

Resilient Seat Butterfly Valves



Description

Designed to last longer with minimal downtime, Siemens resilient seat butterfly valves are available in sizes from 2 to 24 inches (DN 50 to 600) built with the highest temperature and chemical resistance available in the market.

Available in 2-way and 3-way configurations, 2" through 20" butterfly valves are lug style. 24" valves are double-flanged. All have ANSI 125 rated bodies. 3-way valves can be used for mixing and diverting applications and are available in multiple configurations to match job site needs.

These valves are compatible with Siemens A-Series Industrial Electric, and OpenAir[®] Commercial Electric actuators. OpenAir actuators are available in both spring return and non-spring return variants for two-position (On/Off), Floating and Modulating control. All Industrial actuators include a heater to prevent condensation.

Resilient seat butterfly valves provide bubble-tight shut off (leakage class better than ANSI Class VI) up to 175 PSI (Full Cut) and 50 PSI (Under Cut) requirements.

Application

Siemens Resilient Seat butterfly valves are suitable for standard temperature (intermittent 250°F) or high temperature applications (continuous 250°F). Standard temperature assemblies can be field upgraded to high temperature at any time by updating the actuator. There is no need to remove the valve from the piping.

These valves can be used for isolation purposes or as modulating valves. Siemens butterfly valves are optimized for use in Chilled Water, Hot Water and Open Loop Cooling Tower applications.

Features

- High purity, peroxide cured, high temperature EPDM seats to ensure continuous operation at 250°F (121°C)
- Corrosion-resistant, 316 Stainless Steel disc (2" through 12")
- Corrosion-resistant Electroless Nickel Plated Ductile Iron (14" through 24")
- Internal disc-to-stem connection to eliminate leakage through the stem
- Wide variety of direct mount actuators.
- Full 175 PSI and 50 PSI close-off pressure ratings available.

Specifications

Material	Body	ASTM A126 Class A Cast Iron
	Disc for sizes 2"-12"	316 Stainless Steel
	Disc for sizes 14" and above	Electroless Nickel Plated Ductile Iron
	Seat	High purity, peroxide-cured, high temperature EPDM
	Stem Stem Bearing Packing Tee	416 Stainless Steel Heavy Duty Acetal Nitrile Butadiene Rubber (NBR) Ductile Iron (3-Way valves only)
Operating	Body cold working pressure rating	250 psi (17.2 bar)
	Media temperature	-20 to 250°F [continuous] (-28 to 121°C)
	Controlled medium	Hot water, chilled water, condenser water up to 50% Glycol
	Flow characteristic	Modified equal percentage
	Flow Coefficients	Table 1.
	Close-off	2" to 12", 175 PSI, full cut 14" to 24", 150 PSI, full cut 50 PSI dead end service, full cut 50 PSI, all under cut discs
	Angle of rotation	0° to 90°
	Leakage	Bubble tight at 175 PSI close-off (better than ANSI class VI)
	Maximum fluid velocity	30 feet/second (9 m/second)
	Max recommended differential pressure with flow	29 psi (2 bar)
Size Range	2-inch through 24-inch (DN 50 to 600)	
Body Style	Lug (2" through 20") or double flange (24"), 2-way and 3-way, ANSI 125 rated	
Miscellaneous	Dimensions, service envelope, weight	See Tables 5 through 8
	Agency Certification (for actuators)	UL Meets UL 873 or UL 508 cUL Certified to Canadian Standard C22.2 No. 24.93 or C22.2 No. 14
	Agency Certification (for valves)	CE European standard SIL

NOTE:

These performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult your local Siemens office. Siemens, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Table 1. Cv at Opening Angles, Two-Way Valves.

Valve Size (Inches)	Disc Opening Angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	1	7	16	27	43	61	84	114	144
2.5	1.5	11	24	43	67	107	163	223	282
3	2	15	35	61	96	154	267	364	461
4	3	27	62	109	171	274	496	701	841
5	5	43	98	170	268	428	775	1,146	1,376
6	6	56	129	225	354	567	1,025	1,542	1,850
8	12	102	241	421	680	1,081	1,862	2,842	3,316
10	19	162	382	667	1,076	1,710	2,948	4,525	5,430
12	27	353	555	1,005	1,594	2,563	4,393	6,731	8,077
14	34	299	756	1,320	2,149	3,384	5,939	9,974	10,538
16	45	397	1,001	1,749	2,847	4,483	7,867	11,761	13,966
18	58	507	1,281	2,237	3,643	5,736	10,062	14,496	17,214
20	72	632	1,595	2,786	4,536	7,144	12,535	1,812	22,339
24	259	1,028	2,387	4,244	6,962	11,040	18,235	27,186	33,154

Sizing and Selection

1. Determine the designed Cv as follows:

$$Cv = \frac{Q\sqrt{SG}}{\sqrt{\Delta P}}$$

Q = Flow in gallons per minute (GPM) required to pass through the valve

SG = Specific gravity of the fluid (water = 1)

ΔP = Designed pressure drop across the valve in PSI

Cv = Flow coefficient

NOTE: For modulating butterfly valves, size for design flow at 60° rotation.

