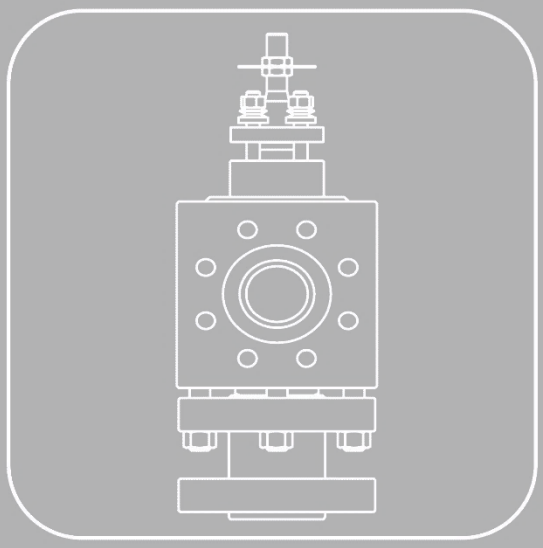


SPECIAL CONTROL VALVES FOR UREA & MELAMINE SERVICE



CV-870U – One piece forged body control valve for HP UREA service – Flanged PN 320

SUMMARY

1. FOREWORD 4
2. BASIC FEATURES 4
3. High Pressure ANGLE VALVES CV-870U for UREA Service 5

3.1. Main Features 5
3.2. Available trims 5
3.3. Materials 5
3.4. Sizes and Pressure Classes 5
3.5. Seat leakage 5
3.6. Design Codes & Product Standards 5
3.7. Options 5

4. Urea High Pressure BUTTERFLY VALVES CV-8660 8

4.1. Main Features 8
4.2. Materials 8
4.3. Sizes and Pressure Classes 8
4.4. Seat leakage 8
4.5. Design Codes & Product Standards 8
4.6. Options 8

5. Low Pressure GLOBE VALVES CV-8408 9

5.1. Main Features 9
5.2. Available trims 9
5.3. Materials 9
5.4. Sizes and Pressure Classes 9
5.5. Seat leakage 9
5.6. Design Codes & Product Standards 9
5.7. Options 9

6. High Pressure ANGLE VALVES CV-870S for MELAMINE Service 11

6.1. Main Features 11
6.2. Available trims 11
6.3. Materials 11
6.4. Sizes and Pressure Classes 11
6.5. Seat leakage 11
6.6. Design Codes & Product Standards 11
6.7. Options 11

7. Accessories 13

1. FOREWORD

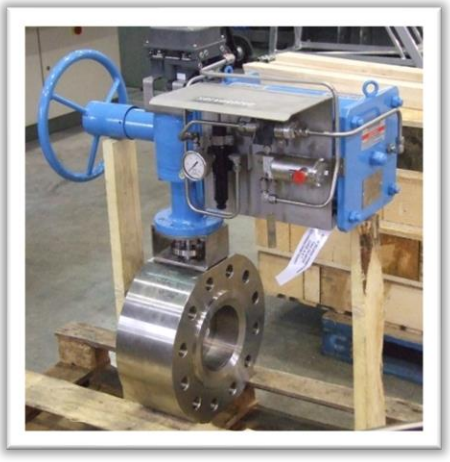


AST was founded in Milan back in 1951 and, since then, it has been serving the most important Italian industrial sites, extending its market shares throughout the world. Production of special valves designed to satisfy customers' specific needs developed the most around 1980's, when AST designed its first valves for melamine plants.
Our expertise has been increasing thanks to the aid of the most updated design methods and the cooperation with important R&D centres for the execution of tests.
AST, thanks to the gained expertise and flexibility, proposes itself as the ideal partner to develop specific products for plants with severe working conditions, granting the long-term reliability of its valves.
The Company's EDP system is constantly updated in order to secure an adequate monitoring of production, purchasing and logistic activities.
AST's EDP system includes an important database for electronic documentation recording, allowing monitoring and immediate availability of documents of origin related to all materials of the valves.

2. BASIC FEATURES



Valve Series CV-870U, CV8408 and CV-8660 were specifically developed from the from basic families CV-8700, CV-8400 and CV-8600 to meet the requirement of a reliable and high performing valve for service on corrosive and crystalizing process fluid.
The valves have been developped on the basis of the experience gained in the field, combined to the optimization of fluid dynamic characteristics and the use of specific materials allowing to obtain high resistance to erosion and corrosion with process fluids particularly aggressive even at high pressures and high temperatures.
One of the peculiarities of the control valves series CV-870U and CV-8660 is that the body and the internal components are made from forged materials. The total absence of threads in all the parts in contact with processing fluid and the absence of stagnation areas avoid possible accumulations and crystallizations. The high stiffness of the stem and the actuator complete their features.
The design also has taken into consideration the simplicity of assembly and disassembly of internal parts to facilitate maintenance operations.

