

## Plastic Laminate Cabinetry Work Surface Color Choices

One of the advantages of Plastic Laminate cabinetry is the designer's ability to incorporate color into the lab. Cabinetry can be coordinated with work surface colors to develop the look you want - from brightly colored to sterile white.

Choose your basic work surface color from the choices below, and if applicable, choose a PVC banding color for accent.

### PVC Banding

- 9H - 3mm Black
- 9I - 3mm Chameleon
- 9J - 3mm Grey
- 9K - 3mm White

### Chemsurf

- 9L - Black
- 9M - Antique White
- CG - Neutral Glace
- CW - White
- FR - Fashion Grey
- GL - Grey Glace

### High-Pressure Laminate

- |                     |                     |                            |
|---------------------|---------------------|----------------------------|
| 1C - Port           | 2Q - Ivory Rose     | 4T - Fortuneberry          |
| 1D - Wineberry      | 2J - Platinum       | 4V - Shogun                |
| 1E - Glazier Blue   | 2L - Shadow Blue    | 4W - Island Sky            |
| 1F - Atlantis       | 2M - Blue Ice       | 4X - Bluebonnet            |
| 1G - Seaspray       | 2N - Brittany Blue  | 4Y - Lapis Blue            |
| 1H - Silver Pine    | 2O - Bluejay        | 8A - Lagoon                |
| 1I - Natural Almond | 2Q - Pepperdust     | 5B - Midori                |
| 1J - Dobsin         | 2R - Larkspur       | 5C - Ming Gold             |
| 1K - Moccasin       | 2S - Bisque         | 5G - Mandarin Red          |
| 1L - Thistle        | 2T - Sand           | 5H - Beige                 |
| 1M - Kaki Brown     | 2U - Pebble         | 5I - Light Beige           |
| 1O - Feather Stone  | 2V - Marigold       | 5J - White                 |
| 1P - Pewter         | 3C - Tyrol Green    | 5K - Antique White         |
| 1Q - Porcelain Rose | 3D - Designer White | 5L - Frosty White          |
| 1R - Mauve Blush    | 3L - Emerald        | 5M - Black                 |
| 1S - Hunter Green   | 3O - Taupestone     | 5N - Caldera Rose          |
| 1T - North Sea      | 3P - Burgundy       | 5P - White Nebula          |
| 1U - Slate Grey     | 3X - Clear Teal     | 5Q - Cloud Nebula          |
| 1V - Dove Grey      | 3Y - Indigo         | 5R - Blue Nebula           |
| 1W - Shadow         | 3Z - Fashion Grey   | 3B - Bengal Teak           |
| 1X - Haze           | 4B - Cloud          | 3J - Canary                |
| 1Y - Wild Rose      | 4C - Beachshell     | GG - Gray Glace            |
| 1Z - Chiffon        | 4G - Pawnee         | 2E - Natural Butcher Block |
| 2B - Naturale       | 4L - Oasis          | 2P - White Leather         |
| 2C - Rose Buff      | 4M - White Sand     | 3M - Winchester Walnut     |
| 2F - Hollyberry     | 4R - Dynasty Purple |                            |



**EarthTech**  
A True International (TM) Company

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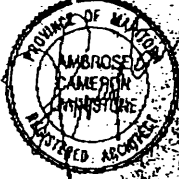
17203-1450th Avenue  
Edmonton, Alberta  
T6E 1J4 CANADA

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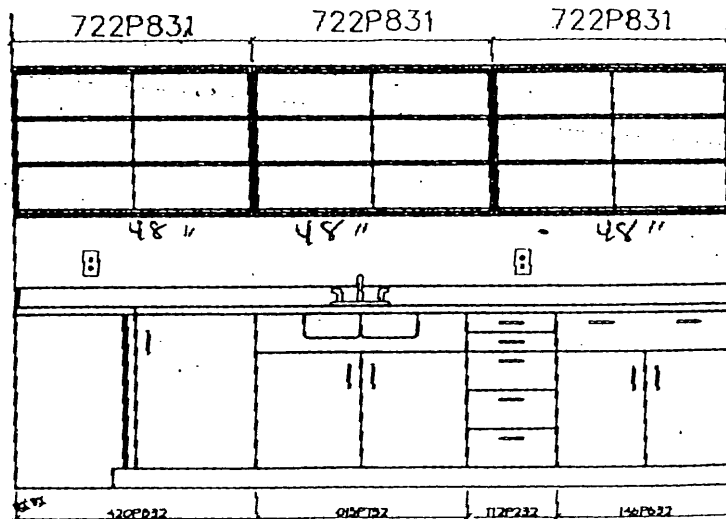
**Livingstone Architect**

P.O. BOX 1186  
1040117, Highway 20A 0100  
Ph: 867 979-4180, Fax: 867 979-3991  
Email: larch@mun.ca

NOTE:  
CABINET BY FISHER  
HAMILTON MODEL



17-15-20 REV 3



144"

2 MILL WORK ELEVATION A  
A152 SCALE = 1:20

17.2 1/1



## Solutions for the Technical Environment

When it comes to choosing furniture for your lab, look to Fisher Hamilton for all your laboratory needs. As the industry leader, Fisher Hamilton offers the most comprehensive selection of product lines, options and accessories in the world today. Nobody else even comes close.

And the markets we serve are as diverse as the products we manufacture. We work very closely with the educational, industrial and healthcare markets, and are actively engaged in the development of new technologies and products to better serve their ever-changing needs.

The many lab furniture lines we can draw upon to build the optimal system to suit your needs include:

### Wood Casework

### Steel Casework

### Plastic Laminate Casework

### MAX/LAB® Adaptable Furniture System

### C-Frame Adaptable Furniture System

### Multiflex Adaptable Furniture System

### SafeAire® Fume Hoods

### MaxWall™ Technical Wall System



## Dealer Planning Expertise

The Fisher Hamilton dealer network is more than a group of passive order-takers. They are talented project management specialists who prefer to get involved in the earliest planning stages possible so they can offer helpful suggestions that can make your laboratory work easier and more efficiently than ever before.

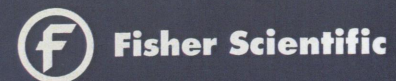
Whether it's product renovation or entirely new construction, Fisher Hamilton dealers have the skills, the expertise and the product selection to get the job done efficiently and cost-effectively. Give your nearest Fisher Hamilton dealer a call today for assistance with the planning process.



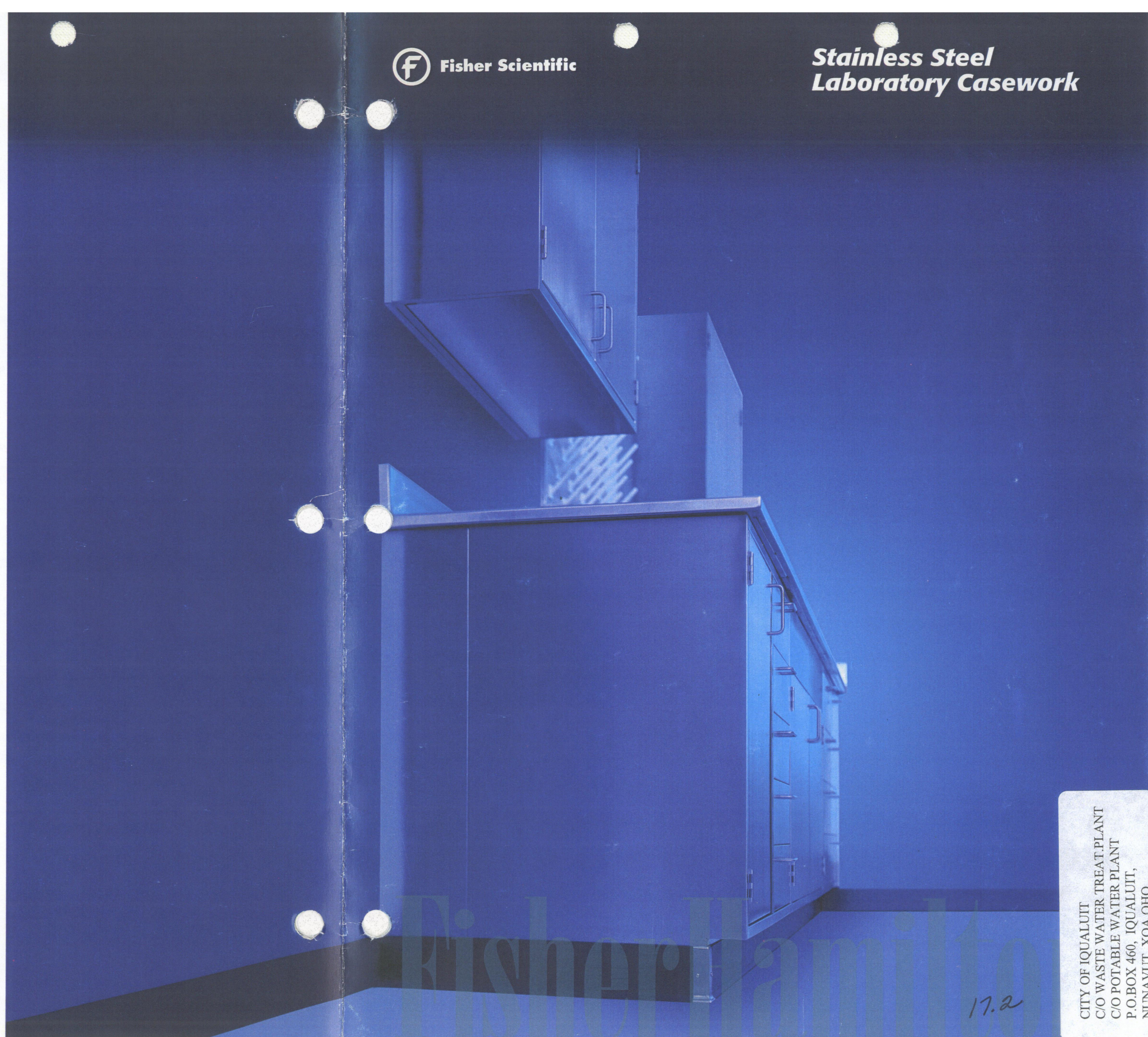
Fisher Hamilton L.L.C.  
1316 18th Street,  
Two Rivers, WI 54241  
Tel: 920-793-1121  
Fax: 920-793-3084  
[www.fisherhamilton.com](http://www.fisherhamilton.com)



AL-1411 DEC00 USA  
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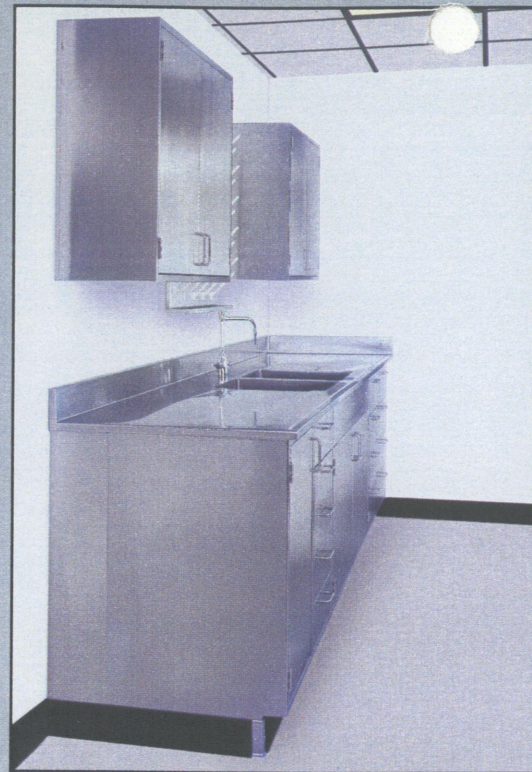
## Stainless Steel Laboratory Casework



CITY OF IQUALUIT  
C/O WASTE WATER TREAT. PLANT  
C/O POTABLE WATER PLANT  
P.O. BOX 460, IQUALUIT,  
NUNAVUT. X0A 0H0

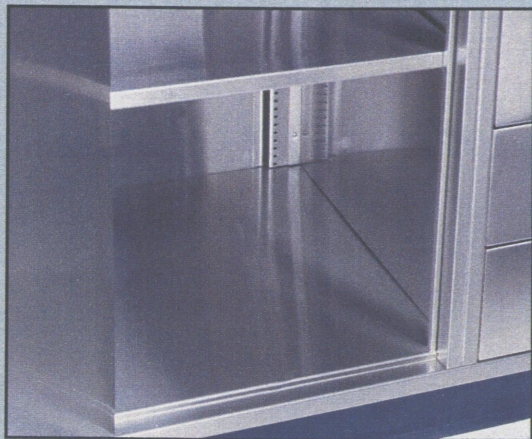
17.2

# Stainless Steel



## Stainless Steel – A long term investment!

- Easy to sanitize: Ideal for healthcare, biological, agricultural, food, petroleum and photo labs, radioactive and clean room applications or any application subject to continuous cleaning or sterilization.
- Tough stainless steel surface ideal for areas subject to heavy abrasion, impact, heat and general abuse.
- Rust-free, moisture-proof construction: Ideal for wet or high humidity environments.
- Resistant to a wide range of chemicals.



## Durable Cabinet Construction

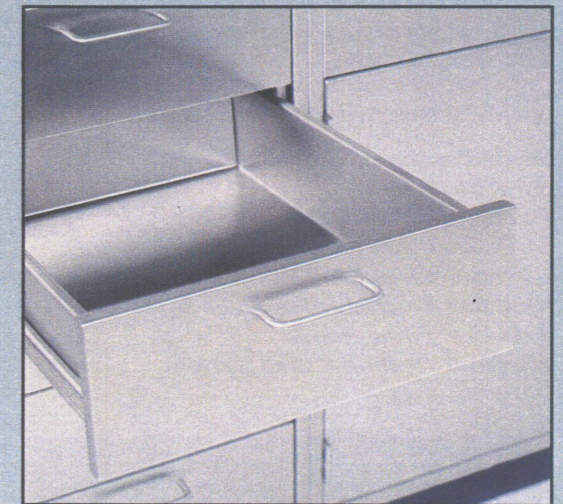
- Die formed, one-piece wrap-around cabinet construction will support 500 lbs. per lineal foot.
- Double corner posts at all four corners enhance structural integrity and load bearing capacity.
- Cabinets available with removable back panels for service chase access or solid perforation-free cabinet backs.
- Leveler access through toe base front panel results in a solid, perforation-free cupboard bottom.
- Door and drawer openings are rabbeted and perforation-free cabinet exterior minimizes potential for contamination of interior contents.



# Laboratory Casework System

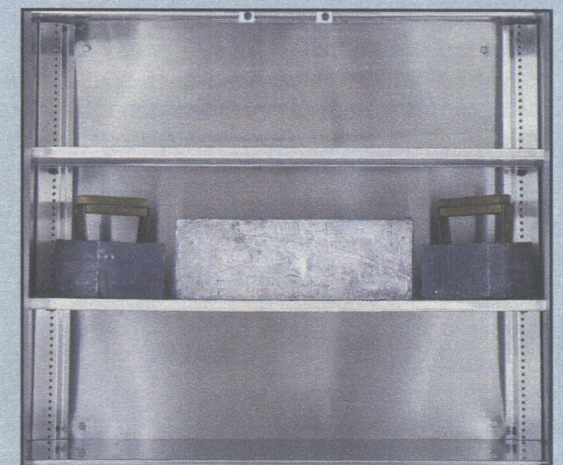
## Broad, Comprehensive Product Offering

- Wide variety of door/drawer configurations.
- Complete offering of modular cabinet sizes.



## Heavy-Duty Drawer Construction

- One-piece welded drawer box construction for lifetime durability.
- Coved joints between drawer bottom and sides are easy to clean.
- Heavy-duty 100 lb. drawer suspension features nylon-tired ball-bearing rollers for smooth, effortless operation. Drawer runs are self-centering and self-closing with hold-open feature.
- 150 lb. full-extension drawer suspension is an available option.



## Tough Shelves

- Strong, rigid shelves are designed to handle loads up to 40 lbs. per square foot in compliance with SEFA standards.

## Environmentally Friendly

- Durable and re-usable – lasts the life of the building – and – provides the best return on investment over the product life cycle.

---

## **Chapter 18EXPANSION JOINT**

### **MANUFACTURER/DISTRIBUTOR:**

WOSELEY

4200, Hickmore

St-Laurent, Qué., H4T 1K2

PH: (514) 344-9378 FAX: 9341

### **18.1 FLEXONICS EXPANSION JOINT FOR V115 & V203**

**END OF CHAPTER 18**

# OPERATING CONDITIONS:

OPERATING PRESSURE : 15 Kg/cm<sup>2</sup> (214 PSIG) FOR 1-1/2" TO 12" - 8 Kg/cm<sup>2</sup> (114 PSIG) FOR 14" TO 20"  
 BURST PRESSURE : 60 Kg/cm<sup>2</sup> (850 PSIG) FOR 1-1/2" TO 12" - 24 Kg/cm<sup>2</sup> (340 PSIG) FOR 14" TO 20"  
 VACUUM RATING : 750mm Hg  
 TEMPERATURE : -10°C (14°F) TO 115°C (240°F)  
 MEDIUM : WATER, HOT WATER, SEA WATER, WEAK ACID, COMPRESSED AIR.  
 FOR OTHER FLUIDS CONSULT FACTORY.

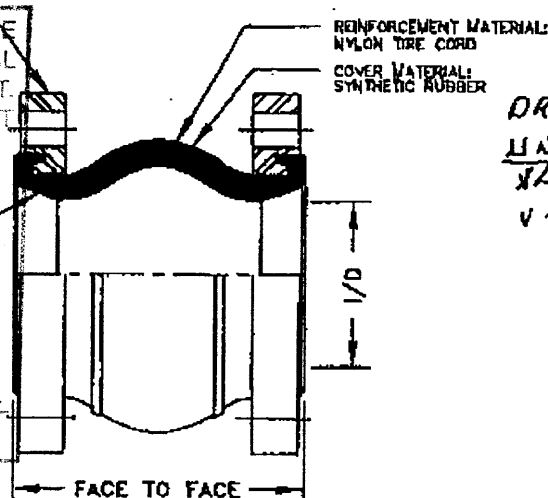
## NOTE:

- 1) CONTACT FLEXONICS FOR HIGHER OPERATING TEMPERATURES.
- 2) MOVEMENTS GIVEN ARE NON-CONCURRENT. CONSULT FLEXONICS FOR CONCURRENT MOVEMENT CAPABILITIES.
- 3) SIZES OVER 20 INCH AVAILABLE UPON REQUEST.

REVIEWED ACCORDING TO THE REQUIREMENTS OF THE CONTRACT. ANY ACTION MUST BE SUBJECT TO THE CONTRACT.

- ☒ APPROVED  
☐ MAILED  
☐ REVIEW & RESUBMIT  
☐ REJECTED

DATE 08/15/05 BY S. Syne  
 EARTH TECH (CANADA) INC.



DRAWING P141  
 UNDER  
 SLANK V-115  
 V-203

| NOMINAL I/D<br>INCHES | LENGTH<br>FACE TO FACE<br>INCHES | ALLOWABLE MOVEMENTS   |                     |                   |                    | PRESSURE<br>@ 70°F / 21°C<br>PSIG |
|-----------------------|----------------------------------|-----------------------|---------------------|-------------------|--------------------|-----------------------------------|
|                       |                                  | COMPRESSION<br>INCHES | EXTENSION<br>INCHES | LATERAL<br>INCHES | ANGULAR<br>DEGREES |                                   |
| 1-1/2                 | 6                                | 1/2                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 2                     | 6                                | 1/2                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 2-1/2                 | 8                                | 1/2                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 3                     | 8                                | 1/2                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 4                     | 8                                | 5/8                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 5                     | 8                                | 5/8                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 6                     | 8                                | 5/8                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 8                     | 8                                | 5/8                   | 3/8                 | ±1/2              | 15°                | 214                               |
| 10                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 214                               |
| 12                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 214                               |
| 14                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 114                               |
| 16                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 114                               |
| 18                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 114                               |
| 20                    | 8                                | 3/4                   | 1/2                 | ±3/4              | 15°                | 114                               |



**FLEXONICS LIMITED**

134 Nelson Street West  
 Brampton, Ontario, Canada L6X 1C9  
 Tel. 416-451-1250 \*\*\* Fax 416-451-1315

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|               |                 |                                                                               |         |        |        |
|---------------|-----------------|-------------------------------------------------------------------------------|---------|--------|--------|
| DRAWN<br>L.R. | DATE<br>9/20/01 | TITLE:<br><br>1-1/2" TO 20" NOMINAL SIZE<br>STYLE 101 SINGLE SPHERE CONNECTOR |         |        |        |
| CHECKED       | DATE            |                                                                               |         |        |        |
| ENG.          | DATE            | CUSTOMER                                                                      | SCALE   | N.T.S. | E.C.N. |
| D.C.          | DATE            | DWG. No.                                                                      | 1019195 | REV.   | 0      |

18.1 1/1

D 1/1

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## **Chapter 19 SMALL VALVES (1/4 - 8 INCH)**

### **MANUFACTURER/DISTRIBUTOR:**

WOSELEY

4200, Hickmore

St-Laurent, Qué., H4T 1K2

PH: (514) 344-9378 FAX: 9341

### **MANUFACTURER/DISTRIBUTOR:**

PROVAN

2315, HALPERN

ST-LAURENT QC. H4S 1S3

PH:514-332-3230 FAX:3552

### **MANUFACTURER/DISTRIBUTOR:**

HAYWARD INDUSTRIAL INC.

ONE HAYWARD INDUSTRIAL DRIVE

CLEMMONS, NC 27012

PH:1-888-429-4635

FAX:1-888-778-8410

- 19.1 BV03 BALL VALVE 2" (V122) PVC.**
- 19.2 PV01 PLUG VALVE 8" (V103-V105-V107) CAST IRON.**
- 19.3 PV01 PLUG VALVE 4" (V118-V119) CAST IRON.**
- 19.4 BRONZE APOLLO VALVES.**
- 19.5 CAMLOC STANDARD.**

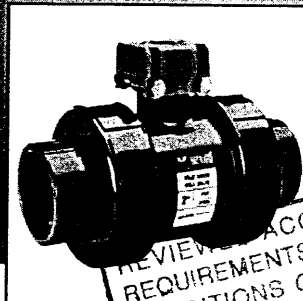
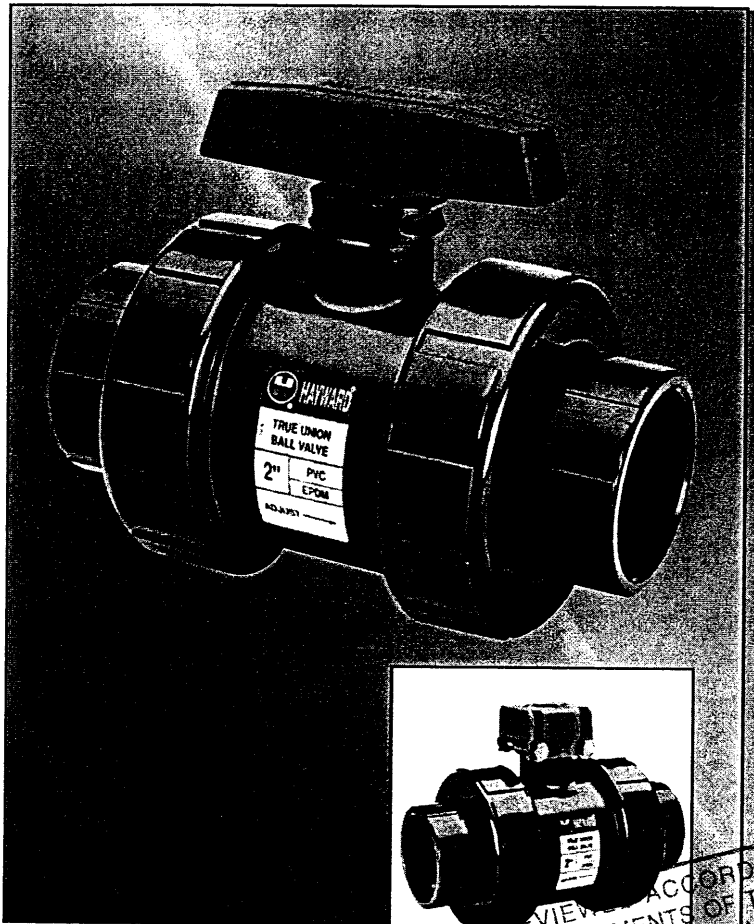
- 
- 19.6 IPEX THERMOPLASTIC VALVE.**
  - 19.7 IPEX THERMOPLASTIC STRAINER.**
  - 19.8 IPEX THERMOPLASTIC CHECK VALVE.**
  - 19.9 STAINLESS STEEL MINI BALL VALVE.**
  - 19.10 STAINLESS STEEL ADJUSTABLE SNUBBER**

**END OF CHAPTER 19**



# True Union Ball Valves

1/4" to 6" - PVC, Corzan® CPVC, PPL



## Rugged, Heavy Wall Plastic Construction

Stands up to the most aggressive of applications. Hayward True Union Ball Valves can take the day to day abuse of industrial service and continue to function.

## True Union Design

This makes these valves very easy to maintain by allowing for easy removal from a piping system without breaking down piping connections. Just unscrew the two assembly nuts and lift the valve body out of the line.

## Advanced Design Features

Hayward True Union Ball Valves are superior performers. A fine-pitch seal retainer thread allows for accurate compensation for seat wear. Reversible seats make it easy to get a damaged valve back in service. Should the seats become damaged they only need to be removed, turned over, and reinstalled to put the valve back on line. These valves feature a double o-ring stem seal for twice the leakage protection of valves with only a single stem seal.

## Solid Actuator Mounting Design

For rock-solid actuator mounting, the valve incorporates a unique design that allows the actuator mounting bracket to mount directly to the valve without the need for glued or clamped-on mounting pads. This assures proper alignment of the actuator to the valve without creating any damaging side loads to cause premature stem seal failure. With this design, the valve can be easily adapted to manual operation - should the need ever arise.

## Never a Problem with Corrosion

Because of the valves' all plastic construction, they will never rust or corrode - and they can survive corrosive environments without the need for painting or expensive epoxy coating.

## Features

- Full Port Design
- Reversible PTFE Seats
- Easy Maintenance
- FPM or EPDM Seals
- Easily Automated
- Double O-Ring Stem Seals
- Adjustable Seat Retainer

Corzan® CPVC is a trademark of Noveon, Inc.

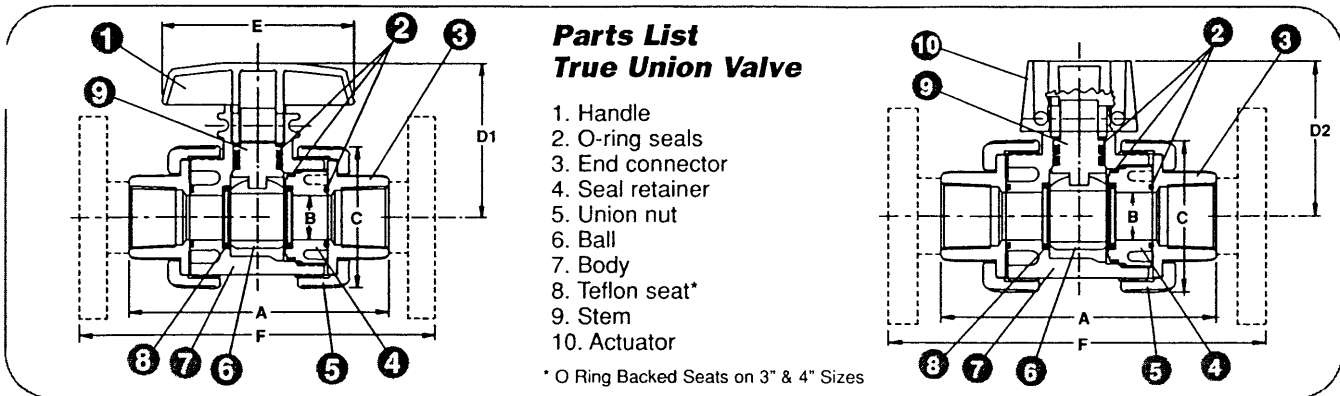
## Options

- Stem Extensions
- Lockouts
- Spring Return Handle
- Pneumatic Actuators
- Electric Actuators
- 2"-Square Operating Nuts
- Drilled Balls For Sodium Hypochlorite Service

REVIEWED ACCORDING TO THE GENERAL REQUIREMENTS OF THE CONTRACT. CONDITIONS OF THE CONTRACT. ANY ACTION INDICATED IS SUBJECT TO THESE REQUIREMENTS. NO EXCEPTIONS TAKEN. MAKE NOTED CORRECTIONS. REVISE & RESUBMIT. REJECTED. JULY 13 2008. NORTHERN TECH (CANADA) INC.

# Technical Information

BV 3



## Dimensions - Inches / Millimeters

| Size        | A           | B         | C          | D1         | D2         | F           | Weight (lb / kg) |              |
|-------------|-------------|-----------|------------|------------|------------|-------------|------------------|--------------|
|             |             |           |            |            |            |             | Soc / Thd        | Flanged      |
| 1/4         | 4.63 / 117  | 0.37 / 13 | 2.25 / 57  | 3.00 / 76  | 2.63 / 67  | N/A         | 0.75 / 0.34      | N/A          |
| 3/8         | 4.63 / 117  | 0.50 / 13 | 2.25 / 57  | 3.00 / 76  | 2.63 / 67  | N/A         | 0.75 / 0.34      | N/A          |
| 1/2 / 20*   | 4.63 / 117  | 0.50 / 13 | 2.25 / 57  | 3.00 / 76  | 2.63 / 67  | 6.75 / 171  | 0.75 / 0.34      | 1.00 / 0.45  |
| 3/4 / 25*   | 4.75 / 120  | 0.75 / 19 | 2.63 / 67  | 3.02 / 77  | 2.81 / 72  | 7.13 / 181  | 0.75 / 0.34      | 1.00 / 0.45  |
| 1 / 32*     | 5.25 / 133  | 1.00 / 25 | 3.00 / 76  | 3.32 / 84  | 3.05 / 77  | 8.00 / 203  | 1.15 / 0.52      | 2.15 / 0.98  |
| 1-1/4 / 40* | 6.30 / 160  | 1.25 / 32 | 4.00 / 102 | 3.92 / 100 | 3.48 / 88  | 9.19 / 233  | 2.15 / 0.98      | 3.50 / 1.6   |
| 1-1/2 / 50* | 6.75 / 171  | 1.50 / 38 | 4.00 / 102 | 3.92 / 100 | 3.48 / 88  | 9.88 / 249  | 2.15 / 0.98      | 3.75 / 1.7   |
| 2 / 63*     | 8.00 / 203  | 2.00 / 51 | 4.75 / 121 | 4.43 / 113 | 4.00 / 101 | 11.4 / 289  | 3.80 / 1.7       | 6.30 / 2.9   |
| 2-1/2       | 10.68 / 271 | 3.00 / 76 | 6.40 / 163 | 5.50 / 140 | 5.50 / 140 | 14.38 / 365 | 10.50 / 4.8      | 14.50 / 6.6  |
| 3 / 90*     | 10.56 / 268 | 3.00 / 76 | 6.40 / 163 | 5.50 / 140 | 5.50 / 140 | 14.44 / 367 | 10.50 / 4.8      | 14.50 / 6.6  |
| 4 / 110*    | 12.94 / 329 | 3.81 / 97 | 8.56 / 217 | 6.50 / 165 | 6.50 / 165 | 17.13 / 435 | 17.60 / 8.0      | 24.80 / 11.3 |
| 6           | N/A         | 3.81 / 97 | 8.56 / 217 | 6.50 / 165 | 6.50 / 165 | 19.19 / 487 | N/A              | 30.75 / 14.0 |

\* Metric End Connections Available in: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

## Selection Chart

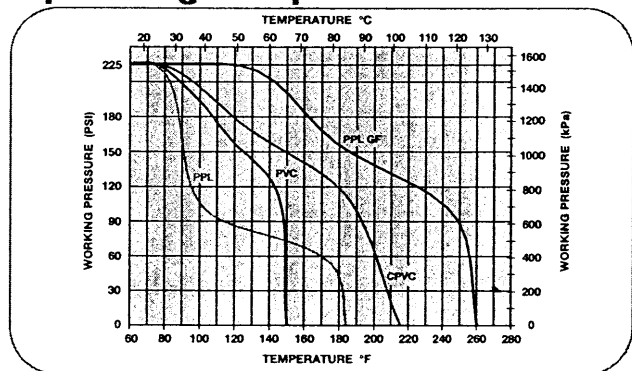
| Size        | Material    | End. Conn                   | Seals       | Pressure Rating              |
|-------------|-------------|-----------------------------|-------------|------------------------------|
| 1/4" - 3/8" | PVC         | Socket or Threaded          | FPM or EPDM | 225 PSI<br>@70F<br>Non-Shock |
| 1/2" - 4"   | PVC or CPVC | Socket, Threaded or Flanged |             |                              |
| 1/2" - 2"   | PPL*        | Threaded                    |             |                              |
| 6"          | PVC or CPVC | Flanged                     |             |                              |

\* natural PPL - 1/2" to 1-1/2" rated at 150psi, 2" = 120psi    \*\* 4" Valve venturied to 6"

## Cv Factors

| Size   | Factor | Size   | Factor |
|--------|--------|--------|--------|
| 1/4"   | 1.0    | 1-1/2" | 90     |
| 3/8"   | 2.8    | 2"     | 150    |
| 1/2"   | 8.0    | 2-1/2" | 340    |
| 3/4"   | 16.0   | 3"     | 490    |
| 1"     | 29.0   | 4"     | 600    |
| 1-1/4" | 75.0   | 6"     | 550    |

## Operating Temperature/Pressure



### Pressure Loss Calculation Formula

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient



Hayward Industrial Products, Inc.

Hayward Industrial Drive, Clemmons, NC 27012  
 Tel: 1-888-429-4635 (1-888-HAYINDL) • Fax: 1-888-778-8410  
 E-mail: hflow@haywardnet.com  
 Web Site: <http://www.haywardindustrial.com>

JOB; WASTE WATER TREATMENT  
 PLANT AT IQUALUIT, NUNAVUT  
 CONTRACTOR PRE-APPROVAL;  
 SIFEC-KUDLIK per; C. FAUTEUX, T.P.  
 G. FAUTEUX, P.ENG.  
 P.A.PELLETIER, P.ENG.

19.1  
2/

V103-V105-V107

~~0103~~ PV01

KUDLIK / SIFEC / IQUALUIT  
WASTE WATER TREATMENT PLANT  
Submittal Data Sheet

DATE: 6/29/2005

Provan Control Associates Inc.  
2315, Halpem  
Saint-Laurent (Qc) H4S 1S3

| ITEM | QTY | DESCRIPTION           |
|------|-----|-----------------------|
| 2    | 3   | PEC,8,F1,CI,NBR,CR*NT |

|                          |     |                                |
|--------------------------|-----|--------------------------------|
| <b>MANUFACTURER:</b>     |     | Dezurik                        |
| <b>STYLE:</b>            | PEC | Eccentric Plug Valve           |
| <b>SIZE:</b>             | 8   | 8 Inch                         |
| <b>END CONNECTION:</b>   | F1  | Flanged Drilling; ANSI 125/150 |
| <b>BODY MATERIAL:</b>    | CI  | Cast Iron                      |
| <b>PACKING MATERIAL:</b> | NBR | Acrylonitrile-Butadiene V-Type |
| <b>PLUG FACING:</b>      | CR  | Chloroprene (RS16/17)          |
| <b>ACTUATOR TYPE:</b>    | NT  | 2" Square Nut Actuator         |

REVIEWED ACCORDING TO THE  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT.  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS.

☒ NO EXCEPTIONS TAKEN  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ REJECTED

DATE July 13, 2005 BY [Signature]  
EARTH TECH (CANADA) INC.

RELATED DOCUMENTS

|         |                             |
|---------|-----------------------------|
| A050941 | Drawing / Instructions      |
| A020730 | Valve Assembly Drawing      |
| A022557 | Actuator Assembly Drawing   |
| D010021 | Valve Instruction Manual    |
| D010061 | Actuator Instruction Manual |

8"

JOB; WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK per; C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.

19.2

P 1/2

| VALVE SIZE |     | DIMENSIONS |              |             |              |           |      |            |           |   |              |
|------------|-----|------------|--------------|-------------|--------------|-----------|------|------------|-----------|---|--------------|
| INCH       | MM  | A          | B            | C           | D            | E         | F    | G          | H         | J | K            |
| 4          | 100 | .88<br>18  | 9.00<br>229  | 8.38<br>137 | 7.50<br>191  | NONE      | NONE | NONE       | .78<br>19 | 8 | 10.19<br>259 |
| 5          | 125 | .78<br>19  | 10.50<br>267 | 8.50<br>165 | 8.50<br>216  | 3/4-10UNC | 4    | 1.00<br>25 | .88<br>22 | 4 | 13.81<br>351 |
|            | 150 | .78<br>19  | 10.50<br>267 | 8.50<br>165 | 9.50<br>241  | NONE      | NONE | NONE       | .88<br>22 | 8 | 13.81<br>351 |
|            | 200 | .81<br>21  | 11.50<br>292 | 8.25<br>210 | 11.75<br>298 | 3/4-10UNC | 4    | .81<br>21  | .88<br>22 | 4 | 15.38<br>391 |

| A | VALVE    |
|---|----------|
| B | ACTUATOR |

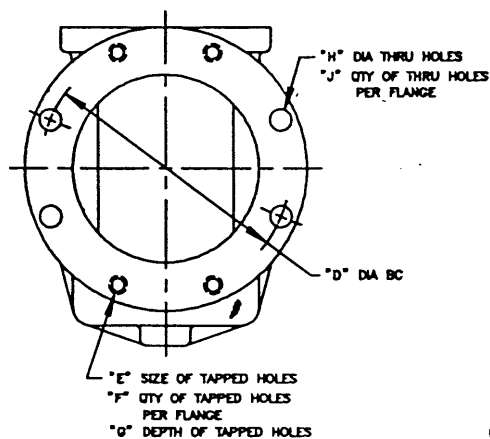
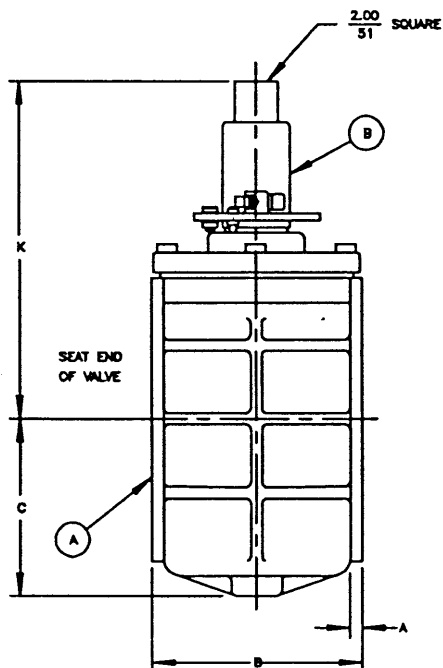
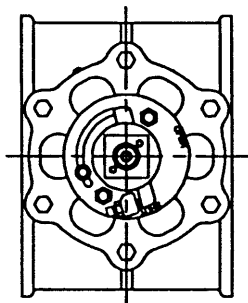
# NOTES:

1. FLANGES ARE FLAT FACED WITH DIAMETER AND DRILLING TO CLASS 125 ANSI STANDARD B16.1, EXCEPT FOR TAPPED HOLES AS INDICATED. SEE A-18368 FOR NON-ANSI FLANGE DATA.