2. Determine if the valve should be line sized or sized to match the designed pressure drop:

Option 1: On/Off Valves

Select the valve size to equal the pipe size

Option 2: Modulating Valves

Size the valve for design flow at 60° open

3. Determine actual pressure drop as follows:

$$\Delta P = \left(\frac{Q\sqrt{SG}}{Cv} \right)^2$$

Pressure drop is recommended to be no higher than 29 PSI or match the designed pressure drop. For modulating applications 3, 4, 5, and 6 PSI are commonly accepted.

4. Ensure that close-off requirements are met.

Actuator Product Numbers

Table 2. A-Series Industrial Electric Actuators, 24V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A126.600	On/Off	24 Vac/dc	600	68	60 sec. AC 40 sec. DC	1.80	--
A126.2K			2,000	226	60 sec.	2.00	--
A126.5K		24 Vac	5,000	565	60 sec.	4.00	--
A166.600	Modulating	24 Vac	600	68	60 sec.	1.80	--
A166.2K			2,000	226	60 sec.	2.00	--
A166.5K			5,000	565	60 sec.	4.00	--

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

Table 3. A-Series Industrial Electric Actuators, 120V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A226.600	On/Off	120 Vac	600	68	30 sec.	0.80	1.00
A226.1K			1,200	135	30 sec.	0.78	2.10
A226.2K			2,000	226	30 sec.	1.00	2.10
A226.3K			3,000	339	30 sec.	1.20	3.00
A226.5K			5,000	565	30 sec.	1.60	3.00
A226.6K			6,500	734	30 sec.	2.30	3.10
A226.13K			13,000	1,470	110 sec.	2.30	3.10
A226.18K			18,000	2,034	110 sec.	2.50	3.10
A226.21K			21,300	2,406	60 sec.	6.5	14
A226.41K			40,680	4,596	60 sec.	6.5	14
A266.600	Modulating	120 Vac	600	68	30 sec.	0.80	1.00
A266.1K			1,200	135	30 sec.	0.78	2.10
A266.2K			2,000	226	30 sec.	1.00	2.10
A266.3K			3,000	339	30 sec.	1.20	3.00
A266.5K			5,000	565	30 sec.	1.60	3.00
A266.6K			6,500	734	30 sec.	2.30	3.10
A266.13K			13,000	1,470	110 sec.	2.30	3.10
A266.18K			18,000	2,034	110 sec.	2.50	3.10
A266.21K			21,300	2,406	60 sec.	6.5	14
A266.41K			40,680	4,496	60 sec.	6.5	14

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

NOTE: 13K, 18K, 21K and 41K torque models are available starting July 2020.

Ordering a Valve/Actuator Assembly

Use the product numbers in the following table to order a valve or a valve and actuator assembly. The valve product number consists of the type, action, valve size, disc type, and valve configuration.

To order an assembly, add a (-) after the valve product number and then choose the application, actuator, voltage, control signal, end switches followed by a separator (.) and the actuator torque.

Table 4. Product Numbers.

Sample:	B	2	02	F	C	-	S	A	1	2	6	.	600
Valve Type: Butterfly													
Action: 2 = 2-Way 3 = 3-Way													
Valve Size: 02=2", 25=2.5", 03=3", 04=4", 05=5", 06=6", 08=8" 10=10", 12=12", 14=14", 16=16", 18=18", 20=20", 24=24"													
Disc Type: F = Full Cut U = Under Cut													
Valve Configuration: 3-Way - A, B, C, D * 2-Way O = Normally Open C = Normally Closed M = Valve assembly with manual operator													
Denotes Assembly													
Application: S = Standard Temp – Intermittent 250°F Operation H = High Temperature – Continuous 250°F Operation Blank = Siemens Commercial Actuator													
Actuator: A = Industrial Actuator GCA = Siemens SR Commercial Actuator GIB = Siemens NSR Commercial Actuator													
Voltage: 1 = 24V 2 = 120V													
Control Signal: 2 = 2-Position 3 = Floating (Commercial Actuators only) 6 = Modulating (0-10V)													
End Switches: 1 = No switches 6 = Switches													
Separator													
Industrial Actuator Torque (lb-in): 600=600, 1K=1200, 2K=2000, 3K=3000, 5K=5000, 6K=6500, 13K=13000, 18K=18000, 21K=21300, 41K=40680, 3U = Shaft adapter with 3-foot cable (Commercial Actuators only)													

* See Figure 1.