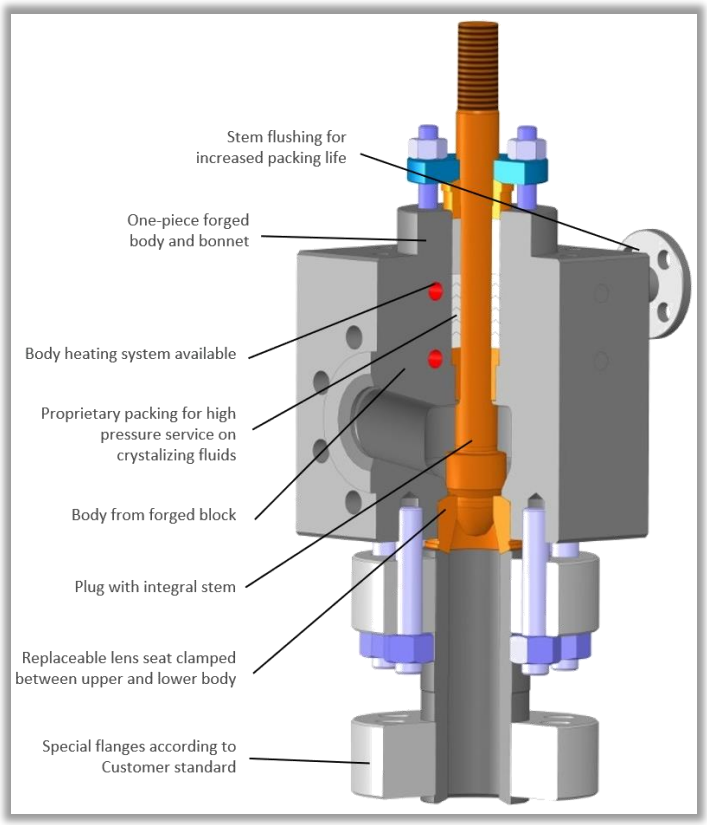


Upon request, valves can be provided electrically traced, or jacketed for steam or diathermic fluids, in order to keep the valve body at the required temperature.
Flushing connections are provided on request, in order to keep clean the valve trim and to grant a good reliability of the valve.
None of the valve components are made with copper or its alloys.
Valves can be equipped with flanged connections in accordance with DIN, ASME and lens type flange in accordance to the Licensor specification.
Pneumatic or electric actuator can be installed, according to customer requirement, for control or on-off service.
The actuator and instrumentation provided with the valve are carefully selected and calibrated to ensure high control performance and reliability.
AST can provide instrumentation with analog or digital communication protocols.

3. High Pressure ANGLE VALVES CV-870U for UREA Service

3.1. Main Features

The peculiarity of these valves is that they are made from a forged block body, in a single piece including bonnet. The total absence of threads in all the parts in contact with process fluid, the absence of stagnation areas and the stem stiffness complete their features.
The expertise gained in the field of urea and melamine plants, the optimization of fluid-dynamic features and the use of specific materials allow to obtain a high resistance to erosion and corrosion, at high pressure, at high operating pressure drops, and at high temperature.
Valve seat is clamped between upper and lower body by means of a flanged connection ensuring easy maintenance and allowing perfect seat to plug alignment.

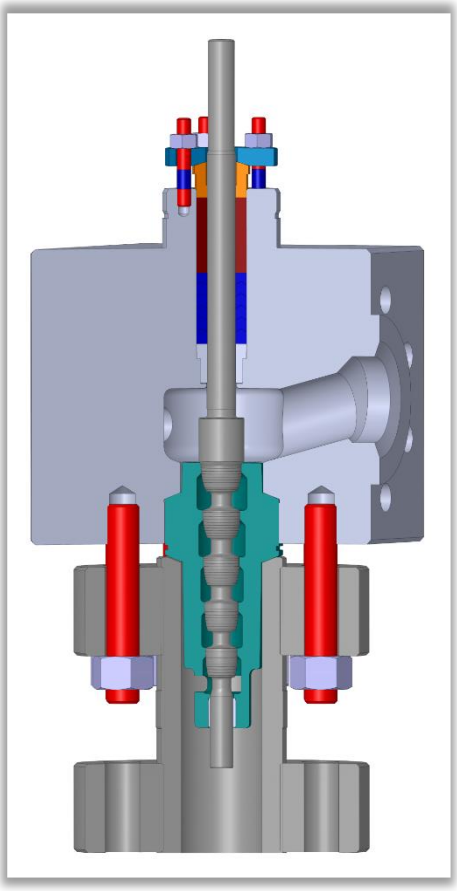


3.2. Available trims

Contoured plug linear, modified linear and equal percentage flow characteristic for control service and quick opening for on-off service are available as standard.
Specialty designed anti-cavitation multi stage cascade trim for most critical service.

3.3. Materials

Body: ASTM A182 F316L, F316L urea grade, Duplex Stainless Steels, F310 MoLn S31050 and others upon request.
Trim: special Duplex Stainless Steels and other materials, in accordance with Licensor standard, are available.
Packing: glass loaded PTFE, proprietary design V-rings, to warrant perfect and reliable stem seal and a proper stem cleaning from crystalized fluid residual. Graphite packing for elevated temperature service is available on request.



3.4. Sizes and Pressure Classes

Size: From NPS 3/4" to NPS 12" as standard, higher dimensions are available on request.
Rating: Up to PN 400 or Class 2500, flanged connections with lenticular metal gasket according to customer specifications.

3.5. Seat leakage

Leakage IEC 60534-4 / ISA FCI 70-2 classes IV and V are available as standard. More stringent leakage classes are available on request.

3.6. Design Codes & Product Standards

IEC 60534, FCI 70-2, EN 12516, EN 1092, ASME B16.34, ASME B16.5, proprietary standards.

