164-18	ZT164-19
	3/8"	5/64"	1/4"-28	ZT164-22	ZT164-20	ZT164-21	ZT164-23	ZT164-44
	5/16"	5/64"	1/4"-28	ZT164-12	ZT164-10	ZT164-11	ZT164-13	ZT164-14
	7/16"	5/64"	1/4"-28	ZT164-26	ZT164-24	ZT164-25	ZT164-27	ZT164-45
	1/2"	5/64"	1/4"-28	ZT164-30	ZT164-28	ZT164-29	ZT164-31	ZT164-46
	1/2"	1/8"	1/4"-28	ZT164-42	ZT164-40	ZT164-41	ZT164-43	ZT164-49
	9/16"	1/8"	1/4"-28	ZT164-58	ZT164-56	ZT164-57	ZT164-59	ZT164-60
	5/8"	1/8"	1/4"-28	ZT164-52	ZT164-50	ZT164-51	ZT164-53	ZT164-54
ZT331	3/4"	3/16"	3/8"-24	ZT165-21	ZT165-19	ZT165-20	ZT165-22	ZT165-23
	7/8"	3/16"	3/8"-24	ZT165-26	ZT165-24	ZT165-25	ZT165-27	ZT165-33
	1"	3/16"	3/8"-24	ZT165-36	ZT165-34	ZT165-35	ZT165-37	ZT165-38
	1-1/8"	3/16"	3/8"-24	ZT165-41	ZT165-39	ZT165-40	ZT165-42	ZT165-43
	1-1/4"	3/16"	3/8"-24	ZT165-46	ZT165-44	ZT165-45	ZT165-47	ZT165-48
	1-3/8"	3/16"	3/8"-24	ZT165-51	ZT165-49	ZT165-50	ZT165-52	ZT165-53
	1-1/2"	3/16"	3/8"-24	ZT165-56	ZT165-54	ZT165-55	ZT165-57	ZT165-58
ZT331	7/8"	3/16"	7/16"-20	ZT163-26	ZT163-24	ZT163-25	ZT163-27	ZT163-33
	1"	3/16"	7/16"-20	ZT163-36	ZT163-34	ZT163-35	ZT163-37	ZT163-38
	1-1/8"	3/16"	7/16"-20	ZT163-41	ZT163-39	ZT163-40	ZT163-42	ZT163-43
	1-1/4"	3/16"	7/16"-20	ZT163-46	ZT163-44	ZT163-45	ZT163-47	ZT163-48
	1-3/8"	3/16"	7/16"-20	ZT163-51	ZT163-49	ZT163-50	ZT163-52	ZT163-53
	1-1/2"	3/16"	7/16"-20	ZT163-56	ZT163-54	ZT163-55	ZT163-57	ZT163-58
	ZT330	1/4"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT154-20-1/8	1/4"-28	ZT170-17	ZT170-15	ZT170-16	ZT170-18
3/8"		1/4"-28		ZT170-22	ZT170-20	ZT170-21	ZT170-23	ZT170-44
5/16"		1/4"-28		ZT170-12	ZT170-10	ZT170-11	ZT170-13	ZT170-14
7/16"		1/4"-28		ZT170-26	ZT170-24	ZT170-25	ZT170-27	ZT170-45
1/2"		1/4"-28		ZT170-30	ZT170-28	ZT170-29	ZT170-31	ZT170-46
9/16"		1/4"-28		ZT170-58	ZT170-56	ZT170-57	ZT170-59	ZT170-60
5/8"		1/4"-28		ZT170-49	ZT170-47	ZT170-48	ZT170-50	ZT170-51
ZT331	3/4"	3/8"-24		ZT171-21	ZT171-19	ZT171-20	ZT171-22	ZT171-23
	7/8"	3/8"-24		ZT171-26	ZT171-24	ZT171-25	ZT171-27	ZT171-33
	1"	3/8"-24		ZT171-36	ZT171-34	ZT171-35	ZT171-37	ZT171-38
	1-1/8"	3/8"-24		ZT171-41	ZT171-39	ZT171-40	ZT171-42	ZT171-43
	1-1/4"	3/8"-24		ZT171-46	ZT171-44	ZT171-45	ZT171-47	ZT171-48
	1-3/8"	3/8"-24		ZT171-51	ZT171-49	ZT171-50	ZT171-52	ZT171-53
ZT334	7/8"	7/16"-20		ZT174-26	ZT174-24	ZT174-25	ZT174-27	ZT174-33
	1"	7/16"-20	ZT174-36	ZT174-34	ZT174-35	ZT174-37	ZT174-38	
	1-1/8"	7/16"-20	ZT174-41	ZT174-39	ZT174-40	ZT174-42	ZT174-43	
	1-1/4"	7/16"-20	ZT174-46	ZT174-44	ZT174-45	ZT174-47	ZT174-48	
	1-3/8"	7/16"-20	ZT174-51	ZT174-49	ZT174-50	ZT174-52	ZT174-53	
	1-1/2"	7/16"-20	ZT174-56	ZT174-54	ZT174-55	ZT174-57	ZT174-58	

Pilot Number	Shank Diameter	Head Diameter D1 +.000 -.001	Cutter in which Used
ZT300	5/64"	When ordering specify head diameter desired	ZT164 with 5/64" Pilot Hole
ZT301	1/8"	example ZT300-1/8	ZT164 with 1/8" Pilot Hole
ZT302	3/16"		ZT165 with 5/64" Pilot Hole



## MICRO STOP COUNTERSINKS CUTTERS AND PILOTS

### CUTTERS

These cutters with solid carbide heads are designed for use in microstop countersink units. They have been specifically designed for use in countersinking of stainless steel, inconel and titanium alloys.



**Carbide Tipped Removable Pilot Countersink Cutters**

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number				
	D	P	C	100° A	78° A	82° A	110° A	115° A
ZT330	3/8"	5/64"	1/4"-28	ZT350-22	ZT350-20	ZT164-21	ZT164-23	ZT164-44
	7/16"	5/64"	1/4"-28	ZT350-26	ZT350-24	ZT164-25	ZT164-27	ZT164-45
	1/2"	5/64"	1/4"-28	ZT350-30	ZT350-28	ZT164-29	ZT164-31	ZT164-46
	1/2"	1/8"	1/4"-28	ZT350-42	ZT350-40	ZT164-41	ZT164-43	ZT164-49
ZT331	5/8"	1/8"	1/4"-28	ZT350-52	ZT350-50	ZT164-51	ZT164-53	ZT164-54
	7/8"	3/16"	3/8"-24	ZT352-26	ZT352-24	ZT352-25	ZT352-27	ZT352-33
	1"	3/16"	3/8"-24	ZT352-36	ZT352-34	ZT352-35	ZT352-37	ZT352-38
	1-1/8"	3/16"	3/8"-24	ZT352-41	ZT352-39	ZT352-40	ZT352-42	ZT352-43
	1-1/4"	3/16"	3/8"-24	ZT352-46	ZT352-44	ZT352-45	ZT352-47	ZT352-48
1-3/8"	3/16"	3/8"-24	ZT352-51	ZT352-49	ZT352-50	ZT352-52	ZT352-53	

Note: MAXIMUM NON CUTTING (DEAD CENTER) DIAMETER 1/32" LARGER THAN PILOT HOLE. USE CUTTERS WITH PILOT HOLE A MINIMUM OF 1/32" SMALLER THAN DESIRED PILOT DIAMETER.



**Carbide Tipped Integral Pilot Countersink Cutters**

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number				
	D	P	C	100° A	78° A	82° A	110° A	115° A
ZT330	3/8"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT154-20-1/8	1/4"-28	ZT354-22	ZT354-20	ZT354-21	ZT354-23	ZT354-44
	7/16"		1/4"-28	ZT354-26	ZT354-24	ZT354-25	ZT354-27	ZT354-45
	1/2"		1/4"-28	ZT354-30	ZT354-28	ZT354-29	ZT354-31	ZT354-46
	5/8"		1/4"-28	ZT354-49	ZT354-47	ZT354-48	ZT354-50	ZT354-51
ZT331	7/8"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT154-20-1/8	3/8"-24	ZT356-26	ZT356-24	ZT356-25	ZT356-27	ZT356-33
	1"		3/8"-24	ZT356-36	ZT356-34	ZT356-35	ZT356-37	ZT356-38
	1-1/8"		3/8"-24	ZT356-41	ZT356-39	ZT356-40	ZT356-42	ZT356-43
	1-1/4"		3/8"-24	ZT356-46	ZT356-44	ZT356-45	ZT356-47	ZT356-48
	1-3/8"		3/8"-24	ZT356-51	ZT356-49	ZT356-50	ZT356-52	ZT356-53



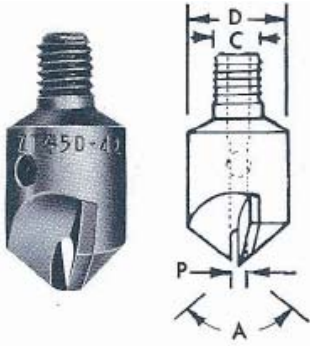
**Hardened Countersink Cutter Pilots**

Pilot Number	Shank Diameter	Head Diameter D1 +.000 -.001	Cutter in which Used
ZT300	5/64"	When ordering specify head diameter desired example ZT300-1/8	ZT350 with 5/64" Pilot Hole
ZT301	1/8"		ZT350 with 1/8" Pilot Hole
ZT302	3/16"		ZT352 with 5/64" Pilot Hole

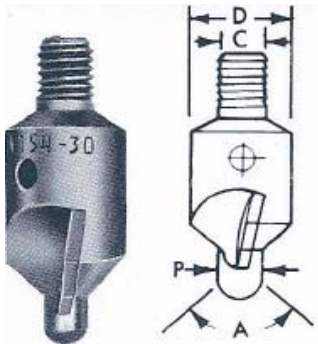


## MICRO STOP COUNTERSINKS CUTTERS AND PILOTS

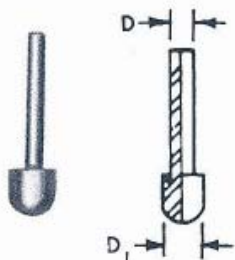
### CUTTERS



**Carbide Insert  
Removable Pilot  
Countersink Cutters**



**Carbide Insert  
Integral Pilot  
Countersink Cutters**



**Hardened  
Countersink Cutter Pilots**

These carbide cutters are designed for use in microstop countersink units. They have been specifically designed for use in countersinking of stainless steel, inconel and titanium alloys.

Used on Countersink Model	Cutter Diameter D	Pilot Hole Diameter P	Cutter Thread C	Cutter Number				
				100° A	78° A	82° A	110° A	115° A
ZT330	7/16"	5/64"	1/4"-28	ZT450-26	ZT450-24	ZT450-25	ZT450-27	ZT450-45
	1/2"	5/64"	1/4"-28	ZT450-30	ZT450-28	ZT450-29	ZT450-31	ZT450-46
	1/2"	1/8"	1/4"-28	ZT450-42	ZT450-40	ZT450-41	ZT450-43	ZT450-49
	5/8"	1/8"	1/4"-28	ZT450-52	ZT450-50	ZT450-51	ZT450-53	ZT450-54
ZT331	3/4"	3/16"	3/8"-24	ZT452-21	ZT452-19	ZT452-20	ZT452-22	ZT452-23
	7/8"	3/16"	3/8"-24	ZT452-26	ZT452-24	ZT452-25	ZT452-27	ZT452-33
	1"	3/16"	3/8"-24	ZT452-36	ZT452-34	ZT452-35	ZT452-37	ZT452-38
	1-1/8"	3/16"	3/8"-24	ZT452-41	ZT452-39	ZT452-40	ZT452-42	ZT452-43
	1-1/4"	3/16"	3/8"-24	ZT452-46	ZT452-44	ZT452-45	ZT452-47	ZT452-48
	1-3/8"	3/16"	3/8"-24	ZT452-51	ZT452-49	ZT452-50	ZT452-52	ZT452-53

Note: MAXIMUM NON CUTTING (DEAD CENTER) DIAMETER 1/32" LARGER THAN PILOT HOLE.  
USE CUTTERS WITH PILOT HOLE A MINIMUM OF 1/32" SMALLER THAN DESIRED PILOT DIAMETER.

ZT450 & 452 SERIES  
78°, 110° & 115° MADE TO ORDER ONLY

Used on Countersink Model	Cutter Diameter D	Pilot Hole Diameter P	Cutter Thread C	Cutter Number				
				100° A	78° A	82° A	110° A	115° A
ZT330	7/16"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT154-20-1/8	1/4"-28	ZT454-26	ZT454-24	ZT454-25	ZT454-27	ZT454-45
	1/2"		1/4"-28	ZT454-30	ZT454-28	ZT454-29	ZT454-31	ZT454-46
	5/8"		1/4"-28	ZT454-49	ZT454-47	ZT454-48	ZT454-50	ZT454-51
ZT331	3/4"		3/8"-24	ZT456-21	ZT456-19	ZT456-20	ZT456-22	ZT456-23
	7/8"		3/8"-24	ZT456-26	ZT456-24	ZT456-25	ZT456-27	ZT456-33
	1"		3/8"-24	ZT456-36	ZT456-34	ZT456-35	ZT456-37	ZT456-38
	1-1/8"	3/8"-24	ZT456-41	ZT456-39	ZT456-40	ZT456-42	ZT456-43	
	1-1/4"	3/8"-24	ZT456-46	ZT456-44	ZT456-45	ZT456-47	ZT456-48	
	1-3/8"	3/8"-24	ZT456-51	ZT456-49	ZT456-50	ZT456-52	ZT456-53	

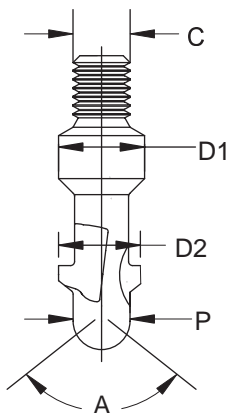
Pilot Number	Shank Diameter	Head Diameter D1 +.000 -.001	Cutter in which Used
ZT300	5/64"	When ordering specify head diameter desired example ZT300-1/8	ZT450 with 5/64" Pilot Hole
ZT301	1/8"		ZT450 with 1/8" Pilot Hole
ZT302	3/16"		ZT452 with 5/64" Pilot Hole



## MICRO STOP COUNTERSINKS CUTTERS AND PILOTS

### CUTTERS

#### ZT385 SHOWN



#### ZT386 SHOWN



For ALUMINUM AND DURAL...These two flute cutters are precision ground with perfect cutting edges for chatterless countersinking. The undercut body diameter provides for faster chip ejection. These cutters are designed to produce close tolerance countersinking and to eliminate sheet damage. Factory regrind service is available on all Zephyr cutters.

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number					Type of Grind
	D			P	C	100° A	78° A	82° A	
ZT330	3/8"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT385-20-1/8	1/4"-28	ZT385-22	ZT385-20	ZT385-21	ZT385-23	ZT385-44	Primary
	7/16"		1/4"-28	ZT385-26	ZT385-24	ZT385-25	ZT385-27	ZT385-45	
	1/2"		1/4"-28	ZT385-30	ZT385-28	ZT385-29	ZT385-31	ZT385-46	

Used on Countersink Model	Cutter Diameter	Cutter Diameter	Pilot	Cutter Thread	Cutter Number					Type of Grind
	D1	D2			P	C	100° A	78° A	82° A	
ZT330-M	3/8"	.256	.0980	1/4"-28	ZT389-22	ZT389-20	ZT389-21	ZT389-23	ZT389-44	Primary
	3/8"	.256	.1270	1/4"-28	ZT385-27	ZT389-25	ZT389-26	ZT389-28	ZT389-29	
	3/8"	.317	.1575	1/4"-28	ZT385-32	ZT389-30	ZT389-31	ZT389-33	ZT389-34	
	3/8"	.375	.1860	1/4"-28	ZT385-37	ZT389-35	ZT389-36	ZT389-38	ZT389-39	
	3/8"	.385	.1895	1/4"-28	ZT385-42	ZT389-40	ZT389-41	ZT389-43	ZT389-44	
	3/8"	.382	.1562	1/4"-28	ZT385-47	ZT389-45	ZT389-46	ZT389-48	ZT389-49	

For Stainless Steel and Titanium. These three-flute cutters are made from special steel and are specially heat treated for efficient cutting of stainless steel and Titanium.

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number					Type of Grind
	D			P	C	100° A	78° A	82° A	
ZT330	3/8"	When ordering these integral pilot cutters, specify dash number and pilot diameter D1 required. Example: ZT386-20-1/8	1/4"-28	ZT386-22	ZT386-20	ZT386-21	ZT386-23	ZT386-44	Primary
	7/16"		1/4"-28	ZT386-26	ZT386-24	ZT386-25	ZT386-27	ZT386-45	
	1/2"		1/4"-28	ZT386-30	ZT386-28	ZT386-29	ZT386-31	ZT386-46	



## COUNTERSINKS CUTTERS MISCELLANEOUS TYPES



### Huck and Hi-Shear Collar removal

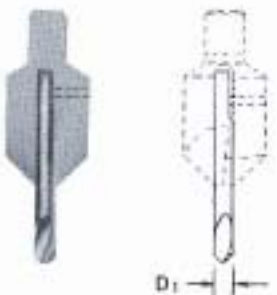
PART NO.	D	B	SHANK	FASTENER & SIZE		
ZT86-1	.365	.124	1/4"-28	HS47	1/8"	HI-SHEAR
ZT86-2	.365	.157	1/4"-28	HS47	5/32"	HI-SHEAR
ZT86-3	.438	.188	1/4"-28	HS47	3/16"	HI-SHEAR
ZT86-4	.500	.247	1/4"-28	HS47	1/4"	HI-SHEAR
ZT86-5	.562	.310	1/4"-28	HS47	5/16"	HI-SHEAR
ZT86-6	.625	.373	1/4"-28	HS47	3/8"	HI-SHEAR
ZT86-7	.750	.434	3/8"-24	HS47	7/16"	HI-SHEAR
ZT86-8	.875	.497	3/8"-24	HS47	1/2"	HI-SHEAR
ZT86-9	.937	.558	3/8"-24	HS47	9/16"	HI-SHEAR
ZT86-10	1.000	.620	3/8"-24	HS47	5/8"	HI-SHEAR
ZT87-1	.323	.188	1/4"-28	3/16"	HUCK LOCK BOLT	
ZT87-2	.413	.250	1/4"-28	1/4"	HUCK LOCK BOLT	
ZT87-3	.372	.265	1/4"-28	1/4"	BLIND RIVET	
ZT87-4	.528	.313	1/4"-28	5/16"	HUCK LOCK BOLT	
ZT87-5	.465	.339	1/4"-28	5/16"	BLIND RIVET	
ZT87-6	.622	.375	1/4"-28	3/8"	HUCK LOCK BOLT	
ZT87-7	.550	.397	1/4"-28	3/8"	BLIND RIVET	



Pilot Drill  
Countersink Cutters

### Pilot Drill Countersink Cutters

Used on Countersink Model	Cutter Diameter	Pilot Hole Diameter	Cutter Thread	Cutter Number				
				100° A	78° A	82° A	110° A	115° A
ZT330	3/8"	Customer Specified Example: ZT184-30-3/16	1/4"-28	ZT184-22	ZT184-20	ZT184-21	ZT184-23	ZT184-44
	7/16"		1/4"-28	ZT184-26	ZT184-24	ZT184-25	ZT184-27	ZT184-45
	1/2"		1/4"-28	ZT184-30	ZT184-28	ZT184-29	ZT184-31	ZT184-46
	5/8"		1/4"-28	ZT184-49	ZT184-47	ZT184-48	ZT184-50	ZT184-51



Pilot Drill

### ZT185 Drills for use with ZT184 Cutters Above

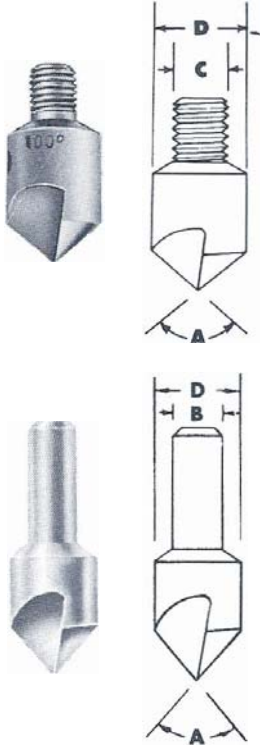
Cutter Diameter	Minimum	Maximum
D	D1	D1
3/8"	3/32"	#20- (.161)
7/16"	3/32"	#10- (.193)
1/2"	3/32"	F (.257)
5/8"	3/32"	F (.257)

When ordering specify ZT185 -(drill size) Example ZT185-3/16



**COUNTERSINKS CUTTERS**

Single Flute Countersink Cutters



Threaded Shank

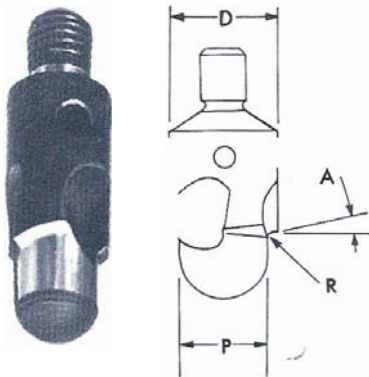
Used on Countersink Model	Cutter Diameter	Cutter Thread	Cutter Number			
	D	C	78° A	82° A	110° A	115° A
ZT330	3/8"	1/4"-28	ZT394-23	ZT394-36	ZT394-49	ZT394-62
	7/16"	1/4"-28	ZT394-24	ZT394-37	ZT394-50	ZT394-63
	1/2"	1/4"-28	ZT394-25	ZT394-38	ZT394-51	ZT394-64

Straight Shank

Cutter Diameter D	Straight Shank Diameter	Cutter Number			
	B	78° A	82° A	110° A	115° A
1/4"	3/16"	ZT395-21	ZT395-34	ZT395-47	ZT395-60
3/8"	1/4"	ZT395-23	ZT395-36	ZT395-49	ZT395-62
1/2"	1/4"	ZT395-25	ZT395-38	ZT395-51	ZT395-64
3/4"	3/8"	ZT395-27	ZT395-40	ZT395-53	ZT395-66
1"	1/2"	ZT395-29	ZT395-42	ZT395-55	ZT395-68

Hole Radius Cutters

Sharp edges may lead to cracking, eliminate this problem with a Precision Radius.



CUTTER NUMBER	CUTTER DIAMETER D	PILOT DIAMETER P	RADIUS R	ANGLE A	CUTTER THREAD
ZT362-.186	.375	.1865	.025	160°	1/4"-28
ZT362-.186	.375	.1865	.030		
ZT362-.187	.375	.1870	.025		
ZT362-.246	.319	.2465	.025		
ZT362-.246	.319	.2465	.030		
ZT362-.250	.319	.2500	.030		
ZT362-.248	.319	.2485	.025		
ZT362-.307	.382	.3075	.030		
ZT362-.307	.382	.3075	.035		
ZT362-.312	.382	.3125	.030		
ZT362-.370	.484	.3700	.035		
ZT362-.372	.484	.3725	.030		
ZT362-.435	.547	.4355	.030		
ZT362-.495	.609	.4950	.035		
ZT362-.497	.609	.4975	.030		

When ordering specify Radius required. Example: ZT362-186 w .025R other sizes of cutter, Pilot and Radius dimensiones available on application.

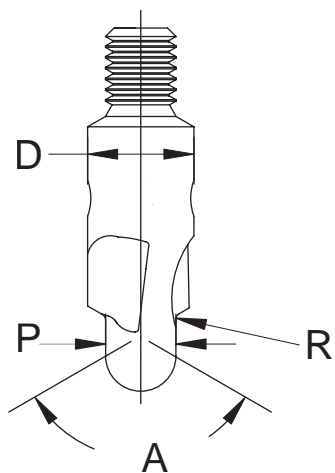




## COUNTERSINKS CUTTERS

### Countersink Radius Cutters

For use on Stainless Steels or Titanium. Countersink with a Precision Radius at the intersection necessary when installing high tensile strength fasteners.



Used on Countersink Model	Cutter Diameter	Cutter Thread	Angle	Pilot Hole Diameter	RADIUS	Cutter Number
	D		A	P	R	
ZT330	1/4"	1/4"-28	100°	SPECIFY	SPECIFY	ZT437-17
	3/8"	1/4"-28				ZT437-22
	5/16"	1/4"-28				ZT437-12
	7/16"	1/4"-28				ZT437-26
	1/2"	1/4"-28				ZT437-30
	9/16"	1/4"-28				ZT437-58
	5/8"	1/4"-28				ZT437-49
ZT331	3/4"	3/8"-24	100°	SPECIFY	SPECIFY	ZT438-21
	7/8"	3/8"-24				ZT438-26
	1"	3/8"-24				ZT438-36
	1-1/8"	3/8"-24				ZT438-41
	1-1/4"	3/8"-24				ZT438-46
	1-3/8"	3/8"-24				ZT438-51
ZT334	7/8"	7/16"-20	100°	SPECIFY	SPECIFY	ZT439-26
	1"	7/16"-20				ZT439-36
	1-1/8"	7/16"-20				ZT439-41
	1-1/4"	7/16"-20				ZT439-46
	1-3/8"	7/16"-20				ZT439-51
	1-1/2"	7/16"-20				ZT439-56

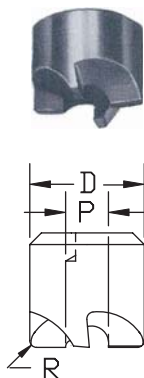
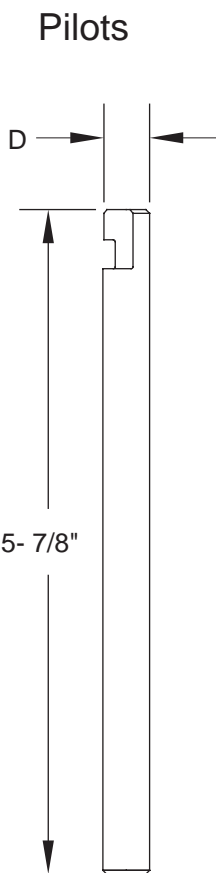
Example Ordering: ZT437-17-5/32-.030R



## BACK SPOTFACERS & COUNTERSINKS

### Back Spotfacers

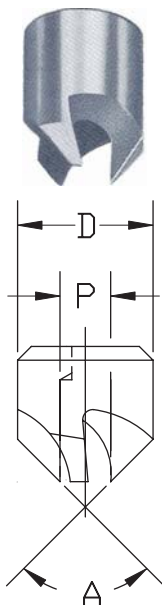
For use on Stainless Steels or Titanium.



PART NUMBER	D	P	R	NO. OF FLUTES	PART NUMBER	D	P	R	NO. OF FLUTES
ZT73-20	1/4"	3/32"	1/32"	3	ZT73-42	11/16"	1/4"	1/32"	4
ZT73-21	1/4"	1/8"	1/32"	3	ZT73-43	11/16"	5/16"	1/32"	4
ZT73-22	5/16"	1/8"	1/32"	3	ZT73-44	3/4"	1/4"	1/32"	4
ZT73-23	5/16"	5/32"	1/32"	3	ZT73-34	3/4"	5/16"	1/32"	4
ZT73-24	3/8"	5/32"	1/32"	4	ZT73-35	3/4"	3/8"	1/32"	4
ZT73-25	3/8"	3/16"	1/32"	4	ZT73-45	13/16"	5/16"	1/32"	4
ZT73-26	7/16"	5/32"	1/32"	4	ZT73-46	13/16"	3/8"	1/32"	4
ZT73-27	7/16"	3/16"	1/32"	4	ZT73-47	7/8"	5/16"	1/32"	4
ZT73-40	1/2"	3/16"	1/32"	4	ZT73-36	7/8"	3/8"	1/32"	4
ZT73-28	1/2"	1/4"	1/32"	4	ZT73-37	7/8"	1/2"	1/32"	4
ZT73-29	1/2"	5/16"	1/32"	4	ZT73-48	1"	5/16"	1/32"	4
ZT73-41	9/16"	3/16"	1/32"	4	ZT73-38	1"	3/8"	1/32"	4
ZT73-30	9/16"	1/4"	1/32"	4	ZT73-49	1-1/8"	3/8"	1/32"	4
ZT73-31	9/16"	5/16"	1/32"	4	ZT73-50	1-1/8"	1/2"	1/32"	4
ZT73-32	5/8"	1/4"	1/32"	4	ZT73-51	1-1/4"	3/8"	1/32"	4
ZT73-33	5/8"	5/16"	1/32"	4	ZT73-52	1-1/4"	1/2"	1/32"	4

Note: Other radius sizes available by special order.

### Back Countersinks

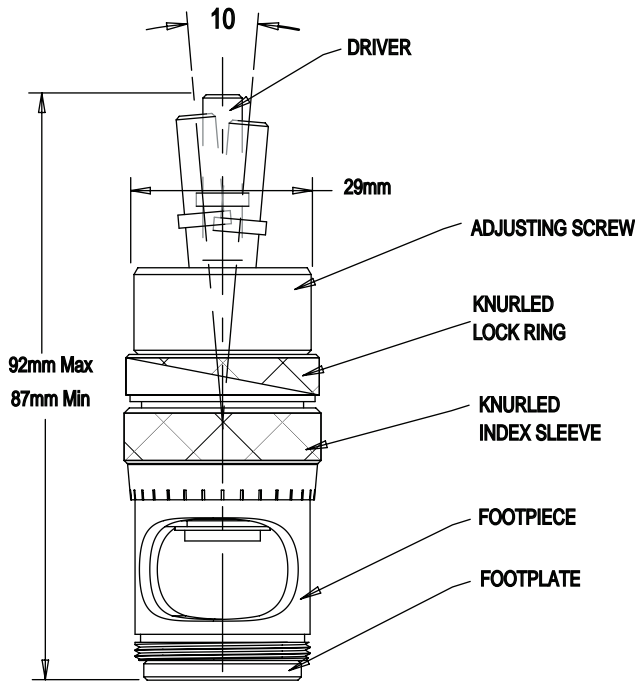


PART NUMBER	D
ZT82A-1	3/32"
ZT82A-2	1/8"
ZT82A-3	5/32"
ZT82A-4	3/16"
ZT82A-5	1/4"
ZT82A-6	5/16"
ZT82A-7	3/8"
ZT82A-8	1/2"

D	P	100° A	78° A	82° A	110° A	115° A	NO. OF FLUTES
1/4"	3/32"	ZT75-60	ZT75-20	ZT75-40	ZT75-80	ZT75-100	3
1/4"	1/8"	ZT75-61	ZT75-21	ZT75-41	ZT75-81	ZT75-101	3
5/16"	1/8"	ZT75-62	ZT75-22	ZT75-42	ZT75-82	ZT75-102	3
5/16"	5/32"	ZT75-63	ZT75-23	ZT75-43	ZT75-83	ZT75-103	3
3/8"	5/32"	ZT75-64	ZT75-24	ZT75-44	ZT75-84	ZT75-104	4
3/8"	3/16"	ZT75-65	ZT75-25	ZT75-45	ZT75-85	ZT75-105	4
7/16"	5/32"	ZT75-66	ZT75-26	ZT75-46	ZT75-86	ZT75-106	4
7/16"	3/16"	ZT75-67	ZT75-27	ZT75-47	ZT75-87	ZT75-107	4
1/2"	3/16"	ZT75-146	ZT75-120	ZT75-133	ZT75-159	ZT75-172	4
1/2"	1/4"	ZT75-68	ZT75-28	ZT75-48	ZT75-88	ZT75-108	4
1/2"	5/16"	ZT75-69	ZT75-29	ZT75-49	ZT75-89	ZT75-109	4
9/16"	3/16"	ZT75-147	ZT75-121	ZT75-134	ZT75-160	ZT75-173	4
9/16"	1/4"	ZT75-70	ZT75-30	ZT75-50	ZT75-90	ZT75-110	4
9/16"	5/16"	ZT75-71	ZT75-31	ZT75-51	ZT75-91	ZT75-111	4
5/8"	1/4"	ZT75-72	ZT75-32	ZT75-52	ZT75-92	ZT75-112	4
5/8"	1/4"	ZT75-73	ZT75-33	ZT75-53	ZT75-93	ZT75-113	4
11/16"	1/4"	ZT75-148	ZT75-122	ZT75-135	ZT75-161	ZT75-174	4
11/16"	5/16"	ZT75-149	ZT75-123	ZT75-136	ZT75-162	ZT75-175	4
3/4"	1/4"	ZT75-150	ZT75-124	ZT75-137	ZT75-163	ZT75-176	4
3/4"	5/16"	ZT75-74	ZT75-34	ZT75-54	ZT75-94	ZT75-114	4
3/4"	3/8"	ZT75-75	ZT75-35	ZT75-55	ZT75-95	ZT75-115	4
13/16"	5/16"	ZT75-151	ZT75-125	ZT75-138	ZT75-164	ZT75-177	4
13/16"	3/8"	ZT75-152	ZT75-126	ZT75-139	ZT75-165	ZT75-178	4
7/8"	5/16"	ZT75-153	ZT75-127	ZT75-140	ZT75-166	ZT75-179	4
7/8"	3/8"	ZT75-76	ZT75-36	ZT75-56	ZT75-96	ZT75-116	4
7/8"	1/2"	ZT75-77	ZT75-37	ZT75-57	ZT75-97	ZT75-117	4
1"	5/16"	ZT75-154	ZT75-128	ZT75-141	ZT75-167	ZT75-180	4
1"	3/8"	ZT75-78	ZT75-38	ZT75-58	ZT75-98	ZT75-118	4
1"	1/2"	ZT75-79	ZT75-39	ZT75-59	ZT75-99	ZT75-119	4
1-1/8"	3/8"	ZT75-155	ZT75-129	ZT75-142	ZT75-168	ZT75-181	4
1-1/8"	1/2"	ZT75-156	ZT75-130	ZT75-143	ZT75-169	ZT75-182	4
1-1/4"	3/8"	ZT75-157	ZT75-131	ZT75-144	ZT75-170	ZT75-183	4
1-1/4"	1/2"	ZT75-158	ZT75-132	ZT75-145	ZT75-171	ZT75-184	4



## ZT666/ZT667/ZT668 Microstop Countersink Cage, Metric, Swivel Shaft, High Speed

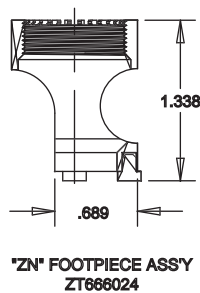
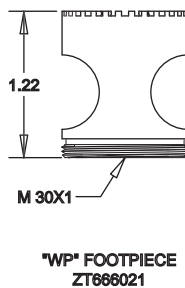
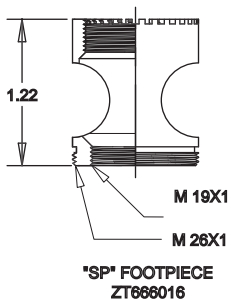
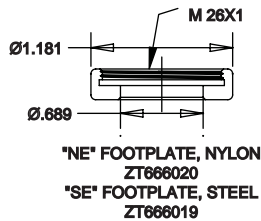
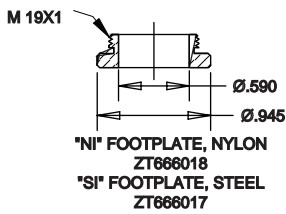


ZT666 SERIES M6X1 THREAD  
ZT667 SERIES M8X1 THREAD  
ZT668 SERIES 1/4-28 THREAD

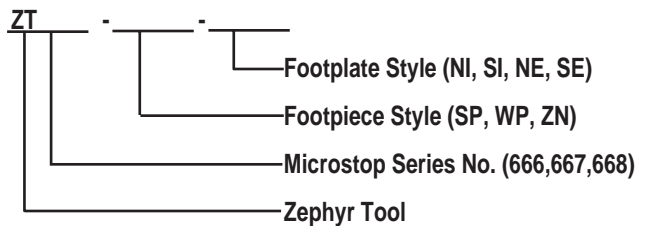
Zephyr's new Swivel Shaft- High Speed Microstops have been precision designed and machined to continuous operation at speeds up to 6,000 RPM without overheating. The unique Swivel Shaft enables you to countersink with up to a 5 degree off angle between the spindle and the cutter axis. The ZT666, ZT667 and ZT668 series microstops utilize a common body design making all footpieces, footplates and spare parts totally interchangeable. Designed for use on all standard materials as well as the latest composite materials in the most demanding applications.

