



# 400 Series Profile Rail Linear Guides

Transport grade ball profile rail system

## Features and Benefits

The 400 Series Profile Rail Linear Guide is the newest addition to the Thomson Linear Guide product line. The 400 Series is a cost effective, transport grade Profile Rail solution for cost-sensitive applications, and is a drop-in replacement with industry-standard envelope and hole patterns. Double-faced ball track bearing arrangements provide compliance during installation as well as equal load carrying capacity in all directions. Caged and non-caged carriages utilize the same rail design. This enables efficient use of inventory, as only one rail type needs to be stocked for either carriage type.

### Low Noise and Vibration

Polymer ball-return tube reduces noise while retaining lubrication.

### Modular Accessory Options

Standard double lip end and longitudinal seals retain lubrication while protecting the bearing from contamination. Additional seals and scrapers available.

### Lubrication Channels

Channels direct lubricant to individual ball tracks to maximize lubrication effectiveness

### Double-Faced Ball Tracks

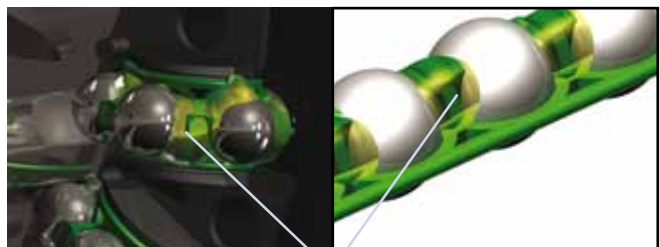
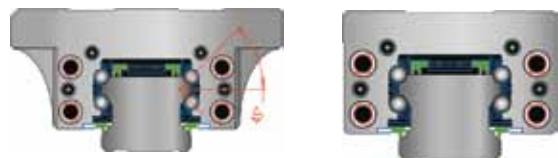
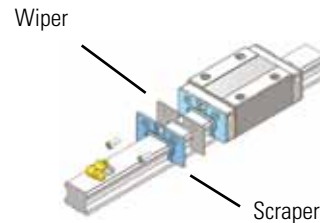
The 400 Series Linear Guide utilizes a 45°, face-to-face bearing arrangement, resulting in equal load-carrying capacity in all directions. The primary advantage of face-to-face configuration is that the rails are much more tolerant of mounting surface inaccuracies. This enables automation machine builders to reduce cost further by not having to prepare super-accurate mounting surfaces

### 400 Series Ball Cage

The 413 ball cage option provides:

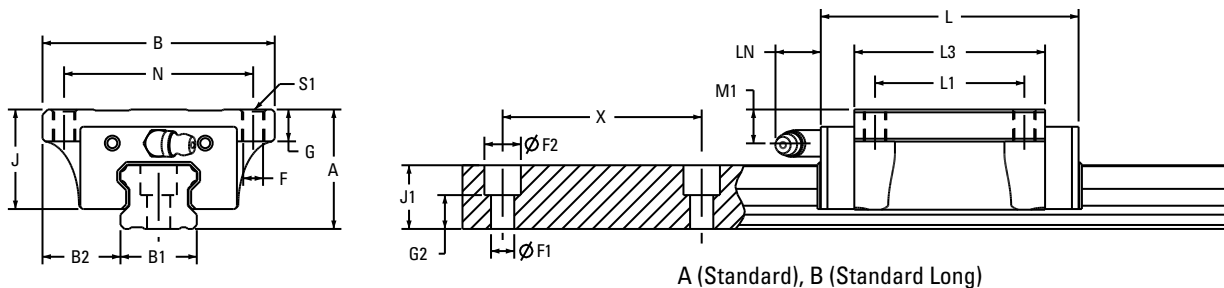
- Increased running smoothness
- Low noise at high speeds
- Individual ball lubricant reservoirs

400 Series Ball/Caged Ball Assortment							
Width	Standard		Narrow				
Length		Long		Long		Long	Short
Height					High	High	
Designator	A	B	C	D	E	F	G
SIZE MM	15	•	•	•	•	•	•
	20	•	•	•	•	•	•
	25	•	•	•	•	•	•
	30	•	•	•	•	•	•
	35	•	•	•	•	•	•
	45	•	•	•	•	•	•



