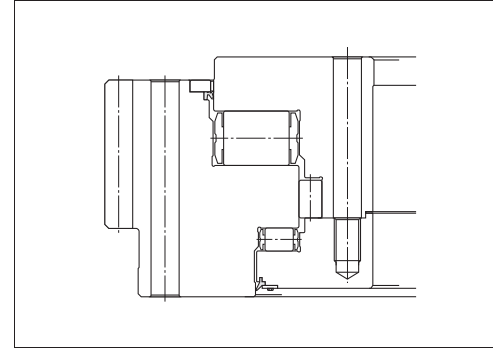


# Slewing rim bearings for tunnel-boring machine

- These bearings are designed to support the main cutters of tunnel-boring machines.

■ DTR...T (triple-row combined roller type) (page 456)

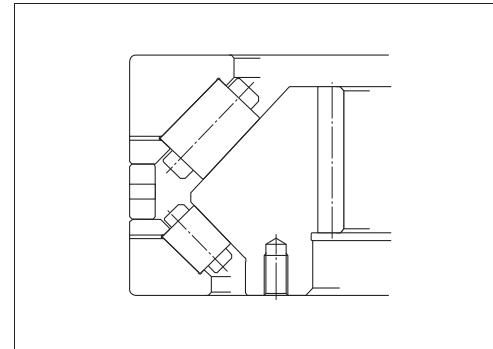


The DTR...T slewing rim bearing is a triple-row combined cylindrical roller bearing. This bearing is provided with various features required to support the main cutters of tunnel-boring machines, including superior impact resistance, high load ratings, and excellent sealing performance. When used with forced oil circulation, this bearing is provided with oil supply and oil drain ports.

As the sealing mechanism of this bearing, a labyrinth, dust seal, or pressure-resistant seal featuring high sealing performance (resistant to a static pressure of 0.3 MPa) can be selected, depending on the lubrication method used.

For convenience of transportation, DTR...T bearings with the bearing rings split cylindrically into two or four parts are also available (SP/DTR...T).

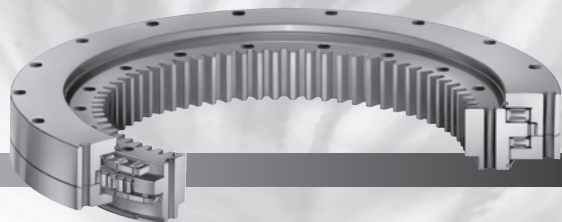
■ 2TR... (double-row tapered roller type) (page 464)



The 2TR... slewing rim bearing is a double-row tapered roller bearing. To ensure high axial load ratings, this bearing features a large contact angle. Large-sized rollers are provided on the axial load-accommodating side.

The bearing ring on the non-gear side is made from bearing steel. It is treated through normal hardening, so therefore does not have any "soft zone," which an induction-hardened bearing may have, thus eliminating limits in determining the location of the non-gear-side bearing ring on machines or equipment.

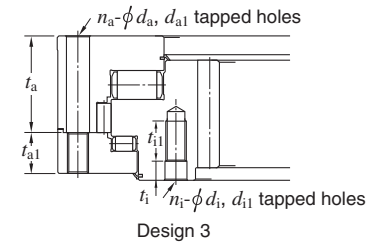
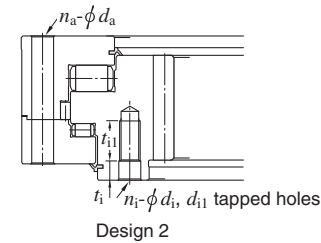
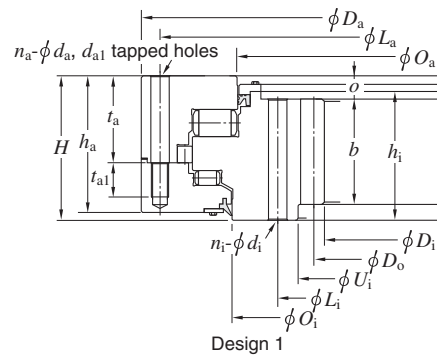
The 2TR... bearing was developed to support the main cutters (oil bath lubrication) of tunnel-boring machines.