Features Include:

- 5 degree swivel shaft
- Full needle bearings and ball thrust bearings for continuous high speed use
- Compact size
- Threaded Knurl Lock Ring to eliminate any possibility of inadvertent resetting of the primary adjustment
- Internal serration design to eliminate chip clogging
- 0.025mm (.001") incremental depth adjustment
- Cutter capacity:
  - 14mm (9/16") Diameter with "SP" Footpiece
  - 21mm (13/16") Diameter with "WP" Footpiece
- Available with M6X1, M8X1 and 1/4-28 Internal Threads



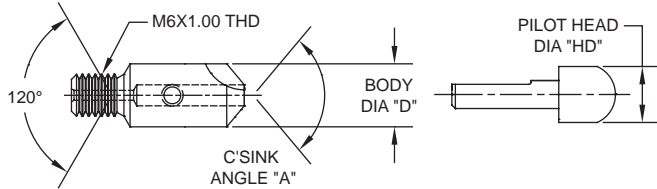
ORDERING INFORMATION:





### METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL REMOVABLE PILOT

## ZT564 Series 2 Flute



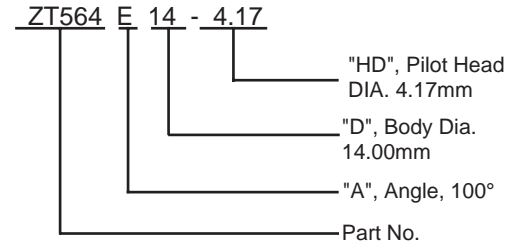
Standard 2 Flute Cutter and Removable pilot with M6 X 1.00 metric male threaded shank for use with all ZT330, ZT663 and ZT666 (-M6) series, and for use with Recoules (-M6) series Microstop Cages.

Angle Code	"A"
A	60°
B	78°
C	82°
D	90°
E	100°
F	110°
G	115°
H	120°
I	130°

Body Dia. Code	"D"
10	10MM
12	12MM
14	14MM
17	17MM

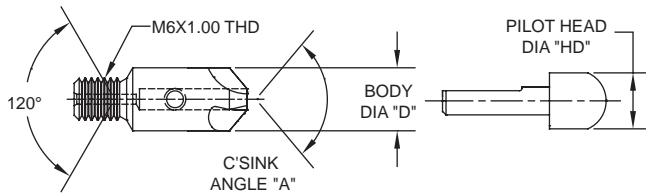
Pilot Head dia. Code	"DH"
2.00	2.00MM
2.38	2.38MM
2.50	2.50MM
2.80	2.80MM
3.00	3.00MM
3.50	3.50MM
4.00	4.00MM
4.17	4.17MM
4.76	4.76MM
4.80	4.80MM
5.00	5.00MM
5.60	5.60MM
6.00	6.00MM
6.35	6.35MM
7.92	7.92MM
8.00	8.00MM

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:



Note:  
Other pilot sizes are available upon request.

## ZT566 Series 3 Flute



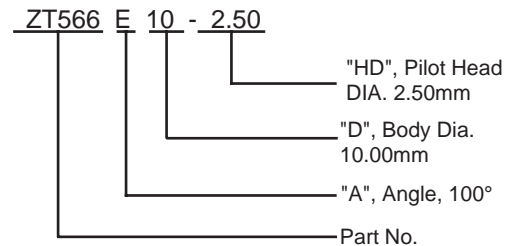
Standard 3 Flute Cutter and Removable pilot with M6 X 1.00 metric male threaded shank for use with all ZT330, ZT663 and ZT666 (-M6) series and for use with Recoules (-M6) series Microstop Cages

Angle Code	"A"
A	60°
B	78°
C	82°
D	90°
E	100°
F	110°
G	115°
H	120°
I	130°

Body Dia. Code	"D"
10	10MM
12	12MM
14	14MM
17	17MM

Pilot Head dia. Code	"DH"
2.00	2.00MM
2.38	2.38MM
2.50	2.50MM
2.80	2.80MM
3.00	3.00MM
3.50	3.50MM
4.00	4.00MM
4.17	4.17MM
4.76	4.76MM
4.80	4.80MM
5.00	5.00MM
5.60	5.60MM
6.00	6.00MM
6.35	6.35MM
7.92	7.92MM
8.00	8.00MM

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

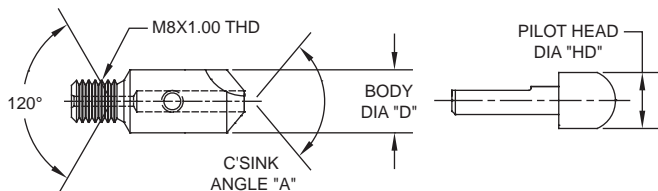


Note:  
Other pilot sizes are available upon request.



## METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL REMOVABLE PILOT

## ZT565 Series 2 Flute



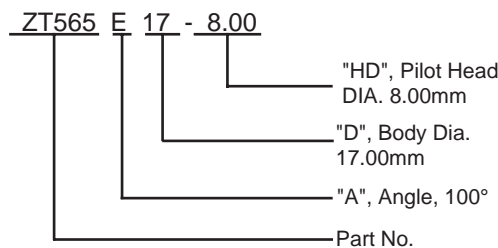
Standard 2 Flute Cutter and Removable pilot with M8 X 1.00 metric male threaded shank for use with all ZT667 (-M8) series, and for use with Recoules (-M8) series Microstop Cages.

Angle Code	"A"
A	60°
B	78°
C	82°
D	90°
E	100°
F	110°
G	115°
H	120°
I	130°

Body Dia. Code	"D"
12	12MM
14	14MM
17	17MM
21	21MM

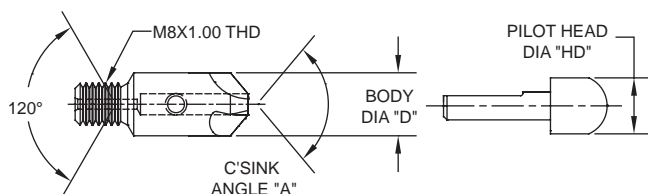
Pilot Head dia. Code	"DH"
4.00	4.00MM
4.17	4.17MM
4.76	4.76MM
4.80	4.80MM
5.00	5.00MM
5.60	5.60MM
6.00	6.00MM
6.35	6.35MM
7.92	7.92MM
8.00	8.00MM
9.52	9.52MM
10.00	10.00MM

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter  
and Pilot Head Dia.  
Example:



Note:  
Other pilot sizes are available upon request.

## ZT567 Series 3 Flute



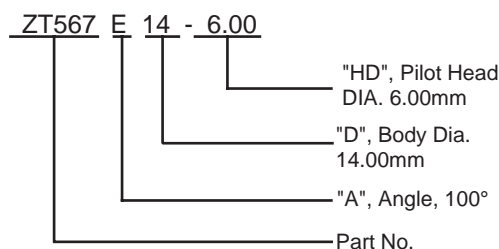
Standard 3 Flute Cutter and Removable pilot with M8 X 1.00 metric male threaded shank for use with all ZT667 (-M8) series and for use with Recoules (-M8) series Microstop Cages

Angle Code	"A"
A	60°
B	78°
C	82°
D	90°
E	100°
F	110°
G	115°
H	120°
I	130°

Body Dia. Code	"D"
12	12MM
14	14MM
17	17MM
21	21MM

Pilot Head dia. Code	"DH"
4.00	4.00MM
4.17	4.17MM
4.76	4.76MM
4.80	4.80MM
5.00	5.00MM
5.60	5.60MM
6.00	6.00MM
6.35	6.35MM
7.92	7.92MM
8.00	8.00MM
9.52	9.52MM
10.00	10.00MM

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter  
and Pilot Head Dia.  
Example:

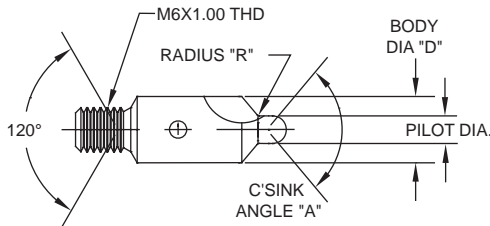


Note:  
Other pilot sizes are available upon request.



## METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL INTEGRAL PILOT

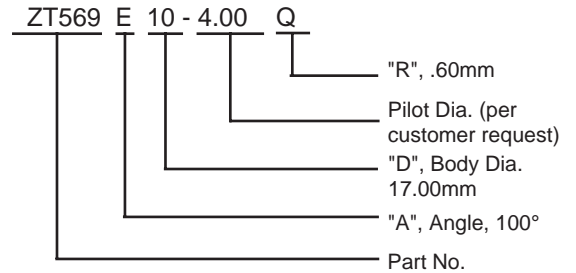
## ZT569 Series 2 Flute



Standard 2 Flute integral pilot cutter with M6 X 1.00 metric male threaded shank for use with all ZT330, ZT663 (-M6) series Microstop Cages.

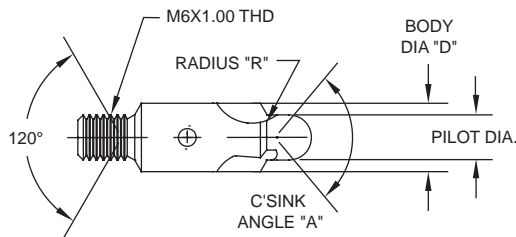
WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	6	6MM	-	.40MM
B	78°	8	8MM	P	.50MM
C	82°	10	10MM	Q	.60MM
D	90°	12	12MM	R	.80MM
E	100°	14	14MM	S	.90MM
F	110°	17	17MM	T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



Note:  
Other pilot sizes are available upon request.

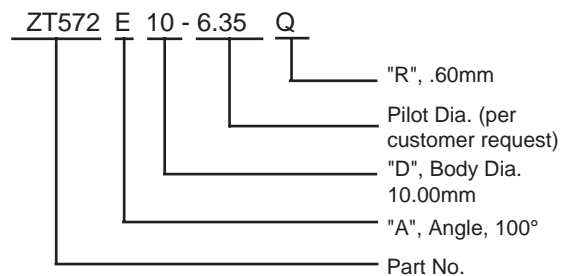
## ZT572 Series 3 Flute



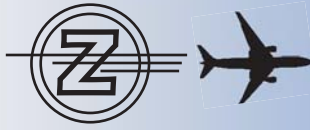
Standard 3 Flute Integral pilot cutter and Removable pilot with M6 X 1.00 metric male threaded shank for use with all ZT330, ZT663 (-M6) series Microstop Cages

Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	6	6MM	-	.40MM
B	78°	8	8MM	P	.50MM
C	82°	10	10MM	Q	.60MM
D	90°	12	12MM	R	.80MM
E	100°	14	14MM	S	.90MM
F	110°	17	17MM	T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

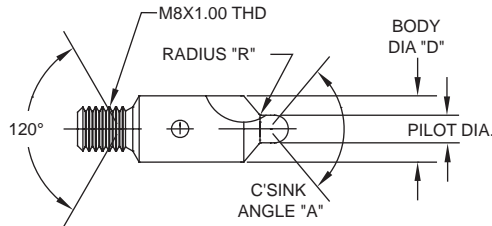


Note:  
Other pilot sizes are available upon request.



## METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL INTEGRAL PILOT

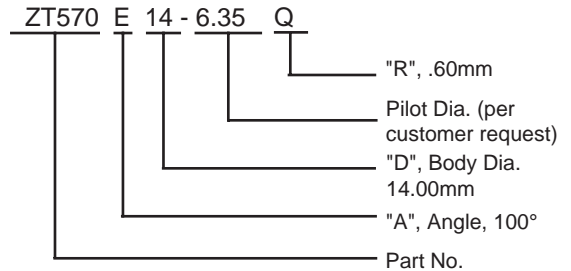
## ZT570 Series 2 Flute



Standard 2 Flute integral pilot cutter with M8 X 1.00 metric male threaded shank for use with all ZT331(-M8) series Microstop Cages.

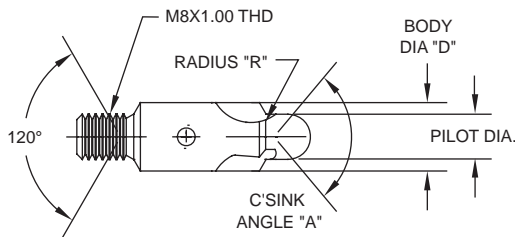
WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	10	10MM	-	.40MM
B	78°	12	12MM	P	.50MM
C	82°	14	14MM	Q	.60MM
D	90°	17	17MM	R	.80MM
E	100°	21	21MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



Note:  
Other pilot sizes are available upon request.

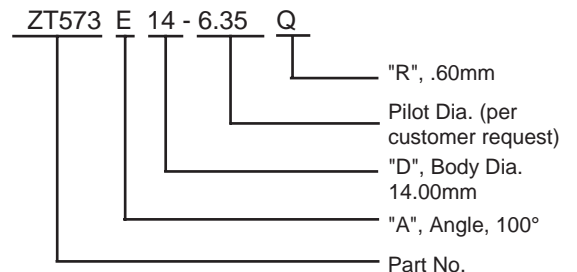
## ZT573 Series 3 Flute



Standard 3 Flute Integral pilot cutter with M8 X 1.00 metric male threaded shank for use with all ZT331(-M8) series Microstop Cages

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	10	10MM	-	.40MM
B	78°	12	12MM	P	.50MM
C	82°	14	14MM	Q	.60MM
D	90°	17	17MM	R	.80MM
E	100°	21	21MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM

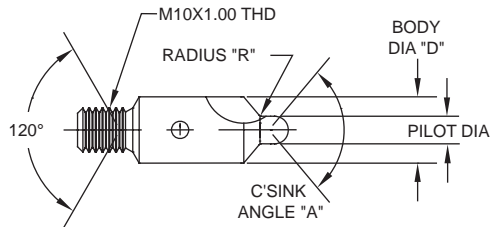


Note:  
Other pilot sizes are available upon request.



## METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL INTEGRAL PILOT

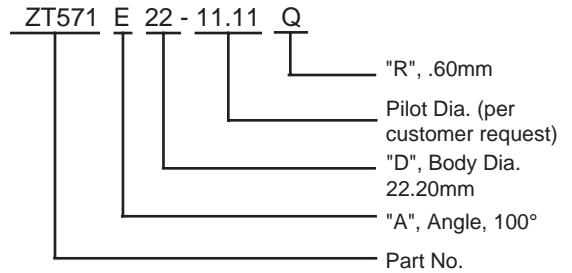
## ZT571 Series 2 Flute



Standard 2 Flute integral pilot cutter with M10 X 1.00 metric male threaded shank for use with all ZT331(-M10) series Microstop Cages.

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

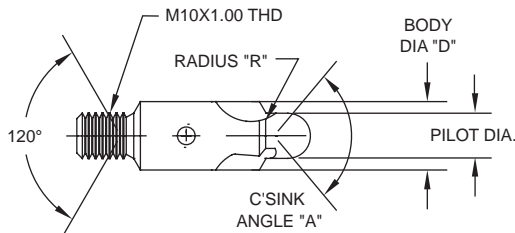
Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	17	17MM	-	.40MM
B	78°	21	21MM	P	.50MM
C	82°	22	22.20MM	Q	.60MM
D	90°	25	25.40MM	R	.80MM
E	100°	28	28.57MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



Note:  
Other pilot sizes are available upon request.

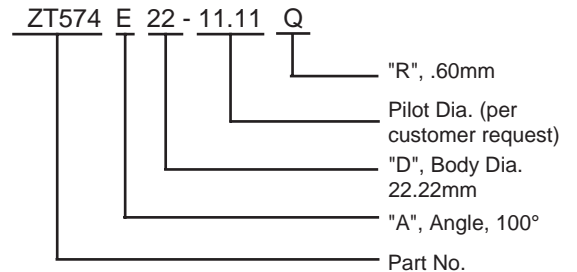
## ZT574 Series 3 Flute

Standard 3 Flute Integral pilot cutter with M10 X 1.00 metric male threaded shank for use with all ZT331(-M10) series Microstop Cages



WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter and Pilot Head Dia.  
Example:

Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	17	17MM	-	.40MM
B	78°	21	21MM	P	.50MM
C	82°	22	22.20MM	Q	.60MM
D	90°	25	25.40MM	R	.80MM
E	100°	28	28.57MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



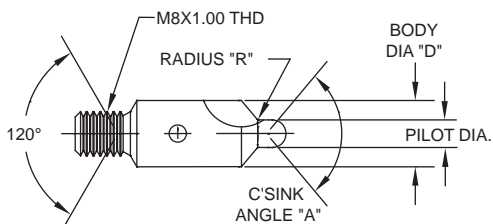
Note:  
Other pilot sizes are available upon request.





## METRIC COUNTERSINK CUTTER COBALT HIGH SPEED STEEL INTEGRAL PILOT

## ZT575 Series 2 Flute

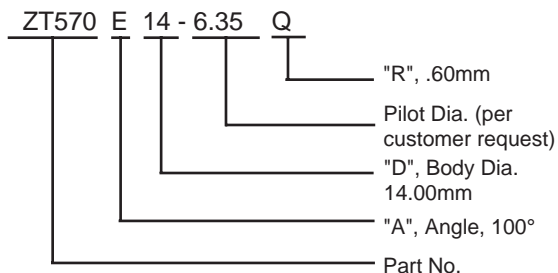


Standard 2 Flute integral pilot cutter with M8 X 1.00 metric male threaded shank for use with Recoules (-M8) series Microstop Cages.

WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter  
and Pilot Head Dia.

Example:

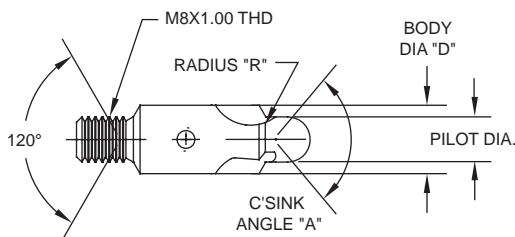
Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	10	10MM	-	.40MM
B	78°	12	12MM	P	.50MM
C	82°	14	14MM	Q	.60MM
D	90°	17	17MM	R	.80MM
E	100°	21	21MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



Note:  
Other pilot sizes are available upon request.

## ZT576 Series 3 Flute

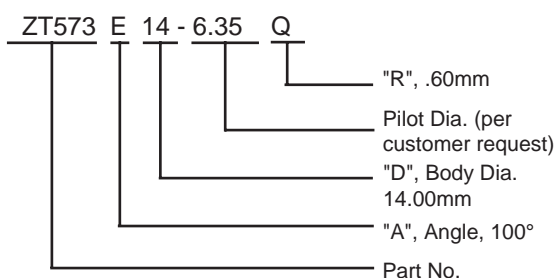
Standard 3 Flute Integral pilot cutter with M8 X 1.00 metric male threaded shank for use with Recoules (-M8) series Microstop Cages



WHEN ORDERING SPECIFY:  
Part Number, Angle, Body Diameter  
and Pilot Head Dia.

Example:

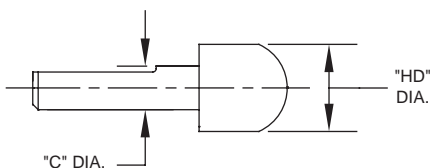
Angle Code	"A"	Body Dia. Code	"D"	Radius Code	"R"
A	60°	10	10MM	-	.40MM
B	78°	12	12MM	P	.50MM
C	82°	14	14MM	Q	.60MM
D	90°	17	17MM	R	.80MM
E	100°	21	21MM	S	.90MM
F	110°			T	1.00MM
G	115°			U	1.10MM
H	120°			V	1.20MM
I	130°			W	1.30MM
				X	1.40MM



Note:  
Other pilot sizes are available upon request.



**ZT590 Series  
Standard Metric Pilots**



"HD" DIA.	"C" DIA.	PART NUMBER	"HD" DIA.	"C" DIA.	PART NUMBER
2.00	2.00	ZT590-2.00-2.00	4.17	3.50	ZT590-3.50-4.17
2.38	2.00	ZT590-2.00-2.38	4.80	3.50	ZT590-3.50-4.80
2.40	2.00	ZT590-2.00-2.40	5.00	3.50	ZT590-3.50-5.00
2.50	2.00	ZT590-2.00-2.50	4.00	4.00	ZT590-4.00-4.00
2.80	2.00	ZT590-2.00-2.80	4.50	4.00	ZT590-4.00-4.50
3.00	2.00	ZT590-2.00-3.00	4.76	4.00	ZT590-4.00-4.76
3.17	2.00	ZT590-2.00-3.17	4.80	4.00	ZT590-4.00-4.80
3.50	2.00	ZT590-2.00-3.50	5.00	4.00	ZT590-4.00-5.00
4.00	2.00	ZT590-2.00-4.00	5.50	4.00	ZT590-4.00-5.50
2.50	2.50	ZT590-2.50-2.50	5.60	4.00	ZT590-4.00-5.60
2.80	2.50	ZT590-2.50-2.50	5.80	4.00	ZT590-4.00-5.80
3.00	2.50	ZT590-2.50-3.00	6.00	4.00	ZT590-4.00-6.00
3.17	2.50	ZT590-2.50-3.17	6.35	4.00	ZT590-4.00-6.35
3.50	2.50	ZT590-2.50-3.50	8.00	4.00	ZT590-4.00-8.00
3.80	2.50	ZT590-2.50-3.80	5.60	5.00	ZT590-5.00-5.60
4.00	2.50	ZT590-2.50-4.00	6.00	5.00	ZT590-5.00-6.00
4.17	2.50	ZT590-2.50-4.17	6.35	5.00	ZT590-5.00-5.35
4.80	2.50	ZT590-2.50-4.80	7.00	5.00	ZT590-5.00-7.00
5.00	2.50	ZT590-2.50-5.00	7.80	5.00	ZT590-5.00-7.80
3.00	3.00	ZT590-3.00-3.00	7.92	5.00	ZT590-5.00-7.92
3.17	3.00	ZT590-3.00-3.17	8.00	5.00	ZT590-5.00-8.00
3.20	3.00	ZTS90-3.00-3.20	9.52	5.00	ZT590-5.00-9.52
3.50	3.00	ZT590-3.00-3.50	10.00	5.00	ZT590-5.0-10.00
3.80	3.00	ZT590-3.00-3.50	12.00	5.00	ZT590-5.0-12.00
4.00	3.00	ZT590-3.00-4.00	11.11	6.00	ZT590-6.0-11.11
5.00	3.00	ZT590-3.00-S.00	12.70	6.00	ZT590-6.0-12.70
6.00	3.00	ZT590-3.00-6.00	14.29	6.00	ZT590-6.0-14.29
3.80	3.50	ZT590-3.50-3.50	15.87	6.00	ZTS90-6.0-15.87
4.00	3.50	ZT590-3.50-4.00			



**ZEPHYR VS. RECOULES  
 METRIC SWIVEL MICROSTOP CAGE**

CROSS-REFERENCE

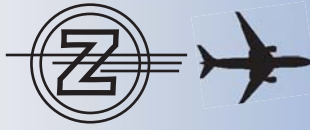
RECOULES	ZEPHYR	METRIC INTERNAL THREAD
RB257		
10015010	NOT AVAILABLE	M6 X 1.00
10015015	ZT666-SP-SI	M6 X 1.00
10015020	ZT666-SP-NI	M6 X 1.00
10015200	ZT666-ZN	M6 X 1.00
RB307		
10020010	NOT AVAILABLE	M8 X 1.00
10020015	ZT667-SP-SI	M8 X 1.00
10020020	ZT667-SP-NI	M8 X 1.00
10020105	NOT AVAILABLE	M8 X 1.00
10020110	ZT667-WP-SI	M8 X 1.00
10020115	ZT667-WP-NI	M8 X 1.00
10020200	ZT667-ZN	M8 X 1.00



**ZEPHYR VS. RECOULES  
 METRIC CUTTER**

CROSS-REFERENCE

RECOULES PART NO.	ZEPHYR PART NO.	No.OF FLUTES	METRIC THREAD	CUTTER ANGLE
31205 000	ZT572D10-2.38	3	M6X1.00	90°
31205 005	ZT572D10-3.17	3	M6X1.00	90°
31205 010	ZT572D10-3.50	3	M6X1.00	90°
31205 015	ZT572D10-3.60	3	M6X1.00	90°
31205 020	ZT572D10-3.96	3	M6X1.00	90°
31205 025	ZT572D10-4.00	3	M6X1.00	90°
31205 030	ZT572D10-4.15	3	M6X1.00	90°
31205 035	ZT572D10-4.76	3	M6X1.00	90°
31205 040	ZT572D10-4.83	3	M6X1.00	90°
31205 045	ZT572D10-5.60	3	M6X1.00	90°
31206 000	ZT572E10-2.38	3	M6X1.00	100°
31206 005	ZT572E10-3.17	3	M6X1.00	100°
31206 010	ZT572E10-3.50	3	M6X1.00	100°
31206 015	ZT572E10-3.60	3	M6X1.00	100°
31206 020	ZT572E10-3.96	3	M6X1.00	100°
31206 025	ZT572E10-4.00	3	M6X1.00	100°
31206 030	ZT572E10-4.15	3	M6X1.00	100°
31206 035	ZT572E10-4.76	3	M6X1.00	100°
31206 040	ZT572E10-4.83	3	M6X1.00	100°
31206 045	ZT572E10-5.60	3	M6X1.00	100°
31207 000	ZT572H10-2.38	3	M6X1.00	120°
31207 005	ZT572H10-3.17	3	M6X1.00	120°
31207 010	ZT572H10-3.50	3	M6X1.00	120°
31207 015	ZT572H10-3.60	3	M6X1.00	120°
31207 020	ZT572H10-3.96	3	M6X1.00	120°
31207 025	ZT572H10-4.00	3	M6X1.00	120°
31207 030	ZT572H10-4.15	3	M6X1.00	120°
31207 035	ZT572H10-4.76	3	M6X1.00	120°
31207 040	ZT572H10-4.83	3	M6X1.00	120°
31207 045	ZT572H10-5.60	3	M6X1.00	120°



**ZEPHYR VS. RECOULES  
 METRIC REMOVABLE PILOT CUTTER**

CROSS-REFERENCE

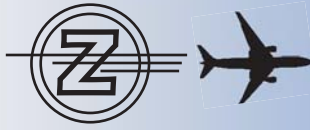
RECOULES PART NO.	ZEPHYR PART NO.	No.OF FLUTES	METRIC THREAD	CUTTER ANGLE
30200 005	ZT564D10-2.00	2	M6X1.00	90°
30200 010	ZT564D10-2.38	2	M6X1.00	90°
30200 015	ZT564D10-2.50	2	M6X1.00	90°
30200 110	ZT564D10-2.80	2	M6X1.00	90°
30200 115	ZT564D10-3.00	2	M6X1.00	90°
30200 120	ZT564D10-3.17	2	M6X1.00	90°
30200 215	ZT564D10-3.50	2	M6X1.00	90°
30200 310	ZT564D10-4.00	2	M6X1.00	90°
30200 315	ZT564D10-4.17	2	M6X1.00	90°
30220 005	ZT564E10-2.00	2	M6X1.00	100°
30220 010	ZT564E10-2.38	2	M6X1.00	100°
30220 015	ZT564E10-2.50	2	M6X1.00	100°
30220 110	ZT564E10-2.80	2	M6X1.00	100°
30220 115	ZT564E10-3.00	2	M6X1.00	100°
30220 120	ZT564E10-3.17	2	M6X1.00	100°
30220 215	ZT564E10-3.50	2	M6X1.00	100°
30220 310	ZT564E10-4.00	2	M6X1.00	100°
30220 315	ZT564E10-4.17	2	M6X1.00	100°
30240 005	ZT564H10-2.00	2	M6X1.00	120°
30240 010	ZT564H10-2.38	2	M6X1.00	120°
30240 015	ZT564H10-2.50	2	M6X1.00	120°
30240 110	ZT564H10-2.80	2	M6X1.00	120°
30240 115	ZT564H10-3.00	2	M6X1.00	120°
30240 120	ZT564H10-3.17	2	M6X1.00	120°
30240 215	ZT564H10-3.50	2	M6X1.00	120°
30240 310	ZT564H10-4.00	2	M6X1.00	120°
30240 315	ZT564H10-4.17	2	M6X1.00	120°



**ZEPHYR VS. RECOULES  
 METRIC CUTTER**

CROSS-REFERENCE

RECOULES PART NO.	ZEPHYR PART NO.	No.OF FLUTES	METRIC THREAD	CUTTER ANGLE
31205 400	ZT574D22-11.11	3	M10X1.00	90°
31205 410	ZT574D25-11.11	3	M10X1.00	90°
31205 430	ZT574D28-12.70	3	M10X1.00	90°
31205 440	ZT574D31-12.70	3	M10X1.00	90°
31205 450	ZT574D30-14.00	3	M10X1.00	90°
31205 460	ZT574D34-14.92	3	M10X1.00	90°
31205 470	ZT574D38-15.87	3	M10X1.00	90°
31206 400	ZT574E22-11.11	3	M10X1.00	100°
31206 410	ZT574E25-11.11	3	M10X1.00	100°
31206 430	ZT574E28-12.70	3	M10X1.00	100°
31206 440	ZT574E31-12.70	3	M10X1.00	100°
31206 450	ZT574E30-14.00	3	M10X1.00	100°
31206 460	ZT574E34-14.92	3	M10X1.00	100°
31206 470	ZT574E38-15.87	3	M10X1.00	100°
31207 400	ZT574H22-11.11	3	M10X1.00	120°
31207 410	ZT574H25-11.11	3	M10X1.00	120°
31207 430	ZT574H28-12.70	3	M10X1.00	120°
31207 440	ZT574H31-12.70	3	M10X1.00	120°
31207 450	ZT574H30-14.00	3	M10X1.00	120°
31207 460	ZT574H34-14.92	3	M10X1.00	120°
31207 470	ZT574H38-15.87	3	M10X1.00	120°



**ZEPHYR VS. RECOULES  
 METRIC CUTTER**

CROSS-REFERENCE

RECOULES PART NO.	ZEPHYR PART NO.	No.OF FLUTES	METRIC THREAD	CUTTER ANGLE
31205 100	ZT576D14-4.76	3	M8X1.00	90°
31205 105	ZT576D14-5.00	3	M8X1.00	90°
31205 110	ZT576D14-5.60	3	M8X1.00	90°
31205 120	ZT576D14-6.00	3	M8X1.00	90°
31205 125	ZT576D14-6.35	3	M8X1.00	90°
31205 200	ZT576D17-8.00	3	M8X1.00	90°
31205 300	ZT576D21-9.50	3	M8X1.00	90°
31205 305	ZTS76D21-10.00	3	M8X1.00	90°
31206 100	ZT576E14-4.76	3	M8X1.00	100°
31206 105	ZT576E14-5.00	3	M8X1.00	100°
31206 110	ZT576E14-5.60	3	M8X1.00	100°
31206 120	ZT576E 14-6.00	3	M8X1.00	100°
31206 125	ZT576E14-6.35	3	M8X1.00	100°
31206 200	ZTS76E17-8.00	3	M8X1.00	100°
31206 300	ZTS76E21 -9.50	3	M8X1.00	100°
31206 305	ZT576E21- 10.00	3	M8X1.00	100°
31207 100	ZT576H14-4.76	3	M8X1.00	120°
31207 105	ZT576H14-5.00	3	M8X1.00	120°
31207 110	ZT576H14-5.60	3	M8X1.00	120°
31207 120	ZT576H14-6.00	3	M8X1.00	120°
31207 125	ZT576H14-6.35	3	M8X1.00	120°
31207 200	ZT576H17-8.00	3	M8X1.00	120°
31207 300	ZT576H21-9.50	3	M8X1.00	120°
31207 305	ZT576H21-10.00	3	M8X1.00	120°



