DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that INHABITANTS OF THE COUNTY OF CUMBERLAND

Located At 50 COUNTY WAY

CBL: 064- A-013-001

Job ID: 2012-11-5350-HVAC

has permission to Install 2 Tecogen interior generators, 2 heat exchangers for energy efficiency upgrades to existing boilers, **provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.**

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.	A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

closed

City of Portland, Maine - Building or Use Permit Application
389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No:	Date Applied:	CBL:	
2012-11-5350-HVAC	11/6/2012	064- A-013-001	
Location of Construction: 50 COUNTY WAY	Owner Name: INHABITANTS OF THE COUNTY OF CUMBERLAND	Owner Address: 42 FEDERAL ST PORTLAND, ME 04101	Phone:
Business Name: Cumberland County Jail	Contractor Name: AAA ENERGY SERVICE CO.	Contractor Address: P.O. Box 908 SCARBOROUGH MAINE 04074	Phone: (207) 883-1473
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC	Zone: I-L
Past Use: County Jail	Proposed Use: Same: County Jail – to install Tecogen heating system	Cost of Work: $77,000.00 Fire Dept: ✓ ___ Approved ___ Denied ___ N/A Signature: Capt. Prime 11-20-12	CEO District: Inspection: Use Group: I-3 Type: HVAC MUBEC. 09 Signature:
Proposed Project Description: Install 2 Tecogen Cogen Units		Pedestrian Activities District (P.A.D.)	
Permit Taken By: Lannie			

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building Permits do not include plumbing, septic or electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland ___ Wetlands ___ Flood Zone ___ Subdivision ___ Site Plan ___ Maj ___ Min ___ MM Date: 11/6/12	___ Variance ___ Miscellaneous ___ Conditional Use ___ Interpretation ___ Approved ___ Denied Date:	✓ Not in Dist or Landmark ___ Does not Require Review ___ Requires Review ___ Approved ___ Approved w/Conditions ___ Denied Date:

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the appication is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT ADDRESS DATE PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE DATE PHONE

1-16-13 Dwn Joe 603-868-8295 Final OK

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

Electrical - Commercial

Final Inspection

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.

PORTLAND MAINE
Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Director of Planning and Urban Development
Jeff Levine

Job ID: 2012-11-5350-HVAC **Located At:** 50 COUNTY WAY **CBL:** 064- A-013-001

Conditions of Approval:

Building

1. Application approval based upon information provided by the applicant or design professional. Any deviation from approved plans requires separate review and approval prior to work.
2. Equipment shall be installed in compliance with the manufacturer's specifications and the UL listing.
3. The installation must comply with the State of Maine Gas Regulations.
4. The and venting shall be installed in accordance with the UL listing, manufacturer's specifications, and NFPA 211.

Fire

Installation shall comply with City Code Chapter 10.

Installation shall comply with NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*;

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*;

NFPA 54, *National Fuel Gas Code*;

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*;

NFPA 91, *Standard for Exhaust Systems for Air Conveying Vapors, Gases, Mists, and Noncombustible Particulate Solids*;

NFPA 70, *National Electrical Code*; and the manufacturer's published instructions.

2012-11-5350

FILL IN AND Sign WITH INK

I-L

APPLICATION FOR PERMIT
HEATING OR POWER EQUIPMENT

Inhabitants of The County of Cumberland Dick - Mr. Dyer - Call when ready

776-0193

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL Cumberland County Jail Use of Building Jail Date 11/6/12

Name and address of owner of appliance 50 County Way 64-A-13

Installer's name and address AAA Energy Service Co PO Box 908

Scarborough, Maine 04070 Telephone 207-883-1473

Location of appliance:
- O Basement
- X Floor
- O Attic
- O Roof

Type of Fuel:
- X Gas
- O Oil
- O Solid

Appliance Name: Tecogen

U.L. Approved X Yes O No

Will appliance be installed in accordance with the manufacture's installation instructions? X Yes O No

IF NO Explain: ____

The Type of License of Installer:
- O Master Plumber #
- O Solid Fuel#
- O Oil#
- X Gas# PNT1132
- O Other-

Type of Chimney:
- O Masonry Lined
  Factory built
- O Metal
  Factory Built U.L. Listing #
- O Direct Vent
  Type ____ UL#

Type of Fuel Tank
- O Oil
- X Gas

S eofTank ____

RECEIVED NOV 06 2012 Dept. of Building Inspections City of Portland Maine

Number of Tanks

Distance from Tank to Center of Flame ____ feet.