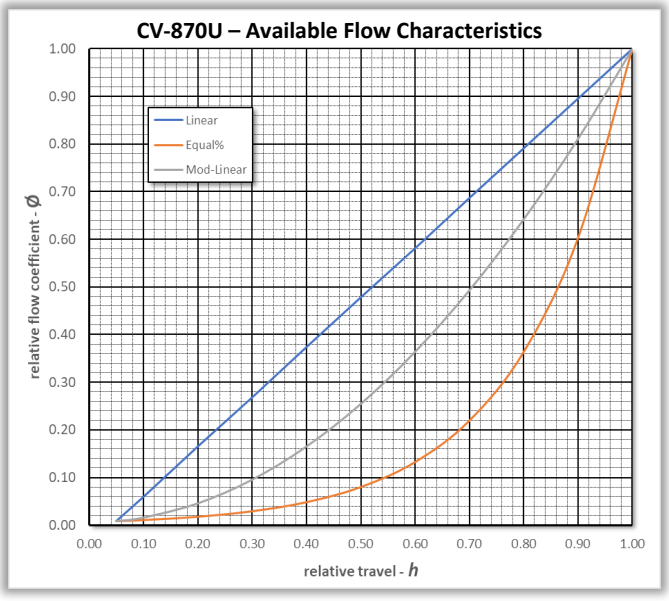
3.7. Options

- Special proprietary materials
- Valve body heating
- Packing flushing
- Flushing nozzles
- Anti-sand protection for valve and actuator stem
- Special tools for assembling/disassembling valves on field.

CV-870U – Coefficients for Linear, Modified Linear and Equal Percentage flow characteristic

DN	Port	Stroke *mm*	Cv Rated	Cv min
3/4"	4	20	0.18	0.022
	6	20	0.402	0.034
	8	20	0.711	0.046
	10	20	1.11	0.059
	12	20	1.58	0.072
1"	12	20	6.12	0.072
	15	20	9.04	0.09
	19	20	12.8	0.12
1 1/2"	12	20	5.93	0.072
	15	20	9.77	0.09
	19	20	15.2	0.12
	23	25	21.2	0.14
	27	25	27.1	0.24
	31	40	32.4	0.34
2"	12	20	5.91	0.072
	15	20	9.7	0.09
	19	20	15	0.12
	23	25	20.5	0.14
	27	25	30	0.24
	31	40	37.7	0.34
	36	40	46.9	0.4
2 1/2"	15	20	9.61	0.09
	19	20	14.6	0.12
	23	25	19.7	0.14
	27	25	31.2	0.24
	31	40	40.3	0.34
	36	40	52.2	0.4
	41	40	64	0.45
	46	50	75.2	0.71
3"	19	20	14.6	0.12
	23	25	19.7	0.14
	27	25	31	0.24
	31	40	39.8	0.34
	36	40	54.6	0.4
	41	40	68.7	0.45
	46	50	83.1	0.71
	51	50	96.9	0.81
	56	50	110	0.89
4"	23	25	19.7	0.14
	27	25	30.4	0.24
	31	40	38.6	0.34
	36	40	53.5	0.4
	41	40	66.5	0.45
	46	50	79.4	0.71
	51	50	91.2	0.81
	56	50	127	0.89
	61	50	146	1.2
	71	50	182	1.4

DN	Port	Stroke *mm*	Cv Rated	Cv min
6"	31	40	38.6	0.34
	36	40	52.5	0.4
	41	40	64.6	0.45
	46	50	76.1	0.71
	51	50	86.4	0.81
	56	50	120	0.89
	61	50	135	1.2
	71	50	162	1.4
	81	60	268	1.7
	91	60	325	2.3
	101	60	380	3
	111	60	431	3.3
8"	61	50	134	1.2
	71	50	160	1.4
	81	60	260	1.7
	91	60	311	2.3
	101	60	358	3
	111	60	498	3.3
	121	80	574	4.7
	131	80	646	5.1
	141	80	716	5.5
	151	80	780	5.9
10"	81	60	252	1.7
	91	60	298	2.3
	101	60	339	3
	111	60	486	3.3
	121	80	556	4.7
	131	80	621	5.1
	141	80	798	5.5
	151	80	891	5.9
	165	80	1020	7.8
	180	80	1150	10
12"	91	60	298	2.3
	101	60	339	3
	111	60	468	3.3
	121	80	528	4.7
	131	80	583	5.1
	141	80	780	5.5
	151	80	866	5.9
	165	80	981	7.8
	180	80	1090	10
	195	80	1450	11



CV-870U – Coefficients - F_L and x_T

		travel	10%	100%
Port 4 to 10 and Port 12 Cv 1.3	Bottom Inlet	F_L	0.97	0.95
		x_T	0.79	0.77
	Side Inlet	F_L	0.90	0.87
		x_T	0.68	0.64
Port 12 to Port 180	Bottom Inlet	F_L	0.97	0.89
		x_T	0.79	0.67
	Side Inlet	F_L	0.52	0.75
		x_T	0.23	0.47

CV-870U – DN 3” PN 250
Body: AISI 316L Urea Grade
Trim: UNS S32550 Duplex Stainless Steel



CV-870U – DN 8” PN 320
Carbammate Recirculation
Body: AISI 316L Urea Grade
Trim: HVD1- Duplex Stainless Steel



CV-870V – DN 3” PN 320
Carbamate Pump Recirculation
Special anti-cavitation trim:
5 stages contoured plug made of hardened UNS S32550 Duplex Stainless Steel.