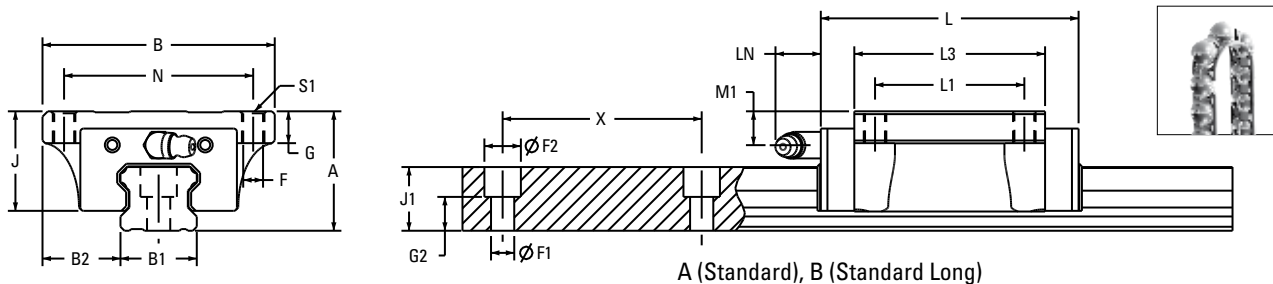
Lubricant

### 400 Series Specifications



#### 411 Standard

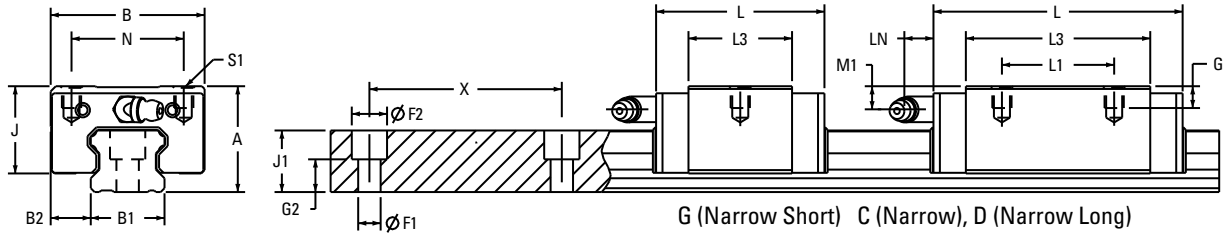
Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight	Rail Weight	
	A	B	B2	J	L	N	L1	S1	F	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]	C0 [N]	[kg]
411N15A0	24	47	16.0	21.0	58.6	38	30	M5	4.4	8.0	40.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.21	1.28
411N15B0	24	47	16.0	21.0	66.1	38	30	M5	4.4	8.0	47.7	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	11,300	23,700	0.23	1.28
411N20A0	30	63	21.5	25.5	69.3	53	40	M6	5.4	9.0	48.5	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	14,300	30,500	0.40	2.15
411N20B0	30	63	21.5	25.5	82.1	53	40	M6	5.4	9.0	61.3	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	18,600	39,500	0.46	2.15
411N25A0	36	70	23.5	30.2	79.7	57	45	M8	7.0	10.0	57.5	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	10.2	20,100	41,100	0.57	2.88
411N25B0	36	70	23.5	30.2	94.4	57	45	M8	7.0	10.0	72.2	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	10.2	25,900	52,800	0.72	2.88
411N30A0	42	90	31.0	35.0	94.8	72	52	M10	8.6	11.0	67.8	M6 X 1.0	8 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	1.10	4.45
411N30B0	42	90	31.0	35.0	105.0	72	52	M10	8.6	11.0	78.0	M6 X 1.0	8 (15.6)	28	22.8	80	9.0	14.0	10.8	38,500	70,700	1.34	4.45
411N35A0	48	100	33.0	40.5	111.5	82	62	M10	8.6	12.0	80.5	M6 X 1.0	8 (16.0)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.50	6.25
411N35B0	48	100	33.0	40.5	123.5	82	62	M10	8.6	12.0	92.5	M6 X 1.0	8 (16.0)	34	26.0	80	9.0	14.0	14.0	52,900	101,400	1.90	6.25
411N45A0	60	120	37.5	51.1	129.0	100	80	M12	10.6	15.5	94.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	2.27	9.60
411N45B0	60	120	37.5	51.1	145.0	100	80	M12	10.6	15.5	110.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	69,000	129,500	2.68	9.60



