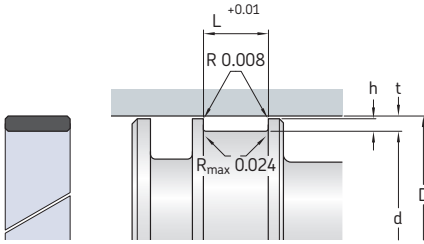


## 5.2 WAT rod or piston guide rings, inch sizes

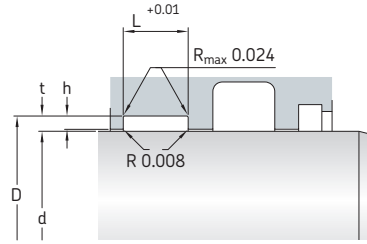
D 1 – 2.25 in.



Diameter tolerances		
Cylinder bore	Tolerances <sup>1)</sup>	
D	D	d
in.	in.	
1 to 4.875	+0.002	-0.002
5 to 7.75	+0.004	-0.003
8 to 10.5	+0.006	-0.004

Piston application  
(dynamic on the outside surface)

$h \geq t/2$



Diameter tolerances		
Housing groove	Tolerances <sup>1)</sup>	
D	D	d
in.	in.	
1 to 5.625	+0.002	-0.002
5.75 to 10.5	+0.003	-0.004

Rod application  
(dynamic on the inside surface)

Dimensions		Designation		
D	d	L	t	
in.		-		
1	0.813	0.25	0.093	WAT93-1000-250-E8D
	0.813	0.312	0.093	WAT93-1000-312-E8D
	0.813	0.375	0.093	WAT93-1000-375-E8D
	0.813	0.5	0.093	WAT93-1000-500-E8D
	0.813	0.625	0.093	WAT93-1000-625-E8D
	0.875	0.25	0.062	WAT62-1000-250-E8D
	0.875	0.312	0.062	WAT62-1000-312-E8D
	0.875	0.375	0.062	WAT62-1000-375-E8D
	0.875	0.5	0.062	WAT62-1000-500-E8D
	0.875	0.625	0.062	WAT62-1000-625-E8D
1.125	0.938	0.25	0.093	WAT93-1125-250-E8D
	0.938	0.312	0.093	WAT93-1125-312-E8D
	0.938	0.375	0.093	WAT93-1125-375-E8D
	0.938	0.5	0.093	WAT93-1125-500-E8D
	0.938	0.625	0.093	WAT93-1125-625-E8D
	1	0.187	0.062	WAT62-1125-187-E8D
	1	0.25	0.062	WAT62-1125-250-E8D
	1	0.312	0.062	WAT62-1125-312-E8D
	1	0.375	0.062	WAT62-1125-375-E8D
	1	0.5	0.062	WAT62-1125-500-E8D
1.25	1	0.625	0.062	WAT62-1125-625-E8D
	1	0.187	0.125	WAT125-1250-187-E8D
	1	0.25	0.125	WAT125-1250-250-E8D
	1	0.312	0.125	WAT125-1250-312-E8D
	1	0.375	0.125	WAT125-1250-375-E8D
	1	0.5	0.125	WAT125-1250-500-E8D
	1	0.625	0.125	WAT125-1250-625-E8D
	1	0.75	0.125	WAT125-1250-750-E8D

Dimensions		Designation		
D	d	L	t	
in.		-		
1.25	1.063	0.25	0.093	WAT93-1250-250-E8D
	1.063	0.312	0.093	WAT93-1250-312-E8D
	1.063	0.375	0.093	WAT93-1250-375-E8D
	1.063	0.5	0.093	WAT93-1250-500-E8D
	1.063	0.625	0.093	WAT93-1250-625-E8D
	1.063	0.75	0.093	WAT93-1250-750-E8D
	1.125	0.187	0.062	WAT62-1250-187-E8D
	1.125	0.25	0.062	WAT62-1250-250-E8D
	1.125	0.312	0.062	WAT62-1250-312-E8D
	1.125	0.375	0.062	WAT62-1250-375-E8D
1.5	1.125	0.5	0.062	WAT62-1250-500-E8D
	1.125	0.625	0.062	WAT62-1250-625-E8D
	1.125	0.75	0.062	WAT62-1250-750-E8D
	1.25	0.187	0.125	WAT125-1500-187-E8D
	1.25	0.25	0.125	WAT125-1500-250-E8D
	1.25	0.312	0.125	WAT125-1500-312-E8D
	1.25	0.375	0.125	WAT125-1500-375-E8D
	1.25	0.5	0.125	WAT125-1500-500-E8D
	1.25	0.625	0.125	WAT125-1500-625-E8D
	1.25	0.75	0.125	WAT125-1500-750-E8D
1.313	1.25	0.875	0.125	WAT125-1500-875-E8D
	1.25	1	0.125	WAT125-1500-1000-E8D
	1.313	0.25	0.093	WAT93-1500-250-E8D
	1.313	0.312	0.093	WAT93-1500-312-E8D
	1.313	0.375	0.093	WAT93-1500-375-E8D
	1.313	0.5	0.093	WAT93-1500-500-E8D

<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

Dimensions				Designation
D	d	L	t	

in.				-
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1.5 cont.	1.313	0.625	0.093	WAT93-1500-625-E8D
	1.313	0.75	0.093	WAT93-1500-750-E8D
	1.313	0.875	0.093	WAT93-1500-875-E8D
	1.313	1	0.093	WAT93-1500-1000-E8D

	1.375	0.187	0.062	WAT62-1500-187-E8D
	1.375	0.25	0.062	WAT62-1500-250-E8D
	1.375	0.312	0.062	WAT62-1500-312-E8D
	1.375	0.375	0.062	WAT62-1500-375-E8D
	1.375	0.5	0.062	WAT62-1500-500-E8D

	1.375	0.625	0.062	WAT62-1500-625-E8D
	1.375	0.75	0.062	WAT62-1500-750-E8D
	1.375	0.875	0.062	WAT62-1500-875-E8D
	1.375	1	0.062	WAT62-1500-1000-E8D

1.75	1.5	0.25	0.125	WAT125-1750-250-E8D
	1.5	0.312	0.125	WAT125-1750-312-E8D
	1.5	0.375	0.125	WAT125-1750-375-E8D
	1.5	0.5	0.125	WAT125-1750-500-E8D

	1.5	0.625	0.125	WAT125-1750-625-E8D
	1.5	0.75	0.125	WAT125-1750-750-E8D
	1.5	0.875	0.125	WAT125-1750-875-E8D
	1.5	1	0.125	WAT125-1750-1000-E8D

	1.563	0.25	0.093	WAT93-1750-250-E8D
	1.563	0.312	0.093	WAT93-1750-312-E8D
	1.563	0.375	0.093	WAT93-1750-375-E8D
	1.563	0.5	0.093	WAT93-1750-500-E8D

	1.563	0.625	0.093	WAT93-1750-625-E8D
	1.563	0.75	0.093	WAT93-1750-750-E8D
	1.563	0.875	0.093	WAT93-1750-875-E8D
	1.563	1	0.093	WAT93-1750-1000-E8D

	1.625	0.25	0.062	WAT62-1750-250-E8D
	1.625	0.312	0.062	WAT62-1750-312-E8D
	1.625	0.375	0.062	WAT62-1750-375-E8D
	1.625	0.5	0.062	WAT62-1750-500-E8D

	1.625	0.625	0.062	WAT62-1750-625-E8D
	1.625	0.75	0.062	WAT62-1750-750-E8D
	1.625	0.875	0.062	WAT62-1750-875-E8D
	1.625	1	0.062	WAT62-1750-1000-E8D

2	1.625	0.25	0.187	WAT187-2000-250-E8D
	1.625	0.312	0.187	WAT187-2000-312-E8D
	1.625	0.375	0.187	WAT187-2000-375-E8D
	1.625	0.5	0.187	WAT187-2000-500-E8D
	1.625	0.625	0.187	WAT187-2000-625-E8D

	1.625	0.75	0.187	WAT187-2000-750-E8D
	1.625	0.875	0.187	WAT187-2000-875-E8D
	1.625	1	0.187	WAT187-2000-1000-E8D
	1.625	1.25	0.187	WAT187-2000-1250-E8D
	1.625	1.5	0.187	WAT187-2000-1500-E8D

	1.75	0.25	0.125	WAT125-2000-250-E8D
	1.75	0.312	0.125	WAT125-2000-312-E8D
	1.75	0.375	0.125	WAT125-2000-375-E8D
	1.75	0.5	0.125	WAT125-2000-500-E8D
	1.75	0.625	0.125	WAT125-2000-625-E8D

Dimensions				Designation
D	d	L	t	

in.				-
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2 cont.	1.75	0.75	0.125	WAT125-2000-750-E8D
	1.75	0.875	0.125	WAT125-2000-875-E8D
	1.75	1	0.125	WAT125-2000-1000-E8D
	1.75	1.25	0.125	WAT125-2000-1250-E8D
	1.75	1.5	0.125	WAT125-2000-1500-E8D

	1.813	0.25	0.093	WAT93-2000-250-E8D
	1.813	0.312	0.093	WAT93-2000-312-E8D
	1.813	0.375	0.093	WAT93-2000-375-E8D
	1.813	0.5	0.093	WAT93-2000-500-E8D
	1.813	0.625	0.093	WAT93-2000-625-E8D

	1.813	0.75	0.093	WAT93-2000-750-E8D
	1.813	0.875	0.093	WAT93-2000-875-E8D
	1.813	1	0.093	WAT93-2000-1000-E8D
	1.813	1.25	0.093	WAT93-2000-1250-E8D
	1.813	1.5	0.093	WAT93-2000-1500-E8D

	1.875	0.25	0.062	WAT62-2000-250-E8D
	1.875	0.312	0.062	WAT62-2000-312-E8D
	1.875	0.375	0.062	WAT62-2000-375-E8D
	1.875	0.5	0.062	WAT62-2000-500-E8D
	1.875	0.625	0.062	WAT62-2000-625-E8D

	1.875	0.75	0.062	WAT62-2000-750-E8D
	1.875	0.875	0.062	WAT62-2000-875-E8D
	1.875	1	0.062	WAT62-2000-1000-E8D
	1.875	1.25	0.062	WAT62-2000-1250-E8D
	1.875	1.5	0.062	WAT62-2000-1500-E8D

2.25	1.875	0.25	0.187	WAT187-2250-250-E8D
	1.875	0.312	0.187	WAT187-2250-312-E8D
	1.875	0.375	0.187	WAT187-2250-375-E8D
	1.875	0.5	0.187	WAT187-2250-500-E8D
	1.875	0.625	0.187	WAT187-2250-625-E8D

	1.875	0.75	0.187	WAT187-2250-750-E8D
	1.875	0.875	0.187	WAT187-2250-875-E8D
	1.875	1	0.187	WAT187-2250-1000-E8D
	1.875	1.25	0.187	WAT187-2250-1250-E8D
	1.875	1.5	0.187	WAT187-2250-1500-E8D

