



KML Motion Industries CO., Ltd.

Address: Rooms 2605-7, Saxon Tower, Cheung Shun
Street, Lai Chi Kok, Kowloon, Hong Kong
Tel: 852-2425-1661
Fax: 852-2480-5866

KML Motion Industries (ShangHai) Holding CO., Ltd.

Address: Room H, Floor 20, XinDongya Hotel, 238
Nandan Road East, Shanghai, China
Tel: 86-21-6468-6262
Fax: 86-21-6427-6197

KML Bearing (Xinchang) Company Ltd.

Address: No. 5 Xia'an Road, Yulin subdistrict, Xinchang
County, Zhejiang, China
Tel: 86-575-8609-0285

E-mail: info@kml-bearing.com [Http://www.kml-bearing.com](http://www.kml-bearing.com)



Ball Screw Support Bearings

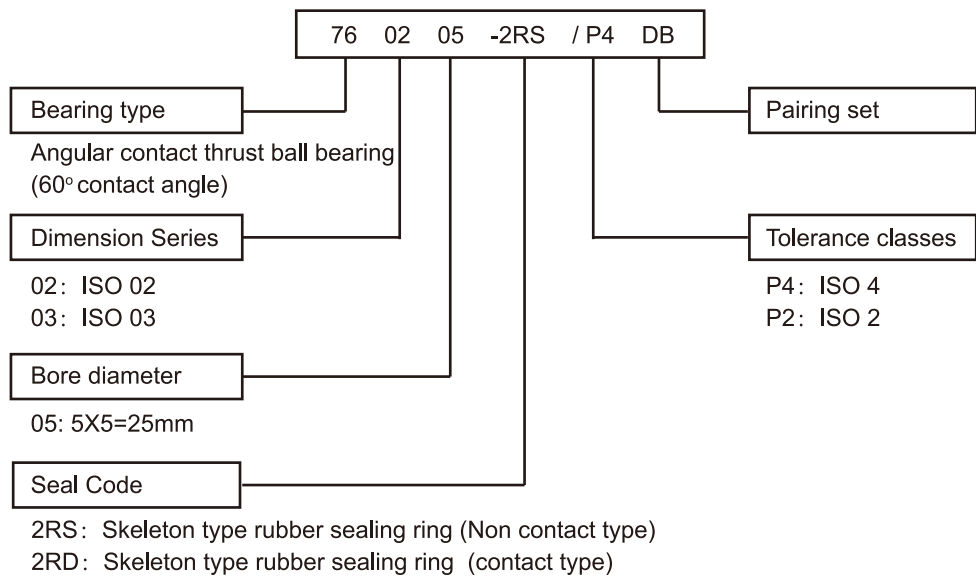


1.Introduction of ball screw support bearings:

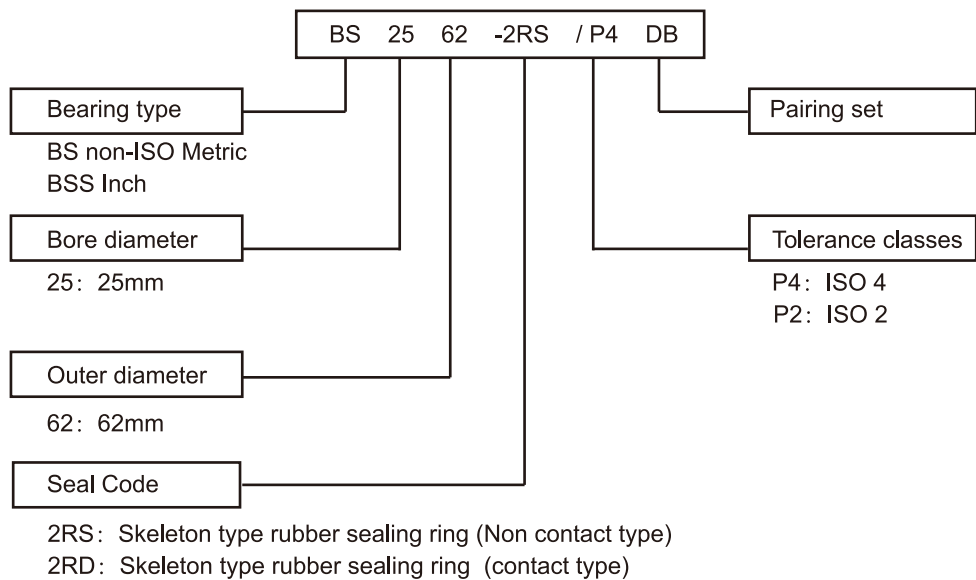
- Ball screw support bearings are high precise angular contact thrust ball bearings with 60°ball contact angle. The special bearings are designed specifically for the supporting of ball screws and similar transmission components on high precision CNC machine tools. The precision grade is in equivalent to P4, P2.
- Lineup of KML ball screw supporting bearings includes four series: 7602, 7603, BS, BBS. Correspondingly, 7602 and 7603 are standard series in accordance with JB/T8564, BS is a non-standard metric series and BSS is an inch series. All ball screw bearings are assemblies with PA66-GF25 nylon cage.
- Ball screw support bearings have been designed specifically to withstand large axial load with an improved radial load capacity, which is normally to be used in two or multiple rows combinations. The combination format is same as angular contact ball bearing.

2. Ball screw supporting bearings designations:

Ball screw supporting bearing identification code (ISO Metric)



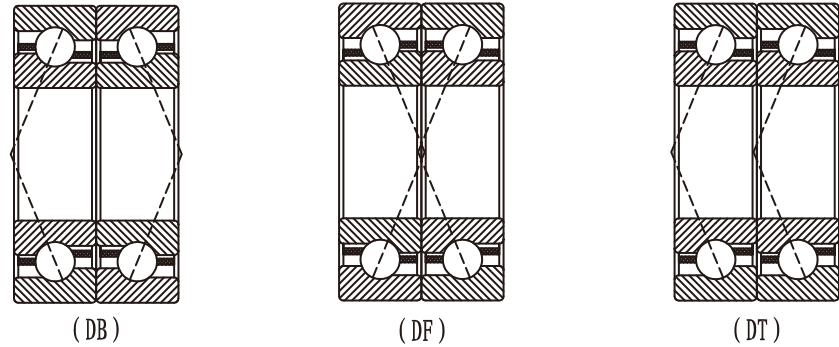
Ball screw supporting bearing identification code (non-ISO)



3. Bearing combinations

To maximize load capacity and rigidity, ball screw supporting bearing is normally to be used in 2 and multiple rows combinations.

2 rows combinations



2 rows combinations normally include three arrangements with features and drawings as below:

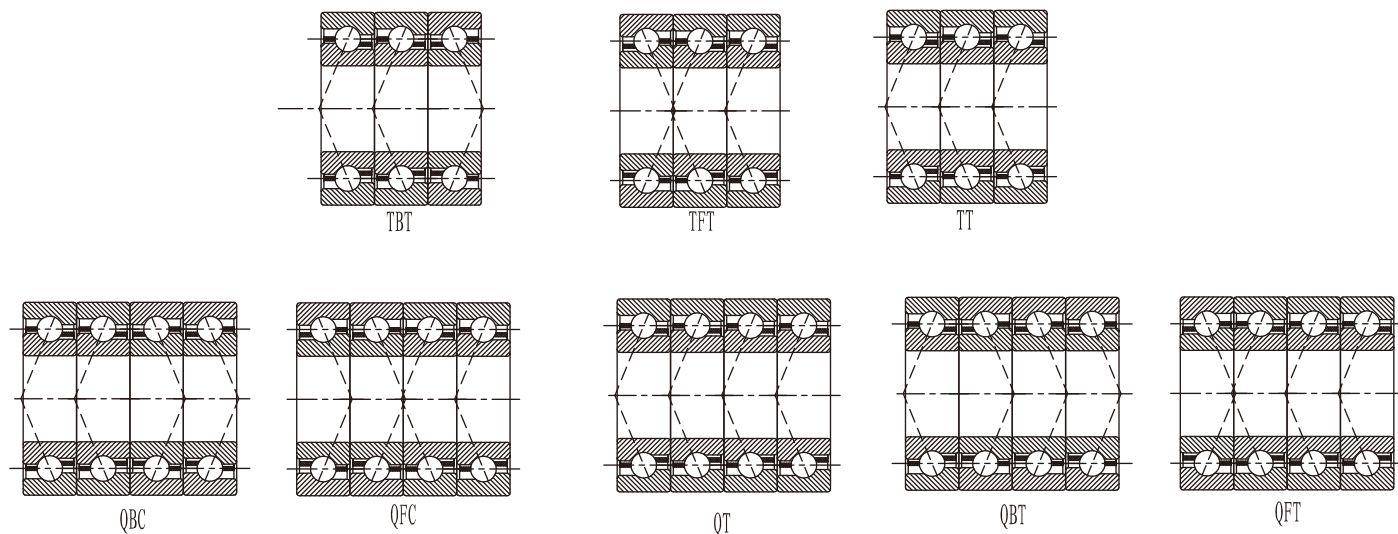
Back-to-back Arrangement, DB: axial loads in both direction and radial loads can be sustained. It is also suitable if moments are applied.

Face-to-face Arrangement, DF: axial loads in both direction and radial loads can be sustained. It provides self-aligning but less capacity to sustain moments.

Tandem Arrangement, DT: Axial loads in one direction and radial loads can be sustained. This combination is used when the axial load in one direction is heavy.

Multiple rows combination

With a purpose that, axial loads in both directions and radial loads can be sustained, the three rows, four rows and five rows types of combination can be applied. Please refer to below drawings for three rows and four rows combinations:





Ball Screw Support Bearings

■ Universal Combination

Other the combinations mentioned previously, KML supplies universal combination ball screw support ball bearings that have the same amount of stand out on both the front and back face. For universal combination bearings, the “GA” code marks the combination with low preload, the “GB” code marks the combination with medium preload and the “GC” code marks the combination with high preload.

4. Bearing installation

To ensure correct mount, prevent unsuitable impact between bearing and housing, recommended chamfers on shaft and housing are shown as below.

The height of housing shoulder is not only designed for the fit of bearing but also with consideration of installation convenience. Under normally situation, the height of housing shoulder is recommended as below.

5. Recommended fit and tolerance of shaft and housing:

Recommended shaft fits tolerance for ball screw support bearings

μm									
Shaft Dia	Over	10	18	30	50	80	120	180	250
d (mm)	Incl	18	30	50	80	120	180	250	315
Tolerance	upper	0	0	0	0	0	0	0	0
	lower	-8	-9	-11	-13	-15	-18	-20	-23
Cylindricity		2	2.5	2.5	3	4	5	7	8
Flatness		1.2	1.5	1.5	2	2.5	3.5	4.5	6
Face runout		2	2.5	2.5	3	4	5	7	8
Surface roughness	Ra	0.4	0.4	0.4	0.4	0.4	0.4	0.8	0.8

Recommended housing fits tolerance for ball screw support bearings

μm									
Shaft Dia	Over	18	30	50	80	120	180	250	315
d (mm)	Incl	30	50	80	120	180	250	315	400
Tolerance	upper	+8	+10	+13	+16	+18	+22	+25	+29
	lower	-5	-6	-6	-6	-7	-7	-7	-7
Cylindricity		2.5	2.5	3	4	5	7	8	9
Flatness		2.5	2.5	3	4	5	7	8	9
Face runout		4	4	5	6	8	10	12	13
Surface roughness	Ra	0.8	0.8	0.8	0.8	0.8	0.8	1.6	1.6