# Slewing rim bearings for tunnel-boring machine

## DTR...T type (With internal gear)

$D_a$  2 550 ~ 5 200 mm



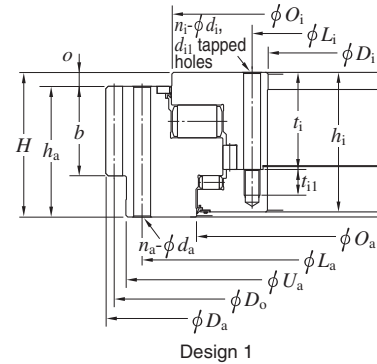
Bearing No.	De- sign	Outside dia. $D_a$	Bore dia. $D_i$	Height $H$	Gear data (pressure angle 20°)			Dimensions							Mounting-hole of outer ring						Mounting-hole of inner ring						Roller PCD	Basic static axial load rating $C_{0a}$ (kN)	Gear specifications		(Refer.) Mass (kg)
					$D_o$	Module	No. of tooth	$b$	$h_a$	$h_i$	$o$	$O_a$	$O_i$	$U_i$	Qty.	$L_a$	$n_a$	$d_a$	$t_a$	$d_{a1}$	$t_{a1}$	Qty.	$L_i$	$n_i$	$d_i$	$t_i$			$d_{i1}$	$t_{i1}$	
DTR2096TBGS	1 <sup>1)</sup>	2 550	2 096	240	2 128	16	133	190	175	210	30	2 298	2 324	2 180	2 500	48	φ24	110	M22	45	2 230	48	φ24	—	—	—	2 357	20 900	—	○	2 150
DTR2156TBGS-1	1 <sup>2)</sup>	2 595	2 156	240	2 184	14	156	190	175	210	30	2 384	2 383	2 230	2 545	48	φ24	120	M22	40	2 285	48	φ24	—	—	—	2 428	19 000	—	○	2 140
DTR2176TBGS	1 <sup>1)</sup>	2 630	2 176	240	2 208	16	138	190	175	210	30	2 378	2 404	2 260	2 580	48	φ24	110	M22	45	2 310	48	φ24	—	—	—	2 437	21 400	—	○	2 200
DTR2160TBGS	1	2 660	2 160	220	2 192	16	137	160	195	190	30	2 420	2 425	2 240	2 600	60	φ26	123	M24	50	2 300	60	φ26	—	—	—	2 474	20 200	—	○	2 480
DTR2240TBGS	1 <sup>1)</sup>	2 705	2 240	240	2 272	16	142	190	175	210	30	2 451	2 477	2 325	2 655	60	φ24	110	M22	45	2 380	60	φ24	—	—	—	2 510	22 300	—	○	2 360
DTR2296ATBGS-1	1 <sup>2)</sup>	2 735	2 296	200	2 324	16	142	190	175	210	30	2 451	2 477	2 325	2 655	60	φ24	110	M22	45	2 380	60	φ24	—	—	—	2 550	29 500	—	○	2 360
DTR2208TBG	1	2 855	2 208	275	2 240	16	140	150	265	240	35	2 512	2 575	2 295	2 790	48	φ33	175	M30	50	2 350	48	φ33	—	—	—	2 595	35 000	—	○	4 470
DTR2674TBGS	2	3 025	2 674	245	2 702	14	193	160	230	215	30	2 855	2 920	2 750	3 140	48	φ33	—	—	—	2 810	48	φ33	30	M30	60	2 940	39 500	—	○	3 790
DTR2816TBGS	1	3 460	2 816	260	2 848	16	178	160	245	230	30	3 125	3 180	2 900	3 400	60	φ30	155	M27	50	2 960	72	φ30	—	—	—	3 210	43 500	—	○	5 240
DTR2960TBGS-1	1	3 645	2 960	300	3 000	20	150	225	270	265	35	3 300	3 320	3 065	3 570	48	φ39	165	M36	60	3 140	60	φ39	—	—	—	3 375	50 300	—	○	6 570
DTR3080TBGS	3	3 750	3 080	295	3 120	20	156	220	280	245	50	3 310	3 415	3 180	3 660	72	φ45	197	M42	83	3 260	72	—	—	M42	85	3 419	63 500	—	○	6 540
DTR3240ATBGS-1	1	3 925	3 240	300	3 280	20	164	225	270	265	35	3 580	3 600	3 345	3 850	48	φ39	165	M36	60	3 420	60	φ39	—	—	—	3 655	53 000	—	○	7 120
DTR3250TBGS	1	3 925	3 250	300	3 280	20	164	225	270	265	35	3 570	3 610	3 355	3 850	48	φ39	165	M36	60	3 430	60	φ39	—	—	—	3 655	53 000	0.25	○	6 970
DTR3834BTBGS	3	4 480	3 834	305	3 870	18	215	200	280	275	30	4 050	4 155	3 925	4 400	60	φ39	197	M36×3	83	4 000	60	φ39	40	M36×3	80	4 159	78 600	—	○	8 120
DTR3996TBGS-1	3	4 700	3 996	348	4 032	18	224	210	328	296	52	4 215	4 330	4 085	4 615	88	φ39	225	M36	103	4 175	88	φ39	50	M36	75	4 335	92 100	—	○	10 500
DTR4176ATBGS	1	5 200	4 176	380	4 224	24	176	290	345	340	40	4 560	4 755	4 300	5 080	100	φ48	230	M45	75	4 395	100	φ48	—	—	—	4 733	159 000	—	○	6 970