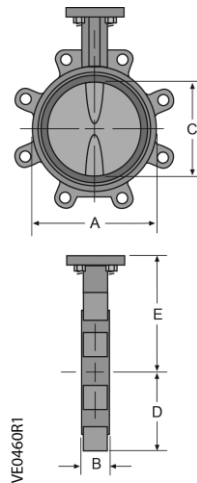
NOTE: 13K, 18K, 21K and 41K torque models are available starting July 2020.

Dimensions – 2-Way, OpenAir Commercial Electric Actuators

Table 5. 2-Way, 2" to 6", Resilient Seat Butterfly Valve Bodies.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data			Weight ¹	
	In.	mm	90°	60°						BC	Holes	Threads	lbs	kg
B202	2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7.0	3.12
B225	2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8.0	3.63
B203	3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9.0	4.08
B204	4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15.0	6.80
B205	5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20.0	9.07
B206	6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23.0	10.43

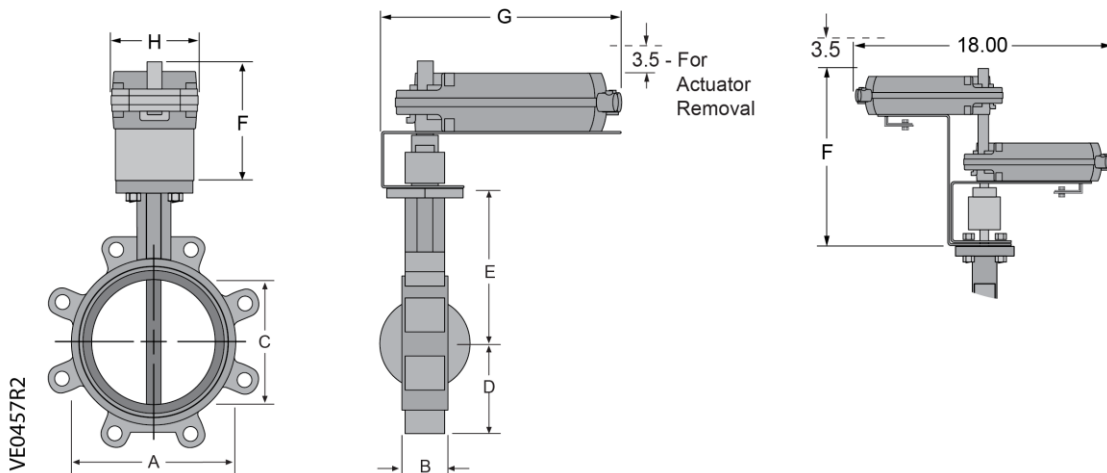
1- Weights are for valve bodies only.



Commercial Actuators

Model Number	F	G	H	Weight ¹	
				lbs	kg
GIB	7.43	10.96	3.95	4.4	2.0
GCA	7.43	10.96	3.95	4.9	2.2
Dual Actuator	11.75	18.00	4.00	12.8	5.8

Largest actuator dimension shown



Configurations – 3-Way Assemblies

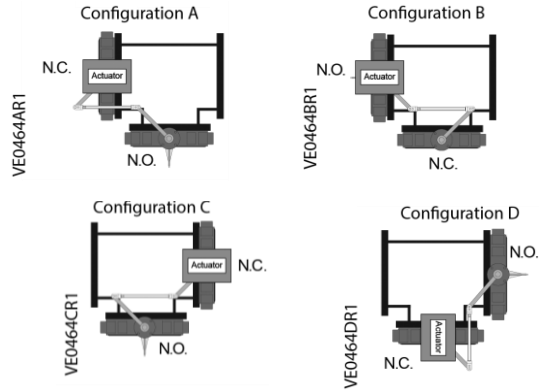
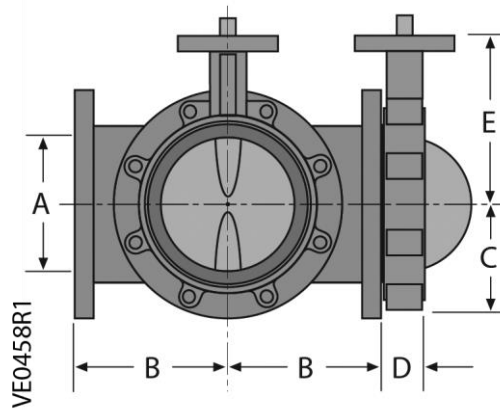


Figure 1. 3-Way Valve Configurations.