Cost of Work: $ $77,000

Permit Fee: $ 790

Approved

Fire: ____

Ele.: ____

Bldg.: ____

Approved with Conditions

O See attached letter or requirement

Inspector's Signature Date Approved

Signature of Installer [signature]

White - Inspection Yellow - File Pink - Applicant's Gold - Assessor's Copy

64.A.13

Dick Dyer

From: Kerri-Ann Richard [KRichard@americandg.com]
Sent: Monday, November 05, 2012 1:29 PM
To: Dick Dyer
Cc: jcasey@yates-electric.com
Subject: Equipment specs for Maine
Attachments: BP422-122.pdf; Beckwith M-3410A-SP.pdf; Amot-Valve-CM-75-units-.pdf; Grundfos-curve-data-sheets.pdf; Mechanical Room Plan.pdf; CM-75 Specs.pdf

Hi Dick:

1) Heat Exchangers: Two (2) 412-122 B&G Brazed Plate (see Specs)
2) Cogen Units: Two (2) Tecogen CM-75 Low Emissions (see Specs)
3) See enclosed Mechanical room floor plan
4) Pumps: Grunfos 2x 40-240's and 2 x 50-160's all cast iron (see Specs)
5) Beckwith M3410A (see Specs)
6) Amot valve (see Specs)

Please let me know if you need anything else.

Kerri-Ann Richard
Project Engineer
American DG Energy Inc.
45 First Avenue
Waltham, MA 02451
phone: (781) 522-6028
cell: (781) 296-9577
fax: (781) 522-6050

AMERICAN DG ENERGY ADGE LISTED NYSE AMEX

1 Module Specifications

1. Module Specifications

The TECOGEN® is a packaged, indoor, cogeneration module that produces both electricity and hot water. It is available at power outputs of 60 kW and 75 kW. The general specifications are presented below.

The TECOGEN® is available with an emissions control option. Detailed specifications on this option are presented in Appendix 1.

The following sections identify the specifications of the primary components of the TECOGEN®.

TECOGEN® Cogeneration Module General Specifications

Model	CM-60 Standard	CM-60 Low Emissions	CM-60 Ultra[1]	CM-75 Standard	CM-75 Low Emissions	CM-75 Ultra[1]
Electrical Output (kW)	60 kW			75 kW		
Thermal Output (Btu/hr)	440,000	458,000	439,000	490,000	511,000	489,000
Engine Jacket/Exhaust Manifolds Remote Exhaust Gas Heat Exchanger		301,000 157,000	289,000 150,000		336,000 175,000	322,000 167,000
Gas Input	760 scfh	782 scfh		900 scfh	927 scfh	
Overall Efficiency @LHV of 905 Btu/scf @HHV of 1020 Btu/scf	93.8% 83.2%	93.6% 83.1%	90.9% 80.7%	91.6% 81.3%	91.4% 81.1%	88.8% 78.7%
Required Gas Pressure	10-28" wc					
Design Hot Water Flow	22 gpm (24 gpm max)					
Maximum Leaving Water Temperature	230 °F					
Maximum Entering Water Temperature	180 °F					
Electrical Service	208V/230V/460 V, 3 PH, 3 – wire					
Acoustic Level	70 dBa @ 20'					
Dimensions	7' 2" L x 3' 8" W x 3' 10"H					
Weight	3000 lb					

Safety Compliance

ETL Listed—Labeled for compliance with the AGA Standard for Gas-Fired Engine Driven Cogeneration Appliances (2-89).

IPX4 Certified—Control and switchgear enclosures have been certified to IPX4 in accordance with IEC 60529. IPX denotes ingress protection against water. IPX4 rating indicates that the enclosures are protected against water splashed from any direction and water sprayed at an angle up to 60° on either side of the vertical.

Interconnection Compliance

IEEE P1547/D07— Certified by Intertek Testing Services to be in compliance with this Draft Standard for Interconnecting Distributed Resources with Electric Power Systems. See Section 1.5.1 for further information.

California Rule 21— Certified to meet the Type Testing and Production Testing requirements of California Rule 21.
Also certified as Non-Islanding.

