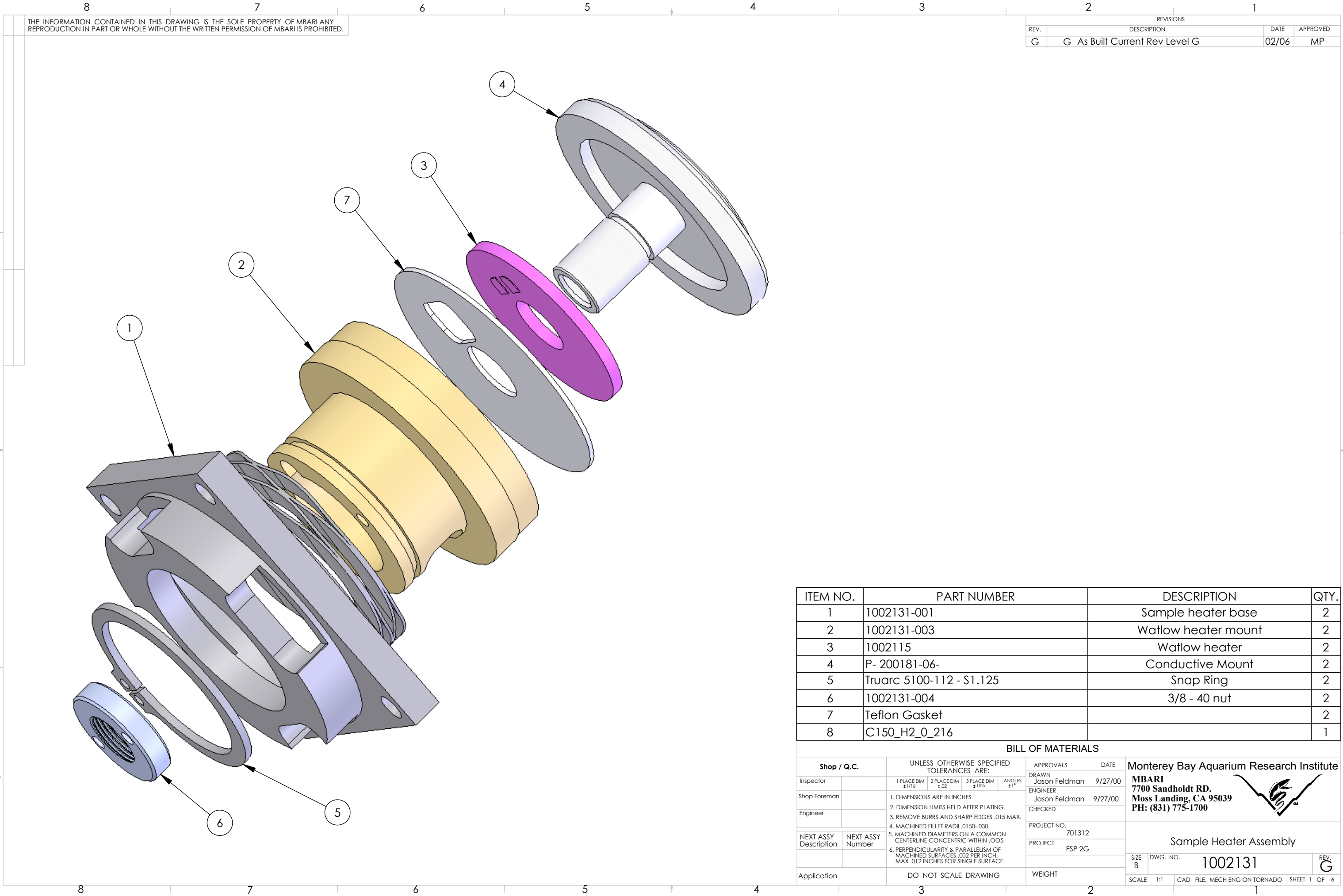




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| REVISIONS |                                |       |          |
|-----------|--------------------------------|-------|----------|
| REV.      | DESCRIPTION                    | DATE  | APPROVED |
| G         | G As Built Current Rev Level G | 02/06 | MP       |