[Notes] 1) Without oil seals.  
2) With seal upper side only.

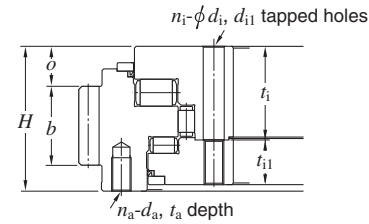
# Slewing rim bearings for tunnel-boring machine

## DTR...T type (With external gear)

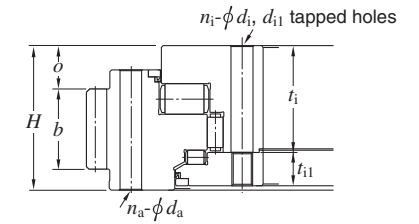
$D_a$  2 688 ~ 4 550 mm



Design 1



Design 2



Design 3

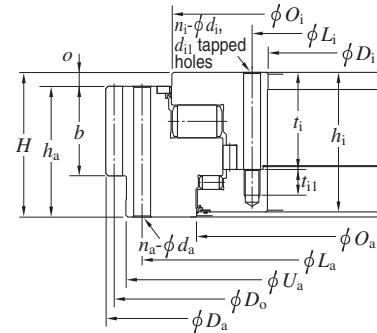
Bearing No.	De- sign	Outside dia. $D_a$	Bore dia. $D_1$	Height $H$	Gear data (pressure angle 20°)			Dimensions							Mounting-hole of outer ring				Mounting-hole of inner ring					Roller PCD	Basic static axial load rating $C_{0a}$ (kN)	Gear specifications		(Refer.) Mass (kg)	
					$D_o$	Module	No. of tooth	$b$	$h_a$	$h_i$	$o$	$O_a$	$O_i$	$U_a$	$L_a$	Qty. $n_a$	$d_a$	$t_a$	$L_i$	Qty. $n_i$	$d_i$	$t_i$	$d_{i1}$			$t_{i1}$	Addendum modification coefficient		Induction hardened tooth flanks and bottoms
DTR2060TAGS	1	2 688	2 060	260	2 656	16	166	160	230	245	30	2 340	2 395	2 610	2 550	60	φ30	—	2 120	60	φ30	155	M27	50	2 310	31 100	—	○	3 780
DTR2150TAGS	1	2 830	2 150	300	2 800	20	140	180	240	285	60	2 480	2 540	2 730	2 650	48	φ39	—	2 235	48	φ39	178	M36	70	2 445	39 500	0.25	○	4 670
DTR2045TAGS	1	2 880	2 045	310	2 840	20	142	225	275	300	35	2 375	2 567	2 774	2 700	44	φ42	—	2 125	40	φ42	195	M39	70	2 420	79 700	—	○	6 320
DTR2020ATAG	1	2 950	2 020	400	2 900	25	116	270	355	375	45	2 420	2 550	2 825	2 720	64	φ48	—	2 120	48	φ48	265	M45	70	2 430	53 100	—	○	8 700
DTR2350TAGS-1	1	3 030	2 350	295	3 000	20	150	180	235	280	60	2 649	2 745	2 930	2 860	48	φ39	—	2 425	48	φ39	197	M36	83	2 645	47 700	0.25	○	4 980
DTR2510CTAGS	1	3 256	2 510	335	3 212	22	146	225	295	310	40	2 860	2 902	3 134	3 060	52	φ48	—	2 590	42	φ48	197	M45	70	2 820	50 700	—	○	6 660
DTR2475TAGS-1	1	3 275	2 475	355	3 225	25	129	270	315	345	40	2 850	2 905	3 134	3 060	52	φ48	—	2 555	42	φ48	225	M45	70	2 813	56 700	—	○	7 800