6. Bearing precision indicated as below:

Inner ring tolerance of P4 grade ball screw ball support bearing

														μm
D		Δdmp		Δds		Vdsp	Vdmp	Kia	Sd	Sia	ΔBs			VBS
mm											whole	normal	modifier ⁽¹⁾	
Over	Incl	upper	lower	upper	lower	max					upper	lower		max
10	18	0	-4	0	-4	3	2	2.5	3	2	0	-80	-250	2.5
18	30	0	-5	0	-5	4	2.5	3	4	2	0	-120	-250	2.5
30	50	0	-6	0	-6	5	3	4	4	2	0	-120	-250	3
50	80	0	-7	0	-7	5	3.5	4	5	3	0	-150	-250	4
80	120	0	-8	0	-8	6	4	5	5	3	0	-200	-380	4
120	150	0	-10	0	-10	8	5	6	6	4	0	-250	-380	5

Note: (1) indicates tolerance of bearing height in 2 row or multiple rows combination.

Outer ring tolerance of P4 grade ball screw ball support bearing

μm													
D		ΔDmp		ΔDs		VDsp	VDmp	Kea	SD	Sea	ΔCs		VCS
mm													
Over	Incl	upper	lower	upper	lower	max					upper	lower	max
18	30	0	-5	0	-5	4	2.5	4	4	2	Values are identical to those for inner ring of same bearing (ΔBs)		2.5
30	50	0	-6	0	-6	5	3	5	4	2			2.5
50	80	0	-7	0	-7	5	3.5	5	4	3			3
80	120	0	-8	0	-8	6	4	6	5	3			4
120	150	0	-9	0	-9	7	5	7	5	4			5
150	180	0	-10	0	-10	8	5	8	5	4			5
180	250	0	-11	0	-11	8	6	10	7	4			7
250	315	0	-13	0	-13	10	7	11	8	5			7

Inner ring tolerance of P2 grade ball screw ball support bearing

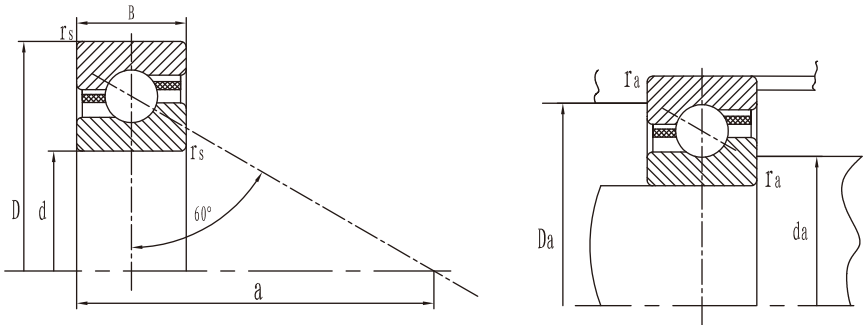
														μm
D		Δdmp		Δds		Vdsp	Vdmp	Kia	Sd	Sia	ΔBs			VBS
mm											whole	normal	modifier ⁽¹⁾	
Over	Incl	upper	lower	upper	lower	max					upper	lower		max
10	18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	2	0	-80	-250	1.5
18	30	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2	0	-120	-250	1.5
30	50	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2	0	-120	-250	1.5
50	80	0	-4	0	-4	4	2	2.5	1.5	3	0	-150	-250	1.5
80	120	0	-5	0	-5	5	2.5	2.5	2.5	3	0	-200	-380	2.5
120	150	0	-7	0	-7	7	3.5	2.5	2.5	4	0	-250	-380	2.5

Note: (1) indicates tolerance of bearing height in 2 row or multiple rows combination.