**ZEPHYR VS. RECOULES  
 METRIC REMOVABLE PILOT CUTTER**

CROSS-REFERENCE

RECOULES PART NO.	ZEPHYR PART NO.	RECOULES PART NO.	ZEPHYR PART NO.
31100 000	ZT590-2.00-2.00	31100 215	ZT590-3.00-3.80
31100 005	ZT590-2.00-2.38	31100 220	ZT590-3.00-4.00
31100 006	ZT590-2.00-2.40	31100 225	ZT590-3.00-5.00
31100 010	ZT590-2.00-2.50	31100 230	ZT590-3.00-6.00
31100 015	ZT590-2.00-2.80	31100 305	ZT590-3.50-3.80
31100 020	ZT590-2.00-3.00	31100 300	ZT590-3.50-4.00
31100 025	ZT590-2.00-3.17	31100 310	ZT590-3.50-4.17
31100 030	ZT590-2.00-3.50	31100 315	ZT590-3.50-4.80
31100 035	ZT590-2.00-4.00	31100 320	ZT590-3.50-5.00
31100 100	ZT590-2.50-2.50	31100 400	ZT590-4.00-4.00
31100 10S	ZTS90-2.50-2.80	31100 405	ZT590-4.00-4.50
31100 110	ZT590-2.50-3.00	31100 410	ZT590-4.00-4.76
31100 115	ZT590-2.50-3.17	31100 415	ZT590-4.00-4.50
31100 120	ZT590-2.50-3.50	31100 420	ZT590-4.00-5.00
31100 125	ZT590-2.50-3.80	31100 425	ZT590-4.00-5.50
31100 130	ZT590-2.50-4.00	31100 430	ZT590-4.00-5.60
31100 131	ZT590-2.50-4.17	31100 435	ZT590-4.00-5.80
31100 133	ZT590-2.50-4.80	31100 440	ZT590-4.00-5.00
31100 135	ZT590-2.50-5.00	31100 445	ZT590-4.00-6.35
31100 200	ZTS90-3.00-3.00	31100 455	ZT590-4.00-5.00
31100 205	ZT590-3.00-3.17	31100 505	ZT590-5.00-5.60
31100 206	ZT590-3.00-3.20	31100 510	ZT590-5.00-6.00
31100 210	ZT590-3.00-3.50	31100 515	ZT590-5.00-6.35
31100 520	ZT590-5.00-7.00	31100 525	ZT590-5.00-7.80
31100 530	ZT590-5.00-7.92	31100 535	ZT590-5.00-8.00
31100 540	ZT590-5.00-9.52	31100 545	ZT590-5.00-10.00
31100 550	ZT590-5.00-12.00	31100 600	ZT590-5.00-11.11
31100 605	ZT590-6.00-12.70	31100 610	ZT590-5.00-14.29
31100 615	ZT590-6.00-15.87		





# Miscellaneous Tools

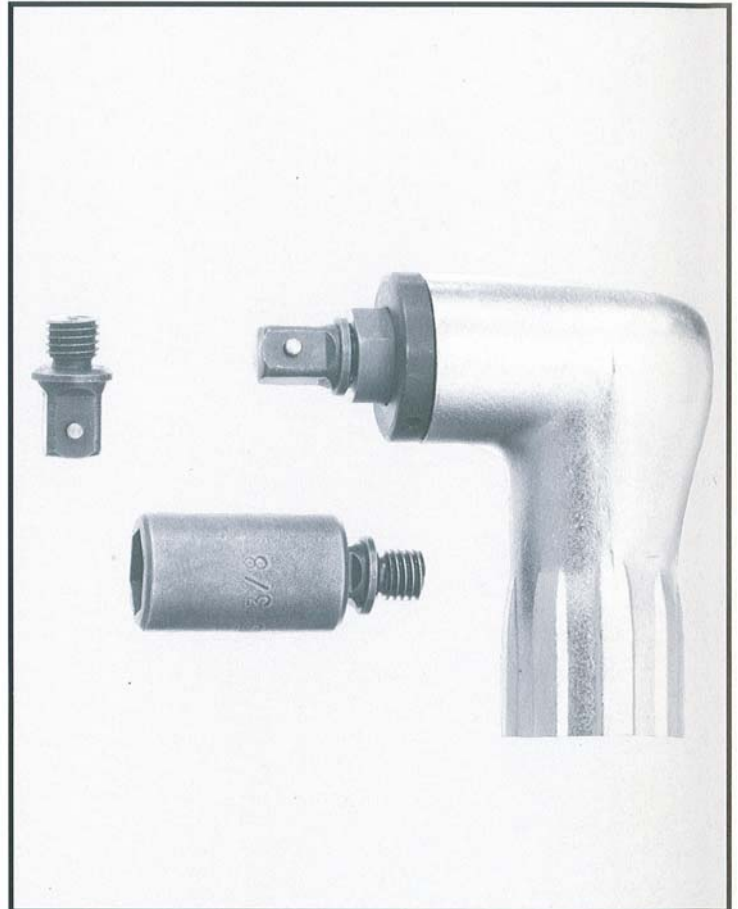




## **Z10SHT-1/2** **Convert 1/4-28 Threaded Drive Angle Drill** **to a 1/4" Square Drive Nut Runner**

Zephyr's new **Z10SHT-1/2 Adapter** allows you to use any 1 1/4-28 threaded drive angle drill as a nut runner for close quarters applications. The Z10SHT-1/2 can be used with any of Zephyr's 1/4" square drive sockets for driving 1/4", 5/16", 3/8" or 7/16" hex head screws or nuts as well as Zephyr's 1/4" square drive insert bit holders for driving screws in hard to reach places.

The new **Z10SHT-1/2 Adapter** was designed for use in the most demanding applications where close quarter limitations result in difficulty in installing and removing fasteners.



Part No. ZT10SHT-1/2

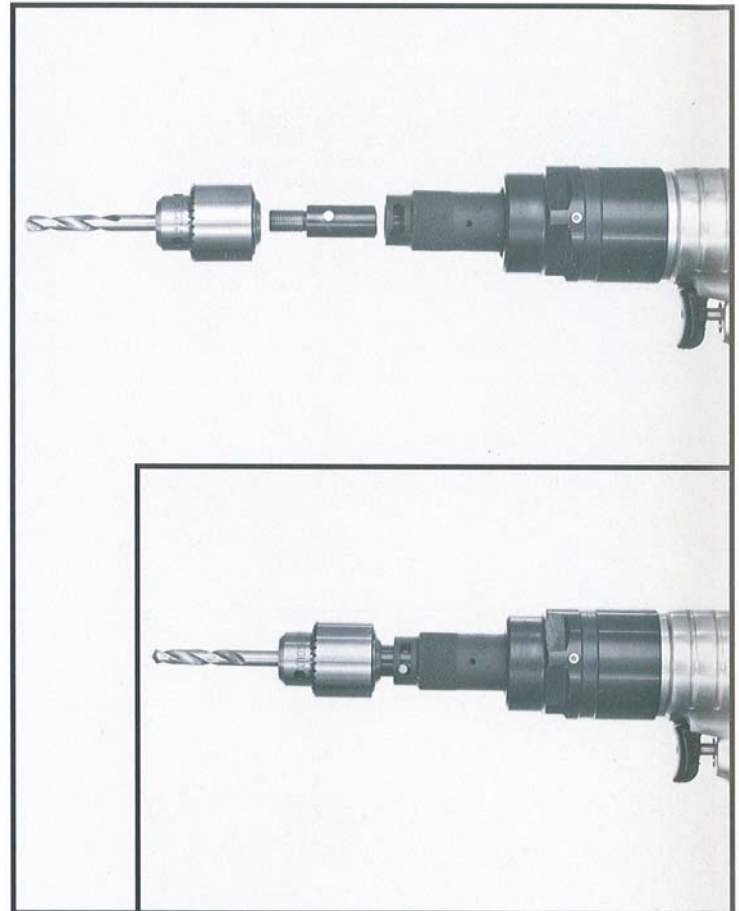


## ZT111P / ZT111L Quick Change Chuck and Adaptor

A precision made TIMESAVING tool combination. The ZT111P and ZT111 L used with Jacobs threaded chucks produce uniform high quality holes, a necessity when working with high strength stainless steel or titanium.

**SAVES TIME**, .At least a 40% savings in time required to change drills. Imagine the time saved by being able to change cutters in seconds.

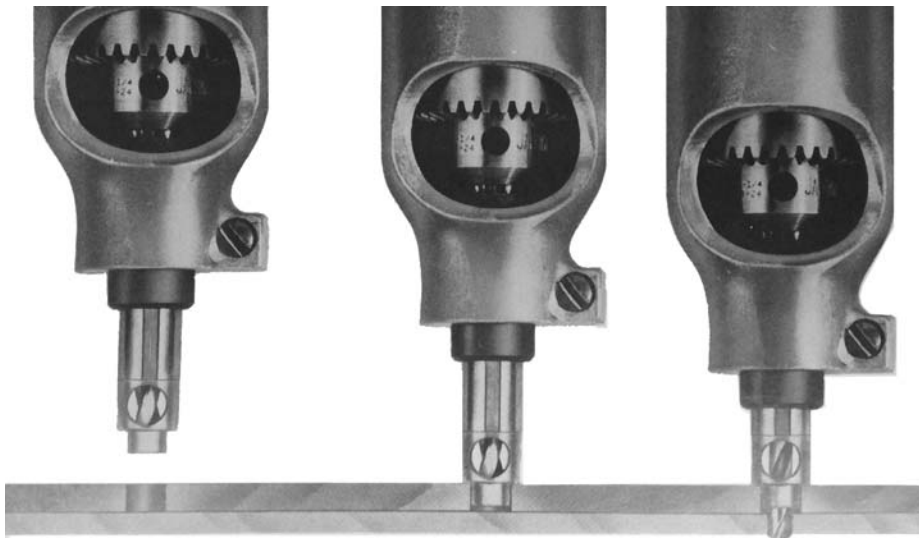
Load the Jacobs chucks with varying sizes of cutters and thread in a ZT111L (3/8 -24) to each. Then insert into the ZT111P (3/8-24) already threaded onto the drill. To change simply unlock adaptor/chuck/cutter combination and insert another. No keys to use. Zephyr brings you the bottom line: less cost, more productivity and top quality resulting in money earned.



Part No. ZT111P and ZT111L



## Collapsible Drill Guides



1. The drill guide is shown in extended position ready to be inserted into templet hole. Note how point of the drill is kept protected by drill guide.

2. Here the drill guide tip is shown seated in the templet. Rotating drill cannot mar or scratch either templet

3. As pressure is applied, the drill guide retracts as the hole is drilled. Drill centers automatically. Chips are discharge easily through large ports in tip.

Zephyr's collapsible drill guides and tips permit use of standard length twist drills. Drill breakage is avoided through accurately aligned and rigidly mounted spring loaded guide and tip. Enables unskilled help to produce more accurately and in greater volume. Eliminates spoiled templets. "off holes" and results in fewer broken drills.

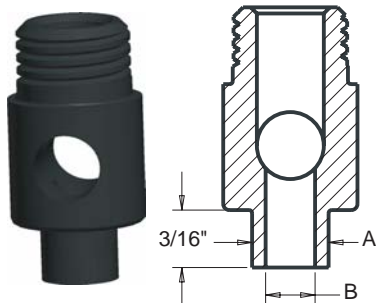
### Drill Guides (less tips)

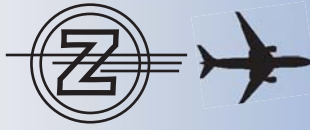
PART NUMBER	T (TRAVEL)	DIMENSION	
ZT38B	9/16"		OPEN
ZT38B-1	1"		CLOSED
ZT38B-2	1-1/2"		

### Replaceable Tips (for drill guides)

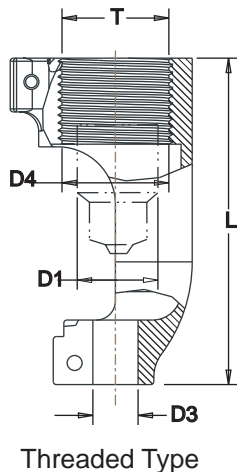
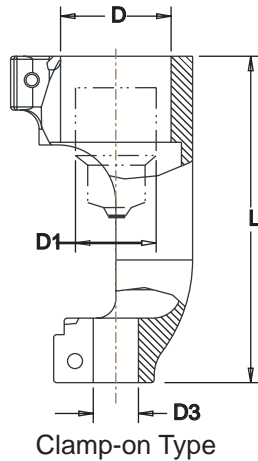
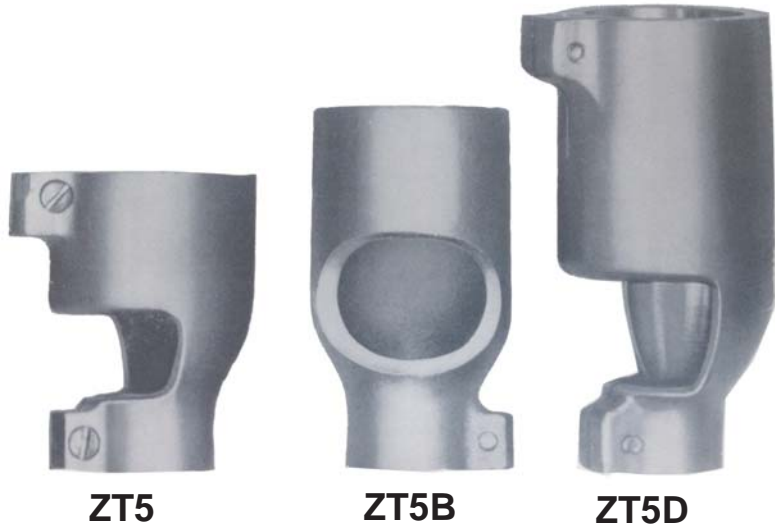
PART NUMBER	A*	B**	A*	B**	PART NUMBER
ZT28T-249-20	.249	#20	.374	#10	ZT28T-374-10
ZT28T-249-21	.249	#21	.374	#11	ZT28T-374-11
ZT28T-249-30	.249	#30	.374	#20	ZT28T-374-20
ZT28T-249-40	.249	#40	.374	#21	ZT28T-374-21
ZT28T-311-3/16	.311	3/16"	.374	#30	ZT28T-374-30
ZT28T-311-11	.311	#11	.374	#40	ZT28T-374-40
ZT28T-311-20	.311	#20	Cupped	ZT28T-Cupped (Specify round or brazier head and hole size)	
ZT28T-311-21	.311	#21			
ZT28T-311-30	.311	#30			
ZT28T-374-3/16	.374	3/16"	Tapered	ZT28T-Tapered (Specify angle and hole size)	
ZT28T-374-1/4	.374	1/4"			
ZT28T-374-8	.374	#8			

- NOTES:
- (\*)Maximum standard O.D. of A is .499" other diameters and types made to special order.
  - (\*\*)Maximum diameter of B is "#F" in all cases. Minimum Diameter of B is #50. If smaller diameter is desired we will furnish blanks which can be drilled by customer as required.
  - Minimum thickness of wall between A and B is .050".
  - Combinations of A and B other than shown above can be furnished on special order only. Tapered and Cupped tips made to order only.





## Drill Guide Mounting Adapters



TYPE	PART NO.	D	D1	D3	D4	T	MAXIMUM CHUCK MODEL	L
Clamp-On Type	ZT5-1	1-1/2"	1-3/16"	11/16"	--	--	1B	2-3/4"
	ZT5-2	1-5/8"	1-3/16"	11/16"	--	--	1B	2-3/4"
	ZT5D-1	1-1/2"	1-7/16"	11/16"	--	--	30B	4-1/4"
	ZT5D-2	1-9/16"	1-7/16"	11/16"	--	--	30B	4-1/4"
	ZT5D-3	1-5/8"	1-7/16"	11/16"	--	--	30B	4-1/4"
	ZT5D-4	1-11/16"	1-7/16"	11/16"	--	--	30B	4-1/4"
Threaded Type	ZT5B-1	--	1-3/16"	11/16"	1-1/4"	1-3/8-20 LH	1B	2-3/4"
	ZT5B-2	--	1-3/16"	11/16"	1-3/8"	1-1/2-20 LH	1B	2-3/4"
	ZT5B-4	--	1-3/16"	11/16"	1-1/4"	1-7/16-20 RH	30B	4-1/4"

Adapters with other D, D4, or T specifications made to order.  
 The above adapters will also accommodate our Flat Offset Angle Drill.



# Rivet Shavers & Accessories



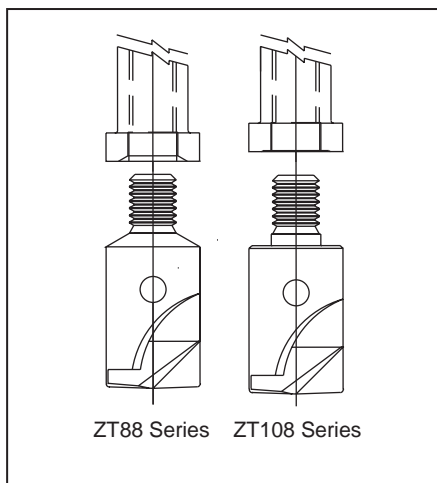


## ZT405AAC RIVET SHAVER

Heavy Duty

1.0 HP

18,000 RPM



### FEATURES

All aluminum head exterior body greatly reduces the overall weight of the rivet shaver.

Back Angle "BA" shaft features a 120 degree seat angle which when used with the ZT88 series cutters greatly improves the flushness of cut.

MODEL	CUTTER CAPACITY	SPINDLE RPM	CUTTER SERIES	WEIGHT	LENGTH
ZT405AAC	1.250"	18,000	ZT108	2.5 lbs	8.75"
ZT405AEAC	1.250"	18,000	ZT108	2.5 lbs	9.00"
ZT405AAC-BA	1.250"	18,000	ZT88	2.5 lbs	8.75"
ZT405AEAC-BA	1.250"	18,000	ZT88	2.5 lbs	9.00"

ZT405016	Stabilizer Assembly	ZT405040	Ext. Stabilizer Assembly
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### Standard Footpieces

ZT405021	Footpiece 5/16"
ZT405022	Footpiece 3/8"
ZT405023	Footpiece 7/16"
ZT405024	Footpiece 1/2"
ZT405025	Footpiece 9/16"
ZT405026	Footpiece 5/8"
ZT405027	Footpiece 3/4"
ZT405028	Footpiece 7/8"
ZT405029	Footpiece 1"
ZT405030	Footpiece 1-1/8"
ZT4050110	Footpiece 1-1/4"

### Extended Footpieces

ZT405051	Extended Footpiece 5/16"
ZT405052	Extended Footpiece 3/8"
ZT405053	Extended Footpiece 7/16"
ZT405054	Extended Footpiece 1/2"
ZT405055	Extended Footpiece 9/16"
ZT405056	Extended Footpiece 5/8"
ZT405057	Extended Footpiece 3/4"
ZT405058	Extended Footpiece 7/8"
ZT405059	Extended Footpiece 1"
ZT405060	Extended Footpiece 1-1/8"
ZT4050167	Extended Footpiece 1-1/4"

Standard Model  
Atlas Copco Motor  
Back Angle Model

## ZT405AAC-BA

### ORDERING INFORMATION

1. Shaver, footpiece, stabilizer and cutter should be ordered separately.
2. Match the diameters of the footpiece and the cutter for best results.
3. Extended footpieces and stabilizer should only be used with extended length shavers (ZT405AE).
4. ZT108 series rivet shaver cutters should be used with standard shavers.
5. ZT88 series rivet shaver cutters should be used with back angle shavers.

### Standard Rivet Shaver Cutters

ZT108-1	Rivet Shaver Cutter 5/16"
ZT108-2	Rivet Shaver Cutter 3/8"
ZT108-3	Rivet Shaver Cutter 7/16"
ZT108-4	Rivet Shaver Cutter 1/2"
ZT108-5	Rivet Shaver Cutter 9/16"
ZT108-6	Rivet Shaver Cutter 5/8"
ZT108-7	Rivet Shaver Cutter 3/4"
ZT108-8	Rivet Shaver Cutter 7/8"
ZT108-9	Rivet Shaver Cutter 1"
ZT108-10	Rivet Shaver Cutter 1 1/8"
ZT108-11	Rivet Shaver Cutter 1 1/4"

### Back Angle Rivet Shaver Cutters

ZT88-1	Rivet Shaver Cutter 5/16"
ZT88-2	Rivet Shaver Cutter 3/8"
ZT88-3	Rivet Shaver Cutter 7/16"
ZT88-4	Rivet Shaver Cutter 1/2"
ZT88-5	Rivet Shaver Cutter 9/16"
ZT88-6	Rivet Shaver Cutter 5/8"
ZT88-7	Rivet Shaver Cutter 3/4"
ZT88-8	Rivet Shaver Cutter 7/8"
ZT88-9	Rivet Shaver Cutter 1"
ZT88-10	Rivet Shaver Cutter 1 1/8"
ZT88-11	Rivet Shaver Cutter 1 1/4"



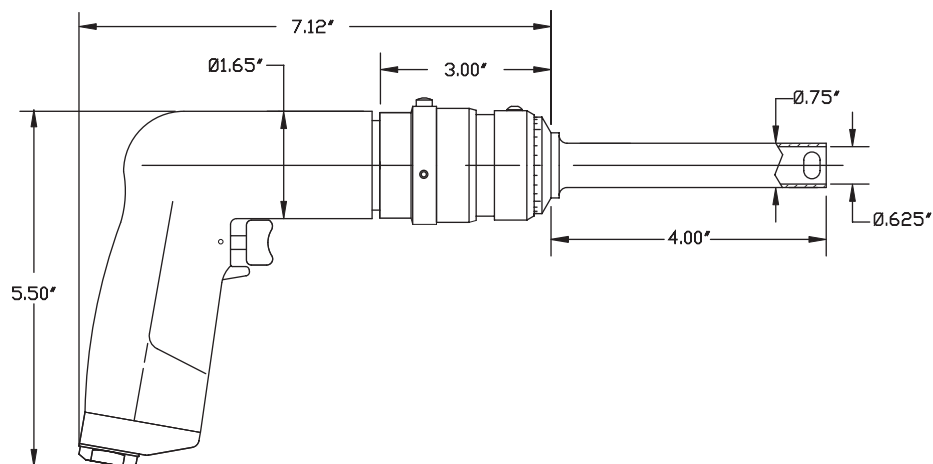
## ZT405AEIR-4 4" Extended Footpiece Heavy Duty Rivet Shaver



Zephyr's ZT405 Heavy Duty Rivet Shavers are designed to shave aluminum or similar strength alloy rivets flush to a precise plane without scratching.

### FEATURES

- New aluminum head reduces the overall weight.
- Footpiece lengths for special restricted access applications, 3", 5", 6" and 7", available on request.
- Footpiece cutter capacity 1/2" to 5/8".
- Depth adjustment in .0005" increments.
- Uses 1/4"-28 threaded cutters.
- 20,000 RPM free speed.
- Weight 3.5 lbs. (1.59Kg).
- Air Supply 90 psi (inlet 1/4").
- CE Certified.
- Manufactured in USA.







**MICRO SHAVERS  
STANDARD AND HEAVY DUTY**

**MODEL  
ZT507C  
SUPER SHAVER**



**MODEL  
ZT706AIR  
STANDARD DUTY**



**MODEL  
ZT405AIR  
HEAVY DUTY**





**MICRO SHAVERS  
 STANDARD AND HEAVY DUTY**

**POSITIVE  
 MICRO-STOP  
 DEPTH CONTROL**



**Fingertips Adjustment  
 in .0005" increments**

Adjustment for depth of cut in increments of .0005". To adjust grasp locking with thumb and index finger and retract. Turn nosepiece to right to increase depth of cut, left to decrease. Retraction of footpiece constant over entire range of adjustment.

Can't  
 Skid



Can't  
 Heel



Can't  
 Undercut



**Shaves clean  
 No Scratching**



Illustrated at the left is an actual photograph of rivets before and after shaving by the Zephyr Micro-Shaver. Rivet has been shaved flush to precise plane of sheet without surface scratching. Shaving process is consistent regardless of rivet height.



## ZT706AIR RIVET SHAVER Standard Duty

**Fingertips Adjustment in .0005" increments**

### FEATURES

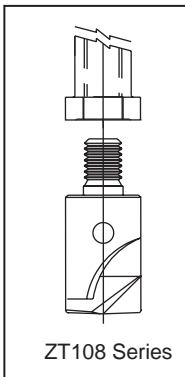
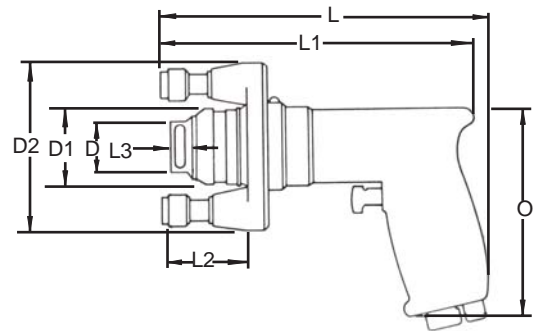
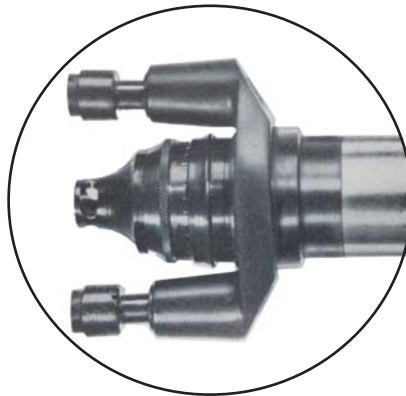
- New aluminum head reduces the overall weight.
- Footpiece lengths for special restricted access
- Footpiece cutter capacity 1/4" to 5/8".
- Depth adjustment in .0005" increments.
- Uses 1/4"-28 threaded cutters.
- 15,000 RPM free speed.
- Weight 3.0 lbs. (1.59Kg).
- Air Supply 90 psi (inlet 1/4").
- CE Certified.
- Manufactured in USA.



Standard Model  
|  
ZT706A IR  
|  
Ingersoll Rand

### ORDERING INFORMATION

1. Shaver, footpiece, stabilizer and cutter should be ordered separately.
2. Match the diameters of the footpiece and the cutter for best results.
3. Extended footpieces and stabilizer should only be used with extended length shavers (ZT706AEIR).
4. ZT108 series rivet shaver cutters should be used with standard shavers.



MODEL	CUTTER CAPACITY	WT. LESS CUTTER	CUTTER RPM	D(max)	D1	D2	L	L1	L2	L3	O
ZT706AIR	5/8"	3#	15,000	1-1/8"	1-1/2"	4"	7-1/2"	6-3/8"	1-7/8"	3/8"	4-7/8"
ZT706AEIR	5/8"	3#	15,000	1-1/8"	1-1/2"	4"	7-13/16"	6-13/16"	2-1/4"	7/8"	4-7/8"



## ZT405AIR RIVET SHAVER Heavy Duty

### Fingertips Adjustment in .0005" increments

#### FEATURES

- New aluminum head reduces the overall weight.
- Footpiece lengths for special restricted access
- Footpiece cutter capacity 1/2" to 5/8".
- Depth adjustment in .0005" increments.
- Uses 1/4"-28 threaded cutters.
- 20,000 RPM free speed.
- Weight 3.5 lbs. (1.59Kg).
- Air Supply 90 psi (inlet 1/4").
- CE Certified.
- Manufactured in USA.

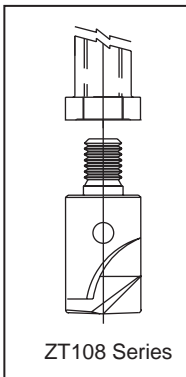
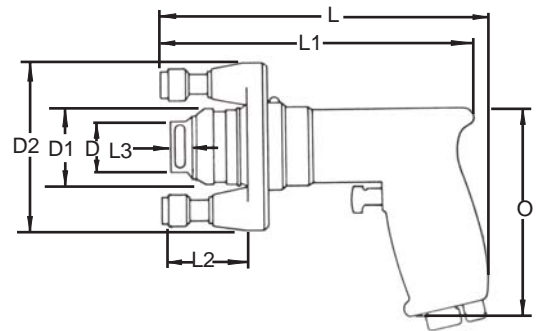
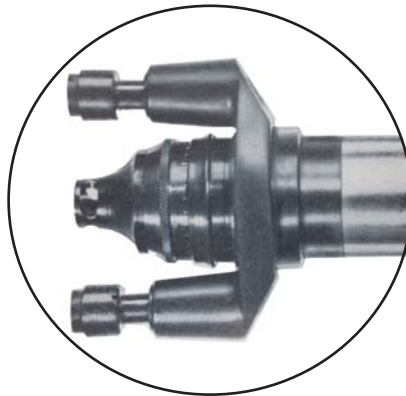


Standard Model  
Ingersoll Rand

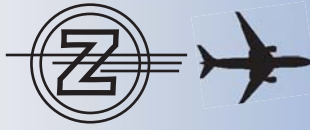
### ZT405AIR

#### ORDERING INFORMATION

1. Shaver, footpiece, stabilizer and cutter should be ordered separately.
2. Match the diameters of the footpiece and the cutter for best results.
3. Extended footpieces and stabilizer should only be used with extended length shavers (ZT405AEIR).
4. ZT108 series rivet shaver cutters should be used with standard shavers.



MODEL	CUTTER CAPACITY	WT. LESS CUTTER	CUTTER RPM	D(max)	D1	D2	L	L1	L2	L3	O
ZT405AIR	1-1/4"	3-1/2#	20,000	1-3/8"	1-3/4"	4"	7-3/4"	6-7/8"	1-3/4"	3/8"	5-1/8"
ZT405AEIR	1-1/4"	3-1/2#	20,000	1-3/8"	1-3/4"	4"	8-1/8"	7-1/4"	2-1/4"	7/8"	5-1/8"



## MICRO SHAVERS STANDARD AND HEAVY DUTY

**THESE CUTTERS ARE DESIGNED FOR USE IN  
ZEPHYR MICRO SHAVERS**


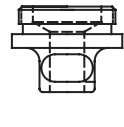
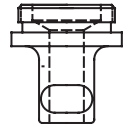
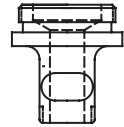
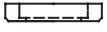
**CARBIDE  
TIPPED  
CUTTERS**



**CUTTERS  
FOOPIECES  
AND  
FOOTPLATES**



These sizes are available with the correct combinations of cutters, Footpieces and Footplates as noted.

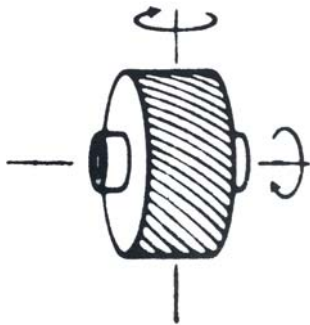
		 ZT108 Series				
	CUTER DIA.	CUTTER STANDARD	FOOTPIECE STANDARD PNEUMATIC	FOOTPIECE EXTENDED PNEUMATIC	FOOTPIECE THREADED EXTENDED PNEUMATIC	FOOTPLATE NYLON TYPE
MODEL ZT706	1/4"	ZT108-0	ZT306020	ZT306040	NOT MADE	NOT MADE
	5/16"	ZT108-1	ZT306021	ZT306041	NOT MADE	NOT MADE
	3/8"	ZT108-2	ZT306022	ZT306042	NOT MADE	NOT MADE
	7/16"	ZT108-3	ZT306023	ZT306043	ZT306050	ZT205053
	1/2"	ZT108-4	ZT306024	ZT306044	ZT306051	ZT205054
	9/16"	ZT108-5	ZT306025	ZT306045	ZT306052	ZT205055
MODEL ZT405	5/8"	ZT108-6	ZT306026	ZT306046	ZT306053	ZT205056
	3/8"	ZT108-2	ZT405022	ZT405052	NOT MADE	NOT MADE
	7/16"	ZT108-3	ZT405023	ZT405053	ZT405032	ZT205053
	1/2"	ZT108-4	ZT405024	ZT405054	ZT405033	ZT205054
	9/16"	ZT108-5	ZT405025	ZT405055	ZT405034	ZT205055
	5/8"	ZT108-6	ZT405026	ZT405056	ZT405035	ZT205056
	3/4"	ZT108-7	ZT405027	ZT405057	ZT405036	ZT205057
	7/8"	ZT108-8	ZT405028	ZT405058	ZT405037	ZT205058
	1"	ZT108-9	ZT405029	ZT405059	ZT405038	ZT205059
	1-1/8"	ZT108-10	ZT405030	ZT405060	ZT405039	ZT205060
	1-1/4"	ZT108-11	ZT4050110			



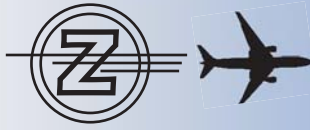
**ZT507C**  
**SUPER SHAVER**

**FOR USE ON TITANIUM , STAINLESS STEEL,  
MONEL AND SIMILAR HIGH STRENGTH FASTENERS**

**DUAL  
ROTATION  
TYPE  
CUTTERS**

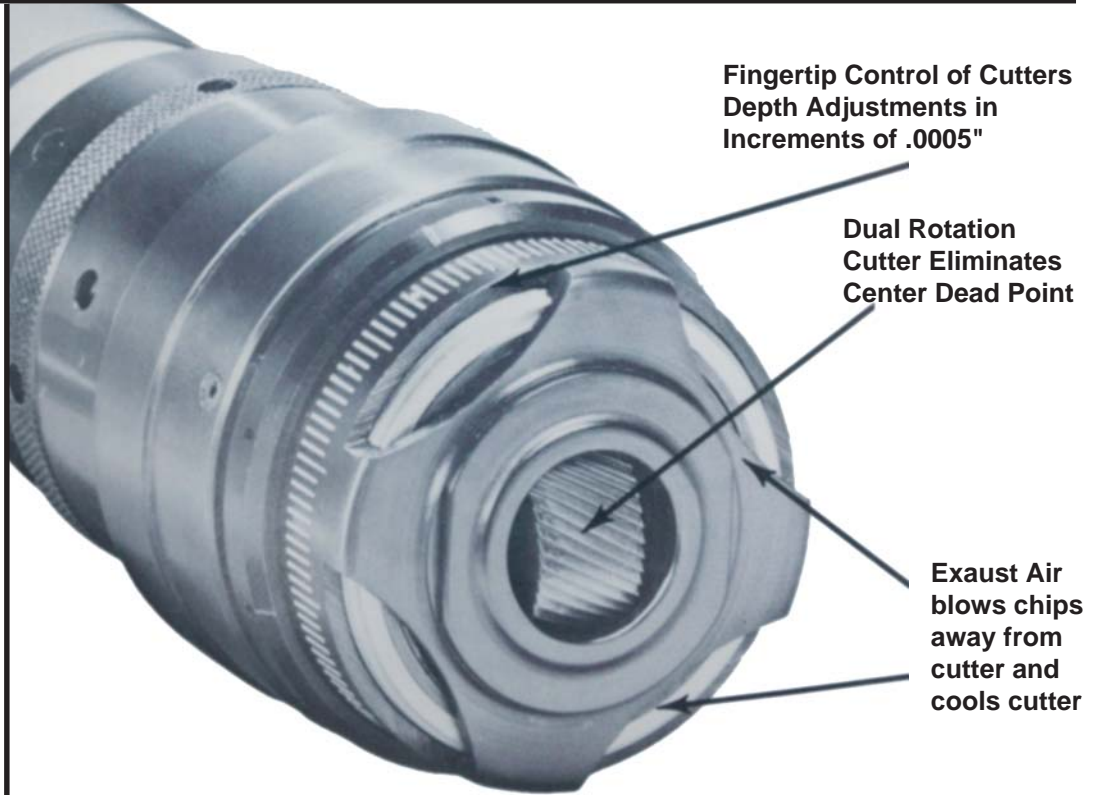


- Dual rotation cutting action.
- Micrometer dial type adjustment with .0005 inch increments.
- Positive cutting depth control
- Solid Carbide Cutters.
- Cutter rotation - 12,000 R.P.M.