DTR2475TAGS-2	1	3 328	2 475	380	3 264	32	102	295	340	345	40	2 850	2 905	3 134	3 060	52	φ48	—	2 555	42	φ48	225	M45	70	2 813	56 700	—	○	8 570
DTR2735TAGS	1	3 490	2 735	350	3 460	20	173	190	290	335	60	3 087	3 185	3 390	3 315	64	φ39	—	2 810	64	φ39	215	M36	70	3 062	62 600	0.25	○	7 700
DTR2760TAGS-1	1	3 636	2 760	415	3 600	24	150	240	335	400	80	3 150	3 305	3 515	3 440	80	φ39	—	2 845	80	φ39	282	M36	75	3 155	81 500	0.25	○	10 900
DTR2870TAGS-8	1	3 696	2 870	365	3 648	24	152	290	325	350	40	3 240	3 305	3 534	3 460	72	φ48	—	2 960	60	φ48	248	M45	65	3 205	66 100	—	○	9 390
DTR2990TAG-1	2	3 740	2 990	350	3 696	22	168	190	295	335	60	3 410	3 470	3 630	3 535	48	M48	80	3 085	48	φ52	228	M48	107	3 365	60 500	—	○	8 380
DTR3460TAGS	1 <sup>1)</sup>	3 984	3 460	245	3 920	14	280	190	215	245	30	3 722	3 735	3 865	3 815	48	φ33	—	3 515	48	φ33	140	M30	50	3 663	40 600	—	○	4 350
DTR3400TAGS	1	4 250	3 400	365	4 200	25	168	290	325	350	40	3 770	3 873	4 120	4 030	100	φ48	—	3 490	80	φ48	248	M45	65	3 745	84 600	—	○	11 300
DTR3330TAGS-3	1	4 268	3 330	435	4 224	22	192	290	395	415	40	3 810	3 893	4 140	4 050	100	φ48	—	3 420	80	φ48	287	M45	85	3 745	99 600	—	○	14 800
DTR3205TAGS-1	1	4 464	3 205	550	4 416	24	184	400	500	480	50	3 650	4 042	4 340	4 230	100	φ62	—	3 295	80	φ48	320	M45	85	3 755	200 000	—	○	25 600
DTR3450TAG	1	4 500	3 450	540	4 450	25	178	250	460	520	80	3 990	4 083	4 350	4 265	108	φ48	—	3 540	91	φ48	360	M45×3	110	3 905	128 000	—	○	21 000
DTR3600TAGS-1	1	4 550	3 600	435	4 500	25	180	300	390	415	45	4 080	4 163	4 410	4 320	100	φ48	—	3 690	80	φ48	287	M45	85	4 015	107 000	—	○	16 100

[Note] 1) Without oil seals.

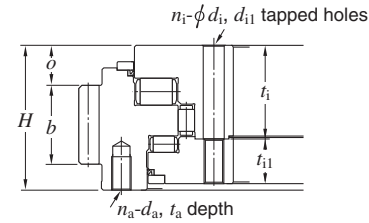
# Slewing rim bearings for tunnel-boring machine