	2	0.25	0.125	WAT125-2250-250-E8D
	2	0.312	0.125	WAT125-2250-312-E8D
	2	0.375	0.125	WAT125-2250-375-E8D
	2	0.5	0.125	WAT125-2250-500-E8D
	2	0.625	0.125	WAT125-2250-625-E8D

	2	0.75	0.125	WAT125-2250-750-E8D
	2	0.875	0.125	WAT125-2250-875-E8D
	2	1	0.125	WAT125-2250-1000-E8D
	2	1.25	0.125	WAT125-2250-1250-E8D
	2	1.5	0.125	WAT125-2250-1500-E8D

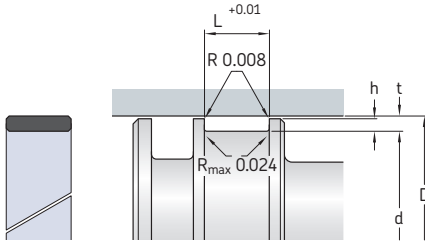
	2.063	0.25	0.093	WAT93-2250-250-E8D
	2.063	0.312	0.093	WAT93-2250-312-E8D
	2.063	0.375	0.093	WAT93-2250-375-E8D
	2.063	0.5	0.093	WAT93-2250-500-E8D
	2.063	0.625	0.093	WAT93-2250-625-E8D

	2.063	0.75	0.093	WAT93-2250-750-E8D
	2.063	0.875	0.093	WAT93-2250-875-E8D
	2.063	1	0.093	WAT93-2250-1000-E8D
	2.063	1.25	0.093	WAT93-2250-1250-E8D
	2.063	1.5	0.093	WAT93-2250-1500-E8D

5.2

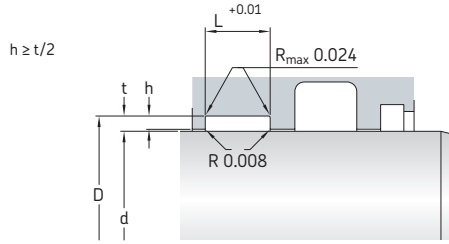
## 5.2 WAT rod or piston guide rings, inch sizes

D 2.25 – 3 in.



Diameter tolerances			
Cylinder bore D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 4.875	+0.002	-0.002	
5 to 7.75	+0.004	-0.003	
8 to 10.5	+0.006	-0.004	

Piston application  
(dynamic on the outside surface)



Diameter tolerances			
Housing groove D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 5.625	+0.002	-0.002	
5.75 to 10.5	+0.003	-0.004	

Rod application  
(dynamic on the inside surface)

Dimensions				Designation	
D	d	L	t		
in.				-	
2.25 cont.	2.125	0.25	0.062	WAT62-2250-250-E8D	
	2.125	0.312	0.062	WAT62-2250-312-E8D	
	2.125	0.375	0.062	WAT62-2250-375-E8D	
	2.125	0.5	0.062	WAT62-2250-500-E8D	
	2.125	0.625	0.062	WAT62-2250-625-E8D	
2.5	2.125	0.75	0.062	WAT62-2250-750-E8D	
	2.125	0.875	0.062	WAT62-2250-875-E8D	
	2.125	1	0.062	WAT62-2250-1000-E8D	
	2.125	1.25	0.062	WAT62-2250-1250-E8D	
	2.125	1.5	0.062	WAT62-2250-1500-E8D	
	2.125	0.25	0.187	WAT187-2500-250-E8D	
	2.125	0.312	0.187	WAT187-2500-312-E8D	
	2.125	0.375	0.187	WAT187-2500-375-E8D	
2.125	0.5	0.187	WAT187-2500-500-E8D		
2.125	0.625	0.187	WAT187-2500-625-E8D		
2.125	0.75	0.187	WAT187-2500-750-E8D		
2.125	0.875	0.187	WAT187-2500-875-E8D		
2.125	1	0.187	WAT187-2500-1000-E8D		
2.125	1.25	0.187	WAT187-2500-1250-E8D		
2.125	1.5	0.187	WAT187-2500-1500-E8D		
2.125	1.75	0.187	WAT187-2500-1750-E8D		
2.25	0.25	0.125	WAT125-2500-250-E8D		
2.25	0.312	0.125	WAT125-2500-312-E8D		
2.25	0.375	0.125	WAT125-2500-375-E8D		
2.25	0.5	0.125	WAT125-2500-500-E8D		
2.25	0.625	0.125	WAT125-2500-625-E8D		
2.25	0.75	0.125	WAT125-2500-750-E8D		

Dimensions				Designation	
D	d	L	t		
in.				-	
2.5 cont.	2.25	0.875	0.125	WAT125-2500-875-E8D	
	2.25	1	0.125	WAT125-2500-1000-E8D	
	2.25	1.25	0.125	WAT125-2500-1250-E8D	
	2.25	1.5	0.125	WAT125-2500-1500-E8D	
	2.25	1.75	0.125	WAT125-2500-1750-E8D	
2.5	2.313	0.25	0.093	WAT93-2500-250-E8D	
	2.313	0.312	0.093	WAT93-2500-312-E8D	
	2.313	0.375	0.093	WAT93-2500-375-E8D	
	2.313	0.5	0.093	WAT93-2500-500-E8D	
	2.313	0.625	0.093	WAT93-2500-625-E8D	
	2.313	0.75	0.093	WAT93-2500-750-E8D	
	2.313	0.875	0.093	WAT93-2500-875-E8D	
	2.313	1	0.093	WAT93-2500-1000-E8D	
2.313	1.25	0.093	WAT93-2500-1250-E8D		
2.313	1.5	0.093	WAT93-2500-1500-E8D		
2.313	1.75	0.093	WAT93-2500-1750-E8D		
2.5	2.375	0.25	0.062	WAT62-2500-250-E8D	
	2.375	0.312	0.062	WAT62-2500-312-E8D	
	2.375	0.375	0.062	WAT62-2500-375-E8D	
	2.375	0.5	0.062	WAT62-2500-500-E8D	
	2.375	0.625	0.062	WAT62-2500-625-E8D	
	2.375	0.75	0.062	WAT62-2500-750-E8D	
	2.375	0.875	0.062	WAT62-2500-875-E8D	
	2.375	1	0.062	WAT62-2500-1000-E8D	
	2.375	1.25	0.062	WAT62-2500-1250-E8D	
	2.375	1.5	0.062	WAT62-2500-1500-E8D	
	2.375	1.75	0.062	WAT62-2500-1750-E8D	

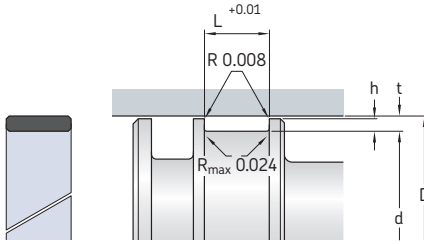
<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

Dimensions				Designation
D	d	L	t	
in.				-
<b>2.625</b>	2.25	0.25	0.187	WAT187-2625-250-E8D
	2.25	0.312	0.187	WAT187-2625-312-E8D
	2.25	0.375	0.187	WAT187-2625-375-E8D
	2.25	0.5	0.187	WAT187-2625-500-E8D
	2.25	0.625	0.187	WAT187-2625-625-E8D
	2.25	0.75	0.187	WAT187-2625-750-E8D
	2.25	0.875	0.187	WAT187-2625-875-E8D
	2.25	1	0.187	WAT187-2625-1000-E8D
	2.25	1.25	0.187	WAT187-2625-1250-E8D
	2.25	1.5	0.187	WAT187-2625-1500-E8D
2.25	1.75	0.187	WAT187-2625-1750-E8D	
2.375	0.25	0.125	WAT125-2625-250-E8D	
2.375	0.312	0.125	WAT125-2625-312-E8D	
2.375	0.375	0.125	WAT125-2625-375-E8D	
2.375	0.5	0.125	WAT125-2625-500-E8D	
2.375	0.625	0.125	WAT125-2625-625-E8D	
2.375	0.75	0.125	WAT125-2625-750-E8D	
2.375	0.875	0.125	WAT125-2625-875-E8D	
2.375	1	0.125	WAT125-2625-1000-E8D	
2.375	1.25	0.125	WAT125-2625-1250-E8D	
2.375	1.5	0.125	WAT125-2625-1500-E8D	
2.375	1.75	0.125	WAT125-2625-1750-E8D	
2.438	0.25	0.093	WAT93-2625-250-E8D	
2.438	0.312	0.093	WAT93-2625-312-E8D	
2.438	0.375	0.093	WAT93-2625-375-E8D	
2.438	0.5	0.093	WAT93-2625-500-E8D	
2.438	0.625	0.093	WAT93-2625-625-E8D	
2.438	0.75	0.093	WAT93-2625-750-E8D	
2.438	0.875	0.093	WAT93-2625-875-E8D	
2.438	1	0.093	WAT93-2625-1000-E8D	
2.438	1.25	0.093	WAT93-2625-1250-E8D	
2.438	1.5	0.093	WAT93-2625-1500-E8D	
2.438	1.75	0.093	WAT93-2625-1750-E8D	
2.5	0.25	0.062	WAT62-2625-250-E8D	
2.5	0.312	0.062	WAT62-2625-312-E8D	
2.5	0.375	0.062	WAT62-2625-375-E8D	
2.5	0.5	0.062	WAT62-2625-500-E8D	
2.5	0.625	0.062	WAT62-2625-625-E8D	
2.5	0.75	0.062	WAT62-2625-750-E8D	
2.5	0.875	0.062	WAT62-2625-875-E8D	
2.5	1	0.062	WAT62-2625-1000-E8D	
2.5	1.25	0.062	WAT62-2625-1250-E8D	
2.5	1.5	0.062	WAT62-2625-1500-E8D	
2.5	1.75	0.062	WAT62-2625-1750-E8D	
<b>2.75</b>	2.375	0.25	0.187	WAT187-2750-250-E8D
	2.375	0.312	0.187	WAT187-2750-312-E8D
	2.375	0.375	0.187	WAT187-2750-375-E8D
	2.375	0.5	0.187	WAT187-2750-500-E8D
	2.375	0.625	0.187	WAT187-2750-625-E8D
	2.375	0.75	0.187	WAT187-2750-750-E8D
	2.375	0.875	0.187	WAT187-2750-875-E8D
	2.375	1	0.187	WAT187-2750-1000-E8D
	2.375	1.25	0.187	WAT187-2750-1250-E8D
	2.375	1.5	0.187	WAT187-2750-1500-E8D
2.375	1.75	0.187	WAT187-2750-1750-E8D	
2.375	2	0.187	WAT187-2750-2000-E8D	
2.5	0.25	0.125	WAT125-2750-250-E8D	
2.5	0.312	0.125	WAT125-2750-312-E8D	