Notes
1. *The Ultra is an advanced emission control option that meets California's SCAQMD 1110.2 and has NJDEP certification for a streamlined permitting process in New Jersey.*
2. *Above performance data is valid up to 100 °F ambient temperature.*
3. *All specifications are +/- 5% and are subject to change without notice.*

Bell & Gossett BPX™

Brazed Plate Heat Exchanger Specification Sheet

Bell & Gossett Heat Transfer Products
175 Standard Parkway
Cheektowaga, New York 14227
1-800-447-7700
www.bellgossett.com

Qty 2

Customer: Date:
Item: Contact:
Inquiry Number:

Performance of One Unit	**422-122**		**Units Connected in Parallel: 1**	
Fluid Name	Water (liquid)		Water (liquid)	
Total Flow	30.0	gpm	50.0	gpm
Inlet Temperature	230.0	F	180.0	F
Outlet Temperature	179.8	F	209.7	F
Operating Pressure	0.0	psig	0.0	psig
Pressure Drop, allow./calc.	0.0/ 0.3	psig	0.0/ 0.9	psig
Density	60.02	lb/ft^3	60.24	lb/ft^3
Viscosity	0.295	cps	0.314	cps
Specific Heat	1.001	Btu/lb-°F	1.000	Btu/lb-°F
Thermal Conductivity	0.380	Btu/hr-ft-°F	0.379	Btu/hr-ft-°F
Specified Fouling Factor	0.00000	ft^2-hr-°F/ Btu	0.00000	ft^2-hr-°F/Btu

Total Heat Exchanged	720813.0	btu/hr
LMTD	NaN	F
Overall Heat Transfer Coefficient, Clean	587	Btu/hr-ft^2-°F
Overall Heat Transfer Coefficient, Service	587	Btu/hr-ft^2-°F
Excess Surface	NaN	%

Construction

Number of Flow Channels	60	61
Number of Flow Passes	1	1
Design Pressure	435 psig	435 psig
Design Temperature	450 °F	450 °F
Inlet Connection (Location) Type	(1) 2" NPT Male Thread	(3) 2" NPT Male Thread
Outlet Connection (Location) Type	(4) 2" NPT Male Thread	(2) 2" NPT Male Thread
Internal Volume	0 gal.	0 gal.

Model	**422-122**
Total Number of Plates	122
Total Heat Transfer Surface Area	129.62 ft^2
Total Internal Volume	0 gal.
Estimated Weight, Empty	0 lbs.
Estimated Weight, Operating	0 lbs.
Overall Dimensions, H x W x D	24.25" x 7.48" x 0"
Plate Material	316L SS
Brazing Material	Copper

Chris Ryan

ITT Ver. No. 1.3.5.0

Type key

Example	UPS	50	-40	(/2)	F	(B)
Type range - UP: Single-speed pump - UPS: Two- or three-speed pump						
Nominal flange diameter [mm]						
Max. head [dm]*						
Number of motor poles (stated if available both as 2- and 4-pole motor)						
Pump with flanges						
Pump with bronze housing						

* With the exception of the following pump types, where the number is to be considered as a reference number:
UP 53-45, UP 53-46, UPS 53-55/57 and UPS 75-69

