

# CLASSIC

## Submittal

JV3/V3-AR18EI  
Classic Architectural  
Copper/Aluminum and  
Steel Elements

### Specification

JV3 Slip Jointed Enclosure

**ENCLOSURE:**

STYLE: Classic Ext. Alum. Inlet  
OUTLET: Extruded Aluminum Grille  
Pencil Proof

LENGTHS: 2'0" thru 8'0" in 6" Increments

MAT'L:  16 Ga. CRS (Std)  
 14 Ga. CRS (Opt'l)  
 16 Ga. Stainless Steel (Opt'l)\*  
 14 Ga. Stainless Steel (Opt'l)\*  
 14 Ga. Aluminum (Opt'l)  
 12 Ga. Aluminum (Opt'l)

\*Available on "J" Style Only

FINISH:  Baked Powder (Std)  
 Baked Metallic (Opt'l)

**FLOOR ANGLE:**

Ext. Al (Clear Anodized)  
 1" x 1" CRS Painted

**ACCESSORIES:**

JV3 Overlapping Type  
 V3 Underlapping Type

**ELEMENT:**

TYPE:  Cu/Al (Mechanically Expanded)

LENGTHS: 2'0" thru 12'6" in 1" Increments for 1" & 1-1/4" Cu.  
2'0" thru 8'0" in 1" Increments for 3/4" Cu.

One End Flared, (Std)

TYPE:  IPS Steel (Mechanically Expanded)

LENGTHS: 2'0" Thru 12'0" in 1" Increments  
 NPT Thread both Ends (Std)  
 Beveled Ends for Field Weld

See Catalog for Working Pressures

V3 Wiped Edge Enclosure

**BACKPLATE:**

TYPE:  Partial B/P

LENGTHS: 8'0" Only

MAT'L:  20 Ga. Prepainted (Std)  
 18 Ga. Galvannealed (Opt'l)

TYPE:  Full Ht. B/P (Opt'l)

LENGTHS: 2'0" thru 8'0" in 6" Increments

MAT'L:  20 Ga. Galvannealed (Opt'l)  
 20 Ga. Painted (Opt'l)  
 18 Ga. Painted (Opt'l)

**AIRSEAL:**

1/8" x 3/8" Closed Cell (Opt'l)

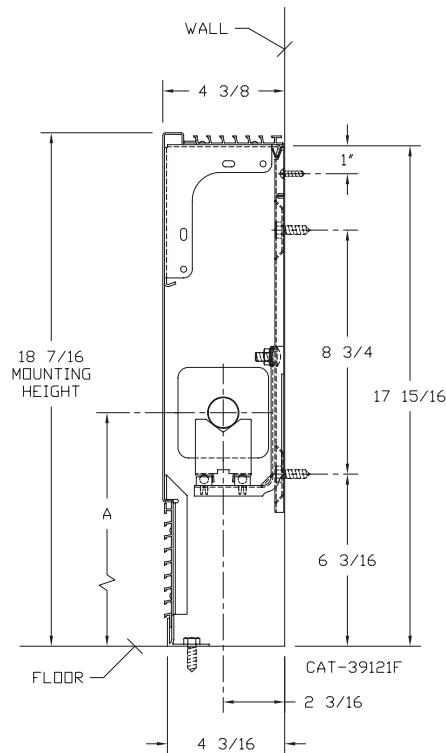
**BRACKETS:**

Vertical Wall Brkt w/B.B. Hgr

**DAMPER:**

Dial Type (Opt'l)  
 Tamper Resistant (Opt'l)

**JV3/V3-AR18EI**  
(JV3 Shown)



ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	CRADLE NUMBER	A MIN	A MAX
3/4 COPPER	3 1/4 x 3 1/4	2	7"	9 1/2"
1" COPPER	3 1/4 x 3 1/4	2	7 1/4"	9 5/8"
1 1/4 COPPER	3 1/4 x 3 1/4	1	7"	9 1/8"
1" STEEL	3 1/4 x 3 1/4	2	7 1/4"	9 3/4"
1 1/4 STEEL	3 1/4 x 3 1/4	1	7"	9 1/4"



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PROJECT: \_\_\_\_\_ DATE: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_  
 ARCHITECT: \_\_\_\_\_  
 ENGINEER: \_\_\_\_\_  
 CONTRACTOR: \_\_\_\_\_  
 PO NUMBER: \_\_\_\_\_