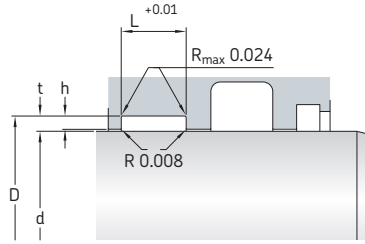
Dimensions				Designation
D	d	L	t	
in.				-
<b>2.75</b>	2.5	0.375	0.125	WAT125-2750-375-E8D
	2.5	0.5	0.125	WAT125-2750-500-E8D
	2.5	0.625	0.125	WAT125-2750-625-E8D
	2.5	0.75	0.125	WAT125-2750-750-E8D
	2.5	0.875	0.125	WAT125-2750-875-E8D
	2.5	1	0.125	WAT125-2750-1000-E8D
	2.5	1.25	0.125	WAT125-2750-1250-E8D
	2.5	1.5	0.125	WAT125-2750-1500-E8D
	2.5	1.75	0.125	WAT125-2750-1750-E8D
	2.5	2	0.125	WAT125-2750-2000-E8D
2.563	0.25	0.093	WAT93-2750-250-E8D	
2.563	0.312	0.093	WAT93-2750-312-E8D	
2.563	0.375	0.093	WAT93-2750-375-E8D	
2.563	0.5	0.093	WAT93-2750-500-E8D	
2.563	0.625	0.093	WAT93-2750-625-E8D	
2.563	0.75	0.093	WAT93-2750-750-E8D	
2.563	0.875	0.093	WAT93-2750-875-E8D	
2.563	1	0.093	WAT93-2750-1000-E8D	
2.563	1.25	0.093	WAT93-2750-1250-E8D	
2.563	1.5	0.093	WAT93-2750-1500-E8D	
2.563	1.75	0.093	WAT93-2750-1750-E8D	
2.563	2	0.093	WAT93-2750-2000-E8D	
2.625	0.25	0.062	WAT62-2750-250-E8D	
2.625	0.312	0.062	WAT62-2750-312-E8D	
2.625	0.375	0.062	WAT62-2750-375-E8D	
2.625	0.5	0.062	WAT62-2750-500-E8D	
2.625	0.625	0.062	WAT62-2750-625-E8D	
2.625	0.75	0.062	WAT62-2750-750-E8D	
2.625	0.875	0.062	WAT62-2750-875-E8D	
2.625	1	0.062	WAT62-2750-1000-E8D	
2.625	1.25	0.062	WAT62-2750-1250-E8D	
2.625	1.5	0.062	WAT62-2750-1500-E8D	
2.625	1.75	0.062	WAT62-2750-1750-E8D	
2.625	2	0.062	WAT62-2750-2000-E8D	
<b>3</b>	2.625	0.25	0.187	WAT187-3000-250-E8D
	2.625	0.312	0.187	WAT187-3000-312-E8D
	2.625	0.375	0.187	WAT187-3000-375-E8D
	2.625	0.5	0.187	WAT187-3000-500-E8D
	2.625	0.625	0.187	WAT187-3000-625-E8D
	2.625	0.75	0.187	WAT187-3000-750-E8D
	2.625	0.875	0.187	WAT187-3000-875-E8D
	2.625	1	0.187	WAT187-3000-1000-E8D
	2.625	1.25	0.187	WAT187-3000-1250-E8D
	2.625	1.5	0.187	WAT187-3000-1500-E8D
2.625	1.75	0.187	WAT187-3000-1750-E8D	
2.625	2	0.187	WAT187-3000-2000-E8D	
2.75	0.25	0.125	WAT125-3000-250-E8D	
2.75	0.312	0.125	WAT125-3000-312-E8D	
2.75	0.375	0.125	WAT125-3000-375-E8D	
2.75	0.5	0.125	WAT125-3000-500-E8D	
2.75	0.625	0.125	WAT125-3000-625-E8D	
2.75	0.75	0.125	WAT125-3000-750-E8D	
2.75	0.875	0.125	WAT125-3000-875-E8D	
2.75	1	0.125	WAT125-3000-1000-E8D	
2.75	1.25	0.125	WAT125-3000-1250-E8D	
2.75	1.5	0.125	WAT125-3000-1500-E8D	
2.75	1.75	0.125	WAT125-3000-1750-E8D	
2.75	2	0.125	WAT125-3000-2000-E8D	

## 5.2 WAT rod or piston guide rings, inch sizes

D 3 – 3.875 in.



$h \geq t/2$



Diameter tolerances			
Cylinder bore D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 4.875	+0.002	-0.002	
5 to 7.75	+0.004	-0.003	
8 to 10.5	+0.006	-0.004	

Piston application  
(dynamic on the outside surface)

Diameter tolerances			
Housing groove D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 5.625	+0.002	-0.002	
5.75 to 10.5	+0.003	-0.004	

Rod application  
(dynamic on the inside surface)

Dimensions	Designation			
	D	d	L	t
in.	-			
3 cont.	2.813	0.25	0.093	WAT93-3000-250-E8D
	2.813	0.312	0.093	WAT93-3000-312-E8D
	2.813	0.375	0.093	WAT93-3000-375-E8D
	2.813	0.5	0.093	WAT93-3000-500-E8D
	2.813	0.625	0.093	WAT93-3000-625-E8D
	2.813	0.75	0.093	WAT93-3000-750-E8D
	2.813	0.875	0.093	WAT93-3000-875-E8D
	2.813	1	0.093	WAT93-3000-1000-E8D
	2.813	1.25	0.093	WAT93-3000-1250-E8D
	2.813	1.5	0.093	WAT93-3000-1500-E8D
	2.813	1.75	0.093	WAT93-3000-1750-E8D
	2.813	2	0.093	WAT93-3000-2000-E8D
	2.875	0.25	0.062	WAT62-3000-250-E8D
	2.875	0.312	0.062	WAT62-3000-312-E8D
	2.875	0.375	0.062	WAT62-3000-375-E8D
	2.875	0.5	0.062	WAT62-3000-500-E8D
	2.875	0.625	0.062	WAT62-3000-625-E8D
	2.875	0.75	0.062	WAT62-3000-750-E8D
	2.875	0.875	0.062	WAT62-3000-875-E8D
	2.875	1	0.062	WAT62-3000-1000-E8D
2.875	1.25	0.062	WAT62-3000-1250-E8D	
2.875	1.5	0.062	WAT62-3000-1500-E8D	
2.875	1.75	0.062	WAT62-3000-1750-E8D	
2.875	2	0.062	WAT62-3000-2000-E8D	
3.25	2.875	0.25	0.187	WAT187-3250-250-E8D
	2.875	0.312	0.187	WAT187-3250-312-E8D
	2.875	0.375	0.187	WAT187-3250-375-E8D

Dimensions	Designation			
	D	d	L	t
in.	-			
3.25 cont.	2.875	0.5	0.187	WAT187-3250-500-E8D
	2.875	0.625	0.187	WAT187-3250-625-E8D
	2.875	0.75	0.187	WAT187-3250-750-E8D
	2.875	0.875	0.187	WAT187-3250-875-E8D
	2.875	1	0.187	WAT187-3250-1000-E8D
	2.875	1.25	0.187	WAT187-3250-1250-E8D
	2.875	1.5	0.187	WAT187-3250-1500-E8D
	2.875	1.75	0.187	WAT187-3250-1750-E8D
	2.875	2	0.187	WAT187-3250-2000-E8D
	3	0.25	0.125	WAT125-3250-250-E8D
3	0.312	0.125	WAT125-3250-312-E8D	
3	0.375	0.125	WAT125-3250-375-E8D	
3	0.5	0.125	WAT125-3250-500-E8D	
3	0.625	0.125	WAT125-3250-625-E8D	
3	0.75	0.125	WAT125-3250-750-E8D	
3	0.875	0.125	WAT125-3250-875-E8D	
3	1	0.125	WAT125-3250-1000-E8D	
3	1.25	0.125	WAT125-3250-1250-E8D	
3	1.5	0.125	WAT125-3250-1500-E8D	
3	1.75	0.125	WAT125-3250-1750-E8D	
3	2	0.125	WAT125-3250-2000-E8D	
3.063	0.25	0.093	WAT93-3250-250-E8D	
3.063	0.312	0.093	WAT93-3250-312-E8D	
3.063	0.375	0.093	WAT93-3250-375-E8D	
3.063	0.5	0.093	WAT93-3250-500-E8D	
3.063	0.625	0.093	WAT93-3250-625-E8D	
3.063	0.75	0.093	WAT93-3250-750-E8D	

<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

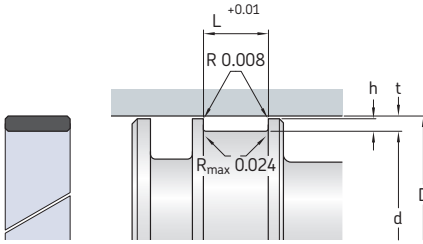
Dimensions				Designation	
D	d	L	t		
in.				-	
3.25 cont.	3.063	0.875	0.093	WAT93-3250-875-E8D	
	3.063	1	0.093	WAT93-3250-1000-E8D	
	3.063	1.25	0.093	WAT93-3250-1250-E8D	
	3.063	1.5	0.093	WAT93-3250-1500-E8D	
	3.063	1.75	0.093	WAT93-3250-1750-E8D	
	3.063	2	0.093	WAT93-3250-2000-E8D	
	3.125	0.25	0.062	WAT62-3250-250-E8D	
	3.125	0.312	0.062	WAT62-3250-312-E8D	
	3.125	0.375	0.062	WAT62-3250-375-E8D	
	3.125	0.5	0.062	WAT62-3250-500-E8D	
	3.125	0.625	0.062	WAT62-3250-625-E8D	
	3.125	0.75	0.062	WAT62-3250-750-E8D	
	3.125	0.875	0.062	WAT62-3250-875-E8D	
	3.125	1	0.062	WAT62-3250-1000-E8D	
	3.125	1.25	0.062	WAT62-3250-1250-E8D	
	3.125	1.5	0.062	WAT62-3250-1500-E8D	
	3.125	1.75	0.062	WAT62-3250-1750-E8D	
	3.125	2	0.062	WAT62-3250-2000-E8D	
	3.5	3.125	0.25	0.187	WAT187-3500-250-E8D
		3.125	0.312	0.187	WAT187-3500-312-E8D
3.125		0.375	0.187	WAT187-3500-375-E8D	
3.125		0.5	0.187	WAT187-3500-500-E8D	
3.125		0.625	0.187	WAT187-3500-625-E8D	
3.125		0.75	0.187	WAT187-3500-750-E8D	
3.125		0.875	0.187	WAT187-3500-875-E8D	
3.125		1	0.187	WAT187-3500-1000-E8D	
3.125		1.25	0.187	WAT187-3500-1250-E8D	
3.125		1.5	0.187	WAT187-3500-1500-E8D	
3.125		1.75	0.187	WAT187-3500-1750-E8D	
3.125		2	0.187	WAT187-3500-2000-E8D	
3.25		0.25	0.125	WAT125-3500-250-E8D	
3.25		0.312	0.125	WAT125-3500-312-E8D	
3.25		0.375	0.125	WAT125-3500-375-E8D	
3.25		0.5	0.125	WAT125-3500-500-E8D	
3.25		0.625	0.125	WAT125-3500-625-E8D	
3.25		0.75	0.125	WAT125-3500-750-E8D	
3.25		0.875	0.125	WAT125-3500-875-E8D	
3.25		1	0.125	WAT125-3500-1000-E8D	
3.25	1.25	0.125	WAT125-3500-1250-E8D		
3.25	1.5	0.125	WAT125-3500-1500-E8D		
3.25	1.75	0.125	WAT125-3500-1750-E8D		
3.25	2	0.125	WAT125-3500-2000-E8D		
3.313	0.25	0.093	WAT93-3500-250-E8D		
3.313	0.312	0.093	WAT93-3500-312-E8D		
3.313	0.375	0.093	WAT93-3500-375-E8D		
3.313	0.5	0.093	WAT93-3500-500-E8D		
3.313	0.625	0.093	WAT93-3500-625-E8D		
3.313	0.75	0.093	WAT93-3500-750-E8D		
3.313	0.875	0.093	WAT93-3500-875-E8D		
3.313	1	0.093	WAT93-3500-1000-E8D		
3.313	1.25	0.093	WAT93-3500-1250-E8D		
3.313	1.5	0.093	WAT93-3500-1500-E8D		
3.313	1.75	0.093	WAT93-3500-1750-E8D		
3.313	2	0.093	WAT93-3500-2000-E8D		
3.375	0.25	0.062	WAT62-3500-250-E8D		
3.375	0.312	0.062	WAT62-3500-312-E8D		
3.375	0.375	0.062	WAT62-3500-375-E8D		