**ZT507C  
SUPER SHAVER**

**FLUSH FINISHES  
EXTRA HARD AND  
TOUGH MATERIALS**



**STABILIZER  
ASSEMBLY**



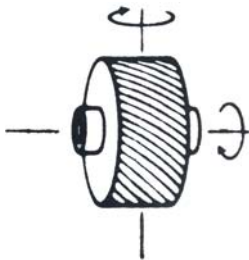
Removable Stabilizer Assembly  
is easily installed on shaver to  
prevent "walking" across the  
sheet the sheet. It is specially  
recommended for use with  
ZT507C Dual Rotation model.

**NOTE: Stabilizer Assembly, available as accessory if required,  
specify at time of order**



## ZT507C SUPER SHAVER

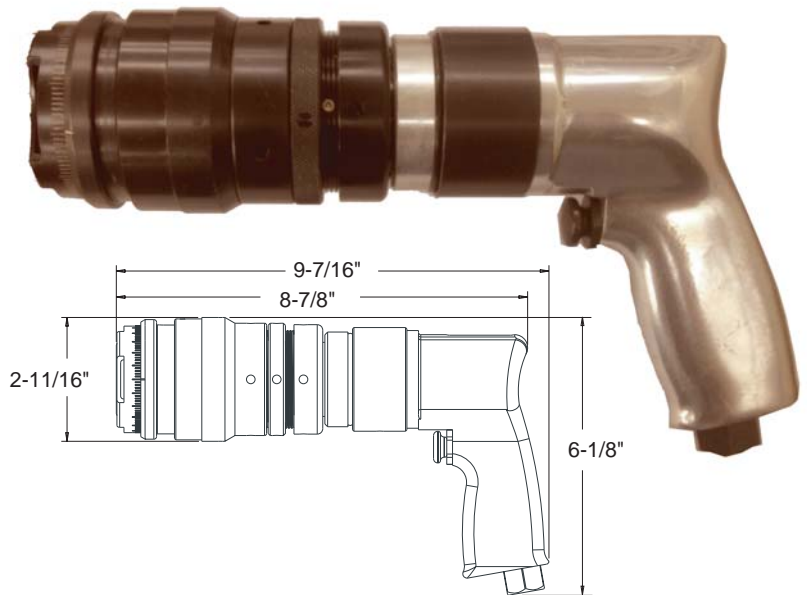
Model ZT507C rotates cutter at approximately 12,000 rpm  
Weight: 5 ½ lbs.



**DUAL  
ROTATION  
TYPE  
CUTTERS**

Zephyr's Super Shavers will flush-finish the toughest and hardest fasteners in seconds. Precision finishing conforms with rigid standards established for construction of supersonic aircraft.

**FOR USE ON TITANIUM , STAINLESS STEEL, MONEL AND SIMILAR HIGH STRENGTH FASTENERS.**



### CARBIDE CUTTERS



FOOTPIECES

CUTTER WIDTH	STEEL FOOTPIECE	NYLON FOOTPIECE	CLOSE QUARTER NOSEPIECE
3/8" & 7/16"	ZT507084	--	ZT507094
1/2"	ZT507029	ZT507041	ZT507092
3/4"	ZT507035	ZT507055	--

### CUTTERS FOR ZT507C SUPER SHAVER

Zephyr's Carbide Cutters are precision ground for high speed usage and long life. They are fluted to meet the special requirements for various metals and finishes.

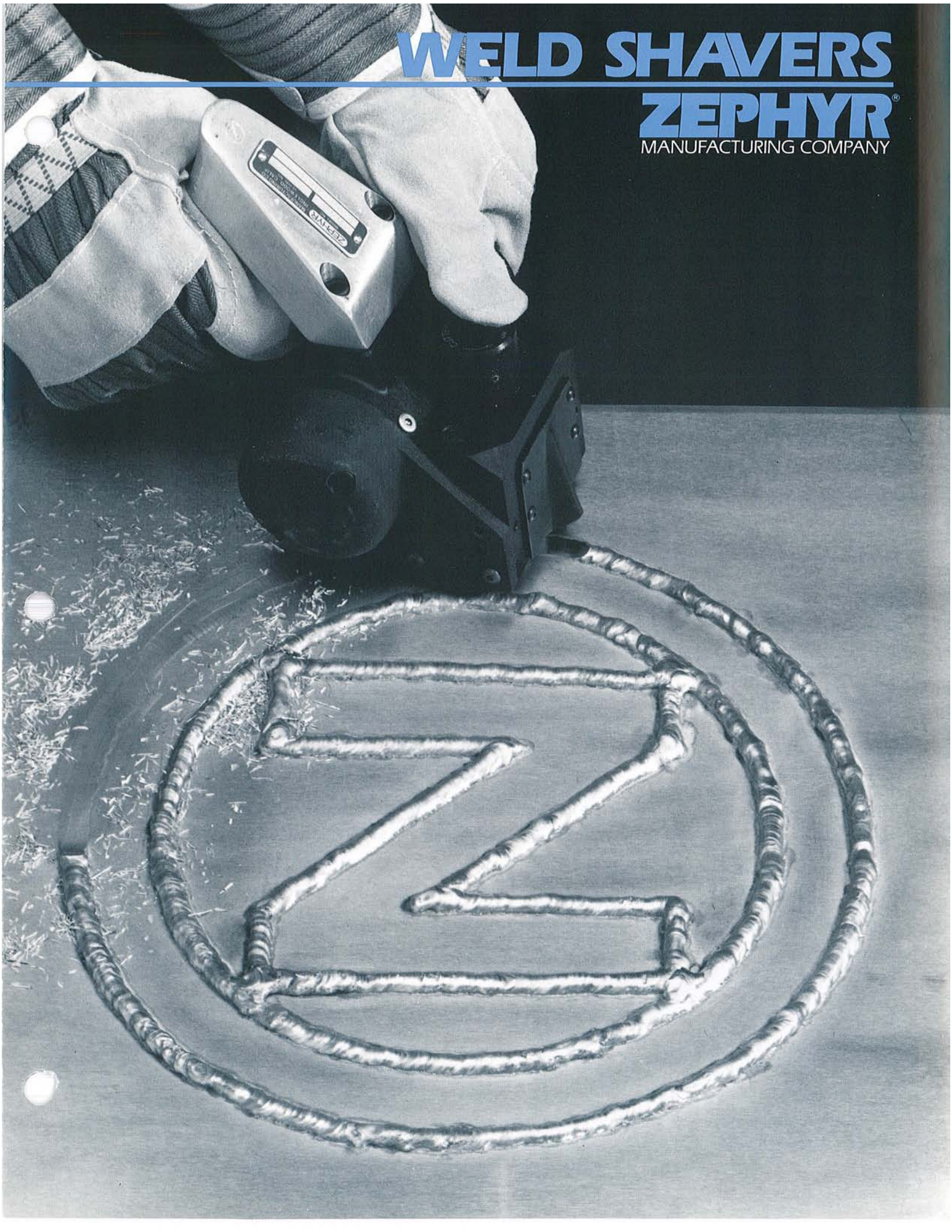
CUTTER NUMBER	MATERIAL	DIAMETER	WIDTH	No. OF TEETH	CHIP BREAKER	APPLICATION
ZT507-20B	CARBIDE	1-1/8"	1/2"	49	NO	MONEL STEEL, TITANIUM
ZT507-21B	CARBIDE	1-1/8"	3/4"	49	NO	MONEL STEEL, TITANIUM
ZT507-22B	CARBIDE	1-1/8"	1/2"	25	NO	MONEL STEEL, TITANIUM, JO BOLT
ZT507-23B	CARBIDE	1-1/8"	3/8"	49	NO	MONEL STEEL, TITANIUM
ZT507-24B	CARBIDE	1-1/8"	1/2"	37	YES	NACA, STRAYLAR RIVET, ALUMINUM, JO BOLT
ZT507-25B	CARBIDE	1-1/8"	3/4"	37	YES	NACA, STRAYLAR RIVET, ALUMINUM, JO BOLT
ZT507-26B	CARBIDE	1-1/8"	3/8"	37	YES	NACA, STRAYLAR RIVET, ALUMINUM, JO BOLT
ZT507-27B	CARBIDE	1-1/8"	1/2"	25	NO	A-286 STAINLESS STEEL RIVET
ZT507-28B	CARBIDE	1-1/8"	3/4"	25	NO	A-286 STAINLESS STEEL RIVET
ZT507-29B	CARBIDE	1-1/8"	7/16"	49	NO	MONEL, STEEL, TITANIUM



# WELD SHAVERS

## ZEPHYR<sup>®</sup>

MANUFACTURING COMPANY



## **R**emove welds in one step instead of three.

The old method was a grind. And with chipping and sanding, it was also a costly, time consuming, three-stage process. But now, with Zephyr Z-Mill™ Pneumatic Weld Shavers, you can remove a weld bead in just one pass.

A Zephyr Weld Shaver will remove a weld bead up to ten times faster than a hand held grinder. Because we've combined three steps into one, you save more than time. You save money.

### **Aluminum, titanium, exotic metals, and more.**

Born in the aerospace industry, we understand specialized materials. That's why we've designed our Weld Shavers to be precision milling tools. You can set them for the depth of shaving you need—something that would be unthinkable with a hand held grinder.

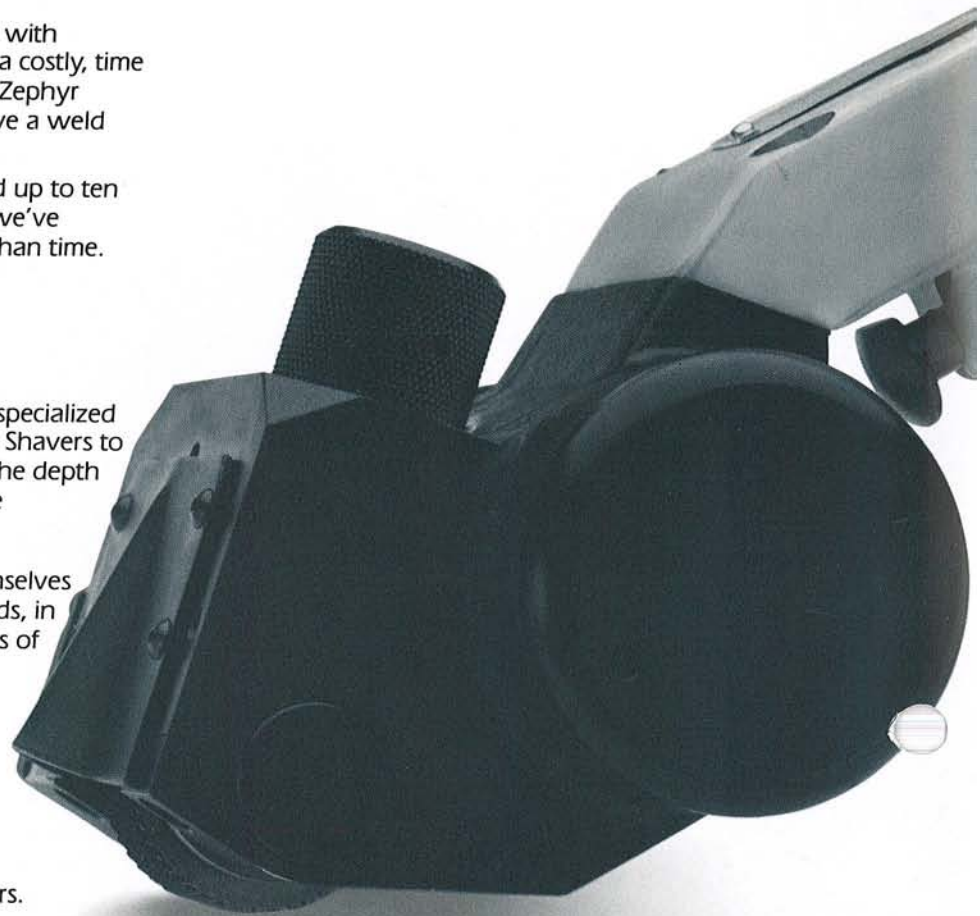
Zephyr Weld Shavers have already proven themselves in application after application: in naval shipyards, in trailer manufacturing plants, even in the facilities of specialized tank manufacturers.

### **Satisfied customers in your industry.**

Builders of electrical and computer cabinetry, refrigeration equipment, and truck and trailer bodies are just a few of the types of companies enjoying the advantages of Zephyr Weld Shavers.

We have complete case studies of Weld Shaver applications by firms like yours. Ask your Zephyr representative for an example in your area of interest.

Then see for yourself how Zephyr Z-Mill™ Weld Shavers will improve your weld finish as well as your bottom line.



# ZT708 & ZT709

## STANDARD DUTY WELD SHAVERS

Remove stainless steel or titanium weld beads with the ZT708. Remove aluminum, copper, magnesium, or other non-ferrous metal weld beads with the ZT709.

Both are portable air-powered tools designed to shave weld beads to a pre-determined height—above, below, or flush to the surface. Each can solve special requirements such as burr removal, beveling, and working at angles or in close quarters. Grooving is accomplished with the ZT709 aluminum shaver only. No matter what your application, these Weld Shavers will perform with precision, giving you a smooth finished surface in less time than ever before.

Here's how they work: two adjustable ball bearing rollers straddle the weld bead, centering the cutter over the weld. The ball bearings keep the cutter at a constant height on any surface, whether flat, convex, or concave.

You have absolute control over the cutter height and can make adjustments in increments of 0.001 inch. You also can select a variety of cutter widths. The different cutter widths require a different roller bracket shaft assembly, each one of which can be rapidly removed when changing or re-sharpening the cutters. This ensures rapid turn-around time on the job. Both Weld Shavers are designed to have the exhaust air blow chips from the work area and cool the cutter.

The ZT708 will shave a maximum weld bead of .030" high by  $\frac{7}{8}$ " wide in one pass. Cutters are slab type, and available in widths of  $\frac{3}{8}$ " to 1" with a chip breaker, or  $\frac{3}{8}$ " to  $\frac{1}{2}$ " without chip breaker.

The ZT709 will shave a maximum bead of 0.125" high by  $\frac{7}{8}$ " wide. Cutters are slab type, and are available in widths of  $\frac{3}{8}$ " to  $\frac{3}{4}$ " in high speed steel;  $\frac{3}{8}$ " to 1" in carbide; and grooving cutters of  $\frac{1}{2}$ " in 60°, 75°, and 88° angles. Grooving aluminum is now a faster process. The grooving cutter can be used to remove a poor weldment that does not have deep roots, which saves the work piece for a re-weld.

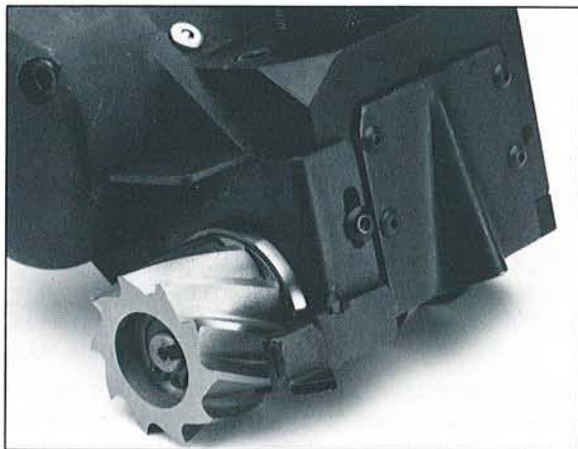
Please see our Specification Sheet for complete details.

## OUTRIGGER & BEVEL ATTACHMENTS

Right hand and left hand outrigger attachments enable you to remove corner fillets or radius welds which are adjacent to 90° plates, walls, or structures. You can shave a 90° weld to  $\frac{9}{64}$ " with a standard slab cutter  $\frac{3}{4}$ " wide. Perform flush cutting with a side recessed 1" cutter. A radius fillet weld finish can be achieved with a side recessed edge radius cutter.

The standard attachment is manually adjusted for depth control without requiring any basic modification of the Weld Shaver. Optional mechanically controlled outriggers are also available to micro-adjust depth and distance from a side plate or wall surface.

The bevel attachment is designed for two jobs: to bevel or chamfer plates prior to welding, and to bevel or chamfer edges of aluminum and stainless steel. A right hand and left hand bevel attachment is available with a standard 60° slide.



# ZT550 & ZT553

## LIGHT DUTY WELD SHAVERS



Both of these Weld Shavers are designed for light duty close-quarters work. The ZT550 shaves aluminum weld beads and grooves aluminum plates. The ZT553 shaves stainless steel weld beads and is therefore slightly larger and heavier.

Adjustable ball bearing rollers straddle the weld bead with the cutter rotating in between. You can shave a weld bead parallel to a flat, concave, or convex work surface. In precise applications, the positive micro-stop adjustment controls cutting depth in 0.0005 inch increments.

Slab cutters for shaving weld beads are available in  $\frac{3}{8}$ " to  $\frac{1}{2}$ " wide in high speed steel and  $\frac{1}{4}$ " to  $\frac{1}{2}$ " wide in carbide. Grooving cutters are available in high speed steel,  $\frac{3}{8}$ " wide, in 40° and 60° angles.

Each cutter width requires a different roller bracket shaft assembly which is easily removed to change or re-sharpen the cutters. The exhaust air serves a dual purpose: blowing chips away from the work area and cooling the cutter.

Please refer to our Specification Sheet for more detailed information.

# ZT501

## HEAVY DUTY WELD SHAVER



Here is a portable milling machine designed for heavy duty use with aluminum, magnesium, and copper. This tool may be used in three ways: to shave weld beads, as a slab mill, and to groove non-ferrous metals.

As in all our Weld Shavers, the ball bearing roller bracket straddles the weld bead with the cutter rotating in between. This design ensures that the weld bead is shaved tangent to the work surface, whether flat, concave, or convex. Positive micro-stop adjustment of the cutter is calibrated in 0.001 inch increments, permitting a shave of a pre-determined height or flush with the work surface.

Slab cutter widths are  $\frac{3}{4}$ " to 2", while the grooving cutters are  $1\frac{1}{2}$ " wide for 60° or  $1\frac{5}{8}$ " wide for 70° to a depth of  $1\frac{1}{16}$ ".

The motor is governor controlled to assure a constant speed. Air exhaust blows away chips and controls the temperature of the cutter. The roller bracket assembly is easily removed, enabling you to rapidly replace the cutter.

Please consult our Specification Sheet for complete details.

# SAFETY

Zephyr products are designed to be safe under proper working conditions. Be sure that you know the proper way to use a tool before working with it. We recommend the wearing of eye protection when using any hand tool or machine shop tool.

Keep your tools clean, lubricated, inspect them from time to time, and replace worn or damaged tools. The nominal cost will be more than offset by the reduction in mistakes and the savings on rework.

# ZEPHYR®

TOOL

**ZEPHYR® Manufacturing Co., Inc.**  
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Inglewood, CA 90301-1519  
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zephyr@zephyrtool.com  
<http://www.zephyrtool.com>

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Printed in USA 9-01 1M





## ZT501 Porta Mil Heavy Duty Weld Shaver



The Porta-Mill is a heavy duty hand held milling machine designed to be used on aluminum, magnesium and copper. The Porta-Mill may be used in 3 ways: to shave weld beads, as a slab mill and to groove non-ferrous metals.

As with all our Weld Shavers, the ball bearing roller bracket straddles the weld bead with the cutter rotating in between. This insures that the weld bead is shaved tangent to the work surface, whether flat, concave or convex. Positive depth control allows the cutter height to be set in increments of .001 inch, making it ease to shave flush to the work surface or to a pre-determined depth.

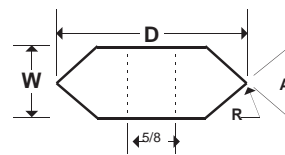
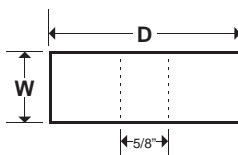
The motor is governor controlled to assure a constant speed. The air exhaust blows away the shavings and helps control the temperature of the cutter. The roller bracket is easily removed, enabling the end user to replace the cutter quickly.

**How to Order:** The basic Porta-Mill assembly consists of the **ZT501 Porta-Mill Shaver**, and two accessories, a **Cutter** and a **Roller Shaft Assembly**. All three are required and must be ordered separately. To select the accessory part numbers refer to the table below. Simply determine the cutter style and the cutter width. The two accessory part numbers will be at either end of that row, in **Bold**.

Cutter Number	Cutter Material	D Diameter	W Width	Number Of Teeth	A Angle	Cutter Style	R Radius	Roller Shaft Assembly
ZT501-19	Carbide	2"	3/4"	10		Slab		<b>ZT5010124</b>
ZT501-20	Carbide	2"	1"	10		Slab		<b>ZT5010121</b>
ZT501-21	Carbide	2"	1 1/2"	10		Slab		<b>ZT5010122</b>
ZT501-22	Carbide	2"	2"	10		Slab		<b>ZT5010123</b>
ZT501-30	Carbide Tipped	3 3/8"	1 1/2"	8	60°	Groove	.156"	<b>ZT5010126</b>
ZT501-31	Carbide Tipped	3 3/8"	1 5/8"	8	70°	Groove	.156"	<b>ZT5010128</b>

### ZT501 Weld Shaver Specification

Horse Power	3.6 hp
Free speed	4700 rpm
Weight	29 lbs
Air consumption at free run (min)	44 cfm
PSI (min)	90 psi
Sound level at free speed	
Air inlet thread	NPT
Hose size (min)	

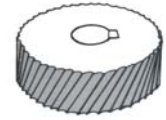




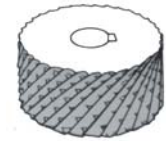
## CUTTERS FOR ZT708

For use on Titanium, Stainless Steel, Monel and similar high strength materials.

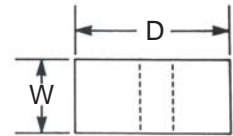
Cutter Part No.	Cutter Material	D	W	Cutter		Roller Shaft Assembly	Cutter Adjustment		Number of Teeth
		Diameter	Width	Style	Type		In	Out	
ZT508-20B	Carbide	1 1/2	1/2	Slab	I	ZT709041	.230	.206	49
ZT508-21B	Carbide	1 1/2	3/4	Slab	I	ZT709042	.230	.206	49
ZT508-22B	Carbide	1 1/2	3/8	Slab	I	ZT709040	.230	.206	49
ZT508-26B	Carbide	1 1/2	1/2	Slab	II	ZT709041	.230	.206	49
ZT508-27B	Carbide	1 1/2	3/4	Slab	II	ZT709042	.230	.206	49
ZT508-28B	Carbide	1 1/2	3/8	Slab	II	ZT709040	.230	.206	49
ZT508-29B	Carbide	1 1/2	5/8	Slab	II	ZT709098	.230	.206	49
ZT508-35B	Carbide	1 1/2	3/8	Slab	II	ZT709040	.230	.206	36
ZT508-36B	Carbide	1 1/2	1/2	Slab	II	ZT709041	.230	.206	36
ZT508-37B	Carbide	1 1/2	3/8	Slab	II	ZT709042	.230	.206	36
ZT508-38B	Carbide	1 1/2	15/16	Slab	II	ZT708031	.230	.206	36
ZT708-20B	Carbide	1 1/2	1	Slab	II	ZT709043	.230	.206	49



Type I slab cutter w/o chipbreaker



Type II slab cutter w/ chipbreaker

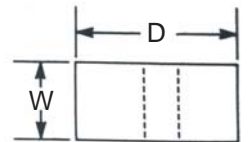


Slab Type

## CUTTERS FOR ZT709

For use on Aluminum, Magnesium, Copper and Softer alloys.

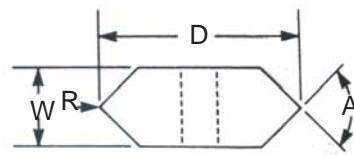
Cutter Part No.	Cutter Material	D	W	A	Cutter Style	R Radius	Roller Shaft Assembly	Cutter Adjustment		Number of Teeth
		Diameter	Width	Angle				In	Out	
ZT509-20	H.S.S.	1 1/2	1/2	-	Slab	-	ZT709041	.230	.206	15
ZT509-21	H.S.S.	1 1/2	3/4	-	Slab	-	ZT709042	.230	.206	15
ZT509-22B	Carbide	1 1/2	1/2	-	Slab	-	ZT709041	.230	.206	15
ZT509-23B	Carbide	1 1/2	3/4	-	Slab	-	ZT709042	.230	.206	15
ZT509-24	H.S.S.	1 1/2	3/8	-	Slab	-	ZT709040	.230	.206	15
ZT509-25B	Carbide	1 1/2	3/8	-	Slab	-	ZT709040	.230	.206	15
ZT509-32B	Carbide	1 1/2	5/8	-	Slab	-	ZT709098	.230	.206	15
ZT509-37B	Carbide	1 1/2	1/2	-	Slab	-	ZT709041	.230	.206	10
ZT509-38B	Carbide	1 1/2	1.00	-	Slab	-	ZT709043	.230	.206	15
ZT509-39B	Carbide	1 1/2	3/4	-	Slab	-	ZT709042	.230	.206	10
ZT509-33	H.S.S.	1 15/16	1/2	75°	Groove	.046	ZT709041	.046	.420	10
ZT509-36B	Carbide Tip	1.906	1/2	60°	Groove	.062	ZT709041	.015	.409	6
ZT509-45B	Carbide Tip	1.687	1/2	88°	Groove	.062	ZT709043	.137	.299	6



Slab Type



Grooving Type





## OUTRIGGER ATTACHMENT FOR ZT708/ZT709

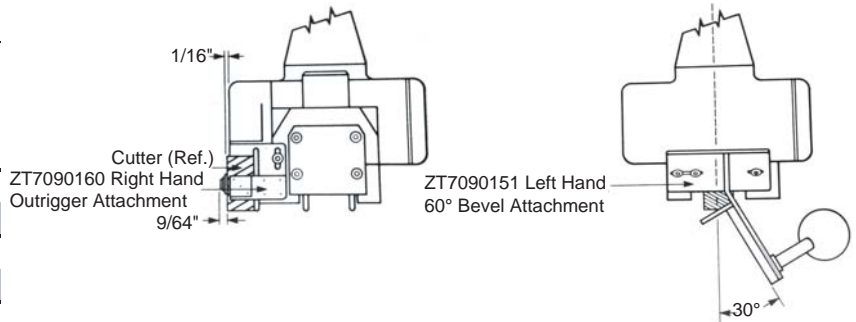
Specify ZT7090160 for right hand cutting, Specify ZT7090170 for left hand cutting

Weld Shaver Number	Outrigger Attachment	Standard Cutter Number	Recessed Flush Cutter Flush	Recessed Radius Flush Cutter	Cutter Radius	Roller Bracket Needed*
ZT708	ZT7090160 Right Hand	ZT508-21B	ZT708-21B	ZT708-23B	.250	ZT709046
		ZT508-27B				ZT709046
		ZT508-37B				ZT709046
ZT708	ZT7090170 Left Hand	ZT508-21B	ZT708-22B	ZT708-24B	.250	ZT709046
		ZT508-27B				ZT709046
		ZT508-37B				ZT709046
ZT709	ZT7090160 Right Hand	ZT509-21	ZT709-20B	ZT709-21B	.250	ZT709046
		ZT509-23B				ZT709046
		ZT509-39B				ZT709046
ZT709	ZT7090170 Left Hand	ZT509-21	ZT709-22B	ZT709-23B	.250	ZT709046
		ZT509-23B				ZT709046
		ZT509-39B				ZT709046

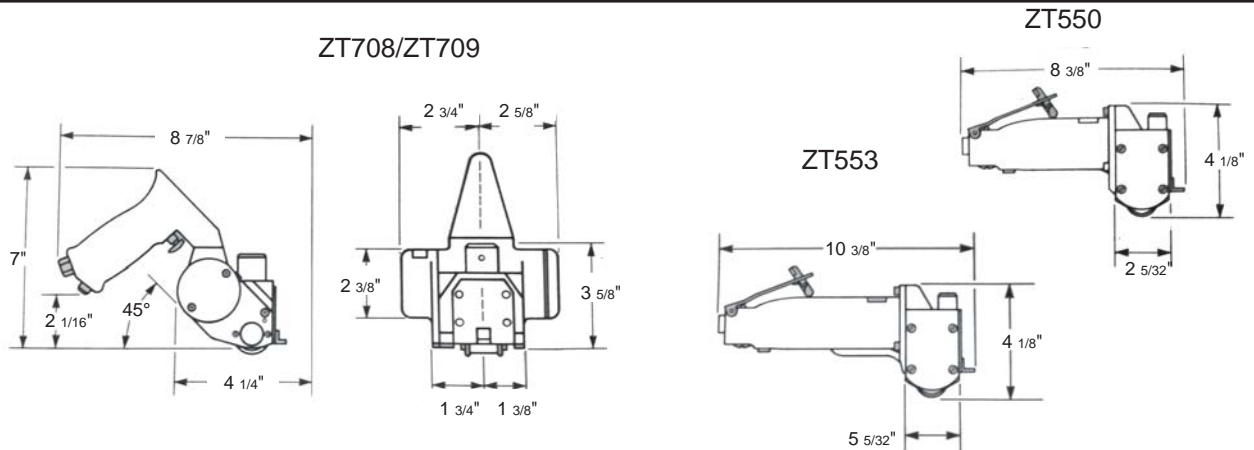
\*Recommended for stability if your ZT708 or ZT709 does not have 3/4" wide roller bracket.

## BEVEL ATTACHMENTS FOR ZT708/ZT709

Weld Shaver Number	Bevel Attachment Number 60°	Cutter Number	Style
ZT708	ZT7090150	ZT708-20B	Right Hand
	ZT7090151	ZT708-20B	Left Hand
ZT709	ZT7090150	ZT509-38B	Right Hand
	ZT7090151	ZT509-38B	Left Hand



## DIMENSIONS AND SPECIFICATIONS OF WELD SHAVERS

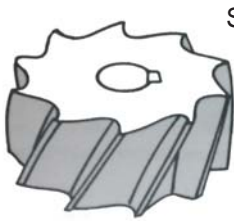




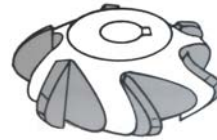
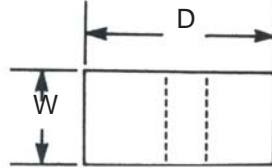
## CUTTERS FOR ZT550

For use on Aluminum, Magnesium, Copper and Softer alloys.

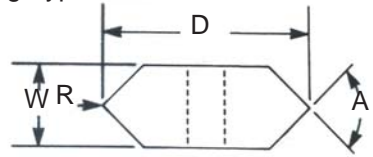
Cutter Part No.	Cutter Material	D	W	A	Cutter Style	R	Roller Shaft Assembly	Cutter Adjustment		Number of Teeth
		Diameter	Width	Angle		Radius		In	Out	
ZT550-21	H.S.S.	1 1/8	3/8	-	Slab	-	ZT550069	.125	.187	10
ZT550-23	H.S.S.	1 1/8	1/2	-	Slab	-	ZT550070	.125	.187	10
ZT550-30	Carbide	1 1/8	1/4	-	Slab	-	ZT550069	.125	.187	10
ZT550-31	Carbide	1 1/8	3/8	-	Slab	-	ZT550069	.125	.187	10
ZT550-32	Carbide	1 1/8	1/2	-	Slab	-	ZT550070	.125	.187	10
ZT550-29	H.S.S.	1 5/16	3/8	60°	Groove	.062	ZT550069	.000	.234	6
ZT550-40	H.S.S.	1 31/64	3/8	40°	Groove	.062	ZT550069	.086	.320	8
ZT550-451	H.S.S.	1 5/16	3/8	40°	Groove	.062	ZT550069	.000	.234	6



Slab Type



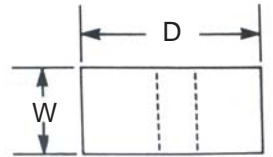
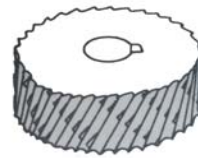
Grooving Type



## CUTTERS FOR ZT553

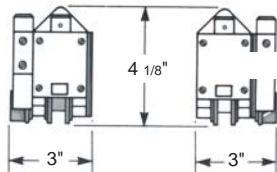
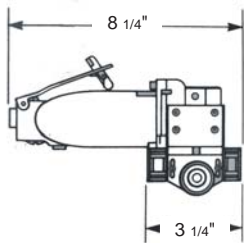
For use on Titanium, Stainless Steel, Monel and similar high strength materials.