V 103-105-107-118-119

## NOTICE

THIS DRAWING DOES NOT SHOW ACTUATOR ACCESSORIES. IF ACCESSORIES ARE REQUIRED, REFER TO THE APPROPRIATE ACCESSORY INSTALLATION DRAWING FOR DIMENSIONS AND OTHER RELATED INFORMATION.



8"



DeZURIK

BARTLETT, BIRMINGHAM, U.S.A. 35077  
CONRODING, ONTARIO, CANADA  
SUNDWY, VICTORIA, AUSTRALIA  
CRANLINGTON, ENGLAND

PEC ECCENTRIC VALVES SIZE 4 - 8 FLANGED MATERIAL GROUP 1  
NT NUT ACTUATED

| DOCT.<br>CODE | DRAWN | CHKD | APPROVED |
|---------------|-------|------|----------|
| C1            | TPK   | TPK  | TPK      |

DATE  
02/08/99

A-50941

19.2

P 2/2

PV01

V118 - V119

KUDLIK / SIFEC / IQUALUIT  
WASTE WATER TREATMENT PLANT

Submittal Data Sheet

DATE: 6/29/2005

Provan Control Associates Inc.  
2315, Halpern  
Saint-Laurent (Qc) H4S 1S3

| ITEM | QTY | DESCRIPTION                |
|------|-----|----------------------------|
| 3    | 2   | PEC, 4, F1, CI, NBR, CR*NT |

|                          |     |                                |
|--------------------------|-----|--------------------------------|
| <b>MANUFACTURER:</b>     |     | Dezurik                        |
| <b>STYLE:</b>            | PEC | Eccentric Plug Valve           |
| <b>SIZE:</b>             | 4   | 4 Inch                         |
| <b>END CONNECTION:</b>   | F1  | Flanged Drilling; ANSI 125/150 |
| <b>BODY MATERIAL:</b>    | CI  | Cast Iron                      |
| <b>PACKING MATERIAL:</b> | NBR | Acrylonitrile-Butadiene V-Type |
| <b>PLUG FACING:</b>      | CR  | Chloroprene (RS16/17)          |
| <b>ACTUATOR TYPE:</b>    | NT  | 2" Square Nut Actuator         |

REVIEWED ACCORDING TO THE  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT.  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS.

☒ NO EXCEPTIONS TAKEN  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT 4"  
☐ REJECTED

DATE July 13, 2005 BY JTB  
EARTH TECH (CANADA) INC.

RELATED DOCUMENTS

|         |                             |
|---------|-----------------------------|
| A050941 | Drawing / Instructions      |
| A020730 | Valve Assembly Drawing      |
| A022557 | Actuator Assembly Drawing   |
| D010021 | Valve Instruction Manual    |
| D010061 | Actuator Instruction Manual |

JOB; WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK per; C. FAUTEUX, T.P.  
G, FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.

19.3

✓ 1/2

| VALVE SIZE |     | DIMENSIONS <small>INCHES<br/>MILLIMETERS</small> |              |             |              |           |      |            |           |   |              |
|------------|-----|--------------------------------------------------|--------------|-------------|--------------|-----------|------|------------|-----------|---|--------------|
| INCH       | MM  | A                                                | B            | C           | D            | E         | F    | G          | H         | J | K            |
| 4          | 100 | .89<br>18                                        | 9.00<br>229  | 5.38<br>137 | 7.50<br>191  | NONE      | NONE | NONE       | .75<br>19 | 8 | 10.19<br>259 |
| 5          | 125 | .75<br>19                                        | 10.50<br>267 | 6.50<br>165 | 8.50<br>216  | 3/4-10UNC | 4    | 1.00<br>25 | .88<br>22 | 4 | 13.81<br>351 |
|            | 150 | .75<br>19                                        | 10.50<br>267 | 6.50<br>165 | 9.50<br>241  | NONE      | NONE | NONE       | .88<br>22 | 8 | 13.81<br>351 |
| 8          | 200 | .81<br>21                                        | 11.50<br>292 | 8.25<br>210 | 11.75<br>298 | 3/4-10UNC | 4    | .81<br>21  | .88<br>22 | 4 | 15.38<br>391 |

|   |          |
|---|----------|
| A | VALVE    |
| B | ACTUATOR |

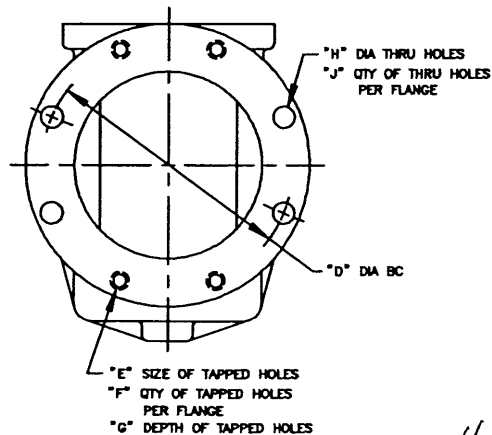
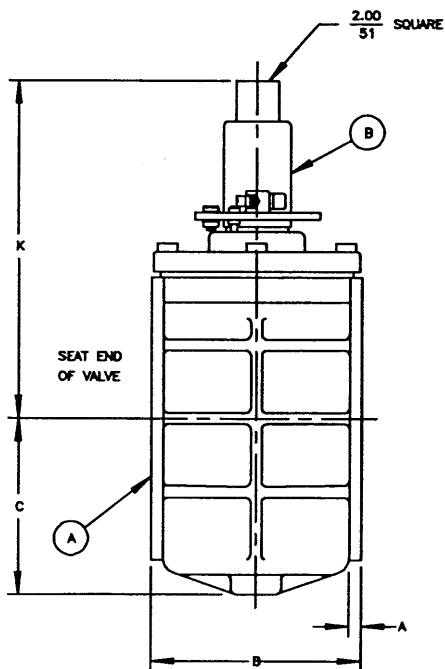
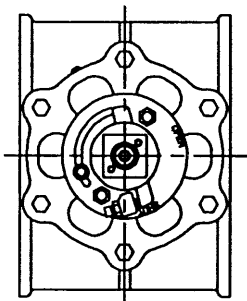
NOTES:

1. FLANGES ARE FLAT FACED WITH DIAMETER AND DRILLING TO CLASS 125 ANSI STANDARD B16.1, EXCEPT FOR TAPPED HOLES AS INDICATED. SEE A-18368 FOR NON-ANSI FLANGE DATA.

V 103-105-107-118-119

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4"

19.3



**DOZRAC**

BARTLE, MINNESOTA, U.S.A. 55377  
CAMBRIDGE, ONTARIO, CANADA  
SPRINGTOWN, VICTORIA, AUSTRALIA  
CRAWFORD, ENGLAND

PEC ECCENTRIC VALVES SIZE 4 - 8 FLANGED MATERIAL GROUP 1  
NT NUT ACTUATED

| DOCT. CODE | DRAWN   | CHKD | APPROVED      |
|------------|---------|------|---------------|
| C1         | CHECKED | TPK  | DATE 02/08/99 |

A-50941

V 2/2

QUALITY  
TAG 1 V-120-121-123-124



| Applications        | Divisions         | Products    | Company          | Promotions   | Literature      | Contact Us         |
|---------------------|-------------------|-------------|------------------|--------------|-----------------|--------------------|
| Automation Products | Backflow Products | Ball Valves | Butterfly Valves | Check Valves | Marine Products | Plumbing & Heating |
|                     |                   |             |                  |              |                 | SRVs<br>Strainers  |

## BRONZE BALL VALVES

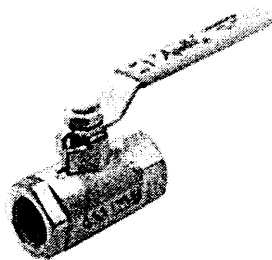
--> Downloadable PDF's ▾

Ball Valves : Bronze : Two-Piece : 70-100-01

Features >

Dimensions >

Temperature Curves >

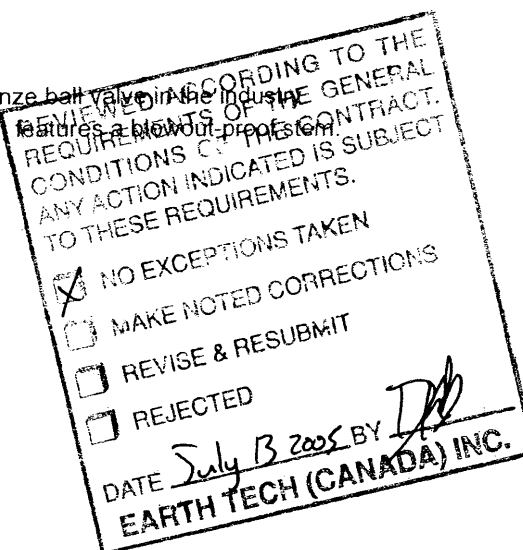


Description: Standard Port Threaded Ball Valve  
Size: 1/4" to 3"

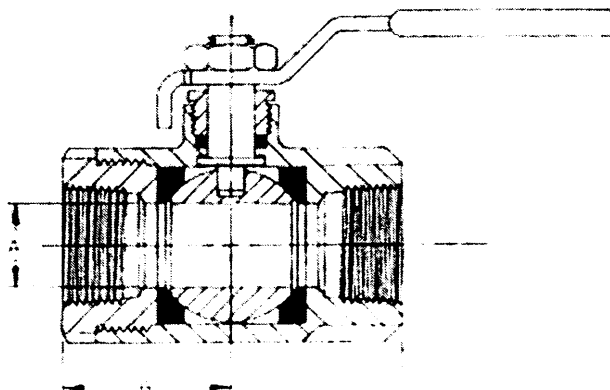
## Features

- The most widely used bronze ball valve in the industry.
- Like all 70 Series valves, it features a blow-out proof stem.
- RPTFE seats.
- Stuffing box ring.
- Adjustable packing gland.
- Chromium-plated ball.

[Back to top]



JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK per: C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.



19.4

1/2

## Temperature Curves

[Click to view >](#)

[\[Back to top\]](#)

## Dimensions

| Part No. | Size<br>in./mm | Size<br>in./mm        | A<br>in./mm     | B<br>in./mm     | C<br>in./mm      |
|----------|----------------|-----------------------|-----------------|-----------------|------------------|
| 70-101   | 1/4<br>8       | 1/4<br>8<br>6.350     | 0.370<br>9.398  | 1.030<br>26.162 | 2.060<br>52.324  |
| 70-102   | 3/8<br>10      | 3/8<br>10<br>9.525    | 0.370<br>9.398  | 1.030<br>26.162 | 2.060<br>52.324  |
| 70-103   | 1/2<br>15      | 1/2<br>15<br>12.700   | 0.500<br>12.700 | 1.120<br>28.448 | 2.250<br>57.150  |
| 70-104   | 3/4<br>20      | 3/4<br>20<br>19.050   | 0.680<br>17.272 | 1.500<br>38.100 | 3.000<br>76.200  |
| 70-105   | 1<br>25        | 1<br>25<br>25.400     | 0.870<br>22.098 | 1.680<br>42.672 | 3.370<br>85.598  |
| 70-106   | 1-1/4<br>32    | 1-1/4<br>32<br>31.750 | 1.000<br>25.400 | 2.000<br>50.800 | 4.000<br>101.600 |
| 70-107   | 1-1/2<br>40    | 1-1/2<br>40<br>38.100 | 1.250<br>31.750 | 2.180<br>55.372 | 4.370<br>110.998 |
| 70-108   | 2<br>50        | 2<br>50<br>50.800     | 1.500<br>38.100 | 2.340<br>59.436 | 4.680<br>118.872 |
| 70-109   | 2-1/2<br>65    | 2-1/2<br>65<br>63.500 | 2.000<br>50.800 | 3.120<br>79.248 | 6.250<br>158.750 |
| 70-100   | 3<br>80        | 3<br>80<br>76.200     | 2.500<br>63.500 | 3.370<br>85.598 | 6.750<br>171.450 |

[\[Back to top\]](#)

1"  
1 1/4"  
2"  
2 1/2"

19.4

2/2

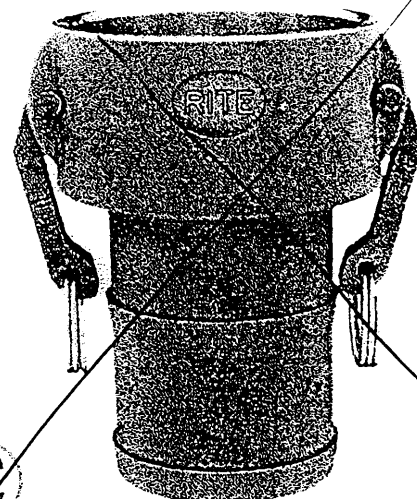
Tight standard parts — each one in 12 sizes



**A**

Part A Adaptor Female Thread

| Size     | 1/2"   | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   |
|----------|--------|------|------|--------|--------|------|
| Part No. | 050A   | 075A | 100A | 125A   | 150A   | 200A |
| Size     | 2 1/2" | 3"   | 4"   | 5"     | 6"     | 8"   |
| Part No. | 250A   | 300A | 400A | 500A   | 600A   | 800A |



**C**

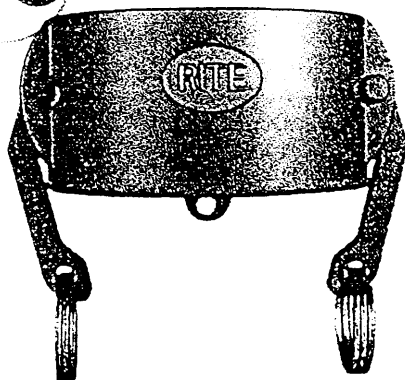
Part C Hose Shank Coupler

| Size     | 1/2"   | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   |
|----------|--------|------|------|--------|--------|------|
| Part No. | 050C   | 075C | 100C | 125C   | 150C   | 200C |
| Size     | 2 1/2" | 3"   | 4"   | 5"     | 6"     | 8"   |
| Part No. | 250C   | 300C | 400C | 500C   | 600C   | 800C |

Part DC Dust Cap For adaptors

| Size     | 1/2"   | 3/4"  | 1"    | 1 1/4" | 1 1/2" | 2"    |
|----------|--------|-------|-------|--------|--------|-------|
| Part No. | 050DC  | 075DC | 100DC | 125DC  | 150DC  | 200DC |
| Size     | 2 1/2" | 3"    | 4"    | 5"     | 6"     | 8"    |
| Part No. | 250DC  | 300DC | 400DC | 500DC  | 600DC  | 800DC |

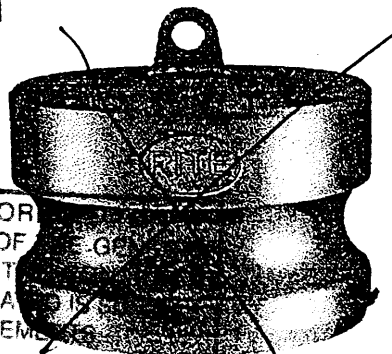
**DC**



Part DP Dust Plug For Couplers

| Size     | 1/2"   | 3/4"  | 1"    | 1 1/4" | 1 1/2" | 2"    |
|----------|--------|-------|-------|--------|--------|-------|
| Part No. | 050DP  | 075DP | 100DP | 125DP  | 150DP  | 200DP |
| Size     | 2 1/2" | 3"    | 4"    | 5"     | 6"     | 8"    |
| Part No. | 250DP  | 300DP | 400DP | 500DP  | 600DP  | 800DP |

**DP**



REVIEWED ACCORDING TO  
REQUIREMENTS OF  
CONDITIONS OF  
ANY ACTION INDICATED  
TO THESE REQUIREMENTS

☒ NO EXCEPTIONS TAKEN

☐ MAKE NOTED CORRECTIONS

☐ REVERSE ENGINEERING

☐ REVERSE ENGINEERING

DATE: 10/1/15 BY: [Signature]

EARTH TECH (CANADA) INC.

JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL:  
SIFEC-KUDLIK, PER: C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A. PELLETIER, P.ENG.

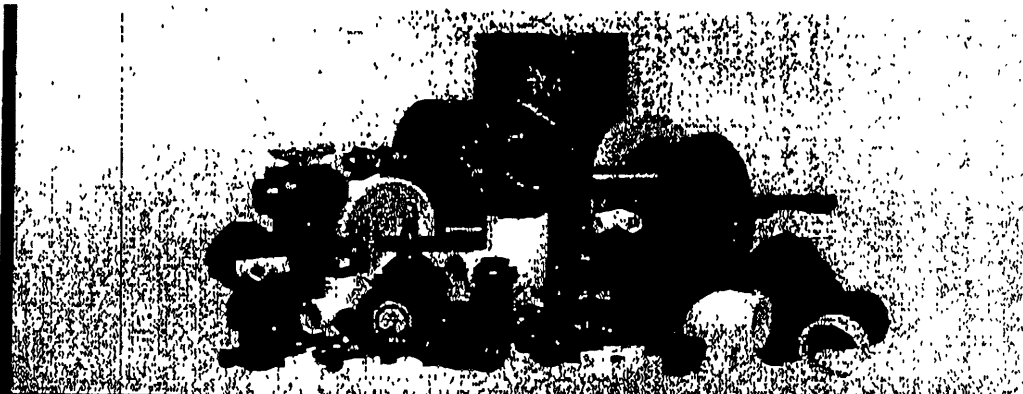
**Rite**

Available with NPT or BSP threads  
1/2" couplers have only one handle  
All 8" couplers have four handles

19.5

2 1/1

# BLOCKING BALL VALVE TRUE UNION



## IPEX THERMOPLASTIC VALVES

### Special Features:

- Full port
- Bi-directional flow
- Dual function handle/  
spanner wrench
- Special blocking  
device thread design  
to prevent accidental  
loosening during  
disassembly of  
union nut
- Ultra-compact  
design
- Part of the Xirtec™  
system of pipe,  
valves and fittings



Body Material:

PVC, CPVC

Size Range:

1/2" thru 6"

Pressure:

232 psi (1/2" - 2")  
150 psi (2 1/2" - 6")

Seats:

PTFE

Seals:

EPDM or VITON

End Connections:

Socket (IPS)  
Threaded (NPT)  
Flanged (ANSI 150)

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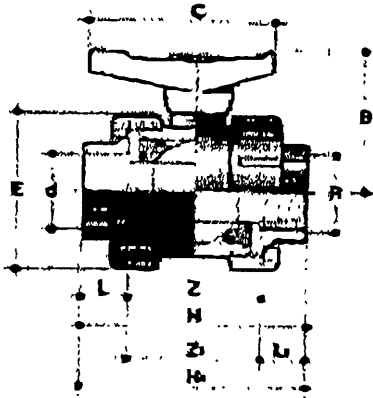
- ☒ NO EXCEPTIONS TAKEN  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ REJECTED

DATE July 21/06 BY GAU  
EARTH TECH CANADA



**IPEX**  
INNOVATION IN THERMOPLASTICS

# TECHNICAL DATA

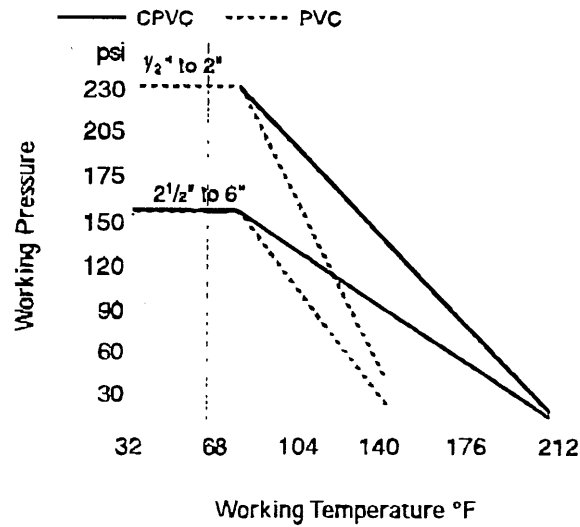


| Size (in) | Cv     |
|-----------|--------|
| 1/2       | 14.00  |
| 3/4       | 26.95  |
| 1         | 53.90  |
| 1 1/4     | 77.00  |
| 1 1/2     | 122.50 |
| 2         | 238.00 |
| 2 1/2     | 367.50 |
| 3         | 497.00 |
| 4         | 665.00 |

Cv = flow rate (GPM) @ 68°F  
with 1 psi pressure drop

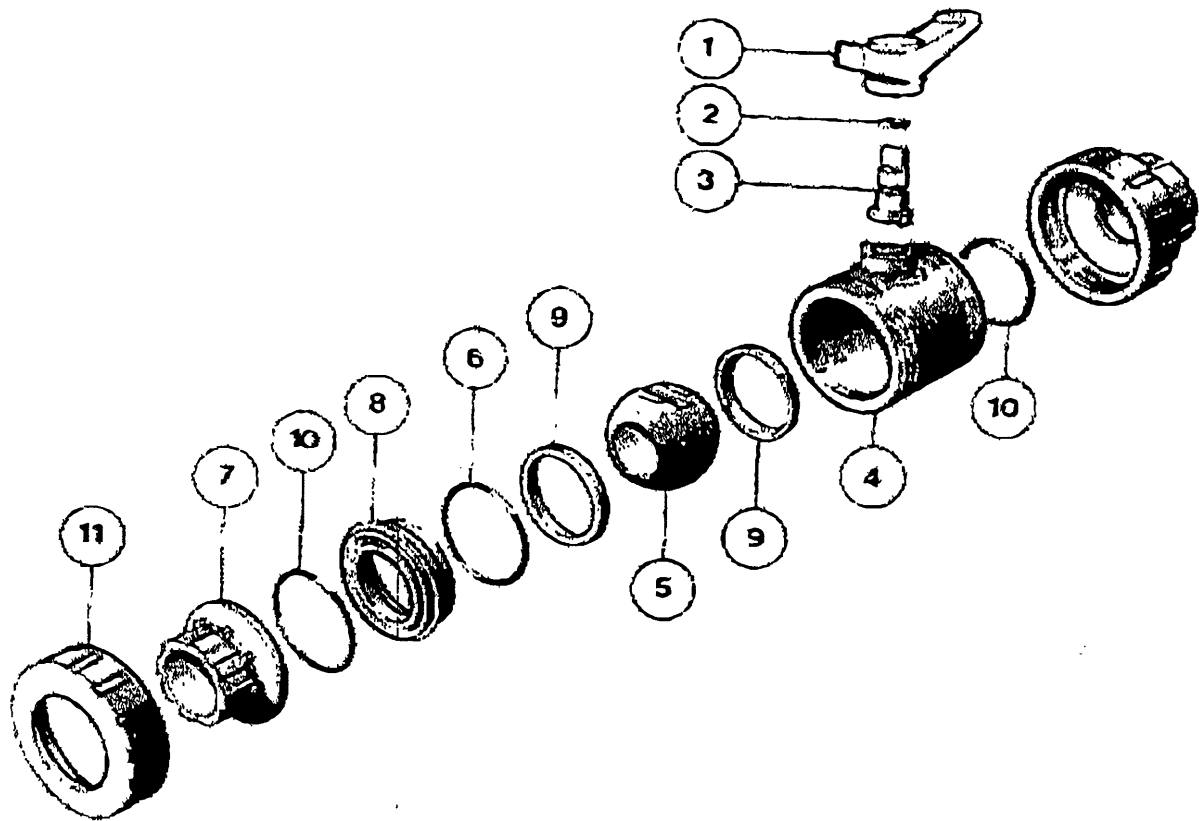
| Dimensions |      |                |      |                |       |                |      |      |       |        |
|------------|------|----------------|------|----------------|-------|----------------|------|------|-------|--------|
| d / R      | L    | L <sub>1</sub> | Z    | Z <sub>1</sub> | H     | H <sub>1</sub> | E    | B    | C     | Weight |
| 1/2        | 0.89 | 0.70           | 2.07 | 2.14           | 3.85  | 3.54           | 2.08 | 1.97 | 2.56  | 0.32   |
| 3/4        | 1.00 | 0.71           | 2.12 | 2.24           | 4.12  | 3.66           | 2.44 | 2.28 | 2.99  | 0.48   |
| 1          | 1.13 | 0.89           | 2.32 | 2.54           | 4.58  | 4.32           | 2.79 | 2.56 | 3.35  | 0.69   |
| 1 1/4      | 1.26 | 0.92           | 2.77 | 2.87           | 5.29  | 4.71           | 3.30 | 2.99 | 3.94  | 1.11   |
| 1 1/2      | 1.38 | 1.12           | 3.03 | 3.23           | 5.79  | 5.47           | 3.86 | 3.37 | 4.41  | 1.59   |
| 2          | 1.50 | 1.40           | 3.82 | 4.05           | 6.82  | 6.85           | 4.61 | 4.05 | 5.39  | 2.74   |
| 2 1/2      | 1.75 | 1.31           | 5.00 | 5.89           | 8.50  | 8.51           | 6.06 | 5.24 | 8.74  | 5.72   |
| 3          | 1.89 | 1.39           | 5.55 | 6.81           | 9.33  | 9.59           | 7.44 | 6.06 | 10.63 | 9.53   |
| 4          | 2.26 | 1.48           | 9.45 | 11.01          | 13.97 | 13.97          | 8.70 | 6.89 | 10.63 | 17.54  |

Dimensions are in inches, weight in pounds. L<sub>1</sub>, Z<sub>1</sub>, H<sub>1</sub> refer to NPT version; L, Z, H refer to IPS socket dimension.



19.6  
2/4

# EXPLODED PARTS VIEW



| Position | Components            | Material      |
|----------|-----------------------|---------------|
| 1        | handle                | HIPVC         |
| 2        | stem o-ring           | EPDM or VITON |
| 3        | stem                  | PVC - CPVC    |
| 4        | body                  | PVC - CPVC    |
| 5        | ball                  | PVC - CPVC    |
| 6        | body o-ring           | EPDM or VITON |
| 7        | end connector         | PVC - CPVC    |
| 8        | support for ball seat | PVC - CPVC    |
| 9        | ball seat             | PTFE          |
| 10       | socket o-ring         | EPDM or VITON |
| 11       | union nut             | PVC - CPVC    |

19.6  
3/4

# GUIDE SPECIFICATION

## VX SERIES: TRUE UNION BALL VALVE

### 1.0 Ball Valves - VX

#### 1.1 Material

- Valve body, stem, ball and unions shall be made of PVC resin which shall meet or exceed the requirements of 12454 according to ASTM D-1784, or
- Valve body, stem ball and unions shall be made of CPVC resin which shall meet or exceed the requirements of 23447 according to ASTM D-1784.

#### 1.2 Seats

- Ball seats shall be Teflon™.

#### 1.3 Seals

- Seal material shall be EPDM or VITON (specifier must select one).

### 2.0 Design Features

- Valve shall be blocking with union ends.
- Valve body shall be single end entry with threaded carrier.
- All valves shall have an expansion compensating groove on molded end.
- All sizes shall be full port.
- Handle shall incorporate a spanner wrench.
- Handle centerline shall be offset for operation in tight places.
- Handle shall have opposing dual mounting positions.

#### 2.1 Pressure Tested

- All valves shall have been pressure tested in both the open and closed positions by the manufacturer.

#### 2.2 Pressure Rating

- Valves shall be rated as follows:  
1/2" thru 2" - 232 psi at 73°F.  
2 1/2" thru 6" - 150 psi at 73°F.

3.0 Ball valves shall be Xirtec™ 140 or Xirtec™ 210 by IPEX or approved equal.

### Customer Service Centers

#### Charlotte

10100 Rodney Street, Pineville, NC 28134  
Tel: (704) 889-2431  
Toll Free: (800) 578-7687  
Fax: (704) 889-2810

#### Chicago

46 Sherwood Terrace, Lake Bluff, IL 60044  
Tel: (847) 295-4643  
Toll Free: (800) 258-1445  
Fax: (847) 295-6038

#### Houston

2226 Wintcrest, Suite H, Houston, TX 77055  
Tel: (713) 683-3898  
Toll Free: (800) 735-4784  
Fax: (713) 683-6259

#### Louisville

2000 Watson Trail, Louisville, KY 40299  
Tel: (502) 491-8939  
Toll Free: (800) 786-2037  
Fax: (502) 491-8796

#### Toronto

2441 Royal Windsor Drive, Mississauga, ON L5J 4C7  
Tel: (905) 403-0264  
Toll Free: (800) 453-9572  
Fax: (905) 403-9195

IPEX offers the world's most extensive range of thermoplastic piping systems for the industrial, mechanical, municipal and electrical markets.

[www.ipexinc.com](http://www.ipexinc.com)

**WARRANTY:** All IPEX products are guaranteed against defects resulting from faulty workmanship or materials. If any such product is found to be defective by reason of faulty workmanship or materials, upon written notice and return of the product, the defective product will be replaced by IPEX free of charge, including shipping charges for the replacement product. Claims for labor costs and other expenses required to replace such defective product or to repair any damage resulting from the use thereof will not be allowed by IPEX. Our liability is limited to the price paid for the defective product. IPEX will not be bound by any warranty, other than above set forth, unless such warranty is in writing.

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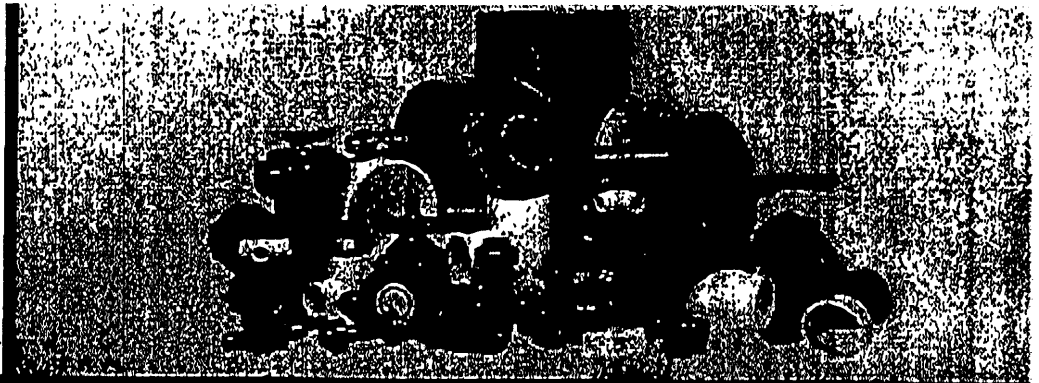
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BRINVLPO10324  
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19.6  
4/4

# RV Y - PATTERN SEDIMENT STRAINER

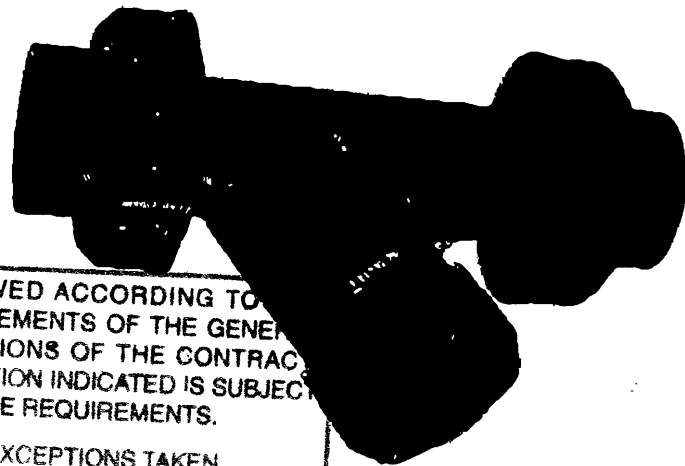


## IPEX THERMOPLASTIC VALVES

### Special Features:

- The RV Series Y - Pattern Strainer protects critical pipeline components by removing solids and suspended impurities
- Filter screen options include four mesh sizes for easy and rapid interchangeability
- The PVC strainer body is molded in transparent material for easy evaluation of filter screen condition
- In-line maintenance
- Strainer design ensures total filtration of pipeline flow
- Part of the Xirtec™ system of pipe, valves and fittings

ITEM 2 15300 SET.2.4



REVIEWED ACCORDING TO  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS.

☒ NO EXCEPTIONS TAKEN  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ PREPARED BY

Body Material: PVC  
Size Range: 1/2" thru 4"  
EARTH TECH (CANADA) INC.  
Pressure:

Seals:

EPDM or VITON

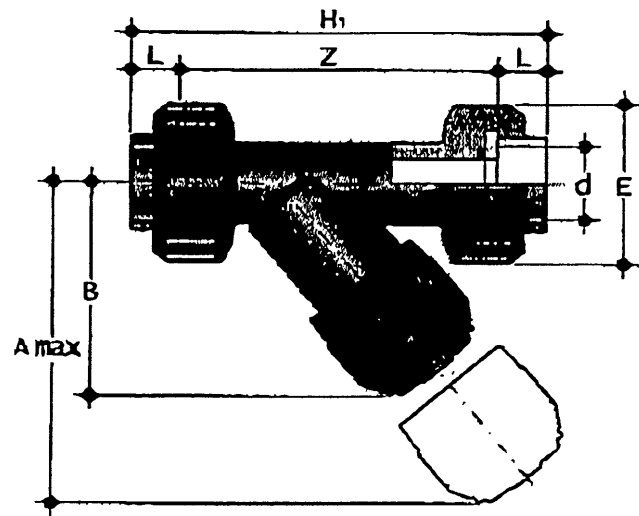
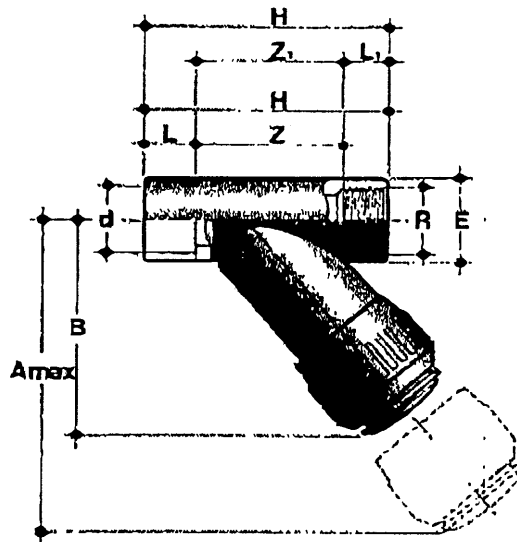
End Connections:

Socket (ASTM)  
Threaded (NPT)  
Flanged (ANSI 150)

JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL:  
SIFEC-KUDLIK, PER: C. FAUTEUX, T.P.  
G. FAUTEUX, P. ENG.  
P.A. PELLETIER, P. ENG.

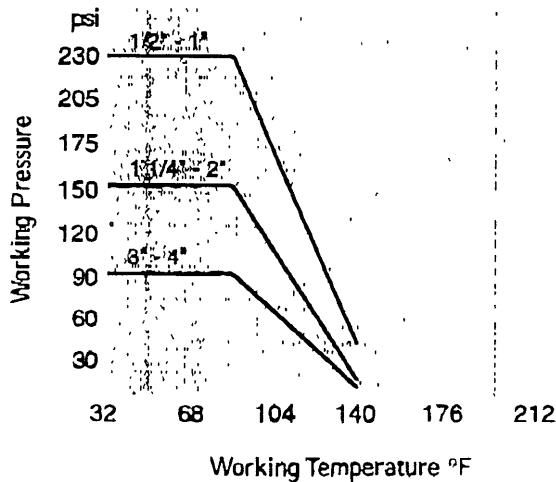
  
**IPEX**  
CORPORATE OFFICE: 1000

# TECHNICAL DATA



| Dimensions |       |      |      |      |      |      |      |       |       |        |
|------------|-------|------|------|------|------|------|------|-------|-------|--------|
| R          | A max | B    | E    | L    | L1   | Z    | Z1   | H     | H1    | Weight |
| 1/2        | 4.92  | 2.83 | 2.17 | 0.88 | 0.70 | 3.54 | 4.19 | -     | 5.59  | .46    |
| 3/4        | 4.92  | 3.30 | 2.60 | 1.00 | 0.71 | 4.21 | 4.84 | -     | 6.26  | .78    |
| 1          | 5.70  | 3.74 | 2.95 | 1.13 | 0.89 | 4.67 | 5.43 | -     | 7.20  | 1.15   |
| 1 1/4      | 6.50  | 4.37 | 3.43 | 1.26 | 0.92 | 5.63 | 6.57 | -     | 8.42  | 1.63   |
| 1 1/2      | 7.48  | 4.72 | 3.94 | 1.38 | 1.12 | 6.81 | 7.00 | -     | 9.25  | 2.43   |
| 2          | 8.27  | 5.47 | 4.72 | 1.50 | 1.40 | 8.72 | 8.41 | -     | 11.22 | 4.12   |
| 3          | 9.45  | 7.56 | 4.57 | 2.01 | 1.87 | 6.30 | 6.57 | 10.32 | -     | 6.54   |
| 4          | 11.81 | 9.09 | 5.43 | 2.40 | 2.25 | 7.99 | 8.29 | 12.79 | -     | 10.14  |

Dimensions are in inches, weight in pounds. L1, Z1, H1 refer to NPT thread; L, Z, H refer to IPS socket.



| Filter Screen Sizes       |           |     |     |     |
|---------------------------|-----------|-----|-----|-----|
| Hole pitch (mm)           | 1.0       | 1.5 | 2.0 | 2.5 |
| Holes per square inch     | 1260      | 670 | 450 | 315 |
| Equivalent ASTM mesh size | 30        | 19  | 15  | 13  |
|                           | PVC - SS* |     |     |     |

\* SS only 19 mesh

Cv = flow rate  
(GPM) @ 68°F  
with 1 psi pressure  
drop

| Size (in) | Cv    |
|-----------|-------|
| 1/2       | 2.8   |
| 3/4       | 4.9   |
| 1         | 7.2   |
| 1 1/4     | 13.2  |
| 1 1/2     | 17.8  |
| 2         | 28.7  |
| 3         | 73.5  |
| 4         | 119.0 |

19.7

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## EXPLODED PARTS VIEW

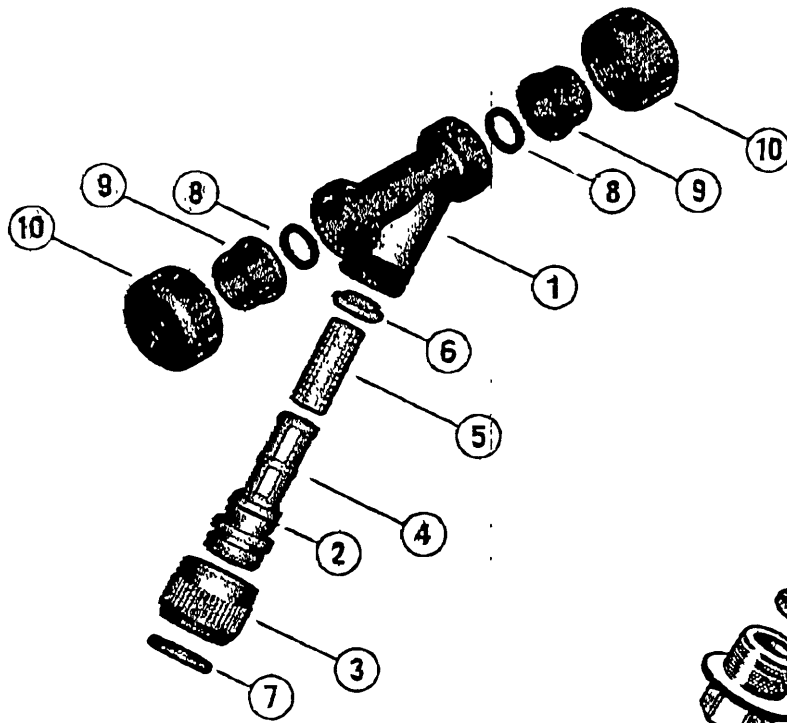


Figure A

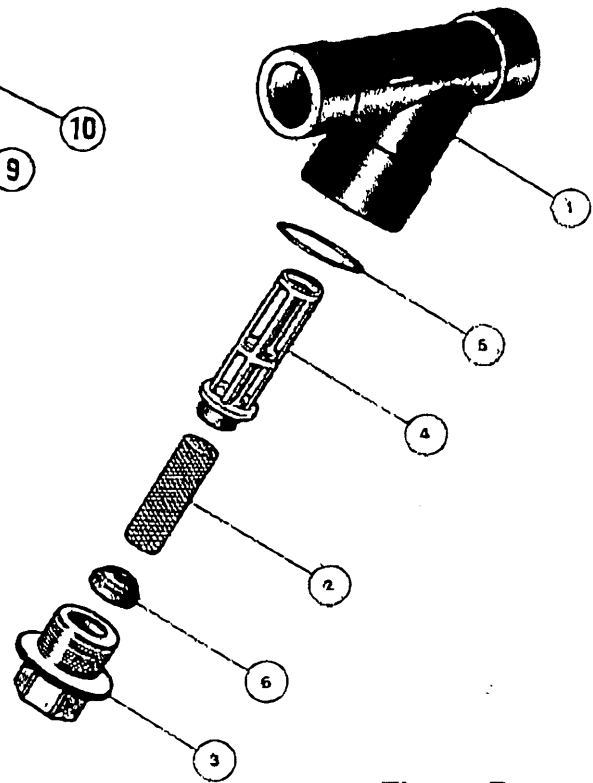


Figure B

| Figure A (1/2" thru 2") |                         |               |
|-------------------------|-------------------------|---------------|
| Position                | Components              | Material      |
| 1                       | body                    | PVC           |
| 2                       | sealing o-ring          | EPDM or VITON |
| 3                       | bonnet                  | PVC           |
| 4                       | mesh housing            | PVC           |
| *5                      | screen mesh 30-19-15-13 | PVC or SS     |
| 6                       | lock nut                | PVC           |
| 7                       | split ring              | PVC           |
| 8                       | o-ring                  | EPDM or VITON |
| 9                       | end connector           | PVC           |
| 10                      | union nut               | PVC           |

\* SS only 19 mesh

| Figure B (3" thru 4") |                         |               |
|-----------------------|-------------------------|---------------|
| Position              | Components              | Material      |
| 1                     | body                    | PVC           |
| *2                    | screen mesh 30-19-15-13 | PVC or SS     |
| 3                     | bonnet                  | PVC           |
| 4                     | screen support housing  | PVC           |
| 5                     | o-ring seal             | EPDM or VITON |
| 6                     | retaining ring          | PVC           |

\* SS only 19 mesh

# GUIDE SPECIFICATION

## RV SERIES: SEDIMENT STRAINER

### 1.0 Strainers - RV

#### 1.1 Material

- Strainer body shall be made of transparent PVC resin which shall meet or exceed the requirements of 12454 according to ASTM D-1784.