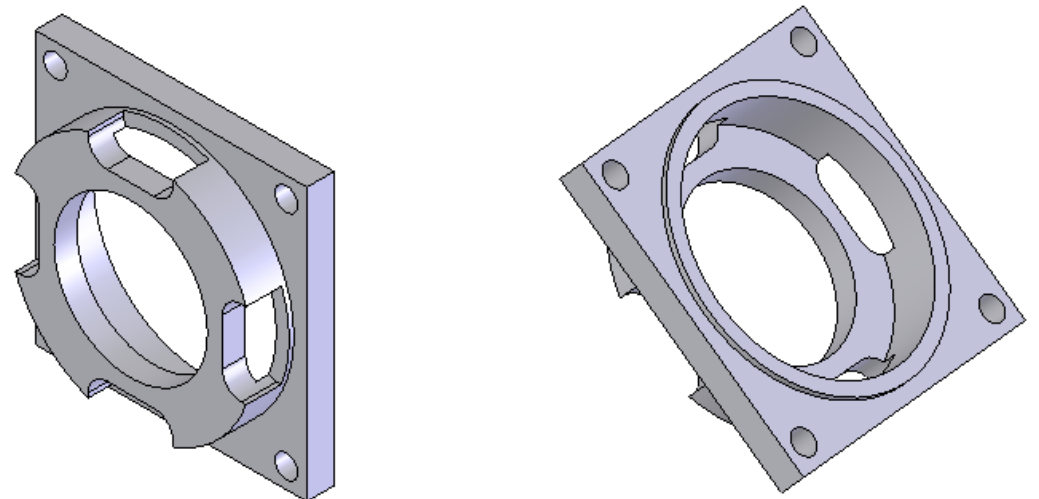
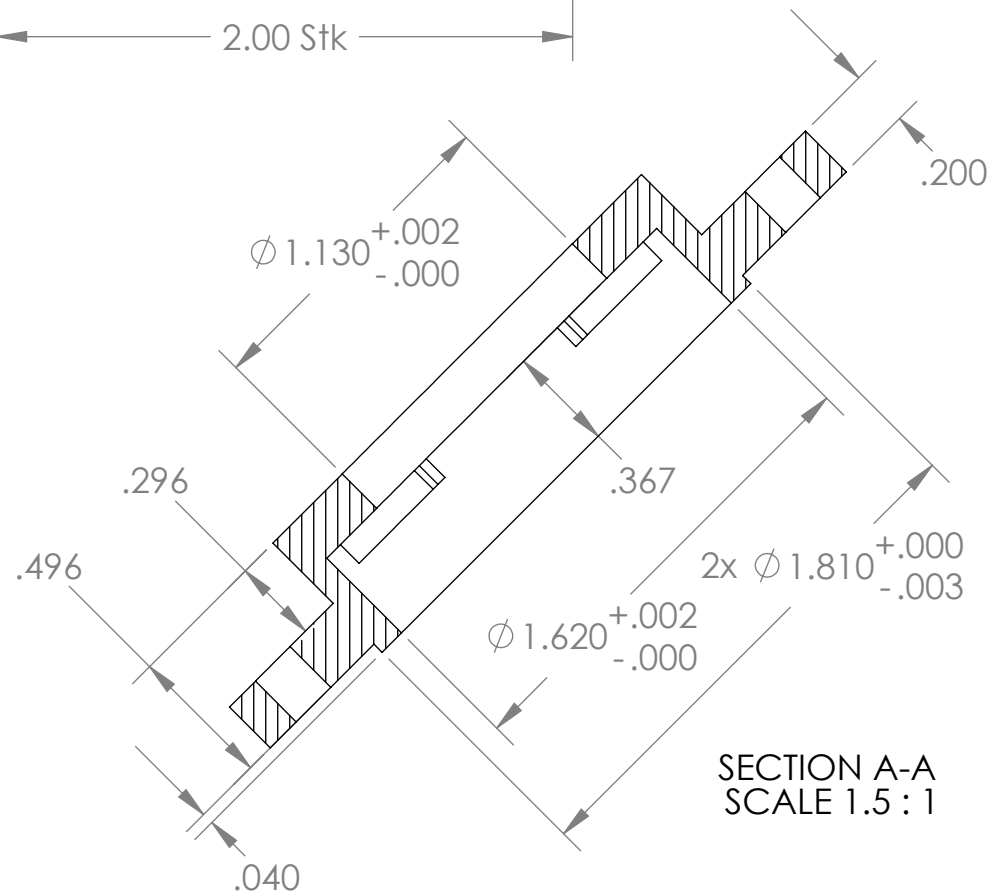
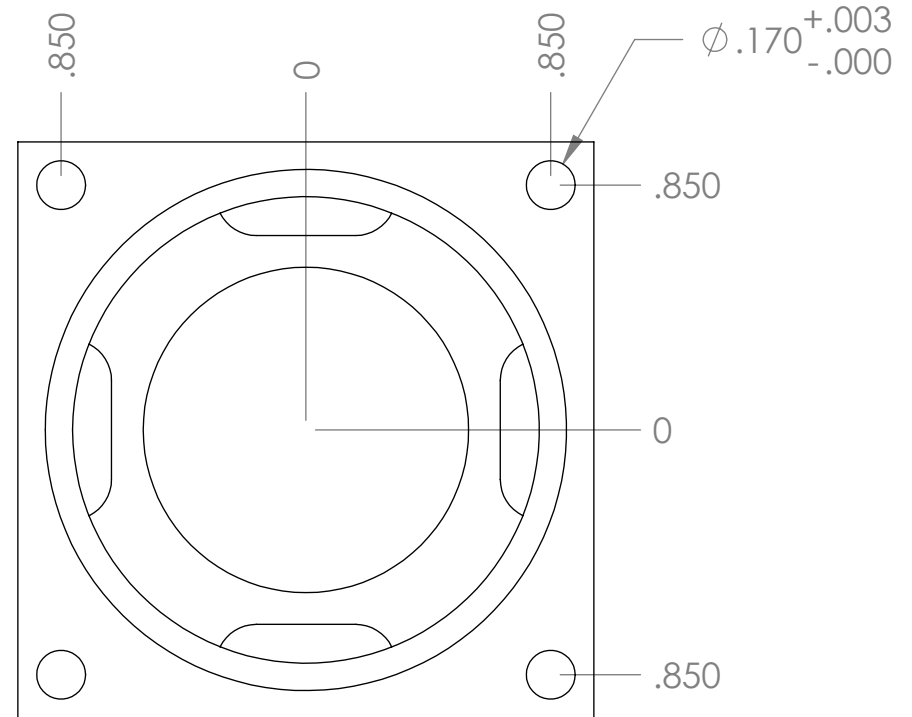
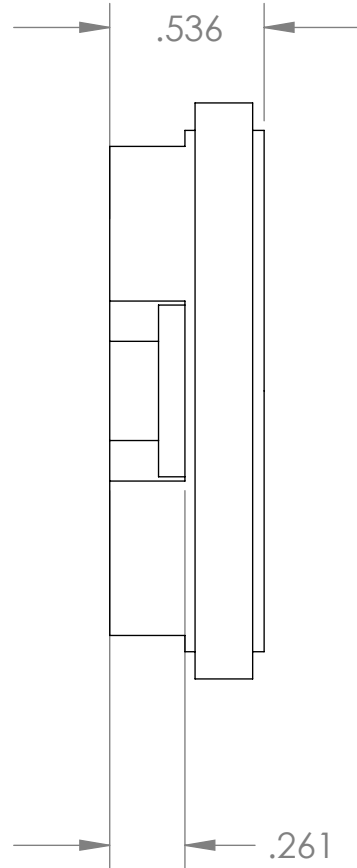
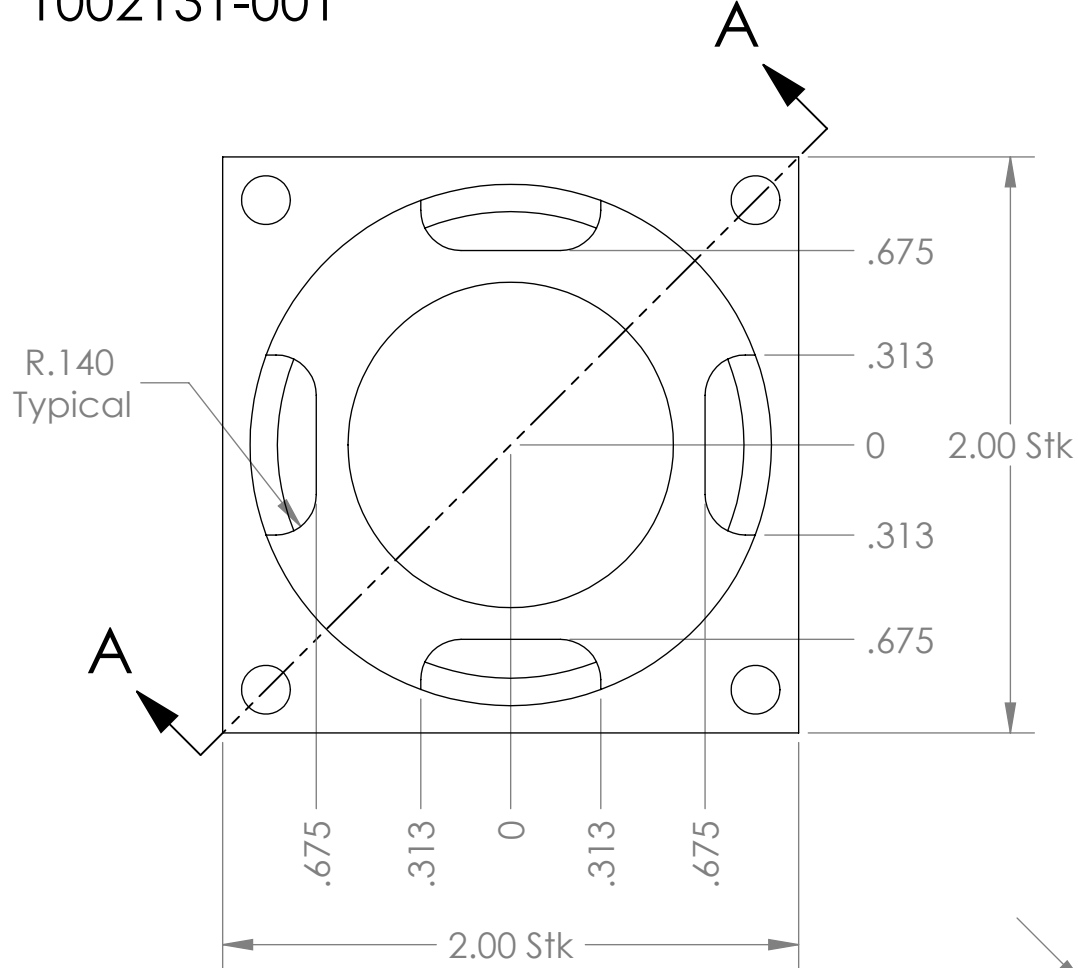
| ITEM NO. | PART NUMBER              | DESCRIPTION         | QTY. |
|----------|--------------------------|---------------------|------|
| 1        | 1002131-001              | Sample heater base  | 2    |
| 2        | 1002131-003              | Watlow heater mount | 2    |
| 3        | 1002115                  | Watlow heater       | 2    |
| 4        | P- 200181-06-            | Conductive Mount    | 2    |
| 5        | Truarc 5100-112 - S1.125 | Snap Ring           | 2    |
| 6        | 1002131-004              | 3/8 - 40 nut        | 2    |
| 7        | Teflon Gasket            |                     | 2    |
| 8        | C150_H2_0_216            |                     | 1    |