Cutter Part No.	Cutter Material	D	W	Cutter Style	Roller Shaft Assembly	Cutter Adjustment		Number of Teeth
		Diameter	Width			In	Out	
ZT553-26	Carbide	1 1/8	1/2	Slab	ZT550070	.125	.187	34
ZT553-28	Carbide	1 1/8	3/8	Slab	ZT550069	.125	.187	34

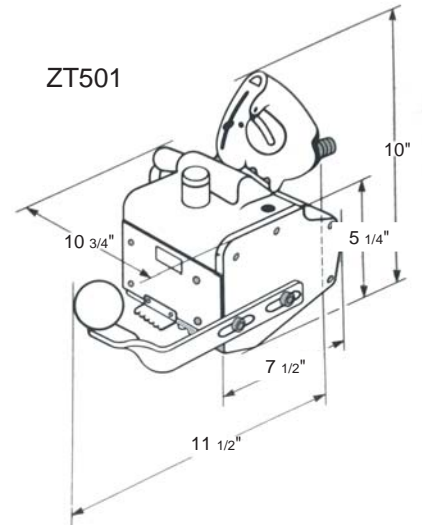


Slab Type

### ZT551/ZT552 ZT554/ZT555



### ZT501



	ZT708	ZT709	ZT550	ZT553	ZT501
Cutter Rotation	2,700	13,500	15,000	3,500	4,600
Weight	6 lbs.	6 lbs.	3 3/4 lbs.	5 lbs.	25 lbs.
Required CFM (Min)	35	35	29	29	44
Required PSI (Min)	90	90	90	90	90

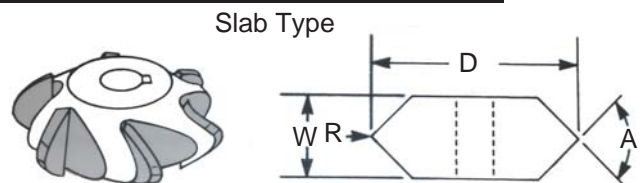
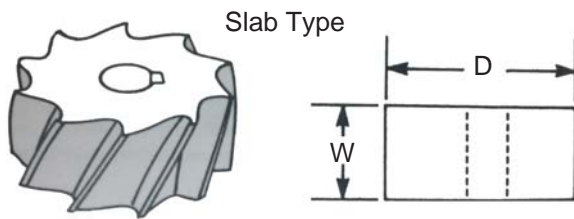




## CUTTERS FOR ZT550

For use on Aluminum, Magnesium, Copper and Softer alloys.

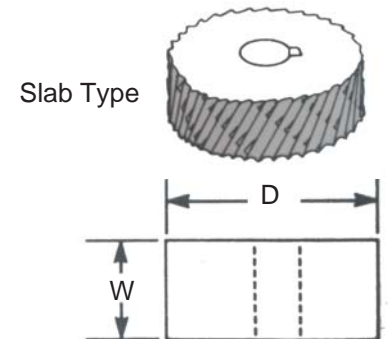
Cutter Part No.	Cutter Material	D	W	A	Cutter Style	R	Cutter Adjustment		Number of Teeth
		Diameter	Width	Angle		Radius	In	Out	
ZT551-30	Carbide	1 1/4	1/2	70°	Groove	.156	.078	.218	6
ZT551-31	H.S.S.	1 1/4	1/2	70°	Groove	.156	.078	.218	6
ZT551-32	Carbide	1 1/8	1/2	-	Slab	-	.125	.187	10
ZT552-32	Carbide	1 1/8	1/2	-	Slab	-	.125	.187	10
ZT552-30	Carbide	1 1/4	1/2	70°	Groove	.156	.078	.187	6



## CUTTERS FOR ZT554/ZT555

For use on Titanium, Stainless Steel, Monel and similar high strength materials.

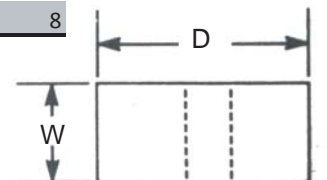
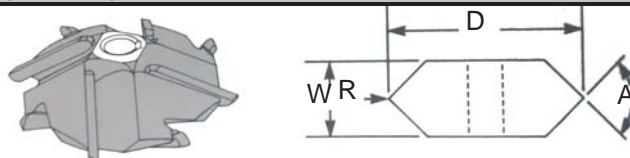
Cutter Part No.	Radius Cutter	Cutter Material	Cutter Radius	D	W	Cutter Style	Cutter Adjustment		Number of Teeth
				Diameter	Width		In	Out	
ZT554-31B		Carbide		1 1/8	1/2	Slab	.125	.187	34
	ZT554-30	Carbide	.250	1 3/8	1/2	Slab	.250	.062	24
ZT555-31B		Carbide		1 3/8	1/2	Slab	.125	.187	34
	ZT555-30	Carbide	.250	1 3/8	1/2	Slab	.250	.062	-

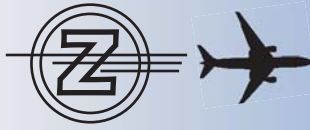


## CUTTERS FOR ZT501

For use on Aluminum, Magnesium, Copper and Softer alloys.

Cutter Part No.	Cutter Material	D	W	A	Cutter Style	R	Roller Shaft Assembly	Cutter Adjustment		Number of Teeth
		Diameter	Width	Angle		Radius		In	Out	
ZT501-19	Carbide	2	3/4	-	Slab	-	ZT5010124	-.240	.240	10
ZT501-20	Carbide	2	1	-	Slab	-	ZT5010121	-.240	.240	10
ZT501-21	Carbide	2	1 1/2	-	Slab	-	ZT5010122	-.240	.240	10
ZT501-22	Carbide	2	2	-	Slab	-	ZT5010123	-.240	.240	10
ZT501-30	Carbide	3 3/8	1 1/2	60°	Groove	.156	ZT5010126	.000	1.060	8
ZT201-31	Carbide	3 3/8	1 5/8	70°	Groove	.156	ZT5010128	.000	1.060	8





# Dimpling Tools & Equipment



## **ZP-450EA-36R**

# **COMPRESSION RIVETER**



Compression Riveter  
With 36" Reach,  
(PLC) Programmable Logic Controller-controlled,  
High-Speed Machine.  
Yoke Deflection Trips Micro-Switch  
for precise control of compression force

**Adjustable Stroke** - Shorten stroke to shorten cycle time and speed up operation.

**Adjustable pressure** - Adjustable pressure regulator limits maximum force applied to rivets.

**Adjustable Speed** - Speed adjustable from fast snap action to slow creep.

**Flexible foot throttle connection**-Throttle can be shifted to the most convention operating position.

**Automatic backhead** - Riveting plunger returns automatically the instant rivet heads is formed. No time lag waiting for operator's foot to act.

**Adjustable dolly**- compensates for varying material thickness and rivet lengths. .001 Increment Adjustment.

**Two Step Action**- The safety feature to operate safely from danger of accidentally stepping on the foot pedal and causing the machine to function at the wrong time.

**External Programming Port**- RS-232 port.

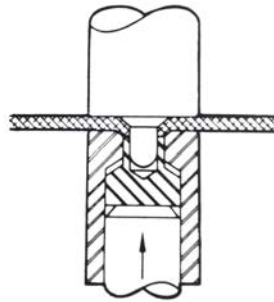
### **Specifications**

1. Yoke Reach	: 36"
2. Height of Yoke Gap	: 8"
3. Rivet Size (Aluminum)	: 1/8"-5/16"
4. Adjustable Compressive Force at 90 PSI	: 24000 lbs.
5. Ram Stroke	: 1-3/8"
6. Foot Pedal with Safety Guard	
7. Safety Device with Two Step Action	
8. External Programming Port	
9. Input Voltage	: 110V Single Phase 60HZ (220V, 60HZ with step-down Transformer)



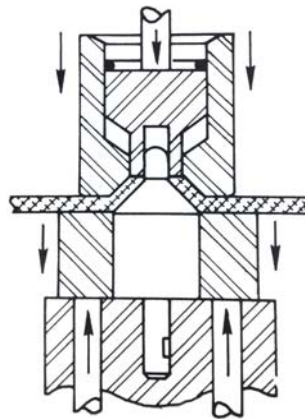
## **DIMPLING PROCESSES**

### **RAM COIN**



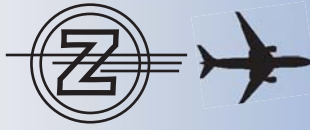
PARALLEL FACES OF DIMPLE CONES assure perfect nesting in all gauges. Special dimpling tools are not required for different gauges or diameters. Geometry held to close tolerances assures consistently accurate crack free dimples

### **TRIPLE ACTION**



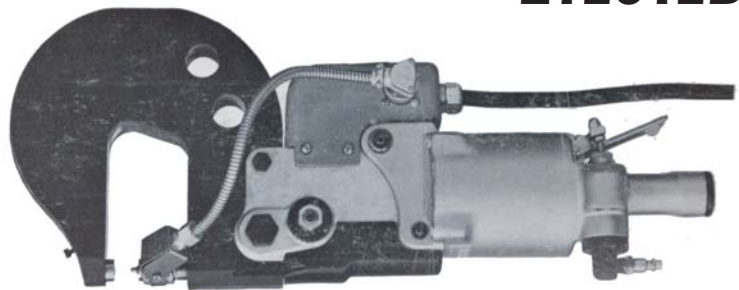
Refinements of the basic RAM COIN DIMPLE PRINCIPLE resulted in the development of TRIPLE ACTION DIMPLING. Use of the fundamental RAM COIN DIMPLE PRINCIPLES plus those developed by the triple action method permits dimpling to closer tolerances and on materials that otherwise cannot be satisfactorily dimpled. In addition, sheet growth or warpage is reduced as much as 75%.

**PORTABLE RAM COIN DIMPLERS**  
**BLIND PULL GUN PORTABLE DIMPLER**  
**STATIONARY DIMPLER**  
**DIMPLE TOOLS**



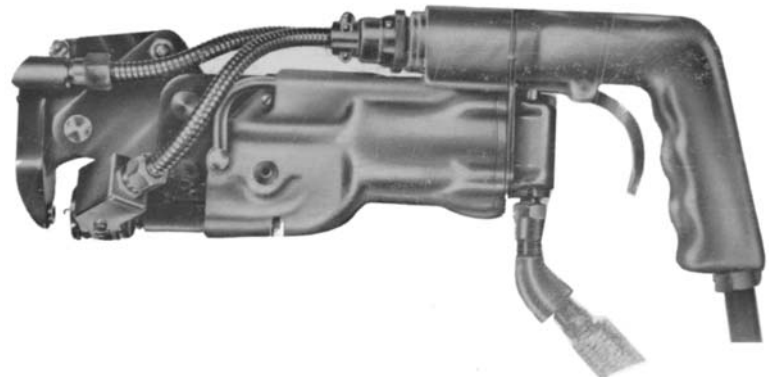
## PORTABLE RAM COIN DIMPLERS

Models ZT2012-8, -C and-D Portable Ram Coin Dimplers can be operated as either hot or cold portable dimplers when used in conjunction with Zephyr Thermo-Dimple Control Panels. Of fixed jaw yoke type, they feature conservative streamlined design, built around established principles.



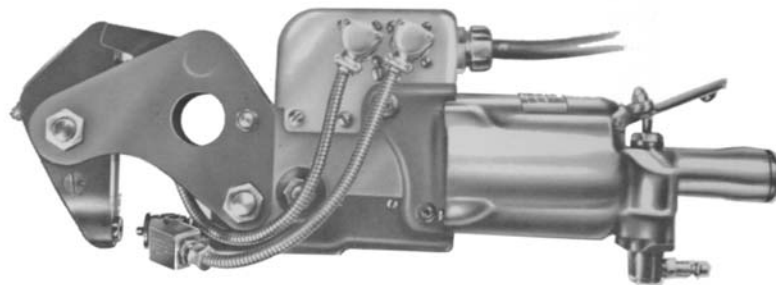
**ZT2012D**

Model ZT2427 incorporates the newly designed Zephyr adjustable, lower jaw, featuring built-in yoke deflection compensator. This new concept of yoke design, coupled to industry accepted, conservatively rated pneumatic power source, has resulted in a lightweight, versatile unit capable of meeting a large percentage of the portable dimpling requirements, especially in thinner gauges and smaller diameter fastener sizes.



**ZT2427**

See chart page F4 for comprehensive information relative to various styles and types of yokes not illustrated.



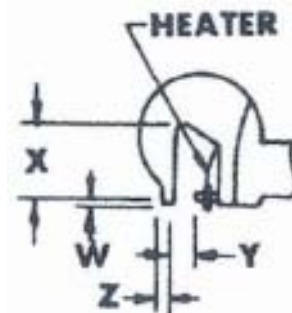
**ZT2429**



## PORTABLE RAM COIN DIMPLER

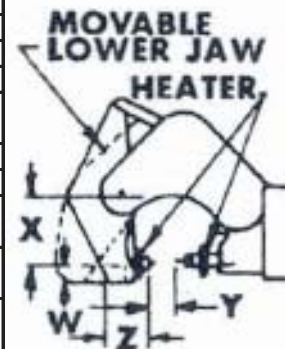
### FIXED JAW

DIMPLER NUMBER		ZT2012A	ZT2012B	ZT2012C	ZT2012D
POWER SOURCE		C.P. 355	C.P. 355	C.P. 355	C.P. 355
WEIGHT WITH CABLE (lbs. approximate)		27.0	27.0	32.0	34.0
MAXIMUM FORCE ON DIES (rated at 90 psi)		12,000	12,000	12,000	12,000
SIZE (length, width, height)		21.5x4.5x7.0	22x4.5x7.0	22x4.5x7.0	22x4.5x7.0
OVER-All YOKE (length, width, depth)		7.2x1.5x5.0	7.2x1.5x5.0	8.5x1.5x9.0	8.7x1.5x9.0
"W" DIMENSION (edge to center of dimpling tool)		.50	.50	.50	.50
"X" DIMENSION (inches) (throat reach)		.95	1.50	3.00	4.68
"Y" DIMENSION- (See Note 1.throat gap, Max. open)		.62	.62	.62	.62
"Z" DIMENSION		1	1	1	1
CAPACITY (maximum gauge and fastener) Aluminum Alloy		.072- #10 Screw .072- 1/4 Rivet	.072- #10 Screw .072- 1/4 Rivet	.072- #10 Screw .072- 1/4 Rivet	.072- #10 Screw .072- 1/4 Rivet
HEATER RECOMMENDED (See Note 2)	Upper (Punch)	ZT1880D10A	ZT1880D10A	ZT1880D10A	ZT1880D10A
	Lower (Die)	NONE	NONE	NONE	NONE
DIE ASSEMBLY (type)		SHORT STANDARD (ZT2953, etc.)	SHORT STANDARD (ZT2953, etc.)	SHORT STANDARD (ZT2953, etc.)	SHORT STANDARD (ZT2953, etc.)
PUNCH ASSEMBLY (type)		STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)



### MOVABLE JAW

DIMPLER NUMBER		ZT2427	ZT2427B	ZT2429	ZT2429B	ZT2429C
POWER SOURCE		C.P. 214	C.P. 214	C.P. 355	C.P. 355	C.P. 355
WEIGHT WITH CABLE (lbs. approximate)		11.0	12.3	30.0	29.7	30.0
MAXIMUM FORCE ON DIES (rated at 90 psi)		3,000	3,000	16,000	16,000	16,000
SIZE (length, width, height)		14.75x3.0x4.2	15.0x3.0x4.75	22x4.5x7.0	20.75x4.5x7.0	21.5x4.5x7.0
OVER-All YOKE (length, width, depth)		3.9x1.2x4.0	4.37x1.2x4.75	7.5x3.1x6.4	6.75x3.1x6.4	7.5x3.1x6.4
"W" DIMENSION (edge to center of dimpling tool)		.37	.37	.50	.28	.44
"X" DIMENSION (inches) (throat reach)		.87	1.50	2.12	2.12	2.12
"Y" DIMENSION- (See Note 1.throat gap, Max. open)		.25	.25	.50	.50	.50
"Z" DIMENSION		.37	.37	1.00	.56	1.00
CAPACITY (maximum gauge and fastener) Aluminum Alloy		.040-5/32 Rivet	.040-5/32 Rivet	.081-1/4 Screw	.064-3/16 Screw	.064-#10 Screw
HEATER RECOMMENDED (See Note 2)	Upper (Punch)	ZT1880E5A		ZT1880D10A		
	Lower (Die)	ZT2427070	ZT2427082	ZT242903	ZT2429073	ZT2429075
DIE ASSEMBLY (type)		MIDGET MOD. RADIUS (ZT2441)	MIDGET MOD. RADIUS (ZT2441)	SHORT STANDARD (ZT2953, etc.)	MIDGET MOD. RADIUS (ZT2441)	MIDGET TYPE III (ZT1771, etc.)
PUNCH ASSEMBLY (type)		STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)	STANDARD TYPE I (ZT1855, etc.)



Notes:

1. Dimension "Y" is maximum clearance between punch pilot and die face. Given dimensions are for dimple tooling corresponding to specific fastener. See under "Capacity", lower line

- 2. ZT2427070
- ZT2427082
- ZT242903
- ZT2429073
- ZT2429075

HEATER CAPACITY 175W 115V  
 HEATER CAPACITY 300W 115V  
 HEATER CAPACITY 400W 115V  
 HEATER CAPACITY 400W 115V  
 HEATER CAPACITY 400W 115V



## Coin Dimple Die Assemblies for Hot or Cold coin Dimpling

Specifically designed for use with ZT2012 and ZT2429 portable hot dimplers

		TYPE X SHORT MIDGET		
FASTENER	SIZE	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY	
			DIE BODY	RAM
AN426 Rivet(100°)	3/32"	ZT2953-3/32	ZT295301-3/32	ZT185302-3/32
	1/8"	ZT2953-1/8	ZT295301-1/8	ZT185302-1/8
	5/32"	ZT2953-5/32	ZT295301-5/32	ZT185302-5/32
	3/16"	ZT2953-3/16	ZT295301-3/16	ZT185302-3/16
	1/4"	ZT2953-1/4	ZT295301-1/4	ZT185302-1/4
AN509 (100°) Screw Standard Pilot Non Drill Out	#6	ZT2963-6	ZT296301-6	ZT186302-6
	#8	ZT2963-8	ZT296301-8	ZT186302-8
	#10	ZT2963-10	ZT296301-10	ZT186302-10
	1/4"	ZT2963-1/4	ZT296301-1/4	ZT186302-1/4
	5/16"	ZT2963-5/16	ZT296301-5/16	ZT186302-5/16
HS 47 (100°) Hi-Sheer Rivet Standard Pilot Non Drill Out	3/16"	ZT2973-3/16	ZT297301-3/16	ZT297302-3/16
	1/4"	ZT2973-1/4	ZT297301-1/4	ZT297302-1/4
	5/16" (1)	ZT2973-5/16	ZT297301-5/16	ZT297302-5/16
AN509 (100°) Screw Standard Pilot Drill Out	#8	ZT2968-8	ZT296301-8	ZT186802-8
	#10	ZT2968-10	ZT296301-10	ZT186802-10
	1/4"	ZT2968-1/4	ZT296301-1/4	ZT186802-1/4
	5/16"	ZT2968-5/16	ZT296801-5/16	ZT286802-5/16
HS 47 (100°) Hi-Sheer Rivet Standard Pilot Drill Out	1/8"	ZT2978-1/8	ZT297801-1/8	ZT175202-1/8
	5/32"	ZT2978-5/32	ZT297801-5/32	ZT187802-5/32
	3/16"	ZT2978-3/16	ZT297801-3/16	ZT187802-5/32
	1/4"	ZT2978-1/4	ZT297801-1/4	ZT187802-1/4
	5/16"	ZT2978-5/16	ZT297801-5/16	ZT187802-5/16
Cherry Rivet (100°) Undersize Pilot Drill-Out Type	1/8"	ZT2912-1/8	ZT297801-1/8	ZT175202-1/8
	5/32"	ZT1912-5/32	ZT297801-5/32	ZT175202-5/32
	3/16"	ZT2912-3/16	ZT297801-3/16	ZT175202-3/16
	1/4"	ZT2912-1/4	ZT297801-1/4	ZT175202-1/4
B. F. Goodrich Rivnut (100°) Undersize Pilot Drill-Out Type	#4	ZT2947-4	ZT294701-4	ZT174902-4
	#6	ZT2947-6	ZT294701-6	ZT174902-6
	#8	ZT2947-8	ZT294701-8	ZT174902-8
	#10	ZT2947-10	ZT294701-10	ZT174902-10
	1/4"	ZT2947-1/4	ZT294701-1/4	ZT174902-1/4
Airloc Fastener w/o Grommet	#2(100°)	ZT2992-3/4	ZT299201-3/4	ZT179202-3/4
	#5 (120°) (1)	ZT2992-1	ZT299201-1	ZT299202-1

1. 1.06 Diameter Flange added to die body



## **BLIND PULL GUN PORTABLE DIMPLER**

### **MODEL ZT2021**

### **Eliminates:**

Skin Marking Buck-Bar,  
elliptical holes, excessive pilot  
breakage



A unit for those areas where the yoke type dimplers cannot reach. Ideal for repair, overhaul, or maintenance work. Forming satisfactory, well defined crack free dimples in gauge fastener material

Ideal for repair,  
Maintenance  
and overhaul  
operations.



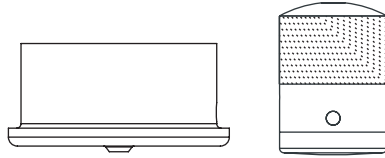
To set the dimple in the heavier gauges, use one medium blow with ball peen hammer, or use rivet gun with gooseneck extension.



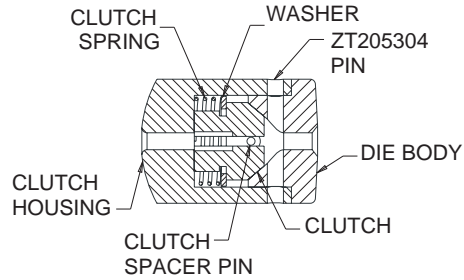


## BLIND PULL GUN DIMPLER

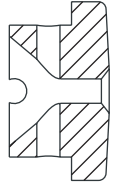
### Standard Die Assembly Parts



### TYPE 1



### TYPE 2

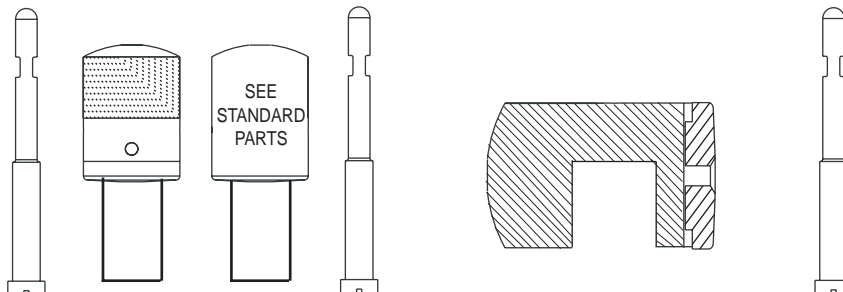


	Fastener	Size	Punch	Die Assembly	Clutch Spring	Clutch Housing	Clutch Spacer Pin (2 Req.)	Die Body	Clutch	Washer
TYPE 1	AN426 Rivet (100°) (NON-DRILL-OUT)	3/32"	ZT2055-3/32	ZT2053-3/32	ZT205302	ZT205301-3/32	ZT205309	ZT205305-3/32	ZT205306	ZT205303
		1/8"	ZT2055-1/8	ZT2053-1/8	ZT205302	ZT205301-1/8	ZT205307	ZT205305-1/8	ZT2053012	ZT205303
		5/32"	ZT2055-5/32	ZT2053-5/32	ZT205302	ZT205301-5/32	ZT205304	ZT205305-5/32	ZT2053013	ZT205303
		3/16"	ZT2055-3/16	ZT2053-3/16	ZT205302	ZT205301-3/16	ZT205304	ZT205305-3/16	ZT2053014	ZT205303
		1/4"	ZT2055-1/4	ZT2053-1/4	ZT2053010	ZT205301-1/4	ZT205308	ZT205305-1/4	ZT2053015	ZT2053011
	AN & NAS Screw (100°) (NON-DRILL-OUT)	#6	ZT2065-6	ZT2063-6	ZT205302	ZT206301-6	ZT205307	ZT206305-6	ZT206306	ZT205303
		#8	ZT2065-8	ZT2063-8	ZT205302	ZT206301-8	ZT205304	ZT206305-8	ZT2053013	ZT205303
		#10	ZT2065-10	ZT2063-10	ZT205302	ZT206301-10	ZT205304	ZT206305-10	ZT2053014	ZT205303
		1/4"-28	ZT2065-1/4	ZT2063-1/4	ZT2053010	ZT206301-1/4	ZT205308	ZT206305-1/4	ZT2053015	ZT2053011
		5/16"-24	ZT2065-5/16	ZT2063-5/16	ZT206302	ZT206301-5/16	ZT206303	ZT206305-5/16	ZT206307	ZT206304
	HS47 High Shear Rivet (100°) (NON-DRILL-OUT)	3/16"	ZT2075-3/16	ZT2073-3/16	ZT205302	ZT207301-3/16	ZT205304	ZT207305-3/16	ZT2053014	ZT205303
		1/4"	ZT2075-1/4	ZT2073-1/4	ZT2053010	ZT207301-1/4	ZT205308	ZT207305-1/4	ZT2053015	ZT2053011
		5/16"	ZT2075-5/16	ZT2073-5/16	ZT206302	ZT207301-5/16	ZT206303	ZT207305-5/16	ZT206307	ZT206304
		#8	ZT2067-8	ZT2068-8	ZT205302	ZT206801-8	ZT205309	ZT206805-8	ZT205306	ZT205303
		#10	ZT2067-10	ZT2068-10	ZT205302	ZT206801-10	ZT205304	ZT206805-10	ZT205306	ZT205303
	AN & NAS Screw (100°) (DRILL-OUT)	1/4"-28	ZT2067-1/4	ZT2068-1/4	ZT2053010	ZT206801-1/4	ZT205304	ZT206805-1/4	ZT205307	ZT205303
		5/16"-24	ZT2067-5/16	ZT2068-5/16	ZT206302	ZT206801-5/16	ZT205308	ZT206805-5/16	ZT2063015	ZT2053011
		1/8"	ZT2077-1/8	ZT2078-1/8	ZT205302	ZT207801-1/8	ZT205309	ZT207805-1/8	ZT205306	ZT205303
		5/32"	ZT2077-5/32	ZT2078-5/32	ZT205302	ZT207801-5/32	ZT205307	ZT207805-5/32	ZT2053012	ZT205303
		3/16"	ZT2077-3/16	ZT2078-3/16	ZT205302	ZT207801-3/16	ZT205304	ZT207805-3/16	ZT2053013	ZT205303
	HS47 High Shear Rivet (100°) (DRILL-OUT)	1/4"	ZT2077-1/4	ZT2078-1/4	ZT2053010	ZT207801-1/4	ZT205308	ZT207805-1/4	ZT207806	ZT2053011
		5/16"	ZT2077-5/16	ZT2078-5/16	ZT206302	ZT207801-5/16	ZT207803	ZT207805-5/16	ZT207807	ZT206304
		AIRLOC	3/4"-100°	ZT2091-3/4	ZT2093-3/4	ZT205302	ZT207301-3/4	ZT205304	ZT209305-3/4	ZT209306
		1"-120°	ZT2091-1	ZT2093-1	ZT2053010	ZT207301-1	ZT209309	ZT2093-1	ZT209307	ZT206304
	1-3/8"-120°	ZT2091-1-3/8	ZT2093-1-3/8	ZT206302	ZT207301-1-3/8	ZT209309	ZT2093-1-3/8	ZT209307	ZT206304	

TYPE 2	AN426 Rivet (100°) (NON-DRILL-OUT)	3/32"	ZT2055-3/32	ZT2041-3/32	ZT205302	ZT205301-3/32	ZT205309	ZT204105-3/32	ZT205306	ZT205303
		1/8"	ZT2055-1/8	ZT2041-1/8	ZT205302	ZT205301-1/8	ZT205307	ZT204105-1/8	ZT2053012	ZT205303
		5/32"	ZT2055-5/32	ZT2041-5/32	ZT205302	ZT205301-5/32	ZT205304	ZT204105-5/32	ZT2053013	ZT205303
		3/16"	ZT2055-3/16	ZT2041-3/16	ZT205302	ZT205301-3/16	ZT205304	ZT204105-3/16	ZT2053014	ZT205303
	AN & NAS Screw (100°) (NON-DRILL-OUT)	#6	ZT2065-6	ZT2042-6	ZT205302	ZT206301-6	ZT205307	ZT204205-6	ZT206306	ZT205303
		#8	ZT2065-8	ZT2042-8	ZT205302	ZT206301-8	ZT205304	ZT204205-8	ZT2053013	ZT205303
		#10	ZT2065-10	ZT2042-10	ZT205302	ZT206301-10	ZT205304	ZT204205-10	ZT2053014	ZT205303
		1/4"-28	ZT2065-1/4	ZT2042-1/4	ZT2053010	ZT206301-1/4	ZT205308	ZT204205-1/4	ZT2053015	ZT2053011
	HS47 High Shear Rivet (100°) (NON-DRILL-OUT)	5/32"	ZT2075-5/32	ZT2043-5/32	ZT205302	ZT204301-5/32	ZT205304	ZT204305-5/32	ZT2053013	ZT205303
		3/16"	ZT2075-3/16	ZT2043-3/16	ZT205302	ZT204301-3/16	ZT205304	ZT204305-3/16	ZT2053014	ZT205303
		1/4"	ZT2075-1/4	ZT2043-1/4	ZT2053010	ZT204301-1/4	ZT205308	ZT204305-1/4	ZT2053015	ZT2053011



## BLIND PULL GUN DIMPLER



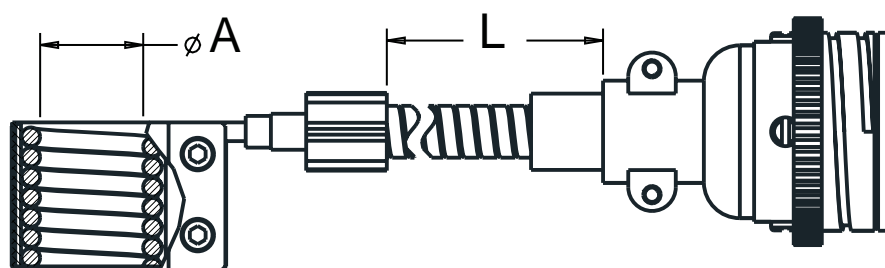
	Fastener	Pull Bar	Cut Away Die Assembly	Cut Away Die Body	Pull Bar	Clutch Housing	Die Body	Offset Die Assembly	Pull Bar
TYPE 1	AN426 Rivet (100°) (NON-DRILL-OUT)	ZT2052-3/32	ZT2056-3/32	ZT205605-3/32	ZT2054-3/32	ZT202301-1/8 ZT202301-5/32	ZT202305-1/8 ZT202305-5/32	ZT2023-1/8 ZT2023-5/32	ZT2022-1/8 ZT2022-5/32
		ZT2052-1/8	ZT2056-1/8	ZT205605-1/8	ZT2054-1/8				
		ZT2052-5/32	ZT2056-5/32	ZT205605-5/32	ZT2054-5/32				
		ZT2052-3/16	ZT2056-3/16	ZT205605-3/16	ZT2054-3/16				
	AN & NAS Screw (100°) (NON-DRILL-OUT)	ZT2062-6	ZT2066-6	ZT206605-6	ZT2064-6	ZT203301-6 ZT203301-8 ZT203301-10	ZT203305-6 ZT203305-8 ZT203305-10	ZT2033-6 ZT2033-8 ZT2033-10	ZT2032-6 ZT2032-8 ZT2032-10
		ZT2062-8	ZT2066-8	ZT206605-8	ZT2064-8				
ZT2062-10		ZT2066-10	ZT206605-10	ZT2064-10					
ZT2062-1/4									
HS47 High Shear Rivet (100°) (NON-DRILL-OUT)	ZT2072-3/16	ZT2049-3/16	ZT204905-3/16	ZT2074-3/16					
	ZT2072-1/4	ZT2049-1/4	ZT204905-1/4	ZT2074-1/4					
AN & NAS Screw (100°) (DRILL-OUT)	ZT2082-8								
	ZT2082-10								
HS47 High Shear Rivet (100°) (DRILL-OUT)	ZT2079-1/8								
	ZT2079-5/32								
	ZT2079-3/16								
AIRLOC	ZT2079-1/4								
	ZT2079-5/16								
	ZT2092-3/4								
	ZT2092-1								
	ZT2092-1-3/8								

TYPE 2	AN426 Rivet (100°) (NON-DRILL-OUT)	ZT2052-3/32							
		ZT2052-1/8							
		ZT2052-5/32							
ZT2052-3/16									
AN & NAS Screw (100°) (NON-DRILL-OUT)	ZT2062-6								
	ZT2062-8								
	ZT2062-10								
	ZT2062-1/4								
HS47 High Shear Rivet (100°) (NON-DRILL-OUT)	ZT2072-5/32								
	ZT2072-3/16								
	ZT2072-1/4								



## DIE HEATERS

Zephyr Band Heaters are designed for continuous operation at 900°F or less. Input Voltage 110V A.C. Heaters are supplied complete with thermocouple, flexible cable & quick disconnect plugs. See chart below for specific details.