#### 1.2 Seals

- Seal material shall be EPDM or VITON (specifier must select one).

#### 1.3 Screens

- Screens shall be:  
PVC  
Stainless Steel

### 2.0 Design Features

- Strainer shall be Y - pattern style and shall have true union ends (1/2" - 2") and solid threaded or socket ends (3" - 4").
- It shall be possible to service the valve without removing it from the line.
- Following mesh sizes shall be available:  
13, 15, 19, 30 (PVC)  
19 (stainless steel)

#### 2.1 Pressure Rating

- Strainers shall be rated as follows:  
1/2" thru 1" - 150 psi at 73°F  
1 1/4" thru 2" - 90 psi at 73°F  
3" thru 4" - 60 psi at 73°F

### 3.0 Sediment Strainers shall be Xirtec™ 140 by IPEX or approved equal.



### Customer Service Centers

#### Charlotte

10300 Rocky Street, Pineville, NC 28134  
Tel: (704) 889-2431  
Toll Free: (800) 578-7681  
Fax: (704) 889-2810

#### Chicago

46 Sherwood Terrace, Lake Bluff, IL 60044  
Tel: (847) 295-4643  
Toll Free: (800) 288-1445  
Fax: (847) 295-8038

#### Houston

2228 Windcrest, Suite H, Houston, TX 77055  
Tel: (713) 883-9893  
Toll Free: (800) 735-4784  
Fax: (713) 883-6259

#### Louisville

2000 Webster Road, Louisville, KY 40299  
Tel: (502) 491-8939  
Toll Free: (800) 756-2037  
Fax: (502) 491-8796

#### Toronto

2441 Rye Road, Windsor, Ontario, ON L5L 4C7  
Tel: (905) 403-0264  
Toll Free: (800) 463-9572  
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## IPEX THERMOPLASTIC VALVES

ITEM (10) 15300 SECT. 2.4

- 

PVC, CPVC

1/2" thru 4"

150 psi

EPDM or VITON

Socket (IPS)  
Threaded (NPT)  
Flanged (ANSI 150)

JOB; WASTE WATER TREATMENT  
 PLANT AT IQUALUIT, NUNAVUT  
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 SISFEC-KUDLIK, PER; C.FAUTEUX, T.P.  
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REQUIREMENTS OF THE A  
FUNCTIONS OF THE OR  
ACTIVITY LOCATED IS C  
THESE REQUIREMENTS

☒ NO CHANGES TAKEN

☐ MAKE CHANGES

☐ REVISE & RESUBMIT

☐ REJECTED

DATE July 21/06 BY \_\_\_\_\_

EARTH TECH (CANADA



# GUIDE SPECIFICATION

## VB SERIES: TRUE UNION BALL CHECK VALVE

### Customer Service Centers

#### Charlotte

10100 Rodney Street, Pineville, NC 28134  
Tel: (704) 889-2431  
Toll Free: (800) 578-7681  
Fax: (704) 889-2810

#### Chicago

46 Sherwood Terrace, Lake Bluff, IL 60044  
Tel: (847) 295-4643  
Toll Free: (800) 258-1445  
Fax: (847) 295-6038

#### Houston

2228 Wirtcrest, Sulta H, Houston, TX 77055  
Tel: (713) 883-3893  
Toll Free: (800) 735-4784  
Fax: (713) 883-6259

#### Louisville

2000 Watterson Trail, Louisville, KY 40299  
Tel: (502) 491-8939  
Toll Free: (800) 766-2037  
Fax: (502) 491-8796

#### Toronto

2441 Royal Windsor Drive, Mississauga, ON L5J 4C7  
Tel: (905) 403-0264  
Toll Free: (800) 463-9572  
Fax: (905) 403-9195

### 1.0 Ball Check Valve - VB

#### 1.1 Material

- Valve body, ball and unions shall be made from PVC resin, which meets or exceeds 12454 according to ASTM D-1784 or CPVC resin which meets or exceeds 23447 according to ASTM D-1784.

#### 1.2 Seals

- Seal material shall be EPDM or VITON (specifier must select one).

### 2.0 Design Features

- True Union.
- Valve cavity shall feature full body guide ribs for increased flow.

#### 2.1 Pressure Rating

- Valves shall be rated for 150 psi at 73°F.

### 3.0 Ball Check valves shall be Xirtec™ 140 or Xirtec™ 210 by IPEX or approved equal.

## TECHNICAL DATA

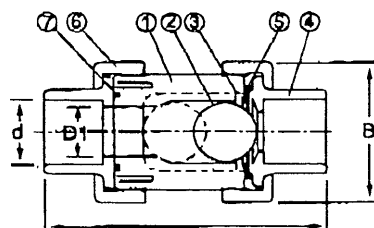
| Dimensions |       |          |          |          |       |        |
|------------|-------|----------|----------|----------|-------|--------|
| d / R      | D1    | d socket | d thread | L socket | B     | Weight |
| 1/2        | 0.598 | 0.84     | NPT      | 3.98     | 2.106 | 0.25   |
| 3/4        | 0.771 | 1.05     | NPT      | 4.53     | 2.492 | 0.50   |
| 1          | 0.984 | 1.32     | NPT      | 5.35     | 2.874 | 0.96   |
| 1 1/4      | 1.259 | 1.66     | NPT      | 6.73     | 3.842 | 2.23   |
| 1 1/2      | 1.574 | 1.90     | NPT      | 6.73     | 3.842 | 2.53   |
| 2          | 1.968 | 2.38     | NPT      | 7.68     | 4.744 | 3.80   |
| 2 1/2      | 2.560 | 2.88     | NPT      | 8.74     | -     | 6.88   |
| 3          | 3.150 | 2.50     | NPT      | 10.79    | -     | 12.87  |
| 4          | 3.940 | 4.50     | NPT      | 14.45    | -     | 19.00  |

Dimensions are in inches, weight in pounds.

| Position | Components    | Material      |
|----------|---------------|---------------|
| 1        | body          | PVC - CPVC    |
| 2        | ball          | PVC - CPVC    |
| 3        | seat carrier  | PVC - CPVC    |
| 4        | end connector | PVC - CPVC    |
| 5        | seat          | EPDM or VITON |
| 6        | union nut     | PVC - CPVC    |
| 7        | O-ring        | EPDM or VITON |

| Size (in) | Cv  |
|-----------|-----|
| 1/2       | 7.5 |
| 3/4       | 14  |
| 1         | 17  |
| 1 1/4     | 29  |
| 1 1/2     | 63  |
| 2         | 97  |
| 2 1/2     | 159 |
| 3         | 310 |
| 4         | 521 |

Cv = flow rate (GPM) @ 68°F  
with 1 psi pressure drop



- Install 10 pipe diameters from the pump
- do not use in systems over 5 fps velocity



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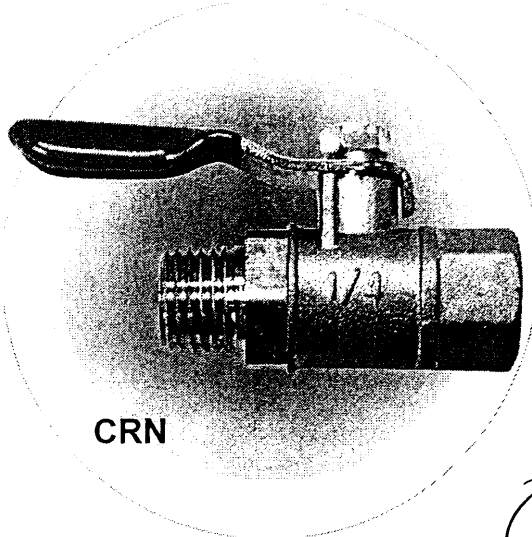
(13)

IQUALUIT  
REF 15070

SECTION 2.3

JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK, PER: C.FAUTEUX, T.P.  
G.FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.

# Mini Ball Valve



CRN

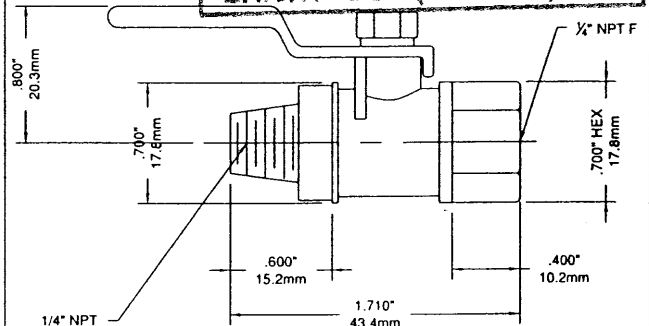
## Description

Winters Mini Ball Valve is an economical isolation valve for controlling any non-corrosive application. The compact size and easy to use handle makes Winters Mini Ball Valve ideal for use with pressure gauges, transmitters and transducers.

REVIEWED ACCORDING TO THE  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT.  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS

- ☒ NO EXCEPTIONS TAKEN  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ REJECTED

DATE July 21/05 BY SDK  
EARTH TECH (CANADA) INC.



## Specifications

|                             |                                 |
|-----------------------------|---------------------------------|
| Body:                       | #59-1 forged brass              |
| Ball:                       | Stainless steel                 |
| Gaskets:                    | Teflon                          |
| Handle:                     | Steel, plated, plastic covered  |
| Process Temperature:        | -9°F to 212°F (-23°C to 100°C)  |
| Maximum Operating Pressure: | 400 psi (2,758 kPa)             |
| Connection:                 | 1/4" NPT female x 1/4" NPT male |

How to order: Specify product code  
A500

Other sizes and materials available upon request.

19.9

1/1

**WINTERS**



Corporate Office: 121 Railside Road • Toronto • ON • M3A 1B2 • (416) 444-2345 • Fax: (416) 444-8979

U.S.A. Office: 600 Ensminger Road • Buffalo • NY • 14150 • (716) 874-8700 • Fax: (716) 874-8800

www.winters.com • 1-800-WINTERS (946-8377)

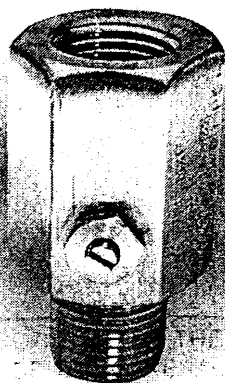
12/02

IQUALUIT  
REF 15070  
SECTION 2.3

JOB; WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK, PER; C.FAUTEUX, T.P.  
G.FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.

# Adjustable Snubber

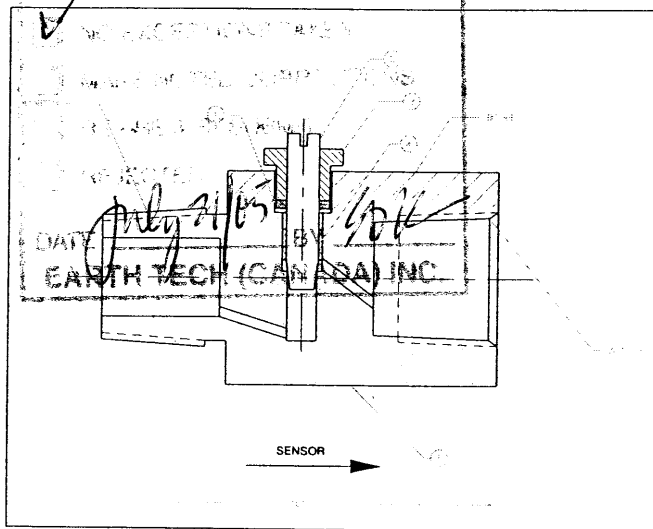
**NEW!**



## Description

The Winters Adjustable Snubber significantly lessens the damaging effects of pulsation on pressure gauges, transducers, transmitters, manometers and pressure switches. These Adjustable Snubbers can be used to change the amount of restriction. Adjustments to the valve can be made even while the snubber is in service. The use of snubbers will improve the reading accuracy of the instrument (i.e. pressure gauges).

Winters Adjustable Snubbers will prolong the life of pressure instruments especially in demanding industrial applications including; pumps, compressors, hydraulic presses or fluid power applications.



## Specifications

| SR. No | Description  | St/St     | Brass     |
|--------|--------------|-----------|-----------|
| 1      | Gland Seal   | Teflon    | Teflon    |
| 2      | Stem         | St/St 316 | St/St 316 |
| 3      | Gland        | St/St 316 | Brass     |
| 4      | Gland Washer | St/St 316 | St/St 316 |
| 5      | Body         | St/St 316 | Brass     |

dep 20

## How to order: Specify product code

| SR. No. | "A"      | "L"        | "B"        |
|---------|----------|------------|------------|
| 1.00    | 1/2" NPT | 62mm/2.44" | 32mm/1.26" |
| 2.00    | 1/4" NPT | 52mm/2.05" | 22mm/0.87" |

### CAUTION:

WHEN ADJUSTING VALVE DO NOT ADJUST MORE THAN TWO TURNS FROM THE CLOSED POSITION AS LEAKAGE WILL OCCUR.

| Product Code | Material / Connection NPT | Seal   | Pressure Rating      |
|--------------|---------------------------|--------|----------------------|
| A540         | Brass 1/4" MxF            | Teflon | 6,000psi/41,368kPa   |
| A541         | Brass 1/2" MxF            | Teflon | 6,000psi/41,368kPa   |
| A542         | St/St 1/4" MxF            | Teflon | 6,000psi/41,368kPa   |
| A543         | St/St 1/2" MxF            | Teflon | 10,000psi/68,947 kPa |

Temperature Rating: -40F - 248F (-40C-120C)

19.10

1/1



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09/03

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## **Chapter 20BIG VALVE (8-18 INCH)**

### **MANUFACTURER/DISTRIBUTOR:**

ROMATEC  
6535,HENRI-BOURASSA OUEST  
MTL.QUEBEC H4R 1C9  
PH:514-332-9302 FAX:0578

### **MANUFACTURER/DISTRIBUTOR:**

ORBINOX  
2050,DAGENAIS WEST  
LAVAL,QUEBEC H7L 5W2  
PH:450-622-8775 FAX:6831

### **MANUFACTURER/DISTRIBUTOR:**

ITT FLYGT  
300 AVE LABROSSE  
POINTE-CLAIRE,QUEBEC  
H9R 4V5  
PH:514-695-0100  
FAX:514-697-0602

- 20.1 BALL CHECK VALVE 8" (V102-V104-V106) FLYGT**
- 20.2 ORBINOX KNIFE GATE VALVE SERIES 10**
- 20.3 ORBINOX KNIFE GATE VALVE SERIES 20**
- 20.4 KEYSTONE RESILIENT SEATED BUTTERFLY VALVE**

**END OF CHAPTER 20**

FLYGT

12 VALUET  
TAGI V-102-104-106

1 of 3

# CLAPET HDL

Un clapet de retenue à  
boulet qui peut être monté  
dans la position horizontale  
verticale ou **inversee**.

REVIEWED ACCORDING TO THE  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS.

☒ NO EXCEPTIONS  
☐ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ REJECTED

DATE July 13, 2005 BY DBB  
EARTH TECH (CANADA) INC.

JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK per: C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A.PELLETIER, P.ENG.



ITT

Flygt

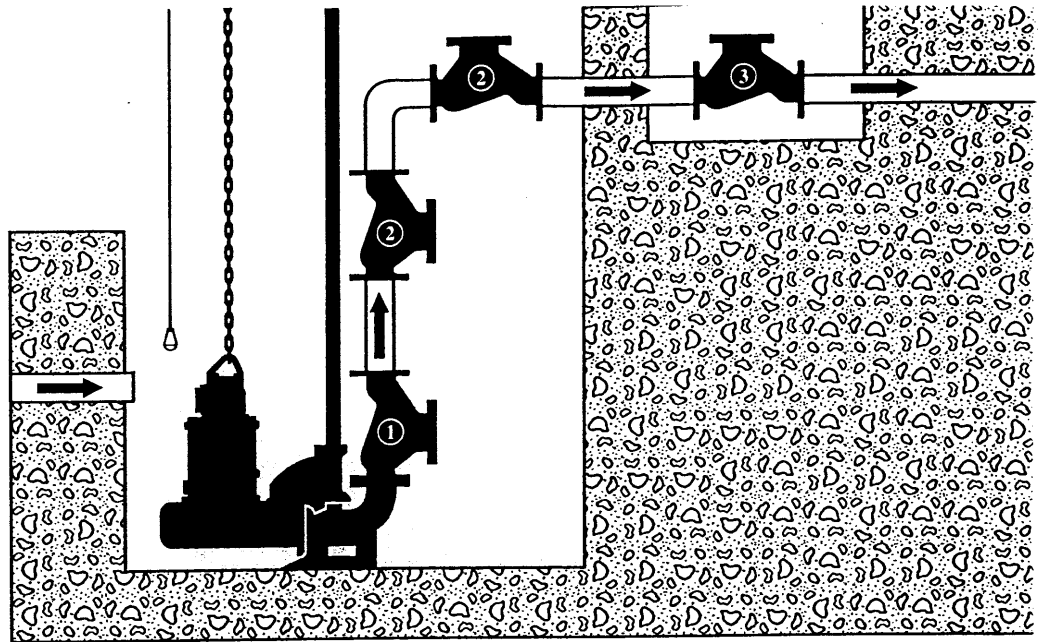
ITT Fluid Technology Corporation

20.1

1/3

## Différentes installations possibles avec une pompe submersible Flygt

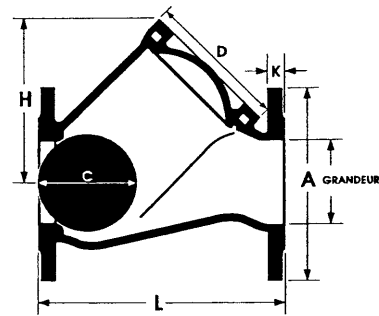
Lorsqu'on emploie le clapet de retenue HDL avec une pompe Flygt, on obtient un système de pompage d'une grande fiabilité. Le schéma ci-contre illustre plusieurs installations possibles: le clapet peut être monté directement sur le coude de décharge ou monté plus haut sur la conduite, à l'intérieur de la station ou même à l'extérieur ③. Cette flexibilité d'installation permet de répondre aux contraintes d'espace en plus de faciliter l'accès au clapet.



**Remarque:** Lorsque la hauteur de charge statique sur le clapet de retenue est inférieure à 3 m (10 pi) d'eau ou 0,28 kg/cm<sup>2</sup> (4 lb/po<sup>2</sup>), le clapet devrait être placé verticalement seulement.

## Modèle 5087

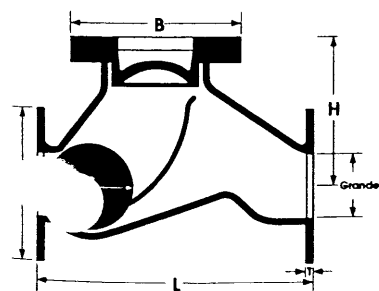
Clapet court de même longueur que les clapets conventionnels. Son boulet en acier, recouvert de caoutchouc, résiste à l'eau de mer, à l'huile et aux eaux usées. Brides percées selon les normes ANSI B16.1, classe 125. Corps en fonte nodulaire. Les grandeurs standards conviennent pour une pression manométrique de service allant jusqu'à 10 bars (145 lb/po<sup>2</sup>).



| Grandeur | A  |     | C       |     | D       |     | H       |     | K       |      | L      |     | Poids  |         |
|----------|----|-----|---------|-----|---------|-----|---------|-----|---------|------|--------|-----|--------|---------|
|          | mm | po  | mm      | po  | mm      | po  | mm      | po  | mm      | po   | mm     | po  | kg     | lb      |
| 50       | 2  | 152 | 5 15/16 | 63  | 2 1/2   | 100 | 4       | 115 | 4 7/16  | 16   | 1 1/16 | 203 | 8      | 9,20    |
| 80       | 3  | 191 | 7 1/2   | 96  | 3 3/4   | 140 | 5 1/2   | 160 | 6 1/4   | 19   | 3/4    | 241 | 9 1/2  | 13,29   |
| 100      | 4  | 229 | 9       | 125 | 4 15/16 | 170 | 6 11/16 | 200 | 7 7/8   | 19   | 3/4    | 292 | 11 1/2 | 20,44   |
| 150      | 6  | 279 | 11      | 180 | 7 1/16  | 230 | 9 1/16  | 260 | 10 3/16 | 16   | 11/16  | 356 | 14     | 42,93   |
| 200      | 8  | 343 | 13 1/2  | 250 | 9 7/8   | 315 | 12 3/8  | 335 | 13 3/16 | 20   | 13/16  | 495 | 19 1/2 | 74,163  |
| 250      | 10 | 406 | 16      | 320 | 12 5/8  | 396 | 15 3/8  | 410 | 16 1/8  | 22   | 7/8    | 622 | 24 1/2 | 138,304 |
| 300      | 12 | 483 | 19      | 370 | 14 3/8  | 460 | 18 1/8  | 490 | 19 5/16 | 24,5 | 15/16  | 699 | 27 3/8 | 200,441 |
| 350      | 14 | 533 | 21      | 440 | 17 5/16 | 544 | 21 1/2  | 590 | 23 3/16 | 24,5 | 15/16  | 787 | 31     | 310,685 |

## Modèle 2016

Clapet long pour des conduites de grand diamètre. Son boulet en acier est recouvert de caoutchouc. Brides percées selon les normes ANSI B 16.1, classe 125. Fabrication standard permettant une pression manométrique de service allant jusqu'à 10 bars (145 lb/po<sup>2</sup>).



| Grandeur | A*  |        | B   |        | C   |        | H   |        | L*   |    | T** |        | Poids |      |
|----------|-----|--------|-----|--------|-----|--------|-----|--------|------|----|-----|--------|-------|------|
| mm po    | mm  | po     | mm  | po     | mm  | po     | mm  | po     | mm   | po | mm  | po     | kg    | lb   |
| 400 16   | 597 | 23 1/2 | 725 | 28 1/2 | 500 | 19 5/8 | 741 | 29 1/8 | 1602 | 63 | 37  | 1 7/16 | 785   | 1727 |

\* Tolérance  $\pm 3,2$  mm (1/8 po). \*\* Tolérance  $\pm 1,6$  mm (1/16 po). Bride standard de 125 lb.

Grandeurs supérieures disponibles sur demande.

20.1

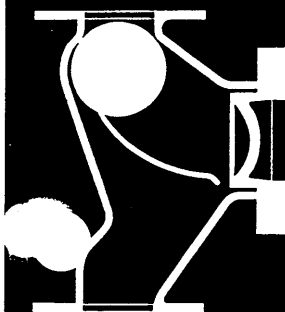
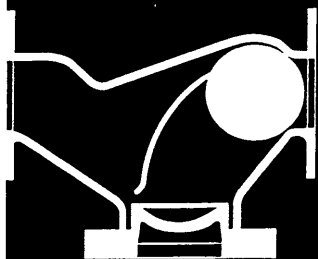
2/3

Installation possible

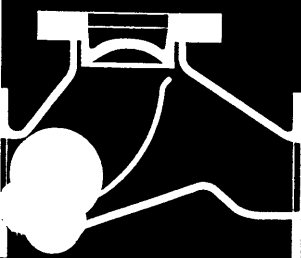
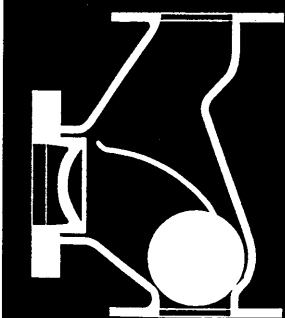
dans toutes les  
positions montrées

-dessous.

Écart admissible  
jusqu'à 30°.



Boulet flottant



Boulet plongeant

## Le clapet HDL de Flygt

Le clapet HDL de Flygt est le seul clapet de retenue à boulet qui ne s'engorge pas et qui donne un plein rendement sans ennuis en position horizontale, verticale ou inversée. Sa conception spéciale a pour avantage de garder le boulet complètement en dehors du passage lorsque le clapet est ouvert, ce qui permet un fonctionnement à plein débit avec une diminution allant jusqu'à 20% de la perte due à la friction, comparativement à celle des clapets conventionnels.

Le clapet HDL est muni d'un boulet creux en acier enrobé d'un épais caoutchouc au nitrile vulcanisé. Lorsque le clapet fonctionne, le boulet est guidé d'une position à l'autre par des nervures entièrement coulées dans la paroi du clapet. Sans saillie ni recoin qui puissent retenir les matières solides, le passage est bien dégagé et rien ne peut gêner le débit. Le boulet se déplace librement dans son logement et n'est soumis à aucune usure concentrée en un point. A cause de la faible inertie de celui-ci, la pression requise pour ouvrir le clapet HDL n'a pas besoin d'être aussi forte que celle requise par un clapet de retenue à contrepoids. Le boulet est maintenu fermement en place sans avoir recours à des ressorts ou autres dispositifs mécaniques. Contrairement aux clapets convention-

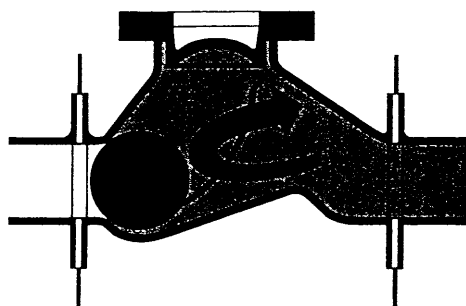
nels, le clapet HDL n'exige aucun entretien.

Le modèle standard convient à des pressions manométriques de service allant jusqu'à 10 bars (145 lb/po<sup>2</sup>) et à des températures allant jusqu'à 80°C. Les clapets HDL modèles 5087, 2016 et 3029 sont également offerts avec des revêtements spéciaux pour liquides corrosifs ou abrasifs, les hautes températures et les pressions élevées.

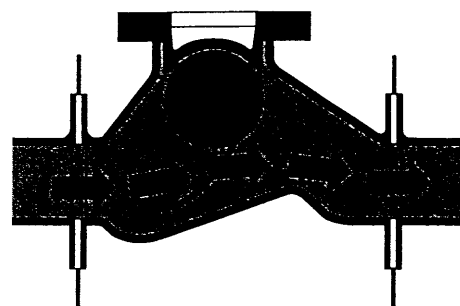
Toutes ces caractéristiques font du clapet HDL une pièce d'équipement particulièrement bien adaptée aux systèmes à risques élevés de blocage, comme les canalisations d'eaux usées et les systèmes d'évacuation des eaux de ruissellement.

Les dimensions standards s'échelonnent de 4 à 40,6 cm (1 1/2" à 16") avec brides de raccordement en fonte, percées selon les normes ANSI B-16.1, classe 125 ou classe 250 selon l'exigence. Le clapet HDL est également offert en fonte avec raccords filetés de 1,9 à 5 cm (3/4" à 2") NPT (modèle 2010).

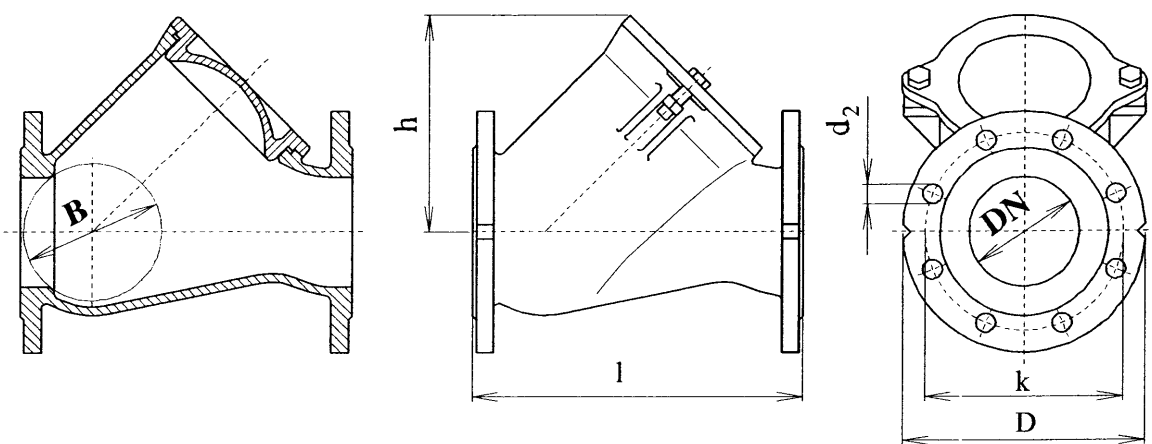
Pompe arrêtée - aucun retour



Pompe en marche



20.1

| <b>HDL<sup>®</sup> Ball Check Valve Type 5087-200</b>                                                                                                                                             |                  |                                                                 |                  |                  |                                                                                       | <b>DN200 - PN 10</b>                                                                                |                       |                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------|------------------|------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|
| <b>Face to face: DIN 3202, series F6</b>                                                                                                                                                          |                  |                                                                 |                  |                  |                                                                                       | <b>Resilient seated</b>                                                                             |                       |                                    |
|                                                                                                                 |                  |                                                                 |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| <b>h</b><br>(mm)                                                                                                                                                                                  | <b>l</b><br>(mm) | <b>B</b><br>(mm)                                                | <b>D</b><br>(mm) | <b>k</b><br>(mm) | <b>d<sub>2</sub></b><br>(mm)                                                          | <b>KV</b><br>m <sup>3</sup> /H                                                                      | <b>Weight</b><br>(kg) | <b>Space</b><br>(dm <sup>3</sup> ) |
| <b>335</b>                                                                                                                                                                                        | <b>500</b>       | <b>250</b>                                                      | <b>340</b>       | <b>295</b>       | <b>23 (8x)</b>                                                                        | <b>1.885</b>                                                                                        | <b>73</b>             | <b>86</b>                          |
| <b><u>Design features and materials:</u></b> (standard Ball Check Valve)                                                                                                                          |                  |                                                                 |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| <b>HDL<sup>®</sup></b> Ball Check Valves with unrestricted passage, resilient seated, low resistance ball operation; a wide range of applications in waste water systems and potable water lines. |                  |                                                                 |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Body and cover:                                                                                                                                                                                   |                  | Nodular cast iron GGG40, DIN 1693 (sheet 1),<br>Mat. nr. 0.7040 |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Ball core:                                                                                                                                                                                        |                  | Aluminium Veral 231 A (DIN 1725, part 2 and 5)                  |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Ball coating:                                                                                                                                                                                     |                  | Nitril, hardness 63° shore A                                    |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Bolts and nuts:                                                                                                                                                                                   |                  | 8.8, zincromat coated                                           |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Gasket:                                                                                                                                                                                           |                  | Nitril O-ring, hardness 70° shore A                             |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Coating:                                                                                                                                                                                          |                  | Outside Alkyd base coat, black (40 microns)                     |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| <b><u>Contact:</u></b>                                                                                                                                                                            |                  |                                                                 |                  |                  |                                                                                       |                                                                                                     |                       |                                    |
| Hillen de Lelie B.V., Amsterdam, The Netherlands                                                                                                                                                  |                  |                                                                 |                  |                  | www.hdl.nl                                                                            |                                                                                                     |                       |                                    |
| Phone: +31 20 636 0982, Fax: +31 20 636 2842, E-mail: info@hdl.nl                                                                                                                                 |                  |                                                                 |                  |                  |  |                                                                                                     |                       |                                    |
| <b>Note:</b> <u>We reserve the right to use other materials of equal or higher grade</u>                                                                                                          |                  |                                                                 |                  |                  |                                                                                       | <br>since 1913 |                       |                                    |

1 QUALWILL  
TAG: V-115-108-109-110-111-  
112-113-117-301-302  
201-202-203-

**SERIES 10**

V 116 à 18"



## DESIGN FEATURES

### BODY:

- Wafer style cast **monoblock** with raised face flanges and reinforced body ribs in larger diameters for extra body strength.
- Internal cast gate wedges and guides allows for tighter shut off.
- Full port design for greater flow capacity and minimal pressure drop.
- Internal design reduces build up of solids that could prevent valve from closing.

### GATE:

- Blade polished on both sides for a tighter seal in the packing chamber.
- Machined beveled gate end shears through solids for a tighter shut off.

### SEAT: (resilient)

- Unique design that mechanically locks the seat inside the valve body with a stainless steel retainer ring.
- Standard EPDM also available in different materials such as Viton, PTFE, etc.

### PACKING CHAMBER:

- Braided long life packing with EPDM O-ring for a tighter packing chamber seal.
- Smooth chamber and cast gland follower with equally distributed gland bolts provides uniform compression of packing.

### STEM

- Corrosion resistance stainless steel stem.
- Single pitch Acme thread reduces torque on handwheel operator and eliminates installation of a gear operator on larger diameters.
- Standard stem protector on all handwheel actuators gives additional protection against dust while the valve is in the open position.

### ACTUATORS:

- All Orbinox actuator models are supplied with a standard mounting kit to allow easy installation on site.

### YOKE & SUPPORT PLATES:

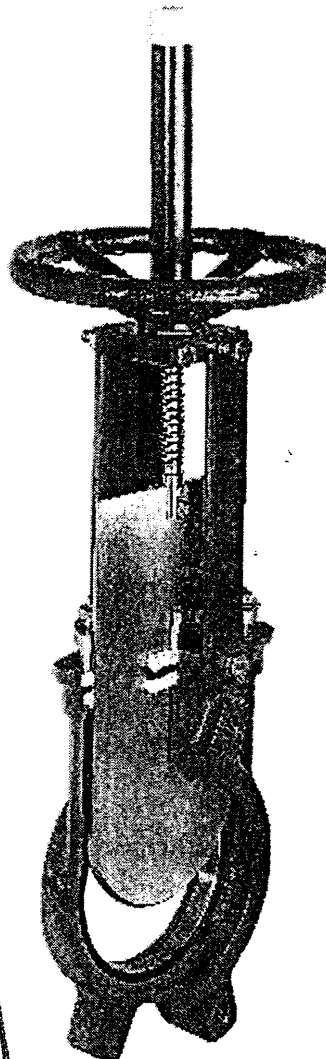
- EPOXY coated steel (stainless steel available on request).
- Compact design makes it extremely robust even in the most severe conditions.

### EPOXY COATING:

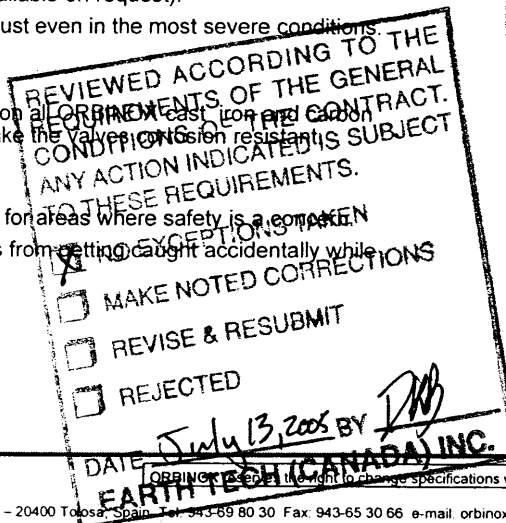
- The electrostatic applied epoxy coating on all ORBINOX cast iron and carbon steel valve bodies and components make the valve corrosion resistant.

### GATE SAFETY PROTECTION:

- Gate guards are available upon request for areas where safety is a concern.
- The design feature prevents any objects from getting caught accidentally while the gate is moving.



JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL;  
SIFEC-KUDLIK per: C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A. PELLETIER, P.ENG.



20.2



ORBINOX SPAIN, Polig. Ind. Anoeta - Apdo 80 - 20400 Tolosa, Spain Tel: 943-69 80 30 Fax: 943-65 30 66 e-mail: orbinox@orbinox.com

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10-2

D 1/3

# SERIES 10



## WAFER STYLE KNIFE GATE VALVE

The **SERIES 10** knife gate is a uni-directional wafer valve designed for general industrial service applications. The design of the valve allows for a tight shut off in services with solids in suspension in industries such as:

- Pulp and Paper
- Chemical Plants
- Food and Beverage
- Mining
- Power Plants
- Waste Water Treatment Plants
- Bulk Handling Material
- etc.