Nameplate

TM03 7712 4806

Fig. 1 Example of nameplate

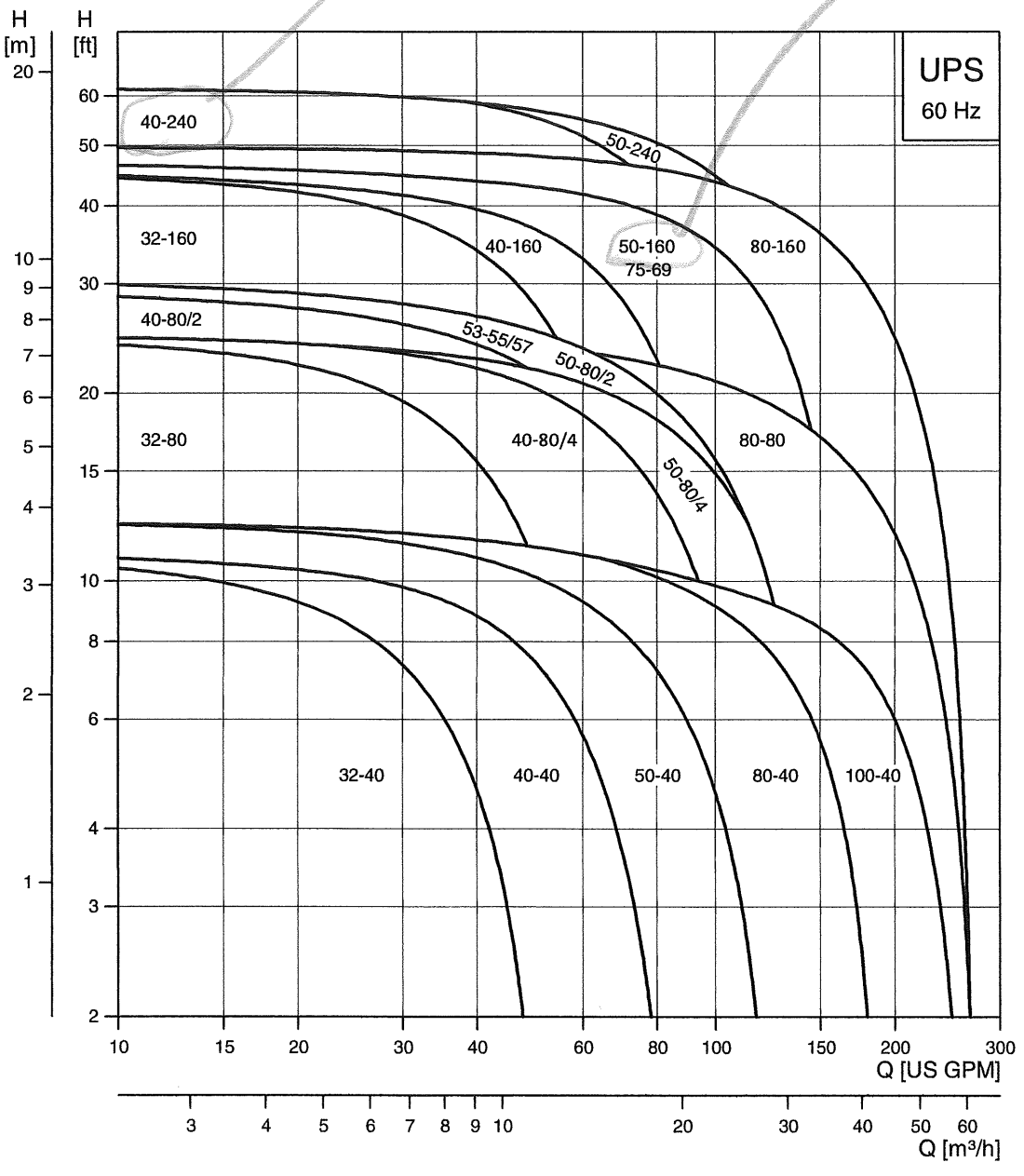
Pos.	Description
1	Type code
2	Product number
3	Model designation
4	Production code (year + week)
5	Country of origin
6	Number of phases and rated voltage
7	Current at speeds 1, 2, 3
8	Power at speeds 1, 2, 3
9	Direction of rotation
10	Approvals
11	Temperature limits
12	Rated frequency
13	Capacitor size
14	Locked Rotor Amps
15	Insulation class

Performance range

UPS pumps

The curves show maximum performance curves for the UPS range:

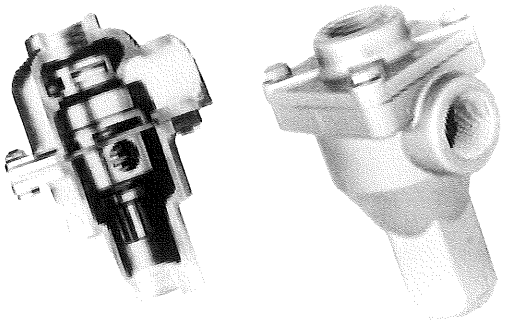
- single-voltage pumps
- two- and three-speed pumps.



Model C

CM, CL, CF, CCM

Thermostatic Valve



FEATURES

- **FLOW RATES OF 6 - 54 GPM**
- **TAMPER-PROOF TEMPERATURE SETTINGS OF 65°F TO 235°F**
- **COMBINATIONS AVAILABLE:**
  - **~ Steel, Bronze, Cast Iron, and Aluminum Housing**
  - **~ 1/2" to 1-1/2" Pipe Sizes**
  - **~ Threaded & Flanged Connections**
- **POSITIVE 3-WAY VALVE ACTION**
- **COMPLETELY SELF-CONTAINED**

APPLICATIONS

- **ENGINE & COMPRESSOR COOLING SYSTEM**
- **LUBE OIL SYSTEMS**
- **COGENERATION HEAT RECOVERY SYSTEMS**
- **PROCESS CONTROL**
- **TEMPERATURE MIXING OR DIVERTING**

AMOT Model C Thermostatic Valves are available in a wide selection of sizes and settings to fill a multitude of fluid temperature control requirements. They utilize the proven expanding wax principle to actuate the 3-way temperature element assemblies. Sturdy housings of cast iron, aluminum, bronze, or steel fit almost any applications or pressure rating. Because some fluids such as synthetic lubricants are not compatible with copper or brass, AMOT element assemblies are available with nickel plating.