# STYLE JV3/V3-AR18EI

## COPPER/ALUMINUM ELEMENT RATINGS

ALL RATINGS ARE IN BTU/HR/LIN FT AND BASED ON 3 FPS VELOCITY, 65° EAT

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FINS PER FT.	FIN THICKNESS IN INCHES	ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)									
									200°	190°	180°	170°	160°	150°	140°	130°	120°	
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES									
									1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
3/4"	VC3/4-33	3-1/4" SQ.	32	.020	18-7/16	1	18-7/16	1050	900	820	720	640	560	470	420	350	270	
3/4"	VC3/4-34	3-1/4" SQ.	40	.020	18-7/16	1	18-7/16	1230	1060	960	850	750	650	550	490	410	320	
3/4"	VC3/4-35	3-1/4" SQ.	50	.020	18-7/16	1	18-7/16	1370	1180	1070	950	840	730	620	550	450	360	
1"	VC33	3-1/4" SQ.	32	.020	18-7/16	1	18-7/16	1130	970	880	780	690	600	510	450	370	290	
1"	VC34	3-1/4" SQ.	40	.020	18-7/16	1	18-7/16	1270	1090	990	880	770	670	570	510	420	330	
1"	VC35	3-1/4" SQ.	50	.020	18-7/16	1	18-7/16	1320	1140	1030	910	810	700	590	530	440	340	
1 1/4"	VC133	3-1/4" SQ.	32	.020	18-7/16	1	18-7/16	960	830	750	660	590	510	430	380	320	250	
1 1/4"	VC134	3-1/4" SQ.	40	.020	18-7/16	1	18-7/16	1130	970	880	780	690	600	510	450	370	290	
1 1/4"	VC135	3-1/4" SQ.	50	.020	18-7/16	1	18-7/16	1270	1090	990	880	770	670	570	510	420	330	

## STEEL ELEMENT RATINGS

ALL RATINGS ARE IN BTU/HR/LIN FT AND BASED ON 3 FPS VELOCITY, 65° EAT

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FINS PER FT.	FIN THICKNESS IN INCHES	ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)									
									200°	190°	180°	170°	160°	150°	140°	130°	120°	
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES									
									1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	VS33	3-1/4" SQ.	32	.032	18-7/16	1	18-7/16	880	760	690	610	540	470	400	350	290	230	
1"	VS34	3-1/4" SQ.	40	.032	18-7/16	1	18-7/16	970	830	760	670	590	510	440	390	320	250	
1"	VS35	3-1/4" SQ.	50	.032	18-7/16	1	18-7/16	1040	890	810	720	630	550	470	420	340	270	
1-1/4"	VS133	3-1/4" SQ.	32	.032	18-7/16	1	18-7/16	870	750	680	600	530	460	390	350	290	230	
1-1/4"	VS134	3-1/4" SQ.	40	.032	18-7/16	1	18-7/16	980	840	760	680	600	520	440	390	320	250	
1-1/4"	VS135	3-1/4" SQ.	50	.032	18-7/16	1	18-7/16	1020	880	800	700	620	540	460	410	340	270	

# DESIGN DATA

## COMMERCIAL FINNED TUBE RATING CORRECTION CHARTS

CATALOG FINNED TUBE RATINGS ARE BASED UPON THE FOLLOWING CONDITIONS:

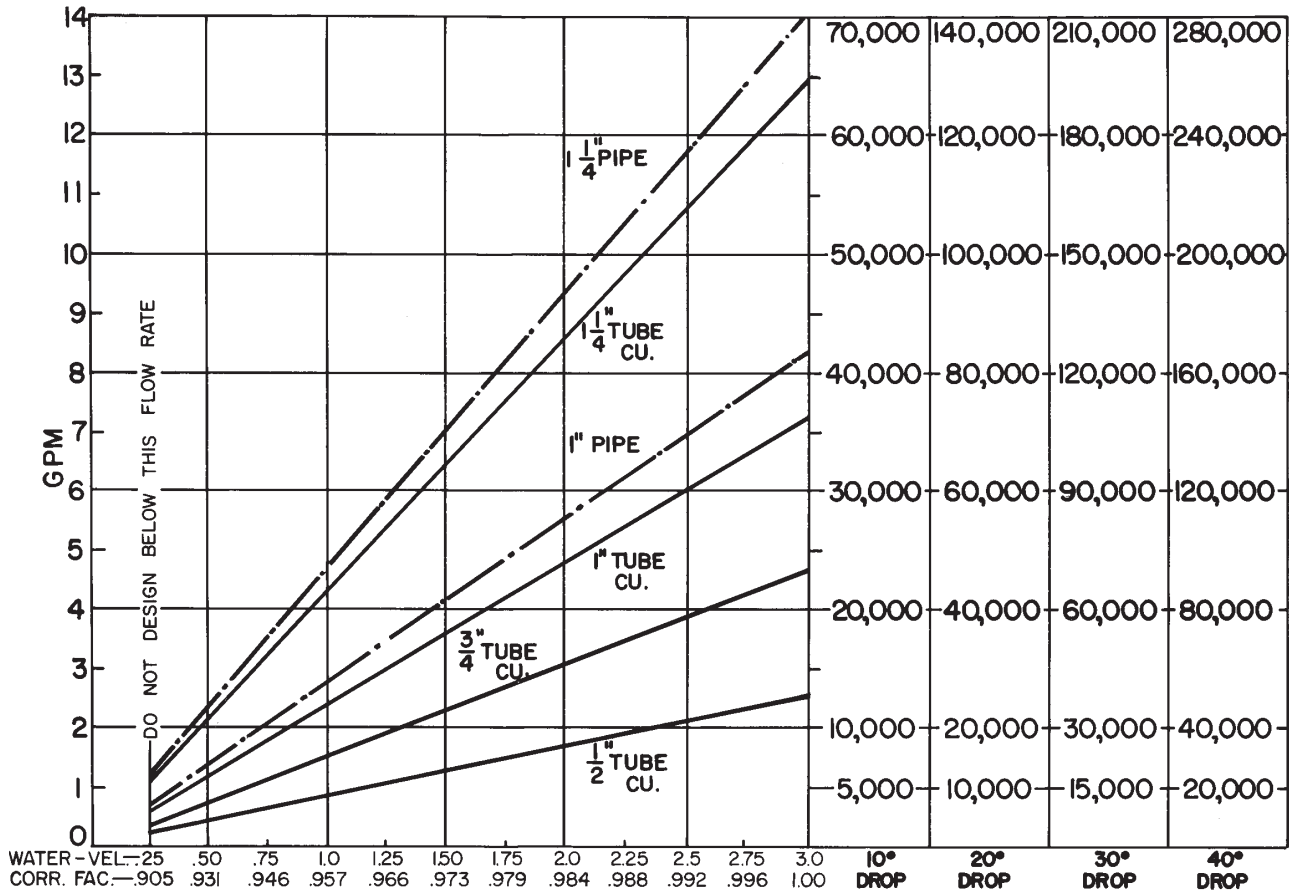
- 215°F AVERAGE WATER OR STEAM TEMPERATURE
- 65°F ENTERING AIR TEMPERATURE
- 3 FEET PER SECOND WATER FLOW RATE
- CATALOG MOUNTING HEIGHT

USE THE FOLLOWING CALCULATION WITH CORRECTION FACTORS FOR JOB CONDITIONS TO DETERMINE CORRECTED RATING:

$$\text{CORRECTED RATING} = (\text{215°F CATALOG RATING}) \times \left( \frac{\text{CORRECTION FACTOR FOR STEAM OR WATER AND AVERAGE AIR TEMP.}}{\text{CORRECTION FACTOR FOR FLOW RATE}} \right) \times \left( \frac{\text{CORRECTION FOR MOUNTING HTG.-SEE CATALOG RATING}}{\text{CORRECTION FOR MOUNTING HTG.-SEE CATALOG RATING}} \right)$$