**Sizes:** 2" to 40" (larger diameters on request)

**Working Pressure:**

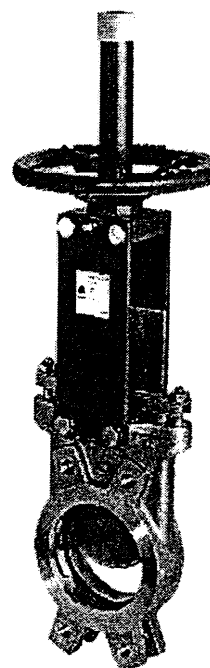
|                  |           |
|------------------|-----------|
| Sizes 2" to 10"  | : 150 PSI |
| Sizes 12" to 16" | : 85 PSI  |
| Size 18"         | : 70 PSI  |
| Sizes 20" to 24" | : 60 PSI  |
| Sizes 28" to 40" | : 30 PSI  |

**Standard Flange**

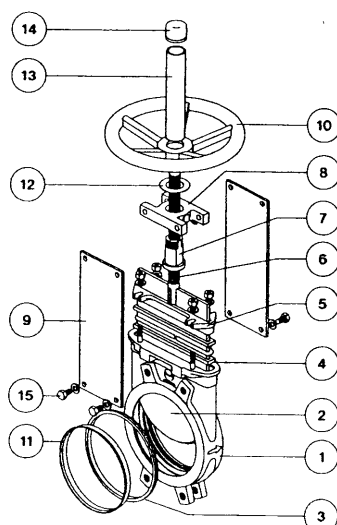
**Connection:** ANSI B16.5 (class 150)

**Note:** Other flange connections are available on request such as:

DIN PN 6      DIN PN 16      DIN PN 25  
BS "D" and "E"      ANSI 125



All valves are tested prior to shipping in accordance with the manufacturers specification developed by the Quality Control department at Orbinox.



### STANDARD PARTS LIST

| Part:                  | Cast Iron:                                       | Stainless Steel: |
|------------------------|--------------------------------------------------|------------------|
| 1- Body                | GG25                                             | CF8M             |
| 2- Gate                | AISI 304                                         | AISI 316         |
| 3- Seat                | Metal or Resilient (EPDM Std.)                   |                  |
| 4- Packing             | AH                                               | NT               |
| 5- Gland Follower      | Aluminum (2" to 12")<br>S.G Iron (14" to 40")    | CF8M             |
| 6- Stem                | AISI 303                                         |                  |
| 7- Stem Nut            | Bronze                                           |                  |
| 8- Yoke                | Carbon Steel (2" to 6")<br>Cast Iron (8" to 40") |                  |
| 9- Support plates      | Carbon Steel - Epoxy Coated                      |                  |
| 10- Handwheel          | Steel (2" to 12")<br>Cast Iron (14" to 40")      |                  |
| 11- Seat Retainer Ring | AISI 304                                         | AISI 316         |
| 12- Thrust Washer      | Bronze                                           |                  |
| 13- Stem Protector     | Carbon Steel - Epoxy Coated                      |                  |
| 14- Cap                | Plastic                                          |                  |

20.2



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ORBINOX reserves the right to change specifications without notice. OBX 1/01 4TH EDITION

10-1

D2/3

# SERIES 10



## SEAT / SEALS

| Material     | Max.Temp.(F °) | Applications                                   |
|--------------|----------------|------------------------------------------------|
| Metal/Metal  | >500           | High temp. Low tightness.                      |
| EPDM (E)     | 250            | Acids and non mineral oils                     |
| Nitrile (N)  | 250            | Petroleum products.                            |
| Viton (V)    | 390            | General chemical service.<br>High temperature. |
| Silicone (S) | 480            | Food service / High temperature                |
| PTFE (T)     | 480            | Corrosion resistance.                          |

More details and other materials on request.

## PACKING

| Material                         | Max.Temp.(F °) | pH     |
|----------------------------------|----------------|--------|
| Tallowd cotton (AH)              | 120            | 6 - 8  |
| Dry cotton (AS)                  | 120            | 6 - 8  |
| PTFE impregn. Natural fibre (NT) | 250            | 4 - 12 |
| PTFE impregn. Synth. Fibre (ST)  | 465            | 2 - 13 |
| Braided PTFE (TH)                | 500            | 0 - 14 |
| Graphite (AG)                    | 575            | 4 - 12 |
| Ceramic fibre (FC)               | 2200           | —      |

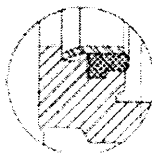
NOTE: Above includes an elastomer O-ring (same material as seal), excluding TH, AG and FC.

## SEAT



### TYPE "A" (metal/metal) standard

- High temperature
- High density media application
- Positive shut off



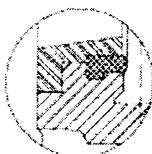
### TYPE "A" (resilient) standard

- Temperature limitations according to seat material selected. Consult the above chart or our technical department for more information.
- Replaceable seat retainer ring.



### TYPE "B" SEAT (metal/metal)

- High temperature
- High density media application
- Positive shut off
- Replaceable design without dismantling the valve



### TYPE "B" SEAT (resilient)

- Temperature limitations according to seat material selected. Consult the above chart or our technical department for more information.
- Replaceable design without dismantling the valve.



### DEFLECTOR CONE

- Deflects the media away from any exposed internal parts of the valve such as gate guides, seat, etc...
- Different types of material available such as AISI 316 stainless, CA15, Ni-Hard, etc...

Face to face dimensions increase:

Sizes 2" to 10" = .375"

Sizes 12" to 24" = .50"

ORBINOX reserves the right to change specifications without notice

OBX 1/01

4TH EDITION

10-5



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ORBINOX USA, 311 North Front Street, Amory, Mississippi 38821 Tel: 662-256-2227 Fax: 662-256-2119 e-mail: orbe@orbevalve.com / www.orbevalve.com

22.2

D 3/3

Paul,  
Re: P/O # 01-00209804  
Please see attached drawings; please send out for approved ASAP.  
Regards,

**Rick Field**  
**V.P. Operations**  
**ORBINOX Canada**  
Tel.: 450-622-8775  
Fax: 450-622-6831



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20.2

01/20

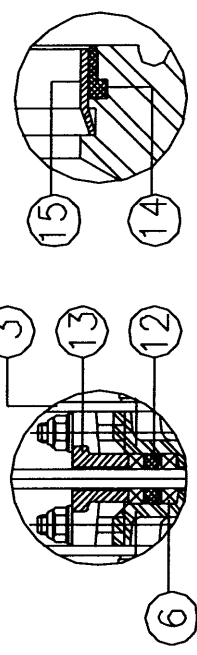
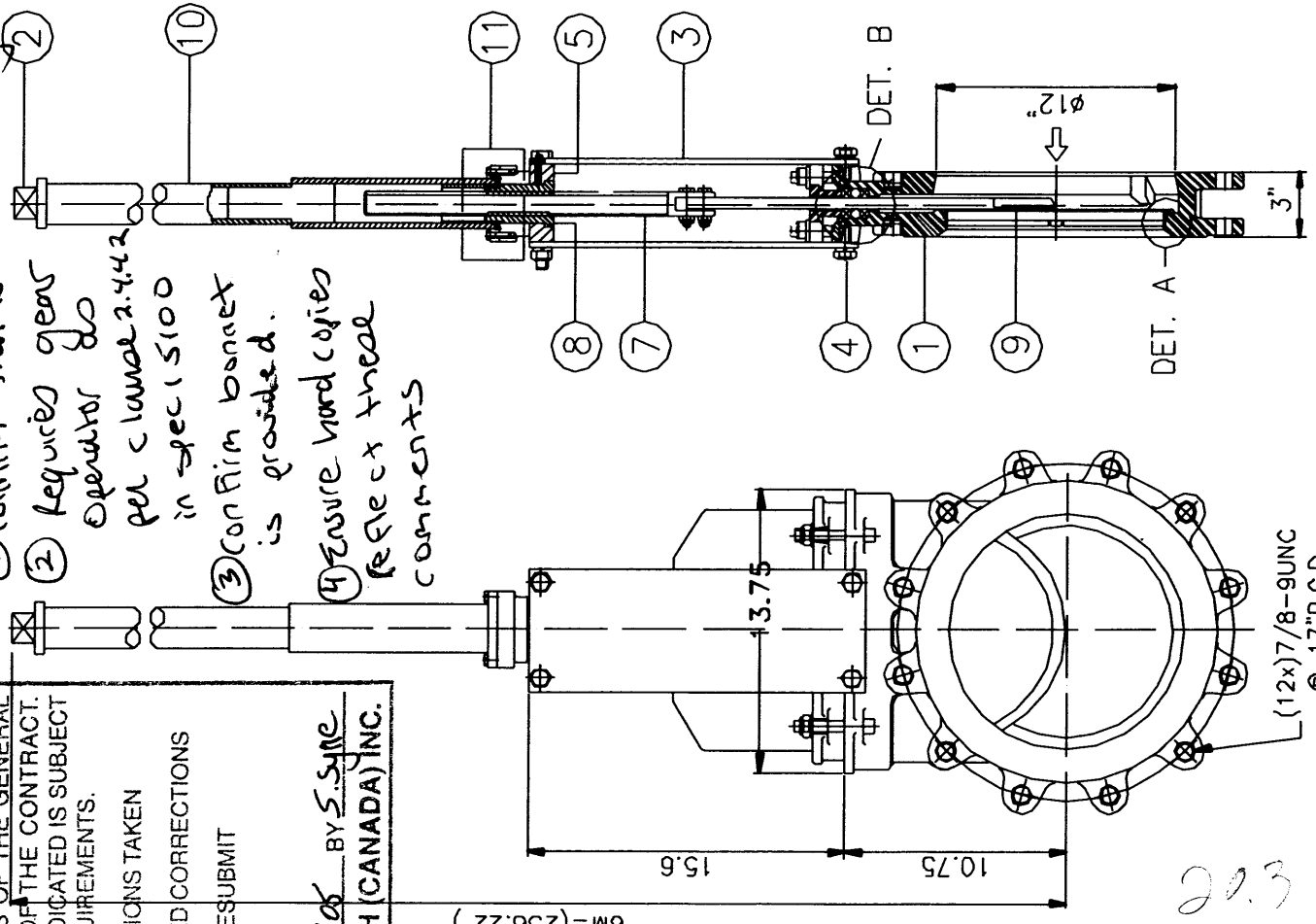
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8/10/2005

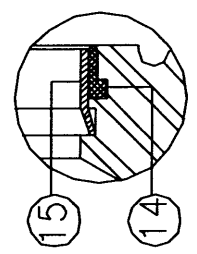
NOTES FOR BOTH 12"/16":

|                                     |                                                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| REVIEW                              | ACCORDING TO THE REQUIREMENTS OF THE GENERAL CONDITIONS OF THE CONTRACT. ANY ACTION INDICATED IS SUBJECT TO THESE REQUIREMENTS. |
| <input type="checkbox"/>            | NO EXCEPTIONS TAKEN                                                                                                             |
| <input checked="" type="checkbox"/> | MAKE NOTED CORRECTIONS                                                                                                          |
| <input type="checkbox"/>            | REVISE & RESUBMIT                                                                                                               |
| <input type="checkbox"/>            | REJECTED                                                                                                                        |
| DATE 08/11/08 BY S.SURE             |                                                                                                                                 |
| EARTH TECH (CANADA) INC.            |                                                                                                                                 |

- 1 Confirm that is non rising stem
- 2 requires gear operator per clause 2.4.4.2 in spec 15100
- 3 Confirm bonnet is provided.
- 4 Ensure hard copies reflect these comments



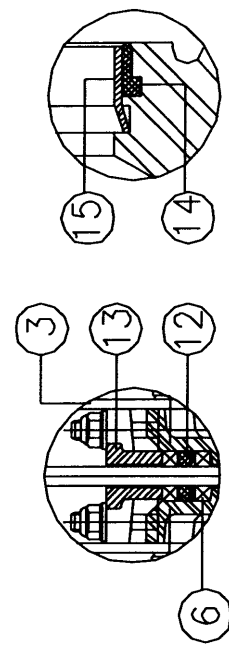
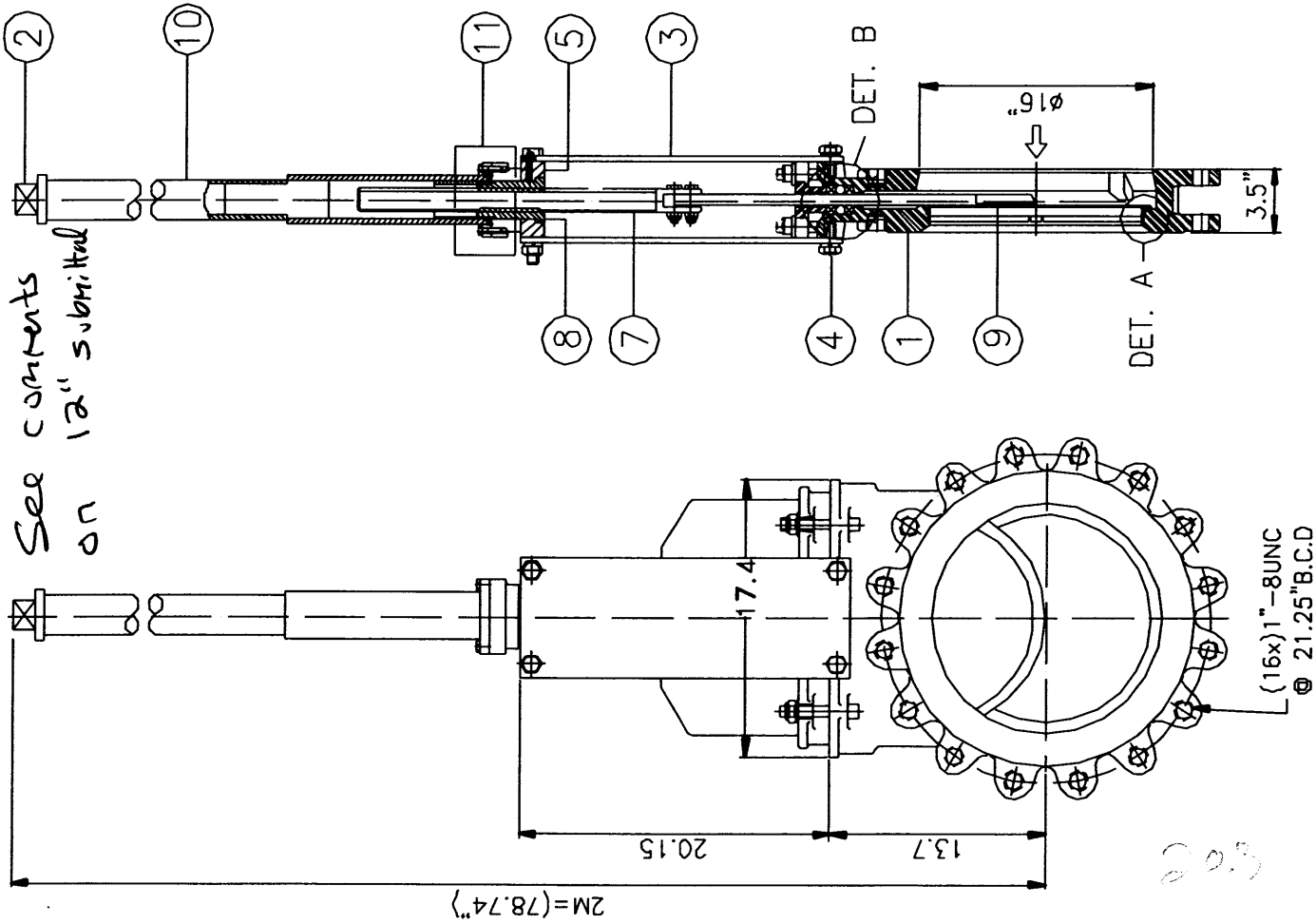
DET. B



DET. A

|                       |                    |                                                          |                 |  |
|-----------------------|--------------------|----------------------------------------------------------|-----------------|--|
| 15                    | SEAT RING          | 1                                                        | 316 SS          |  |
| 14                    | SEAT               | 1                                                        | EPDM            |  |
| 13                    | PACKING GLAND      | 1                                                        | CF8M            |  |
| 12                    | O-RING             | 1                                                        | EPDM            |  |
| 11                    | EXT COUPLING ASS'Y | 1                                                        | STAINLESS STEEL |  |
| 10                    | STEM EXTENSION     | 1                                                        | STAINLESS STEEL |  |
| 9                     | GATE               | 1                                                        | 316 SS          |  |
| 8                     | BUSHING            | 1                                                        | BRONZE          |  |
| 7                     | STEM               | 1                                                        | STAINLESS STEEL |  |
| 6                     | PACKING            | -                                                        | PTFE            |  |
| 5                     | BLOCK              | 1                                                        | STAINLESS STEEL |  |
| 4                     | BOLTS + NUTS       | -                                                        | STAINLESS STEEL |  |
| 3                     | SUPPORT PLATE      | 2                                                        | STAINLESS STEEL |  |
| 2                     | 2" SQUARE NUT      | 1                                                        | STAINLESS STEEL |  |
| 1                     | BODY               | 1                                                        | CF8M            |  |
| ITEM                  | PART NAME          | QTY                                                      | MATERIAL        |  |
| DIMENSIONS IN INCHES. |                    |                                                          |                 |  |
| CUSTOMER:             | x                  | Valves tested conform to standards TIS405-8 and MSS-SP81 |                 |  |
| PROJECT:              |                    |                                                          |                 |  |
| ORDER#:               |                    |                                                          |                 |  |
| DATE:                 | Aug. 5, 2005       |                                                          |                 |  |
| CUST. APPROVAL:       |                    |                                                          |                 |  |
| 12" SER. 20 VALVE     |                    |                                                          |                 |  |
| 6M EXT. 2" SQUARE NUT |                    |                                                          |                 |  |
|                       |                    | 20-3636R-12.0                                            |                 |  |
|                       |                    | ORBITON                                                  |                 |  |

203



DET. B

DET. A

|                                  |                    |                                                                                     |                 |
|----------------------------------|--------------------|-------------------------------------------------------------------------------------|-----------------|
| 15                               | SEAT RING          | 1                                                                                   | 316 SS          |
| 14                               | SEAT               | 1                                                                                   | EPDM            |
| 13                               | PACKING GLAND      | 1                                                                                   | CF8M            |
| 12                               | O-RING             | 1                                                                                   | EPDM            |
| 11                               | EXT COUPLING ASS'Y | 1                                                                                   | STAINLESS STEEL |
| 10                               | STEM EXTENSION     | 1                                                                                   | STAINLESS STEEL |
| 9                                | GATE               | 1                                                                                   | 316 SS          |
| 8                                | BUSHING            | 1                                                                                   | BRONZE          |
| 7                                | STEM               | 1                                                                                   | STAINLESS STEEL |
| 6                                | PACKING            | -                                                                                   | PTFE            |
| 5                                | BLOCK              | 1                                                                                   | STAINLESS STEEL |
| 4                                | BOLTS + NUTS       | -                                                                                   | STAINLESS STEEL |
| 3                                | SUPPORT PLATE      | 2                                                                                   | STAINLESS STEEL |
| 2                                | 2" SQUARE NUT      | 1                                                                                   | STAINLESS STEEL |
| 1                                | BODY               | 1                                                                                   | CF8M            |
| ITEM                             | PART NAME          | QTY                                                                                 | MATERIAL        |
| DIMENSIONS IN INCHES.            |                    |                                                                                     |                 |
| DWC #16"-3636R-2in-Sq Nut-2M-Ext |                    |                                                                                     |                 |
| CUSTOMER:                        | x                  | Valves tested conform to standards                                                  |                 |
| PROJECT:                         |                    | TIS405-B and MSS-SP81                                                               |                 |
| ORDER#:                          |                    |                                                                                     |                 |
| DATE:                            | Aug. 5, 2005       |                                                                                     |                 |
| CUST. APPROVAL:                  |                    | 20-3636R-16.0                                                                       |                 |
| 16" SER. 20 VALVE                |                    |                                                                                     |                 |
| 6M EXT. 2" SQUARE NUT            |                    |                                                                                     |                 |
|                                  |                    |  |                 |
|                                  |                    | ORBINOX                                                                             |                 |



16" SER. 20 VALVE  
6M EXT. 2" SQUARE NUT

(16x) 1"-8UNC  
@ 21.25" B.C.D

REF: 1 QUALUIT  
TAG: UV-101

PAGE 1 OF 2

V<sub>101</sub> - V<sub>201</sub> - V<sub>202</sub>

SERIES 20



## DESIGN FEATURES

### BODY:

- One piece integrally cast stainless steel body with raised face flanges and reinforced body ribs in larger diameters for extra body strength.
- Internal cast gate wedges and guides allows for tighter shut off.
- Full port design according to MSS-SP-81 and TAPPI TIS 405-8.
- Internal design reduces any build up of solids that could prevent valve from closing.

### GATE:

- Blade polished on both sides for a tighter seal in the packing chamber.
- Machined beveled gate end shears through solids for a tighter shut off.

### SEAT:

- Unique design that mechanically locks the seat inside the valve body with a stainless steel retainer ring.
- Standard EPDM seat; available in different materials such as Viton, PTFE, etc.

### PACKING CHAMBER:

- Standard braided PTFE impregnated fiber with EPDM O-ring for a tight seal.
- Smooth chamber and cast gland follower with equally distributed gland bolts provides uniform compression of packing.

### STEM:

- Corrosion resistance stainless steel stem.
- Single pitch Acme thread reduces torque on handwheel operator and eliminates installation of a gear operator on larger diameters.
- Standard stem protector on all handwheel actuators gives additional protection against dust while the valve is in the open position.

### ACTUATORS:

- All Orbinox actuator models are supplied with a standard mounting kit to allow easy installation on site.

### YOKE & SUPPORT PLATES:

- EPOXY coated steel (stainless steel available on request).
- Compact design makes it extremely robust even in the most severe conditions.

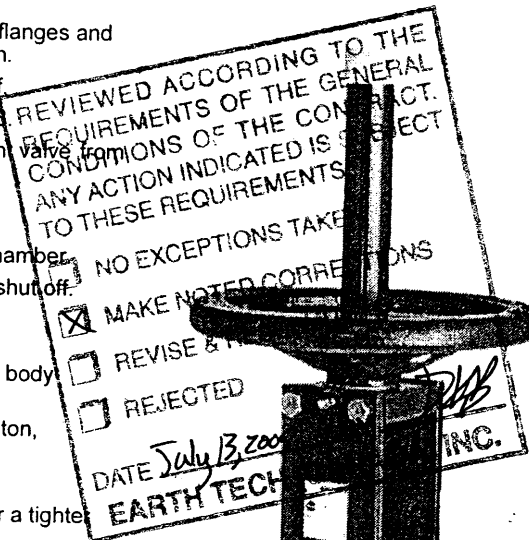
### EPOXY COATING:

- The electrostatic applied epoxy coating on all ORBINOX cast iron and carbon steel valve bodies and components make the valves corrosion resistant.

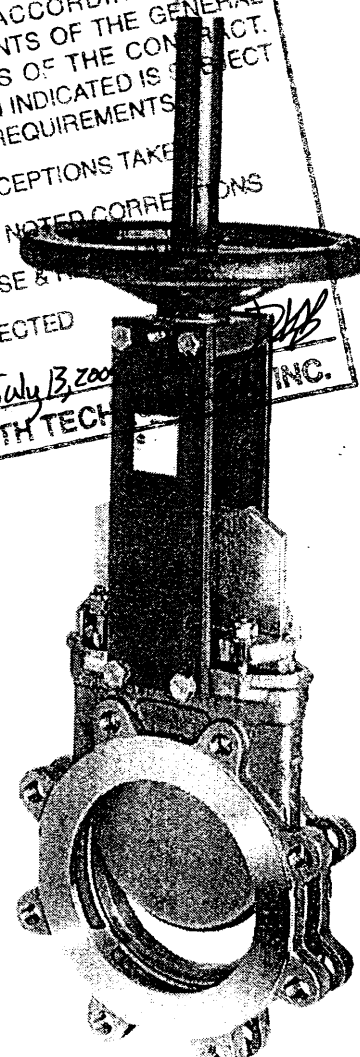
### GATE SAFETY PROTECTION:

- Gate guards are available upon request for areas where safety is a concern.
- The design feature prevents any objects from getting caught accidentally while the gate is moving.

TO HAVE NON-RISING STEM FOR SUBMERGED APPLICATIONS.



JOB: WASTE WATER TREATMENT  
PLANT AT IQUALUIT, NUNAVUT  
CONTRACTOR PRE-APPROVAL:  
SIFEC-KUDLIK per: C. FAUTEUX, T.P.  
G. FAUTEUX, P.ENG.  
P.A. PELLETIER, P.ENG.



ORBINOX SPAIN, Polig. Ind. Anoeta - Apdo 80 - 20400 Tolosa, Spain Tel: 943-69 80 30 Fax: 943-65 30 66 e-mail: orbinox@orbinox.com

ORBINOX CANADA, 2050 Dagenais West, Laval, Quebec, H7L 5W2 Tel: 450-622-8775 Fax: 450-622-6831 e-mail: orbe@orbevalve.com / www.orbevalve.com

ORBINOX USA, 311 North Front Street, Amory, Mississippi 38821 Tel: 662-256-2227 Fax: 662-256-2119 e-mail: orbe@orbevalve.com / www.orbevalve.com

ORBINOX reserves the right to change specifications without notice. OBX 101 4TH EDITION

20-2

T 1/2

2 of 2

# SERIES 20



## HEAVY DUTY KNIFE GATE VALVE

The **SERIES 20** knife gate is a uni / bi directional lug type valve designed according to the MSS-SP-81 and TAPPI TIS 405-8 standard for industrial service applications.

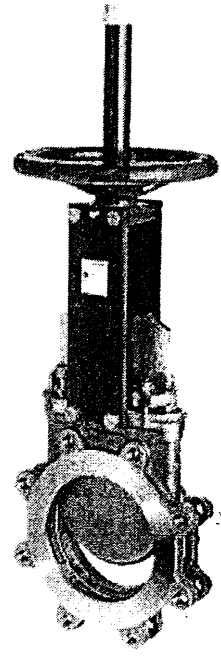
The design of the valve allows for a tight shut off in services with solids in suspension in industries such as:

- Pulp and Paper
- Chemical Plants
- etc.
- Power Plants
- Waste Water
- Mining
- Food and Beverage

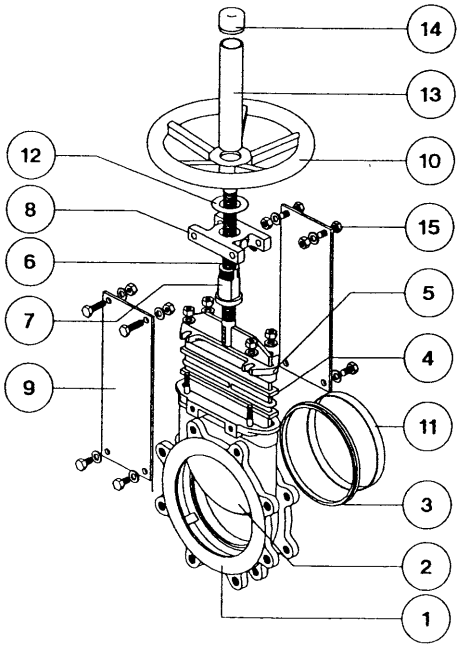
**Sizes:** 2" to 24" (larger diameters on request)

**Working Pressure:** 2" to 24" : 150 PSI to 60 PSI

**Standard Flange Connection:** ANSI B16.5 (class 150) and DIN PN 10



All valves are tested prior to shipping in accordance with the manufacturers specification developed by the Quality Control department at Orbinox.



### STANDARD PARTS LIST

| Part:                  | Stainless Steel:                                 |
|------------------------|--------------------------------------------------|
| 1- Body                | CF8M                                             |
| 2- Gate                | AISI 316                                         |
| 3- Seat                | Metal or Resilient (EPDM Std.)                   |
| 4- Packing             | Braided PTFE                                     |
| 5- Gland Follower      | CF8M                                             |
| 6- Stem                | AISI 303                                         |
| 7- Stem Nut            | Bronze                                           |
| 8- Yoke                | Carbon Steel (2" to 6")<br>Cast Iron (8" to 40") |
| 9- Support plates      | Carbon Steel - Epoxy Coated                      |
| 10- Handwheel          | Cast Iron (2" to 24")                            |
| 11- Seat Retainer Ring | AISI 316                                         |
| 12- Thrust Washer      | Bronze                                           |
| 13- Stem Protector     | Carbon Steel - Epoxy Coated                      |
| 14- Cap                | Plastic                                          |

20.3



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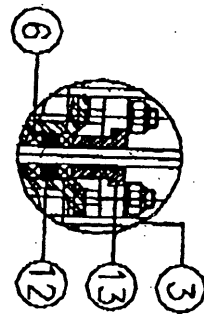
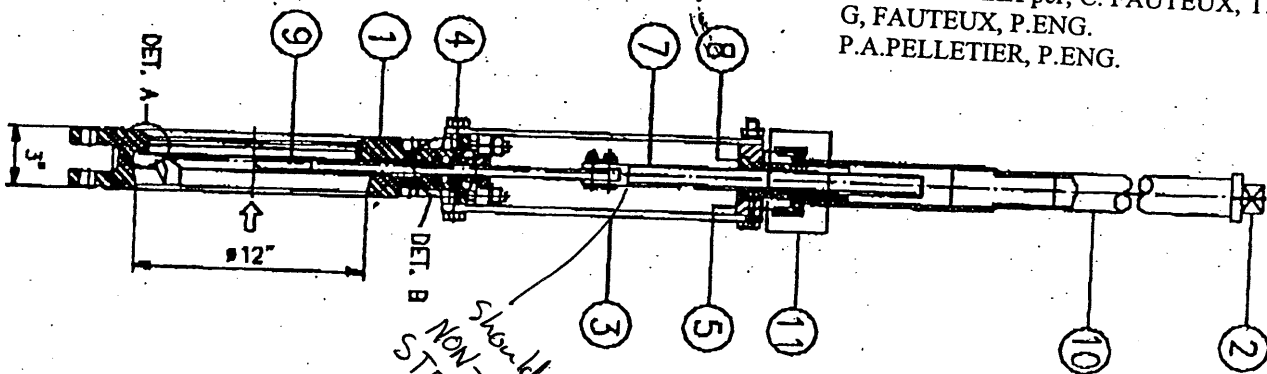
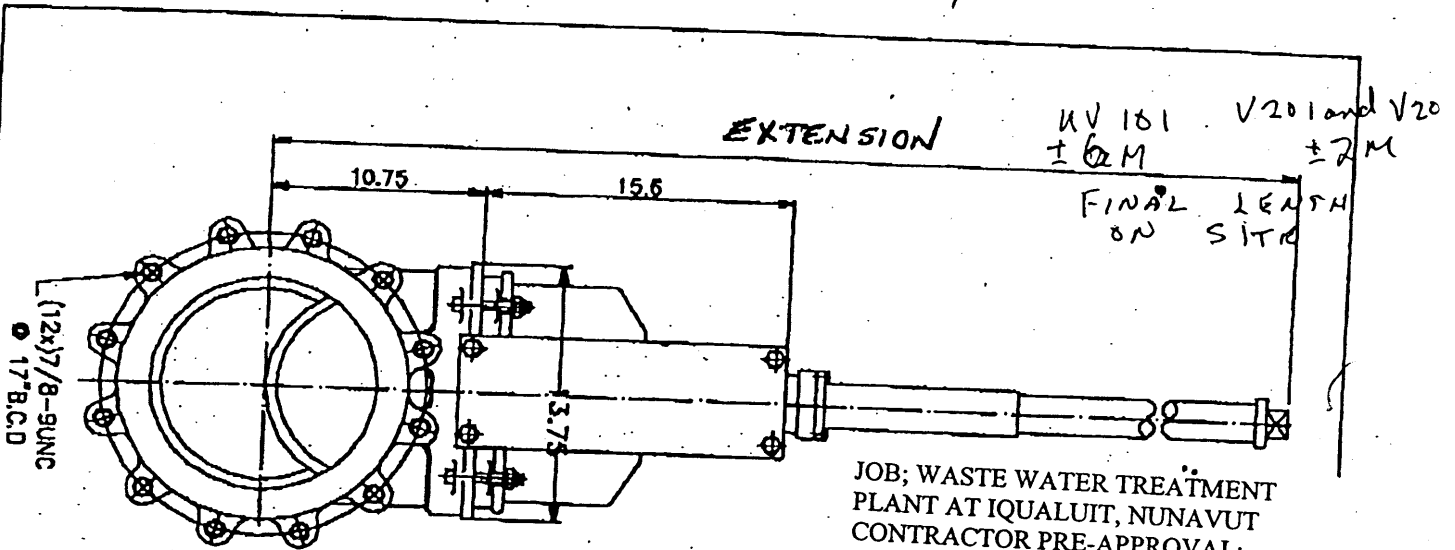
ORBINOX CANADA, 2050 Dagenais West, Laval, Quebec, H7L 5W2 Tel: 450-622-8775 Fax: 450-622-6831 e-mail: orbe@orbevalve.com / www.orbevalve.com

ORBINOX USA, 311 North Front Street, Amory, Mississippi 38821 Tel: 662-256-2227 Fax: 662-256-2119 e-mail: orbe@orbevalve.com / www.orbevalve.com

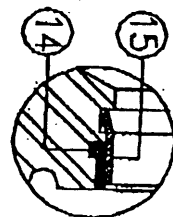
T 2/2

6M ⇒ KV 101

2M ⇒ V 201 AND V 202



DET. B



DET. A

| ITEM                 | PART NAME               | QTY | MATERIAL                           |
|----------------------|-------------------------|-----|------------------------------------|
| 15                   | SEAT RING               | 1   | 316 SS                             |
| 14                   | SEAT                    | 1   | PTFE                               |
| 13                   | PACKING GLAND           | 1   | CF8M                               |
| 12                   | O-RING                  | 1   | EPDM                               |
| 11                   | EXT COUPLING            | 1   | S.S.                               |
| 10                   | STEM EXTENSION          | 1   | S.S.                               |
| 9                    | GATE                    | 1   | 316 SS                             |
| 8                    | BUSHING                 | 1   | BRONZE                             |
| 7                    | STEM                    | 1   | STAINLESS STEEL                    |
| 6                    | PACKING                 | -   | PTFE                               |
| 5                    | BLOCK                   | 1   | S.S.                               |
| 4                    | BOLTS + NUTS            | -   | STAINLESS STEEL                    |
| 3                    | SUPPORT PLATE           | 2   | S.S.                               |
| 2                    | 2" SQUARE NUT           | 1   | S.S.                               |
| 1                    | BODY                    | 1   | CF8M                               |
| DIMENSIONS IN INCHES |                         |     |                                    |
| CUSTOMER             | 1                       |     |                                    |
| PROJECT              |                         |     | Valves tested conform to standards |
| ORDER#               |                         |     | TS-403-B and MS-SP-61              |
| DATE                 | FEB. 9, 2005            |     |                                    |
| CUST. APPROVAL:      |                         |     |                                    |
|                      | 12" SER. 20 VALVE       |     |                                    |
|                      | 8FT. EXT. 2" SQUARE NUT |     |                                    |

20-3636R-12.0



20.3

S 11

# KEYSTONE

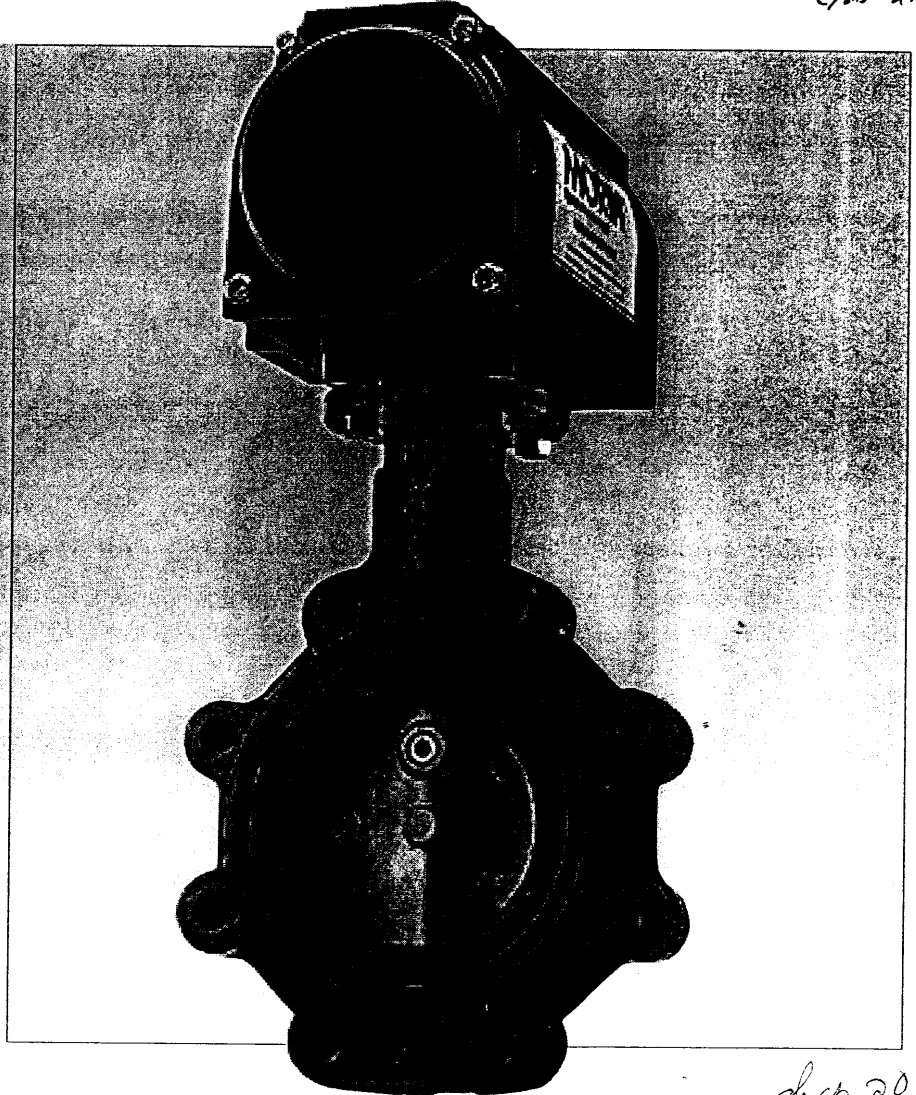
## Resilient Seated Butterfly Valve Sizes 2 thru 12-inch to 250 psi

BODY  
DISC  
STEM  
SEAL  
OPERATOR

CI  
AL-PRZ  
ALGSS  
EPDM  
HANDLER  
C/M HARE

### Features and Benefits

- Molded-in resilient seat provides bubble-tight shutoff to 250 psi.
- Offered in two body styles: wafer and lug. The lugged body is drilled and tapped for isolation and removal of downstream piping at full rated pressure.
- Round, polished disc and hub edge provides 360 degree concentric seating, minimum flow restriction, lower torques and longer seal life.
- Upper and lower inboard bronze bearings ensure longer service life with low operating torques.
- Thru-stem design provides high strength and positive disc control with standardized end connection for operator interchangeability.
- Extended neck allows adequate clearance for flanges and insulation.
- Bi-directional, self-adjusting stem seal, located in the upper journal, is suitable for vacuum and pressure while also preventing external contamination of the stem area.
- Heavy-duty corrosion resistant top bushing, located in the upper journal, absorbs actuator side thrust.
- Cast-in top plate is an integral part of the body and is standardized to allow direct mounting of all Tyco actuators.
- Each valve is factory tested to 110 percent of specified pressure rating.



### General Application

Heating, ventilation, air conditioning and general industrial services.

### Technical Data

Size Range : 2 thru 12-inch wafer and lug style

Pressure Rating : 250 psi bi-directional shutoff. Lugged body style is rated for 250 psi bi-directional dead-end service with downstream piping removed.

REVIEWED ACCORDING TO THE REQUIREMENTS OF THE GENERAL CONDITIONS OF THE CONTRACT. ANY ACTION INDICATED IS SUBJECT TO THESE REQUIREMENTS.