The available Model CM, CL, CF and CCM valves may be used for diverting or mixing service. They are ideal for blending two streams of differing temperatures to a desired temperature. They make very economical temperature limiting valves to prevent scalding in home, motel or hotel hot water supply systems. Radiant heating systems can use these valves in limiting water temperature to prevent surface cracking and over-heating of plastic piping. Other applications include electronic and battery cooling circuits, pump temperature relief valves, etc.

When used as mixing valves or hot water temperature limiters, the differential pressure between C and B ports must not exceed 20 psi. When used in "Water Saver" applications pressure in at A must not exceed that at C or B ports by more than 75 psi.

Many special variations on standard Model C valves are available for particular requirements.

- Nickel plated element & Viton seals
  - ~ synthetic lubricants
  - ~ deionized water in electronic cooling circuits
- Electroless Nickel plated elements & Neoprene seals
  - ~ lube system of ammonia refrigeration compressors
  - ~ salt water systems
- Electroless Nickel plated elements & Buna N seals
  - ~ lube systems with Hydrogen Sulfide in oil
- Neoprene seals
  - ~ lube oil system of freon refrigeration compressors
- Leak holes
  - ~ 2-way water saver applications
  - ~ start up under cold ambient conditions
- Special threaded or flanged connections

APPLICATION

Model C is available in various versions for custom fit or application needs.

Model CM - The most commonly selected version because of the wide availability of options. They have threaded connections and are for flows of 9 to 32 GPM.

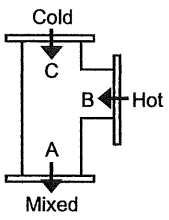
Model CL - A low flow version of the Model CM. Selected for flow of 6 to 12 GPM (for lower flows see Model J).

Model CF - Flange version available only in 1-1/2 sizes. The cast iron valve has ANSI class 125# flat face flanges. For high pressure requirements the steel valve is available in ANSI class 150#, 300#, and 600# raise face flanges.

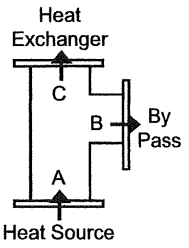
Model CCM - High flow version for 28 to 54 GPM. Only available in 1-1/4 NPT connections and cast iron body. A bronze version is special order.

PIPING DIAGRAMS

FOR MIXING APPLICATIONS



FOR DIVERTING APPLICATIONS



SELECTION / DIMENSIONS

BRONZE HOUSING - CM, CL

Basic Model	Pipe Size	U	V	W	Y	Z	Net Weight (lbs.)
1/2C	1/2	3-7/8	2-1/4	3-1/8	1-7/8	6-1/8	4-3/4
3/4C	3/4	3-7/8	2-1/4	3-1/8	1-7/8	6-1/8	4-3/4
1C	1	3-7/8	2-1/4	3-1/8	1-7/8	6-1/8	5
1-1/2C	1-1/2	4-5/8	2-7/8	3-3/8	1-1/2	6-1/4	7-3/8

ALUMINUM HOUSING - CM, CL

3/4C	3/4	3-3/4	2-1/8	3-1/4	2-1/8	6-5/16	2
1C	1	3-3/4	2-1/8	3-1/4	2-1/8	6-5/16	2

CAST IRON HOUSING - CM, CL, CCM

Basic Model	Pipe Size	U	V	W	Y	Z	Net Weight
1/2C	1/2	3-9/16	2	3-1/8	1-3/4	6	4-3/4
3/4C	3/4	3-5/8	2	3-1/8	1-3/4	6	4-3/4
1C	1	3-5/8	2	3-1/8	1-3/4	6	4-3/4
1-1/2C	1-1/2	4-5/8	2-7/8	3-3/8	1-1/2	6-1/4	6-1/4
1-1/4CCM	1-1/4	7-1/2	4-3/8	3-7/8	1-9/16	6-1/8	9-3/8