## DIE HEATER DATA

TYPE	PART NO.	A (in)	L (in)	WATTS	CONNECTOR	USED WITH DIMPLER MODEL
OFFSET <b>II</b>	ZT1880B15A	.718	15	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1880B20A	.718	20	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1880B30A	.718	30	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
STRAIGHT <b>I</b>	ZT1881B15A	.718	15	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1881B20A	.718	20	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1881B30A	.718	30	225	ZT1883-5B	ZP-450EA (Hot & Triple Action)
OFFSET <b>II</b>	ZT1880D5A	.718	5	225	ZT2429-29	ZT2012, ZT2429 Portable Dimpler
	ZT1880D9A	.718	9	225	ZT2429-29	ZT2012, ZT2429 Portable Dimpler
	ZT1880D10A	.718	10	225	ZT2429-29	ZT2012, ZT2429 Portable Dimpler
	ZT1880D15A	.718	15	225	ZT2429-29	ZT2012, ZT2429 Portable Dimpler
STRAIGHT <b>I</b>	ZT1881D10A	.718	10	225	ZT2429-29	ZT2012, ZT2429 Portable Dimpler
OFFSET <b>II</b>	ZT1880E5A	.718	5	225	ZT2427-51	ZT2427 Portable Dimpler
	ZT1880E6A	.718	9	225	ZT2427-51	ZT2427 Portable Dimpler
	ZT1880E7A	.718	9	225	ZT2427-51	ZT2427 Portable Dimpler
	ZT1880E15A	.718	15	225	ZT2427-51	ZT2427 Portable Dimpler
STRAIGHT <b>I</b>	ZT1882B15A	1.312	15	350	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1882B20A	1.312	20	350	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1882B30A	1.312	30	350	ZT1883-5B	ZP-450EA (Hot & Triple Action)
	ZT1882J6A	1.312	6	350	No Connector	ZT2021



## **PORTABLE CONTROLS THERMO DIMPLE CONTROL PANEL**

### **PORTABLE MODEL ZT2409G**



Designed to accurately and selectively control both high and low limit heating of either one or two die heaters; to control pre-pressures and dwell times on dimpling dies; to control high and low dimpling pressures; to permit selective use of either a compression dimpler or blind pull gun dimpler, and to control all phases of a complete hot or cold dimpling cycle.

Cycling is fully automatic and any element of the cycle can be pre-set or varied to suit conditions at hand.

Incorporated in the panel is the important "fail-safe" electric-pneumatic interlock which prevents operation of the panel if heaters are not operating in accordance with pre-selected conditions.

Selective switching can be used to take heaters out of circuit thus permitting "cold dimpling" under automatically controlled pressure conditions

### **PORTABLE MODEL ZT2411**

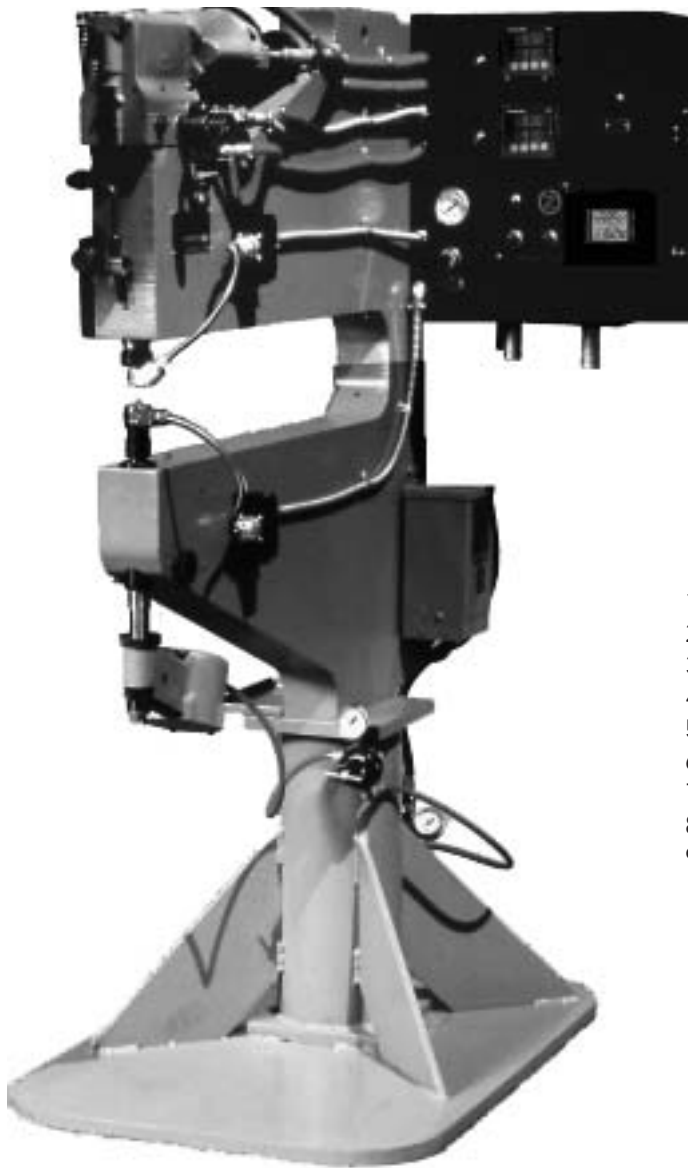
## **Roll-a-way Cart**

Specially designed "roll-away" cart permits storage of ZT2409G Panel together with other accessory items as desired. Provides storage space for portable dimplers, buck bars, rivet gun, extra heaters, dies, punches, etc.





## **ZP-450EA-36H & 36HTT HOT RAM COIN DIMPLING MACHINE AND TRIPLE ACTION**



Hot Ram Coin Dimpler  
with 36" Reach,  
Air Coin Post,  
Fully Automatic Electrical  
and Pneumatic Controls

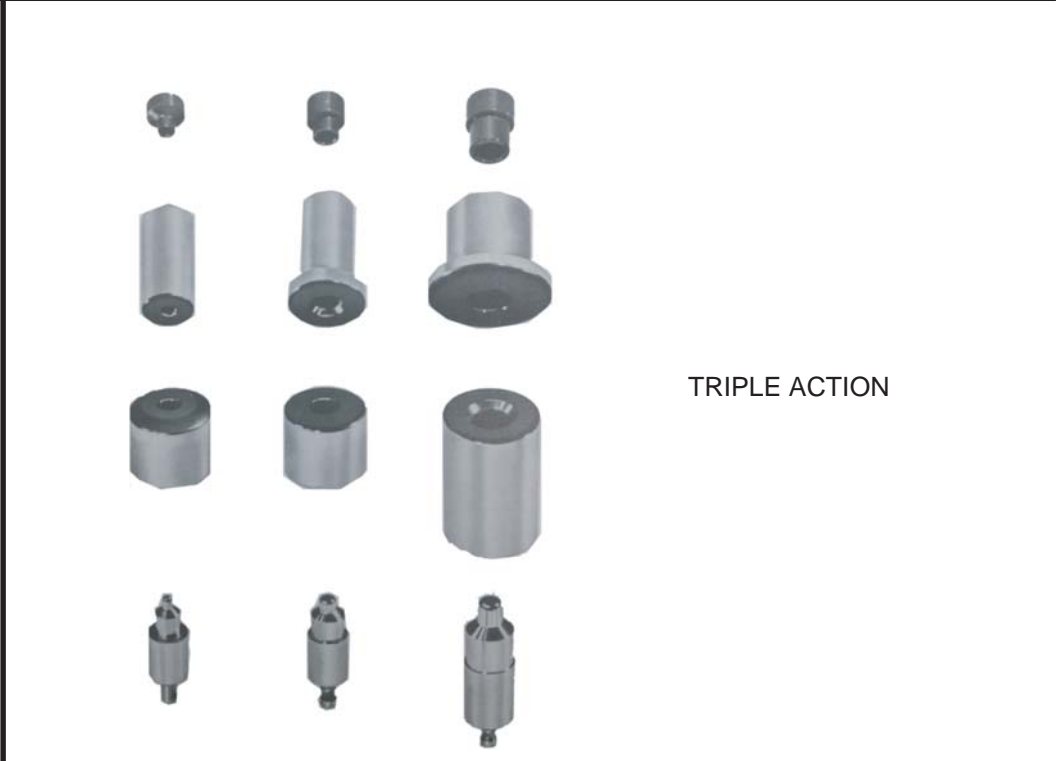
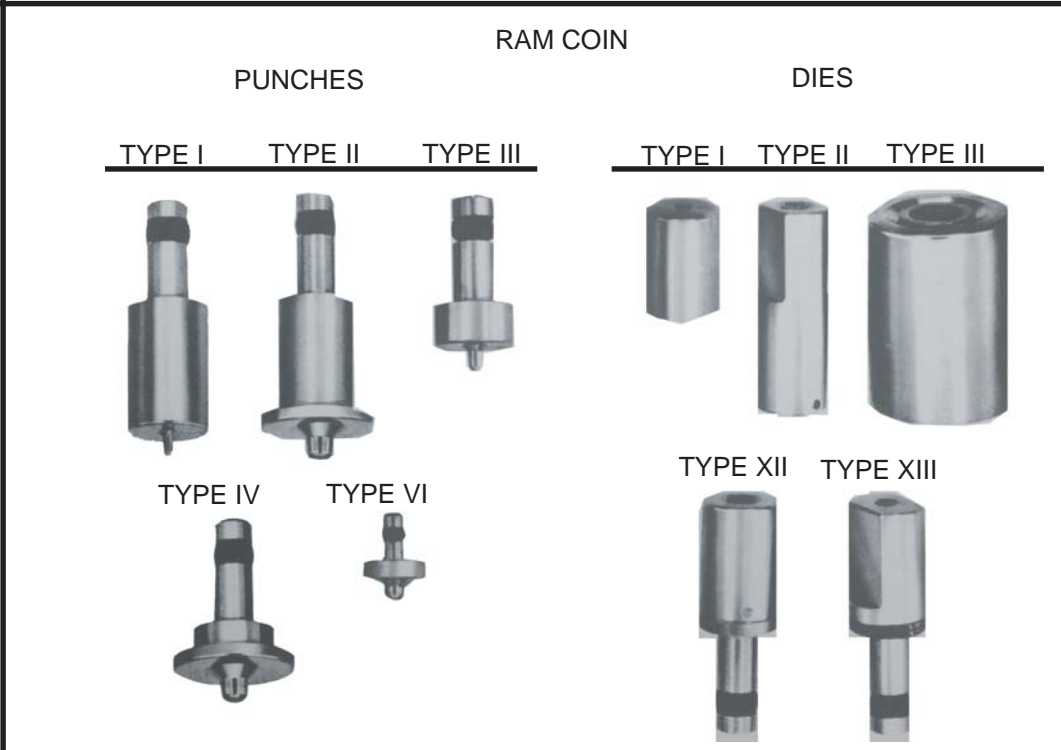
### **Specifications**

1. Capacity	: 8"
2. Reach	: 36"
3. Maximum Pressure at 90 PSI	: 24000 lbs.
4. Maximum Set Holder Travel	: 1-3/4"
5. Stroke Force at start	: 1-3/4 ~ 3/16"
6. Foot Pedal with Safety Guard	
7. Digital Temperature Controller	: 68°F to 1250°F
8. Digital Dwell Timer	: .01 ~ 30.00 sec.
9. Input Voltage	: 110V Single Phase 60HZ, (220V, 60HZ with step-down Transformer)



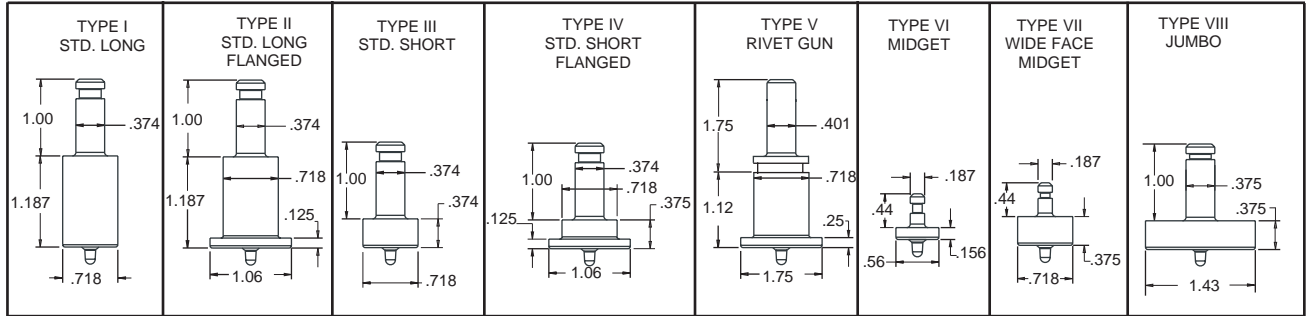
**DIMPLE TOOLS**

A wide variety of Zephyr ram coin dimple dies and punches are available. These tools are turned from heat-treated, shock-resistant, finest tool steel, precision ground to extremely close tolerances.





## Coin Dimple Punch Assemblies for Hot or Cold coin Dimpling

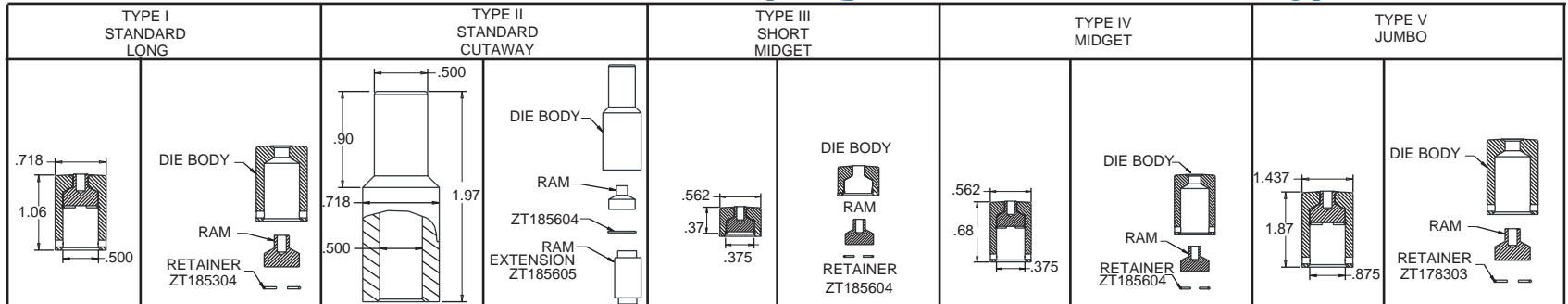


FASTENER	SIZE	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE V	TYPE VI	TYPE VII	TYPE VIII
AN426 Rivet(100°)	3/32"	ZT1855-3/32		ZT1852-3/32		ZT1835-3/32	ZT1895-3/32	ZT1741-3/32	
	1/8"	ZT1855-1/8		ZT1852-1/8		ZT1835-1/8	ZT1895-1/8	ZT1741-1/8	
	5/32"	ZT1855-5/32		ZT1852-5/32		ZT1835-5/32	ZT1895-5/32	ZT1741-5/32	
	3/16"	ZT1855-3/16		ZT1852-3/16		ZT1835-3/16	ZT1895-3/16	ZT1741-3/16	
See note # 1	1/4"		ZT1855-1/4		ZT1852-1/4	ZT1835-1/4			
AN & NAS Screw (100°)	#6	ZT1865-6		ZT1862-6		ZT1836-8	ZT1896-8	ZT1742-6	
	#8	ZT1865-8		ZT1862-8		ZT1836-10	ZT1896-10	ZT1742-8	
	#10	ZT1865-10		ZT1862-10		ZT1836-1/4		ZT1742-10	
See note #1	#1/4		ZT1865-1/4		ZT1862-1/4				
	#5/16 (5)		ZT1865-5/16		ZT1862-5/16				
HS 47	3/16"	ZT1875-3/16		ZT1872-3/16		ZT1837-3/16	ZT1847-3/16	ZT1743-3/16	
Hi-Shear Rivet (100°)	1/4"	ZT1875-1/4		ZT1872-1/4		ZT1837-1/4	ZT1847-1/4	ZT1743-1/4	
See note # 1	5/16"		ZT1875-5/16		ZT1872-5/16	ZT1837-5/16			
AN & NAS Screw (100°)	#8	ZT1867-8		ZT1869-8		ZT1838-8	ZT1897-8	ZT1744-8	
	#10	ZT1867-10		ZT1869-10		ZT1838-10	ZT1897-10	ZT1744-10	
High Stress Drill-Out Type	#1/4		ZT1867-1/4		ZT1869-1/4	ZT1838-1/4			
See note # 2	#5/16		ZT1867-5/16		ZT1869-5/16	ZT1838-5/16			
HS47	1/8"	ZT1877-1/8		ZT1879-1/8		ZT1839-1/8	ZT1845-1/8	ZT1745-1/8	
Hi-Shear Rivet (100°)	5/32"	ZT1877-5/32		ZT1879-3/16		ZT1839-3/16	ZT1845-3/16	ZT1745-3/16	
	3/16"	ZT1877-3/16		ZT1879-1/4		ZT1839-1/4	ZT1845-1/4	ZT1745-1/4	
	1/4"	ZT1877-1/4							
See note # 2	5/16"		ZT1877-5/16		ZT1879-5/16	ZT1839-5/16			
Blind Rivet (100°) (Huck, Cherry, DuPont)	1/8"	ZT1751-1/8		ZT1753-1/8				ZT1746-1/8	
	5/32"	ZT1751-5/32		ZT1753-5/32				ZT1746-5/32	
High Stress Drill-Out Type	3/16"		ZT1751-3/16		ZT1753-3/16			ZT1746-3/16	
See note # 2									
B. F. Goodrich Rivnut (100°) Drill-Out Type	#4	ZT1748-4							
	#6		ZT1748-6						
	#8		ZT1748-8						
	#10		ZT1748-10						
See note # 2	1/4" (4)		ZT1748-1/4						
DZUS Fastener Type "FA"	FA-5 Stud								ZT1784
	FA-5 Spring								ZT1786
	FA-61/2 Stud								ZT1788
See Note #1	FA-61/2 Spring								ZT1790
Airloc Fastener w/o Grommet	3/4 (100°)		ZT1791-3/4						
	1" (120°) (4)		ZT1791-1			ZT1777-1			
See notes #1 & #3	1 3/8" (128°)								ZT1793-1-3/8
Airloc Fastener w/Grommet	1" (120°) (4)		ZT1793-1						
See note # 1	1 3/8" (128°)								ZT1793-1-3/8
Camloc Fastener	CLC-4S7		ZT1723						ZT795
See note #1	4S10-1		ZT1718						
DZUS Fastener Type F	F4 Spring (4)		ZT1710						
	F4 w/Grommet (4)		ZT1715						

1. For Pilot Drill and Dimple type installation.
2. For Pilot Drill, Dimple and Redrill type installation.
3. Punches to Cowl Fastener Specification "AND 10076" made to customer installation requirements,
4. Flange diameter is increased from 1.06 to 1.22.
5. Flange diameter is increased from 1.06 to 1.31 Flange thickness increased to .25.
6. Coin Dimple Punches ordered by fastener size, an D punch type, and not shown here, are made to special order,
7. For superior flushness on installation, the HS47 precision Hi Shear Rivet is recommended,



### Coin Dimple Die Assemblies for Hot or Cold coin Dimpling Spring loaded or air coin anvil type



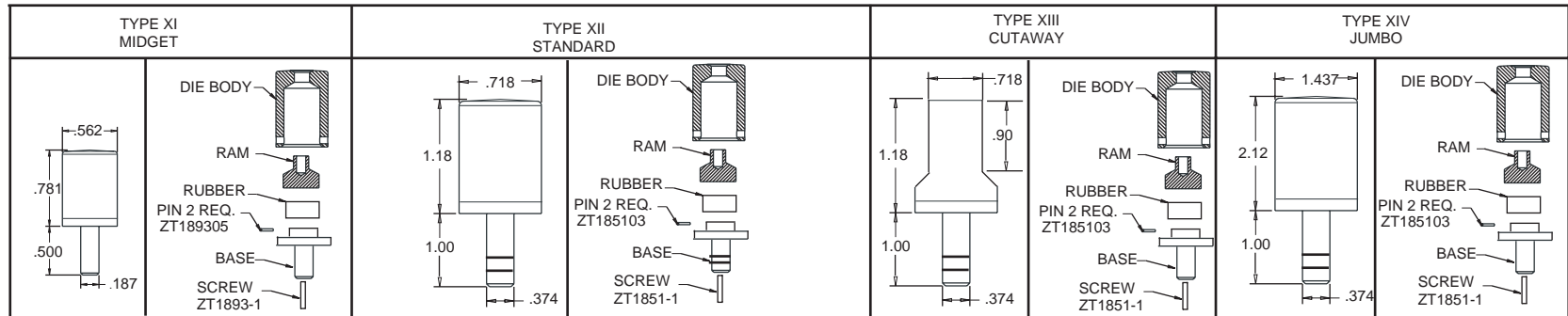
FASTENER	SIZE	TYPE I STANDARD LONG			TYPE II STANDARD CUTAWAY			TYPE III SHORT MIDGET			TYPE IV MIDGET			TYPE V JUMBO			
		DIE ASSEMBLY	PARTS IN DIE ASSEMBLY DIE BODY	RAM	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY DIE BODY	RAM	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY DIE BODY	RAM	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY DIE BODY	RAM	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY DIE BODY	RAM	
AN426 Rivet (100°)	3/32" 1/8" 5/32" 3/16"	ZT1853-3/32 ZT1853-1/8 ZT1853-5/32 ZT1853-3/16	ZT185301-3/32 ZT185301-1/8 ZT185302-5/32 ZT185301-3/16	ZT185302-3/32 ZT185302-1/8 ZT185302-5/32 ZT185302-3/16	ZT1856-3/32 ZT1856-1/8 ZT1856-5/32 ZT1856-3/16	ZT185601-3/32 ZT185601-1/8 ZT185601-5/32 ZT185601-3/16	ZT185402-3/32 ZT185402-1/8 ZT185402-5/32 ZT185402-3/16	ZT1771-3/32 ZT1771-1/8 ZT1771-5/32 ZT1771-3/16	ZT177101-3/32 ZT177101-1/8 ZT177101-5/32 ZT177101-3/16	ZT189302-3/32 ZT189302-1/8 ZT189302-5/32 ZT189302-3/16	ZT1891-3/32 ZT1891-1/8 ZT1891-5/32 ZT1891-3/16	ZT189301-3/32 ZT189301-1/8 ZT189301-5/32 ZT189301-3/16	ZT189302-3/32 ZT189302-1/8 ZT189302-5/32 ZT189302-3/16				
AN & NAS Screw (100°)	#6 #8 #10 #1/4 #5/16 (5)	ZT1863-6 ZT1863-8 ZT1863-10 ZT1863-1/4 ZT1863-5/16	ZT186301-6 ZT186301-8 ZT186301-10 ZT186301-1/4 ZT186301-5/16	ZT186302-6 ZT186302-8 ZT186302-10 ZT186302-1/4 ZT179402-1	ZT1866-6 ZT1866-8 ZT1866-10	ZT186601-6 ZT186601-8 ZT186601-10	ZT186402-6 ZT186402-8 ZT186402-10	ZT1772-6 ZT1772-8 ZT1772-10	ZT177201-6 ZT177201-8 ZT177201-10	ZT189402-6 ZT189402-8 ZT189402-10	ZT1892-6 ZT1892-8 ZT1892-10	ZT189401-6 ZT189401-8 ZT189401-10	ZT189402-6 ZT189402-8 ZT189402-10				
HS 47 Hi-Shear Rivet (100°)	3/16" 1/4" 5/16"	ZT1873-3/16 ZT1873-1/4 ZT1873-5/16	ZT187301-3/16 ZT187301-1/4 ZT187301-5/16	ZT187302-3/16 ZT187302-1/4 ZT187302-5/16	ZT1849-3/16 ZT1849-1/4	ZT184901-3/16 ZT184901-1/4	ZT187402-3/16 ZT187402-1/4	ZT1773-3/16 ZT1773-1/4	ZT177301-3/16 ZT177301-1/4	ZT188802-3/16 ZT188802-1/4	ZT1833-3/16 ZT1833-1/4	ZT188801-3/16 ZT188801-1/4	ZT188802-3/16 ZT188802-1/4				
AN & NAS Screw (100°) High Stress Drill-Out Type	#8 #10 #1/4 #5/16 (5)	ZT1868-8 ZT1868-10 ZT1868-1/4 ZT1868-5/16	ZT186301-8 ZT186301-10 ZT186301-1/4 ZT186301-5/16	ZT186802-8 ZT186802-10 ZT186802-1/4 ZT186802-5/16	ZT1846-8 ZT1846-10	ZT186601-8 ZT186601-10	ZT184402-8 ZT184402-10	ZT1774-8 ZT1774-10	ZT177201-8 ZT177201-10	ZT189802-8 ZT189802-10	ZT1898-8 ZT1898-10	ZT189401-8 ZT189401-10	ZT189802-8 ZT189802-10				
HS47 Hi-Shear Rivet (100°)	1/8" 5/32" 3/16" 1/4" 5/16"	ZT1878-1/8 ZT1878-5/32 ZT1878-3/16 ZT1878-1/4 ZT1878-5/16	ZT187801-1/8 ZT187801-5/32 ZT187801-3/16 ZT187801-1/4 ZT187801-5/16	ZT175202-1/8 ZT185302-5/32 ZT187802-3/16 ZT187802-1/4 ZT187802-5/16	ZT1876-1/8 ZT1876-5/32 ZT1876-3/16 ZT1876-1/4	ZT187601-1/8 ZT187601-5/32 ZT187601-3/16 ZT187601-1/4	ZT175402-1/8 ZT187602-5/32 ZT183402-3/16 ZT183402-1/4	ZT1775-1/8 ZT1775-5/32 ZT1775-3/16 ZT1775-1/4	ZT177501-1/8 ZT177501-5/32 ZT177501-3/16 ZT177501-1/4	ZT175502-1/8 ZT188702-5/32 ZT188702-3/16 ZT188702-1/4	ZT1887-1/8 ZT1887-5/32 ZT1887-3/16 ZT1887-1/4	ZT188701-1/8 ZT188701-5/32 ZT188701-3/16 ZT188701-1/4	ZT175502-1/8 ZT188702-5/32 ZT188702-3/16 ZT188702-1/4				
Blind Rivet (100°) (Huck, Cherry, DuPont) High Stress Drill-Out Type	1/8" 5/32" 3/16"	ZT1752-1/8 ZT1752-5/32 ZT1752-3/16	ZT175201-1/8 ZT175201-5/32 ZT175201-3/16	ZT175202-1/8 ZT175202-5/32 ZT175202-3/16	ZT1754-1/8 ZT1754-5/32 ZT1754-3/16	ZT175401-1/8 ZT175401-5/32 ZT175401-3/16	ZT175402-1/8 ZT175402-5/32 ZT175402-3/16	ZT1755-1/8 ZT1755-5/32 ZT1755-3/16	ZT175501-1/8 ZT175501-5/32 ZT175501-3/16	ZT175502-1/8 ZT175502-5/32 ZT175502-3/16							
B. F. Goodrich Rivnut (100°) Drill-Out Type	#4 #6 #8 #10 1/4" (4)	ZT1747-4 ZT1747-6 ZT1747-8 ZT1747-10 ZT1747-1/4	ZT186301-6 ZT174901-6 ZT174901-8 ZT174901-10 ZT174901-1/4	ZT174902-4 ZT174902-6 ZT174902-8 ZT174902-10 ZT174902-1/4										ZT1782 ZT1797 ZT1798 ZT1799	ZT178301 ZT178701 ZT178901	ZT178302 ZT178702 ZT178902	
DZUS Fastener Type "FA"	FA-5 Stud FA-5 Spring FA-61/2 Stud FA-61/2 Spring																
Airloc Fastener w/o Grommel See notes #1 & #3	3/4 (100°) 1" (120°) (4) 1 3/8" (128°)	ZT1792-3/4 ZT1792-1	ZT179201-3/4 ZT179201-1	ZT179202-3/4 ZT179202-1											ZT1792-1-3/8	ZT179201-1-3/8	ZT179202-1-3/8
Airloc Fastener w/Grommet See note #1	1" (120°) (4) 1 3/8" (128°)	ZT1794-1	ZT179401-1	ZT179402-1											ZT1794-1-3/8	ZT179401-1-3/8	ZT179402-1-3/8
Camloc fastener See note #1	CLC-4S7 4S10-1	ZT1724 ZT1717	ZT172401 ZT171701	ZT172402 ZT171702											ZT1796	ZT179601	ZT179602
DZUS Fastener Type F	F4 Spring (4) (4)	ZT1709	ZT170901	ZT171602 ZT171602													

- For Pilot Drill and Dimple type installation.
- For Pilot Drill, Dimple and Redrill type installation.
- Die Assemblies to Cowl Fastener Specification "AND 10076" made to customer installation requirements.
- To adapt Type V Die Assembly to CP-450 EA use ZT1781 Adapter Assembly.
- 1.06 diameter flange added to die body.
- Coin Die Assemblies ordered by Fastener Size and Die Assembly type and not shown here made to special order.
- For superior flushness on installation, the HS47 precision Hi-Shear Rivet is recommended





## Coin Dimple Die Assemblies for Hot or Cold coin Dimpling Rubber Loaded Ram type



FASTENER	SIZE	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY		DIE ASSEMBLY	PARTS IN DIE ASSEMBLY				DIE ASSEMBLY	PARTS IN DIE ASSEMBLY		DIE ASSEMBLY	PARTS IN DIE ASSEMBLY	
			DIE BODY	RAM		DIE BODY	RAM	RUBBER	BASE		DIE BODY	RAM		DIE BODY	RAM
AN426 Rivet(100°)  See note #2	3/32"	ZT1893-3/32	ZT189301-3/32	ZT189302-3/32	ZT1851-3/32	ZT185301-3/32	ZT185302-3/32	ZT1851-6	ZT185104	ZT1854-3/32	ZT185401-3/32	ZT185402-3/32			
	1/8"	ZT1893-1/8	ZT189301-1/8	ZT189302-1/8	ZT1851-1/8	ZT185301-1/8	ZT185302-1/8	ZT1851-6	ZT185104	ZT1854-1/8	ZT185401-1/8	ZT185402-1/8			
	5/32"	ZT1893-5/32	ZT189301-5/32	ZT189302-5/32	ZT1851-5/32	ZT185301-5/32	ZT185302-5/32	ZT1851-6	ZT185104	ZT1854-5/32	ZT185401-5/32	ZT185402-5/32			
	3/16"	ZT1893-3/16	ZT189301-3/16	ZT189302-3/16	ZT1851-3/16	ZT185301-3/16	ZT185302-3/16	ZT1851-6	ZT185104	ZT1854-3/16	ZT185401-3/16	ZT185402-3/16			
AN & NAS Screw (100°) See note #2	#6	ZT1894-6	ZT189401-6	ZT189402-6	ZT1861-6	ZT186301-6	ZT186302-6	ZT1851-6	ZT185104	ZT1864-6	ZT186401-6	ZT186402-6			
	#8	ZT1894-8	ZT189401-8	ZT189402-8	ZT1861-8	ZT186301-8	ZT186302-8	ZT1851-6	ZT185104	ZT1864-8	ZT186401-8	ZT186402-8			
	#10				ZT1861-10	ZT186301-10	ZT186302-10	ZT1851-5	ZT185106						
HS 47 Hi-Shear Rivet (100°) See note #2 and #7	3/16"	ZT1888-3/16	ZT188801-3/16	ZT188802-3/16	ZT1871-3/16	ZT187301-3/16	ZT187302-3/16	ZT1851-6	ZT185104	ZT1874-3/16	ZT187401-3/16	ZT187402-3/16			
	1/4"	ZT1888-1/4	ZT188801-1/4	ZT188802-1/4	ZT1871-1/4	ZT187301-1/4	ZT187302-1/4	ZT1851-5	ZT185106	ZT1874-1/4	ZT187401-1/4	ZT187402-1/4			
AN & NAS Screw (100°) High Stress Drill-Out Type See note #3	#8	ZT1899-8	ZT189401-8	ZT189402-8	ZT1889-8	ZT186301-8	ZT186802-8	ZT1851-6	ZT185104	ZT1844-8	ZT186401-8	ZT184402-8			
	#10				ZT1889-10	ZT186301-10	ZT186802-10	ZT1851-5	ZT185106						
HS47 Hi-Shear Rivet (100°) See note #3 and #7	3/16"	ZT1890-3/16	ZT188701-3/16	ZT188702-3/16	ZT1848-3/16	ZT187801-3/16	ZT187802-3/16	ZT1851-6	ZT185104	ZT1834-3/16	ZT183401-3/16	ZT183402-3/16			
	1/4"	ZT1890-1/4	ZT188701-1/4	ZT188702-1/4	ZT1848-1/4	ZT187801-1/4	ZT187802-1/4	ZT1851-5	ZT185106	ZT1834-1/4	ZT183401-1/4	ZT183402-1/4			
B. F. Goodrich Rivnut (100°) Drill-Out Type  See note #3	#4				ZT1749-4	ZT174901-4	ZT174902-4	ZT1851-6	ZT185104						
	#6				ZT1749-6	ZT174901-6	ZT174902-6	ZT1851-6	ZT185104						
	#8				ZT1749-8	ZT174901-8	ZT174902-8	ZT1851-6	ZT185104						
	#10				ZT1749-10	ZT174901-10	ZT174902-10	ZT1851-5	ZT185106						
1/4"				ZT1749-1/4	ZT174901-1/4	ZT174902-1/4	ZT1851-5	ZT185106							
DZUS Fastener Type "FA"  See Note #2	FA-5 Stud												ZT1783	ZT178301	ZT178302
	FA-5 Spring												ZT1785		ZT178302
Airlloc Fastener w/o Grommet See notes #2 & #4	1" (120°) (5)				ZT1761-3/4	ZT179201-3/4	ZT179202-3/4								
	1 3/8" (128°)				ZT1761-1	ZT179201-1	ZT179202-1							ZT1763-1-3/8	ZT179201-1-3/8
Airlloc Fastener w/Grommet See note #2	1" (120°) (5)				ZT1762-1	ZT179401-1	ZT179402-1								
1 3/8" (128°)													ZT1764-1-3/8	ZT179401-1-3/8	ZT179402-1-3/8
Camloc Fastener See note #2													ZT1765	ZT179601	ZT179602

1. Die Assemblies shown to be used with Punches shown on page F12.

2. For Pilot Drill, Dimple type installation.

3. For Pilot Drill, Dimple and Redrill type installation.

4. Die Assemblies to Cowl Fastener Specification "AND 10076" made to customer installation requirements.

5. 1.06 diameter flange added to die body.