BILL OF MATERIALS

| Shop / Q.C.           |                  | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                                                                                                                                                                                                                                                      |                     | APPROVALS                 | DATE    | Monterey Bay Aquarium Research Institute<br>MBARI<br>7700 Sandholdt RD.<br>Moss Landing, CA 95039<br>PH: (831) 775-1700 |                     |
|-----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------|---------|-------------------------------------------------------------------------------------------------------------------------|---------------------|
| Inspector             |                  | 1 PLACE DIM<br>±1/16                                                                                                                                                                                                                                                                                                                            | 2 PLACE DIM<br>±.02 | DRAWN<br>Jason Feldman    | 9/27/00 |                                                                                                                         |                     |
| Shop Foreman          |                  | 3 PLACE DIM<br>±.005                                                                                                                                                                                                                                                                                                                            | ANGLES<br>±1°       | ENGINEER<br>Jason Feldman | 9/27/00 |                                                                                                                         |                     |
| Engineer              |                  | 1. DIMENSIONS ARE IN INCHES<br>2. DIMENSION LIMITS HELD AFTER PLATING.<br>3. REMOVE BURRS AND SHARP EDGES .015 MAX.<br>4. MACHINED FILLET RADII .0150-.030.<br>5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005<br>6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE. |                     | CHECKED                   |         |                                                                                                                         |                     |
| NEXT ASSY Description | NEXT ASSY Number |                                                                                                                                                                                                                                                                                                                                                 |                     | PROJECT NO.<br>701312     |         | Sample Heater Assembly                                                                                                  |                     |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     | PROJECT<br>ESP 2G         |         |                                                                                                                         |                     |
| Application           |                  | DO NOT SCALE DRAWING                                                                                                                                                                                                                                                                                                                            |                     | WEIGHT                    |         | SIZE<br>B                                                                                                               | DWG. NO.<br>1002131 |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                           |         | SCALE<br>1:1                                                                                                            | REV.<br>G           |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                           |         | CAD<br>FILE: MECH ENG ON TORNADO                                                                                        | SHEET<br>1 OF 6     |