Dimensions				Designation
D	d	L	t	
in.				-
3.5 cont.	3.375	0.5	0.062	WAT62-3500-500-E8D
	3.375	0.625	0.062	WAT62-3500-625-E8D
	3.375	0.75	0.062	WAT62-3500-750-E8D
3.375	0.875	0.062	WAT62-3500-875-E8D	
3.375	1	0.062	WAT62-3500-1000-E8D	
3.375	1.25	0.062	WAT62-3500-1250-E8D	
3.375	1.5	0.062	WAT62-3500-1500-E8D	
3.375	1.75	0.062	WAT62-3500-1750-E8D	
3.375	2	0.062	WAT62-3500-2000-E8D	
3.75	3.375	0.312	0.187	WAT187-3750-312-E8D
	3.375	0.375	0.187	WAT187-3750-375-E8D
	3.375	0.5	0.187	WAT187-3750-500-E8D
	3.375	0.625	0.187	WAT187-3750-625-E8D
	3.375	0.75	0.187	WAT187-3750-750-E8D
	3.375	0.875	0.187	WAT187-3750-875-E8D
	3.375	1	0.187	WAT187-3750-1000-E8D
	3.375	1.25	0.187	WAT187-3750-1250-E8D
	3.375	1.5	0.187	WAT187-3750-1500-E8D
	3.375	1.75	0.187	WAT187-3750-1750-E8D
3.375	2	0.187	WAT187-3750-2000-E8D	
3.5	0.312	0.125	WAT125-3750-312-E8D	
3.5	0.375	0.125	WAT125-3750-375-E8D	
3.5	0.5	0.125	WAT125-3750-500-E8D	
3.5	0.625	0.125	WAT125-3750-625-E8D	
3.5	0.75	0.125	WAT125-3750-750-E8D	
3.5	0.875	0.125	WAT125-3750-875-E8D	
3.5	1	0.125	WAT125-3750-1000-E8D	
3.5	1.25	0.125	WAT125-3750-1250-E8D	
3.5	1.5	0.125	WAT125-3750-1500-E8D	
3.5	1.75	0.125	WAT125-3750-1750-E8D	
3.5	2	0.125	WAT125-3750-2000-E8D	
3.563	0.312	0.093	WAT93-3750-312-E8D	
3.563	0.375	0.093	WAT93-3750-375-E8D	
3.563	0.5	0.093	WAT93-3750-500-E8D	
3.563	0.625	0.093	WAT93-3750-625-E8D	
3.563	0.75	0.093	WAT93-3750-750-E8D	
3.563	0.875	0.093	WAT93-3750-875-E8D	
3.563	1	0.093	WAT93-3750-1000-E8D	
3.563	1.25	0.093	WAT93-3750-1250-E8D	
3.563	1.5	0.093	WAT93-3750-1500-E8D	
3.563	1.75	0.093	WAT93-3750-1750-E8D	
3.563	2	0.093	WAT93-3750-2000-E8D	
3.625	0.312	0.062	WAT62-3750-312-E8D	
3.625	0.375	0.062	WAT62-3750-375-E8D	
3.625	0.5	0.062	WAT62-3750-500-E8D	
3.625	0.625	0.062	WAT62-3750-625-E8D	
3.625	0.75	0.062	WAT62-3750-750-E8D	
3.625	0.875	0.062	WAT62-3750-875-E8D	
3.625	1	0.062	WAT62-3750-1000-E8D	
3.625	1.25	0.062	WAT62-3750-1250-E8D	
3.625	1.5	0.062	WAT62-3750-1500-E8D	
3.625	1.75	0.062	WAT62-3750-1750-E8D	
3.625	2	0.062	WAT62-3750-2000-E8D	
3.875	3.5	0.312	0.187	WAT187-3875-312-E8D
	3.5	0.375	0.187	WAT187-3875-375-E8D
	3.5	0.5	0.187	WAT187-3875-500-E8D



## 5.2 WAT rod or piston guide rings, inch sizes

D 3.875 – 4.75 in.

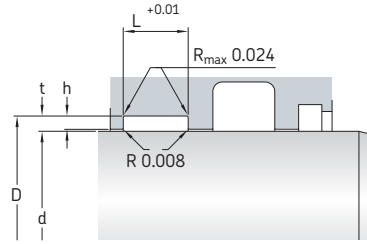


### Diameter tolerances

Cylinder bore D	Tolerances <sup>1)</sup>	
	D	d
in.	in.	
<b>1 to 4.875</b>	+0.002	-0.002
<b>5 to 7.75</b>	+0.004	-0.003
<b>8 to 10.5</b>	+0.006	-0.004

Piston application  
(dynamic on the outside surface)

$h \geq t/2$



### Diameter tolerances

Housing groove D	Tolerances <sup>1)</sup>	
	D	d
in.	in.	
<b>1 to 5.625</b>	+0.002	-0.002
<b>5.75 to 10.5</b>	+0.003	-0.004

Rod application  
(dynamic on the inside surface)

Dimensions				Designation
D	d	L	t	
in.				-
<b>3.875</b>	3.5	0.625	0.187	<b>WAT187-3875-625-E8D</b>
cont.	3.5	0.75	0.187	<b>WAT187-3875-750-E8D</b>
	3.5	0.875	0.187	<b>WAT187-3875-875-E8D</b>
	3.5	1	0.187	<b>WAT187-3875-1000-E8D</b>
	3.5	1.25	0.187	<b>WAT187-3875-1250-E8D</b>
	3.5	1.5	0.187	<b>WAT187-3875-1500-E8D</b>
	3.5	1.75	0.187	<b>WAT187-3875-1750-E8D</b>
	3.5	2	0.187	<b>WAT187-3875-2000-E8D</b>
	3.625	0.312	0.125	<b>WAT125-3875-312-E8D</b>
	3.625	0.375	0.125	<b>WAT125-3875-375-E8D</b>
	3.625	0.5	0.125	<b>WAT125-3875-500-E8D</b>
	3.625	0.625	0.125	<b>WAT125-3875-625-E8D</b>
	3.625	0.75	0.125	<b>WAT125-3875-750-E8D</b>
	3.625	0.875	0.125	<b>WAT125-3875-875-E8D</b>
	3.625	1	0.125	<b>WAT125-3875-1000-E8D</b>
	3.625	1.25	0.125	<b>WAT125-3875-1250-E8D</b>
	3.625	1.5	0.125	<b>WAT125-3875-1500-E8D</b>
	3.625	1.75	0.125	<b>WAT125-3875-1750-E8D</b>
	3.625	2	0.125	<b>WAT125-3875-2000-E8D</b>
	3.688	0.312	0.093	<b>WAT93-3875-312-E8D</b>
	3.688	0.375	0.093	<b>WAT93-3875-375-E8D</b>
	3.688	0.5	0.093	<b>WAT93-3875-500-E8D</b>
	3.688	0.625	0.093	<b>WAT93-3875-625-E8D</b>
	3.688	0.75	0.093	<b>WAT93-3875-750-E8D</b>
	3.688	0.875	0.093	<b>WAT93-3875-875-E8D</b>
	3.688	1	0.093	<b>WAT93-3875-1000-E8D</b>

Dimensions				Designation
D	d	L	t	
in.				-
<b>3.875</b>	3.688	1.25	0.093	<b>WAT93-3875-1250-E8D</b>
cont.	3.688	1.5	0.093	<b>WAT93-3875-1500-E8D</b>
	3.688	1.75	0.093	<b>WAT93-3875-1750-E8D</b>
	3.688	2	0.093	<b>WAT93-3875-2000-E8D</b>
	3.75	0.312	0.062	<b>WAT62-3875-312-E8D</b>
	3.75	0.375	0.062	<b>WAT62-3875-375-E8D</b>
	3.75	0.5	0.062	<b>WAT62-3875-500-E8D</b>
	3.75	0.625	0.062	<b>WAT62-3875-625-E8D</b>
	3.75	0.75	0.062	<b>WAT62-3875-750-E8D</b>
	3.75	0.875	0.062	<b>WAT62-3875-875-E8D</b>
	3.75	1	0.062	<b>WAT62-3875-1000-E8D</b>
	3.75	1.25	0.062	<b>WAT62-3875-1250-E8D</b>
	3.75	1.5	0.062	<b>WAT62-3875-1500-E8D</b>
	3.75	1.75	0.062	<b>WAT62-3875-1750-E8D</b>
	3.75	2	0.062	<b>WAT62-3875-2000-E8D</b>
<b>4</b>	3.625	0.312	0.187	<b>WAT187-4000-312-E8D</b>
	3.625	0.375	0.187	<b>WAT187-4000-375-E8D</b>
	3.625	0.5	0.187	<b>WAT187-4000-500-E8D</b>
	3.625	0.625	0.187	<b>WAT187-4000-625-E8D</b>
	3.625	0.75	0.187	<b>WAT187-4000-750-E8D</b>
	3.625	0.875	0.187	<b>WAT187-4000-875-E8D</b>
	3.625	1	0.187	<b>WAT187-4000-1000-E8D</b>
	3.625	1.25	0.187	<b>WAT187-4000-1250-E8D</b>
	3.625	1.5	0.187	<b>WAT187-4000-1500-E8D</b>
	3.625	1.75	0.187	<b>WAT187-4000-1750-E8D</b>
	3.625	2	0.187	<b>WAT187-4000-2000-E8D</b>

<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ *Gap extrusion*, page 34)