Outer ring tolerance of P2 grade ball screw ball support bearing

μm													
D		ΔDmp		ΔDs		VDsp	VDmp	Kea	SD	Sea	ΔCs		VCS
mm													
Over	Incl	upper	lower	upper	lower	max					upper	lower	max
18	30	0	-4	0	-4	4	2	2.5	1.5	2	Values are identical to those for inner ring of same bearing (ΔBs)		1.5
30	50	0	-4	0	-4	4	2	2.5	1.5	2			1.5
50	80	0	-4	0	-4	4	2	4	1.5	3			1.5
80	120	0	-5	0	-5	5	2.5	5	2.5	3			2.5
120	150	0	-5	0	-5	5	2.5	5	2.5	4			2.5
150	180	0	-7	0	-7	7	3.5	5	2.5	4			2.5
180	250	0	-8	0	-8	8	4	7	4	4			4
250	315	0	-8	0	-8	8	4	7	5	5			5

7. Product list



Bearing No.	Other No.					Boundary dimensions					Mounting dimensions			Basic load ratings		Limiting speeds		Mass kg ≈
											da	Da	ra					
	FAG	SKF	NSK	NTN	SNFA	d	D	B	rsm	a	h12	H12	max	Ca	Coa	Grease	Oil	
						mm ≈							KN		r/min			
760201	7602012TVP	BSA201	15TAC02AT85		BS212	12	32	10	0.6	24	17.0	27.0	0.6	11.6	12.5	17000	24000	0.04
760202	7602015TVP	BSA202			BS215	15	35	11	0.6	27	20.5	30.0	0.6	12.5	15.0	15000	20000	0.05
760203	7602017TVP				BS217	17	40	12	0.6	31	23.0	34.5	0.6	16.6	20.0	13000	18000	0.07
760204	7602020TVP	BSA204			BS220	20	47	14	1.0	36	27.5	39.5	1.0	19.3	25.0	12000	17000	0.13
760205	7602025TVP	BSA205	25TAC02AT85		BS225	25	52	15	1.0	41	32.0	45.0	1.0	22.0	30.5	11000	16000	0.16
760206	7602030TVP	BSA206			BS230	30	62	16	1.0	48	39.5	52.5	1.0	26.0	39.0	9000	13000	0.24
760207	7602035TVP	BSA206			BS235	35	72	17	1.1	55	46.5	60.5	1.1	30.0	50.0	8000	11000	0.34
760208	7602040TVP				BS240	40	80	18	1.1	62	53.5	69.5	1.1	37.5	64.0	7000	9500	0.44
760209	602045TVP				BS245	45	85	19	1.1	66	57.0	73.0	1.1	38.0	68.0	6700	9000	0.50
760210	7602050TVP				BS250	50	90	20	1.1	71	63.0	79.0	1.1	39.0	75.0	6300	8500	0.57
760211	602055TVP					55	100	21	1.5	78	69.5	85.5	1.5	40.5	81.5	6000	8000	0.75
760212	7602060TVP				BS260	60	110	22	1.5	86	77.0	96.0	1.5	56.0	112.0	5000	6700	0.96
760213	7602065TVP					65	120	23	1.5	92	84.0	103.0	1.5	57.0	122.0	4800	6300	1.20
760214	7602070TVP					70	125	24	1.5	96	87.0	108.0	1.5	65.5	137.0	4500	6000	1.32
760215	7602075TVP				BS275	75	130	25	1.5	101	93.5	114.5	1.5	67.0	150.0	4300	5600	1.45
760216	7602080TVP					80	140	26	2.0	108	100.0	122.0	2.0	76.5	175.0	4000	5300	1.76
760217	7602085TVP					85	150	28	2.0	116	107.0	131.0	2.0	86.5	196.0	3800	5000	2.19
760218	7602090TVP					90	160	30	2.0	123	113.5	138.5	2.0	98.0	224.0	3600	4800	2.69
760219	7602095TVP					95	170	32	2.1	131	119.5	146.5	2.1	110.0	255.0	3400	4500	3.26
760220	7602110TVP					100	180	34	2.1	138	125.5	154.5	2.1	122.0	285.0	3200	4300	3.91
760222	7602115TVP					110	200	38	2.1	153	139.0	171.0	2.1	146.0	355.0	2800	3800	5.50
760224	7602120TVP					120	215	40	2.1	165	150.0	185.0	2.1	176.0	425.0	2600	3600	6.50
760226	7602130TVP					130	230	40	3.0	176	162.5	197.0	3.0	180.0	455.0	2400	3400	7.40