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# Heater Base 1002131-001



| ITEM NO. | Material   | PART NUMBER | DESCRIPTION        | QTY. |
|----------|------------|-------------|--------------------|------|
| 1        | 6061-T6 Al | 1002131-001 | Sample heater base | 2    |

| BILL OF MATERIALS     |                  |                                                                                                           |                       |                                |
|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------|
| Shop / Q.C.           |                  | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                |                       | APPROVALS                      |
| Inspector             |                  | 1 PLACE DIM $\pm 1/16$                                                                                    | 2 PLACE DIM $\pm .02$ | DATE                           |
| Shop Foreman          |                  | 3 PLACE DIM $\pm .005$                                                                                    | ANGLES $\pm 1^\circ$  | DRAWN Jason Feldman 9/27/00    |
| Engineer              |                  | 1. DIMENSIONS ARE IN INCHES                                                                               |                       | ENGINEER Jason Feldman 9/27/00 |
| NEXT ASSY Description | NEXT ASSY Number | 2. DIMENSION LIMITS HELD AFTER PLATING.                                                                   |                       | CHECKED                        |
| Application           |                  | 3. REMOVE BURRS AND SHARP EDGES .015 MAX.                                                                 |                       | PROJECT NO. 701312             |
|                       |                  | 4. MACHINED FILLET RADII .0150-.030.                                                                      |                       | PROJECT ESP 2G                 |
|                       |                  | 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005                                       |                       | WEIGHT                         |
|                       |                  | 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE. |                       | SCALE 1:1                      |
|                       |                  | DO NOT SCALE DRAWING                                                                                      |                       | CAD FILE: MECH ENG ON TORNADO  |
|                       |                  |                                                                                                           |                       | SHEET 2 OF 6                   |

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Moss Landing, CA 95039  
PH: (831) 775-1700