#### 413 Standard (Caged)

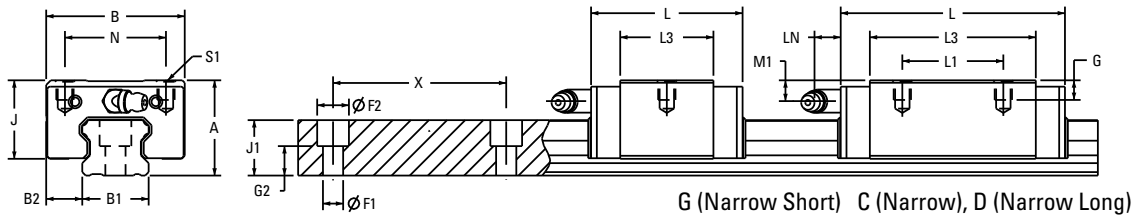
Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight	Rail Weight	
	A	B	B2	J	L	N	L1	S1	F	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]	C0 [N]	[kg]
413N15A0	24	47	16.0	21.0	58.6	38	30	M5	4.4	8.0	40.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.21	1.28
413N15B0	24	47	16.0	21.0	66.1	38	30	M5	4.4	8.0	47.7	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	11,300	23,700	0.23	1.28
413N20A0	30	63	21.5	25.5	69.3	53	40	M6	5.4	9.0	48.5	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	14,300	30,500	0.40	2.15
413N20B0	30	63	21.5	25.5	82.1	53	40	M6	5.4	9.0	61.3	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	18,600	39,500	0.46	2.15
413N25A0	36	70	23.5	30.2	79.7	57	45	M8	7.0	10.0	57.5	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	10.2	20,100	41,100	0.57	2.88
413N25B0	36	70	23.5	30.2	94.4	57	45	M8	7.0	10.0	72.2	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	10.2	25,900	52,800	0.72	2.88
413N30A0	42	90	31.0	35.0	94.8	72	52	M10	8.6	11.0	67.8	M6 X 1.0	8 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	1.10	4.45
413N30B0	42	90	31.0	35.0	105.0	72	52	M10	8.6	11.0	78.0	M6 X 1.0	8 (15.6)	28	22.8	80	9.0	14.0	10.8	38,500	70,700	1.34	4.45
413N35A0	48	100	33.0	40.5	111.5	82	62	M10	8.6	12.0	80.5	M6 X 1.0	8 (16.0)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.50	6.25
413N35B0	48	100	33.0	40.5	123.5	82	62	M10	8.6	12.0	92.5	M6 X 1.0	8 (16.0)	34	26.0	80	9.0	14.0	14.0	52,900	101,400	1.90	6.25
413N45A0	60	120	37.5	51.1	129.0	100	80	M12	10.6	15.5	94.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	2.27	9.60
413N45B0	60	120	37.5	51.1	145.0	100	80	M12	10.6	15.5	110.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	69,000	129,500	2.68	9.60