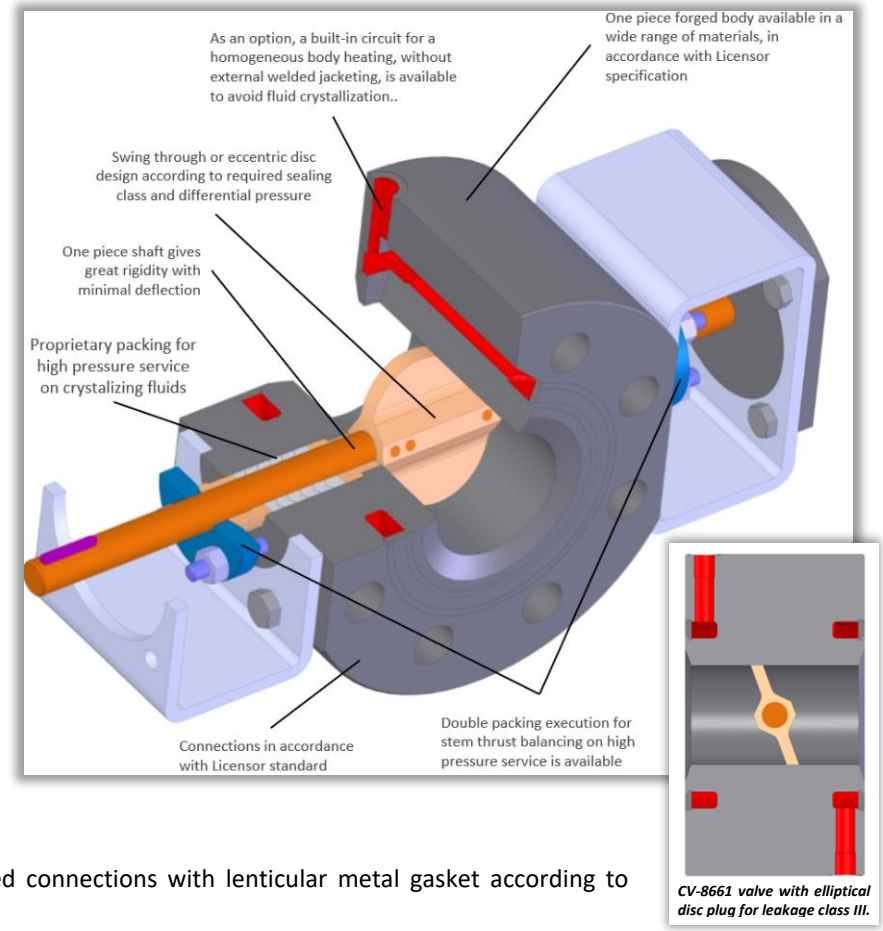




4. Urea High Pressure BUTTERFLY VALVES CV-8660

4.1. Main Features

This series of butterfly valves hss been specially designed for applications on aggressive and corrosive fluids, as required for Urea plant application.
The valve body is from a single forged block. Labyrinth heating circuit for steam or diathermic fluids is available on request.



CV-8661 valve with elliptical disc plug for leakage class III.

4.2. Materials

Body: ASTM A182 F316L, F316L urea grade, Duplex Stainless Steels, F310 MoLn S31050 and others upon request.
Trim: special Duplex Stainless Steels and other materials, in accordance with Licensor standard, are available.
Packing: glass loaded PTFE, proprietary design V-rings, to warrant perfect and reliable stem seal and a proper stem cleaning from crystalized fluid residual.
Graphite packing for elevated temperature service is available on request.

4.3. Sizes and Pressure Classes

Sizes: From NPS 4" to NPS 10" as standard, higher dimensions are available on request.
Rating: Up to PN 400 or Class 2500, flanged connections with lenticular metal gasket according to customer specifications.

4.4. Seat leakage

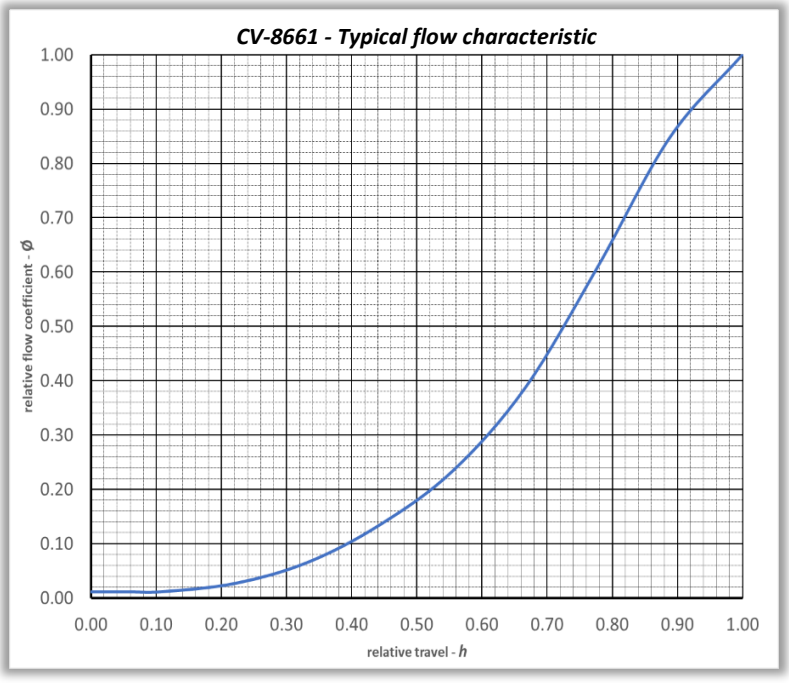
Leakage IEC 60534-4 / ISA FCI 70-2 classes II and III, with closure at 20° with elliptical disc plug, are available as standard. Class I with calibrated leakage at closed position and Class IV are available on request.

4.5. Design Codes & Product Standards

IEC 60534, FCI 70-2, EN 12516, EN 1092, ASME B16.34, ASME B16.5, proprietary standards.