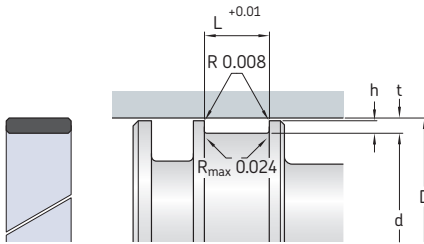
Dimensions				Designation
D	d	L	t	
in.				-
4	3.75	0.312	0.125	WAT125-4000-312-E8D
	3.75	0.375	0.125	WAT125-4000-375-E8D
cont.	3.75	0.5	0.125	WAT125-4000-500-E8D
	3.75	0.625	0.125	WAT125-4000-625-E8D
	3.75	0.75	0.125	WAT125-4000-750-E8D
	3.75	0.875	0.125	WAT125-4000-875-E8D
	3.75	1	0.125	WAT125-4000-1000-E8D
	3.75	1.25	0.125	WAT125-4000-1250-E8D
	3.75	1.5	0.125	WAT125-4000-1500-E8D
	3.75	1.75	0.125	WAT125-4000-1750-E8D
	3.75	2	0.125	WAT125-4000-2000-E8D
	3.813	0.312	0.093	WAT93-4000-312-E8D
	3.813	0.375	0.093	WAT93-4000-375-E8D
	3.813	0.5	0.093	WAT93-4000-500-E8D
	3.813	0.625	0.093	WAT93-4000-625-E8D
	3.813	0.75	0.093	WAT93-4000-750-E8D
	3.813	0.875	0.093	WAT93-4000-875-E8D
	3.813	1	0.093	WAT93-4000-1000-E8D
	3.813	1.25	0.093	WAT93-4000-1250-E8D
	3.813	1.5	0.093	WAT93-4000-1500-E8D
	3.813	1.75	0.093	WAT93-4000-1750-E8D
	3.813	2	0.093	WAT93-4000-2000-E8D
4.25	3.875	0.375	0.187	WAT187-4250-375-E8D
	3.875	0.5	0.187	WAT187-4250-500-E8D
	3.875	0.625	0.187	WAT187-4250-625-E8D
	3.875	0.75	0.187	WAT187-4250-750-E8D
	3.875	0.875	0.187	WAT187-4250-875-E8D
	3.875	1	0.187	WAT187-4250-1000-E8D
	3.875	1.25	0.187	WAT187-4250-1250-E8D
	3.875	1.5	0.187	WAT187-4250-1500-E8D
	3.875	1.75	0.187	WAT187-4250-1750-E8D
	3.875	2	0.187	WAT187-4250-2000-E8D
	4	0.375	0.125	WAT125-4250-375-E8D
	4	0.5	0.125	WAT125-4250-500-E8D
	4	0.625	0.125	WAT125-4250-625-E8D
	4	0.75	0.125	WAT125-4250-750-E8D
	4	0.875	0.125	WAT125-4250-875-E8D
	4	1	0.125	WAT125-4250-1000-E8D
	4	1.25	0.125	WAT125-4250-1250-E8D
	4	1.5	0.125	WAT125-4250-1500-E8D
	4	1.75	0.125	WAT125-4250-1750-E8D
	4	2	0.125	WAT125-4250-2000-E8D
	4.063	0.375	0.093	WAT93-4250-375-E8D
	4.063	0.5	0.093	WAT93-4250-500-E8D
	4.063	0.625	0.093	WAT93-4250-625-E8D
	4.063	0.75	0.093	WAT93-4250-750-E8D
	4.063	0.875	0.093	WAT93-4250-875-E8D
	4.063	1	0.093	WAT93-4250-1000-E8D
	4.063	1.25	0.093	WAT93-4250-1250-E8D
	4.063	1.5	0.093	WAT93-4250-1500-E8D
	4.063	1.75	0.093	WAT93-4250-1750-E8D
	4.063	2	0.093	WAT93-4250-2000-E8D
4.5	4.125	0.375	0.187	WAT187-4500-375-E8D
	4.125	0.5	0.187	WAT187-4500-500-E8D
	4.125	0.625	0.187	WAT187-4500-625-E8D
	4.125	0.75	0.187	WAT187-4500-750-E8D
	4.125	0.875	0.187	WAT187-4500-875-E8D

Dimensions				Designation
D	d	L	t	
in.				-
4.5	4.125	1	0.187	WAT187-4500-1000-E8D
	4.125	1.25	0.187	WAT187-4500-1250-E8D
cont.	4.125	1.5	0.187	WAT187-4500-1500-E8D
	4.125	1.75	0.187	WAT187-4500-1750-E8D
	4.125	2	0.187	WAT187-4500-2000-E8D
	4.25	0.375	0.125	WAT125-4500-375-E8D
	4.25	0.5	0.125	WAT125-4500-500-E8D
	4.25	0.625	0.125	WAT125-4500-625-E8D
	4.25	0.75	0.125	WAT125-4500-750-E8D
	4.25	0.875	0.125	WAT125-4500-875-E8D
	4.25	1	0.125	WAT125-4500-1000-E8D
	4.25	1.25	0.125	WAT125-4500-1250-E8D
	4.25	1.5	0.125	WAT125-4500-1500-E8D
	4.25	1.75	0.125	WAT125-4500-1750-E8D
	4.25	2	0.125	WAT125-4500-2000-E8D
	4.313	0.375	0.093	WAT93-4500-375-E8D
	4.313	0.5	0.093	WAT93-4500-500-E8D
	4.313	0.625	0.093	WAT93-4500-625-E8D
	4.313	0.75	0.093	WAT93-4500-750-E8D
	4.313	0.875	0.093	WAT93-4500-875-E8D
	4.313	1	0.093	WAT93-4500-1000-E8D
	4.313	1.25	0.093	WAT93-4500-1250-E8D
	4.313	1.5	0.093	WAT93-4500-1500-E8D
	4.313	1.75	0.093	WAT93-4500-1750-E8D
	4.313	2	0.093	WAT93-4500-2000-E8D
4.75	4.375	0.375	0.187	WAT187-4750-375-E8D
	4.375	0.5	0.187	WAT187-4750-500-E8D
	4.375	0.625	0.187	WAT187-4750-625-E8D
	4.375	0.75	0.187	WAT187-4750-750-E8D
	4.375	0.875	0.187	WAT187-4750-875-E8D
	4.375	1	0.187	WAT187-4750-1000-E8D
	4.375	1.25	0.187	WAT187-4750-1250-E8D
	4.375	1.5	0.187	WAT187-4750-1500-E8D
	4.375	1.75	0.187	WAT187-4750-1750-E8D
	4.375	2	0.187	WAT187-4750-2000-E8D
	4.5	0.375	0.125	WAT125-4750-375-E8D
	4.5	0.5	0.125	WAT125-4750-500-E8D
	4.5	0.625	0.125	WAT125-4750-625-E8D
	4.5	0.75	0.125	WAT125-4750-750-E8D
	4.5	0.875	0.125	WAT125-4750-875-E8D
	4.5	1	0.125	WAT125-4750-1000-E8D
	4.5	1.25	0.125	WAT125-4750-1250-E8D
	4.5	1.5	0.125	WAT125-4750-1500-E8D
	4.5	1.75	0.125	WAT125-4750-1750-E8D
	4.5	2	0.125	WAT125-4750-2000-E8D
	4.563	0.375	0.093	WAT93-4750-375-E8D
	4.563	0.5	0.093	WAT93-4750-500-E8D
	4.563	0.625	0.093	WAT93-4750-625-E8D
	4.563	0.75	0.093	WAT93-4750-750-E8D
	4.563	0.875	0.093	WAT93-4750-875-E8D
	4.563	1	0.093	WAT93-4750-1000-E8D
	4.563	1.25	0.093	WAT93-4750-1250-E8D
	4.563	1.5	0.093	WAT93-4750-1500-E8D
	4.563	1.75	0.093	WAT93-4750-1750-E8D
	4.563	2	0.093	WAT93-4750-2000-E8D



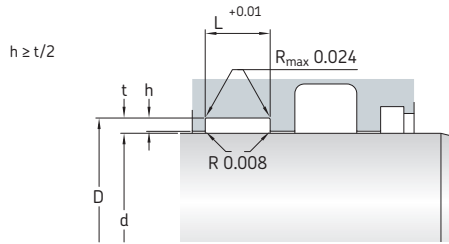
## 5.2 WAT rod or piston guide rings, inch sizes

D 4.875 – 5.75 in.



Diameter tolerances			
Cylinder bore D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 4.875	+0.002	-0.002	
5 to 7.75	+0.004	-0.003	
8 to 10.5	+0.006	-0.004	

Piston application  
(dynamic on the outside surface)



Diameter tolerances			
Housing groove D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 5.625	+0.002	-0.002	
5.75 to 10.5	+0.003	-0.004	

Rod application  
(dynamic on the inside surface)

Dimensions				Designation			
D	d	L	t				
in.				-			
4.875	4.5	0.375	0.187	WAT187-4875-375-E8D			
	4.5	0.5	0.187	WAT187-4875-500-E8D			
	4.5	0.625	0.187	WAT187-4875-625-E8D			
	4.5	0.75	0.187	WAT187-4875-750-E8D			
	4.5	0.875	0.187	WAT187-4875-875-E8D			
	4.5	1	0.187	WAT187-4875-1000-E8D			
	4.5	1.25	0.187	WAT187-4875-1250-E8D			
	4.5	1.5	0.187	WAT187-4875-1500-E8D			
	4.5	1.75	0.187	WAT187-4875-1750-E8D			
	4.5	2	0.187	WAT187-4875-2000-E8D			
	4.625	0.375	0.125	WAT125-4875-375-E8D			
	4.625	0.5	0.125	WAT125-4875-500-E8D			
4.625	0.625	0.125	WAT125-4875-625-E8D				
4.625	0.75	0.125	WAT125-4875-750-E8D				
4.625	0.875	0.125	WAT125-4875-875-E8D				
4.625	1	0.125	WAT125-4875-1000-E8D				
4.625	1.25	0.125	WAT125-4875-1250-E8D				
4.625	1.5	0.125	WAT125-4875-1500-E8D				
4.625	1.75	0.125	WAT125-4875-1750-E8D				
4.625	2	0.125	WAT125-4875-2000-E8D				
4.688	0.375	0.093	WAT93-4875-375-E8D				
4.688	0.5	0.093	WAT93-4875-500-E8D				
4.688	0.625	0.093	WAT93-4875-625-E8D				
4.688	0.75	0.093	WAT93-4875-750-E8D				
4.688	0.875	0.093	WAT93-4875-875-E8D				
4.688	1	0.093	WAT93-4875-1000-E8D				
4.688	1.25	0.093	WAT93-4875-1250-E8D				