STEEL HOUSING - CM, CL, CF

3/4C	3/4	3-13/16	2-1/8	3-5/8	2-1/8	6-5/16	7-1/2
1C	1	3-13/16	2-1/8	3-5/8	2-1/8	6-5/16	7-1/2
1-1/2CFSJ	1-1/2	—	2-7/8	7	5	3-31/32	20
1-1/2CFSH	1-1/2	—	2-7/8	8	6-1/8	4-3/4	30
1-1/2CFSK	1-1/2	—	2-7/8	8-3/4	6-1/8	5-1/8	36
1-1/2CFCF	1-1/2	—	—	7	5	3-31/32	25

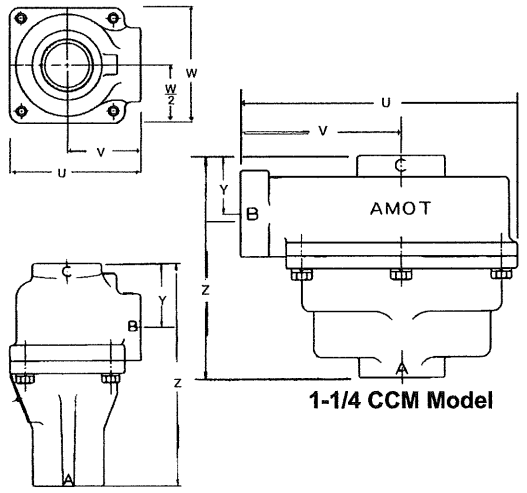
*All Dimensions in inches

INSTALLATION

These valves may be mounted in any position. When connecting the piping, never use excessive force to stop thread leakage. Apply a quality thread sealant such as Loctite™ Pipe Sealant to the pipe threads. Do not permit sand, scale, wood chips or other objects to enter the valve as they can block the element sliding valve and prevent proper operation.

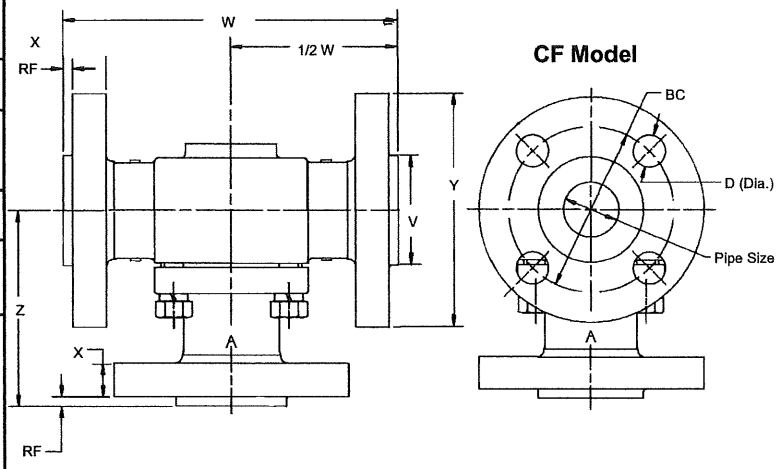
If the valve is to be installed at a high point in liquid systems, a small hole should be drilled in the top of the element (if no leak hole was ordered initially) to permit air to vent and to prevent build-up of air volume around the element.

When valves are used for diverting service, the inlet is Port A (temperature sensing port), with Port C being connected to the cooler, and Port B connected to the cooler by-pass line. For mixing service, Port C is the cold fluid inlet port from the cooler, Port B is the hot by-pass fluid inlet, and Port A is the common outlet. Port A is the temperature sensing port and will mix the hot and cold fluids in the correction proportion so as to produce the desired outlet temperature leaving Port A.



1-1/4 CCM Model

1/2, 3/4, 1-1/4, 1-1/2 C Model



CF Model

FLANGE

No. of Holes	D	B,C	X	RF
4	5/8	3-7/8	1/2	1/16
4	7/8	4-1/2	3/4	1/16
4	7/8	4-1/2	7/8	1/4
4	5/8	3-7/8	—	—

SPECIFICATIONS

Internal Trim Materials ..... Stainless Steel & Bronze
Standard Seal Materials ..... Buna N
Max. Pressure Drop Across Valve ..... 20 psi (140 kPa)
Valve Pressure Rating:
- Cast Iron Body ..... 150 psi (134 kPa)
- Bronze Body ..... 150 psi (134 kPa)
- Aluminum Body ..... 350 psi (2412 kPa)
- Steel Body, CMS, CLS ..... 700 psi (4823 kPa)
- CFSJ ..... 230 psi (1585 kPa)
- CFSH ..... 655 psi (4512 kPa)
- CFSK ..... 1050 psi (7234 kPa)

Weight ..... See Selection / Dimensions

For long life, standard AMOT C valves should not be exposed to continuous temperatures exceeding 65°F above the nominal temperature setting. For occasional short periods such as 1/2 hour, they can be exposed to temperature of 90°F above the nominal temperature setting, but not to exceeded 250°F. Contact factory for special requirements.