4.6. Options

- Special proprietary materials
- Valve body heating
- Packing flushing
- Flushing nozzles
- Anti-sand protection for valve and actuator stem



CV-8661 – Cv table

DN	Port	Rated Cv	Valve Rang.
4"	77	300	120
4"	90	450	150
6"	116	850	90
6"	135	1230	100
8"	153	1450	115
10"	190	2200	135

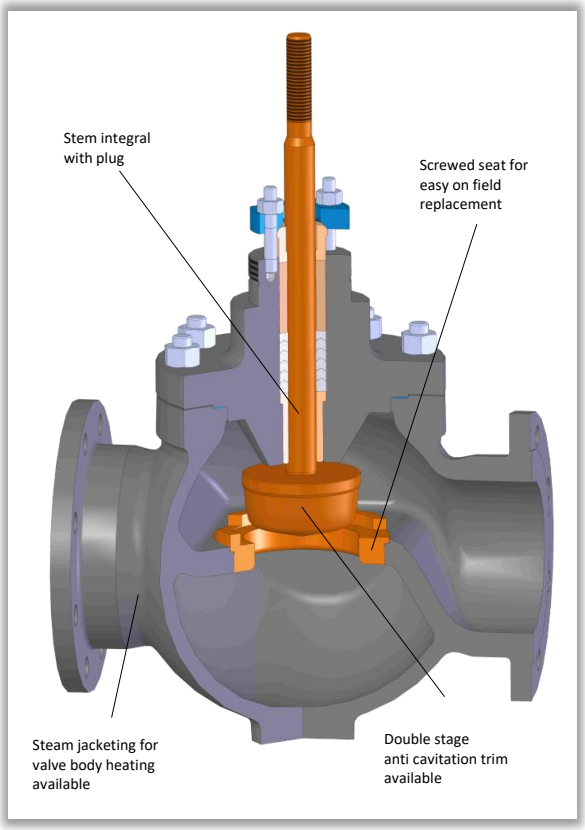
Coefficients - F_L and x_T

travel	10%	100%
F_L	0.95	0.58
x_T	0.85	0.24

5. Low Pressure GLOBE VALVES CV-8408

5.1. Main Features

CV-8408 series has an integral stem with the plug, also having the function of guide, avoiding the presence of dead volumes where crystallizing fluid can accumulate.
Valve seat is screwed inside the body ensuring easy maintenance and on field replacement.



5.2. Available trims

Contoured plug linear, modified linear and equal percentage flow characteristic are available as standard.
Double stage anti cavitation trim is available for special applications.

5.3. Materials

Body: ASTM A351 CF8M or ASTM A351 CF3M as standard.
Trim: Stainless Steel or special Duplex Stainless Steels are available.
Packing: V-Ring or Braided PTFE rings, reinforced graphite rings for high temperature service.

5.4. Sizes and Pressure Classes

Sizes: From NPS 1/2" to NPS 8" as standard, higher dimensions are available on request.
Rating: Class 150 to class 600, ASME or PN flanged connections available as standard.
Connections according to other standards available as an option.

5.5. Seat leakage

Leakage IEC 60534-4 / ISA FCI 70-2 classes IV and V are available as standard.
More stringent leakage classes are available on request.

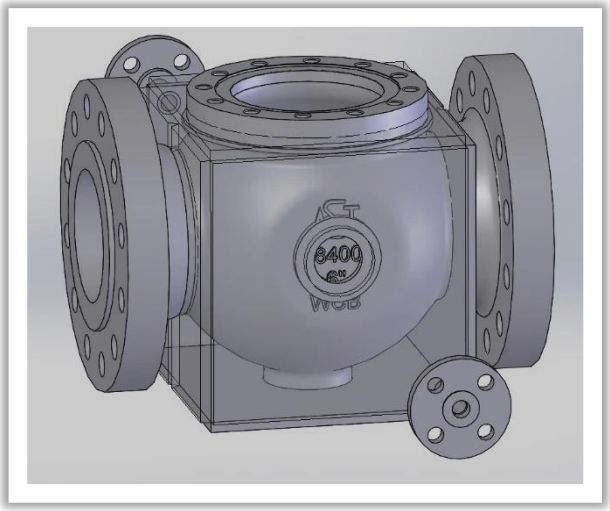


5.6. Design Codes & Product Standards

IEC 60534, FCI 70-2, EN 12516, EN 1092, ASME B16.34, ASME B16.5.

5.7. Options

- Anti-sand protection for valve and actuator stem
- Steam jacketing for valve body heating

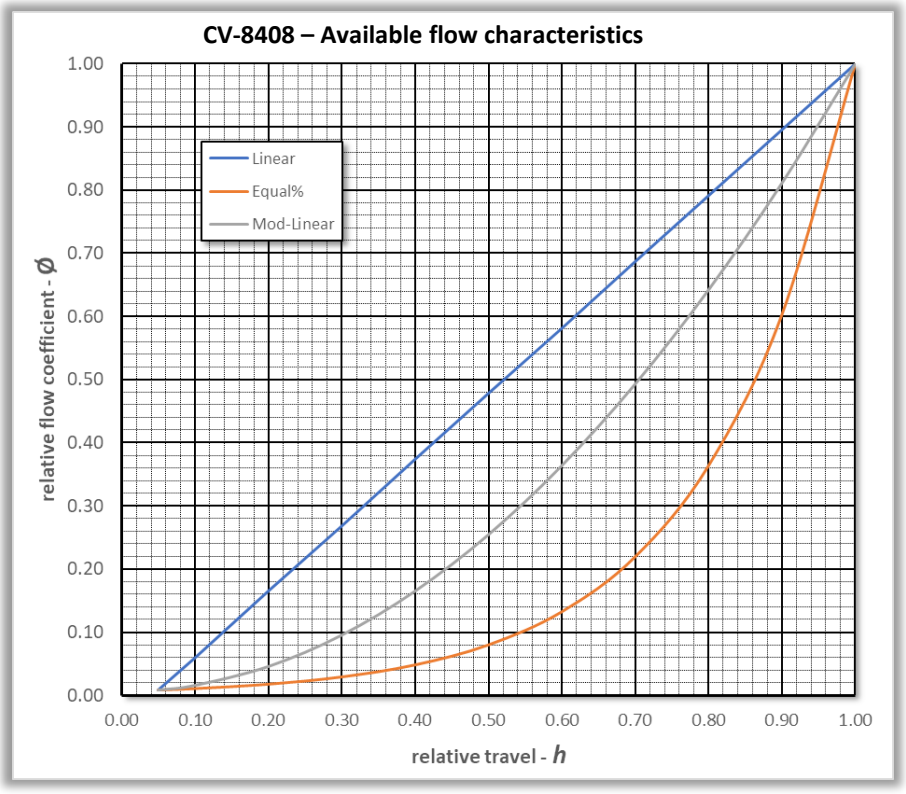


CV-8408 – Coefficients for Linear, Modified Linear and Equal Percentage flow characteristic