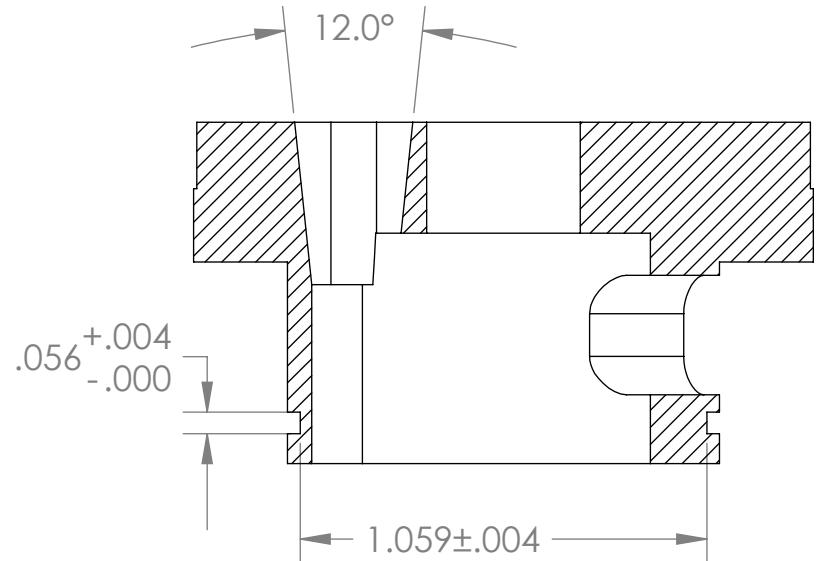
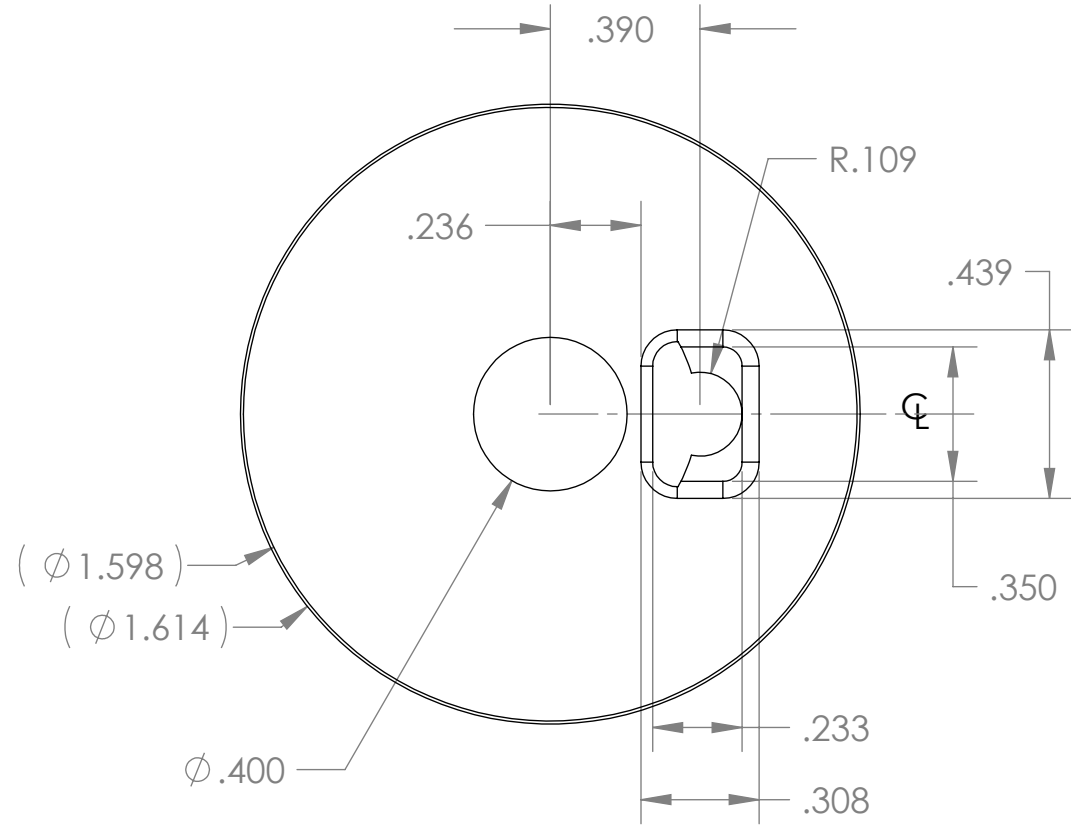
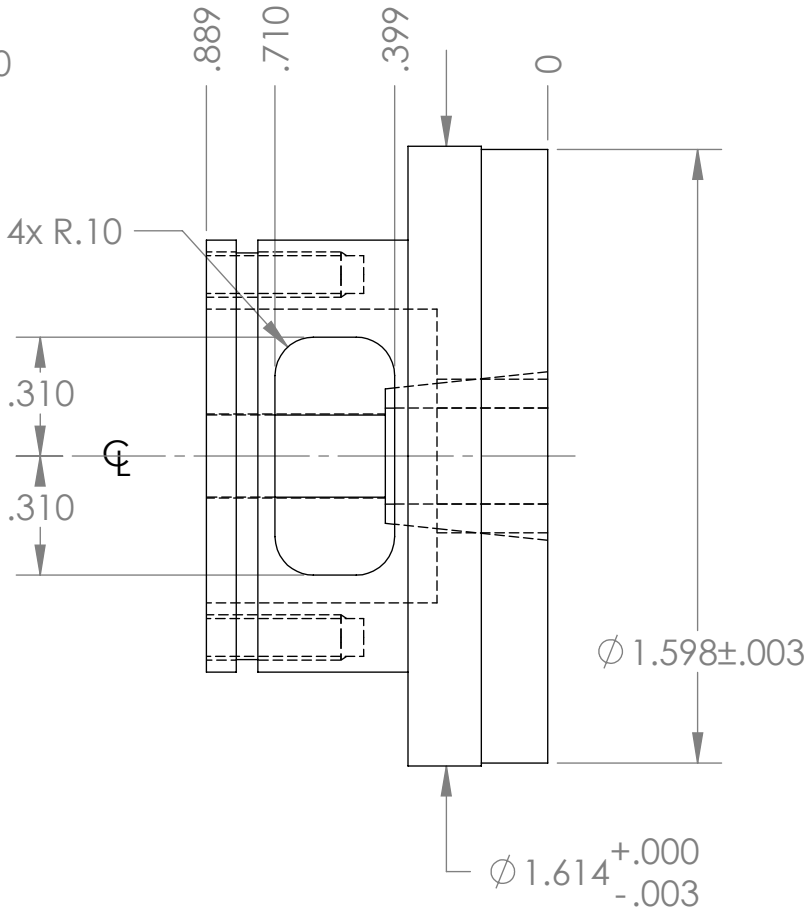
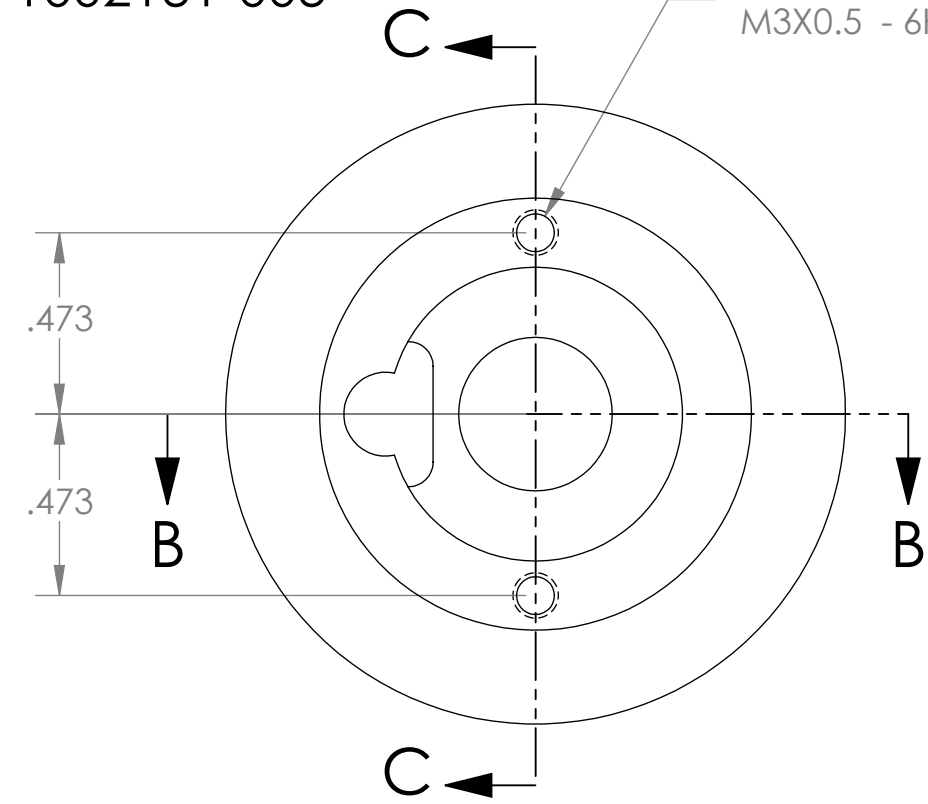
Sample Heater Assembly