- ☐ NO EXCEPTIONS TAKEN
- ☒ MAKE NOTED CORRECTIONS
- ☐ REVISE & RESUBMIT
- ☐ REJECTED

DATE

July 21/05

BY

tyco TECHNOLOGY CORP. INC.

Bronze disc

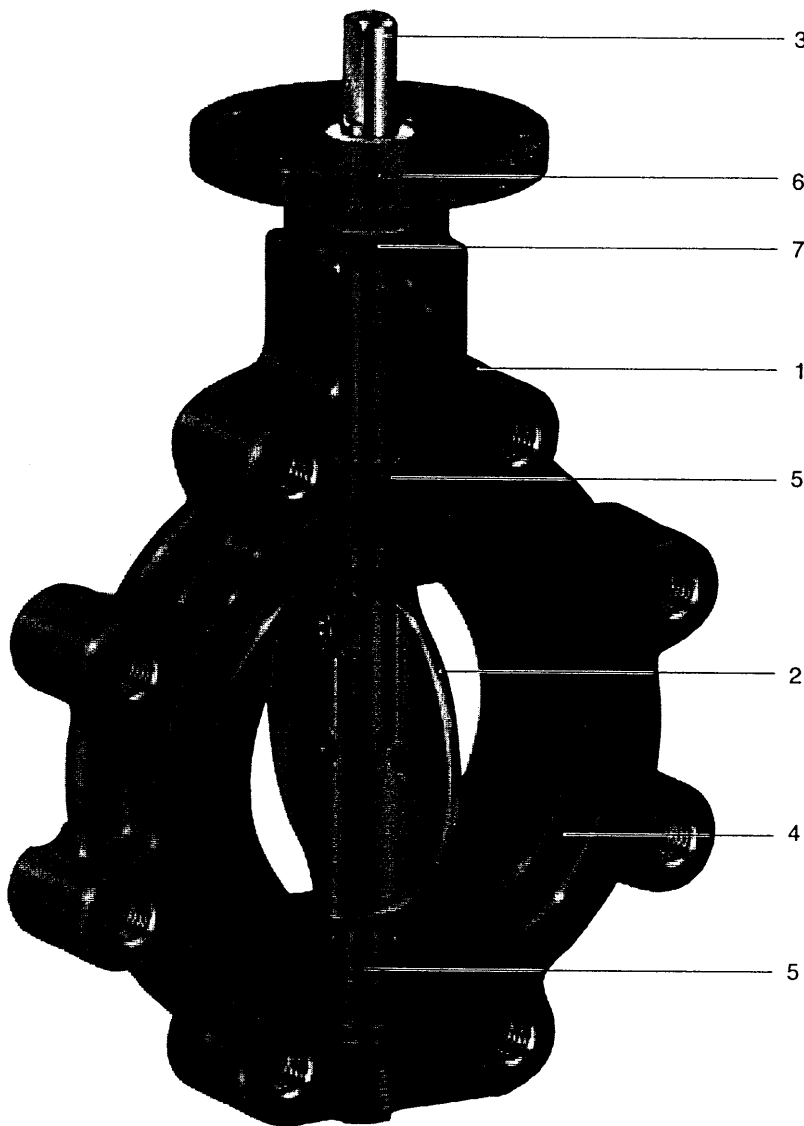
JOB; WASTE WATER TREATMENT PLANT AT IQUALUIT, NUNAVUT CONTRACTOR PRE-APPROVAL; SIFEC-KUDLIK, PER; C.FAUTEUX, T.P. G.FAUTEUX, P.ENG. P.A.PELLETIER, P.ENG.

20.4

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Materials

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Materials

| Part               | Material        | Material Standards            |
|--------------------|-----------------|-------------------------------|
| 1 Body             | Cast iron       | ASTM-A 126 Class B            |
| 2 Disc             | Aluminum bronze | ASTM-B 148 UNS C95200 Grade A |
| 3 Stem             | 316 SS          | ASTM-A 743 CF8M               |
| 4 Molded-in liner  | 416 SS          | ASTM-A 582 UNS S41600         |
| 5 Inboard bearings | EPDM            |                               |
| 6 Upper bushing    | NBR             |                               |
| 7 Upper stem seal  | Bronze          |                               |
|                    | Polyester       |                               |
|                    | NBR             |                               |

Valve C<sub>v</sub>s

| Size (in) | Size (mm) | 10° | 20° | 30° | 40° | 50°   | 60°   | 70°   | 80°   | 90°   |
|-----------|-----------|-----|-----|-----|-----|-------|-------|-------|-------|-------|
| 2         | 50        | 0   | 1.3 | 5   | 14  | 26    | 40    | 52    | 59    | 60    |
| 2 1/2     | 65        | 0   | 1.4 | 6   | 21  | 44    | 74    | 107   | 138   | 150   |
| 3         | 80        | 0   | 1.5 | 8   | 29  | 67    | 115   | 175   | 234   | 262   |
| 4         | 100       | 1   | 15  | 48  | 107 | 196   | 318   | 463   | 589   | 647   |
| 5         | 125       | 3   | 32  | 99  | 206 | 362   | 579   | 832   | 1,045 | 1,141 |
| 6         | 150       | 4   | 47  | 145 | 295 | 510   | 810   | 1,160 | 1,450 | 1,580 |
|           | 200       | 6   | 84  | 239 | 450 | 751   | 1,190 | 1,754 | 2,385 | 2,892 |
|           | 250       | 9   | 133 | 360 | 652 | 1,064 | 1,683 | 2,524 | 3,596 | 4,593 |
|           | 300       | 12  | 192 | 509 | 899 | 1,449 | 2,288 | 3,470 | 5,085 | 6,682 |

20.4

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## Dimensions

## 221 Wafer

## 222 Lug

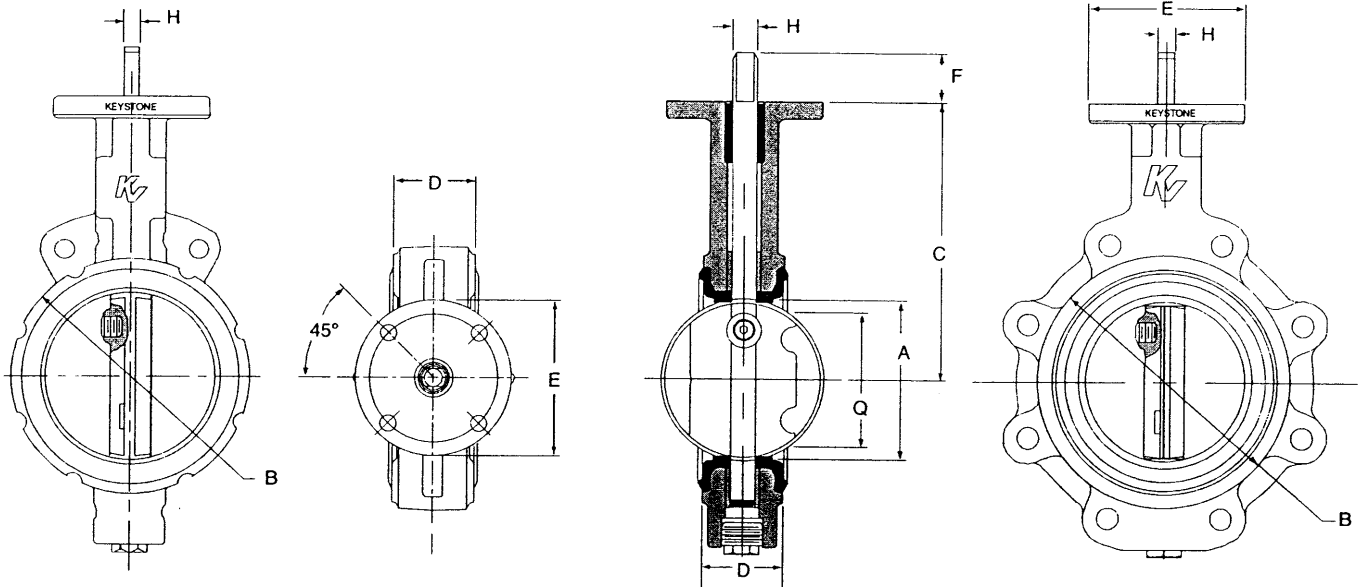


Figure 221 Dimensions (inches)

| Size  | A                                | B                                | C                               | D                               | Q                               | E | F                             | G                              | H                              | Key                                                           | Top Plate Drilling            |           |                                | Weight (lbs.) | Adapt. Code |
|-------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|---|-------------------------------|--------------------------------|--------------------------------|---------------------------------------------------------------|-------------------------------|-----------|--------------------------------|---------------|-------------|
|       |                                  |                                  |                                 |                                 |                                 |   |                               |                                |                                |                                                               | Bolt Circle                   | No. Holes | Hole Diam.                     |               |             |
| 2     | 2 <sup>1</sup> / <sub>16</sub>   | 4 <sup>1</sup> / <sub>8</sub>    | 5 <sup>5</sup> / <sub>16</sub>  | 1 <sup>11</sup> / <sub>16</sub> | 1 <sup>3</sup> / <sub>8</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 7.7           | BAB         |
| 2 1/2 | 2 <sup>9</sup> / <sub>16</sub>   | 4 <sup>5</sup> / <sub>8</sub>    | 5 <sup>15</sup> / <sub>16</sub> | 1 <sup>13</sup> / <sub>16</sub> | 2                               | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 8.8           | BAB         |
| 3     | 3 <sup>1</sup> / <sub>16</sub>   | 5 <sup>3</sup> / <sub>16</sub>   | 6 <sup>5</sup> / <sub>16</sub>  | 1 <sup>13</sup> / <sub>16</sub> | 2 <sup>5</sup> / <sub>8</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 10.2          | BAB         |
| 4     | 4 <sup>1</sup> / <sub>16</sub>   | 6 <sup>3</sup> / <sub>8</sub>    | 7 <sup>1</sup> / <sub>8</sub>   | 2 <sup>1</sup> / <sub>16</sub>  | 3 <sup>11</sup> / <sub>16</sub> | 4 | 1 <sup>1</sup> / <sub>4</sub> | 5 <sup>3</sup> / <sub>8</sub>  | 7 <sup>1</sup> / <sub>16</sub> | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 16.9          | BAC         |
| 5     | 5 <sup>1</sup> / <sub>16</sub>   | 7 <sup>3</sup> / <sub>8</sub>    | 7 <sup>11</sup> / <sub>16</sub> | 2 <sup>1</sup> / <sub>4</sub>   | 4 <sup>3</sup> / <sub>4</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 19.9          | BAD         |
| 6     | 5 <sup>13</sup> / <sub>16</sub>  | 8 <sup>1</sup> / <sub>2</sub>    | 8 <sup>5</sup> / <sub>16</sub>  | 2 <sup>1</sup> / <sub>4</sub>   | 5 <sup>9</sup> / <sub>16</sub>  | 4 | 1 <sup>1</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 25.3          | BAD         |
| 8     | 7 <sup>13</sup> / <sub>16</sub>  | 10 <sup>11</sup> / <sub>16</sub> | 9 <sup>1</sup> / <sub>2</sub>   | 2 <sup>3</sup> / <sub>8</sub>   | 7 <sup>3</sup> / <sub>4</sub>   | 6 | 1 <sup>1</sup> / <sub>4</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 5 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 40.5          | CAE         |
| 10    | 9 <sup>13</sup> / <sub>16</sub>  | 13                               | 10 <sup>7</sup> / <sub>8</sub>  | 2 <sup>11</sup> / <sub>16</sub> | 9 <sup>3</sup> / <sub>4</sub>   | 6 | 2                             | 1 <sup>1</sup> / <sub>8</sub>  | N/A                            | 1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub> | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 61.1          | CAF         |
| 12    | 11 <sup>13</sup> / <sub>16</sub> | 14 <sup>13</sup> / <sub>16</sub> | 12 <sup>1</sup> / <sub>4</sub>  | 3 <sup>1</sup> / <sub>8</sub>   | 11 <sup>3</sup> / <sub>4</sub>  | 6 | 2                             | 1 <sup>1</sup> / <sub>8</sub>  | N/A                            | 1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub> | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 82.7          | CAF         |

Figure 222 Dimensions (inches)

| Size  | A                                | B                                | C                               | D                               | Q                               | E | F                             | G                              | H                              | Key                                                           | Top Plate Drilling            |           |                                | Tapped Lug Data                |           |                                           | Weight (lbs.) | Adapt. Code |
|-------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|---|-------------------------------|--------------------------------|--------------------------------|---------------------------------------------------------------|-------------------------------|-----------|--------------------------------|--------------------------------|-----------|-------------------------------------------|---------------|-------------|
|       |                                  |                                  |                                 |                                 |                                 |   |                               |                                |                                |                                                               | Bolt Circle                   | No. Holes | Hole Diam.                     | Bolt Circle                    | No. Holes | Tap                                       |               |             |
| 2     | 2 <sup>1</sup> / <sub>16</sub>   | 4 <sup>1</sup> / <sub>8</sub>    | 5 <sup>5</sup> / <sub>16</sub>  | 1 <sup>11</sup> / <sub>16</sub> | 1 <sup>3</sup> / <sub>8</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 4 <sup>3</sup> / <sub>4</sub>  | 4         | 5 <sup>8</sup> / <sub>16</sub> -11 UNC-2B | 9.0           | BAB         |
| 2 1/2 | 2 <sup>9</sup> / <sub>16</sub>   | 4 <sup>5</sup> / <sub>8</sub>    | 5 <sup>15</sup> / <sub>16</sub> | 1 <sup>13</sup> / <sub>16</sub> | 2                               | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 5 <sup>1</sup> / <sub>2</sub>  | 4         | 5 <sup>8</sup> / <sub>16</sub> -11 UNC-2B | 10.5          | BAB         |
| 3     | 3 <sup>1</sup> / <sub>16</sub>   | 5 <sup>3</sup> / <sub>16</sub>   | 6 <sup>5</sup> / <sub>16</sub>  | 1 <sup>13</sup> / <sub>16</sub> | 2 <sup>5</sup> / <sub>8</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 9 <sup>1</sup> / <sub>16</sub> | 3 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 6                              | 4         | 5 <sup>8</sup> / <sub>16</sub> -11 UNC-2B | 11.9          | BAB         |
| 4     | 4 <sup>1</sup> / <sub>16</sub>   | 6 <sup>3</sup> / <sub>8</sub>    | 7 <sup>1</sup> / <sub>8</sub>   | 2 <sup>1</sup> / <sub>16</sub>  | 3 <sup>11</sup> / <sub>16</sub> | 4 | 1 <sup>1</sup> / <sub>4</sub> | 5 <sup>3</sup> / <sub>8</sub>  | 7 <sup>1</sup> / <sub>16</sub> | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 7 <sup>1</sup> / <sub>2</sub>  | 8         | 5 <sup>8</sup> / <sub>16</sub> -11 UNC-2B | 21.4          | BAC         |
| 5     | 5 <sup>1</sup> / <sub>16</sub>   | 7 <sup>3</sup> / <sub>8</sub>    | 7 <sup>11</sup> / <sub>16</sub> | 2 <sup>1</sup> / <sub>4</sub>   | 4 <sup>3</sup> / <sub>4</sub>   | 4 | 1 <sup>1</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 8 <sup>1</sup> / <sub>2</sub>  | 8         | 3 <sup>4</sup> / <sub>16</sub> -10 UNC-2B | 25.7          | BAD         |
| 6     | 5 <sup>13</sup> / <sub>16</sub>  | 8 <sup>1</sup> / <sub>2</sub>    | 8 <sup>5</sup> / <sub>16</sub>  | 2 <sup>1</sup> / <sub>4</sub>   | 5 <sup>9</sup> / <sub>16</sub>  | 4 | 1 <sup>1</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | N/A                                                           | 3 <sup>1</sup> / <sub>4</sub> | 4         | 7 <sup>1</sup> / <sub>16</sub> | 9 <sup>1</sup> / <sub>2</sub>  | 8         | 3 <sup>4</sup> / <sub>16</sub> -10 UNC-2B | 31.0          | BAD         |
| 8     | 7 <sup>13</sup> / <sub>16</sub>  | 10 <sup>11</sup> / <sub>16</sub> | 9 <sup>1</sup> / <sub>2</sub>   | 2 <sup>3</sup> / <sub>8</sub>   | 7 <sup>3</sup> / <sub>4</sub>   | 6 | 1 <sup>1</sup> / <sub>4</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 5 <sup>3</sup> / <sub>8</sub>  | N/A                                                           | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 11 <sup>3</sup> / <sub>4</sub> | 8         | 3 <sup>4</sup> / <sub>16</sub> -10 UNC-2B | 48.0          | CAE         |
| 10    | 9 <sup>13</sup> / <sub>16</sub>  | 13                               | 10 <sup>7</sup> / <sub>8</sub>  | 2 <sup>11</sup> / <sub>16</sub> | 9 <sup>3</sup> / <sub>4</sub>   | 6 | 2                             | 1 <sup>1</sup> / <sub>8</sub>  | N/A                            | 1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub> | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 14 <sup>1</sup> / <sub>4</sub> | 12        | 7 <sup>8</sup> / <sub>16</sub> -9 UNC-2B  | 75.8          | CAF         |
| 12    | 11 <sup>13</sup> / <sub>16</sub> | 14 <sup>13</sup> / <sub>16</sub> | 12 <sup>1</sup> / <sub>4</sub>  | 3 <sup>1</sup> / <sub>8</sub>   | 11 <sup>3</sup> / <sub>4</sub>  | 6 | 2                             | 1 <sup>1</sup> / <sub>8</sub>  | N/A                            | 1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub> | 5                             | 4         | 9 <sup>1</sup> / <sub>16</sub> | 17                             | 12        | 7 <sup>8</sup> / <sub>16</sub> -9 UNC-2B  | 106.5         | CAF         |

## Note

'Q' dimension is the minimum allowable pipe or flange inside diameter at the centered body face to protect the disc sealing edge against damage when opening the valve.

---

## Chapter 21 HEATING AND VENTILATION

### **MANUFACTURER/DISTRIBUTOR:**

FERNAND ST-HILAIRE EQUIPEMENTS  
19, CHEMIN DE LA HUCHE  
LAC-BEAUPORT, QUE. G0A 2C0

### **MANUFACTURER/DISTRIBUTOR:**

TRANE  
3535, BLV. PISFIELD  
ST-LAURENT, QUE. H4S 1H3  
PH: 514-337-3321 FAX: 3880

### **MANUFACTURER/DISTRIBUTOR:**

ANCO INC.  
5905, BLV. HÉBERT  
VILLE STE-CATHERINE, QUEBEC  
J5C 1B5  
PH: 450-632-0950 FAX: 1856

### **MANUFACTURER/DISTRIBUTOR:**

VENTIL EXPERT  
9855, LOUIS-H LAFONTAINE  
ANJOU, MTL. QUE.  
H1J 2A3  
PH: 514-355-4540 FAX: 4346

### **MANUFACTURER/DISTRIBUTOR:**

EHPRICE  
4905, DOBRIN  
MTL. QUE. H4R 2L8  
PH: 514-334-9804 FAX: 514-745-3159

### **MANUFACTURER/DISTRIBUTOR:**

AXIOM INDUSTRIES LIMITED  
2615 WENTZ AVENUE  
SASKATOON, SK S7K 5J1  
PHONE: (306) 651-1815  
FAX: (306) 242-3373  
TOLL FREE: (877) 651-1815



- 
- 21.1 TRANE WALLFIN SWE-SW.**
  - 21.2 DANFOSS RA-2000 THERMOSTATIC RADIATOR VALVES.**
  - 21.3 BELIMO NV SERIES SPRING RETURN ACTUATOR “MIXING”**
  - 21.4 INGÉNIA HEAT RECOVERY AIR HANDLING UNIT.**
  - 21.5 MAGNEHELIC DIFFERENTIAL PRESSURE GAGES.**
  - 21.6 TRANE UNIT HEATER OPERATION & MAINTENANCE.**
  - 21.7 POLYPROPYLENE GLYCOL DOWFROST HD “GENERAL”**
  - 21.8 POLYPROPYLENE GLYCOL DOWFROST HD “MSDS”**
  - 21.9 VENTILATION DAMPERS USEFUL HARDWARE.**
  - 21.10 VENTILATION DAMPERS, GRILLES AND REGISTER.**
  - 21.11 RIELLO BURNER SERIES 40.**
  - 21.12 AXIOM SF100 PACKAGED HYDRONIC SYSTEM FEEDER.**

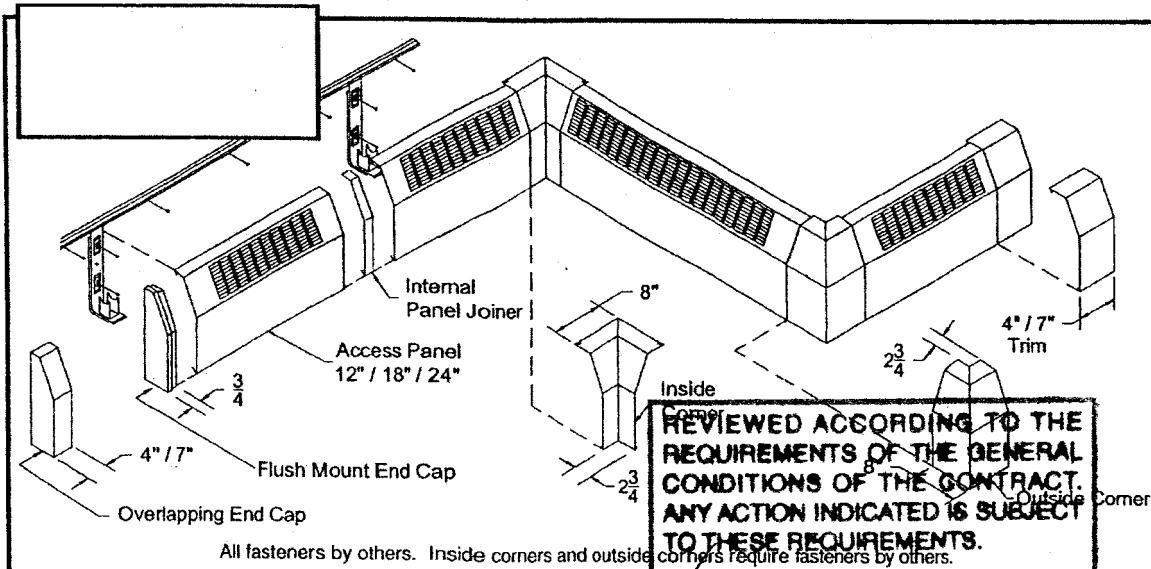
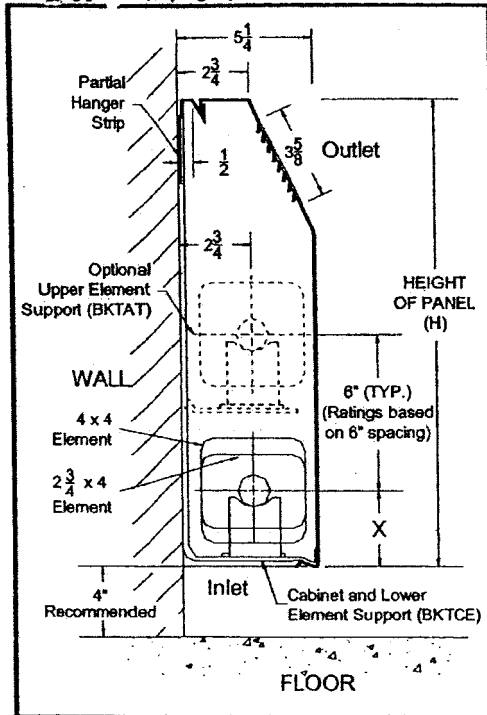
**END OF CHAPTER 20**



**Wallfin SWE-S****Slope Top  
Standard Width Enclosure  
Dimensions**PROJECT: IQALUIT WWTPTAG: WF-1\* Performance: 2.0 kW/m based upon 82°C AWT**SPECIFICATIONS**

|              |                                                            |                                                  |
|--------------|------------------------------------------------------------|--------------------------------------------------|
| HEIGHT (H)   | <input type="checkbox"/> 12"                               | <input type="checkbox"/> 18"                     |
|              | <input checked="" type="checkbox"/> 24"                    | <input type="checkbox"/>                         |
| MATERIAL     | <input checked="" type="checkbox"/> Steel (std.)           | <input type="checkbox"/> Stainless Steel         |
|              | <input type="checkbox"/>                                   | <input type="checkbox"/>                         |
| MATERIAL     | <input type="checkbox"/> 18 GA                             | <input checked="" type="checkbox"/> 16 GA (std.) |
| GAUGE        | <input type="checkbox"/> 14 GA                             | <input type="checkbox"/>                         |
| INLET STYLE  | <input checked="" type="checkbox"/> Open (std.)            | <input type="checkbox"/> Stamped Louvers         |
|              | <input type="checkbox"/> Alum. Bargrille                   | <input type="checkbox"/>                         |
| OUTLET STYLE | <input checked="" type="checkbox"/> Stamped Louvers (std.) | <input type="checkbox"/> Alum. Bargrille         |
|              | <input type="checkbox"/>                                   | <input type="checkbox"/>                         |
| CONTROL      | <input checked="" type="checkbox"/> None (std.)            | <input type="checkbox"/> Manual Dampers          |
|              | <input type="checkbox"/>                                   | <input type="checkbox"/>                         |
| HANGERSTRIP  | <input checked="" type="checkbox"/> Partial (std.)         | <input type="checkbox"/> Full Back Plate         |
| FINISH       | <input checked="" type="checkbox"/> Primer                 | <input type="checkbox"/> Std. Baked Enamel       |
|              | <input type="checkbox"/>                                   | <input type="checkbox"/>                         |

| ELEMENT MOUNTING DIMENSIONS | Element Model | Dim X open inlet                | Dim X closed inlet              |
|-----------------------------|---------------|---------------------------------|---------------------------------|
|                             | C075          | 2 <sup>3</sup> / <sub>4</sub> " | 4 <sup>3</sup> / <sub>4</sub> " |
|                             | C100          | 3"                              | 5"                              |
|                             | C125          | 3"                              | 5"                              |



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CONDITIONS OF THE CONTRACT.  
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TO THESE REQUIREMENTS.

☒ NO EXCEPTIONS TAKEN

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☐ REVISE & RESUBMIT

☐ REJECTED

DATE July 21/05 BY GDK

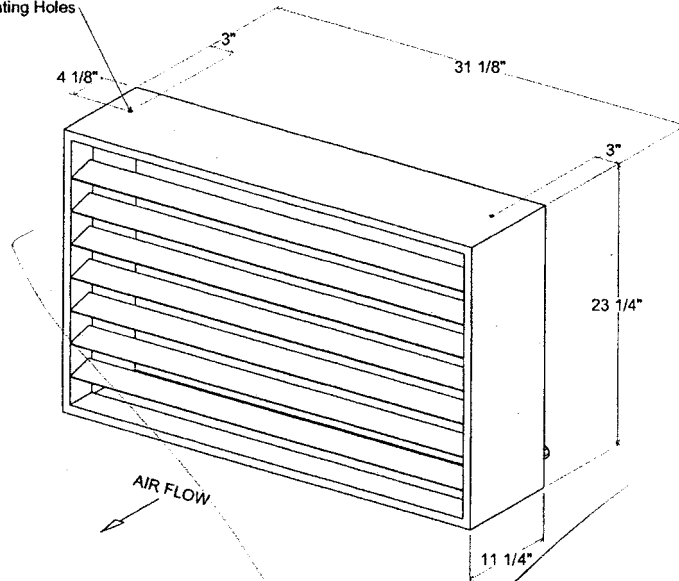
**EARTH TECH (CANADA) INC.**

Unit Dimensions - Hydronic Unit Heaters

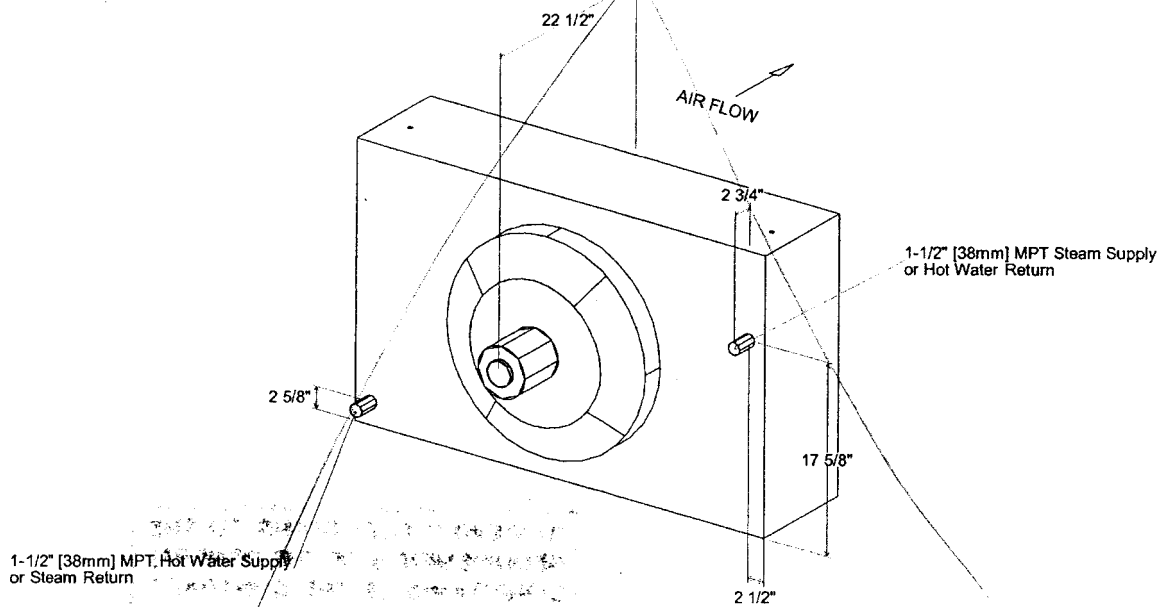
Item: A3 Qty: 1 Tag(s): UH-12

15650

(2) 3/8" [10mm] - 16 Mounting Holes

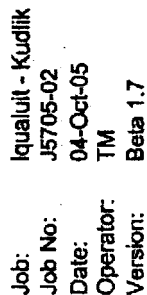


FRONT VIEW



BACK VIEW

| UNIT WEIGHT |    |
|-------------|----|
| 100         | lb |



**NOTE: Only use Offset for Pedestal type enclosure. A minimum value of 6" is recommended for this pedestal type enclosure**

[illegible]

| Enclosure |     |         |          |    |              |
|-----------|-----|---------|----------|----|--------------|
| No.       | Tag | Type    | Material | Ga | Paint Finish |
| 1         | A   | SWE-24S | Steel    | 16 | Primer       |
| 2         |     |         |          |    |              |
| 3         |     |         |          |    |              |
| 4         |     |         |          |    |              |
| 5         |     |         |          |    |              |
| 6         |     |         |          |    |              |
| 7         |     |         |          |    |              |
| 8         |     |         |          |    |              |
| 9         |     |         |          |    |              |
| 10        |     |         |          |    |              |

## UNITS

| Sort<br>Tag | Room<br>Tag | Enclosure<br>Tag | Enclosure<br>Type | Site<br>Measurement |        | Left |      | Right |      | Access<br>Doors | Manual<br>Mode |
|-------------|-------------|------------------|-------------------|---------------------|--------|------|------|-------|------|-----------------|----------------|
|             |             |                  |                   | Feet                | Inches | Cond | LHAP | Cond  | RHAP |                 |                |
|             |             | A                | SWE-24S           | 0                   | 147.6  | E-7  | 0    | 0     | 0    | 0               | 1              |
|             |             | A                | SWE-24S           | 0                   | 35.43  | 1    | 0    | 0     | E-7  | 0               | 1              |
| A Total:    |             |                  |                   | 15                  | 3      | 0    |      |       |      |                 |                |

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Job: Iqualuit - Kudlik  
Job No: J5705-02  
Date: 04-Oct-05  
Operator: TM  
Version: Beta 1.7

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Page 2 of 2





# Data Sheet RA-2000 Thermostatic Radiator Valves

## Application

RA-2000 Thermostatic Radiator Valves regulate the flow of hot water or steam through free-standing radiators, baseboards or convectors in hot water and two-pipe low pressure steam systems.

## Operator Features

- Valve mounted operators provide fast acting modulating control of the space temperature through a patented vapor charge, ensuring the highest level of comfort control.
- Standard valve mounted operators are equipped with a "snap-action" mechanism that allows for easy installation and removal without the use of tools. Optional anti theft protection clips are available.
- Tamper resistant versions of the valve mounted operators are available to discourage unauthorized adjustment, vandalism and theft.
- Conforms to ASHRAE / ANSI Standard 102-1983

## RA-2000 Operators

|                                                                                    |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|   |  |
| Standard Valve Mounted Dial and Sensor                                             | Standard Valve Mounted Dial with Remote Sensor                                      |
|   |  |
| Tamper Resist. Valve Mtd. Dial and Sensor                                          | Tamper Resist. Valve Mtd. Dial w/ Remote Sensor                                     |
|  |  |
| Combined Remote Mounted Dial and Sensor                                            | Separate Remote Mounted Dial and Sensor                                             |

## Valve Features

- RA-2000 valves are fitted with a packing gland assembly that is replaceable while the system is in operation. The packing gland is fitted with a grease cup to ensure the o-ring packing is lubricated for life.
- Sturdy EPDM rubber valve disc provides a positive seal against the valve seat at differential pressures of up to 20 PSI in Hydronic hot water heating systems.
- Plastic cap supplied to protect the valve pushpin can provide manual control of the valve during installation. If manual operation is required, a separate hand knob is available as an accessory.
- Conforms to ASHRAE / ANSI Standard 102-1983.

## RA-2000 Valve Bodies

|                                                                                      |                                                                                       |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |
| Straight FPT x MPT Union Tailpiece                                                   | Angle FPT x MPT Union Tailpiece                                                       |
|  |  |
| Side Mount Angle EPT x MPT Union Tailpiece                                           | Straight Double Solder Union                                                          |

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Datasheet

RA-2000 Thermostatic Radiator Valves

## Technical Specifications

### Hydronic Hot Water Systems

|                              |                  |
|------------------------------|------------------|
| Maximum Temperature:         | 250°F            |
| Maximum Static Pressure:     | 145 psi          |
| Maximum Test Pressure:       | 232 psi          |
| Max. Diff. Pressure (water): | 20 psi           |
| Max. Sensor Temperature:     | 140°F            |
| Adjustable Temp. Range:      | 45-86°F (7-30°C) |

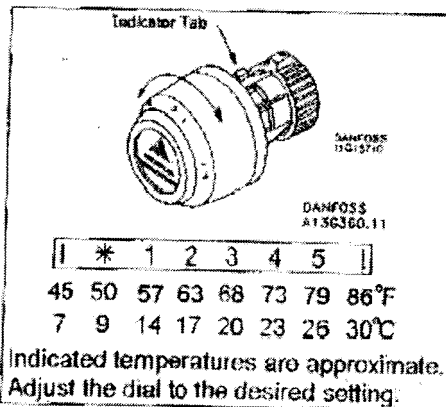
### Two-Pipe Low-Pressure Steam Systems

|                          |                  |
|--------------------------|------------------|
| Maximum Temperature:     | 250°F            |
| Maximum Test Pressure:   | 232psig          |
| Maximum Steam Pressure:  | 15psig           |
| Max. Sensor Temperature: | 140°F            |
| Adjustable Temp. Range:  | 45-86°F (7-30°C) |

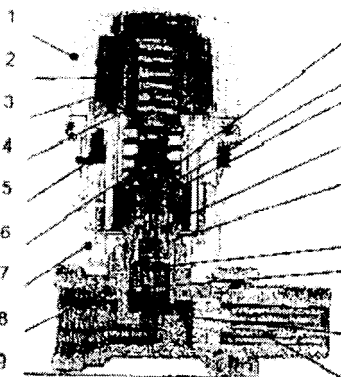
## Comfort Control

Control of the space temperature at a comfortable level is easily accomplished by adjusting the dial clockwise or counter-clockwise. The dial has a numbered scale of 1 to 5 corresponding to temperatures of approximately 57°F to 79°F (14°C to 26°C).

Should the space be vacant for an extended period or if the room is to be aired, the dial can be set to the "\*" symbol for freeze protection (50°F or 9°C) to save energy.



## Design and Function



The RA 2000 thermostatic operator consists of a saturated vapor charged bellows and a setting dial. The dial is set to the position equal to the desired temperature. When the ambient temperature lowers, the pressure from the bellows will reduce, allowing the valve to open. A rise of temperature increases the pressure in the bellows closing the valve. The balanced pressures between the adjustment spring and the bellows ensure a smooth and modulating operation of the valve.

Danfoss RA 2000 are manufactured to the highest quality standards in an ISO 9001 factory

| No. | Description                      |
|-----|----------------------------------|
| 1   | Operator setting dial (ABS)      |
| 2   | Vapor charged bellows            |
| 3   | Safety spring (steel)            |
| 4   | Adjustment spring (steel)        |
| 5   | Locking/limiting pin (steel)     |
| 6   | Pressure spindle (plastic)       |
| 7   | Snap-on mounting ring            |
| 8   | Valve body (nickel plated brass) |
| 9   | Union nut (nickel plated brass)  |
| 10  | Ball piece (nickel plated brass) |
| 11  | Valve disc (EPDM)                |
| 12  | Valve spindle (brass)            |
| 13  | Valve spring (stainless steel)   |
| 14  | Back seat washer (EPDM)          |
| 15  | Valve bonnet (brass)             |
| 16  | Pressure pin (stainless steel)   |
| 17  | Packing o-ring (EPDM)            |
| 18  | Packing gland (BRZ brass)        |

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A PARTIAL REVIEW OF THE SUBJECT TO THE CONTRACT

- ☒ DESIGN REVIEW  
☐ DRAWING REVIEW  
☐ REVISION REVIEW

Danfoss Inc. 3950EN

☐ REJECTED

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08/23/05 5002 12 1100

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Datasheet

RA-2000 Thermostatic Radiator Valves

Ordering Information

| RA 2000 Operators                                                                 |          |                                                         |          |           |
|-----------------------------------------------------------------------------------|----------|---------------------------------------------------------|----------|-----------|
| Symbol                                                                            | Code No. | Description                                             | Sensor   | Capillary |
|  | 013G8250 | Valve mounted dial & sensor                             | Built-in | -         |
|  | 013G8252 | Valve mounted dial with remote sensor                   | Remote   | 6'        |
|  | 013G8240 | Valve mounted dial and sensor, tamper-resistant         | Built-in | -         |
|  | 013G2922 | Valve mounted dial with remote sensor, tamper-resistant | Remote   | 6'        |
|  | 013G8562 | Combined remote mounted dial & sensor*                  | -        | 6'        |
|                                                                                   | 013G8565 | Combined remote mounted dial & sensor*                  | -        | 18'       |
|                                                                                   | 013G5068 | Combined remote mounted dial & sensor                   | -        | 26'       |
|  | 013G8664 | Separate remote mounted dial and sensor*                | Remote   | 6' + 8'   |

\* Includes socket for use on RAV, KOVM, and VMT valve bodies.

| RA 2000 Valves                                                                      |          |        |            |     |                              |
|-------------------------------------------------------------------------------------|----------|--------|------------|-----|------------------------------|
| Symbol                                                                              | Code No. | Size   | Pattern    | Cv  | Connections (inlet x outlet) |
|  | 013G8015 | 1/2"   | Straight   | 1.6 | FPT X MPT Union Tailpiece    |
|                                                                                     | 013G8020 | 3/4"   |            | 2.7 |                              |
|                                                                                     | 013G8025 | 1"     |            | 2.8 |                              |
|                                                                                     | 013G8032 | 1 1/2" |            | 2.8 |                              |
|  | 013G8014 | 1/2"   | Angle      | 1.6 | FPT X MPT Union Tailpiece    |
|                                                                                     | 013G8019 | 3/4"   |            | 2.7 |                              |
|                                                                                     | 013G8024 | 1"     |            | 2.8 |                              |
|                                                                                     | 013G8031 | 1 1/2" |            | 2.8 |                              |
|  | 013G8013 | 1/2"   | Side Mount | 1.6 | FPT X MPT Union Tailpiece    |
|                                                                                     | 013G8018 | 3/4"   |            | 2.1 |                              |
|                                                                                     | 013G8023 | 1"     | Angle      | 2.8 |                              |
|                                                                                     | 013G8030 | 1 1/2" |            | 2.8 |                              |
|  | 013G8042 | 1/2"   | Straight   | 1.6 | Double Solder Union          |
|                                                                                     | 013G8044 | 3/4"   |            | 2.7 |                              |

Cv is the water flow rate through the fully open valve at a pressure drop of 1psi. To determine the pressure drop through the valve at other flow rates use the formula:  $\Delta P = (Q/C_v)^2$ , where Q = water flow in GPM.