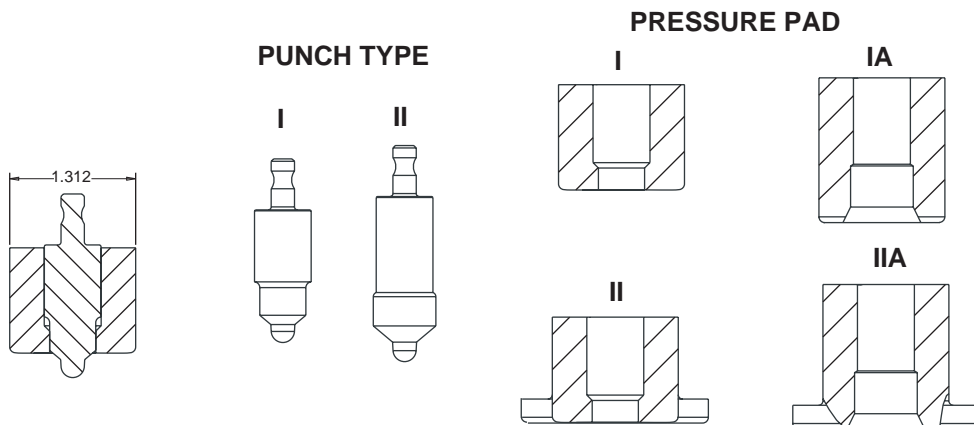
6. Coin Die Assemblies ordered by Fastener Size and Die Assembly type and not shown here made to special order.

7. For superior flushness on installation, the HS47 precision Hi-Shear Rivet is recommended

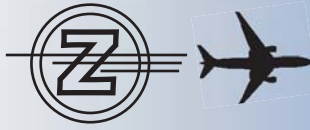


## Triple Action Punch & Pressure Pad Assembly

For use where minimum sheet warpage and marking are required

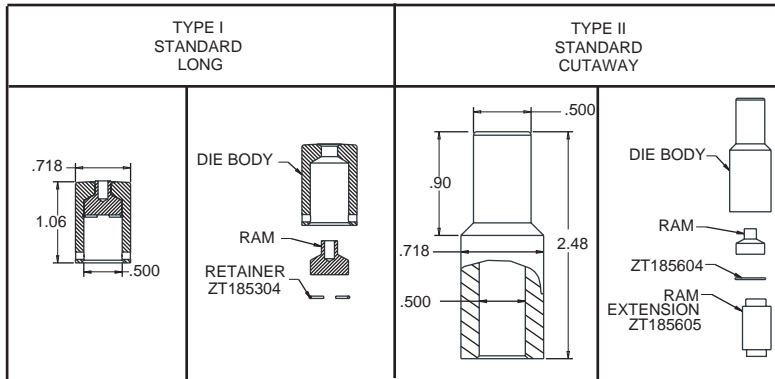


FASTENER	SIZE	PUNCH ASSEMBLY	PARTS IN PUNCH ASSEMBLY			
			PUNCH	TYPE	PRESSURE PAD	TYPE
AN426 (100°) Rivet Std. Pilot Non Drill-Out	3/32"	ZT3855-3/32	ZT385501-3/32	I	ZT385502-3/32	I
	1/8"	ZT3855-1/8	ZT385501-1/8	I	ZT385502-1/8	I
	5/32"	ZT3855-5/32	ZT385501-5/32	I	ZT385502-5/32	I
	3/16"	ZT3855-3/16	ZT385501-3/16	I	ZT385502-3/16	I
	1/4"	ZT3855-1/4	ZT385501-1/4	I	ZT385502-1/4	I
	5/16"	ZT3855-5/16	ZT385501-5/16	I	ZT385502-5/16	IIA
AN509 (100°) Screw Std. Pilot Non Drill-Out	#6	ZT3865-6	ZT386501-6	I	ZT386502-6	I
	#8	ZT3865-8	ZT386501-8	I	ZT386502-8	I
	#10	ZT3865-10	ZT386501-10	I	ZT386502-10	I
	1/4"	ZT3865-1/4	ZT386501-1/4	I	ZT386502-1/4	I
AN509 (100°) Screw Undersize Pilot Drill-Out	#6	ZT3867-6	ZT386701-6	I	ZT386702-6	I
	#8	ZT3867-8	ZT386701-8	I	ZT386702-8	I
	#10	ZT3867-10	ZT386701-10	I	ZT386702-10	I
	1/4"	ZT3867-1/4	ZT386701-1/4	I	ZT386702-1/4	I
	5/16"	ZT3867-5/16	ZT386701-5/16	II	ZT386702-5/16	II
	3/8"	ZT3867-3/8	ZT386701-3/8	II	ZT386702-3/8	IIA
HS47 (100°) Hi-Shear Rivet Undersize Pilot Drill-Out	1/8"	ZT3877-1/8	ZT387701-1/8	I	ZT387702-1/8	I
	5/32"	ZT3877-5/32	ZT387701-5/32	I	ZT387702-5/32	I
	3/16"	ZT3877-3/16	ZT387701-3/16	I	ZT387702-3/16	I
	1/4"	ZT3877-1/4	ZT387701-1/4	I	ZT387702-1/4	I
	5/16"	ZT3877-5/16	ZT387701-5/16	I	ZT387702-5/16	I
	3/8"	ZT3877-3/8	ZT387701-3/8	I	ZT387702-3/8	II
Blind Rivet (100°) Huck, Cherry, DuPont, Undersize Pilot Drill-Out	1/8"	ZT3811-1/8	ZT381101-1/8	I	ZT381102-1/8	I
	5/32"	ZT3811-5/32	ZT381101-5/32	I	ZT381102-5/32	I
	3/16"	ZT3811-3/16	ZT381101-3/16	I	ZT381102-3/16	I
Camloc Drill-Out	4S14	ZT3823	ZT382301	I	ZT382302	IA
DZUS Non Drill-Out	FAS Stud	ZT3884	ZT388401	II	ZT388402	IIA
	FAS Spring	ZT3886	ZT388601	II	ZT388602	IIA
Airloc w/o Grommet Drill-Out	#5	ZT3891-1	ZT389101-1	II	ZT389102-1	IIA
Airloc with Grommet Drill-Out	#5	ZT3893-1	ZT389301-1	II	ZT389302-1	IIA



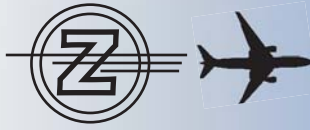
## Triple Action Dies Assemblies

For use where minimum sheet warpage and marking are required



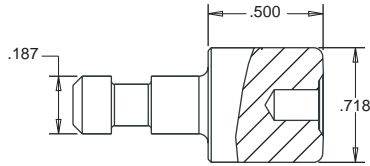
FASTENER	SIZE	DIE ASSEMBLY	PARTS IN DIE ASSEMBLY		DIE ASSEMBLY	PARTS IN DIE ASSEMBLY	
			DIE BODY	RAM		DIE BODY	RAM
AN426 (100°) Rivet Std. Pilot Non Drill-Out	3/32"	ZT3853-3/32	ZT385301-3/32	ZT385302-3/32	ZT3856-3/32	ZT385601-3/32	ZT185402-3/32
	1/8"	ZT3853-1/8	ZT385301-1/8	ZT385302-1/8	ZT3856-1/8	ZT385601-1/8	ZT185402-1/8
	5/32"	ZT3853-5/32	ZT385301-5/32	ZT385302-5/32	ZT3856-5/32	ZT385601-5/32	ZT185402-5/32
	3/16"	ZT3853-3/16	ZT385301-3/16	ZT385302-3/16	ZT3856-3/16	ZT385601-3/16	ZT185402-3/16
	1/4" (1) 5/16" (1)	ZT3853-1/4 ZT3853-5/16	ZT385301-1/4 ZT385301-5/16	ZT385302-1/4 ZT385302-5/16			
AN509 (100°) Screw Non Drill-Out	#8	ZT3863-8	ZT386301-8	ZT386302-8	ZT3866-8	ZT386601-8	ZT386402-8
	#10	ZT3863-10	ZT386301-10	ZT386302-10	ZT3866-10	ZT386601-10	ZT386402-10
	1/4"	ZT3863-1/4	ZT386301-1/4	ZT386302-1/4			
AN509 (100°) Screw Undersize Pilot Drill-Out	#6	ZT3868-6	ZT386801-6	ZT386802-6	ZT3846-6	ZT384601-6	ZT384602-6
	#8	ZT3868-8	ZT386801-8	ZT386802-8	ZT3846-8	ZT384601-8	ZT384602-8
	#10	ZT3868-10	ZT386801-10	ZT386802-10	ZT3846-10	ZT384601-10	ZT384602-10
	1/4"	ZT3868-1/4	ZT386801-1/4	ZT386802-1/4			
	5/16" (1) 3/8" (2)	ZT3868-5/16 ZT3868-3/8	ZT386801-5/16 ZT386801-3/8	ZT386802-5/16 ZT386802-3/8			
HS47 (100°) Hi-Shear Rivet Undersize Pilot Drill-Out	1/8"	ZT3878-1/8	ZT387801-1/8	ZT387802-1/8			
	5/32"	ZT3878-5/32	ZT387801-5/32	ZT387802-5/32			
	3/16"	ZT3878-3/16	ZT387801-3/16	ZT387802-3/16			
	1/4"	ZT3878-1/4	ZT387801-1/4	ZT387802-1/4			
	5/16" 3/8"	ZT3878-5/16 ZT3878-3/8	ZT387801-5/16 ZT387801-3/8	ZT387802-5/16 ZT387802-3/8			
Blind Rivet (100°) Huck, Cherry, DuPont, Undersize Pilot Drill-Out	1/8"	ZT3812-1/8	ZT381201-1/8	ZT175202-1/8	ZT3813-1/8	ZT381301-1/8	ZT381302-1/8
	5/32"	ZT3812-5/32	ZT381201-5/32	ZT381202-5/32	ZT3813-5/32	ZT381301-5/32	ZT381302-5/32
	3/16"	ZT3812-3/16	ZT381201-3/16	ZT381202-3/16	ZT3813-3/16	ZT381301-3/16	ZT381302-3/16
Camloc Drill-Out DZUS Non Drill-Out	4S14	ZT3824	ZT382401	ZT215302-5/16			
	FAS Stud	ZT3882	ZT388201	ZT388202			
	FAS Spring	ZT3897	ZT389701	ZT389702			
Airloc w/o Grommet Drill-Out	#5	ZT3892-1	ZT389201-1	ZT179202-1			
Airloc with Grommet Drill-Out	#5	ZT3894-1	ZT389401-1	ZT179402-1			

1. 1.062 Flanged added to die body
2. 2.44 Flanged added to die body

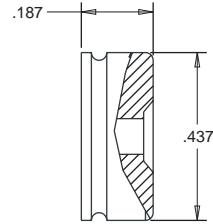


## Modified Radius Dimple Tools

TYPE I



TYPE II



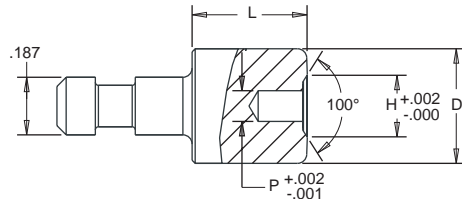
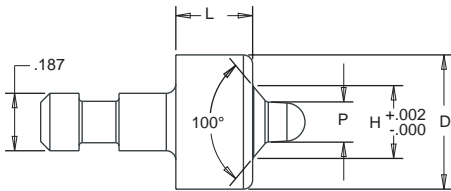
FASTENER	SIZE	TYPE I DIE	TYPE II DIE	PUNCH*	PUNCH
AN426 (100°) Rivet Non Drill-Out	3/32"	ZT1841-3/32	ZT2441-3/32	ZT1741-3/32	ZT1855-3/32
	1/8"	ZT1841-1/8	ZT2441-1/8	ZT1741-1/8	ZT1855-1/8
	5/32"	ZT1841-5/32	ZT2441-5/32	ZT1741-5/32	ZT1855-5/32
	3/16"	ZT1841-3/16	ZT2441-3/16	ZT1741-3/16	ZT1855-3/16
	1/4"	ZT1841-1/4		ZT1741-1/4	ZT1855-1/4
AN & NAS (100°) Screw Non Drill-Out	#6	ZT1842-6	ZT2442-6	ZT1742-6	ZT1865-6
	#8	ZT1842-8	ZT2442-8	ZT1742-8	ZT1865-8
	#10	ZT1842-10	ZT2442-10	ZT1742-10	ZT1865-10
	1/4"	ZT1842-1/4		ZT1742-1/4	ZT1865- 1/4
2R2, 2R7, HS47, NAS 177 Hi-Shear (100°) Rivet Non Drill	1/8"	ZT1843-1/8	ZT2443-1/8	ZT1743-1/8	ZT1875-1/8
	5/32"	ZT1843-5/32	ZT2443-5/32	ZT1743-5/32	ZT1875-5/32
	3/16"	ZT1843-3/16	ZT2443-3/16	ZT1743-3/16	ZT1875-3/16
Blind Rivet (100°) Huck, Cherry, DuPont, Undersize Pilot Drill-Out	1/8"	ZT1713-1/8	ZT2444-1/8	ZT1714-1/8	ZT2445-1/8
	5/32"	ZT1713-5/32	ZT2444-5/32	ZT1714-5/32	ZT2445-5/32
	3/16"	ZT1713-3/16	ZT2444-3/16	ZT1714-3/16	ZT2445-3/16
	1/8"	ZT1730-1/8		ZT1714-1/8	ZT2445-1/8
	5/32"	ZT1770-5/32		ZT1714-5/32	ZT2445-1/8
3/16"	ZT1770-3/16		ZT1714-3/16	ZT2445-3/16	

TYPE I - For use in ZP-450EA-36H Stationary Dimpler - Using ZT2416050.

TYPE II- For use in ZT2427-ZT2429 Portable Dimplers.

Punch\* When used in the above equipment - incorporate adapter ZT2416051

## Radius Dimple Tools



Part No.	Rivet Size	P	H	D	L
ZT26-9	3/32"	.095	.184	3/8"	When ordering specify length
ZT26-10	1/8"	.126	.237	7/16"	
ZT26-11	5/32"	.157	.307	1/2"	
ZT26-12	3/16"	.188	.367	5/8"	

Part No.	Rivet Size	P	H	D	L
ZT27-9	3/32"	.098	.206	3/8"	When ordering specify length
ZT27-10	1/8"	.129	.257	7/16"	
ZT27-11	5/32"	.160	.321	1/2"	
ZT27-12	3/16"	.191	.384	5/8"	

AVAILABLE LENGTHS: 5/16", 3/8", 7/16" 1/2", 5/8" 11/16", 3/4" : Sample ZT26-11-3/8 - Male Punch 5/32" Rivet Size.

Lengths other than listed above are made to special order.



# Positive Feed Drills





## **ZT3000** **Advanced Positive Feed Drill System**

### Description

Zephyr's new ZT3000 Positive Feed Drill offers a high power to weight ratio in a compact modular design with ease of operation and maintenance in mind. In addition to its unique features, the ZT3000 offers a wider range of RPM's and feed rates than any other tool in its class. One spindle size (1/2 in.) is used for the full range of RPM's and feed rate configurations.

#### Features

1. Angle and Inline head design, available with built in indexing or non-indexing.
2. Designed for oil hole applications.
3. Advanced Air Logic System.
  - Pull to start/ push to stop
  - Auto retract at the end of drilling cycle
  - **Auto shut off at the completion of the retract cycle**
  - The tool can start in either feed or retract mode
  - **The spindle can be retracted at any given point during the feed cycle by depressing the retract bottom**
  - Rapid spindle retraction
  - **Automatic start of on-board cutting lubricant emitter upon start of drilling cycle**
  - **Automatic shut-off of on-board cutting lubricant emitter upon start of auto retract**
4. Nosepiece index mechanism (Built in).
  - Easy access index lever
  - Allows orientation of the tool around drill axis in 30° increments
5. Air motor housing sub-assembly.
  - To maximize accessibility, the air hose can be attached to any one of the three inlet port locations on the air motor housing
  - The air motor housing is easily adapted to any on-board coolant system, such as the: Unist Mini-Back lubricators
6. Gear reducer sub-assembly.
  - Modular designed gear reducers use fewer components while offering a wide range of RPM's and can be interchanged with no shimming required
7. Drill head module.
  - The drill head module can be configured to any of its standard feed rates by simply changing two gears. Gears easily identified by number of detents
  - Spindle guard sub-assembly can be quickly attached to either an on-board coolant system or any outside coolant system

**ZT3000**



## ZT3000A, ZT3000AB Angle Head Positive Feed Drill

### Specifications

Capacity:  
 Aluminum- Ø1.25" (31.75 mm)  
 Steel-Ø.75" (19.05mm)  
 Titanium-Ø.75" (19.05mm)

Stroke:  
 Minimum- .375" (9.525mm)  
 Maximum- unlimited

RPM's:  
 230, 350, 550, 750, 1000, 2100, 3200 and 4500 RPM

Feed Rates:  
 .001, .002, .003, .004, .005, .006, .007 and .008 IPR.

Air Motor Power: 2.0 HP

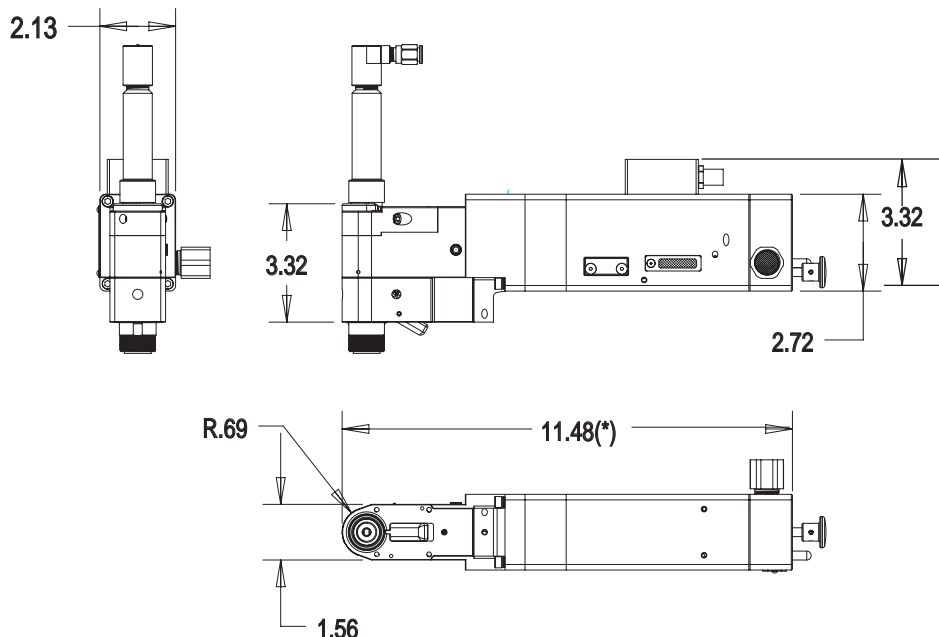
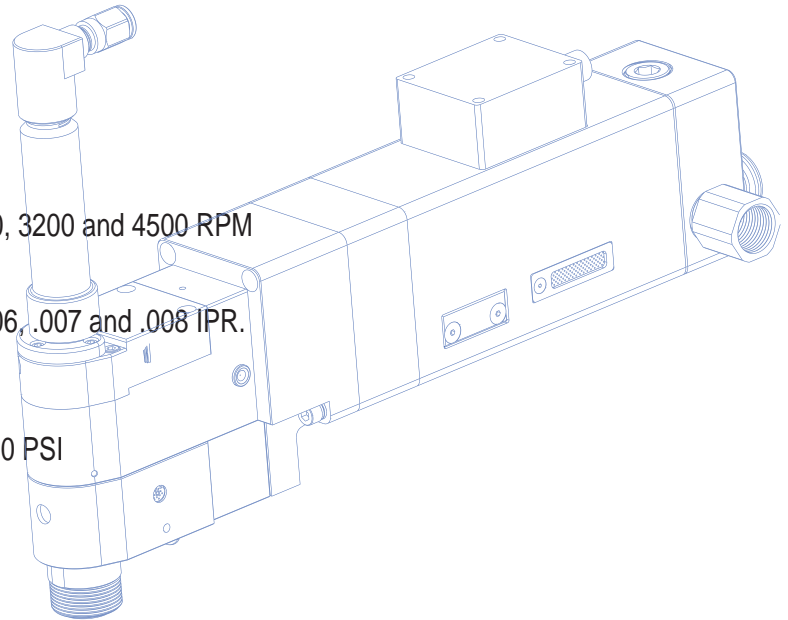
Operative Air Pressure: 90 - 120 PSI

Air Consumption: 53 S.C.F.M

Noise: 85 dB scale A

Vibration below 2.5 cm/sec<sup>2</sup>

Weight with single Gear Reduction: 7.8 lb.



(\*) The overall dimension will increase by 1.16" when using a double gear reduction

ZT3000



**ZT3000I, ZT3000IB**  
**Inline Positive Feed Drill**

**Specifications**

Capacity:  
 Aluminum- Ø1.25" (31.75 mm)  
 Steel-Ø.75" (19.05mm)  
 Titanium-Ø.75" (19.05mm)

Stroke:  
 Minimum- .375" (9.525mm)  
 Maximum- unlimited

RPM's:  
 230, 350, 550, 750, 1000, 2100, 3200 and 4500 RPM

Feed Rates:  
 .001, .002, .003, .004, .005, .006, .007 and .008 IPR.

Air Motor Power: 2.0 HP

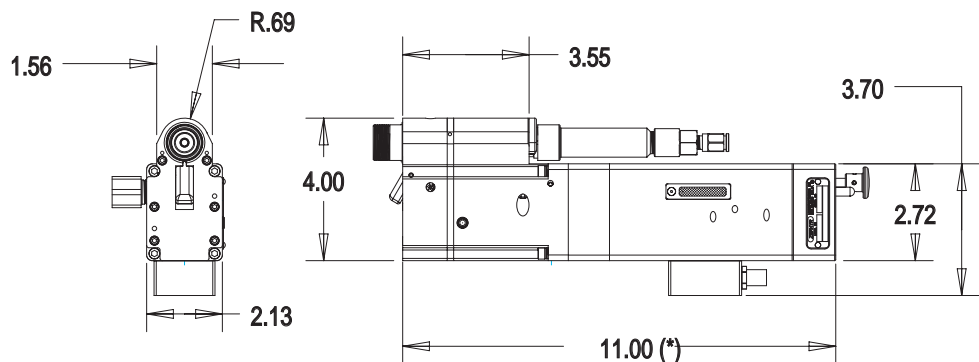
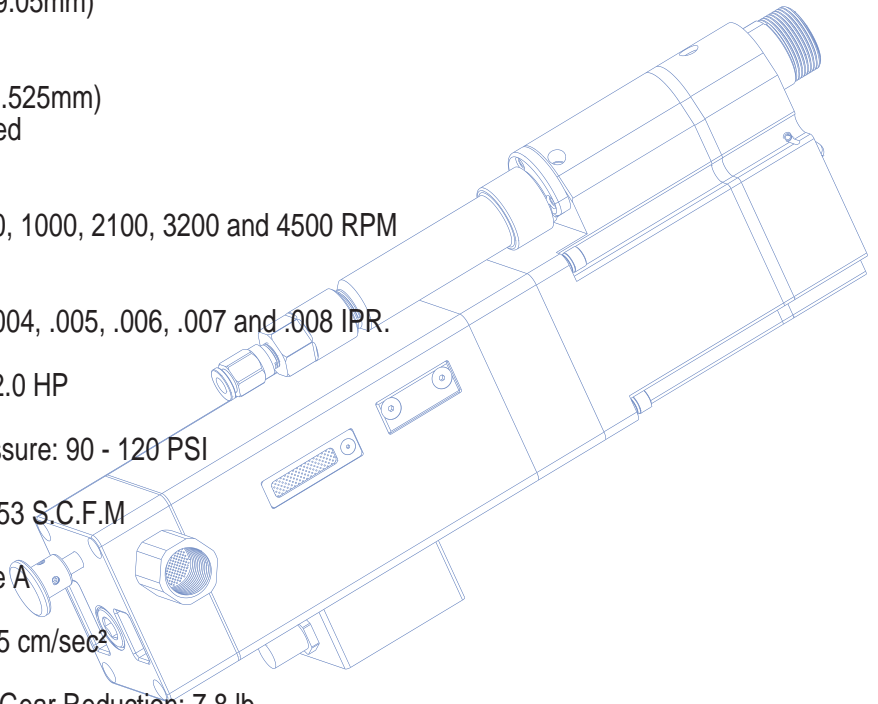
Operative Air Pressure: 90 - 120 PSI

Air Consumption: 53 S.C.F.M

Noise: 85 dB scale A

Vibration below 2.5 cm/sec<sup>2</sup>

Weight with single Gear Reduction: 7.8 lb.



(\* ) The overall dimension will increase by 1.16" when using a double gear reduction

**ZT3000**





**ZT3000**

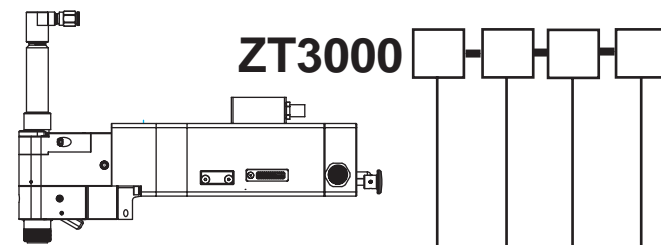
**HOW TO CONFIGURE YOUR TOOL**

**Advanced Positive Feed Drill System**

**Indicate**

**TYPE OF TOOL, RPM, FEED RATE & STROKE**

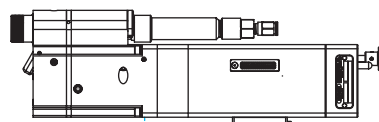
**ZT3000**



**ZT3000**

**Angle Head**

- A = INDEXING
- AB = NON-INDEXING



**Inline**

- I = INDEXING
- IB = NON-INDEXING

**Available Strokes**

STROKE	
1	= 1.00"
2	= 2.00"
3	= 3.00"
4	= 4.00"
5	= 5.00"
6	= 6.00"
7	= 7.00"
8	= 8.00"

**Available Speeds**

RPM	
2	= 230
3	= 350
5	= 550
7	= 750
10	= 1000
21	= 2100
32	= 3200
45	= 4500

**Available Feed Rates**

FEED RATE IN/REV.	
1	= .001
2	= .002
3	= .003
4	= .004
5	= .005
6	= .006
7	= .007
8	= .008

Example: ZT3000A-21-6-3

This is a ZT3000 motor with Indexing Angle head design  
 2100 RPM, .006 Feed Rate, and a 3 inch stroke

(\*) Nosepiece adapters, Nosepieces, and Taper Lock Bushings  
 available on request.

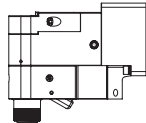


# ZT3000

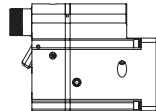
## Advanced Positive Feed Drill System

ZT3000

### Assembly Angle Head Module



### Assembly Inline Head Module

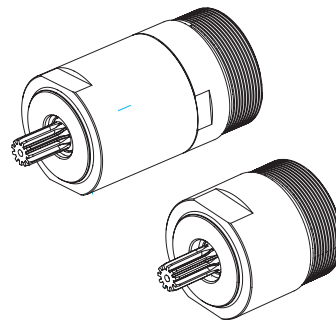


### Available Feed Rates

FEED RATE IN/REV.	ASSEMBLY INDEXING ANGLE HEAD MODULE	ASSEMBLY NON-INDEXING ANGLE HEAD MODULE	ASSEMBLY INDEXING INLINE HEAD MODULE	ASSEMBLY NON-INDEXING INLINE HEAD MODULE
.001	ZT3000301	ZT3000291	ZT3000601	ZT3000651
.002	ZT3000302	ZT3000292	ZT3000602	ZT3000652
.003	ZT3000303	ZT3000293	ZT3000603	ZT3000653
.004	ZT3000304	ZT3000294	ZT3000604	ZT3000654
.005	ZT3000305	ZT3000295	ZT3000605	ZT3000655
.006	ZT3000306	ZT3000296	ZT3000606	ZT3000656
.007	ZT3000307	ZT3000297	ZT3000607	ZT3000657
.008	ZT3000308	ZT3000298	ZT3000608	ZT3000658

### Available Speeds

RPM	ASSEMBLY GEAR REDUCER
230	ZT3000202
350	ZT3000203
550	ZT3000204
750	ZT3000207
1000	ZT3000210
2100	ZT3000220
3200	ZT3000230
4500	ZT3000242



### Available Strokes

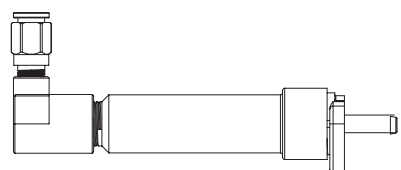
STROKE	SPINDLE	ASSEMBLY SPINDLE GUARD ANGLE HEAD	ASSEMBLY SPINDLE GUARD INLINE
1"	ZT3000491	ZT3000441	ZT3000641
2"	ZT3000492	ZT3000442	ZT3000642
3"	ZT3000493	ZT3000443	ZT3000643
4"	ZT3000494	ZT3000444	ZT3000644
5"	ZT3000495	ZT3000445	ZT3000645
6"	ZT3000496	ZT3000446	ZT3000646
7"	ZT3000497	ZT3000447	ZT3000647
8"	ZT3000498	ZT3000448	ZT3000648



Spindle: Internal Thread 9/16"-18



Assembly Spindle Guard Inline



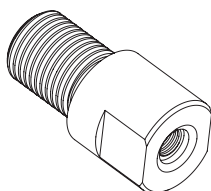
Assembly Spindle Guard Angle Head



**ZT3000**  
**Advanced Positive Feed Drill System**

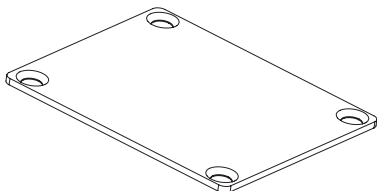
ZT3000 Accesories

Spindle Adapter



PART No.	DESCRIPTION
ZT3000417	SPINDLE ADAPTER THREAD 9/16"-18 TO 1/4"-28
ZT3000418	SPINDLE ADAPTER THREAD 9/16"-18 TO 5/16"-24
ZT3000419	SPINDLE ADAPTER THREAD 9/16"-18 TO 3/8"-24

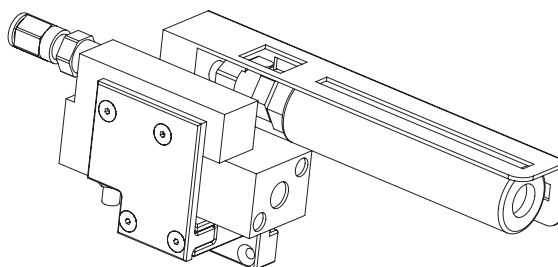
ZT3000180  
 Small Hole silencer



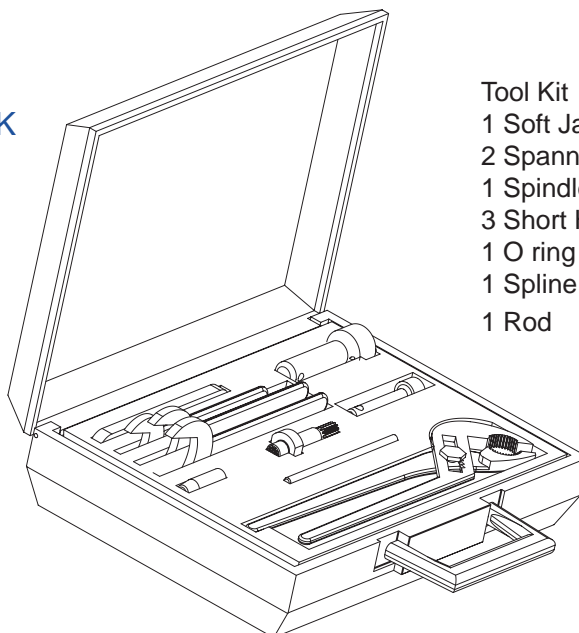
If the tool is going to be used to drill small holes you may not need all of the horse power the ZT3000 produces. You can reduce the noise level from 85dB down to less than 80dB by replacing the air motor muffler retainer.