SIZE B DWG. NO. 1002131 REV. G

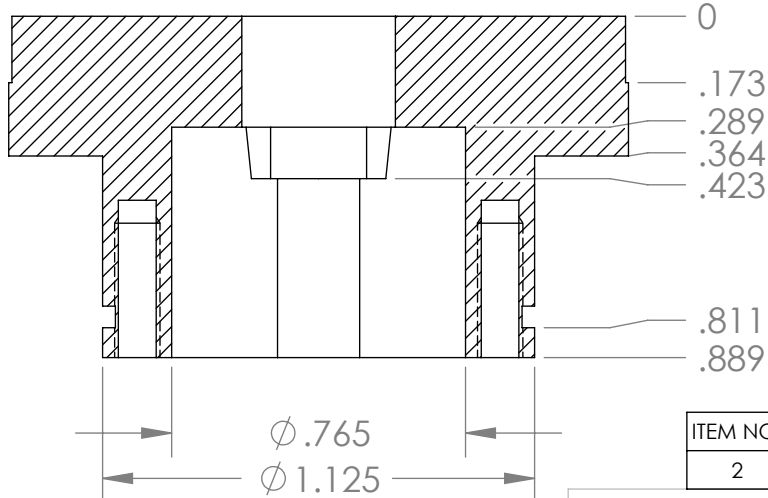
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# Watlow Heater Mount 1002131-003

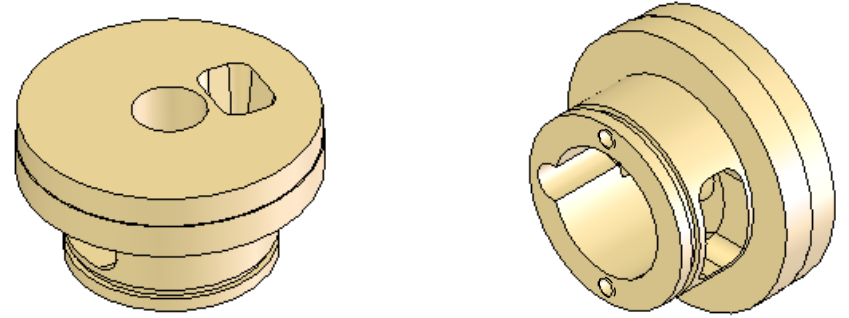
2X  $\phi$  .098  $\nabla$  .409  
M3X0.5 - 6H  $\nabla$  .350



SECTION B-B  
SCALE 2 : 1



SECTION C-C  
SCALE 2 : 1



| ITEM NO. | PART NUMBER | Material | DESCRIPTION         | QTY. |
|----------|-------------|----------|---------------------|------|
| 2        | 1002131-003 | PEEK     | Watlow heater mount | 2    |