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- ☒ NO EXCEPTIONS TAKEN  
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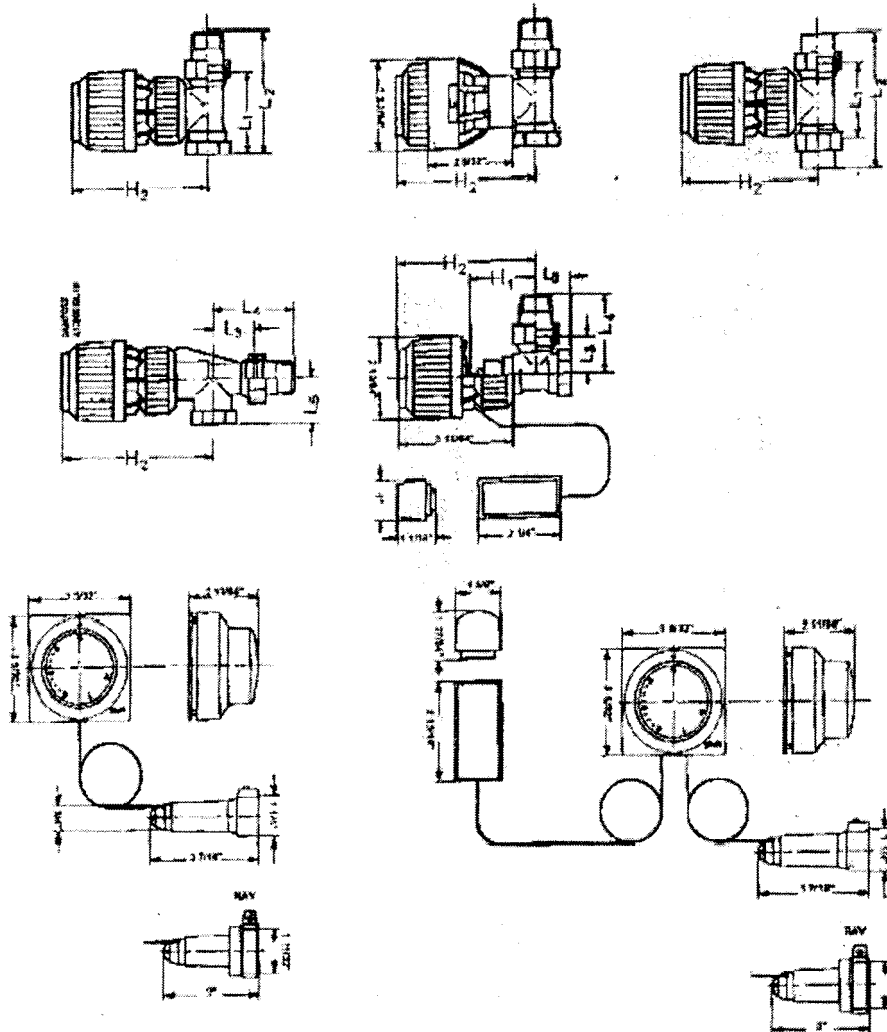
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 EARTH TECH (CANADA) INC.

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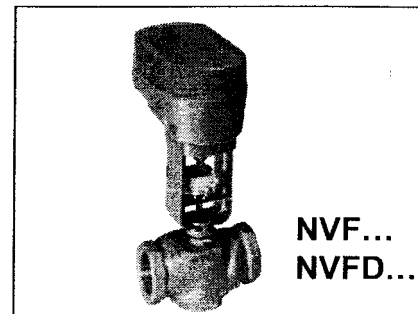


**Dimensions**



| Valve Type          | Connection Type | L1       | L2       | L3       | L4      | L5       | H1       | H2       |
|---------------------|-----------------|----------|----------|----------|---------|----------|----------|----------|
| Straight            | 1/2" NPT        | 2 5/8"   | 3 3/4"   |          |         |          | 1 57/64" | 3 3/4"   |
|                     | 3/4" NPT        | 2 20/32" | 4 1/16"  |          |         |          | 2 1/16"  | 3 15/16" |
|                     | 1" NPT          | 3 17/32" | 4 31/32" |          |         |          | 2 1/8"   | 3 15/16" |
|                     | 1 1/4" NPT      | 4 1/4"   | 5 23/32" |          |         |          | 2 7/8"   | 4 1/64"  |
| Angle               | 1/2" NPT        |          |          | 1 3/16"  | 2 9/32" | 1 1/64"  | 1 57/64" | 3 3/4"   |
|                     | 3/4" NPT        |          |          | 1 11/32" | 2 5/8"  | 1 5/64"  | 2 1/16"  | 3 15/16" |
|                     | 1" NPT          |          |          | 1 9/16"  | 3"      | 1 11/32" | 2 1/8"   | 3 15/16" |
|                     | 1 1/4" NPT      |          |          | 1 3/4"   | 3 3/8"  | 1 5/16"  | 2 1/8"   | 3 15/16" |
| Side Mount Angle    | 1/2" NPT        |          |          | 1 1/8"   | 2 1/4"  | 1 1/64"  | 2 1/8"   | 4 1/4"   |
|                     | 3/4" NPT        |          |          | 1 11/32" | 2 5/8"  | 1 5/64"  | 2 1/8"   | 4 1/16"  |
|                     | 1" NPT          |          |          | 1 9/16"  | 3"      | 1 11/32" | 2 3/8"   | 4 1/4"   |
|                     | 1 1/4" NPT      |          |          | 1 3/4"   | 3 3/8"  | 1 5/16"  | 2 3/8"   | 4 1/4"   |
| Double Solder Union | 1/2"            | 2 5/8"   | 3 15/16" |          |         |          | 1 57/64" | 3 3/4"   |
|                     | 3/4"            | 2 15/16" | 4 5/8"   |          |         |          | 2 1/8"   | 3 15/16" |





### G3 Three-Way Mixing Globe Valve with NVF... Spring Return

| Valve   |                       |                    |       |               | Spring Return Actuator – See set-up chart on opposite page |                                      |                                   |                                      |
|---------|-----------------------|--------------------|-------|---------------|------------------------------------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|
| Model # | C <sub>v</sub> Rating | Valve Nominal Size |       | Close-Off psi | NVFD and NVF Actuator Spring Up                            |                                      | NVFD and NVF Actuator Spring Down |                                      |
|         |                       |                    |       |               | On/Off                                                     | On/Off / Floating Proportional / MFT | On/Off                            | On/Off / Floating Proportional / MFT |
|         |                       | Inches             | DN mm |               | NVFD24 US                                                  | NVFD24-MFT US†<br>NVF24-MFT US†      | NVFD24-E US                       | NVFD24-MFT-E US†<br>NVF24-MFT-E US†  |
| G314    | 2.2                   | 1/2"               | 15    | 250           | NVFD24 US                                                  | \$ 580.00                            | NVFD24-E US                       | \$ 660.00                            |
| G315    | 4.4                   | 1/2"               | 15    | 250           | NVFD24 US                                                  | \$ 580.00                            | NVFD24-E US                       | \$ 660.00                            |
| G320    | 7.5                   | 3/4"               | 20    | 250           | NVFD24 US                                                  | \$ 600.00                            | NVFD24-E US                       | \$ 680.00                            |
| G325    | 14                    | 1"                 | 25    | 207           |                                                            | \$ 750.00                            |                                   | \$ 750.00                            |
| G332    | 20                    | 1-1/4"             | 32    | 130           |                                                            | \$ 850.00                            |                                   | \$ 850.00                            |
| G340    | 28                    | 1-1/2"             | 40    | 88            |                                                            | \$ 980.00                            |                                   | \$ 980.00                            |
| G350    | 41                    | 2"                 | 50    | 47            |                                                            | \$ 1,080.00                          |                                   | \$ 1,080.00                          |

† Specify when ordering proportional (V-10001), floating point (V-30001), on/off (V-40002) – no additional cost

### G3...D Three-Way Diverting Globe Valve with NVF... Spring Return

| Valve   |                       |                    |       |               | Spring Return Actuator – See set-up chart on opposite page |                                      |                                   |                                      |
|---------|-----------------------|--------------------|-------|---------------|------------------------------------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|
| Model # | C <sub>v</sub> Rating | Valve Nominal Size |       | Close-Off psi | NVFD and NVF Actuator Spring Up                            |                                      | NVFD and NVF Actuator Spring Down |                                      |
|         |                       |                    |       |               | On/Off                                                     | On/Off / Floating Proportional / MFT | On/Off                            | On/Off / Floating Proportional / MFT |
|         |                       | Inches             | DN mm |               | NVFD24 US                                                  | NVFD24-MFT US†<br>NVF24-MFT US†      | NVFD24-E US                       | NVFD24-MFT-E US†<br>NVF24-MFT-E US†  |
| G315D   | 4.4                   | 1/2"               | 15    | 250           | NVFD24 US                                                  | \$ 740.00                            | NVFD24-E US                       | \$ 820.00                            |
| G320D   | 7.5                   | 3/4"               | 20    | 250           | NVFD24 US                                                  | \$ 760.00                            | NVFD24-E US                       | \$ 840.00                            |
| G325D   | 15                    | 1"                 | 25    | 250           |                                                            | \$ 860.00                            |                                   | \$ 860.00                            |
| G332D   | 20                    | 1-1/4"             | 32    | 250           |                                                            | \$ 936.00                            |                                   | \$ 936.00                            |
| G340D   | 28                    | 1-1/2"             | 40    | 250           |                                                            | \$ 1,100.00                          |                                   | \$ 1,100.00                          |
| G350D   | 40                    | 2"                 | 50    | 250           |                                                            | \$ 1,512.00                          |                                   | \$ 1,512.00                          |

† Specify when ordering proportional (V-10001), floating point (V-30001), on/off (V-40002) – no additional cost

### Multi-Function Technology

For complete technical information refer to Product Documentation Multi-Function Technology: 2.5

| Model   | Power Supply | Control Input       | Feedback  | List Price |
|---------|--------------|---------------------|-----------|------------|
| V-10001 | 24VAC/DC     | 2-10 VDC (4-20 mA)* | 2-10 VDC  | –          |
| V-10002 | 24 VAC/DC    | 0-10 VDC            | 0-10 VDC  | \$ 30.00   |
| V-10003 | 24 VAC/DC    | 2-10 VDC            | 0-5 VDC   | \$ 30.00   |
| V-10004 | 24 VAC/DC    | 4-7 VDC             | 2-10 VDC  | \$ 30.00   |
| V-10005 | 24 VAC/DC    | 6-9 VDC             | 2-10 VDC  | \$ 30.00   |
| V-10006 | 24 VAC/DC    | 10.5-13.5 VDC       | 2-10 VDC  | \$ 30.00   |
| V-10012 | 24 VAC/DC    | 0-5 VDC             | 0-2.5 VDC | \$ 30.00   |
| V-20001 | 24 VAC/DC    | 0.59-2.93 sec. PWM  | 2-10 VDC  | \$ 30.00   |
| V-20002 | 24 VAC/DC    | 0.02-5.00 sec. PWM  | 2-10 VDC  | \$ 30.00   |
| V-20003 | 24 VAC/DC    | 0.10-25.5 sec. PWM  | 2-10 VDC  | \$ 30.00   |
| V-30001 | 24 VAC/DC    | Floating Point      | 2-10 VDC  | –          |
| V-40002 | 24 VAC/DC    | On/Off              | 2-10 VDC  | –          |

\* With 500Ω resistor

Example: NVF24-MFT US is the basic model. Add the V... pre-set MFT configuration number and list price to the actuator when ordering, as needed.

† Specify when ordering proportional (V-10001), floating point (V-30001), on/off (V-40002) – no additional cost



# G3 Series Globe Valves, NV Series Spring Return Actuator



## Specifications – For G3...and G3...D Series

|                     |                                  |
|---------------------|----------------------------------|
| Service             | chilled or hot water, 60% glycol |
| Flow Characteristic | linear                           |
| Action              | stem up open port B to AB        |
| Sizes               | 1/2" to 2"                       |
| Type of End Fitting | NPT                              |
| Materials:          |                                  |
| Body                | bronze                           |
| Seat                | bronze                           |
| Stem                | stainless steel                  |
| Plug                | brass                            |
| Packing             | spring loaded TFE                |

|                               |                                 |
|-------------------------------|---------------------------------|
| ANSI Class                    | 250 (up to 400 psi below 150°F) |
| Leakage                       | ANSI Class III                  |
| Media Temp. Range             | 20°F to 250°F [-7°C to 120°C]   |
| Maximum Differential Pressure | water 35 psi [241 kPa]          |
| Rangeability                  | 500:1                           |

2" G350 NVFD 24-MFT-E US  
V-10003  
2-10 VOLTS DC

## ORDERING EXAMPLE

|                                                           | Model No.   | Selected Criteria                                                   | Pricing (from table on opposite page) |
|-----------------------------------------------------------|-------------|---------------------------------------------------------------------|---------------------------------------|
| VALVE                                                     | G315        | 1/2" Globe Valve 3-way Mixing<br>4.4 Cv Rating                      | \$ 580.00                             |
| ACTUATOR                                                  | NVFD24-E US | Spring Return, Spring Down<br>On/Off Control                        |                                       |
| MFT Configuration<br>(Select from chart on opposite page) |             | Not available for selected actuator<br>(\$ 30.00 list if available) | \$ 00.00                              |
| SET-UP<br>(See set-up chart)                              |             | Normally Open A to AB<br>Fail Open A to AB                          | No Charge                             |
| TAGGING                                                   |             | Not specified (\$ 10.00 list if needed)                             | \$ 00.00                              |
| ORDER USING THIS NUMBER: G315 + NVFD24-E US + NO/FO       |             |                                                                     | Total \$ 580.00 List                  |

Set-Up - 3-way valves - Factory Defaults and Custom Set-ups.  
Valves will be shipped with the default set-up unless custom set-up is specified upon ordering.

| SPRING RETURN ACTUATOR            | SPRING ACTION              | DEFAULT (3-way)                                          | CUSTOM (3-way)                                         |
|-----------------------------------|----------------------------|----------------------------------------------------------|--------------------------------------------------------|
| NVF24-MFT US<br>NVFD24-MFT US     | Spring Up<br>Spring Up     | NC = Normally Closed A to AB<br>FC = Fail Closed A to AB | NO = Normally Open A to AB<br>FC = Fail Closed A to AB |
| NVF24-MFT-E US<br>NVFD24-MFT-E US | Spring Down<br>Spring Down | NC = Normally Closed A to AB<br>FO = Fail Open A to AB   | NO = Normally Open A to AB<br>FO = Fail Open A to AB   |

Note: All valves are set-up closed A to AB at 2V. Increase in voltage/power will open valve A to AB. NO/NC action can be changed using S3 switch in actuator.

## Example:

3-way spring closed (A to AB) valve is required.  
Correct Actuator:  
NVF24-MFT US or  
NVFD24-MFT US

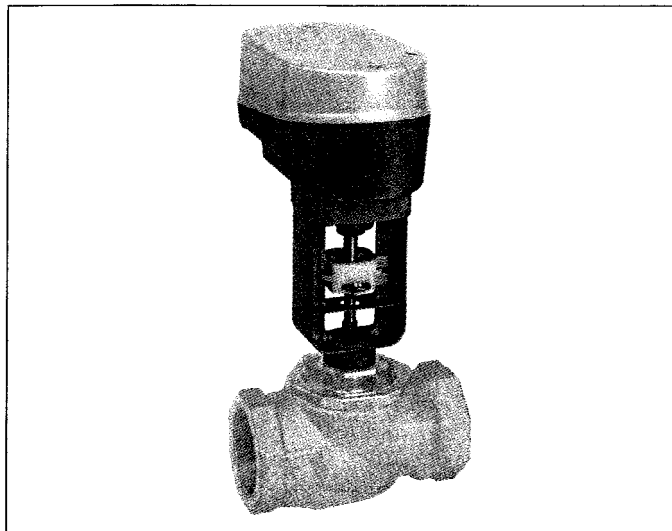
A 3-way spring open (A to AB) valve is required.  
Correct Actuator:  
NVF24-MFT-E US or  
NVFD24-MFT-E US

drop P2/2



Non-spring return, on/off, floating point, proportional control

2" HEATING

**On/Off, Floating Point Control, 24 VAC/DC Power****NV24-3 US, NVD24-3 US**

Power consumption: 3W  
 Transformer sizing: 5 VA (Class 2 power source)  
 Force: ☐ NV24-3 US: 180 lbf [800N]  
           ☐ NVD24-3 US: 90 lbf [400N]

**Proportional Control, 24 VAC/DC Power**

Features Multi-Function Technology® (MFT)

**NV24-MFT US, NVD24-MFT US**

Power consumption: 5W  
 Transformer sizing: 7 VA (Class 2 power source)  
 Operating range: Default: 2 to 10 VDC, 4 to 20 mA  
                           (w/500Ω, 1/4 W resistor)  
 Input impedance: 100kΩ for 2 to 10 VDC  
 Feedback output 'U': Default: 2 to 10 VDC, 2 mA max  
 Force: ☐ NV24-MFT US: 180 lbf [800N]  
           ☐ NVD24-MFT US: 90 lbf [400N]

**Common Data**

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| Power supply:          | 24 VAC ± 20% 50/60 Hz<br>24 VDC ±10%                           |
| Electrical connection: | 3 ft, 18 GA appliance cable,<br>1/2" conduit fitting           |
| Overload protection:   | electronic throughout stroke                                   |
| Maximum stroke:        | 3/4" [20 mm]                                                   |
| Position indication:   | stroke indicator on bracket                                    |
| Manual override:       | 3/16" hex, 5mm hex, phillips head<br>screwdriver               |
| Running time:          | 150 secs. independent of stroke<br>(NV24-MFT US, NVD24-MFT US) |
| Actuating Time:        | 50s/.25", [7.5s/mm]<br>(NV24-3US, NVD24-3 US)                  |
| Run time stability     | ± 5%                                                           |
| Humidity:              | 5 to 95% RH, noncondensing                                     |
| Ambient temperature:   | -22° F to 122° F [-30° C to 50° C]                             |
| Media temperature:     | 20° F to 250° F [-7° C to 120° C]                              |
| Storage temperature:   | -40° F to 176° F [-40° C to 80° C]                             |
| Housing:               | NEMA 2 / IP54 with cable entry down                            |
| Housing material:      | UL 94-5V (flammability rating)                                 |
| Agency listings:       | CE, UL 873, CSA 4813 02                                        |
| Quality standard:      | ISO 9001                                                       |
| Noise level:           | max. 35 dB(A)                                                  |
| Servicing:             | maintenance free                                               |
| Weight:                | 3.3 lb [1.5 kg]                                                |

NV24-3 US  
 NVD24-3 US  
 NV24-MFT US  
 NVD24-MFT US

**Application**

For on/off, floating point and proportional control of globe valves. Actuator will mate to an integrated adaptor bracket. Adaptor bracket shown fits valves manufactured by Siebe Environmental Controls under designations VB7000 and VB9000.

**Functional safety**

The actuator is secured against short circuiting and incorrect polarity. The stroke is adapted automatically and is overload-protected.

**Manual operation**

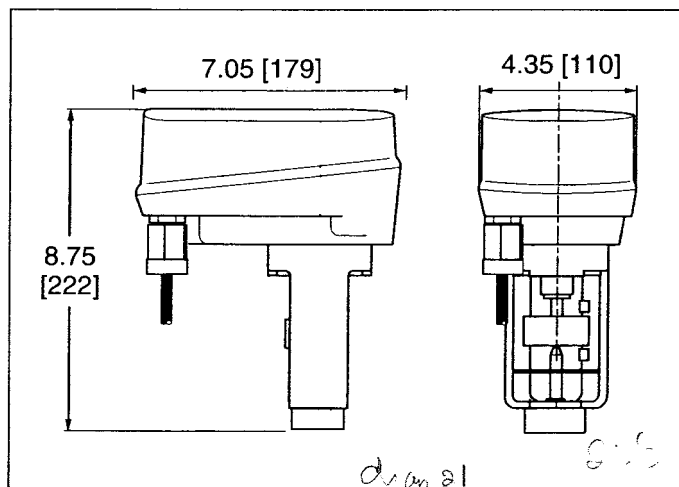
When a 3/16" or 5 mm hex is inserted and turned clockwise, the actuator plunger pushes out. The actuator plunger retains the position until the nominal voltage is applied.

**Display of function**

The stroke is shown mechanically on the adaptor bracket, and the maximum stroke is set automatically. Under the housing cover on -MFT models is a two-colored LED status display.

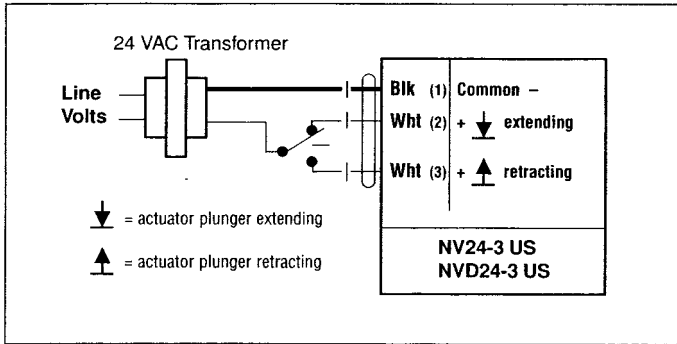
**Multi-Function Technology® (MFT)**

An integrated microprocessor allows for a variety of parameters to be easily configured at the factory or in the field.

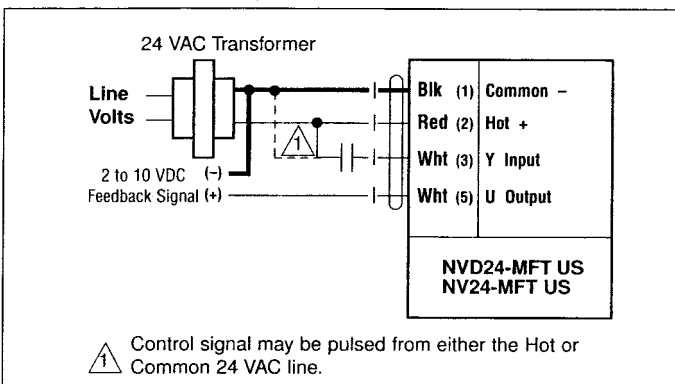
**Dimensions in inches (numbers in brackets are metric)**

# NV... Direct Coupled Globe Valve Actuator

Non-spring return, on/off, floating point, proportional control



Floating point or on/off control (With default position of S1.2: Off. See page 10.)



Pulse width modulation control wiring

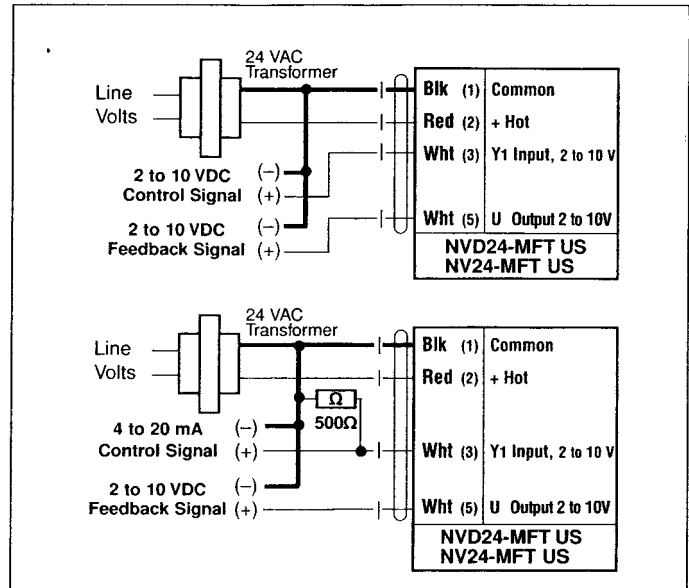
Range Available: 20 ms to 50 sec.

Typical: 0.59 to 2.93

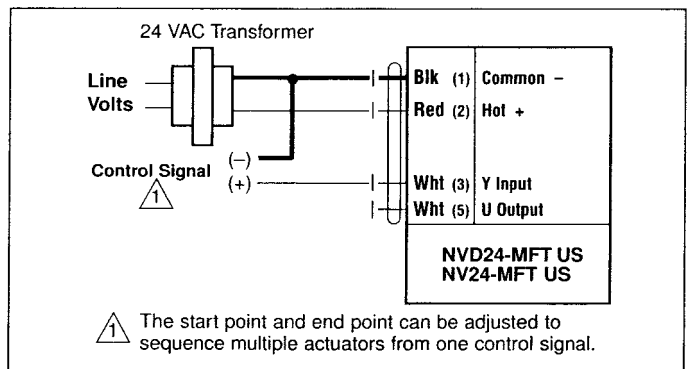
0.02 to 5.00

0.10 to 25.5

(With default position of S3.2: 3-way Off, 2-way On. See page 9.)

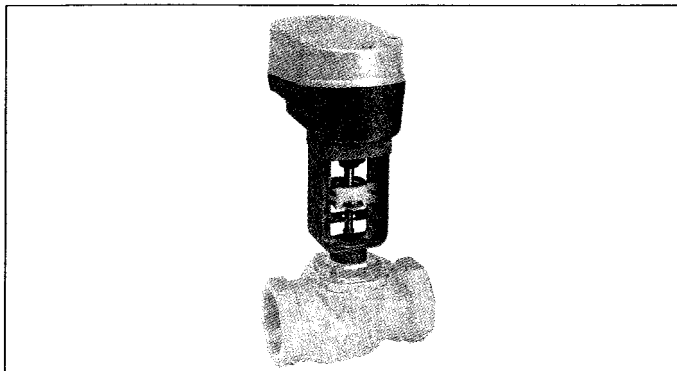


MFT typical 2 to 10 VDC or 4 to 20 mA wiring (With default position of S3.2: 3-way Off, 2-way On. See page 9.)



Start point and stop adjustable wiring (With default position of S3.2: 3-way Off, 2-way On. See page 9.)

Spring return fail safe, on/off, floating point, proportional control



#### On/Off, 24 VAC/DC Power

##### NVFD24 US, NVFD24-E US

Force: 90 lbf [400N]  
 Plunger: ☐ NVFD24 US (spring up)  
☐ NVFD24-E US (spring down)

#### Floating/Proportional Control, 24 VAC/DC Power

Features Multi-Function Technology® (MFT)

##### NVFD24-MFT US, NVFD24-MFT-E US

Operating range: 2 to 10 VDC,  
 4 to 20 mA (w/500Ω, 1/4 W resistor)  
 Input impedance: 100kΩ for 2 to 10 VDC  
 Feedback output 'U': 2 to 10 VDC, 2 mA max  
 Force: 90 lbf [400N]  
 Plunger: ☐ NVFD24-MFT US (spring up)  
☐ NVFD24-MFT-E US (spring down)

##### NVF24-MFT US, NVF24-MFT-E US

Operating range: 2 to 10 VDC,  
 4 to 20 mA (w/500Ω, 1/4 W resistor)  
 Input impedance: 100kΩ for 2 to 10 VDC  
 Feedback output 'U': 2 to 10 VDC, 2 mA max  
 Force: 180 lbf [800N]  
 Plunger: ☐ NVF24-MFT US (spring up)  
☐ NVF24-MFT-E US (spring down)

#### Common Data

|                        |                                                                                 |
|------------------------|---------------------------------------------------------------------------------|
| Power supply:          | 24 VAC ± 20% 50/60 Hz, 24 VDC ±10%                                              |
| Power consumption:     | 5.5 W                                                                           |
| Transformer sizing:    | 10 VA (Class 2 power source)                                                    |
| Electrical connection: | 3 ft, 18 GA appl. cable, 1/2" conduit fit.                                      |
| Overload protection:   | electronic throughout stroke                                                    |
| Maximum stroke:        | 3/4" [20 mm]                                                                    |
| Position indication:   | stroke indicator on bracket                                                     |
| Manual override:       | 3/16" hex, 5mm hex, phillips screwdriver                                        |
| Running time:          | motor: 150 secs. independent of stroke<br>spring: 30 secs. at 3/4"[20mm] stroke |
| Run time stability     | ± 5%                                                                            |
| Humidity:              | 5 to 95% RH, noncondensing                                                      |
| Ambient temperature:   | -22° F to 122° F [-30° C to 50° C]                                              |
| Media temperature:     | 20° F to 250° F [-7° C to 120° C]                                               |
| Storage temperature:   | -40° F to 176° F [-40° C to 80° C]                                              |
| Housing:               | NEMA 2 / IP54 with cable entry down                                             |
| Housing material:      | UL 94-5V (flammability rating)                                                  |
| Agency listings:       | CE, UL 873, CSA 4813 02                                                         |
| Quality standard:      | ISO 9001                                                                        |
| Noise level:           | max. 35 dB(A)                                                                   |
| Servicing:             | maintenance free                                                                |
| Weight:                | 4 lb [1.8 kg]                                                                   |

NVFD24 US  
 NVFD24-E US  
 NVFD24-MFT US  
 NVFD24-MFT-E US  
 NVF24-MFT US  
 NVF24-MFT-E US

#### Application

For on/off, floating point and proportional control of globe valves. Actuator will mate to an integrated adaptor bracket. Adaptor bracket shown fits valves manufactured by Siebe Environmental Controls under designations VB7000 and VB9000.

#### Functional safety

The actuator is secure against short circuiting and incorrect polarity. The stroke is adapted automatically and is overload-protected. The spring return function in the actuator is pre-tensioned when delivered. Pressing a 3/16" or 5 mm hex into the housing cover releases the spring stop.

#### Manual operation

When a 3/16" or 5 mm hex is inserted, depressed and turned clockwise, the actuator plunger pushes out. The actuator plunger retains the position until the nominal voltage is applied.

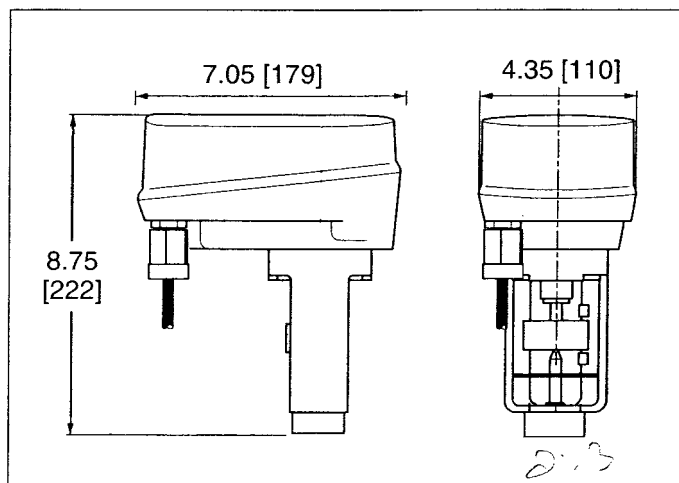
#### Display of function

The stroke is shown mechanically on the adaptor bracket, and the maximum stroke is set automatically. Under the housing cover on -MFT models is a two-colored LED display which will verify that the actuator is set up properly.

#### Multi-Function Technology® (MFT)

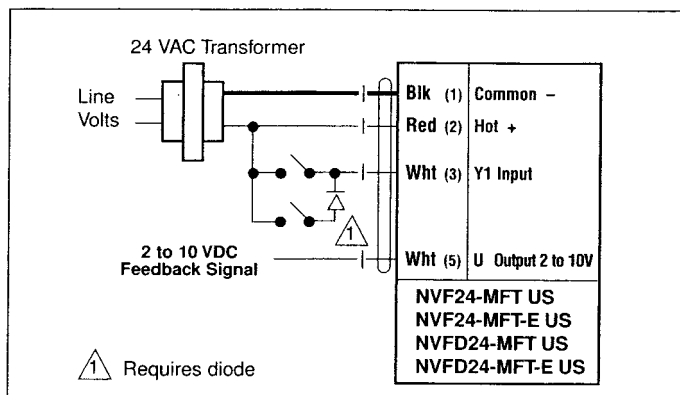
An integrated microprocessor allows for a great variety of parameters to be easily configured at the factory or in the field.

#### Dimensions in inches (numbers in brackets are metric)

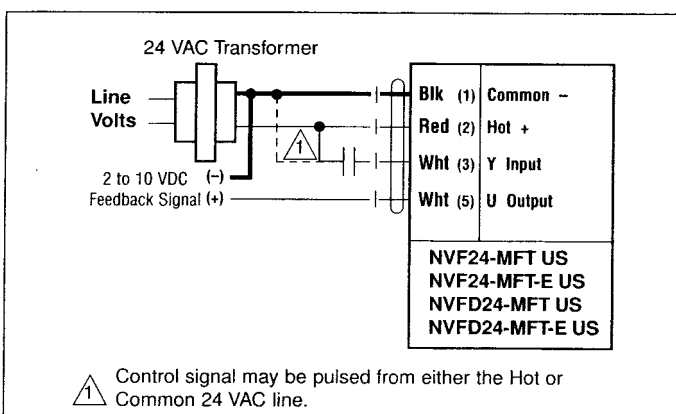


# NVF... Direct Coupled Globe Valve Actuator

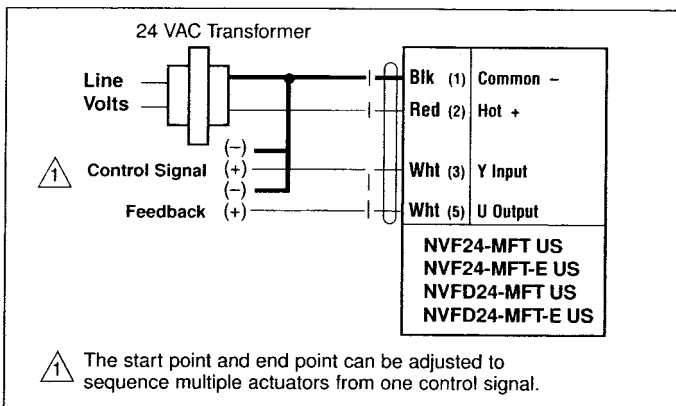
Spring return fail safe, on/off, floating point, proportional control



**Floating point control (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**

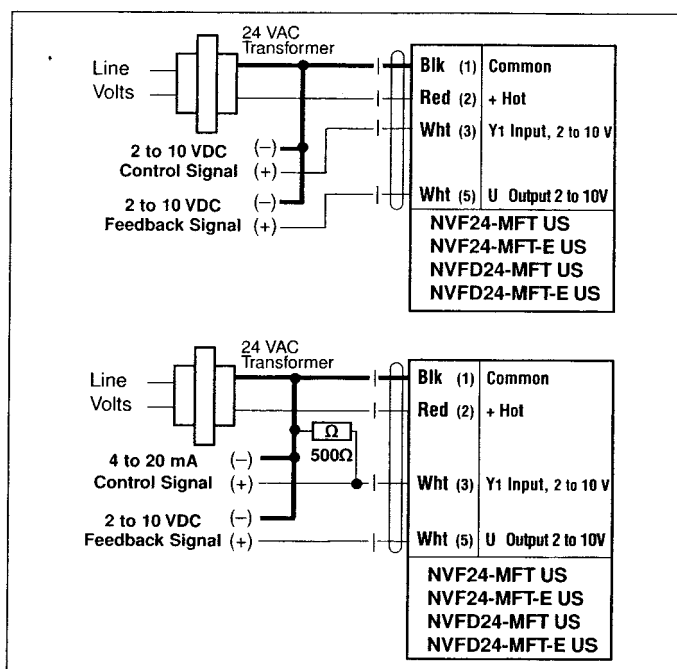
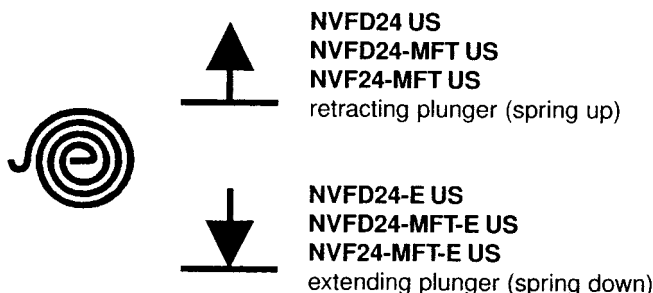


**Pulse width modulation control wiring (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**

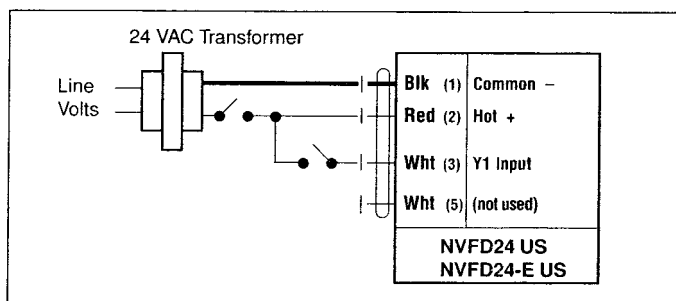


**Start point and stop adjustable wiring (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**

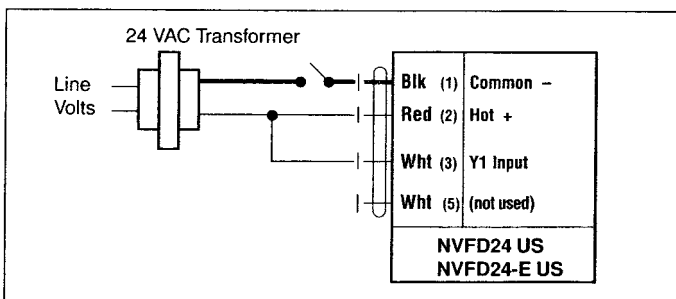
**Spring return actuators model designation**



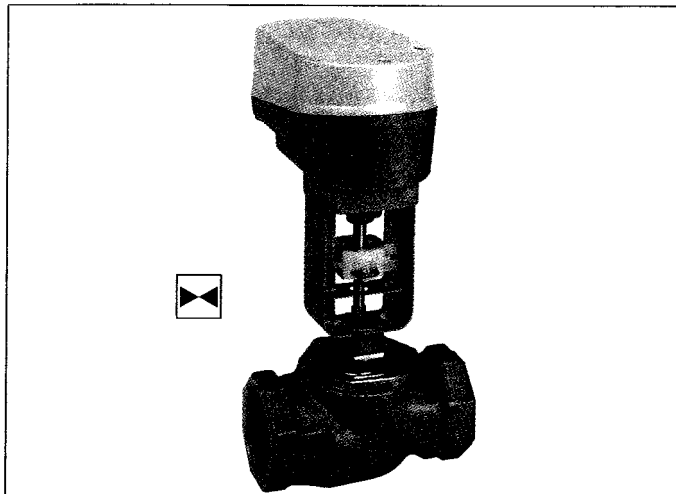
**MFT typical 2 to 10 VDC or 4 to 20 mA wiring (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**



**On/off control—using actuator to drive open/close, spring upon power loss. (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**



**On/off control—using actuator to drive one direction and spring the opposite direction. Note: A bridge must be made inside the NVF between terminals 2 and 3. (With default position of S3.2: 3-way Off, 2-way On. See page 9.)**



## G2 Series Two-Way

### Application

G2 Series two-way valves control water or steam for 2-position or modulating control applications. Valves conform to ANSI class 250 rating for screwed cast bronze bodies.