USE THE FOLLOWING CHARTS TO SELECT CORRECTION FACTORS

### CHART/WATER VEL./CORR. FACTOR / PRESS. DROP/TOTAL BTU.

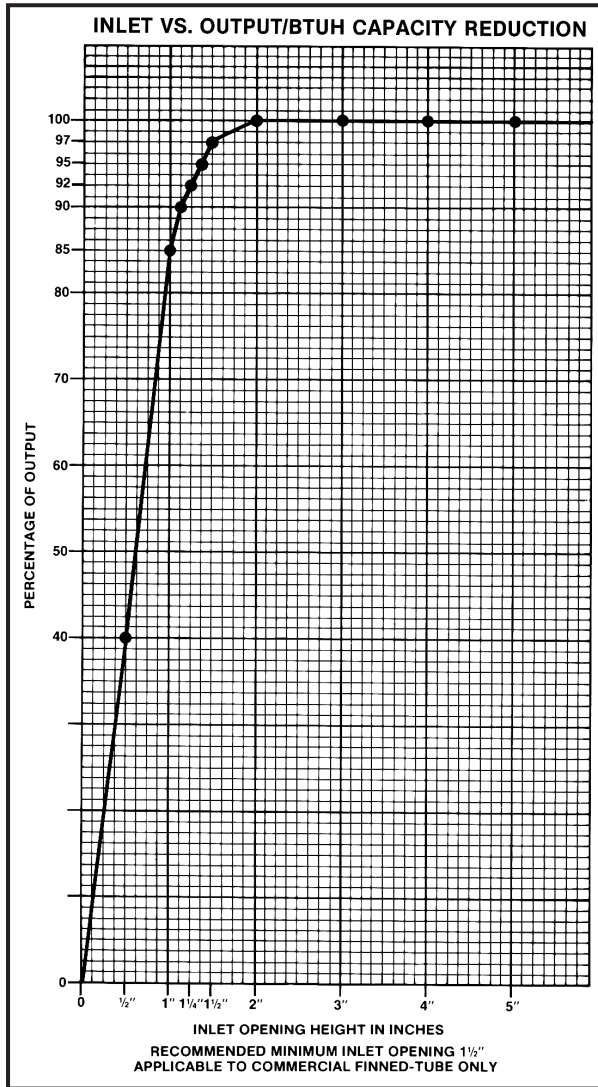


1/2" COP. ALUM.	1,80	2,33	5,33	9,16					
3/4" COP. ALUM.	.5	1,5	3,16	5,4	6,25				
1" COP. ALUM.	.233	.41	.83	1,45	2,16	2,83	3,66		
1" PIPE	.37	.79	1,3	2,00	2,70	3,70	4,80		
1 1/4" COP. ALUM.	.16	.33	.55	.79	1,08	1,33	1,8	2,25	2,26
1 1/4" PIPE	.09	.18	.31	.5	.70	1,0	1,1	1,3	1,6
								1,8	2,58
								2,3	3,3

PRESSURE DROP PER 100 LINEAR FT., IN FEET OF HEAD

# DESIGN DATA

## INLET AIR CORRECTION FACTOR



## GUARANTEED WORKING PRESSURES

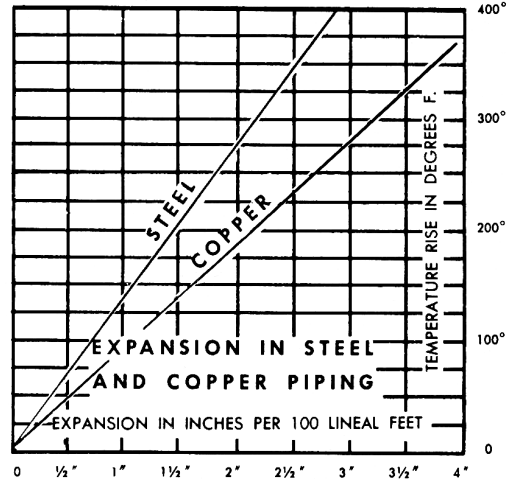
- 1" IPS — 780 AT TEMPERATURES UP TO 650°F.
  - 1 1/4" IPS — 660 AT TEMPERATURES UP TO 650°F.
  - 2" IPS — 405 AT TEMPERATURES UP TO 650°F.
  - 1 1/4" CU — 194 AT TEMPERATURES UP TO 300°F.
  - 1" CU — 204 AT TEMPERATURES UP TO 300°F.
  - 3/4" CU — 218 PSI AT TEMPERATURES UP TO 300°F.
- MAXIMUM PRESSURES AT OTHER TEMPERATURES ARE AVAILABLE UPON REQUEST.