## 400 Series Specifications



### 411 Narrow

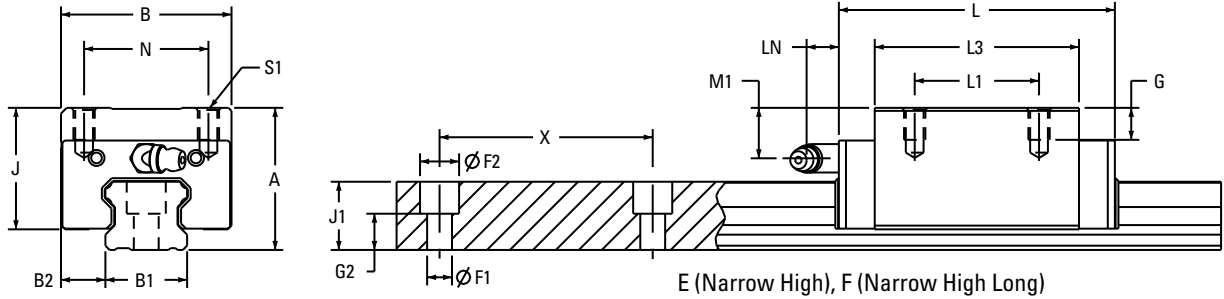
Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight [kg]	Rail Weight [kg/m]
	A	B	B2	J	L	N	L1	S1	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]		
411N15GO	24	34	9.5	21.0	40.6	26	--	M4	4.8	22.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	4,600	9,800	0.10	1.28
411N15CO	24	34	9.5	21.0	58.6	26	26	M4	4.8	40.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.17	1.28
411N15DO	24	34	9.5	21.0	66.1	26	26	M4	4.8	47.7	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	11,300	23,700	0.18	1.28
411N20GO	28	42	11.0	23.5	48.3	32	--	M5	5.5	27.5	M6 X 1.0	5.1 (15.6)	20	16.3	60	6.0	9.5	7.8	7,400	15,700	0.17	2.15
411N20CO	30	44	12.0	25.5	69.3	32	36	M5	6.5	48.5	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	14,300	30,500	0.31	2.15
411N25GO	33	48	12.5	27.2	54.5	35	--	M6	6.8	32.3	M6 X 1.0	7.2 (15.6)	23	19.2	60	7.0	11.0	10.2	10,300	21,000	0.21	2.88
411N25CO	36	48	12.5	30.2	79.7	35	35	M6	9.0	57.5	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	9.0	20,100	41,100	0.40	2.88
411N25DO	36	48	12.5	30.2	109.1	35	50	M6	9.0	86.9	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	9.0	29,200	63,300	0.67	2.88
411N30GO	42	60	16.0	35.0	64.2	40	--	M8	10.0	37.2	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	10.8	14,700	27,000	0.50	4.45
411N30CO	42	60	16.0	35.0	94.8	40	40	M8	10.0	67.8	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	0.80	4.45
411N30DO	42	60	16.0	35.0	130.5	40	60	M8	10.0	103.5	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	12.0	42,900	86,700	1.16	4.45
411N35GO	48	70	18.0	40.5	75.5	50	--	M8	10.0	44.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	14.0	21,200	40,700	0.80	6.25
411N35CO	48	70	18.0	40.5	111.5	50	50	M8	10.0	80.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.20	6.25
411N35DO	48	70	18.0	40.5	153.5	50	72	M8	10.0	122.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	12.0	58,300	125,300	1.84	6.25
411N45CO	60	86	20.5	51.1	129.0	60	60	M10	15.5	94.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	1.64	9.60
411N45DO	60	86	20.5	51.1	174.0	60	80	M10	15.5	139.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	17.0	79,700	163,300	2.42	9.60