## DTR...T type (With external gear)

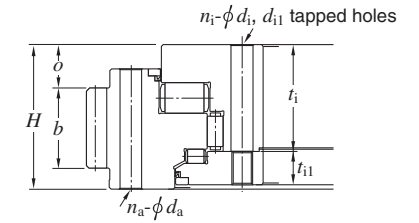
$D_a$  4 851 ~ 7 200 mm



Design 1



Design 2



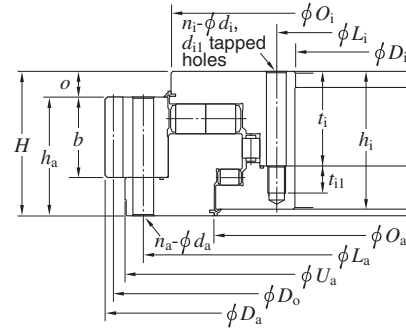
Design 3

Bearing No.	De- sign	Outside dia. $D_a$	Bore dia. $D_i$	Height $H$	Gear data (pressure angle 20°)			Dimensions							Mounting-hole of outer ring				Mounting-hole of inner ring					Roller PCD	Basic static axial load rating $C_{0a}$ (kN)	Gear specifications		(Refer.) Mass (kg)	
					$D_o$	Module	No. of tooth	$b$	$h_a$	$h_i$	$o$	$O_a$	$O_i$	$U_a$	Qty. $L_a$	$n_a$	$d_a$	$t_a$	Qty. $L_i$	$n_i$	$d_i$	$t_i$	$d_{i1}$			$t_{i1}$	Addendum modification coefficient		Induction hardened tooth flanks and bottoms
DTR3915TAGS	1	4 851	3 915	420	4 818	22	219	260	350	405	70	4 327	4 480	4 735	4 640	120	φ45	—	4 010	96	φ48	282	M45	75	4 330	113 000	0.25	○	16 500
DTR4075TAGS	1	4 851	4 075	365	4 818	22	219	260	295	345	70	4 440	4 538	4 740	4 650	96	φ45	—	4 160	96	φ45	225	M42	80	4 415	92 100	0.25	○	11 800
DTR4210TAG-2	3	5 202.4	4 210	400	5 152	28	184	224	335	390	119	4 710	4 780	5 070	4 950	60	φ60	—	4 330	72	φ60	297	M56	93	4 652	114 000	—	○	17 500
DTR4555ATAGS	1	5 500	4 555	420	5 456	22	248	260	380	405	40	4 975	5 117	5 385	5 290	120	φ48	—	4 650	96	φ48	282	M45	75	4 970	131 000	—	○	19 400
DTR4600TAG	1	5 544	4 600	420	5 500	22	250	260	380	405	40	5 075	5 160	5 430	5 335	96	φ48	—	4 695	96	φ48	282	M45	75	5 020	123 000	—	○	19 700
DTR4510TAG-1	1	5 550	4 510	440	5 500	25	220	320	390	430	50	5 035	5 140	5 420	5 310	100	φ60	—	4 620	100	φ60	300	M56	85	4 993	135 000	—	○	22 200
DTR5850TAG	1	7 200	5 850	535	7 140	30	238	300	455	515	80	6 415	6 713	7 045	6 930	120	φ62	—	5 960	120	φ62	375	M56	85	6 475	345 000	—	○	46 000

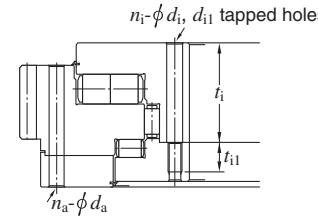
# Slewing rim bearings for tunnel-boring machine

SP/DTR...T type (Splitted race and with external gear)

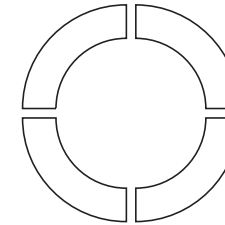
$D_a$  2 950 ~ 7 140 mm



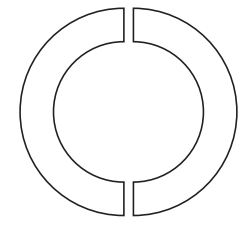
Design 1 (quarter split type)



Design 2 (double split type)