Dimensions – 3-Way, OpenAir Commercial Electric Actuators

Table 6. 3-Way, 2" to 6", Resilient Seat Butterfly Valve Bodies.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data		
	In.	mm	90°	60°						BC	Holes	Threads
B302	2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
B325	2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
B303	3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
B304	4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
B305	5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
B306	6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10

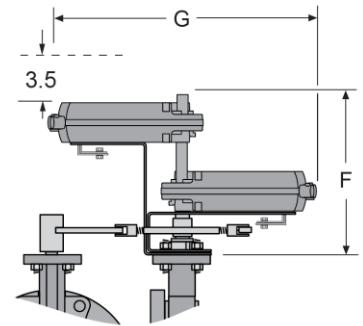
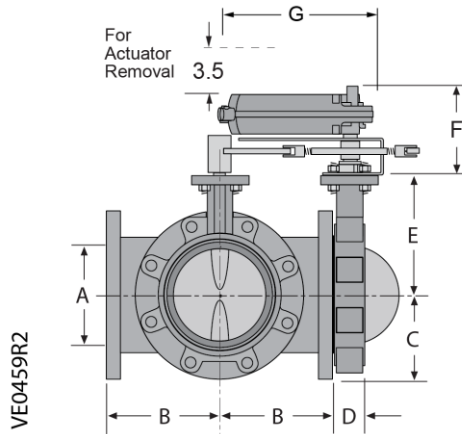


Dimensions – 3-Way, OpenAir Commercial Electric Actuators, Continued

3-Way Tee Weights			
Size		Weight	
Inches	mm	lbs	kg
2	50	19	8.6
2.5	65	27	12.2
3	80	39	17.7
4	100	62	28.1
5	125	79	35.8
6	150	96	43.5
8	200	155	70.3
10	250	270	122.5
12	300	380	172.4
14	350	435	197.3
16	400	550	249.5
18	450	665	301.6
20	500	855	387.8
24	609	1330	603.3

OpenAir Commercial Electric Actuators

Model Number	F	G	Weight ¹	
			lbs	kg
GIB	7.43	10.96	4.4	2.0
GCA	7.43	10.96	4.9	2.2
Dual Actuator	11.75	18.00	12.8	5.8
Largest actuator dimension shown				

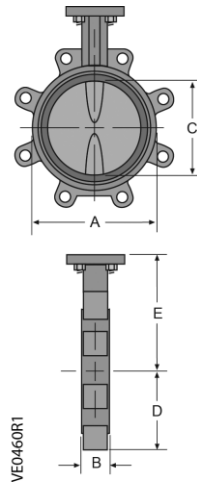


Dimensions – Industrial Actuators

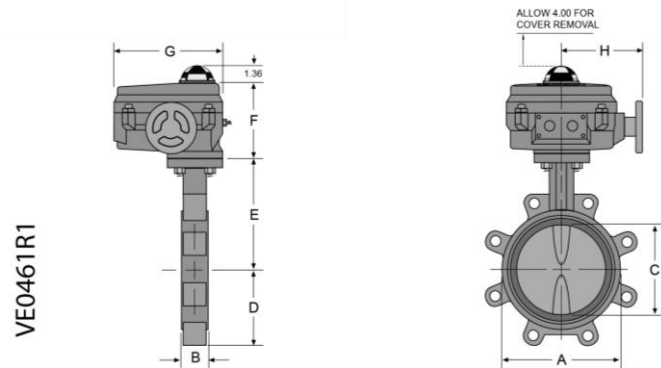
Table 7. 2-Way, 2" to 24", Resilient Seat Butterfly Valve Bodies.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data			Weight ¹	
	In.	mm	90°	60°						BC	Holes	Threads	lbs	kg
B202	2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7	3.12
B225	2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8	3.63
B203	3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9	4.08
B204	4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15	6.80
B205	5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20	9.07
B206	6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23	10.43
B208	8	200	3316	1081	10.59	2.50	7.75	6.05	9.50	11.75	8	3/4-10	42	19.05
B210	10	250	5430	1710	12.75	2.50	9.75	7.69	10.75	14.25	12	7/8-9	66	29.94
B212	12	300	8077	2563	14.88	3.00	11.75	9.02	12.25	17.00	12	7/8-9	88	39.92
B214	14	350	10538	3384	17.05	3.00	13.25	9.93	13.62	18.75	12	1-8	114	51.71
B216	16	400	13966	4483	19.21	4.00	15.25	11.30	14.75	21.25	16	1-8	166	75.30
B218	18	450	17214	5736	21.12	4.25	17.25	12.16	16.00	22.75	16	1 1/8-7	226	102.51
B220	20	500	22339	7144	22.25	5.00	19.25	14.00	17.25	25.00	20	1 1/8-7	305	138.35
B224	24	600	33154	11040	33.00	5.94	23.28	17.56	19.50	29.50	4	1 1/4-7	500	226.80