### 413 Narrow (Caged)

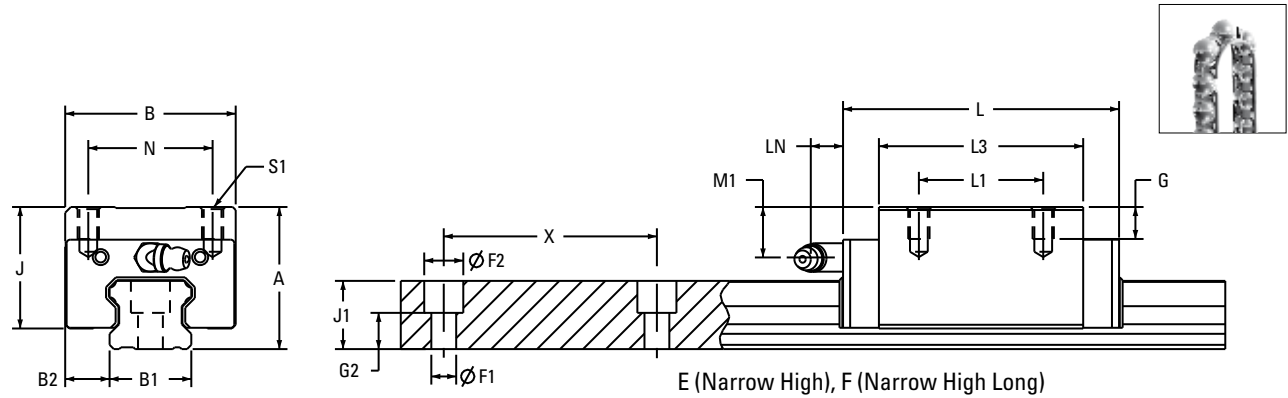
Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight [kg]	Rail Weight [kg/m]
	A	B	B2	J	L	N	L1	S1	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]		
413N15GO	24	34	9.5	21.0	40.6	26	--	M4	4.8	22.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	4,600	9,800	0.10	1.28
413N15CO	24	34	9.5	21.0	58.6	26	26	M4	4.8	40.2	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.17	1.28
413N15DO	24	34	9.5	21.0	66.1	26	26	M4	4.8	47.7	M4 X 0.7	5.5 (5.0)	15	13.0	60	4.5	7.5	7.0	11,300	23,700	0.18	1.28
413N20GO	28	42	11.0	23.5	48.3	32	--	M5	5.5	27.5	M6 X 1.0	5.1 (15.6)	20	16.3	60	6.0	9.5	7.8	7,400	15,700	0.17	2.15
413N20CO	30	44	12.0	25.5	69.3	32	36	M5	6.5	48.5	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	14,300	30,500	0.31	2.15
413N25GO	33	48	12.5	27.2	54.5	35	--	M6	6.8	32.3	M6 X 1.0	7.2 (15.6)	23	19.2	60	7.0	11.0	10.2	10,300	21,000	0.21	2.88
413N25CO	36	48	12.5	30.2	79.7	35	35	M6	9.0	57.5	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	9.0	24,900	41,100	0.40	2.88
413N25DO	36	48	12.5	30.2	109.1	35	50	M6	9.0	86.9	M6 X 1.0	10.2 (15.6)	23	19.2	60	7.0	11.0	9.0	36,000	63,300	0.67	2.88
413N30GO	42	60	16.0	35.0	64.2	40	--	M8	10.0	37.2	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	10.8	14,700	27,000	0.50	4.45
413N30CO	42	60	16.0	35.0	94.8	40	40	M8	10.0	67.8	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	0.80	4.45
413N30DO	42	60	16.0	35.0	130.5	40	60	M8	10.0	103.5	M6 X 1.0	8.0 (15.6)	28	22.8	80	9.0	14.0	12.0	52,900	86,700	1.16	4.45
413N35GO	48	70	18.0	40.5	75.5	50	--	M8	10.0	44.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	14.0	21,200	40,700	0.80	6.25
413N35CO	48	70	18.0	40.5	111.5	50	50	M8	10.0	80.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.20	6.25
413N35DO	48	70	18.0	40.5	153.5	50	72	M8	10.0	122.5	M6 X 1.0	8.0 (15.6)	34	26.0	80	9.0	14.0	12.0	71,900	125,300	1.84	6.25
413N45CO	60	86	20.5	51.1	129.0	60	60	M10	15.5	94.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	1.64	9.60
413N45DO	60	86	20.5	51.1	174.0	60	80	M10	15.5	139.0	M8 X 1.25	14.4 (16.0)	45	31.1	105	14.0	20.0	17.0	98,400	163,300	2.42	9.60

400 Series Specifications



411 Narrow High

Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight [kg]	Rail Weight [kg/m]
	A	B	B2	J	L	N	L1	S1	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]		
411N15E0	28	34	9.5	21.0	58.6	26	26	M4	6.0	40.2	M4 X 0.7	9.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.19	1.28
411N20F0	30	44	12.0	25.5	82.1	32	50	M5	6.5	61.3	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	18,600	39,500	0.36	2.15
411N25E0	40	48	12.5	34.2	79.7	35	35	M6	9.0	57.5	M6 X 1.0	14.2 (15.6)	23	19.2	60	7.0	11.0	10.2	20,100	41,100	0.45	2.88
411N25F0	40	48	12.5	34.2	94.4	35	50	M6	9.0	72.2	M6 X 1.0	14.2 (15.6)	23	19.2	60	7.0	11.0	10.2	25,900	52,800	0.66	2.88
411N30E0	45	60	16.0	38.0	94.8	40	40	M8	12.0	67.8	M6 X 1.0	11.0 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	0.91	4.45
411N30F0	45	60	16.0	38.0	105.0	40	60	M8	12.0	78.0	M6 X 1.0	11.0 (15.6)	28	22.8	80	9.0	14.0	10.8	38,500	70,700	1.04	4.45
411N35E0	55	70	18.0	47.5	111.5	50	50	M8	12.0	80.5	M6 X 1.0	15.0 (15.6)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.50	6.25
411N35F0	55	70	18.0	47.5	123.5	50	72	M8	12.0	92.5	M6 X 1.0	15.0 (15.6)	34	26.0	80	9.0	14.0	14.0	52,900	101,400	1.80	6.25
411N45E0	70	86	20.5	61.1	129.0	60	60	M10	18.0	94.0	M8 X 1.25	24.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	2.28	9.60
411N45F0	70	86	20.5	61.1	145.0	60	80	M10	18.0	110.0	M8 X 1.25	24.4 (16.0)	45	31.1	105	14.0	20.0	14.1	69,000	129,500	2.67	9.60