quarter split type



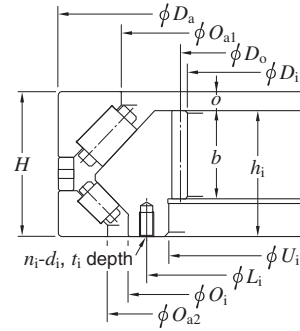
double split type

Bearing No.	De-sign	Outside dia. $D_a$	Bore dia. $D_i$	Height $H$	Gear data (pressure angle 20°)			Dimensions							Mounting-hole of outer ring			Mounting-hole of inner ring					Roller PCD	Basic static axial load rating $C_{0a}$ (kN)	Gear specifications Induction hardened tooth flanks and bottoms	(Refer.) Mass (kg)	
					$D_o$	Module	No. of tooth	$b$	$h_a$	$h_i$	$o$	$O_a$	$O_i$	$U_a$	Qty. $L_a$	Qty. $n_a$	$d_a$	Qty. $L_i$	Qty. $n_i$	$d_i$	$t_i$	$d_{i1}$					$t_{i1}$
SP/DTR2020TAG	1	2 950	2 020	400	2 900	25	116	270	355	375	45	2 420	2 550	2 825	2 720	64	$\phi 50$	2 120	48	$\phi 50$	265	M45	70	2 430	47 200	○	8 700
SP/DTR4430TAG	1	5 550	4 430	410	5 500	25	220	250	360	390	50	4 925	5 140	5 420	5 310	80	$\phi 62$	4 550	80	$\phi 62$	280	M56	110	4 955	159 000	○	22 300
SP/DTR4860TAG	1	6 050	4 860	450	6 000	25	240	250	370	430	80	5 370	5 640	5 920	5 810	80	$\phi 62$	4 980	80	$\phi 62$	295	M56	85	5 420	222 000	○	28 000
SP/DTR5060TAG	1	6 250	5 060	450	6 200	25	248	250	370	430	80	5 570	5 840	6 120	6 010	80	$\phi 62$	5 180	80	$\phi 62$	295	M56	85	5 620	232 000	○	29 100
SP/DTR5060TAG-2	1	6 250	5 060	450	6 200	25	248	285	405	430	45	5 570	5 840	6 120	6 010	80	$\phi 62$	5 180	72	$\phi 62$	300	M56	85	5 620	232 000	○	30 000
SP/DTR5060TAG-1	1	6 300	5 060	450	6 240	30	208	250	370	430	80	5 570	5 840	6 120	6 010	96	$\phi 62$	5 180	72	$\phi 62$	300	M56	85	5 620	232 000	○	29 700
SP/DTR5790TAG	1	7 140	5 790	535	7 080	30	236	300	455	515	80	6 340	6 685	6 985	6 870	120	$\phi 62$	5 900	96	$\phi 62$	235	M56	85	6 415	319 000	○	45 600

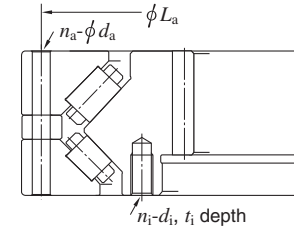
Slewing rim bearings for tunnel-boring machine

2TR...type (with internal gear)

$D_a$  2 580 ~ 3 800 mm



Design 1



Design 2

Bearing No.	De-sign	Outside dia. $D_a$	Bore dia. $D_i$	Outer ring width $H$	Gear data (pressure angle 20°)			Dimensions							Mounting-hole of outer ring			Mounting-hole of inner ring				Basic static axial load rating $C_{0a}$ (kN)	Gear specifications Induction hardened tooth flanks and bottoms	(Refer.) Mass (kg)
					$D_o$	Module	No. of tooth	$b$	$h_i$	$o$	$O_{a1}$	$O_{a2}$	$O_i$	$U_i$	$L_a$	Qty. $n_a$	$d_a$	$L_i$	Qty. $n_i$	$d_i$	$t_i$			
2TR2048-1CS	1	2 580	2 048	320	2 080	16	130	160	260	60	2 320	2 385	2 310	2 140	—	—	—	2 230	48	M30×3	50	13 600	○	3 530
2TR2376CS	2	2 800	2 376	180	2 400	12	200	130	180	—	2 582	2 605	2 550	2 450	2 750	84	$\phi 23.5$	2 500	84	M27	50	7 200	○	1 920
2TR2448-1CS	1	2 980	2 448	330	2 480	16	155	160	265	65	2 710	2 770	2 700	2 540	—	—	—	2 630	60	M30×3	50	15 200	○	4 240
2TR2450CS	1	2 980	2 464	330	2 492	14	178	160	265	65	2 710	2 770	2 700	2 540	—	—	—	2 630	60	M30×3	50	15 200	○	4 200
2TR3000ACS	2	3 500	2 996	210	3 024	14	216	160	210	-10	3 256	3 266	3 210	3 070	3 455	96	$\phi 23$	3 140	96	M33×3	50	10 000	○	3 300
2TR3180-1CS	1	3 797	3 180	330	3 220	20	161	220	285	45	3 516	3 580	3 488	3 305	—	—	—	3 405	96	M36×3	60	20 300	○	6 390
2TR3216CS	1	3 800	3 216	330	3 248	16	203	200	285	45	3 516	3 580	3 488	3 305	—	—	—	3 405	96	M33×3	55	20 300	○	6 200