AVAILABLE VERSIONS TABLE

Cast Iron	Bronze	Alum.	Steel	Stainless Steel
Threaded	Threaded	Threaded	Threaded	
1/2 CM/CL	1/2 CM/CL	3/4 CM/CCL	3/4 CM/CL	Special
3/4 CM/CL	3/4 CM/CL	1 CM/CL	1 CM/CL	Order
1 CM/CL	1 CM/CL	Flanged	Flanged	Only
1-1/4 CCM	1-1/2 CM/CL	None	1-1/2 CFSJ	
1-1/2 CM/CL	Flanged		1-1/2 CFSH	
Flanged	None		1-1/2 CFSK	
1-1/2 CFCF				

HOW TO ORDER

Use Select Chart and Version Table to make basic selection. When ordering please specify the following:

1. Pipe Sizes connections (see Table A of Model Code System below).
2. Indicate Model CM, CCM, CL or CF (see Table B).
3. Housing Material (see Table C).
4. Type of Connection (see Table D).
5. Nominal Temperature Setting (see Table E).
6. Element Type and Seal Material (see Table F).
7. Element Leak Hole, if required (see Table G).

SELECTION TABLE

All Flow Rates in US GPM

	Water or Water/Glycol		Lubricating Oil (at 100°F)					
			SAE 10-20 SSU 170-550		SAE 30 SSU 550-800		SAE 40 SSU 800-1100	
Model No.	Flow Rate Min.	Max.	Flow Rate Min.	Max.	Flow Rate Min.	Max.	Flow Rate Min.	Max.
1/2 CL	6	10	5	9	4	8	4	8
1/2 CM	9	18	8	16	8	14	7	14
3/4 CL	7	11	6	11	6	10	5	10
3/4 CM	13	25	11	21	10	20	10	19
1 CL	7	11	6	11	6	10	5	10
1 CM	14	27	11	21	10	20	10	19
1-1/4 CCM	28	54	24	46	23	42	22	41
1-1/2 CL	8	12	7	13	7	12	6	12
1-1/2 CM	17	32	13	24	12	23	12	22
1-1/2 CF	17	32	13	24	12	23	12	22

MODEL CODE SYSTEM

3/4 CM A T 120 01 - - ( )

Special Requirements (MTO) Made-To-Order

TABLE A — Valve Size

1/2"
3/4"
1"
1-1/4"
1-1/2"

TABLE B — Model Type

CM
CCM
*CL
CF

TABLE C — Housing Material

Code No.	Material
A	Aluminum
B	Bronze
C	Cast Iron
S	Steel
R	Stainless Steel

TABLE D — Thread Type**

Code No.	Thread Type
T	NPT (Std)
U	BSP (PL)
V	BSP (TR) JIS
W	SAE O-Ring Seal
F	125# ANSI F.F. Flange
J	150# ANSI R.F. Flange
H	300# ANSI R.F. Flange
K	600# ANSI R.F. Flange
M	Socket Weld

TABLE E — Nominal Temperature Setting

°F	(°C)
65	(18)
75	(24)
85	(29)
95	(35)
100	(38)
110	(43)
120	(49)
130	(54)
140	(60)
150	(66)
160	(71)
170	(77)
175	(79)
180	(82)
190	(88)
200	(93)
205	(96)
215	(102)
225	(107)
235	(113)

TABLE F* — Element Type & Seal Material

Code No.	Element Type	Seal Material
01	1125X (Temp) Standard Element	Buna N
*01	10765X (Temp) CL Only	Buna N
06	1125X (Temp)	Viton
*06	10765X (Temp) CL Only	Viton
02	1125P (Temp) Nickel Plated	Viton
82	9778C (Temp) Electroless Nickel Plated	Neoprene
*82	10765K (Temp) Electroless Nickel Plated CL Only	Neoprene
99	3362U (Temp)	Neoprene

TABLE G — Element Leak Hole

Code No.	Leak Hole Diameter
None	(STD)
B	1/32"
C	1/16"
D	3/32"
F	1/8"
G	1/4"
H	3/16"

[ ] Indicates Non-Standard Product

* Model CL uses a unique element assembly. ** Former model coding omitted Table D.