413 Narrow High (Caged)

Item	Assembly [mm]				Carriage [mm]								Rail [mm]						Load Rating		Carriage Weight [kg]	Rail Weight [kg/m]
	A	B	B2	J	L	N	L1	S1	G	L3	Oil H	M1	LN	B1	J1	X	F1	F2	G2	C [N]		
413N15E0	28	34	9.5	21.0	58.6	26	26	M4	6.0	40.2	M4 X 0.7	9.5 (5.0)	15	13.0	60	4.5	7.5	7.0	9,300	19,600	0.19	1.28
413N20F0	30	44	12.0	25.5	82.1	32	50	M5	6.5	61.3	M6 X 1.0	7.1 (15.6)	20	16.3	60	6.0	9.5	7.8	18,600	39,500	0.36	2.15
413N25E0	40	48	12.5	34.2	79.7	35	35	M6	9.0	57.5	M6 X 1.0	14.2 (15.6)	23	19.2	60	7.0	11.0	10.2	20,100	41,000	0.45	2.88
413N25F0	40	48	12.5	34.2	94.4	35	50	M6	9.0	72.2	M6 X 1.0	14.2 (15.6)	23	19.2	60	7.0	11.0	10.2	25,900	52,800	0.66	2.88
413N30E0	45	60	16.0	38.0	94.8	40	40	M8	12.0	67.8	M6 X 1.0	11.0 (15.6)	28	22.8	80	9.0	14.0	10.8	29,700	54,600	0.91	4.45
413N30F0	45	60	16.0	38.0	105.0	40	60	M8	12.0	78.0	M6 X 1.0	11.0 (15.6)	28	22.8	80	9.0	14.0	10.8	38,500	70,700	1.04	4.45
413N35E0	55	70	18.0	47.5	111.5	50	50	M8	12.0	80.5	M6 X 1.0	15.0 (15.6)	34	26.0	80	9.0	14.0	14.0	42,400	81,100	1.50	6.25
413N35F0	55	70	18.0	47.5	123.5	50	72	M8	12.0	92.5	M6 X 1.0	15.0 (15.6)	34	26.0	80	9.0	14.0	14.0	52,900	101,400	1.80	6.25
413N45E0	70	86	20.5	61.1	129.0	60	60	M10	18.0	94.0	M8 X 1.25	24.4 (16.0)	45	31.1	105	14.0	20.0	14.1	58,000	108,900	2.28	9.60
413N45F0	70	86	20.5	61.1	145.0	60	80	M10	18.0	110.0	M8 X 1.25	24.4 (16.0)	45	31.1	105	14.0	20.0	14.1	69,000	129,500	2.67	9.60

## Accuracy Class

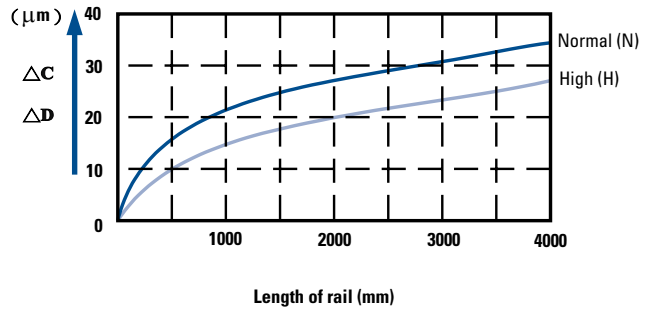
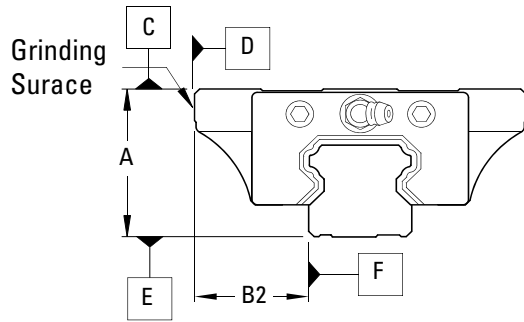
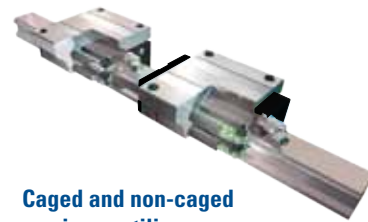