### Actuators

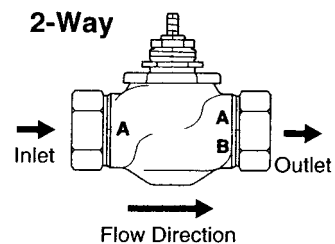
A number of combinations are possible. Both spring return (NVF...) and non-spring return actuators (NV...) are available.

### Piping

The valve should be mounted in a weather-protected area in a location that is within the ambient limits of the actuator. Allow sufficient room for valve with actuator and for service. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator vertical or horizontal in relation to the pipe. G2 series two-way "A" port is inlet, "AB" port is outlet (Do not reverse flow direction).

### WARNING

These valves are not for combustible gas applications as leaks and explosions could result.

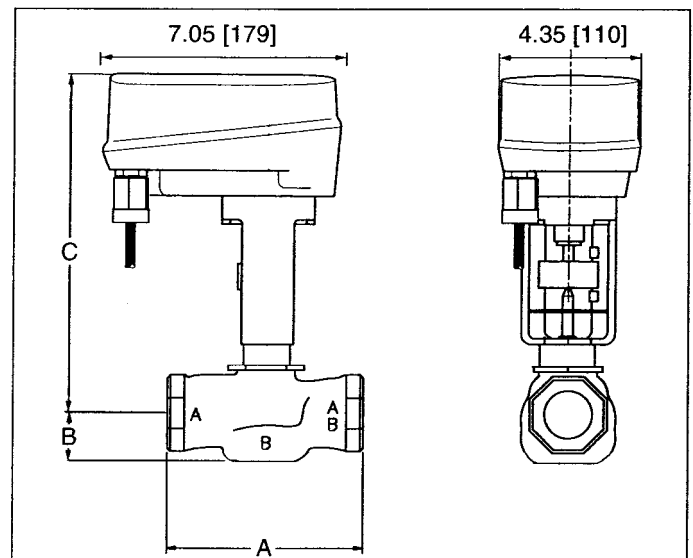


### Specifications

|                               |                                                  |
|-------------------------------|--------------------------------------------------|
| Service                       | chilled or hot water, 50% glycol, steam          |
| Flow Characteristic           | equal percentage                                 |
| Action                        | stem up open A to AB                             |
| Sizes                         | 1/2" to 2"                                       |
| Type of End Fitting           | NPT                                              |
| Materials:                    |                                                  |
| Body                          | bronze                                           |
| Seat                          | bronze                                           |
| Stem                          | stainless steel                                  |
| Plug                          | brass                                            |
| Packing                       | spring loaded TFE                                |
| Disc                          | EPDM                                             |
| ANSI Class                    | 250 (up to 400 psi below 150°F)                  |
| Leakage                       | Ansi IV Close-off                                |
| Maximum Inlet Pressure Steam  | 15 psi [103 kPa]                                 |
| Media Temp. Range             | 20°F to 250°F [-7°C to 120°C]                    |
| Maximum Differential Pressure | water 35 psi [241 kPa]<br>steam 15 psi [103 kPa] |

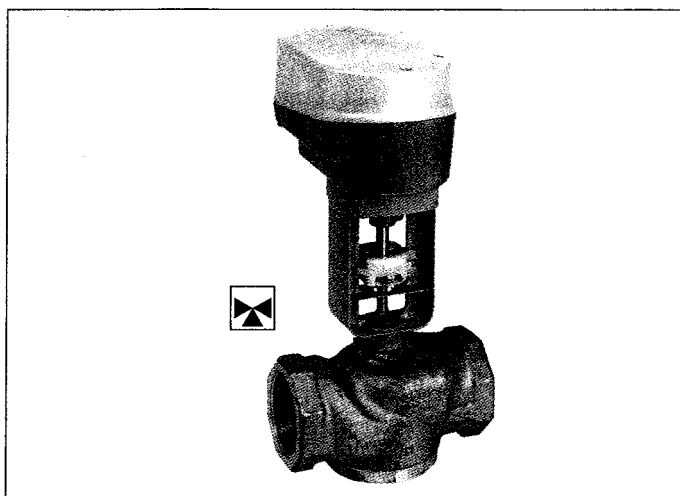
Note: The NV/NVF actuator cannot be used for 2-way steam applications above 15 psi inlet pressure. For inlet pressures between 15 psi and 35 psi, call Belimo for standard G2 Series valve with another Belimo actuator. For steam applications exceeding 35 psi, stainless steel trim must be used. Call Belimo for pricing.

### Assembly Dimensions in inches (numbers in brackets are metric)



### 2-Way

| Pipe Size   | A            | B            | C               |
|-------------|--------------|--------------|-----------------|
| 1/2" [15]   | 3-1/16" [78] | 1-1/16" [27] | 9-3/4" [248]    |
| 3/4" [20]   | 3-5/8" [92]  | 1-1/16" [27] | 9-3/4" [248]    |
| 1" [25]     | 4-5/8" [117] | 1-1/8" [29]  | 10-7/16" [265]  |
| 1-1/4" [32] | 4-5/8" [117] | 1-3/8" [35]  | 10-7/16" [265]  |
| 1-1/2" [40] | 5-3/8" [137] | 1-1/2" [38]  | 10-1/2" [267]   |
| 2" [50]     | 6-1/8" [156] | 1-9/16" [40] | 10-13/16" [275] |



## G3 Series Three-Way (mixing)

### Application

G3 Series three-way mixing valves control water for two position or modulating control applications. Call Belimo for diverting applications. Valves conform to ANSI class 250 rating for screwed cast bronze bodies.

### Actuators

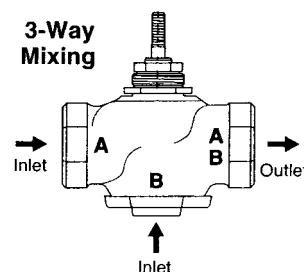
A number of combinations are possible. Both spring return (NVF...) and non-spring return actuators (NV...) are available.

### Piping

The valve should be mounted in a weather-protected area in a location that is within the ambient limits of the actuator. Allow sufficient room for valve with actuator and for service. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator vertical or horizontal in relation to the pipe. G3 series three-way: "A" port is inlet, "B" port is bypass, "AB" port is outlet. (Do not reverse flow direction).

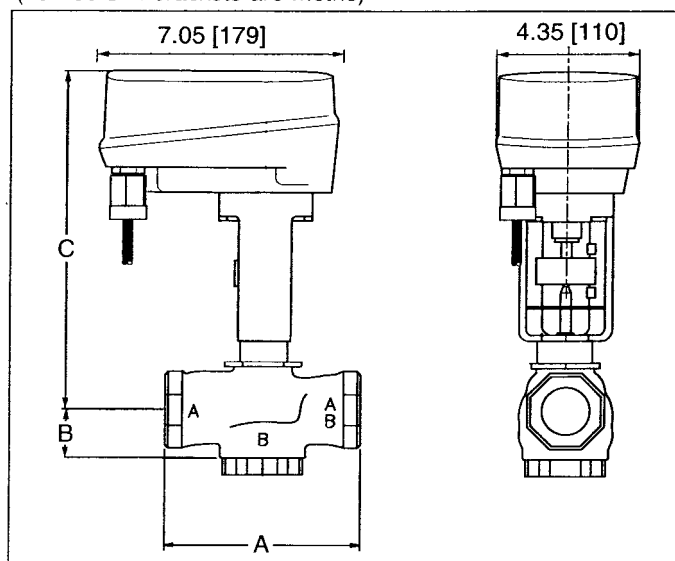
### WARNING

These valves are not for combustible gas applications as leaks and explosions could result.



### Assembly Dimensions in inches

(numbers in brackets are metric)



### Specifications

|                               |                                   |
|-------------------------------|-----------------------------------|
| Service                       | chilled or hot water, 50% glycol  |
| Flow Characteristic           | linear - mixing only              |
| Action                        | stem up open port B to AB         |
| Sizes                         | 1/2" to 2"                        |
| Type of End Fitting           | NPT                               |
| Materials:                    |                                   |
| Body                          | bronze                            |
| Seat                          | bronze                            |
| Stem                          | stainless steel                   |
| Plug                          | brass                             |
| Packing                       | spring loaded TFE                 |
| ANSI Class                    | 250 (up to 400 psi below 150 °F)  |
| Leakage                       | Ansi III Close-off                |
| Media Temp. Range             | 20 °F to 250 °F [-7 °C to 120 °C] |
| Maximum Differential Pressure | water 35 psi [241 kPa]            |

| 3-Way       |              |               |                |
|-------------|--------------|---------------|----------------|
| Pipe Size   | A            | B             | C              |
| 1/2" [15]   | 3-1/16" [78] | 1-3/8" [35]   | 9-3/4" [248]   |
| 3/4" [20]   | 3-5/8" [92]  | 1-11/16" [43] | 9-3/4" [248]   |
| 1" [25]     | 4-5/8" [117] | 1-9/16" [40]  | 9-13/16" [249] |
| 1-1/4" [32] | 4-5/8" [117] | 1-5/8" [41]   | 10-1/16" [256] |
| 1-1/2" [40] | 5-3/8" [137] | 1-5/8" [41]   | 9-3/16" [234]  |
| 2" [50]     | 6-1/8" [156] | 1-7/8" [48]   | 9-1/4" [235]   |

**Installation instructions for Siebe VB7000 and VB9000 series valves.**

1. Remove all existing linkage and push stem to down position.
2. Screw stem adaptor onto valve stem. Top of stem adaptor must be 1.77" [45 mm] from surface of valve bonnet. (Fig. 1)
3. Tighten lock-nut to base of stem adaptor.
4. Screw NV actuator (A) onto valve, and tighten valve bonnet nut (B).
5. Preload condition: press locking mechanism (C) into valve coupling (D). Locking pin (F) must be down (see Fig. 2).
6. Lower plunger (E) using manual override (p.9) until stem adaptor meets valve coupling. When connected, locking mechanism (C) pops out of valve coupling.
7. Secure by pressing locking pin (F) up into locking mechanism.
8. Move sliding stroke indicators (G) to sit above and below lip on valve coupling (H). Stroke indicators are automatically repositioned to the maximum stroke when power is applied to actuator.

When disassembling, the locking pin (F) must first be withdrawn from the locking mechanism. The locking mechanism is then pressed into the valve coupling, and the valve stem will disengage when plunger (E) is raised.

**Recommended installation location**

It is permissible to install the NV actuator upright or horizontally. However, it is recommended that the valve stem not be installed facing downward. Allow 12 inches of clearance for removal of actuator and 6 inches for removal of cover.

**No special tools are needed for the installation.**

Corresponding installation instructions are packaged with the NV actuator and valve.

**Initial start-up**

The unit must not be started up until the valve and actuator have been assembled according to instructions. Adaptation (initialization) will only occur the first time the actuator is powered. To reset, remove housing cover and press adaptation button S2.

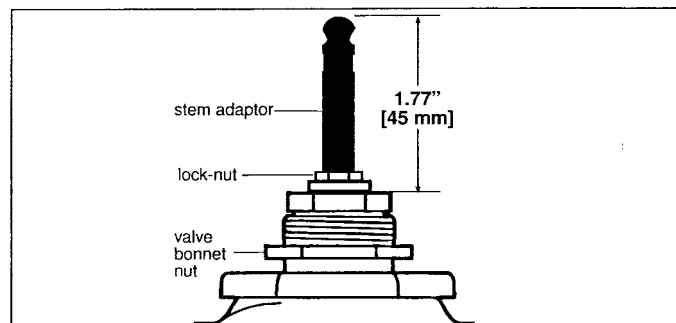


Fig. 1

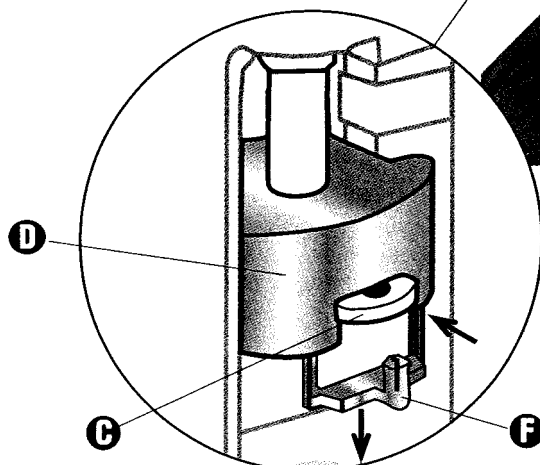
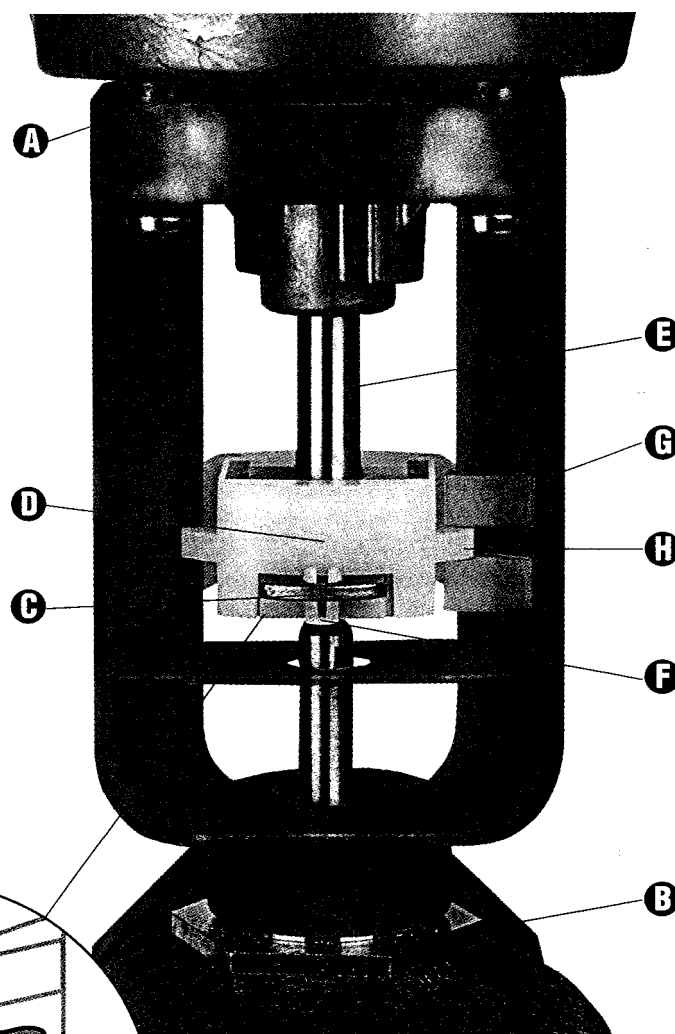


Fig. 2

## NV Series

### Manual Override NV...Non-spring Return

The valve coupling can be adjusted by inserting a 3/16" or 5 mm hex in the housing cover. (Fig. 3).

If the hex is turned clockwise, the coupling moves down; counterclockwise turning moves it up. The manual override is protected against overload. The coupling remains in the manual position as long as the actuator is not connected to the nominal voltage. With the nominal voltage applied to the actuator, the coupling follows the positioning signal.

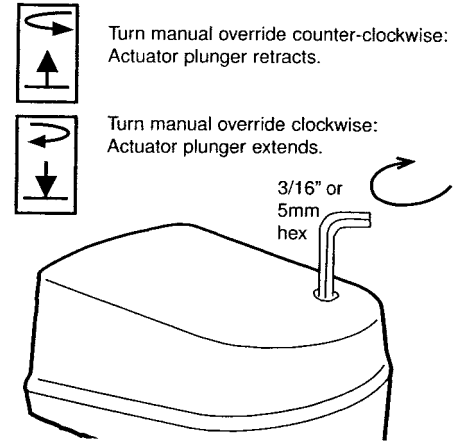


Fig. 3

Over-torquing manual override will not damage actuator.

### Manual Override NVF...Spring Return

The valve coupling can be adjusted by inserting a 3/16" or 5 mm hex in the housing cover. (Fig. 3).

The spring return function in the actuator is pre-tensioned when delivered.

The manual operating mechanism is overload-proof. The plunger will remain at the manual setting until the power supply to the actuator is turned on or, the next time the power supply is interrupted, it moves to whichever end position has been selected.

- NOTE:** (For first production series only-through March 2001)
1. Do not override the NVF while power is applied to the actuator.
  2. If the actuator is overridden while power is applied, remove cover and perform manual adaptation function by pressing S2 button.
  3. When overriding the actuator turn the hex 3/4 turn and then press down to lock after the desired position is found. This prevents the gear from over-tightening into an end-position which would prevent the override mechanism from unlocking automatically during power up. If the manual override does not unlock automatically during power-up you must unlock the actuator manually with the hex.
  4. Use the NV... MFT in only closed control loops.

### NVF... Retracting, Spring Up

#### ① Disengaging manual operation

Turn the hex clockwise 45° until resistance is encountered. Then lift the key approx. 1/4" [7 mm] until the black socket for the key is level with the top of the housing cover. The spring mechanism will now rotate the key counter-clockwise and the plunger will retract.

#### ② Manual operation

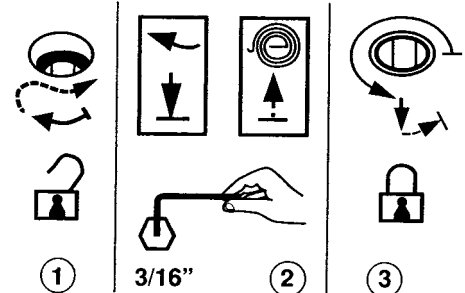
Turning the hex clockwise causes the plunger to extend to the required position.

#### ③ Locking manual operation

Turn the hex 3/4 turn counter-clockwise and then press it down into the cover of the housing (the black socket will move inwards approx. 1/4" [7 mm]). Slight counter-clockwise rotation of the key will then lock the manual operating mechanism in position.

**Note:** Do not trigger the spring mechanism and turn the manual operating mechanism clockwise to the "spring-up" end position at the same time.

#### NVF24-MFT US



### NVF...-E Extending, Spring Down

#### ① Disengaging manual operation

Turn the hex counter-clockwise 45° until resistance is encountered. Then lift the key approx. 1/4" [7 mm] until the black socket for the key is level with the top of the housing cover. The spring mechanism will now rotate the key clockwise, the plunger will extend.

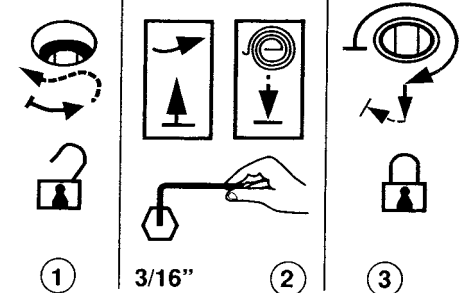
#### ② Manual operation

Turning the hex counter-clockwise causes the plunger to retract to the required position.

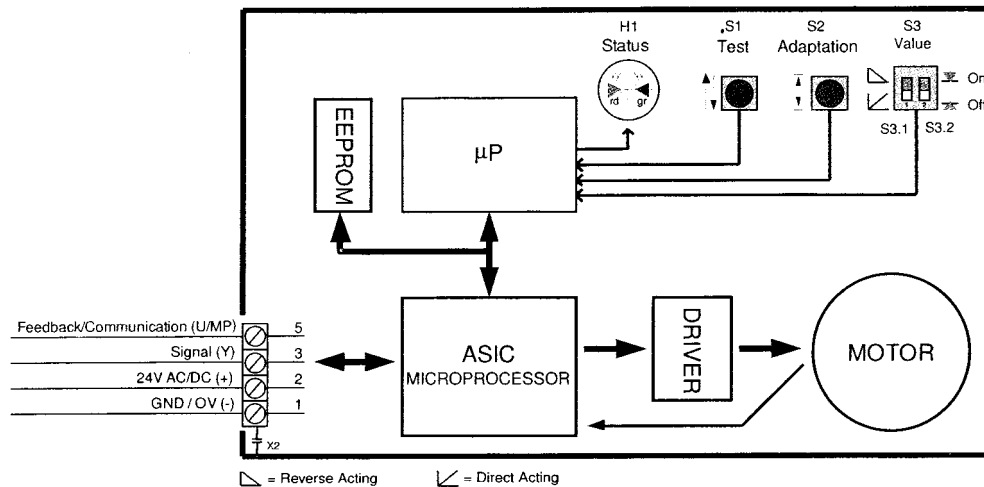
#### ③ Locking manual operation

Turn the hex back clockwise 3/4 turn and then press it down into the cover of the housing (the black socket will move inwards approx. 1/4" [7 mm]). Slight clockwise rotation of the key will then lock the manual operating mechanism in position.

#### NVF24-MFT-E US



## Block diagram: MFT and Spring Return Actuators



## General

Beneath the cover of the actuator are the terminals for the cable connection, the S1 and S2 buttons, S3 switch, and the LED status display H1.

The setting signal is processed in the microprocessor, and conveyed to the motor via drivers. By setting the slide switch S3 or pressing the buttons S1 and S2, the actuator can easily be configured on site to the requirements, if there are changes from the factory settings.

The NV and NVF actuators are maintenance-free. The two-color LED display is located beneath the

cover of the actuator. This display allows immediate recognition of the functional state of the actuator. In addition, it permits simple set-up if the factory settings need to be changed.

## Operation of Switches/LED

The S1 button makes it simple to check the wiring and overall functioning of the actuator. The first time voltage is applied, the stroke is adapted automatically. Independently of this, an adaptation can be repeated as necessary by pressing button S2. The stroke direction can be adjusted to be reverse or direct acting. Under the factory setting, the stroke increases as the setting signal increases. Depending upon the type of valve (NO/NC), the closing point (stroke = 0%) can be chosen with the valve stem retracted or extended.

### LED operating display H1

|                             |                                                                                                                                                                                                                       |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green steady light          | Actuator working properly                                                                                                                                                                                             |
| Green flashing light        | Test run or adaptation with synchronization in progress                                                                                                                                                               |
| Red steady light            | Fault; repeat adaptation                                                                                                                                                                                              |
| Red flashing light          | After power interruption (>2 sec.). By the next closing movement the valve will be automatically synchronized in the chosen closing point. The LED indicator will change from a red flashing into green steady light. |
| Alternating red/green light | Master control system being addressed and operation of the adaptation button S2 in progress                                                                                                                           |

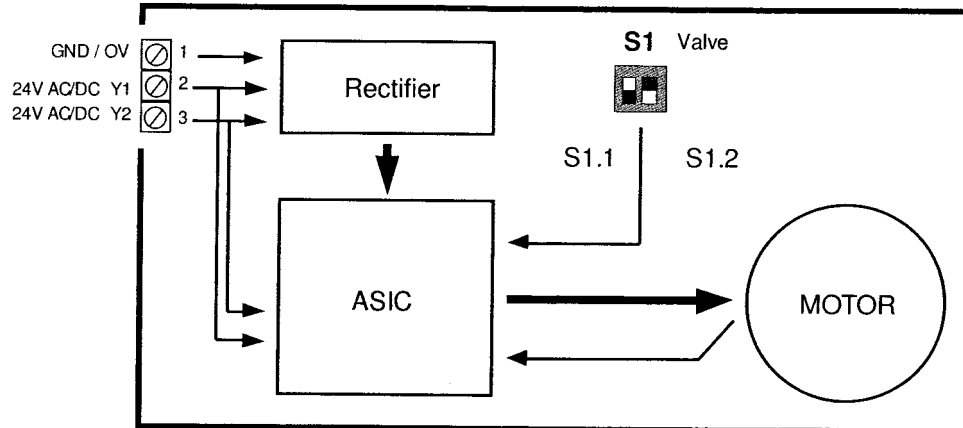
## Functional description

|      |                                                                        |                                                                                                                                                                                                                |
|------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S1   | Test                                                                   | The valve performs full stroke at maximum running time and checks the adapted stroke.                                                                                                                          |
| S2   | Adaptation                                                             | The stroke effected (between the two mechanical end-stops of the valve) is acquired as 100% stroke and stored in the microprocessor. The control signal and running time are then matched to this 100% stroke. |
| S3   | <b>Setting the direction of stroke and selecting the closing point</b> |                                                                                                                                                                                                                |
| S3.1 | Direction of stroke                                                    | The direction of stroke is inverted in relation to the control signal                                                                                                                                          |
|      | Off position (Default)                                                 | Control signal = 0% corresponding to 0% stroke                                                                                                                                                                 |
|      | On position                                                            | Control signal = 100% corresponding to 0% stroke                                                                                                                                                               |
| S3.2 | Selecting the closing point                                            | Closing point is with the actuator plunger extended or retracted                                                                                                                                               |
|      | Off position (3-way Default)                                           | Closing point is with the actuator lifting plunger retracted                                                                                                                                                   |
|      | On position (2-way Default)                                            | Closing point is with the actuator plunger extended                                                                                                                                                            |

Only properly authorized and trained persons may change the settings of switch S3 and buttons S1 and S2.

## Block diagram: NV24-3 US, NVD24-3 US

Rated voltage: 24 VAC/DC



## NV24-3 US, NVD24-3 US

Beneath the cover of the actuator are the terminals for the cable connection and the S1 switch.

The floating point signal is processed in the microprocessor and conveyed to the motor.

Supply voltage is created by the rectifier.

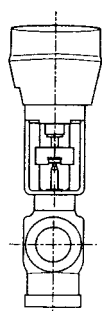
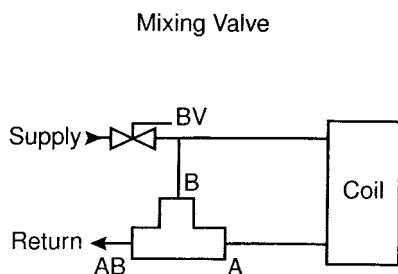
The stroke direction can be reversed with the switch S1.2 (On/Off is indicated on switch). This defines if the valve closes with the plunger up or down. The direction of the plunger can also be inverted by exchanging the wires Y1 and Y2.

## Functional description

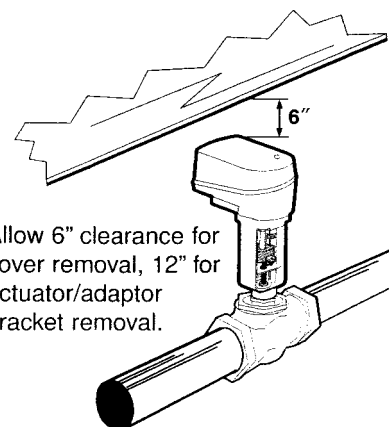
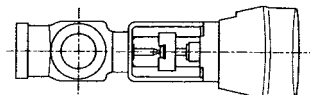
| S1 Setting the running times and selecting the valve closing point |                              |                                                                        |
|--------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------|
| S1.1                                                               | Actuating time               |                                                                        |
|                                                                    | Off position (Default)       | 50s/.25" [7.5s/mm]                                                     |
|                                                                    | On position                  | Deactivated not used                                                   |
| S1.2                                                               | Selecting the closing point  | Valve closing point is with the actuator plunger extended or retracted |
|                                                                    | Off position (3-way Default) | Valve closing point is with the actuator lifting plunger retracted     |
|                                                                    | On position (2-way Default)  | Valve closing point is with the actuator plunger extended              |

Only properly authorized and trained persons may change the settings of switch S1.

## Piping/Mounting Orientation



Assembly can be mounted horizontally or vertically. Do not install with actuator below pipe.

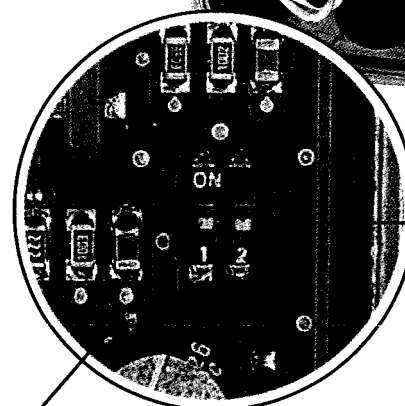
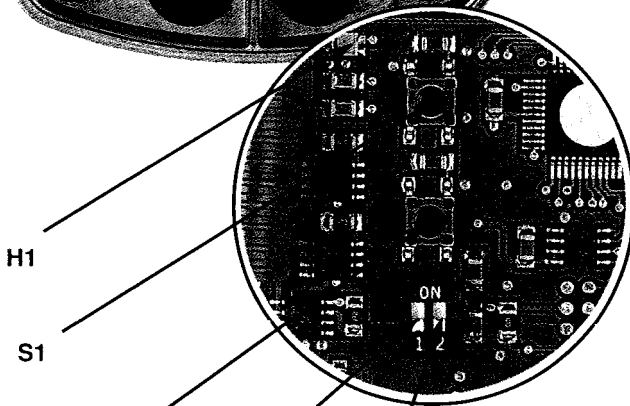
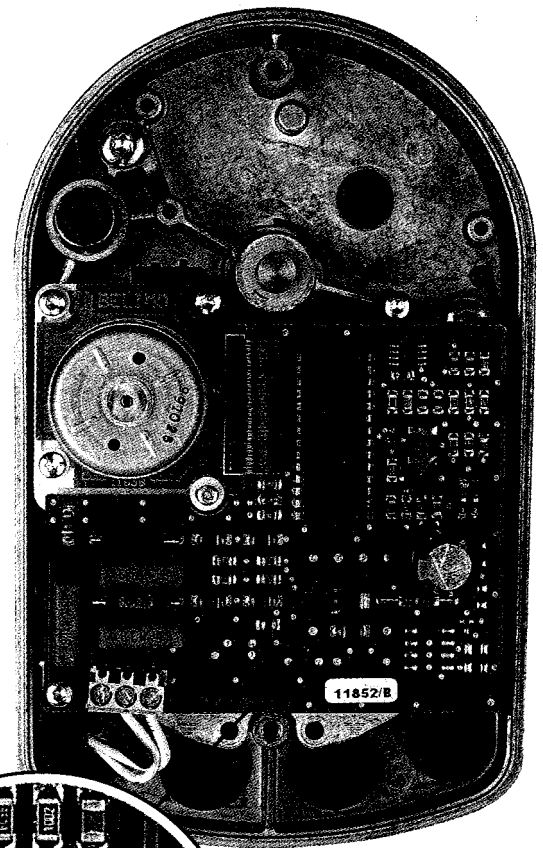
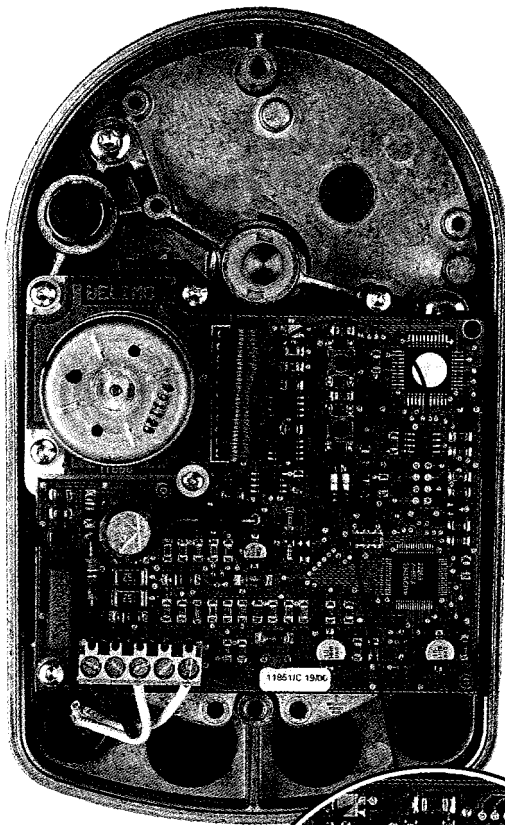


## Note:

Do not cover adaptor bracket with insulation material.

NV...MFT US  
NVF...MFT US

NV24-3 US



H1

S1

S2

S3.1

S3.2

S1.1

S1.2

21.3



15800

**ingenia**  
HVAC INNOVATION & TECHNOLOGIES

REVIEWED ACCORDING TO THE  
REQUIREMENTS OF THE GENERAL  
CONDITIONS OF THE CONTRACT.  
ANY ACTION INDICATED IS SUBJECT  
TO THESE REQUIREMENTS.

- ☐ NO EXCEPTIONS TAKEN  
☒ MAKE NOTED CORRECTIONS  
☐ REVISE & RESUBMIT  
☐ REJECTED

DATE July 21/05 BY GRK  
EARTH TECH (CANADA) INC.

Project: City of Iqaluit  
Iqaluit WWTP Plant Conversion

Consulting Engineer:

Project Location: Iqaluit

Mechanical Contractor: Guy Fauteux

Contractor Ref. No.:

Agent: Trane Montreal

Agent Ref. No.: MV15162-PP

Product: Air Handling Unit

Ingenia Ref. No.: 100058

Revision: 0

Submitted for: Approval

Date: June 30, 2005

*Coordinate installation with  
building construction &  
potential clearance issues.*

KUDLIK CONSTRUCTION LTD  
P.O. BOX 727, 1519 FEDERAL ROAD  
IQALUIT, NUNAVUT X0A 0H0  
PHONE: (867) 979-1166  
FAX: (867) 979-1169

# INTERIOR AIR-HANDLING UNIT

CERTIFIED PERFORMANCE

# ineēniē

TAG: AHU-03

REV. 0

## GENERAL UNIT DESCRIPTION

Double wall cabinets are built with dual panels and assembled together with industrial fasteners. The internal space is uniformly filled with fiberglass insulation. Adjacent wall panel segments are fastened to each other through common heavy gauge compression rails. The compression rails are bolted to the panel assembly.

The air seal is accomplished in a permanent fashion by installing butyl membranes on the surface of adjacent panel joints located underneath the compression rails. The panel detail described above is identical for wall, roof and floor assemblies.

The access doors are heavy duty type and include one or two handles depending on the unit size. Stainless steel hinges are standard.

Unit casing and internal weight loads are supported by a dual heavy gauge formed galvanized structural perimeter channel. Fully insulated perimeter channel heights will vary according to the unit size.

Galvanized steel support beams are installed at regular intervals and are bolted to the perimeter channels to support the floor loads.

*\* Assembly & components to be CSA Certified*

| UNIT MODEL:                  |       |     |
|------------------------------|-------|-----|
| Quantity of identical units: |       | 1   |
| Quantity of modules:         |       | 1   |
| Total unit weight:           | (lbs) | n/a |
| Heaviest module weight:      | (lbs) | n/a |

| NOMINAL UNIT DIMENSIONS |       |        |
|-------------------------|-------|--------|
| Total Height:           | (in.) | 108.00 |
| Total width:            | (in.) | 81.60  |
| Total length:           | (in.) | 203.00 |
| Perimeter height:       | (in.) | 6.25   |

| FLOOR AND WALL CHARACTERISTICS |                            |          |
|--------------------------------|----------------------------|----------|
| Wall panel thickness:          | (in.)                      | 2        |
| Floor panel thickness:         | (in.)                      | 4        |
| Wall insulation density:       | (lbs/ft <sup>3</sup> )     | 1.3      |
| Floor insulation density:      | (lbs/ft <sup>3</sup> )     | 1.3      |
| Insulation thermal resistance: | ft <sup>2</sup> *hr*°F/BTU | R-4/inch |
| Thermal break construction:    |                            | n/a      |

| UNIT ACCESSORIES          |       |     |
|---------------------------|-------|-----|
| Unit exterior painted     |       | n/a |
| Unit interior painted     |       | n/a |
| Extended perimeter height | (in.) | n/a |

*air dried enamel finish*

| TOTAL STATIC PRESSURE PATH (SUPPLY) |               |
|-------------------------------------|---------------|
| Component                           | ΔP (in. w.g.) |
| Prefilter 30% <sup>1</sup>          | 0.55          |
| Plate heat exchanger                | 0.51          |
| coil                                | 0.13          |
| external                            | 0.50          |
| Estimated T.S.P.                    | 1.69          |
| Fan selected at:                    | 1.75          |

| TOTAL STATIC PRESSURE PATH (EXHAUST) |               |
|--------------------------------------|---------------|
| Component                            | ΔP (in. w.g.) |
| Prefilter 30% <sup>1</sup>           | 0.55          |
| Plate heat exchanger                 | 0.12          |
| coil                                 | 0.00          |
| external                             | 0.50          |
| Estimated T.S.P.                     | 1.17          |
| Fan selected at:                     | 1.25          |

## NOTES:

1. Based on mid-life filter pressure drop.

## FRESH AIR HEATING COIL SECTION

**ineēniē**

TAG: AHU-03

REV. 0

| CONFIGURATION |  |   |
|---------------|--|---|
| Module        |  | A |
| Section No.   |  | 9 |

| SECTION CHARACTERISTICS: |       |              |
|--------------------------|-------|--------------|
| height:                  | (in)  | 54.00        |
| width:                   | (in)  | 81.60        |
| length:                  | (in)  | 15.00        |
| weight:                  | (lbs) | n/a          |
| knock-down:              |       | n/a          |
| exterior wall material:  |       | 16 ga. Galv. |
| exterior finish          |       | un-painted   |
| interior wall material:  |       | 22 ga. Galv. |
| interior finish          |       | un-painted   |
| floor material:          |       | 16 ga. Galv. |
| floor finish             |       | G-90 galv.   |

| COIL CONSTRUCTION:           |           |                     |
|------------------------------|-----------|---------------------|
| number of coils high:        |           | 1                   |
| number of coils wide:        |           | 1                   |
| tube O.D. :                  | (in)      | 5/8                 |
| fin height:                  | (in)      | 30.00               |
| finned length :              | (in)      | 60.00               |
| total face area              | (sq. ft.) | 12.5                |
| tubing material :            | (in)      | 0.020" copper       |
| circuit                      |           | 1/2 (HALF)          |
| fin material :               | (in)      | Aluminium           |
| fin type:                    |           | Wave                |
| number of rows               |           | 2                   |
| number of fins / inch        |           | 6                   |
| supply conn qty/size         |           | 1 - 2" npt          |
| casing material:             |           | 16 ga. Galv.        |
| header material:             |           | carbon steel        |
| connection material:         |           | carbon steel        |
| connection type:             |           | npt-M               |
| vent/drain type & location   |           | 3/8"npt-M on header |
| coating:                     |           | none                |
| hand connection <sup>1</sup> |           | right               |

| ATMOSPHERIC CONDITIONS: |       |       |
|-------------------------|-------|-------|
| pressure                | in hg | 29.92 |
| elevation               | ft    | 0     |

| SECTION ACCESSORIES:               |      |     |
|------------------------------------|------|-----|
| drain:                             |      | n/a |
| drain size:                        | (in) | n/a |
| drain qty:                         |      | n/a |
| moisture eliminators               |      | n/a |
| pressure test port                 |      | n/a |
| drain hand connection <sup>1</sup> |      | n/a |
|                                    |      |     |
|                                    |      |     |

| COIL SELECTION:    |       |                          |
|--------------------|-------|--------------------------|
| coil manufacturer: |       | Aerofin                  |
| coil type:         |       | HW                       |
| model number:      |       | HW-6.0AW-30.0x60.0-2-0.5 |
| weight (dry)       | (lbs) | 127                      |
| weight (w/fluid)   | (lbs) |                          |

| AIR SIDE PERFORMANCE: |         |       |
|-----------------------|---------|-------|
| airflow               | (ACFM)  | 5,200 |
| air velocity          | (FPM)   | 416   |
| altitude              | (Ft.)   | 0     |
| ent. air DB           | (°F)    | 33.0  |
| ent. air WB           | (°F)    | n/a   |
| lv. air DB            | (°F)    | 91.2  |
| lv. air WB            | (°F)    | n/a   |
| total capacity        | (MBH)   | 326.9 |
| sens. Capacity        | (MBH)   | 326.9 |
| standard APD          | (in wg) | 0.13  |

| FLUID SIDE PERFORMANCE: |                       |                      |
|-------------------------|-----------------------|----------------------|
| fluid type              |                       | water                |
| Propylene Glycol        |                       | 50%                  |
| entering fluid          | (°F)                  | <del>180.0</del> 190 |
| leaving fluid           | (°F)                  | <del>160.0</del> 170 |
| fluid flow              | (GPM)                 | 37.7                 |
| fluid PD                | (FT H <sub>2</sub> O) | 9.8                  |
| fluid velocity          | (ft/sec)              | 4.0                  |

## NOTES:

1. Coil hand is determined by standing parallel to the airflow &amp; air behind the head of the observer

3/32

## EXHAUST AIR FILTER SECTION

**ineēniā**

TAG: AHU-03

REV. 0

| CONFIGURATION              |           |
|----------------------------|-----------|
| Module                     | A         |
| Section No.                | 7         |
| Filter section arrangement | 1.5H x 3W |
| Filter section type        | 2" flat   |
| Filter loading             | front     |

| SECTION ACCESSORIES:          |      |
|-------------------------------|------|
| access/inspection door:       | none |
| pressure test port:           | none |
| magnahelic gauge              | yes  |
| pre-filter magnahelic gauge   | 2001 |
| final filter magnahelic gauge | none |

| SECTION CHARACTERISTICS: |                      |       |
|--------------------------|----------------------|-------|
| height:                  | (in)                 | 54.00 |
| width:                   | (in)                 | 81.60 |
| length:                  | (in)                 | 7.00  |
| weight:                  | (lbs)                | n/a   |
| mounting frame           | type 8 holding frame |       |
| filter mounting clips    | G90 galv. Steel      |       |
| knock-down:              | n/a                  |       |
| exterior wall material:  | 18 ga. Galv.         |       |
| exterior finish          | un-painted           |       |
| interior wall material:  | 22 ga. Galv.         |       |
| interior finish:         | un-painted           |       |
| floor material:          | 16 ga. Galv.         |       |
| floor finish:            | G-90 galv.           |       |
| blanking material        | G-90 galv. steel     |       |

| PREFILTER CHARACTERISTICS: |                      |                   |
|----------------------------|----------------------|-------------------|
| manufacturer               |                      | FARR              |
| prefilter model            |                      | 2" - Aeropleat IV |
| filter depth               | (in)                 | 2                 |
| efficiency <sup>3</sup>    |                      | 20-25%            |
| MERV                       |                      | 6                 |
| qty - 24" x 24"            |                      | 3                 |
| qty - 12" x 24"            |                      | 3                 |
| total face area:           | (ft <sup>2</sup> )   | 18                |
| actual cfm:                | (acfm)               | 5,720             |
| face velocity:             | (fpm)                | 318               |
| initial ΔP:                | (" H <sub>2</sub> O) | 0.10              |
| final ΔP <sup>2</sup> :    | (" H <sub>2</sub> O) | 1.00              |

## NOTES:

1. Positioning right/left is determined by standing parallel to the airflow & air behind the head of the observer
2. Final resistance is based on the maximum manufacturer's recommendation.