## RATE OF PITCH FOR STEAM 1/2" DROP OVER 20 FT. RUN.

PIPE WATER CAPACITIES AND QUANTITIES CIRCULATED AT VELOCITY OF 3* FEET PER SECOND			
Pipe Size	Gals. Per Linear Ft.	Gals./Min. @ 3' Sec. Vel.*	Lbs./Hr. @ 3' Sec. Vel.*
1/2"	.016	2.88	1440
3/4"	.023	4.14	2070
1"	.040	7.20	3600
1 1/4"	.063	11.34	5660
1 1/2"	.102	18.36	9160
2"	.170	30.60	15300
2 1/2"	.275	49.50	24850
3"	.390	70.20	35000

\*3 Ft./Sec. Velocity is Basic for Hot Water Rating Factors Shown on this Page.

$$\text{VELOCITY FT./SEC.} = \frac{\text{LBS. PER HOUR}}{(\text{GALS. PER FT.}) (3600) (8.3)}$$



## GLYCOL CORRECTION FACTORS

### Fluid Temperature 200°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.952	.988
30	.921	.968
40	.888	.943
50	.852	.912

### Fluid Temperature 180°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.946	.982
30	.913	.961
40	.879	.934
50	.842	.902

### Fluid Temperature 140°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.934	.97
30	.898	.946
40	.861	.916
50	.821	.881

## ALTITUDE FACTORS

Approximate factors for convective heat value at varying altitudes

Altitude	Ferrous Units	Copper Alum. Units
Sea Level	1.000	1.000
1,000 ft.	.984	.969
2,000 ft.	.968	.938
3,000 ft.	.952	.908
4,000 ft.	.936	.878
5,000 ft.	.920	.850
6,000 ft.	.904	.822
7,000 ft.	.889	.795
8,000 ft.	.874	.768
9,000 ft.	.859	.743
10,000 ft.	.844	.718
15,000 ft.	.771	.603
20,000 ft.	.703	.502

## CORRECTION FACTORS FOR STEAM PRESSURES AND AIR TEMPERATURES OTHER THAN STANDARD

STEAM		ENTERING AIR TEMPERATURE, °F														
Pressure		Temp.			STD											
Gauge	Abs. Psi	°F	45	55	65	70	75	80	85	90	100	110	120	130	140	150
(Vac) 15" Hg	7.32	178.9	0.90	0.80	0.70	0.65	0.60	0.56	0.51	0.45	0.39	0.32	0.25	0.18	0.13	0.08
(Vac) 10"	9.78	192.2	1.02	0.91	0.81	0.76	0.71	0.66	0.62	0.55	0.48	0.40	0.33	0.26	0.20	0.14
(Vac) 5"	12.25	202.9	1.11	1.00	0.90	0.85	0.79	0.75	0.70	0.63	0.56	0.48	0.40	0.33	0.27	0.20
(Vac) 0 Psi	14.696	212.0	1.19	1.09	0.97	0.92	0.87	0.82	0.77	0.70	0.63	0.54	0.46	0.38	0.31	0.25
▶ .899	15.595	215.0	1.22	1.11	1.00	0.95	0.90	0.84	0.80	0.75	0.65	0.57	0.48	0.40	0.33	0.26
5	19.70	227.1	1.34	1.22	1.11	1.05	1.00	0.95	0.90	0.81	0.75	0.66	0.57	0.49	0.41	0.34
10	24.70	239.4	1.45	1.33	1.22	1.17	1.11	1.05	1.00	0.91	0.85	0.75	0.66	0.58	0.50	0.42
15	29.70	249.8	1.55	1.43	1.31	1.26	1.20	1.14	1.09	1.00	0.94	0.84	0.75	0.66	0.57	0.49
20	34.70	258.8	1.63	1.52	1.40	1.33	1.28	1.23	1.17	1.07	1.02	0.92	0.82	0.73	0.64	0.55
25	39.70	266.8	1.71	1.59	1.47	1.41	1.36	1.30	1.25	1.15	1.09	0.98	0.89	0.80	0.71	0.62
30	44.70	274.0	1.78	1.66	1.54	1.48	1.42	1.37	1.31	1.21	1.15	1.05	0.95	0.85	0.76	0.68
40	54.70	286.7	1.91	1.79	1.66	1.61	1.54	1.49	1.43	1.32	1.27	1.16	1.06	0.97	0.87	0.78
50	64.70	297.7	2.02	1.90	1.77	1.71	1.65	1.60	1.54	1.42	1.37	1.26	1.16	1.06	0.96	0.87
60	74.70	307.3	2.10	2.00	1.87	1.81	1.75	1.69	1.63	1.51	1.47	1.35	1.25	1.15	1.05	0.95
70	84.70	316.0	2.20	2.09	1.95	1.89	1.83	1.77	1.71	1.59	1.55	1.44	1.33	1.23	1.12	1.03
80	94.70	323.9	2.27	2.17	2.03	1.97	1.91	1.85	1.80	1.69	1.63	1.52	1.41	1.31	1.20	1.10
90	104.70	331.2	2.36	2.24	2.11	2.05	1.98	1.93	1.87	1.74	1.70	1.59	1.48	1.38	1.28	1.17
100	114.70	337.9	2.43	2.31	2.18	2.11	2.05	2.00	1.94	1.81	1.77	1.65	1.54	1.44	1.33	1.23
125	139.70	352.9	2.59	2.47	2.33	2.27	2.21	2.16	2.10	1.96	1.92	1.80	1.69	1.59	1.48	1.38
150	164.70	365.9	2.73	2.62	2.47	2.43	2.35	2.29	2.23	2.08	2.05	1.94	1.82	1.72	1.61	1.51
175	189.70	377.4	2.86	2.74	2.60	2.54	2.47	2.41	2.35	2.21	2.17	2.05	1.95	1.85	1.73	1.63
200	214.70	387.8	2.95	2.85	2.71	2.63	2.58	2.52	2.47	2.31	2.29	2.17	2.06	1.96	1.84	1.75