ZT3000500  
 Unist Lubricator

(\*) Refill Kit ZT3000-61



ZT3000-TK  
 Tool Kit



- Tool Kit
- 1 Soft Jaw Plier
  - 2 Spanner Wrench
  - 1 Spindle Wrench
  - 3 Short Handle Wrench,
  - 1 O ring installation tool
  - 1 Spline Shaft
  - 1 Rod

**ZT3000**



## ZT3000 Service Kit

### ZT3000-SK

ITEM	PART NO.	DESCRIPTION
1	ZT3000A-SK-1	SERVICE KIT, MOTOR HOUSING
2	ZT3000A-SK-2	SERVICE KIT, AIR MOTOR
3	ZT3000A-SK-3	SERVICE KIT, GEAR REDUCER
4	ZT3000A-SK-4	SERVICE KIT, ANGLE HEAD

#### ZT3000-SK-1 SERVICE KIT, MOTOR HOUSING

ITEM	PART NO.	DESCRIPTION	QTY.
1	ZT3000-10	O RING	2
2	ZT3000109	GASKET, END CAP	1
3	ZT3000-11	O RING	1
4	ZT3000-12	SPRING, COMPRESSION	2
5	ZT3000-13	RING, RETAINING	4
6	ZT3000-14	O RING	11
7	ZT3000141	MUFFLER, RIGHT REAR	1
8	ZT3000144	MUFFLER, LEFT REAR	1
9	ZT3000162	FILTER, RETRACT VALVE	1
10	ZT3000163	FILTER, SHUT OFF VALVE	1
11	ZT3000166	MUFFLER, AIR MOTOR TOP	1
12	ZT3000167	GASKET, AIR MOTOR	1
13	ZT3000-18	O RING	2
14	ZT3000-21	SPRING, COMPRESSION	1
15	ZT3000-47	SPRING, COMPRESSION	1
16	ZT507-48	O RING	1
17	ZT709-28	RING, RETAINING	2
18	ZT821-7	O RING	1
19	ZT831-57	O RING	1
20	ZT940-21	RING, RETAINING	1
21	ZT960-31	O RING	1

#### ZT3000-SK-4 SERVICE KIT, HEAD

ITEM	PART NO.	DESCRIPTION	QTY.
1	8152	BEARING, THRUST	1
2	73342	BEARING, NEEDLE	1
3	ZT3000-49	O RING	12
4	ZT3000-52	RING, RETAINING	1
5	ZT3000-63	SPRING, COMPRESSION	1
6	ZT3000-64	SPRING, COMPRESSION	1
7	ZT3000-66	SPRING, COMPRESSION	1
8	ZT3000-67	O RING	1
9	ZT3000-73	RING, RETAINING	2
10	ZT3000-77	O RING	1
11	ZT3000-79	BEARING, BALL	1
12	ZT507-45	O RING	1
13	ZT511-9	BEARING, BALL	2
14	ZT550-3	BALL	17
15	ZT709-28	RING, RETAINING	1
16	ZT801-9	BEARING, NEEDLE	3
17	ZT811-13	O RING	1
18	ZT821-35	O RING	1
19	ZT821-60	BEARING, BALL	1
20	ZT3000345	TUBE, AIR	4

#### ZT3000-SK-2 SERVICE KIT, AIR MOTOR

ITEM	PART NO.	DESCRIPTION	QTY.
1	ZT206-4	BEARING, BALL	2
2	ZT821-60	BEARING, BALL	1
3	ZT3000146	VANE, ROTOR	6

#### ZT3000-SK-3 SERVICE KIT, GEAR REDUCER

ITEM	PART NO.	DESCRIPTION	QTY.
1	ZT821-60	BEARING, BALL	3
2	ZT210-2	BEARING, NEEDLE	6

ZT3000



## ZT3000A POSITIVE FEED DRILL

### Design and Features Characteristics

Zephyr's new ZT3000A Positive Feed Drill offers a high power to weight ratio in a compact modular design with ease of operation and maintenance in mind.

In addition to its unique features, the ZT3000A offers a wider range of RPM's and feed rates than any other tool in its class.

One spindle size (1/2 in.) is used for the full range of RPM's and feed rate configurations.

#### Drill Capacity

Aluminum- 1.25" (31.75 mm)  
Steel-.75" (19.05mm)  
Titanium-.75" (19.05mm)

#### Stroke

Minimum- .375" (9.525mm)  
Maximum- unlimited

#### RPM

230, 350, 550, 750, 1000, 2100, 3200 and 4500 RPM

#### Feed Rate

.001, .002, .003, .004, .005, .006, .007 and .008 IPR

#### Weight

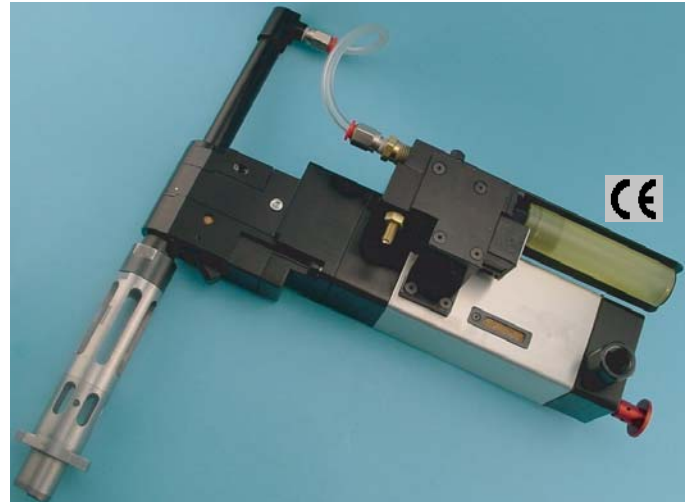
7.8lbs - 3.5 Kg

#### Features

1. 2.0 HP motor.
2. Right Angle design for close quarter application.
3. Designed for through spindle coolant delivery.
4. Spindle utilize 9/16-18 internal thread for standard thread shank drill (adapter for different thread sizes available).
5. One size spindle that can be used for the full range of RPM's and feed rate configurations.
6. Advance Air Logic System.
  - Pull to start/ push to stop.
  - Auto retract at the end of drilling cycle.
  - Auto shut off at the completion of the retract cycle.
  - The tool can start in either feed or the retract mode.
  - The spindle can be retracted at any given point during the feed cycle by depressing the retract button.
  - Rapid spindle retraction.
  - *Automatic start of through spindle coolant delivery upon start of feed cycle.*
  - *Automatic shut-off of through spindle coolant delivery upon activation of retract.*

#### Modular Design

1. Air motor housing sub-assembly.
  - To maximize accessibility, the air hose can be attached into one of the three inlet port locations on the air motor housing.
  - The air motor housing is easily adapted to any on-board coolant system, such as the Unist Mini-Piggy-Back lubricators.
2. Gear reducer sub-assembly.
  - Modular designed gear reducers use fewer components while offering a wide range of RPM's.
3. Drill head module.
  - The drill head module can be configured to any of its standard feed rates by simply changing two gears.
  - Spindle guard sub-assembly can be quickly attached to either on-board coolant system or to any outside coolant system.
4. Nose piece Index Mechanism.
  - Easy access simple to operate index lever.
  - Allows orientation of the tool around drill axis in 30° increments.
5. No adapter needed for standard 1"-20 thread nosepiece.



PATENTS PENDING  
12/703,627  
61/769,013



**ZT3000A ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS. COMPETITION**

ZT3000A	COMPETITION	ZT3000A BENEFIT
<u>Capacity:</u> Aluminum 1 1/4 in. Steel 3/4 in. Titanium 3/4 in.	Aluminum 5/8 in. Steel 7/16 in. Titanium 7/16 in.	Higher horse power and torque provide for drilling larger hole sizes in a wide variety of material types.
<u>Stroke:</u> Minimum .125 IN. Maximum Unlimited	Minimum 2.36 in. Maximum unlimited	Shorter minimum stroke requirement allows shorter overall lengths for small material thickness and limited access areas.
<u>Feed Rates (IPR)</u> .001, .002, .003, .004, .005, .006, .007, .008	.0012, .002, .0028, .004, .005	A wider variety of feed rates to accommodate today's difficult drilling operation
<u>RPM's:</u> 230, 350, 550, 750, 1000, 2100, 3200, 4500	450, 800, 1300, 1600, 2000, 3200, 4500	<ul style="list-style-type: none"> <li>• Greater RPM selection with lower RPM's for drilling today's aerospace materials</li> <li>• Modular design allows for quick and easy RPM's changes</li> </ul>
<u>Spindle Thread</u> 1/2 - 40	1/2 - 22	Provides greater thrust, fine stroke adjustment, larger hole size capacity and wider range of feed rates.
Motor Power: 2.00 HP Tool Weight 7.8 LBS.	.9 HP and 1.2 HP 5.8 LBS.	A single motor with high power to weight ratio.
<u>Motor Operation:</u> Simple two button operation, color coded.	Single button and lever operation.	Color coding helps prevent pushing the wrong button in emergency. No pinch points.



**ZT3000A ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS. COMPETITION**

ZT3000A	COMPETITION	ZT3000A BENEFIT
<p><u>Feed Rate Changes:</u>                      Simple two gear change with dot identified feed rate.</p>	<p>Simple two gear change.</p>	<p>Dot marking on gears helps prevent mismatching gears.</p>
<p><u>Advance Air Logic Control</u></p> <ul style="list-style-type: none"> <li>• No booster pump</li> <li>• Spindle Nuts</li> <li>• No external tube</li> <li>• Retract button at the rear of the tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Uses booster pump</li> <li>• Lever</li> <li>• Uses external tube</li> <li>• Lever operation close to drill and spindle.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce maintenance cost, increased reliability</li> <li>• Eliminates pinch points, reduced personal injury.</li> <li>• Reduces pressure drop and response time.</li> <li>• Easy access and eliminate pinch points.</li> </ul>
<p><u>Fully Enclosed Spindle Guard</u></p>	<p><u>Partially Enclosed Spindle Guard</u></p>	<p>Insulates the internal components from dust and grit which is an essential feature when drilling composites.</p>
<p><u>Angle Head Module</u>                      Totally interchangeable with all the gear reducers, no shims or adjustment are needed to assemble to the air motor housing.</p>	<p>Measurement and using shims for adjustment is required to assemble the air motor to the housing.</p>	<p>A true modular design that eliminates extra process, guess work, and reduces spare parts inventory and allows for easy assembly and maintenance.</p>
<p><u>Differential gearing system</u></p>	<p><u>Differential gearing system with booster pump.</u></p>	<p>Patented differential gearing system that ensures:</p> <ul style="list-style-type: none"> <li>• Positive and rapid retraction</li> <li>• positive feed cycle with maximum thrust load.</li> <li>• Eliminates the need for booster pump</li> <li>• Increases the load capacity by using heavy duty gears without increasing the envelope size of the angle head module.</li> </ul>



**ZT3000A ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS COMPETITION**

ZT3000A	COMPETITION	ZT3000A BENEFIT
<p><u>Feed Rate Changes:</u>                      Simple two gear change with dot identified feed rate.</p>	<p>Simple two gear change.</p>	<p>Dot marking on gears helps prevent mismatching gears.</p>
<p><u>Advance Air Logic Control</u></p> <ul style="list-style-type: none"> <li>• No booster pump</li> <li>• Spindle Nuts</li> <li>• No external tube</li> <li>• Retract button at the rear of the tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Uses booster pump</li> <li>• Lever</li> <li>• Uses external tube</li> <li>• Lever operation close to drill and spindle.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce maintenance cost, increased reliability</li> <li>• Eliminates pinch points, reduced personal injury.</li> <li>• Reduces pressure drop and response time.</li> <li>• Easy access and eliminate pinch points.</li> </ul>
<p><u>Fully Enclosed Spindle Guard</u></p>	<p><u>Partially Enclosed Spindle Guard</u></p>	<p>Insulates the internal components from dust and grit which is an essential feature when drilling composites.</p>
<p><u>Angle Head Module</u>                      Totally interchangeable with all the gear reducers, no shims or adjustment are needed to assemble to the air motor housing.</p>	<p>Measurement and using shims for adjustment is required to assemble the air motor to the housing.</p>	<p>A true modular design that eliminates extra process, guess work, and reduces spare parts inventory and allows for easy assembly and maintenance.</p>
<p><u>Differential gearing system</u></p>	<p><u>Differential gearing system with booster pump.</u></p>	<p>Patented differential gearing system that ensures:</p> <ul style="list-style-type: none"> <li>• Positive and rapid retraction</li> <li>• positive feed cycle with maximum thrust load.</li> <li>• Eliminates the need for booster pump</li> <li>• Increases the load capacity by using heavy duty gears without increasing the envelope size of the angle head module.</li> </ul>





## ZT3000I INLINE POSITIVE FEED DRILL

### Design and Features Characteristics

Zephyr's new ZT3000I Inline Positive Feed Drill offers a high power to weight ratio in a compact modular design with ease of operation and maintenance in mind.

In addition to its unique features, the ZT3000I offers a wider range of RPM's and feed rates than any other tool in its class.

One spindle size (1/2 in.) is used for the full range of RPM's and feed rate configurations.

#### Capacity

Aluminum- 1.25" (31.75 mm)

Steel-.75" (19.05mm)

Titanium-.75" (19.05mm)

#### Stroke

Minimum- .375" (9.525mm)

Maximum- unlimited

#### RPM

230, 350, 550, 750, 1000, 2100, 3200 and 4500 RPM

#### Feed Rate

.001, .002, .003, .004, .005, .006, .007 and .008 IPR

#### Weight

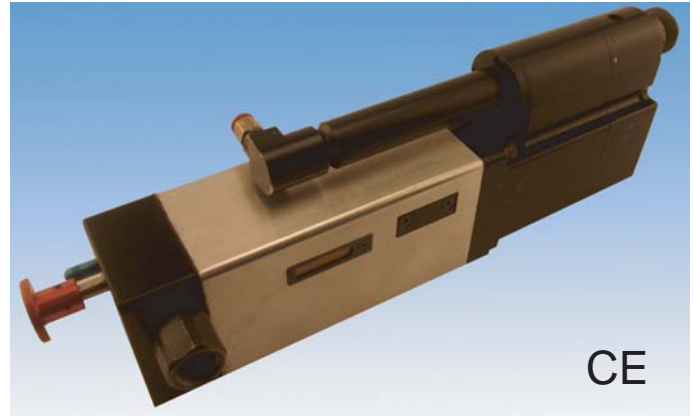
8 lbs - 3.6 Kg

#### Features

1. 2.00 HP motor
2. Inline design for close quarter application
3. Designed for oil hole application
4. Spindles utilize 9/16-18 internal thread for standard threaded shank drill (adapter for different thread sizes available)
5. One size spindle that can be used for the full range of RPM's and feed rate configurations
6. Advance Air Logic System
  - Pull to start/ push to stop
  - Auto retract at the end of drilling cycle
  - Auto shut off at the completion of the retract cycle
  - The tool can start in either feed or the retract mode
  - The spindle can be retracted at any given point during the feed cycle by depressing the retract button
  - Rapid spindle retraction

#### Modular Design

1. Air motor housing sub-assembly
  - To maximize accessibility, the air hose can be attached into one of the three inlet port locations on the air motor housing
  - The air motor housing is easily adapted to any on-board coolant system, such as the Unist Mini-Piggy-Back lubricators
2. Gear reducer sub-assembly
  - Modular designed gear reducers use fewer components while offering a wide range of RPM's
3. Drill head module
  - The drill head module can be configured to any of its standard feed rates by simply changing two gears
  - Spindle guard sub-assembly can be quickly attached to either on-board coolant system or to any outside coolant system
4. Nose piece Index Mechanism
  - Easy access simple to operate index lever
  - Allows orientation of the tool around drill axis in 30° increments
5. No adapter needed for standard 1-20 thread nosepiece



PATENTS PENDING

12/703,627

61/769,013

All parts of the New ZT3000I are interchangeable with the ZT3000A Right Angle Positive Feed Drill



**ZT3000I ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS COMPETITION**

<b>ZT3000I</b>	<b>COMPETITION</b>	<b>ZT3000I BENEFIT</b>
<u>Capacity:</u> Aluminum 1 1/4 in. Steel 3/4 in. Titanium 3/4 in.	Aluminum 5/8 in. Steel 7/16 in. Titanium 7/16 in.	Higher horse power and torque provide for drilling larger hole sizes in a wide variety of material types.
<u>Stroke:</u> Minimum .125 IN. Maximum Unlimited	Minimum 2.36 in. Maximum unlimited	Shorter minimum stroke requirement allows shorter overall lengths for small material thickness and limited access areas.
<u>Feed Rates (IPR)</u> .001, .002, .003, .004, .005, .006, .007, .008	.0012, .002, .0028, .004, .005	A wider variety of feed rates to accommodate today's difficult drilling operation
<u>RPM's:</u> 230, 350, 550, 750, 1000, 21000, 3200, 4500	450, 800, 1300, 1600, 2000, 3200, 4500	<ul style="list-style-type: none"> <li>• Greater RPM selection with lower RPM's for drilling today's aerospace materials</li> <li>• Modular design allows for quick and easy RPM's changes</li> </ul>
<u>Spindle Thread</u> 1/2 - 40	1/2 - 22	Provides greater thrust, fine stroke adjustment, larger hole size capacity and wider range of feed rates.
Motor Power: 2.00 HP Tool Weight 7.8 LBS.	.9 HP and 1.2 HP 5.8 LBS.	A single motor with high power to weight ratio.
<u>Motor Operation:</u> Simple two button operation, color coded.	Single button and lever operation.	Color coding helps prevent pushing the wrong button in emergency. No pinch points.



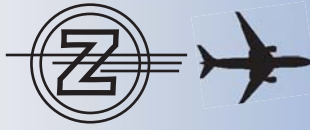
**ZT3000 I ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS COMPETITION**

ZT3000 I	COMPETITION	ZT3000 I BENEFIT
<p><u>Feed Rate Changes:</u>                      Simple two gear change with dot identified feed rate.</p>	<p>Simple two gear change.</p>	<p>Dot marking on gears helps prevent mismatching gears.</p>
<p><u>Advance Air Logic Control</u></p> <ul style="list-style-type: none"> <li>• No booster pump</li> <li>• Spindle Nuts</li> <li>• No external tube</li> <li>• Retract button at the rear of the tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Uses booster pump</li> <li>• Lever</li> <li>• Uses external tube</li> <li>• Lever operation close to drill and spindle.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce maintenance cost, increased reliability</li> <li>• Eliminates pinch points, reduced personal injury.</li> <li>• Reduces pressure drop and response time.</li> <li>• Easy access and eliminate pinch points.</li> </ul>
<p><u>Fully Enclosed Spindle Guard</u></p>	<p><u>Partially Enclosed Spindle Guard</u></p>	<p>Insulates the internal components from dust and grit which is an essential feature when drilling composites.</p>
<p><u>Inline Head Module</u>                      Totally interchangeable with all the gear reducers, no shims or adjustment are needed to assemble to the air motor housing.</p>	<p>Measurement and using shims for adjustment is required to assemble the air motor to the housing.</p>	<p>A true modular design that eliminates extra process, guess work, and reduces spare parts inventory and allows for easy assembly and maintenance.</p>
<p><u>Differential gearing system</u></p>	<p><u>Differential gearing system with booster pump.</u></p>	<p>Patented differential gearing system that ensures:</p> <ul style="list-style-type: none"> <li>• Positive and rapid retraction</li> <li>• positive feed cycle with maximum thrust load.</li> <li>• Eliminates the need for booster pump</li> <li>• Increases the load capacity by using heavy duty gears without increasing the envelope size of the angle head module.</li> </ul>



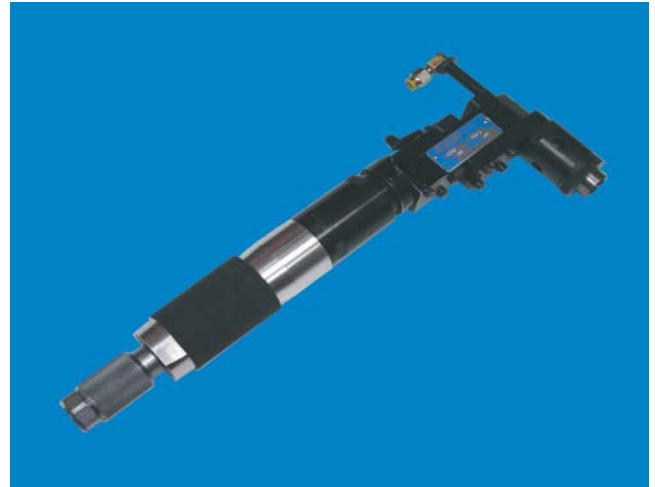
ZT3000 I ADVANCED POSITIVE DRILL  
 FEATURES AND BENEFITS  
 ZEPHYR VS COMPETITION

ZT3000 I	COMPETITION	ZT3000 I BENEFIT
<u>Three inlet ports</u>	<u>Single inlet port</u>	Multiple air inlets provide for easier adaptation to drill fixtures in limited access area.
<u>Silencer for small hole drilling</u>	<u>None</u>	Available small hole drilling silencer reduces DB's



## ZT802X POSITIVE FEED DRILL

A 90 DEGREE, MANUALLY OPERATED ANGLE DRILL WITH AUTO RETRACT AND MINIMUM SPINDLE OFFSET PERMITS USE IN RESTRICTED AREAS



### Specifications

Zephyr's new ZT802X Positive Feed Drill offers a high power to weight ratio in a compact modular design with ease of operation and maintenance in mind. In addition to its unique features, the ZT802X offers a wider range of RPM's and feed rates than any other tool in its class.

### Capacity:

Aluminum- .Ø750" (19.0 mm)  
Steel-Ø.500" (12.7 mm)  
Titanium-Ø.500" (12.7mm)  
-(Ø.625" Intermittent use)

### Stroke:

Minimum- .375" (9.525mm)  
Maximum- unlimited

### RPM:

400, 500, 700, 1000, 1400, 2800 RPM

### Feed Rate:

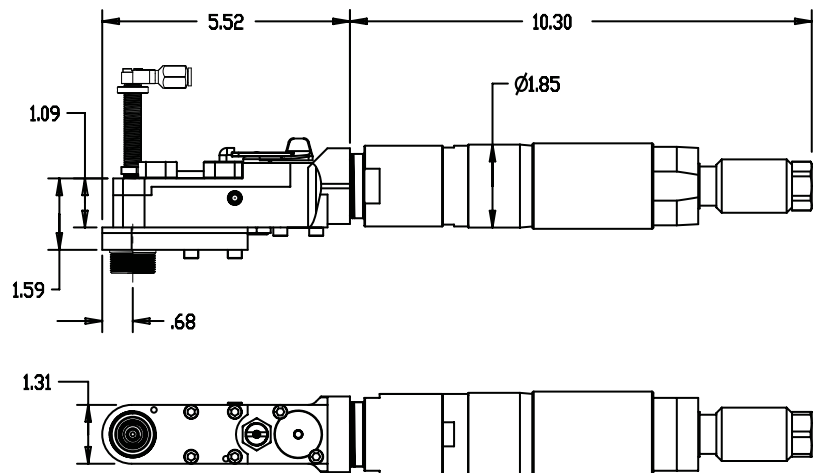
.0007, .001, .002, .003, .004, .006, and .008 IPR

### Weight:

4-1/4 lbs - 1.93 Kg

### Features:

1. 1.5 HP motor.
2. Right Angle design for close quarter application.
3. Designed for oil hole application.
4. Spindle utilizes 1/4-28 or 5/16-24 (R.H. Threads) internal threads for standard threaded shank drill.
5. Auto retract at the end of drilling cycle.
6. The tool can start in either feed or the retract mode.
7. The spindle can be retracted at any given point during the feed cycle.
8. Rapid spindle retraction permits faster drilling cycle.



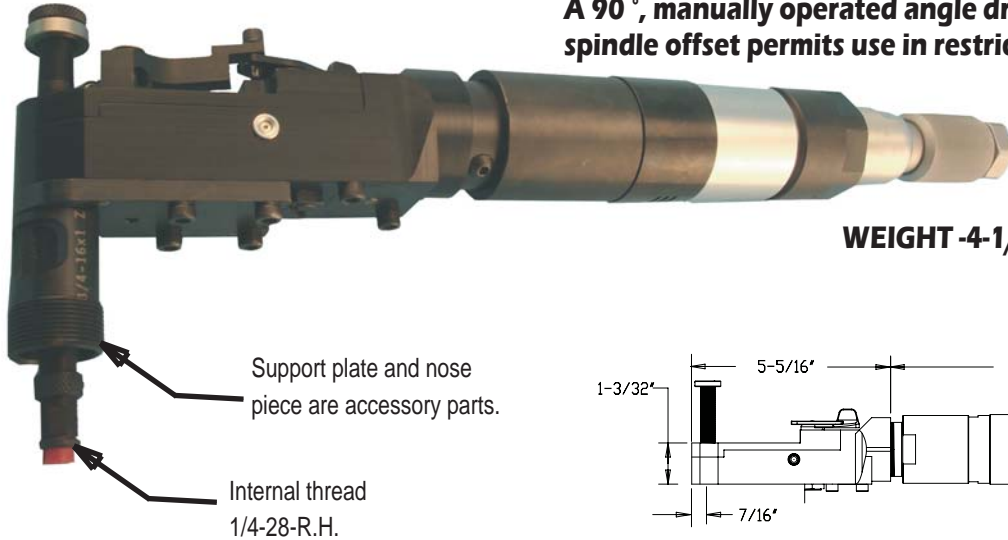
### Modular Design

1. Gear reducer sub-assembly:
  - Modular designed gear reducers use fewer components while offering a wide range of RPM's.
2. Drill head module:
  - Smallest Drill head for close quarters drilling.
3. Nose piece Index Mechanism:
  - Easy access simple to operate index lever.
  - Allows orientation of the tool around drill axis in 30° increments.
4. No adapter needed for standard 1-20 internal thread nosepiece.
5. For peak performance air line pressures should be 90-100 P.S.I. with hose of 3/8" diameter and tool fitting of 9/32".



## ZT802 POSITIVE FEED DRILL

A 90°, manually operated angle drill with minimum spindle offset permits use in restricted areas.

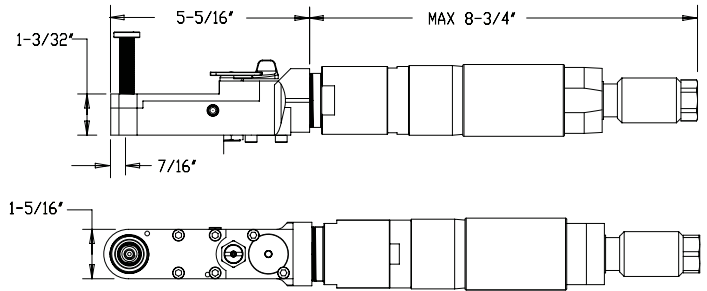


**WEIGHT -4-1/4 Lbs.**

Drill Capacity  
 1/2" Dia. in Aluminum  
 3/8" Dia. in Steel  
 3/8" Dia. in Titanium

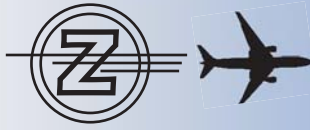
### SPECIFICATIONS

- Standard .5 H.P. fixed speed or optional variable speed motors. State specific speed or speeds required.
- Drill supplied with standard length solid spindle or optional oil hole spindle through spindle coolant attachment available. State spindle length and style.
- Standard feed rates are listed optional feed rates from .0007 to .016 are available. State specific rate required.
- Support plate nosepiece, and nose lock bushing are accessory parts and are not included as standard parts. If required, state length, diameter and nose lock bushing size and series type.
- Drill and motor cases, transmission and motors are machined from solid bar stock and are fully heat treated.
- Spindle is supported by heavy duty bearings.
- Shear key overload system prevents damage to critical components.
- Rapid spindle retraction permits faster drilling cycle.
- No change in spindle rotation during the retraction cycle produce superior holes.
- Mounting dimensions are shown for use on special fixtures.
- For peak performance air line pressures should be 90-100 P.S.I. with hose of 3/8" inside diameter and tool fitting of 9/32".



AVAILABLE SPEEDS	AVAILABLE FEED (AT ANY SPEED) INCH PER REV.	STROKE	SPINDLE LENGTH
150, 200, 300, 400, 665, 1000, 1330	.0007	1/2"	1-1/2"
		1"	2"
		2"	3"
	.001	1/2"	1-1/2"
		1"	2"
		2"	3"
	.002	1/2"	1-1/2"
		1"	2"
		2"	3"
	.003	1/2"	1-1/2"
		1"	2"
		2"	3"
	.004	1/2"	1-1/2"
		1"	2"
		2"	3"
	.006	1/2"	1-1/2"
		1"	2"
		2"	3"
	.008	1/2"	1-1/2"
		1"	2"
		2"	3"

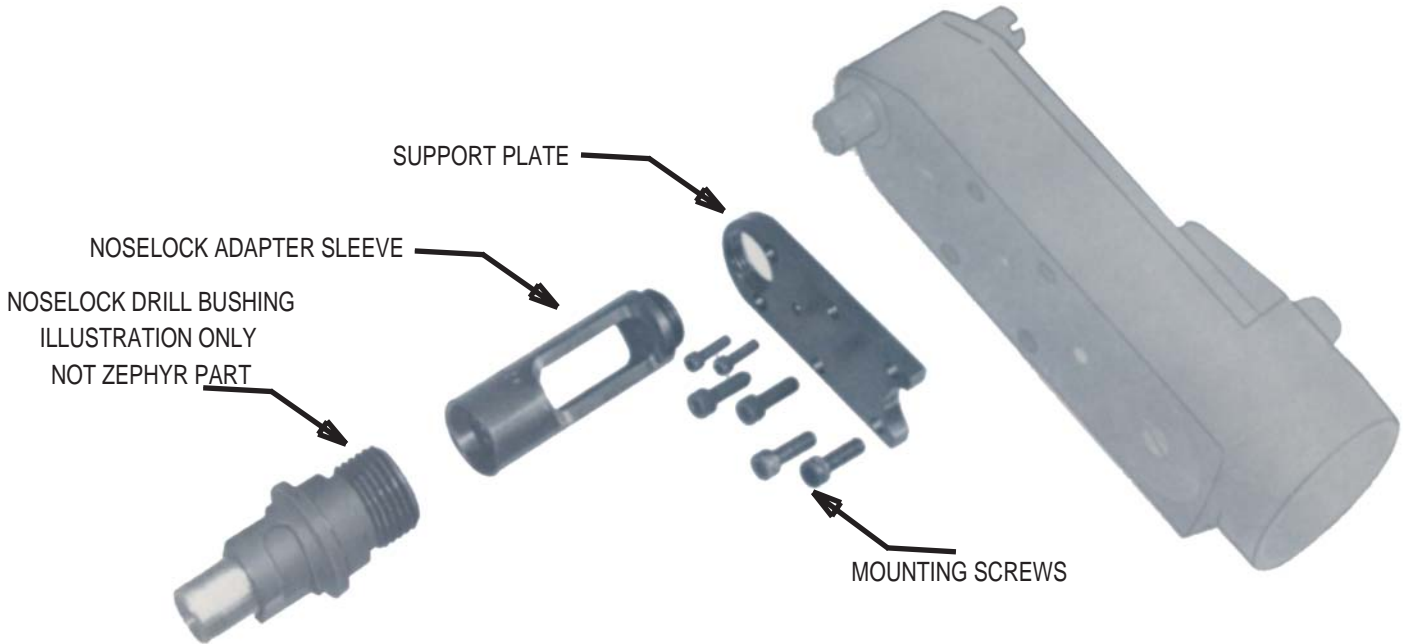
Other motor speeds available on request.



**POSITIVE FEED DRILL  
 ACCESSORIES**

Other motor speeds available on request.

**NOSELOCK BUSHING ADAPTORS**



USED ON DRILL MODEL	SPINDLE STROKE LENGTH	BUSHINGS THREADS L. HAND	ASSEMBLY NUMBER	SUPPORT PLATE	NOSELOCK ADAPTOR	MOUNTING SCREWS
ZT802	1"	3/4"-16	ZT802099	ZT8020106	ZT8010107	ZT449-15
	2"		ZT8020100		ZT8010108	&
	3"		ZT8020101		ZT8010109	ZT507-2

Other Noselock Bushing adaptors are available on request, these allow for fine length adjustments and positioning of the tool in relation to the structure.



## POSITIVE FEED DRILLS

Zephyr Automatic and Semi-Automatic Air Powered Positive Feed Drills represent a significant advancement in drilling precision holes for both aerospace and industrial applications. Zephyr positive feed drills incorporate a simple, rugged and highly versatile power and transmission system that results in unmatched performance and reliability whether the application is aluminum, heat treated steel, titanium or advanced composite structure. Straight, tapered, countersunk or counterbored holes, up to three inches in diameter and fifteen inches long, with finish diameter tolerances of .0003 can be drilled at high production rates with Zephyr drill systems.

Zephyr positive feed drills ensure high quality and productivity because of their built-in design features. Zephyr drills produce high quality holes by drilling at a fixed rate of feed with respect to drill rotation. The positive feed system avoids work hardening caused by drill rotation without cutting and premature drill failure due to excess pressure applied by the operator or drill breakthrough. The drilling cycle is fully automatic, the operator needs only to start the drill by a simple button or valve.

Zephyr positive feed drills have been designed to achieve performance levels and unmatched service life with motor sizes and transmission systems significantly smaller than current systems. These features reduce operator fatigue, increase productivity, allow access in severely restricted areas and reduce the use of compressed air.

Zephyr drills have been designed for long service life at high production rates. They require minimum maintenance and will deliver reliable performance under severe operating conditions.

Zephyr positive feed drill systems are available in a wide range of sizes and styles, inline, piggy -back and right angle drills. Feed rates of .0005 to .016 and motor speeds in excess of 3,000 RPM's are available. In addition Zephyr offers a wide range of standard and special accessories such as magnetic bases, lubricators, special nose pieces, offsets, portable gun drills and fully automated systems.

Zephyr has a major ongoing commitment to the development of new drilling concepts, designed to increase both productivity and quality standards.

We would welcome the opportunity to service your special requirements on an individual basis.





## **POSITIVE FEED DRILLS**

DESIGNED AND MANUFACTURED WITH RIGID PRECISION REQUIREMENTS, A MINIMUM OF DETAIL PARTS, PLUS THE USE OF QUALITY MATERIALS, PRESENTS A STRONG AND RUGGED UNIT WITH A MINIMUM OF MAINTENANCE NEEDS.

CHECK THESE FEATURES:

1. POSITIVE FEED
2. RAPID SPINDLE RETURN
3. FULL AUTOMATIC CYCLE, OR
4. SEMI AUTOMATIC CYCLE, (RESET FOR DRILLING)
5. MINIMUM SPINDLE OFFSET
6. OVERLOAD PROTECTION
7. STROKE LENGTH CONTROL
8. OPTIONAL SPINDLE LENGTH
9. OPTIONAL MOTOR SPEEDS
10. OPTIONAL FEED RATES
11. ACCURATE DEPTH CONTROL FOR COUNTERSINKING

COMPARE THE ABOVE WITH THE TOOLS YOU ARE NOW USING, THEN WRITE AND REQUEST A DEMONSTRATION IN YOUR PLANT.