Dimensions				Designation			
D	d	L	t				
in.				-			
4.875 cont.	4.688	1.5	0.093	WAT93-4875-1500-E8D			
	4.688	1.75	0.093	WAT93-4875-1750-E8D			
	4.688	2	0.093	WAT93-4875-2000-E8D			
5	4.625	0.375	0.187	WAT187-5000-375-E8D			
	4.625	0.5	0.187	WAT187-5000-500-E8D			
	4.625	0.625	0.187	WAT187-5000-625-E8D			
	4.625	0.75	0.187	WAT187-5000-750-E8D			
	4.625	0.875	0.187	WAT187-5000-875-E8D			
	4.625	1	0.187	WAT187-5000-1000-E8D			
	4.625	1.25	0.187	WAT187-5000-1250-E8D			
	4.625	1.5	0.187	WAT187-5000-1500-E8D			
	4.625	1.75	0.187	WAT187-5000-1750-E8D			
	4.625	2	0.187	WAT187-5000-2000-E8D			
	4.75	0.375	0.125	WAT125-5000-375-E8D			
	4.75	0.5	0.125	WAT125-5000-500-E8D			
4.75	0.625	0.125	WAT125-5000-625-E8D				
4.75	0.75	0.125	WAT125-5000-750-E8D				
4.75	0.875	0.125	WAT125-5000-875-E8D				
4.75	1	0.125	WAT125-5000-1000-E8D				
4.75	1.25	0.125	WAT125-5000-1250-E8D				
4.75	1.5	0.125	WAT125-5000-1500-E8D				
4.75	1.75	0.125	WAT125-5000-1750-E8D				
4.75	2	0.125	WAT125-5000-2000-E8D				
4.813	0.375	0.093	WAT93-5000-375-E8D				
4.813	0.5	0.093	WAT93-5000-500-E8D				
4.813	0.625	0.093	WAT93-5000-625-E8D				
4.813	0.75	0.093	WAT93-5000-750-E8D				

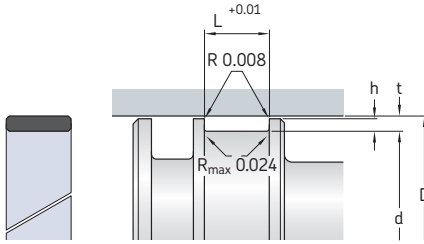
<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

Dimensions				Designation
D	d	L	t	
in.				-
5	4.813	0.875	0.093	WAT93-5000-875-E8D
cont.	4.813	1	0.093	WAT93-5000-1000-E8D
	4.813	1.25	0.093	WAT93-5000-1250-E8D
	4.813	1.5	0.093	WAT93-5000-1500-E8D
	4.813	1.75	0.093	WAT93-5000-1750-E8D
	4.813	2	0.093	WAT93-5000-2000-E8D
5.25	4.875	0.375	0.187	WAT187-5250-375-E8D
	4.875	0.5	0.187	WAT187-5250-500-E8D
	4.875	0.625	0.187	WAT187-5250-625-E8D
	4.875	0.75	0.187	WAT187-5250-750-E8D
	4.875	0.875	0.187	WAT187-5250-875-E8D
	4.875	1	0.187	WAT187-5250-1000-E8D
	4.875	1.25	0.187	WAT187-5250-1250-E8D
	4.875	1.5	0.187	WAT187-5250-1500-E8D
	4.875	1.75	0.187	WAT187-5250-1750-E8D
	4.875	2	0.187	WAT187-5250-2000-E8D
	4.875	2.25	0.187	WAT187-5250-2250-E8D
	4.875	2.5	0.187	WAT187-5250-2500-E8D
5	0.375	0.125		WAT125-5250-375-E8D
5	0.5	0.125		WAT125-5250-500-E8D
5	0.625	0.125		WAT125-5250-625-E8D
5	0.75	0.125		WAT125-5250-750-E8D
5	0.875	0.125		WAT125-5250-875-E8D
5	1	0.125		WAT125-5250-1000-E8D
5	1.25	0.125		WAT125-5250-1250-E8D
5	1.5	0.125		WAT125-5250-1500-E8D
5	1.75	0.125		WAT125-5250-1750-E8D
5	2	0.125		WAT125-5250-2000-E8D
5	2.25	0.125		WAT125-5250-2250-E8D
5	2.5	0.125		WAT125-5250-2500-E8D
5.063	0.375	0.093		WAT93-5250-375-E8D
5.063	0.5	0.093		WAT93-5250-500-E8D
5.063	0.625	0.093		WAT93-5250-625-E8D
5.063	0.75	0.093		WAT93-5250-750-E8D
5.063	0.875	0.093		WAT93-5250-875-E8D
5.063	1	0.093		WAT93-5250-1000-E8D
5.063	1.25	0.093		WAT93-5250-1250-E8D
5.063	1.5	0.093		WAT93-5250-1500-E8D
5.063	1.75	0.093		WAT93-5250-1750-E8D
5.063	2	0.093		WAT93-5250-2000-E8D
5.063	2.25	0.093		WAT93-5250-2250-E8D
5.063	2.5	0.093		WAT93-5250-2500-E8D
5.5	5.125	0.375	0.187	WAT187-5500-375-E8D
	5.125	0.5	0.187	WAT187-5500-500-E8D
	5.125	0.625	0.187	WAT187-5500-625-E8D
	5.125	0.75	0.187	WAT187-5500-750-E8D
	5.125	0.875	0.187	WAT187-5500-875-E8D
	5.125	1	0.187	WAT187-5500-1000-E8D
	5.125	1.25	0.187	WAT187-5500-1250-E8D
	5.125	1.5	0.187	WAT187-5500-1500-E8D
	5.125	1.75	0.187	WAT187-5500-1750-E8D
	5.125	2	0.187	WAT187-5500-2000-E8D
	5.25	0.375	0.125	WAT125-5500-375-E8D
	5.25	0.5	0.125	WAT125-5500-500-E8D
	5.25	0.625	0.125	WAT125-5500-625-E8D
	5.25	0.75	0.125	WAT125-5500-750-E8D
	5.25	0.875	0.125	WAT125-5500-875-E8D

Dimensions				Designation
D	d	L	t	
in.				-
5.5	5.25	1	0.125	WAT125-5500-1000-E8D
cont.	5.25	1.25	0.125	WAT125-5500-1250-E8D
	5.25	1.5	0.125	WAT125-5500-1500-E8D
	5.25	1.75	0.125	WAT125-5500-1750-E8D
	5.25	2	0.125	WAT125-5500-2000-E8D
	5.313	0.375	0.093	WAT93-5500-375-E8D
	5.313	0.5	0.093	WAT93-5500-500-E8D
	5.313	0.625	0.093	WAT93-5500-625-E8D
	5.313	0.75	0.093	WAT93-5500-750-E8D
	5.313	0.875	0.093	WAT93-5500-875-E8D
	5.313	1	0.093	WAT93-5500-1000-E8D
	5.313	1.25	0.093	WAT93-5500-1250-E8D
	5.313	1.5	0.093	WAT93-5500-1500-E8D
	5.313	1.75	0.093	WAT93-5500-1750-E8D
	5.313	2	0.093	WAT93-5500-2000-E8D
5.625	5.25	0.375	0.187	WAT187-5625-375-E8D
	5.25	0.5	0.187	WAT187-5625-500-E8D
	5.25	0.625	0.187	WAT187-5625-625-E8D
	5.25	0.75	0.187	WAT187-5625-750-E8D
	5.25	0.875	0.187	WAT187-5625-875-E8D
	5.25	1	0.187	WAT187-5625-1000-E8D
	5.25	1.25	0.187	WAT187-5625-1250-E8D
	5.25	1.5	0.187	WAT187-5625-1500-E8D
	5.25	1.75	0.187	WAT187-5625-1750-E8D
	5.25	2	0.187	WAT187-5625-2000-E8D
	5.375	0.375	0.125	WAT125-5625-375-E8D
	5.375	0.5	0.125	WAT125-5625-500-E8D
	5.375	0.625	0.125	WAT125-5625-625-E8D
	5.375	0.75	0.125	WAT125-5625-750-E8D
	5.375	0.875	0.125	WAT125-5625-875-E8D
	5.375	1	0.125	WAT125-5625-1000-E8D
	5.375	1.25	0.125	WAT125-5625-1250-E8D
	5.375	1.5	0.125	WAT125-5625-1500-E8D
	5.375	1.75	0.125	WAT125-5625-1750-E8D
	5.375	2	0.125	WAT125-5625-2000-E8D
	5.438	0.375	0.093	WAT93-5625-375-E8D
	5.438	0.5	0.093	WAT93-5625-500-E8D
	5.438	0.625	0.093	WAT93-5625-625-E8D
	5.438	0.75	0.093	WAT93-5625-750-E8D
	5.438	0.875	0.093	WAT93-5625-875-E8D
	5.438	1	0.093	WAT93-5625-1000-E8D
	5.438	1.25	0.093	WAT93-5625-1250-E8D
	5.438	1.5	0.093	WAT93-5625-1500-E8D
	5.438	1.75	0.093	WAT93-5625-1750-E8D
	5.438	2	0.093	WAT93-5625-2000-E8D
5.75	5.375	0.375	0.187	WAT187-5750-375-E8D
	5.375	0.5	0.187	WAT187-5750-500-E8D
	5.375	0.625	0.187	WAT187-5750-625-E8D
	5.375	0.75	0.187	WAT187-5750-750-E8D
	5.375	0.875	0.187	WAT187-5750-875-E8D
	5.375	1	0.187	WAT187-5750-1000-E8D
	5.375	1.25	0.187	WAT187-5750-1250-E8D
	5.375	1.5	0.187	WAT187-5750-1500-E8D
	5.375	1.75	0.187	WAT187-5750-1750-E8D
	5.375	2	0.187	WAT187-5750-2000-E8D

## 5.2 WAT rod or piston guide rings, inch sizes

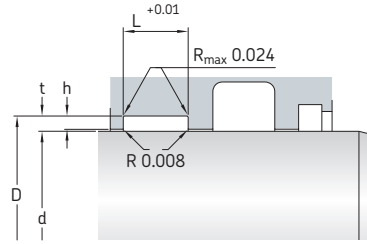
D 5.75 – 7.75 in.