**Tag Data - Hydronic Unit Heaters (Qty: 3)**

| Item | Tag(s) | Qty | Description           | Model Number          |
|------|--------|-----|-----------------------|-----------------------|
| A1   | UH-09  | 1   | Hydronic Unit Heaters | UHSA060S2EAA1E00B0000 |
| A2   | UH-10  | 1   | Hydronic Unit Heaters | UHSA100S2EAA1E00B0000 |
| A3   | UH-12  | 1   | Hydronic Unit Heaters | UHSA126S2EAA1E00B0000 |

**Product Data - Hydronic Unit Heaters****All Units**

Model S Unit Heater  
 S Style Steam or Hot Water  
 132 fins/foot [433 fins/meter]  
 Model S Design Sequence  
 Copper Tubes  
 115/60/1  
 Explosion Proof Motor  
 Model S Louver Fin Diffuser

Item: A1 Qty: 1 Tag(s): UH-09  
 60,500 Btu [63,800 kJ]

Item: A2 Qty: 1 Tag(s): UH-10  
 96,000 Btu [101,300 kJ]

Item: A3 Qty: 1 Tag(s): UH-12  
 125,700 Btu [132,600 kJ]

|                                                                                                                                                                                                     |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>REVIEWED ACCORDING TO THE<br/>         REQUIREMENTS OF THE GENERAL<br/>         CONDITIONS OF THE CONTRACT.<br/>         ANY ACTION INDICATED IS SUBJECT<br/>         TO THESE REQUIREMENTS.</b> |                        |
| <input checked="" type="checkbox"/>                                                                                                                                                                 | NO EXCEPTIONS TAKEN    |
| <input type="checkbox"/>                                                                                                                                                                            | MAKE NOTED CORRECTIONS |
| <input type="checkbox"/>                                                                                                                                                                            | REVISE & RESUBMIT      |
| <input type="checkbox"/>                                                                                                                                                                            | REJECTED               |
| DATE                                                                                                                                                                                                | BY                     |
| July 21/05                                                                                                                                                                                          | [Signature]            |
| EARTH TECH (CANADA) INC.                                                                                                                                                                            |                        |

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**Mechanical Specifications - Hydronic Unit Heaters****Item: A1 - A3 Qty: 3 Tag(s): UH-09, UH-10, UH-12****Casing - Model S**

The unit casing is manufactured from galvanized steel with two piece "picture frame" front formed into wrap around sides, top and bottom. Back plate is 18 gauge [1.3mm] with deep drawn fan orifice remainder of unit is 20 gauge [1mm]. Complete casing phosphatized to prevent corrosion and painted with a gray baked enamel finish. Horizontal louvers are furnished in discharge side and painted with matching baked enamel finish. Fan is Trane designed and manufactured with high efficiency model "A" fan with aluminum blades. Quiet, factory balanced and durable applications. Fins are aluminum or copper sigma-flo, mechanically bonded to tubes. All coils one row deep in airflow direction. Each coil has two steel male thread pipe connections located on the back of the unit. All coils factory tested at 450 psig [3103kPa] air under water.

**Hot Water - Steam Coil**

The hot water - steam coil is rectangular 3 or 4 sided, on-pass, multiple circuit, with aluminum sigma-flo fins mechanically bonded to tubes. Coil is one row deep in direction of air flow. Supply and return connections are steel pipe. Coils factory tested at 450 psig [3103 kPa] air under water. Standard coil has .031" [0.79mm] wall copper tubing suitable for steam pressure to 75 psig [520 kPa] or hot water to 225 psi [1550 kPa] or 325 F [163 C].

**Copper Tubing**

Copper tubing suitable for steam pressure to 75 psi [520 kPa] or hot water to 200 psi [1380 kPa] or 325 F [163 C].

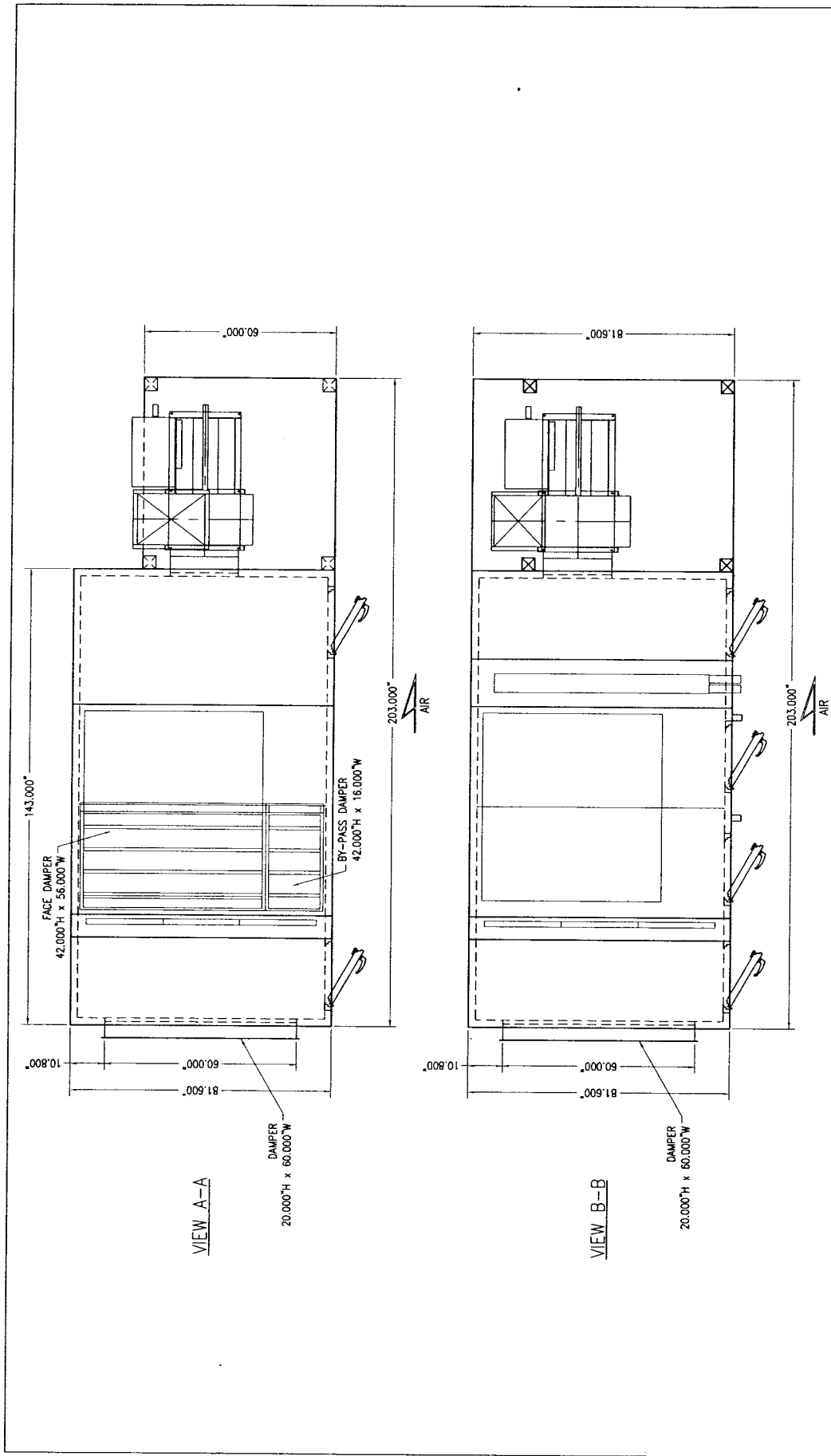
**1 Phase Explosion Proof Motor**

Motor is 115 volt 60 cycle 1 phase, explosion proof, Class I, Group D; and Class II, Groups F & G hazardous atmospheres, 1140 rpm [19 rps] operation.

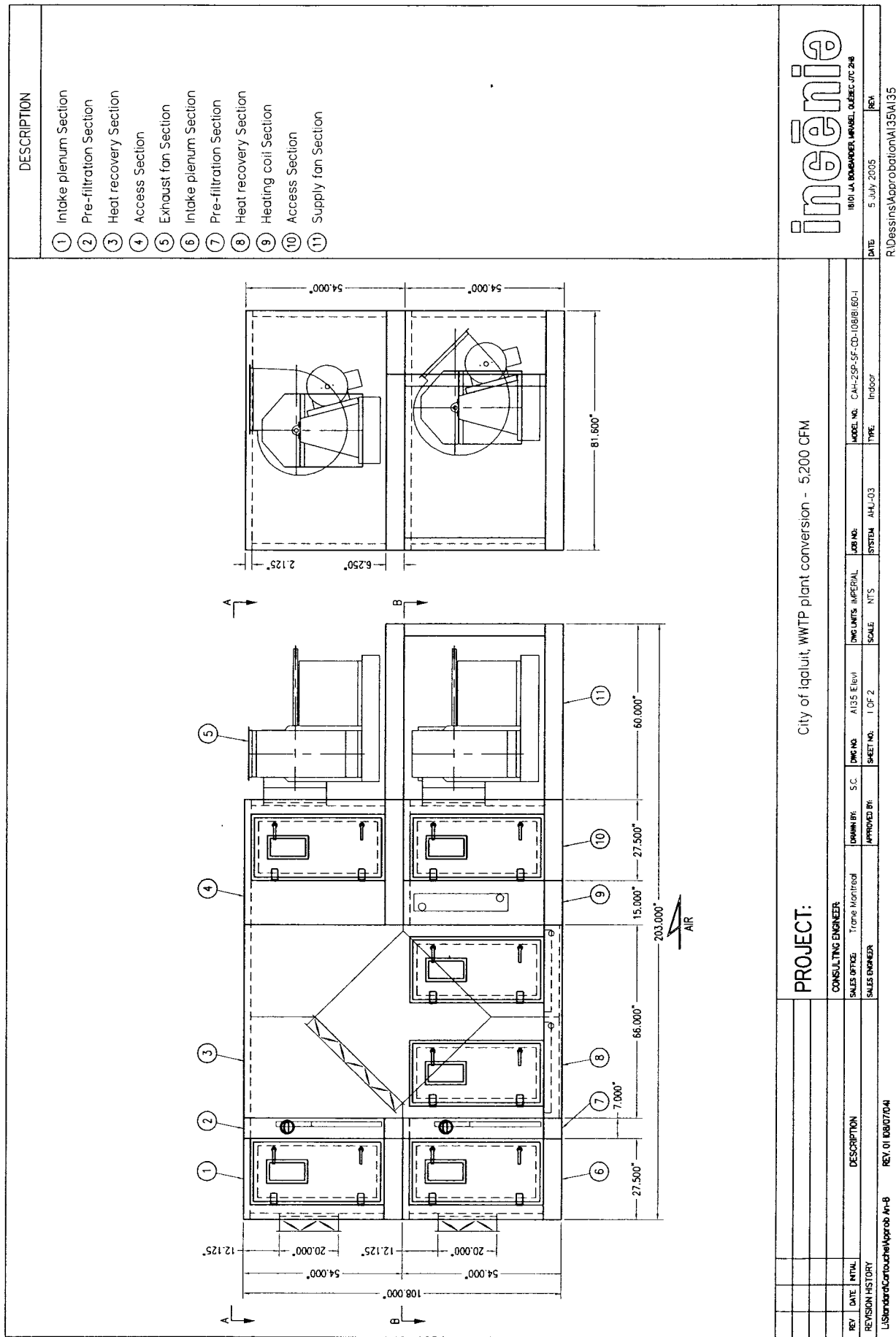
**Louver Fin Diffuser**

Louver fin diffusers shall clip onto standard horizontal louvers for versatility in lateral air diffusion, to provide 4 way air direction control.

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|                                   |     |                                                    |             |                               |                |           |      |             |           |                           |          |
|-----------------------------------|-----|----------------------------------------------------|-------------|-------------------------------|----------------|-----------|------|-------------|-----------|---------------------------|----------|
| PROJECT:                          |     | City of Iqaluit, WWTP plant conversion - 5,200 CFM |             |                               |                |           |      |             |           |                           |          |
| CONSULTING ENGINEER               |     | ineénia                                            |             |                               |                |           |      |             |           |                           |          |
| REVISION HISTORY                  | REV | DATE                                               | DESCRIPTION | SALES OFFICE                  | SALES ENGINEER | DESIGN BY | S.C. | DWG NO.     | ALIS Plan | DWG UNITS                 | IMPERIAL |
|                                   | 1   | 08/07/04                                           |             |                               |                |           |      |             |           |                           |          |
| REVISION HISTORY                  |     | DATE                                               |             | JOB NO.                       |                | SYSTEM    |      | TYPE        |           | MODEL NO.                 |          |
|                                   |     | 05 July 2005                                       |             | 1801 JA BOMBER                |                | AHJ-03    |      | Indoor      |           | CAH-2SP-SF-CD-108/81-60-1 |          |
| L:\Standard\Cartouche\Approb An-8 |     | REV 01 10/07/04                                    |             | R/Dessins\Approbation\135\135 |                | REV       |      | 5 July 2005 |           | 1801 JA BOMBER            |          |
|                                   |     |                                                    |             |                               |                |           |      |             |           |                           |          |



# FRESH AIR INTAKE SECTION

**incēniā**

TAG: AHU-03

REV. 0

| CONFIGURATION |  |   |
|---------------|--|---|
| Module No.    |  | A |
| Section No.   |  | 1 |

| SECTION CHARACTERISTICS: |       |              |
|--------------------------|-------|--------------|
| height:                  | (in)  | 54.00        |
| width:                   | (in)  | 81.60        |
| length:                  | (in)  | 27.50        |
| weight:                  | (lbs) | n/a          |
| knock-down:              |       | n/a          |
| exterior wall material:  |       | 16 ga. Galv. |
| exterior finish          |       | un-painted   |
| interior wall material:  |       | 22 ga. Galv. |
| interior finish:         |       | un-painted   |
| floor material:          |       | 16 ga. Galv. |
| floor finish:            |       | G-90 galv.   |

| SECTION ACCESSORIES:    |                    |
|-------------------------|--------------------|
| access/inspection door: | right              |
| inspection window:      | yes                |
| light:                  | n/a                |
| wired to:               | n/a                |
| receptacle:             | n/a                |
| pressure test port:     | n/a                |
| drain:                  | n/a                |
| return air opening      | back               |
| damper                  | Tamco, series 9000 |
| blade type              | parallel blades    |
| damper height           | 20.00"             |
| damper length           | 60.00"             |
| damper actuator         | n/a                |

## FRESH AIR FILTER SECTION

**incēniā**

TAG: AHU-03

REV. 0

| CONFIGURATION              |           |
|----------------------------|-----------|
| Module                     | A         |
| Section No.                | 2         |
| Filter section arrangement | 1.5H x 3W |
| Filter section type        | 2" flat   |
| Filter loading             | front     |

| SECTION ACCESSORIES:          |      |
|-------------------------------|------|
| access/inspection door:       | none |
| pressure test port:           | none |
| magnahelic gauge              | yes  |
| pre-filter magnahelic gauge   | 2001 |
| final filter magnahelic gauge | none |

| SECTION CHARACTERISTICS: |                      |       |
|--------------------------|----------------------|-------|
| height:                  | (in)                 | 54.00 |
| width:                   | (in)                 | 81.60 |
| length:                  | (in)                 | 7.00  |
| weight:                  | (lbs)                | n/a   |
| mounting frame           | type 8 holding frame |       |
| filter mounting clips    | G90 galv. Steel      |       |
| knock-down:              | n/a                  |       |
| exterior wall material:  | 18 ga. Galv.         |       |
| exterior finish          | un-painted           |       |
| interior wall material:  | 22 ga. Galv.         |       |
| interior finish:         | un-painted           |       |
| floor material:          | 16 ga. Galv.         |       |
| floor finish:            | G-90 galv.           |       |
| blanking material        | G-90 galv. steel     |       |

| PREFILTER CHARACTERISTICS: |                      |                   |
|----------------------------|----------------------|-------------------|
| manufacturer               |                      | FARR              |
| prefilter model            |                      | 2" - Aeropleat IV |
| filter depth               | (in)                 | 2                 |
| efficiency <sup>3</sup>    |                      | 20-25%            |
| MERV                       |                      | 6                 |
| qty - 24" x 24"            |                      | 3                 |
| qty - 12" x 24"            |                      | 3                 |
| total face area:           | (ft <sup>2</sup> )   | 18                |
| actual cfm:                | (cfm)                | 5,200             |
| face velocity:             | (fpm)                | 289               |
| initial ΔP:                | (" H <sub>2</sub> O) | 0.09              |
| final ΔP <sup>2</sup> :    | (" H <sub>2</sub> O) | 1.00              |

## NOTES:

1. Positioning right/left is determined by standing parallel to the airflow & air behind the head of the observer
2. Final resistance is based on the maximum manufacturer's recommendation.

**Innergy tech inc.**

389 Notre-Dame,  
Notre-Dame-du-Bon-Conseil,  
QC Canada J0C 1A0  
Tel.: (800) 203-9015  
Fax: (819) 475-9541

Project name: Projet Grand Nord Canadien  
Location:  
Engineer/Customer: Ingénia  
Project date: 2005-06-23  
Unit tag:  
Quote #:

**Engineering submittal data**

Winter

**PHE500 - Extruded polypropylene plate exchanger****AIR-TO-AIR PLATE EXCHANGER****POLYPROPYLENE PLATE EXCHANGER PERFORMANCE**

Rated in accordance with ASHRAE Standard 84-91

Application ratings based on ARI 1060-2001 certification



A Participating Company in the  
ARI 1060-2001 Certification Program.

Plate exchanger Model: PHE500-56H-42S-0.24

Face area supply side (sq. ft): 16.3

Face area exhaust side (sq. ft): 16.3

**Dimensions (in):**

|                         |       |
|-------------------------|-------|
| Height (in) (H):        | 56    |
| Supply side (in) (S1):  | 42    |
| Exhaust side (in) (S2): | 42    |
| Diagonal (in) (D):      | 60.02 |

Weight (lbs): 303

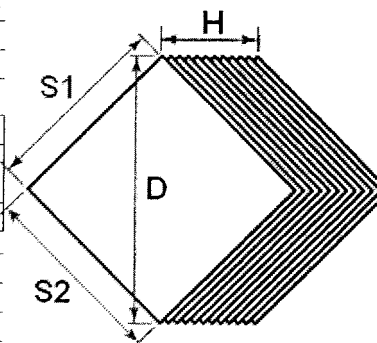
Face velocity of supply air (ft/min): 326

Face velocity of return air (ft/min): 359

Frost control required: Yes

Unit will be shipped in sections of 14" (H): 4 Section(s)

Altitude (ft): 0

**Performance**

|                 | <b>Effectiveness</b> | <b>Capacity</b> |
|-----------------|----------------------|-----------------|
| <b>Sensible</b> | 66.6 %               | 437834 Btu/hr   |
| <b>Latent</b>   | 0 %                  |                 |
| <b>Total</b>    | 55.9 %               |                 |

**Entering supply air (T1)**

-10.7 Btu/lb  
5200 cfm  
-45 DB °F  
-45 WB °F  
0.6 gr/lb  
100 RH %

**Leaving exhaust air (T4)**

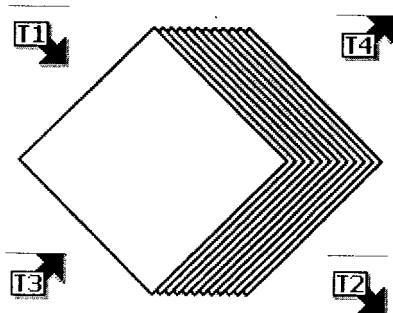
5.8 Btu/lb  
5720 cfm  
15.4 DB °F  
15.4 WB °F  
13.7 gr/lb  
100 RH %  
0.12 A.P.D.

**Entering exhaust air (T3)**

22.7 Btu/lb  
5720 cfm  
72 DB °F  
54.4 WB °F  
34.8 gr/lb  
30 RH %

**Leaving supply air (T2)**

8 Btu/lb  
5200 cfm  
32.9 DB °F  
22.4 WB °F  
0.6 gr/lb  
2 RH %  
0.51 A.P.D.



TAG: AHU-03

REV. 0

| CONFIGURATION |  |         |
|---------------|--|---------|
| Module        |  | A       |
| Section No.   |  | 3 and 8 |

| SECTION CHARACTERISTICS: |       |                |
|--------------------------|-------|----------------|
| height:                  | (in)  | 108.00         |
| width:                   | (in)  | 81.60          |
| length:                  | (in)  | 66.00          |
| weight:                  | (lbs) | n/a            |
| knock-down:              |       | n/a            |
| exterior wall material:  |       | 16 ga. Galv.   |
| exterior finish          |       | un-painted     |
| interior wall material:  |       | 22 ga. Galv.   |
| interior finish          |       | un-painted     |
| floor finish:            |       | (2) drain pans |
| floor material           |       | 16 ga. SS304   |

| SUPPLY AIR SIDE PERFORMANCE: |         |       |
|------------------------------|---------|-------|
| airflow                      | (ACFM)  | 5,200 |
| air velocity                 | (FPM)   | 318   |
| ent. air DB                  | (°F)    | -45.0 |
| ent. air WB                  | (°F)    | -45.0 |
| lv. air DB                   | (°F)    | 32.9  |
| lv. air WB                   | (°F)    | 22.4  |
| standard APD                 | (in wg) | 0.51  |

| SECTION ACCESSORIES:               |                    |
|------------------------------------|--------------------|
| drain:                             | yes                |
| drain size:                        | 2"                 |
| drain qty:                         | 2                  |
| moisture eliminators               | n/a                |
| pressure test port                 | n/a                |
| drain hand connection <sup>1</sup> | right              |
| face & bypass damper               | Tamco, series 9000 |
| blade type                         | opposed blades     |

| PLATE EXCHANGER SELECTION: |                     |
|----------------------------|---------------------|
| manufacturer:              | Innergy tech inc.   |
| coil type:                 | plate exchanger     |
| model number:              | PHE500-56H-42S-0.24 |
| weight (dry)               | (lbs) 303           |
| weight (w/fluid)           | (lbs) n/a           |

| EXHAUST AIR SIDE PERFORMANCE: |  |       |
|-------------------------------|--|-------|
| airflow                       |  | 5,720 |
| air velocity                  |  | 350   |
| ent. air DB                   |  | 72.0  |
| ent. air WB                   |  | 54.4  |
| lv. air DB                    |  | 15.4  |
| lv. air WB                    |  | 15.4  |
| standard APD                  |  | 0.12  |

## NOTES:

1. Coil hand is determined by standing parallel to the airflow & air behind the head of the observer

# FRESH AIR DISCHARGE SECTION

**incēniā**

TAG: AHU-03

REV. 0

| CONFIGURATION |  |   |
|---------------|--|---|
| Module No.    |  | A |
| Section No.   |  | 4 |

| SECTION CHARACTERISTICS: |       |              |
|--------------------------|-------|--------------|
| height:                  | (in)  | 54.00        |
| width:                   | (in)  | 81.60        |
| length:                  | (in)  | 42.50        |
| weight:                  | (lbs) | n/a          |
| knock-down:              |       | n/a          |
| exterior wall material:  |       | 16 ga. Galv. |
| exterior finish          |       | un-painted   |
| interior wall material:  |       | 22 ga. Galv. |
| interior finish:         |       | un-painted   |
| floor material:          |       | 16 ga. Galv. |
| floor finish:            |       | G-90 galv.   |

| SECTION ACCESSORIES:    |              |
|-------------------------|--------------|
| access/inspection door: | right        |
| inspection window:      | yes          |
| light:                  | n/a          |
| wired to:               | n/a          |
| receptacle:             | n/a          |
| pressure test port:     | n/a          |
| drain:                  | n/a          |
| air opening             | front        |
| damper                  | n/a          |
| opening height          | see drawings |
| opening width           | see drawings |

**Innergy tech inc.**

389 Notre-Dame,  
Notre-Dame-du-Bon-Conseil,  
QC Canada J0C 1A0  
Tel.: (800) 203-9015  
Fax: (819) 336-2283

Project name: Projet Grand Nord Canadien

Location:

Engineer/Customer: Ingénia

Project date: 2005-06-23

Unit tag:

Quote #:

## **General Notes**

- 1- Heat exchanger installation must permit drainage of condensate.
- 2- Air filters should be installed in front of both entering air streams of the exchanger to reduce plate fouling.
- 3- Air streams composition should be compatible with plate material.
- 4- The energy saving estimation does not consider the effect of the frost control system.
- 5- For more information contact the manufacturer or his distributor.
- 6- All prices are unitary prices, some set-up charges may be applied. Contact Innergy tech inc. for volume discount.

## **Warranty**

This Air-to-Air plate exchanger is a high quality product, built and packed with care. All systems are guaranteed for one (1) year from the shipment date against any operational defects due to parts and/or manufacturing. This warranty applies to all cases where damage is not a result of poor installation, improper use, improper AHU design, mistreatment or negligence, acts of Gods or any other circumstances beyond the control of Innergy tech inc. Also, Innergy tech inc. will not be held responsible for any bodily injuries or damages to personal property or real estate and shall not be liable for any consequential loss or damages.

The sole liability of Innergy tech inc. shall be, at its option: A) to refund the purchase price of the equipment, B) to repair any defective parts or C) to supply replacement parts EXW the factory where parts are manufactured with all freight costs paid by customer.

This warranty supersedes all prior warranties.



# Twin City Fan & Blower

A Twin City Fan Company

5959 Trenton Lane · Minneapolis, MN 55442-3238  
Phone (763) 551-7600 · Fax (763) 551-7601 · [www.tcf.com](http://www.tcf.com)



Customer: W/A  
Job Name: City of Iqaluit  
Job ID: 100058

June 29, 2005  
Page: 1

## Fan Description

Tag ..... Exhaust fan  
Type ..... BAF-SW  
Size ..... 200  
Width ..... SWSI  
Class ..... I  
Wheel diameter (in.) ..... 20  
Drive method ..... 60 Hz belt drive  
Percentage width ..... 100%  
Percentage diameter ..... 100%

## Fan Performance

CFM ..... 5,720  
Operating SP (in.wg) ..... 1.25  
Standard SP (in.wg) ..... 1.25  
RPM ..... 1561  
Tip Speed (fpm) ..... 8,173  
Oper. BHP ..... 2.48  
Standard BHP ..... 2.48  
Outlet area (sq. ft) ..... 2.3  
Outlet Velocity (fpm) ..... 2,487  
Temperature (°F) ..... 70  
Altitude (ft) ..... 0  
Density (lb/ft³) ..... 0.075  
Max RPM for Class ..... 2093  
Static Efficiency ..... 45.33  
Mechanical Efficiency ..... 59.31

## Sound

Sound Power Levels in dB re.  $10^{-12}$  Watts:

| Octave Bands   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | LwA |
|----------------|----|----|----|----|----|----|----|----|-----|
| Level at Inlet | 83 | 84 | 85 | 84 | 80 | 75 | 69 | 62 | 85  |

Estimated sound pressure level in dBA (re: 0.0002 microbar) based on a single\* ducted installation:

| Distance in ft | 1  | 3  | 5  |
|----------------|----|----|----|
| dBA at Inlet   | 85 | 75 | 71 |

\*To estimate dBA level for ducted inlet and ducted outlet (into and out of the room) type installation, deduct 20 from the LWA value shown.

Using a directivity factor of 1.

Estimated Sound Pressure based on free field, spherical ( $Q = 1$ ) radiation at the stated distance.

## Definitions:

LwA The overall (single value) fan sound power level, 'A' weighted.

dBA The environment for each fan installation influences its measured sound value, therefore dBA levels cannot be guaranteed. Consult AMCA Publication 303 for further details.  
A fan's dBA is influenced by nearby reflective surfaces.

## EXHAUST FAN

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TAG: AHU-03

REV. 0

| CONFIGURATION              |                    |
|----------------------------|--------------------|
| module type                | Return/exhaust fan |
| module                     | A                  |
| section No.                | 5                  |
| fan type                   | SWSI               |
| no. of fans in the section | 1                  |
| inlet location             | Back               |
| fan discharge              | see drawings       |

| SECTION CHARACTERISTICS: |                  |
|--------------------------|------------------|
| height:                  | n/a              |
| width:                   | 60.00            |
| length:                  | 60.00            |
| exterior wall material:  | n/a              |
| exterior finish          | n/a              |
| interior wall material:  | n/a              |
| interior finish:         | n/a              |
| floor material:          | 0.090" aluminium |
| floor finish:            | diamond          |
| weight:                  | n/a              |

| FAN DETAILS:                           |             |
|----------------------------------------|-------------|
| fan cfm:                               | 5,720       |
| system I.S.P. (IN.W.G.):               | 0.67        |
| available E.S.P. (IN.W.G.):            | 0.58        |
| system T.S.P. (IN.W.G.):               | 1.25        |
| fan manufacturer:                      | Twin City   |
| fan type:                              | BAF-SWSI    |
| fan size:                              | 200         |
| AMCA class:                            | II          |
| fan wheel width:                       | 100%        |
| fan arrangement:                       | 9           |
| fan rotation/discharge:                | CCW-UBD     |
| fan RPM:                               | 1561        |
| maximum RPM for class:                 | 2648        |
| fan BHP:                               | 2.48        |
| WR <sup>2</sup> (lb-ft <sup>2</sup> ): |             |
| static efficiency:                     | 45.33%      |
| mechanical efficiency:                 | 59.31%      |
| bearings (AFBMA L-50):                 | 200,000 hrs |

| VIBRATION PROTECTION:     |          |
|---------------------------|----------|
| base type:                | integral |
| isolators:                | seismic  |
| nominal static deflexion: | 2"       |
| flexible connector:       | inlet    |
| thrust restraints:        | none     |

| SECTION ACCESSORIES:            |     |
|---------------------------------|-----|
| access/inspection door:         | n/a |
| inspection window:              | n/a |
| light                           | n/a |
| receptacle                      | n/a |
| wiring                          | n/a |
| extended lube lines:            | n/a |
| pressure test port:             | n/a |
| drain:                          | n/a |
| Starter/factory wired & mounted | n/a |
| VFD:                            | n/a |
| VFD installation                | n/a |

| MOTOR DETAILS:                              |               |
|---------------------------------------------|---------------|
| motor HP / motor frame:                     | 5 - 184T      |
| motor type:                                 | ODP-EPAAct    |
| motor speed RPM:                            | 1800/900      |
| motor V/Ph/Hz:                              | 575/3         |
| cycles:                                     | 60 cycles/sec |
| efficiency:                                 | 84.0%         |
| FLA:                                        | 5.4/2.2       |
| maximum load inertia (lb-ft <sup>2</sup> ): | n/a           |
| thermistors:                                | n/a           |
| position (motor & J. Box):                  | F1            |
| application:                                | std           |
| manufacturer:                               | Marathon      |
| catalog no.:                                | Y487-575      |
| motor weight:                               | 79            |

| DRIVE DETAILS:      |          |
|---------------------|----------|
| drive arrangement:  | V-belt   |
| drive location:     | n/a      |
| type:               | constant |
| service factor:     | 1.5      |
| motor sheave:       | t.b.a.   |
| motor bushing:      | t.b.a.   |
| fan sheave:         | t.b.a.   |
| fan bushing:        | t.b.a.   |
| belt model and qty: | t.b.a.   |

| SAFETY:           |      |
|-------------------|------|
| belt guard:       | OSHA |
| inlet screen:     | n/a  |
| discharge screen: | n/a  |

## NOTES:

1. Blower built with spark resistant construction, type AMCA "B"

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## EXHAUST AIR INTAKE SECTION

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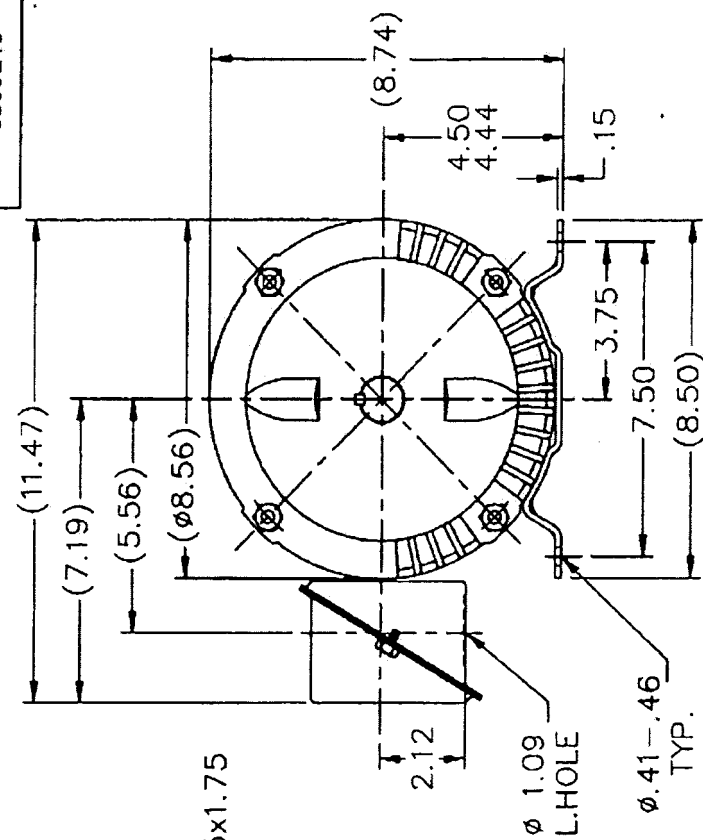
TAG: AHU-03

REV. 0

| CONFIGURATION |  |   |
|---------------|--|---|
| Module No.    |  | A |
| Section No.   |  | 6 |

| SECTION CHARACTERISTICS: |       |              |
|--------------------------|-------|--------------|
| height:                  | (in)  | 54.00        |
| width:                   | (in)  | 81.60        |
| length:                  | (in)  | 27.50        |
| weight:                  | (lbs) | n/a          |
| knock-down:              |       | n/a          |
| exterior wall material:  |       | 16 ga. Galv. |
| exterior finish          |       | un-painted   |
| interior wall material:  |       | 22 ga. Galv. |
| interior finish:         |       | un-painted   |
| floor material:          |       | 16 ga. Galv. |
| floor finish:            |       | G-90 galv.   |

| SECTION ACCESSORIES:    |                    |
|-------------------------|--------------------|
| access/inspection door: | right              |
| inspection window:      | yes                |
| light:                  | n/a                |
| wired to:               | n/a                |
| receptacle:             | n/a                |
| pressure test port:     | n/a                |
| drain:                  | n/a                |
| return air opening      | back               |
| damper                  | Tamco, series 9000 |
| blade type              | parallel blades    |
| damper height           | 20.00"             |
| damper length           | 60.00"             |
| damper actuator         | n/a                |



BOX CAN BE ROTATED IN 90° STEPS.

| DASH | FR.  | C     | BS   | MOUNTING | REMARKS | DASH | FR.  | C     | BS   | MOUNTING | REMARKS |
|------|------|-------|------|----------|---------|------|------|-------|------|----------|---------|
| 575  | 182T | 12.72 | 2.25 | F1 OR F2 |         | 775  | 182T | 14.72 | 3.25 | F1 ONLY  |         |
| 625  | 182T | 13.22 | 2.50 | F1 OR F2 |         | 775  | 184T | 14.72 | 3.25 | F1 ONLY  |         |
| 675  | 182T | 13.72 | 2.75 | F1 OR F2 |         | 825  | 184T | 15.22 | 3.50 | F1 ONLY  |         |
| 675  | 184T | 13.72 | 2.75 | F1 OR F2 |         | 875  | 184T | 15.72 | 3.75 | F1 ONLY  |         |
| 725  | 182T | 14.22 | 3.00 | F1 ONLY  |         | 925  | 184T | 16.22 | 4.00 | F1 ONLY  |         |
| 725  | 184T | 14.22 | 3.00 | F1 ONLY  |         |      |      |       |      |          |         |