DN	Port	Travel *mm*	Cv Rated	Cv min
1/2"	1/32"	13	0.01	0.0017
	3/64"	13	0.04	0.0129
	1/16"	13	0.08	0.0129
	7/64"	13	0.15	0.0236
	1/8"	13	0.25	0.0108
	5/32"	13	0.45	0.0129
	3/16"	13	0.65	0.0212
	1/4"	13	0.85	0.0371
	3/8"	13	1.90	0.0469
	1/2"	13	3.50	0.0688
3/4"	1/32"	13	0.01	0.0017
	3/64"	13	0.04	0.0129
	1/16"	13	0.08	0.0129
	7/64"	13	0.15	0.0236
	1/8"	13	0.25	0.0108
	5/32"	13	0.45	0.0129
	3/16"	13	0.65	0.0212
	1/4"	13	0.85	0.0371
	3/8"	13	1.90	0.0469
	1/2"	13	3.50	0.0688
	3/4"	13	6.00	0.150
1"	1/32"	13	0.01	0.0017
	3/64"	13	0.04	0.0129
	1/16"	13	0.08	0.0129
	7/64"	13	0.15	0.0236
	1/8"	13	0.25	0.0108
	5/32"	13	0.45	0.0129
	3/16"	13	0.65	0.0212
	1/4"	13	0.85	0.0371
	3/8"	13	1.90	0.0469
	1/2"	13	3.50	0.0688
	3/4"	13	6.00	0.150
	1"	13	130	0.2280

DN	Port	Travel *mm*	Cv Rated	Cv min
1 1/2"	3/8"	20	1.9	0.0469
	3/4"	20	6	0.150
	1"	20	13	0.228
	1 1/4"	20	18	0.389
	1 1/2"	20	28	0.484
2"	3/8"	25	1.9	0.0469
	3/4"	25	6	0.150
	1"	25	13	0.228
	1 1/4"	25	18	0.389
	1 1/2"	25	28	0.484
	2"	25	50	0.791
3"	1"	40	13	0.228
	1 1/4"	40	18	0.389
	1 1/2"	40	28	0.484
	2"	40	50	0.791
	2 1/2"	40	76	0.946
	3"	40	110	1.34
4"	1"	40	13	0.228
	1 1/4"	40	18	0.389
	1 1/2"	40	28	0.484
	2"	40	50	0.791
	2 1/2"	40	76	0.946
	3"	40	110	1.34
	4"	40	190	2.47
6"	3"	60	110	1.34
	4"	60	190	2.47
	5"	60	320	3.28
	6"	60	440	5.1
8"	4"	60	190	2.47
	5"	60	320	3.28
	6"	60	440	5.1
	7"	60	545	6.69
	8"	80	650	7.38

Tabulated coefficients are valid for flow under the plug.



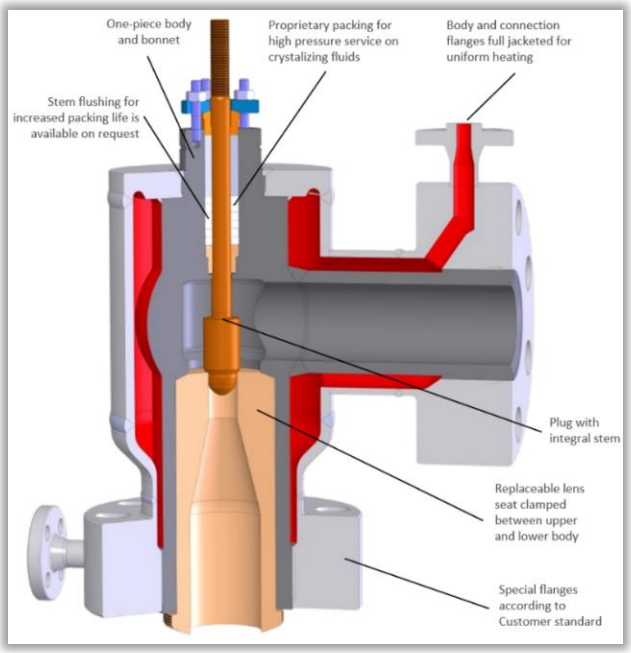
CV-8408 – Coefficients - F_L and x_T

	travel	10%	100%
1/32" to 7/64"	F_L	0.97	0.95
	x_T	0.79	0.77
1/8" to 8"	F_L	0.94	0.90
	x_T	0.74	0.68

6. High Pressure ANGLE VALVES CV-870S for MELAMINE Service

6.1. Main Features

Having started the production of control valves for the melamine service in the 1970s, AST can provide the customer with the experience gained in over 40 years of design, production and on field experimentation.
Valve body is integral with bonnet and fabricated by two forged blocks angle welded with qualified process.
Design is free from threads and stagnation areas in all parts in contact with process fluid.
Valve plug is one piece integral with stem warranting high stiffness, and avoiding crevice corrosion.
Valve body is designeded to maximize flow coefficients and optimize fluid-dynamic features.
Valve seat, outside shaped according to licenser design lenticular metal gasket, is clamped between body lower flange and connected piping flange, ensuring easy maintenance and allowing perfect seat to plug alignment.
Valve body and connection flanges are fully jacketed for heating by high temperature vaporized diathermic oil to avoid any fluid crystallization.