Note: Letters or numbers in the MTO space, other than nothing A1 or AA indicate the unit is built to special requirements, and some of the code numbers may not be valid. Check with the factory for full specification of such models.

MAINTENANCE

When properly applied and installed, AMOT C Thermostatic Valves should operate for years with no maintenance. The only maintenance required is the replacement of the thermostatic element and seals whenever some variation in the controlled temperature is noticed. The frequency of element replacement will depend upon operating conditions and the type of fluid being controlled. Because of the diaphragm and plug construction of the wax-actuated element, calibration will be maintained over thousands of cycles. Such accuracy is not available in the cheaper "squeeze-push" type of wax elements sometimes used by other manufacturers.

An element may be quickly checked by immersing it in an agitated bath of water (or a water-glycol mixture for temperatures above the boiling point of water). **Never use oil for checking the element.** The element part number and nominal temperature setting (the last three numbers of the part number) are stamped on the flange of the element. At 10°F to 13°F above the nominal setting, the bypass port B should be closed.

Order new elements by Part No. and Nominal Temperature Setting, which are found on the element flange. If these are not known, send the complete Model No. and Serial No. on the Valve Nameplate, requesting AMOT to furnish the correct element. O-ring Seals shown below should be replaced whenever replacing elements. Notice that 3 Seals are required on the Steel and Aluminum Models and 2 seals are required per element on the Cast Iron and Bronze Models. When reinstalling seals or installing new ones, always lubricate them with light grease to make installing of the element easier, and to prevent leakage of the housing.

For convenience, O-ring Seals and Elements may be ordered as a kit as shown below, or they may be ordered individually by their Part No.

When communicating with AMOT regarding operation of a control, always give the Model No. If ordering service parts kits, also include the description, Part No. and quantity desired. If any parts are ordered by Reference No. only, please also include the Form No. and date of this brochure.

SERVICE KITS

Seal Kit No. 9170X001 Buna N

Ref. No.	* Qty.	Description	Part No.
4	1	O-ring	1205
5	1	O-ring	277L145
6	1	O-ring	11080L001
7	1	O-ring	11079L001

Seal Kit No. 9170X011 Viton

Ref. No.	* Qty.	Description	Part No.
4	1	O-ring	706
5	1	O-ring	878L145
6	1	O-ring	11080L002
7	1	O-ring	11079L002

This Service Parts List effective with valve Serial No. A791.

Service Kit No. 9167X (Temp.) Standard Element, Buna N

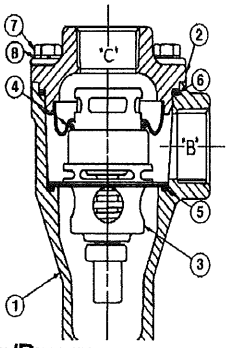
Ref. No.	* Qty.	Description	Part No.
3	1	Element	1125X(Temp.)
4	1	O-ring	1205
5	1	O-ring	277L145
6	1	O-ring	11080L001
7	1	O-ring	11079L001

Service Kit No. 9166X (Temp.) Standard Element, Viton

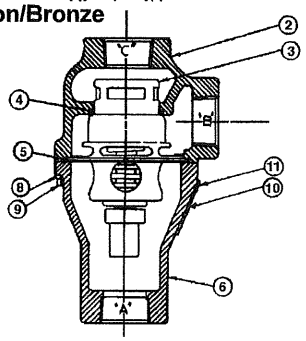
Ref. No.	* Qty.	Description	Part No.
3	1	Element	1125X(Temp.)
4	1	O-ring	706
5	1	O-ring	878L145
6	1	O-ring	11080L002
7	1	O-ring	11079L002

*Two Kits required for Model 1-1/4 CCM.

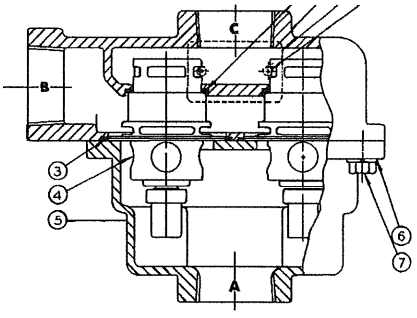
Aluminum/Steel



Cast Iron/Bronze



CCM



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