From Keenan and Keyes — Linear Interpolation.

Note: Gauge pressure should be corrected for altitude.

## CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD

AVERAGE WATER TEMP. °F	ENTERING AIR TEMPERATURE, °F														
	45	55	STD	70	75	80	85	90	95	100	110	120	130	140	150
90	.19	.13	.11	.06											
100	.25	.19	.15	.11	.08	.06									
110	.31	.25	.20	.16	.13	.11	.08	.06							
120	.38	.31	.26	.21	.19	.16	.13	.11	.08	.06					
130	.45	.38	.33	.28	.25	.21	.19	.16	.13	.11	.06				
140	.53	.45	.40	.34	.31	.28	.25	.21	.19	.16	.11	.06			
150	.61	.53	.45	.41	.38	.34	.31	.28	.25	.21	.16	.11	.06		
160	.69	.61	.53	.49	.45	.41	.38	.34	.31	.28	.21	.16	.11	.06	
170	.77	.69	.61	.57	.53	.49	.45	.41	.38	.34	.28	.21	.16	.11	.06
180	.86	.77	.69	.65	.61	.57	.53	.49	.45	.41	.34	.28	.21	.16	.11
190	.95	.86	.78	.73	.69	.65	.61	.57	.53	.49	.41	.34	.28	.21	.16
200	1.05	.95	.86	.82	.77	.73	.69	.65	.61	.57	.49	.41	.34	.28	.21
210	1.14	1.05	.95	.91	.86	.82	.77	.73	.69	.65	.57	.49	.41	.34	.28
▶ 215 (STD.)	1.19	1.09	1.00	.95	.91	.86	.82	.77	.73	.69	.61	.53	.45	.38	.31
220	1.24	1.14	1.05	1.00	.95	.91	.86	.82	.77	.73	.65	.57	.49	.41	.34
230	1.34	1.24	1.14	1.09	1.05	1.00	.95	.91	.86	.82	.73	.65	.57	.49	.41
240	1.44	1.34	1.25	1.19	1.14	1.09	1.05	1.00	.95	.91	.82	.73	.65	.57	.49
250	1.55	1.44	1.34	1.29	1.24	1.19	1.14	1.09	1.05	1.00	.91	.82	.73	.65	.57
260	1.66	1.55	1.44	1.39	1.34	1.29	1.24	1.19	1.14	1.09	1.00	.91	.82	.73	.65
270	1.76	1.66	1.55	1.50	1.44	1.39	1.34	1.29	1.24	1.19	1.09	1.00	.91	.82	.73
280	1.87	1.76	1.66	1.60	1.55	1.50	1.44	1.39	1.34	1.29	1.19	1.09	1.00	.91	.82
290	1.99	1.87	1.76	1.71	1.66	1.60	1.55	1.50	1.44	1.39	1.29	1.19	1.09	1.00	.91
300	2.10	1.99	1.87	1.82	1.76	1.71	1.66	1.60	1.55	1.50	1.39	1.29	1.19	1.09	1.00