Fig. 1-1 400 Series rail length and running parallelism

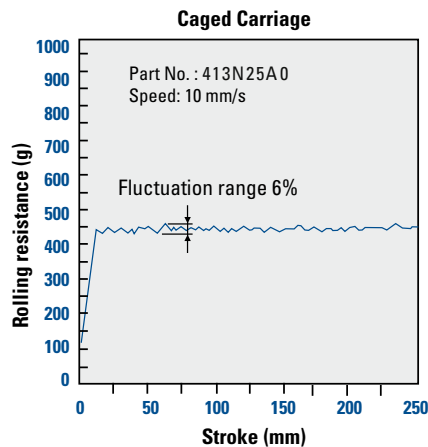
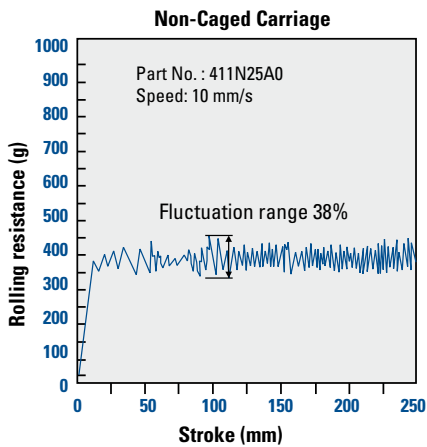
Grade	Normal (N)	High (H)
Height Tolerance (A)	± 0.1	± 0.04
Width Tolerance (B2)	± 0.1	± 0.04
Pair variation max ( $\Delta A$ )	0.03	0.02
Pair variation max ( $\Delta B2$ )	0.03	0.02
Running parallelism of carriage surface C with respect to surface E.	$\Delta C$ refer to Fig. 1-1	
Running parallelism of carriage surface D with respect to surface F.	$\Delta D$ refer to Fig. 1-1	

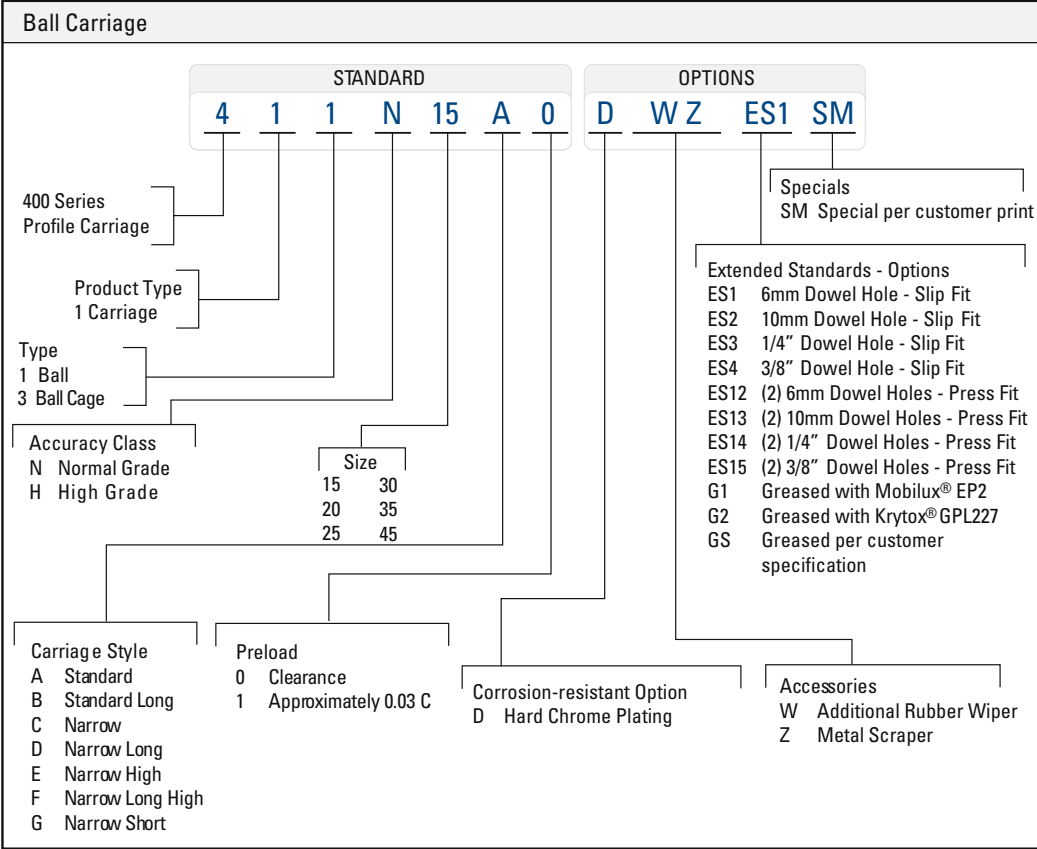
All items in mm.