Diameter tolerances			
Cylinder bore D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 4.875	+0.002	-0.002	
5 to 7.75	+0.004	-0.003	
8 to 10.5	+0.006	-0.004	

Piston application  
(dynamic on the outside surface)

$h \geq t/2$



Diameter tolerances			
Housing groove D	Tolerances <sup>1)</sup>		d
	D		
in.	in.		
1 to 5.625	+0.002	-0.002	
5.75 to 10.5	+0.003	-0.004	

Rod application  
(dynamic on the inside surface)

Dimensions				Designation	
D	d	L	t		
in.				-	
5.75 cont.	5.5	0.375	0.125	WAT125-5750-375-E8D	
	5.5	0.5	0.125	WAT125-5750-500-E8D	
	5.5	0.625	0.125	WAT125-5750-625-E8D	
	5.5	0.75	0.125	WAT125-5750-750-E8D	
	5.5	0.875	0.125	WAT125-5750-875-E8D	
	5.5	1	0.125	WAT125-5750-1000-E8D	
	5.5	1.25	0.125	WAT125-5750-1250-E8D	
	5.5	1.5	0.125	WAT125-5750-1500-E8D	
	5.5	1.75	0.125	WAT125-5750-1750-E8D	
	5.5	2	0.125	WAT125-5750-2000-E8D	
	5.563	0.375	0.093	WAT93-5750-375-E8D	
	5.563	0.5	0.093	WAT93-5750-500-E8D	
	5.563	0.625	0.093	WAT93-5750-625-E8D	
	5.563	0.75	0.093	WAT93-5750-750-E8D	
	5.563	0.875	0.093	WAT93-5750-875-E8D	
5.563	1	0.093	WAT93-5750-1000-E8D		
5.563	1.25	0.093	WAT93-5750-1250-E8D		
5.563	1.5	0.093	WAT93-5750-1500-E8D		
5.563	1.75	0.093	WAT93-5750-1750-E8D		
5.563	2	0.093	WAT93-5750-2000-E8D		
6	5.625	0.375	0.187	WAT187-6000-375-E8D	
	5.625	0.5	0.187	WAT187-6000-500-E8D	
	5.625	0.625	0.187	WAT187-6000-625-E8D	
	5.625	0.75	0.187	WAT187-6000-750-E8D	
	5.625	0.875	0.187	WAT187-6000-875-E8D	
	5.625	1	0.187	WAT187-6000-1000-E8D	
	5.625	1.25	0.187	WAT187-6000-1250-E8D	

Dimensions				Designation	
D	d	L	t		
in.				-	
6 cont.	5.625	1.5	0.187	WAT187-6000-1500-E8D	
	5.625	1.75	0.187	WAT187-6000-1750-E8D	
	5.625	2	0.187	WAT187-6000-2000-E8D	
6.25	5.75	0.375	0.125	WAT125-6000-375-E8D	
	5.75	0.5	0.125	WAT125-6000-500-E8D	
	5.75	0.625	0.125	WAT125-6000-625-E8D	
	5.75	0.75	0.125	WAT125-6000-750-E8D	
	5.75	0.875	0.125	WAT125-6000-875-E8D	
	5.75	1	0.125	WAT125-6000-1000-E8D	
	5.75	1.25	0.125	WAT125-6000-1250-E8D	
	5.75	1.5	0.125	WAT125-6000-1500-E8D	
	5.75	1.75	0.125	WAT125-6000-1750-E8D	
	5.75	2	0.125	WAT125-6000-2000-E8D	
5.875	0.5	0.187	WAT187-6250-500-E8D		
5.875	0.625	0.187	WAT187-6250-625-E8D		
5.875	0.75	0.187	WAT187-6250-750-E8D		
5.875	0.875	0.187	WAT187-6250-875-E8D		
5.875	1	0.187	WAT187-6250-1000-E8D		
5.875	1.25	0.187	WAT187-6250-1250-E8D		
5.875	1.5	0.187	WAT187-6250-1500-E8D		
5.875	1.75	0.187	WAT187-6250-1750-E8D		
5.875	2	0.187	WAT187-6250-2000-E8D		
6	0.5	0.125	WAT125-6250-500-E8D		
6	0.625	0.125	WAT125-6250-625-E8D		
6	0.75	0.125	WAT125-6250-750-E8D		
6	0.875	0.125	WAT125-6250-875-E8D		

<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

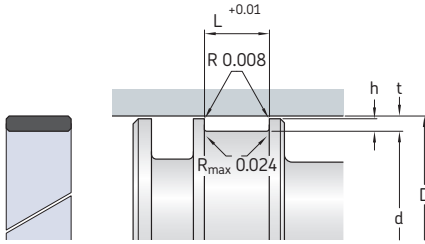
Dimensions				Designation
D	d	L	t	
in.				-
6.25 cont.	6	1	0.125	WAT125-6250-1000-E8D
	6	1.25	0.125	WAT125-6250-1250-E8D
	6	1.5	0.125	WAT125-6250-1500-E8D
	6	1.75	0.125	WAT125-6250-1750-E8D
	6	2	0.125	WAT125-6250-2000-E8D
6.5	6.125	0.5	0.187	WAT187-6500-500-E8D
	6.125	0.625	0.187	WAT187-6500-625-E8D
	6.125	0.75	0.187	WAT187-6500-750-E8D
	6.125	0.875	0.187	WAT187-6500-875-E8D
	6.125	1	0.187	WAT187-6500-1000-E8D
	6.125	1.25	0.187	WAT187-6500-1250-E8D
	6.125	1.5	0.187	WAT187-6500-1500-E8D
	6.125	1.75	0.187	WAT187-6500-1750-E8D
	6.125	2	0.187	WAT187-6500-2000-E8D
	6.25	0.5	0.125	WAT125-6500-500-E8D
	6.25	0.625	0.125	WAT125-6500-625-E8D
	6.25	0.75	0.125	WAT125-6500-750-E8D
	6.25	0.875	0.125	WAT125-6500-875-E8D
	6.25	1	0.125	WAT125-6500-1000-E8D
	6.25	1.25	0.125	WAT125-6500-1250-E8D
6.25	1.5	0.125	WAT125-6500-1500-E8D	
6.25	1.75	0.125	WAT125-6500-1750-E8D	
6.25	2	0.125	WAT125-6500-2000-E8D	
6.75	6.375	0.5	0.187	WAT187-6750-500-E8D
	6.375	0.625	0.187	WAT187-6750-625-E8D
	6.375	0.75	0.187	WAT187-6750-750-E8D
	6.375	0.875	0.187	WAT187-6750-875-E8D
	6.375	1	0.187	WAT187-6750-1000-E8D
	6.375	1.25	0.187	WAT187-6750-1250-E8D
	6.375	1.5	0.187	WAT187-6750-1500-E8D
	6.375	1.75	0.187	WAT187-6750-1750-E8D
	6.375	2	0.187	WAT187-6750-2000-E8D
	6.5	0.5	0.125	WAT125-6750-500-E8D
	6.5	0.625	0.125	WAT125-6750-625-E8D
	6.5	0.75	0.125	WAT125-6750-750-E8D
	6.5	0.875	0.125	WAT125-6750-875-E8D
	6.5	1	0.125	WAT125-6750-1000-E8D
	6.5	1.25	0.125	WAT125-6750-1250-E8D
6.5	1.5	0.125	WAT125-6750-1500-E8D	
6.5	1.75	0.125	WAT125-6750-1750-E8D	
6.5	2	0.125	WAT125-6750-2000-E8D	
7	6.625	0.5	0.187	WAT187-7000-500-E8D
	6.625	0.625	0.187	WAT187-7000-625-E8D
	6.625	0.75	0.187	WAT187-7000-750-E8D
	6.625	0.875	0.187	WAT187-7000-875-E8D
	6.625	1	0.187	WAT187-7000-1000-E8D
	6.625	1.25	0.187	WAT187-7000-1250-E8D
	6.625	1.5	0.187	WAT187-7000-1500-E8D
	6.625	1.75	0.187	WAT187-7000-1750-E8D
	6.625	2	0.187	WAT187-7000-2000-E8D
	6.75	0.5	0.125	WAT125-7000-500-E8D
	6.75	0.625	0.125	WAT125-7000-625-E8D
	6.75	0.75	0.125	WAT125-7000-750-E8D
	6.75	0.875	0.125	WAT125-7000-875-E8D
	6.75	1	0.125	WAT125-7000-1000-E8D
	6.75	1.25	0.125	WAT125-7000-1250-E8D

Dimensions				Designation
D	d	L	t	
in.				-
7 cont.	6.75	1.5	0.125	WAT125-7000-1500-E8D
	6.75	1.75	0.125	WAT125-7000-1750-E8D
	6.75	2	0.125	WAT125-7000-2000-E8D
7.25	6.875	0.5	0.187	WAT187-7250-500-E8D
	6.875	0.625	0.187	WAT187-7250-625-E8D
	6.875	0.75	0.187	WAT187-7250-750-E8D
	6.875	0.875	0.187	WAT187-7250-875-E8D
	6.875	1	0.187	WAT187-7250-1000-E8D
	6.875	1.25	0.187	WAT187-7250-1250-E8D
	6.875	1.5	0.187	WAT187-7250-1500-E8D
	6.875	1.75	0.187	WAT187-7250-1750-E8D
	6.875	2	0.187	WAT187-7250-2000-E8D
7	0.5	0.125	WAT125-7250-500-E8D	
7	0.625	0.125	WAT125-7250-625-E8D	
7	0.75	0.125	WAT125-7250-750-E8D	
7	0.875	0.125	WAT125-7250-875-E8D	
7	1	0.125	WAT125-7250-1000-E8D	
7	1.25	0.125	WAT125-7250-1250-E8D	
7	1.5	0.125	WAT125-7250-1500-E8D	
7	1.75	0.125	WAT125-7250-1750-E8D	
7	2	0.125	WAT125-7250-2000-E8D	
7.5	7.125	0.5	0.187	WAT187-7500-500-E8D
	7.125	0.625	0.187	WAT187-7500-625-E8D
	7.125	0.75	0.187	WAT187-7500-750-E8D
	7.125	0.875	0.187	WAT187-7500-875-E8D
	7.125	1	0.187	WAT187-7500-1000-E8D
	7.125	1.25	0.187	WAT187-7500-1250-E8D
	7.125	1.5	0.187	WAT187-7500-1500-E8D
	7.125	1.75	0.187	WAT187-7500-1750-E8D
	7.125	2	0.187	WAT187-7500-2000-E8D
7.25	0.5	0.125	WAT125-7500-500-E8D	
7.25	0.625	0.125	WAT125-7500-625-E8D	
7.25	0.75	0.125	WAT125-7500-750-E8D	
7.25	0.875	0.125	WAT125-7500-875-E8D	
7.25	1	0.125	WAT125-7500-1000-E8D	
7.25	1.25	0.125	WAT125-7500-1250-E8D	
7.25	1.5	0.125	WAT125-7500-1500-E8D	
7.25	1.75	0.125	WAT125-7500-1750-E8D	
7.25	2	0.125	WAT125-7500-2000-E8D	
7.75	7.375	0.625	0.187	WAT187-7750-625-E8D
	7.375	0.75	0.187	WAT187-7750-750-E8D
	7.375	0.875	0.187	WAT187-7750-875-E8D
	7.375	1	0.187	WAT187-7750-1000-E8D
	7.375	1.25	0.187	WAT187-7750-1250-E8D
	7.375	1.5	0.187	WAT187-7750-1500-E8D
	7.375	1.75	0.187	WAT187-7750-1750-E8D
	7.375	2	0.187	WAT187-7750-2000-E8D
7.5	0.625	0.125	WAT125-7750-625-E8D	
7.5	0.75	0.125	WAT125-7750-750-E8D	
7.5	0.875	0.125	WAT125-7750-875-E8D	
7.5	1	0.125	WAT125-7750-1000-E8D	
7.5	1.25	0.125	WAT125-7750-1250-E8D	
7.5	1.5	0.125	WAT125-7750-1500-E8D	
7.5	1.75	0.125	WAT125-7750-1750-E8D	
7.5	2	0.125	WAT125-7750-2000-E8D	

5.2

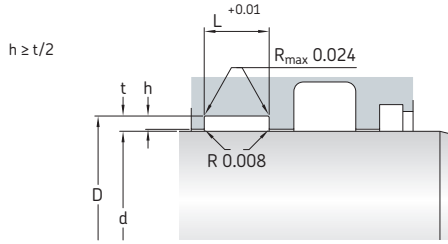
## 5.2 WAT rod or piston guide rings, inch sizes

D 8 – 10.5 in.