Bearing No.	Other No.					Boundary dimensions					Mounting dimensions			Basic load ratings		Limiting speeds		Mass kg ≈
											da	Da	ra					
	FAG	SKF	NSK	NTN	SNFA	d	D	B	r _{min}	a	h12	H12	max	Ca	Coa	Grease	Oil	
BS1547			15TAC47B			15	47	15	1.0	35	27.5	39.5	1.0	21.5	27	12000	17000	0.14
BS1747			17TAC47B			17	47	15	1.0	35	27.5	39.5	1.0	21.5	27	12000	17000	0.14
BS17477			17TAC47B	BST17X 47-1B		20	47	15	1.0	37	27.5	39.5	1.0	19.3	25	12000	17000	0.13
BS2047	BSB020047T	BSD2047	20TAC47B	BST20X 47-1B		25	62	15	1.0	46	38.0	52.0	1.0	28.5	41.5	9000	13000	0.24
BS2562	BSB025062T	BSD2562	25TAC62B	BST25X 62-1B		30	62	15	1.0	48	39.5	52.5	1.0	26	39	9000	13000	0.23
BS3062	BSB030062T	BSD3062	30TAC62B	BST30X 62-1B		30	72	15	1.0	52	45.0	61.0	1.1	31	54	8000	11000	0.35
BS3572	BSB035072T	BSD3572	35TAC72B	BST35X 72-1B		35	72	15	1.0	54	46.5	60.5	1.1	30	50	8000	11000	0.30
BS4072	BSB040072T		40TAC72B	BST40X 72-1B		40	72	15	1.0	56	49.0	62.5	1.1	28	49	8000	11000	0.26
BS4090	BSB040090T		40TAC90B	BST40X 92-1B		40	90	20	1.5	67	56.5	75.5	1.5	50	83	6300	8500	0.65
BS4575	BSB045075T	BSD4575	45TAC75B	BST45X 75-1B		45	75	15	1.0	60	52.0	68.0	1.0	28.5	52	7500	10000	0.26
BS45100	BSD45100		45TAC100B	BST45X 100-1B		45	100	20	1.5	74	64.5	85.5	1.5	58.5	104	5600	7500	0.81
BS50100	BSB050100T		50TAC100B	BST50X 100-1B		50	100	20	1.5	76	64.5	85.5	1.5	58.5	104	5600	7500	0.75
BS5590	BSB055090T					55	90	15	1.0	70	65.0	80.5	1.0	32.5	65.5	6300	8500	0.38
BS55100	BSB055100T		55TAC100B	BST55X 100-1B		55	100	20	1.5	77	69.5	85.5	1.5	40.5	81.5	6000	8000	0.75
BS55120	BSB055120T		55TAC120B	BST55X 120-1B		55	120	20	1.5	86	77.0	97.5	2.0	60	116	5000	6700	1.18
BS60120	BSB060120T		60TAC120B	BST60X 120-1B		60	120	20	1.5	88	79.5	100.5	1.5	61	120	4800	6300	1.11
BS75110	BSB075110T					75	110	15	1.5	88	85.0	99.5	1.5	35.5	83	5000	6700	0.75
BS100150	BSB100150T					100	150	22.5	2.0	120	114.5	135.0	2.0	69.5	173	3800	5000	1.37