6.2. Available trims

Contoured plug linear, modified linear and equal percentage flow characteristic for control service and quick opening for on-off service are available as standard.

6.3. Materials

Appropriate selection of materials for valve *body and trim*, to maximize resistance to erosion and corrosion, at high pressure and temperature, including Hastelloy C276 and Alloy 59. Hastelloy C22, Hastelloy C276, Alloy 59 and others, in accordance with customer request.
Other materials, in accordance with Licensor standard, are available on request.
Packing: pure soft graphite with Inconel 600 wire reinforcement to warrant mechanical properties and corrosion resistence at operating temperature and providing a proper wipe effect on stem.



6.4. Sizes and Pressure Classes

Size: From NPS 3/8" to NPS 8" as standard, higher dimensions are available on request.
Rating: Up to PN 400 or Class 2500, flanged connections with lenticular metal gasket according to Licensor specifications.

6.5. Seat leakage

Leakage IEC 60534-4 / ISA FCI 70-2 classes IV and V are available as standard.
More stringent leakage classes are available on request.

6.6. Design Codes & Product Standards

IEC 60534, FCI 70-2, EN 12516, EN 1092, ASME B16.34, ASME B16.5, proprietary standards.

6.7. Options

- Special proprietary materials
- Packing flushing
- Flushing nozzles
- Anti-sand protection for valve and actuator stem
- Special tools for assembling/disassembling valves on field.

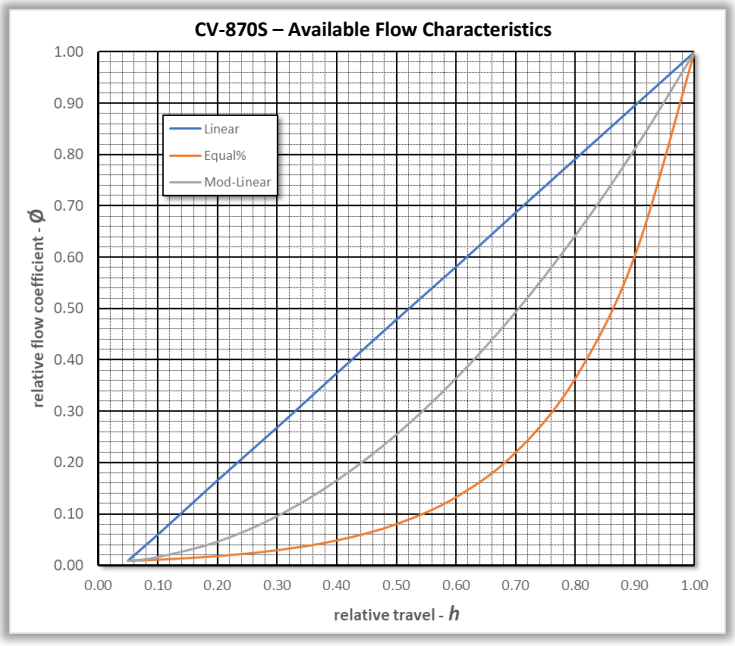
CV-870S – Coefficients for Linear, Modified Linear and Equal Percentage flow characteristic

DN	Port	Travel mm	Cv Rated	Cv min
3/8"	4	20	0.18	0.022
	6	20	0.401	0.0337
	8	20	0.706	0.0459
	12	20	1.52	0.0719
1/2"	4	20	0.18	0.022
	6	20	0.402	0.0337
	8	20	0.712	0.0459
	12	20	5.86	0.0719
	15	20	8.26	0.0899
1"	12	20	6.24	0.0719
	15	20	9.44	0.0899
	19	20	14	0.119
	23	25	18.3	0.144
1 1/2"	12	20	6.36	0.0719
	15	20	9.85	0.0899
	19	20	15.5	0.119
	23	25	22	0.144
	27	25	29	0.24
2"	12	20	6.38	0.0719
	15	20	9.93	0.0899
	19	20	15.8	0.119
	23	25	22.9	0.144
	27	25	31.1	0.24
	31	40	40	0.341
	36	40	51.5	0.396
	41	40	62.8	0.451
2 1/2"	15	20	9.95	0.0899
	19	20	15.9	0.119
	23	25	23.2	0.144
	27	25	31.9	0.24
	31	40	41.8	0.341
	36	40	55.6	0.396
	41	40	70.7	0.451
	46	50	86.7	0.709
	51	50	103	0.809
	56	50	119	0.888
	61	50	134	1.24
3"	19	20	15.9	0.119
	23	25	23.3	0.144
	27	25	32.1	0.24
	31	40	42.1	0.341
	36	40	56.3	0.396
	41	40	72.2	0.451
	46	50	89.5	0.709
	51	50	108	0.809
	56	50	126	0.888
	61	50	145	1.24
	71	50	180	1.44
4"	23	25	23.3	0.144
	27	25	32.2	0.24
	31	40	42.4	0.341
	36	40	57	0.396
	41	40	73.6	0.451
	46	50	92.2	0.709
	51	50	112	0.809
	56	50	134	0.888
	61	50	157	1.24
	71	50	205	1.44
	81	60	253	1.68
	91	60	300	2.28