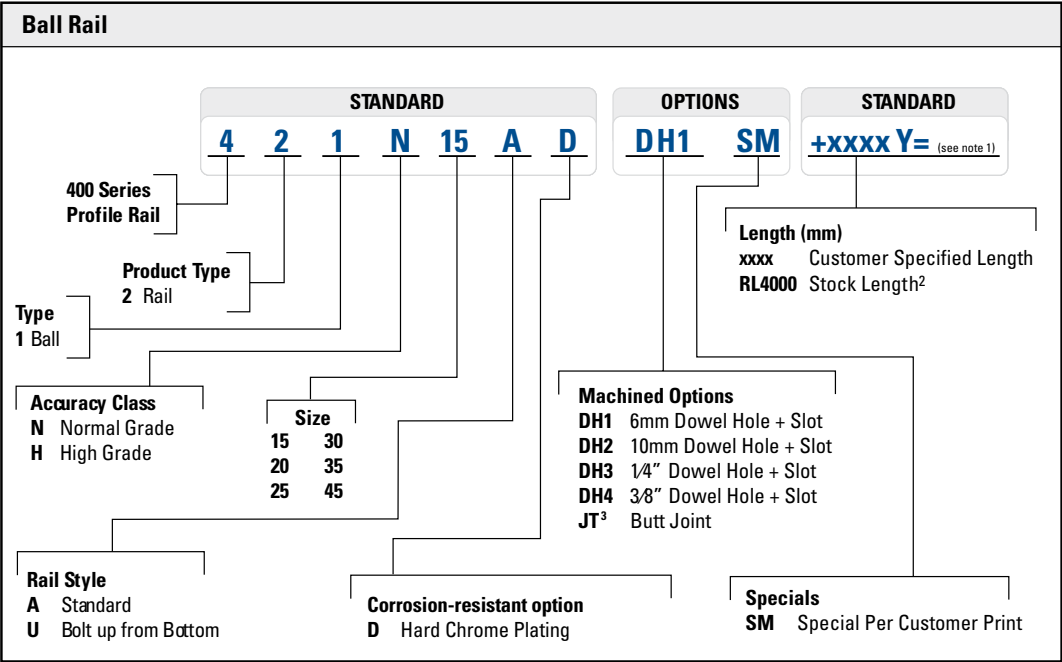
Caged and non-caged carriages utilize same rail design

## 413 Caged Ball Carriage Increased Running Smoothness





1. Carriage does not retain ball bearings when end cap is removed. Removal of end caps can result in loss of ball bearings.
2. Carriage dynamic load ratings based on a travel life of 50 km.



1. Y = Distance from end of rail to center of first mounting hole, Y1 = Y2 unless specified.
2. Stock length of rails are considered random length, total length may exceed specified length, and Y1/Y2 are not equal. To be used only by customer who will cut to length.
3. Customer drawing required at time of quote and order.

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