Diameter tolerances		
Cylinder bore	Tolerances <sup>1)</sup>	
D	D	d
in.	in.	
1 to 4.875	+0.002	-0.002
5 to 7.75	+0.004	-0.003
8 to 10.5	+0.006	-0.004

Piston application  
(dynamic on the outside surface)



Diameter tolerances		
Housing groove	Tolerances <sup>1)</sup>	
D	D	d
in.	in.	
1 to 5.625	+0.002	-0.002
5.75 to 10.5	+0.003	-0.004

Rod application  
(dynamic on the inside surface)

Dimensions				Designation
D	d	L	t	
in.				-
8	7.625	0.625	0.187	WAT187-8000-625-E8D
	7.625	0.75	0.187	WAT187-8000-750-E8D
	7.625	0.875	0.187	WAT187-8000-875-E8D
	7.625	1	0.187	WAT187-8000-1000-E8D
	7.625	1.25	0.187	WAT187-8000-1250-E8D
	7.625	1.5	0.187	WAT187-8000-1500-E8D
	7.625	1.75	0.187	WAT187-8000-1750-E8D
	7.625	2	0.187	WAT187-8000-2000-E8D
	7.75	0.625	0.125	WAT125-8000-625-E8D
	7.75	0.75	0.125	WAT125-8000-750-E8D
	7.75	0.875	0.125	WAT125-8000-875-E8D
	7.75	1	0.125	WAT125-8000-1000-E8D
8.25	7.875	0.625	0.187	WAT187-8250-625-E8D
	7.875	0.75	0.187	WAT187-8250-750-E8D
	7.875	0.875	0.187	WAT187-8250-875-E8D
	7.875	1	0.187	WAT187-8250-1000-E8D
	7.875	1.25	0.187	WAT187-8250-1250-E8D
	7.875	1.5	0.187	WAT187-8250-1500-E8D
	7.875	1.75	0.187	WAT187-8250-1750-E8D
	7.875	2	0.187	WAT187-8250-2000-E8D

Dimensions				Designation
D	d	L	t	
in.				-
8.25	8	0.625	0.125	WAT125-8250-625-E8D
	8	0.75	0.125	WAT125-8250-750-E8D
	8	0.875	0.125	WAT125-8250-875-E8D
	8	1	0.125	WAT125-8250-1000-E8D
8.5	8	1.25	0.125	WAT125-8250-1250-E8D
	8	1.5	0.125	WAT125-8250-1500-E8D
	8	1.75	0.125	WAT125-8250-1750-E8D
	8	2	0.125	WAT125-8250-2000-E8D
	8.125	0.625	0.187	WAT187-8500-625-E8D
	8.125	0.75	0.187	WAT187-8500-750-E8D
	8.125	0.875	0.187	WAT187-8500-875-E8D
	8.125	1	0.187	WAT187-8500-1000-E8D
	8.125	1.25	0.187	WAT187-8500-1250-E8D
	8.125	1.5	0.187	WAT187-8500-1500-E8D
	8.125	1.75	0.187	WAT187-8500-1750-E8D
	8.125	2	0.187	WAT187-8500-2000-E8D
8.25	8.25	0.625	0.125	WAT125-8500-625-E8D
	8.25	0.75	0.125	WAT125-8500-750-E8D
	8.25	0.875	0.125	WAT125-8500-875-E8D
	8.25	1	0.125	WAT125-8500-1000-E8D
	8.25	1.25	0.125	WAT125-8500-1250-E8D
	8.25	1.5	0.125	WAT125-8500-1500-E8D
	8.25	1.75	0.125	WAT125-8500-1750-E8D
	8.25	2	0.125	WAT125-8500-2000-E8D

<sup>1)</sup> Adjustments according to tolerances provided for rod or piston seals are possible, however, the maximum e-gap also need to be considered (→ Gap extrusion, page 34)

Dimensions				Designation
D	d	L	t	
in.				-
8.75	8.375	0.625	0.187	WAT187-8750-625-E8D
	8.375	0.75	0.187	WAT187-8750-750-E8D
	8.375	0.875	0.187	WAT187-8750-875-E8D
	8.375	1	0.187	WAT187-8750-1000-E8D
	8.375	1.25	0.187	WAT187-8750-1250-E8D
	8.375	1.5	0.187	WAT187-8750-1500-E8D
	8.375	1.75	0.187	WAT187-8750-1750-E8D
	8.375	2	0.187	WAT187-8750-2000-E8D
	8.5	0.625	0.125	WAT125-8750-625-E8D
	8.5	0.75	0.125	WAT125-8750-750-E8D
	8.5	0.875	0.125	WAT125-8750-875-E8D
	8.5	1	0.125	WAT125-8750-1000-E8D
8.5	1.25	0.125	WAT125-8750-1250-E8D	
8.5	1.5	0.125	WAT125-8750-1500-E8D	
8.5	1.75	0.125	WAT125-8750-1750-E8D	
8.5	2	0.125	WAT125-8750-2000-E8D	
9	8.625	0.625	0.187	WAT187-9000-625-E8D
	8.625	0.75	0.187	WAT187-9000-750-E8D
	8.625	0.875	0.187	WAT187-9000-875-E8D
	8.625	1	0.187	WAT187-9000-1000-E8D
	8.625	1.25	0.187	WAT187-9000-1250-E8D
	8.625	1.5	0.187	WAT187-9000-1500-E8D
	8.625	1.75	0.187	WAT187-9000-1750-E8D
	8.625	2	0.187	WAT187-9000-2000-E8D
	8.75	0.625	0.125	WAT125-9000-625-E8D
	8.75	0.75	0.125	WAT125-9000-750-E8D
	8.75	0.875	0.125	WAT125-9000-875-E8D
	8.75	1	0.125	WAT125-9000-1000-E8D
8.75	1.25	0.125	WAT125-9000-1250-E8D	
8.75	1.5	0.125	WAT125-9000-1500-E8D	
8.75	1.75	0.125	WAT125-9000-1750-E8D	
8.75	2	0.125	WAT125-9000-2000-E8D	
9.25	8.875	0.75	0.187	WAT187-9250-750-E8D
	8.875	0.875	0.187	WAT187-9250-875-E8D
	8.875	1	0.187	WAT187-9250-1000-E8D
	8.875	1.25	0.187	WAT187-9250-1250-E8D
	8.875	1.5	0.187	WAT187-9250-1500-E8D
	8.875	1.75	0.187	WAT187-9250-1750-E8D
	8.875	2	0.187	WAT187-9250-2000-E8D
	9	0.75	0.125	WAT125-9250-750-E8D
	9	0.875	0.125	WAT125-9250-875-E8D
	9	1	0.125	WAT125-9250-1000-E8D
	9	1.25	0.125	WAT125-9250-1250-E8D
	9	1.5	0.125	WAT125-9250-1500-E8D
9	1.75	0.125	WAT125-9250-1750-E8D	
9	2	0.125	WAT125-9250-2000-E8D	
9.5	9.125	0.75	0.187	WAT187-9500-750-E8D
	9.125	0.875	0.187	WAT187-9500-875-E8D
	9.125	1	0.187	WAT187-9500-1000-E8D
	9.125	1.25	0.187	WAT187-9500-1250-E8D
	9.125	1.5	0.187	WAT187-9500-1500-E8D
	9.125	1.75	0.187	WAT187-9500-1750-E8D
	9.125	2	0.187	WAT187-9500-2000-E8D

Dimensions				Designation
D	d	L	t	
in.				-
9.5	9.25	0.75	0.125	WAT125-9500-750-E8D
	9.25	0.875	0.125	WAT125-9500-875-E8D
	9.25	1	0.125	WAT125-9500-1000-E8D
	9.25	1.25	0.125	WAT125-9500-1250-E8D
	9.25	1.5	0.125	WAT125-9500-1500-E8D
	9.25	1.75	0.125	WAT125-9500-1750-E8D
	9.25	2	0.125	WAT125-9500-2000-E8D
	9.75	0.75	0.187	WAT187-9750-750-E8D
	9.75	0.875	0.187	WAT187-9750-875-E8D
	9.75	1	0.187	WAT187-9750-1000-E8D
	9.75	1.25	0.187	WAT187-9750-1250-E8D
	9.75	1.5	0.187	WAT187-9750-1500-E8D
9.75	1.75	0.187	WAT187-9750-1750-E8D	
9.75	2	0.187	WAT187-9750-2000-E8D	
9.5	0.75	0.125	WAT125-9750-750-E8D	
9.5	0.875	0.125	WAT125-9750-875-E8D	
9.5	1	0.125	WAT125-9750-1000-E8D	
9.5	1.25	0.125	WAT125-9750-1250-E8D	
9.5	1.5	0.125	WAT125-9750-1500-E8D	
9.5	1.75	0.125	WAT125-9750-1750-E8D	
9.5	2	0.125	WAT125-9750-2000-E8D	
10	9.625	0.75	0.187	WAT187-10000-750-E8D
	9.625	0.875	0.187	WAT187-10000-875-E8D
	9.625	1	0.187	WAT187-10000-1000-E8D
	9.625	1.25	0.187	WAT187-10000-1250-E8D
	9.625	1.5	0.187	WAT187-10000-1500-E8D
	9.625	1.75	0.187	WAT187-10000-1750-E8D
	9.625	2	0.187	WAT187-10000-2000-E8D
	9.625	2.25	0.187	WAT187-10000-2250-E8D
	9.75	0.75	0.125	WAT125-10000-750-E8D
	9.75	0.875	0.125	WAT125-10000-875-E8D
	9.75	1	0.125	WAT125-10000-1000-E8D
	9.75	1.25	0.125	WAT125-10000-1250-E8D
9.75	1.5	0.125	WAT125-10000-1500-E8D	
9.75	1.75	0.125	WAT125-10000-1750-E8D	
9.75	2	0.125	WAT125-10000-2000-E8D	
9.75	2.25	0.125	WAT125-10000-2250-E8D	
10.5	10.125	0.75	0.187	WAT187-10500-750-E8D
	10.125	0.875	0.187	WAT187-10500-875-E8D
	10.125	1	0.187	WAT187-10500-1000-E8D
	10.125	1.25	0.187	WAT187-10500-1250-E8D
	10.125	1.5	0.187	WAT187-10500-1500-E8D
	10.125	1.75	0.187	WAT187-10500-1750-E8D
	10.13	2	0.187	WAT187-10500-2000-E8D
	10.25	0.75	0.125	WAT125-10500-750-E8D
	10.25	0.875	0.125	WAT125-10500-875-E8D
	10.25	1	0.125	WAT125-10500-1000-E8D
	10.25	1.25	0.125	WAT125-10500-1250-E8D
	10.25	1.5	0.125	WAT125-10500-1500-E8D
10.25	1.75	0.125	WAT125-10500-1750-E8D	
10.25	2	0.125	WAT125-10500-2000-E8D	