DN	Port	Travel mm	Cv Rated	Cv min
5"	23	25	23.4	0.144
	27	25	32.2	0.24
	31	40	42.5	0.341
	36	40	57.2	0.396
	41	40	74	0.451
	46	50	93.1	0.709
	51	50	114	0.809
	56	50	137	0.888
	61	50	162	1.24
	71	50	216	1.44
	81	60	274	1.68
	91	60	336	2.28
	101	60	399	2.98
	111	60	459	3.28
	121	80	515	4.69
6"	31	40	42.5	0.341
	36	40	57.2	0.396
	41	40	74.1	0.451
	46	50	93.3	0.709
	51	50	114	0.809
	56	50	137	0.888
	61	50	163	1.24
	71	50	218	1.44
	81	60	280	1.68
	91	60	346	2.28
	101	60	415	2.98
	111	60	484	3.28
	121	80	553	4.69
	131	80	617	5.08
	141	80	676	5.47
8"	61	50	164	1.24
	71	50	221	1.44
	81	60	286	1.68
	91	60	358	2.28
	101	60	437	2.98
	111	60	520	3.28
	121	80	608	4.69
	131	80	696	5.08
	141	80	786	5.47
	151	80	873	5.85
	165	80	992	7.85
	180	80	1110	10.2

CV-870S – Coefficients - F_L and x_T

		travel	10%	100%
Port 4 to 8 and Port 12 Cv 1.31	Bottom Inlet	F_L	0.97	0.95
		x_T	0.79	0.77
	Side Inlet	F_L	0.90	0.87
		x_T	0.68	0.64
Port 12 to Port 141	Bottom Inlet	F_L	0.97	0.89
		x_T	0.79	0.67
	Side Inlet	F_L	0.52	0.75
		x_T	0.23	0.47



7. Accessories

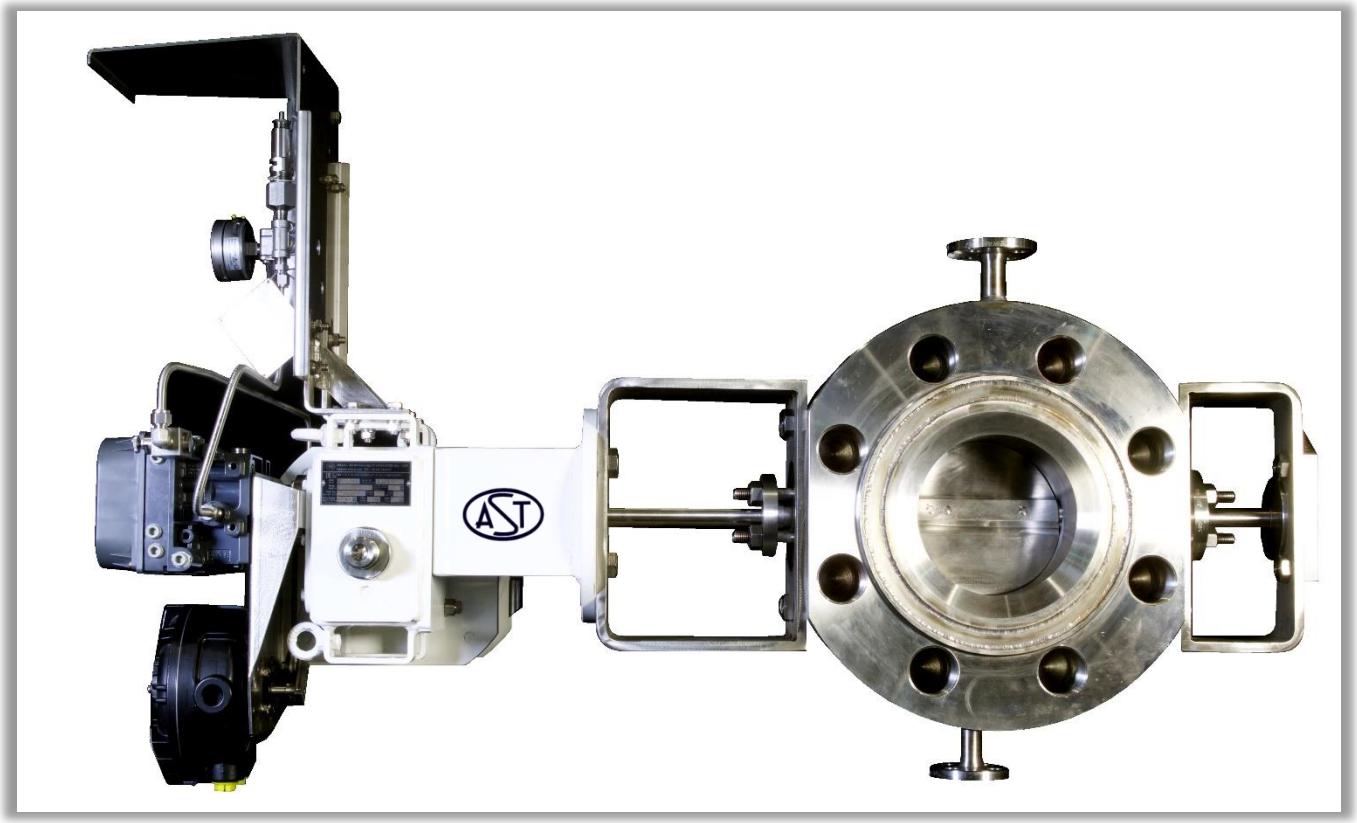
- Pneumatic, electropneumatic or digital positioners,
- Remote position feedback configuration for heavy duty services,
- Air set,
- Flow boosters,
- Lockup valves,
- Solenoid valves for fast strokes and for valve action to fail position,
- Mechanical stroke limiters,
- Hydraulic manual operator.



CV-870S - HP valve for melamine service, with full jacketed body - Flanged PN 320



CV-870S - HP control valve for melamine service, with full jacketed body and actuator support - Flanged PN 320.



CV-8661 – Steam jacketed butterfly valve for for HP urea service – Flanged PN 320

How to reach us







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