Bearing No.	Other No.					Boundary dimensions					Mounting dimensions			Basic load ratings		Limiting speeds		Mass kg ≈
											da	Da	ra					
	FAG	SKF	NSK	NTN	SNFA	d	D	B	r _{min}	a	h12	H12	max	Ca	Coa	Grease	Oil	
BSS2047		BDAB634200	20TAC 47XB			20.000	47	15.875	1.0	38	27.5	39.5	1.0	19.3	25	12000	17000	0.13
BSS2362		BDAB634201	23TAC 62B			23.838	62	15.875	1.0	45	38.0	52.0	1.0	28.5	41.5	9000	13000	0.24
BSS3872		BDAB634202	38AC 72B			38.100	72	15.875	1.0	56	49.0	62.5	1.1	28	49	8000	11000	0.26
BSS4476		BDAB634203	44AC 76B			44.475	76.2	15.875	1.0	60	52.0	68.0	1.0	28.5	52	7500	10000	0.26
BSS5790		BDAB634204	57AC 90B			57.150	90	15.875	1.0	72	65.0	80.0	1.0	32.5	65.5	6300	8500	0.38
BSS76110		BDAB634205	76AC 110B			76.200	110	15.875	1.5	88	85.0	99.5	1.5	35.5	83	5000	6700	0.75
BSS101145		BDAB634206	101TAC 145B			101.600	145	22.225	1.5	118	114.5	132.0	2.0	69.5	173	3800	500	1.37

Bearing No.	Other No.					Boundary dimensions					Mounting dimensions			Basic load ratings		Limiting speeds		Mass kg ≈
											da	Da	ra					
	FAG	SKF	NSK	NTN	SNFA	d	D	B	r _{min}	a	h12	H12	max	Ca	Coa	Grease	Oil	
						mm ≈					KN			r/min				
760304	7603020TVP		TAC35-2T85			20	52	15	1.1	39	30.5	43.5	1.1	24.5	32	11000	16000	0.17
760305	7603025TVP	BSA305				25	62	17	1.1	46	38.0	52.0	1.1	28.5	41.5	9000	13000	0.28
760306	7603030TVP	BSA306				30	72	19	1.1	53	45.0	61.0	1.1	34.5	55	8000	11000	0.41
760307	7603035TVP	BSA307				35	80	21	1.5	60	51.0	67.0	1.5	36.5	61	7000	9500	0.55
760307X3			40TAC03AT85			35	90	23	1.5	68	56.5	75.7	1.5	50	83	6300	8500	0.81
760308	7603040TVP	BSA308				40	90	23	1.5	68	56.5	75.7	1.5	50	83	6300	8500	0.76
760309	7603045TVP					45	100	25	1.5	75	64.5	85.5	1.5	58.5	104	5600	7500	1.02
760309X3	TAC45-2T85					45	110	27	2.0	83	72.0	94.0	2.0	69.5	127	5000	6700	1.41
760310	7603050TVP		50TAC03AT85			50	110	27	2.0	83	72.0	94.0	2.0	69.5	127	5000	6700	1.33
760311	7603055TVP		55TAC03AT85			55	120	29	2.0	90	77.0	101.0	2.0	78	146	4800	6300	1.69
760312	7603060TVP		60TAC03AT85			60	130	31	2.1	98	82.5	107.5	2.1	88	166	4500	6000	2.12
760313	7603065TVP					65	140	33	2.1	105	91.5	118.5	2.1	100	196	4000	5300	2.60
760314	7603070TVP					70	150	35	2.1	113	95.5	124.5	2.1	110	220	3800	5000	3.16
760315	7603075TVP					75	160	37	2.1	120	105.5	135.5	2.1	125	255	3600	4800	3.79
760316	7603080TVP		80TAC03AT85			80	170	39	2.1	128	111.0	143.0	2.1	137	285	3400	4500	4.50
760317	7603085TVP					85	180	41	3.0	135	116.0	151.0	3.0	160	325	3200	4300	5.29
760318	7603090TVP					90	190	43	3.0	143	122.5	157.5	3.0	163	345	3000	4000	6.17
760319	7603095TVP					95	200	45	3.0	150	130.0	165.0	3.0	163	360	3000	4000	7.15
760320	7603100TVP		100TAC03AT85			100	215	47	3.0	160	140.0	178.0	3.0	193	430	2600	3600	8.73
760322	7603110TVP					110	240	50	3.0	176	154.5	200.0	3.0	250	560	2400	3400	11.80
760324			120TAC03AT85			120	260	55	3.0	192	165.0	210.0	3.0	265	620	2200	3200	14.60
760326	7603130TVP					130	280	58	3.0	206	181.0	229.0	3.0	390	695	2000	3000	18.70