1- Weights are for valve bodies only.



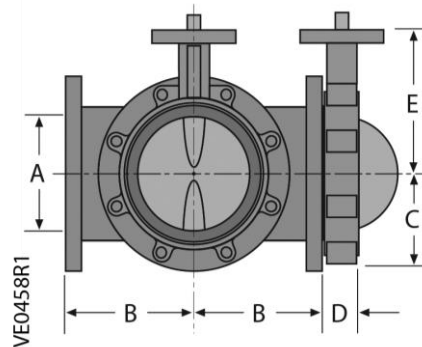
A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.600	5.6	7.5	5.8	13
Axxx.1K/Axxx.2K	6.6	10.1	7.8	28
Axxx.3K/Axxx.5K/Axxx.6K	7.2	12.1	9.5	48
Axxx.13K/Axxx.18K	12.1	18.8	9.5	118
Axxx.21K	12.3	32.1	28.9	195
Axxx.41K	12.3	32.1	28.9	195



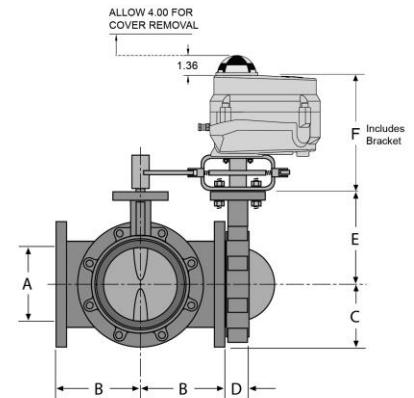
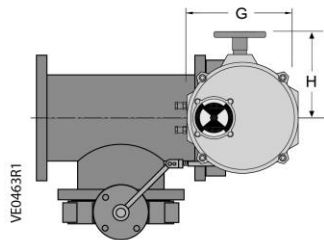
Dimensions – Industrial Actuators

Table 8. 3-Way, 2" to 6", Resilient Seat Butterfly Valve Bodies.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data		
	In.	mm	90°	60°						BC	Holes	Threads
B302	2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
B325	2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
B303	3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
B304	4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
B305	5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
B306	6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10
B308	8	200	3316	1081	8.00	9.00	6.05	2.50	9.50	11.75	8	3/4-10
B310	10	250	5430	1710	10.00	11.00	7.69	2.50	19.75	14.25	12	7/8-9
B312	12	300	8077	2563	12.00	12.00	9.02	3.00	12.25	17.00	12	7/8-9
B314	14	350	10538	3384	14.00	14.00	9.93	3.00	13.62	18.75	12	1-8
B316	16	400	13966	4483	16.00	15.00	11.30	4.00	14.75	21.25	16	1-8
B318	18	450	17214	5736	18.00	16.50	12.16	4.20	16.00	22.75	16	1-1/8-7
B320	20	500	22339	7144	20.00	18.00	14.00	5.00	17.25	25.00	18	1-1/8-7
B324	24	610	33154	11044	24.00	22.00	16.00	5.94	19.50	29.50	20	1-1/4-7



A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.600	8.6	7.5	5.8	12
Axxx.1K/Axxx.2K	10.73	10.1	7.8	28
Axxx.3K	11.33	12.10	3.50	48
Axxx.5K	13.2	12.10	9.50	48
Axxx.6K	13.2	12.10	9.50	118
Axxx.13K/Axxx.18K	20.5	12.10	9.50	118
Axxx.21K	22.3	32.1	28.9	195
Axxx.41K	22.3	32.1	28.9	195



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