| BILL OF MATERIALS     |                      |                                                                                                           |                       |                                |
|-----------------------|----------------------|-----------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------|
| Shop / Q.C.           |                      | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                |                       | APPROVALS DATE                 |
| Inspector             |                      | 1 PLACE DIM $\pm$ 1/16                                                                                    | 2 PLACE DIM $\pm$ .02 | DRAWN Jason Feldman 9/27/00    |
| Shop Foreman          |                      | 3 PLACE DIM $\pm$ .005                                                                                    | ANGLES $\pm$ 1°       | ENGINEER Jason Feldman 9/27/00 |
| Engineer              |                      | 1. DIMENSIONS ARE IN INCHES                                                                               |                       | CHECKED                        |
| NEXT ASSY Description | NEXT ASSY Number     | 2. DIMENSION LIMITS HELD AFTER PLATING.                                                                   |                       | PROJECT NO. 701312             |
|                       |                      | 3. REMOVE BURRS AND SHARP EDGES .015 MAX.                                                                 |                       | PROJECT ESP 2G                 |
|                       |                      | 4. MACHINED FILLET RADII .0150-.030.                                                                      |                       | WEIGHT                         |
|                       |                      | 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005                                       |                       | SCALE 1:1                      |
|                       |                      | 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE. |                       | CAD FILE: MECH ENG ON TORNADO  |
| Application           | DO NOT SCALE DRAWING |                                                                                                           |                       | SHEET 3 OF 6                   |

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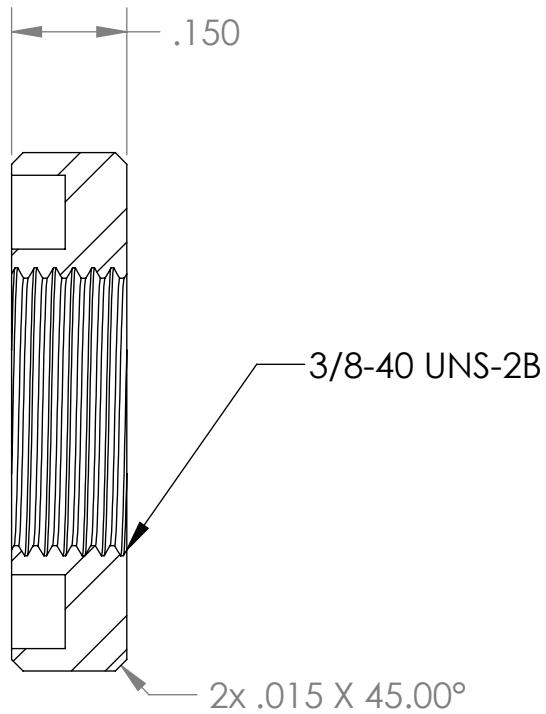
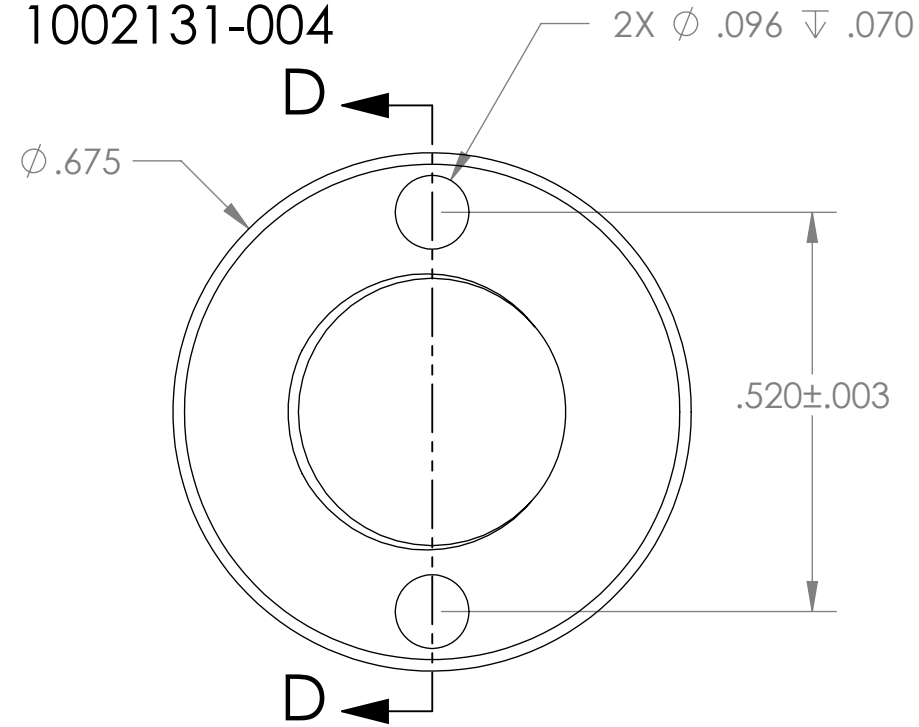
Sample Heater Assembly

SIZE B DWG. NO. 1002131 REV. G

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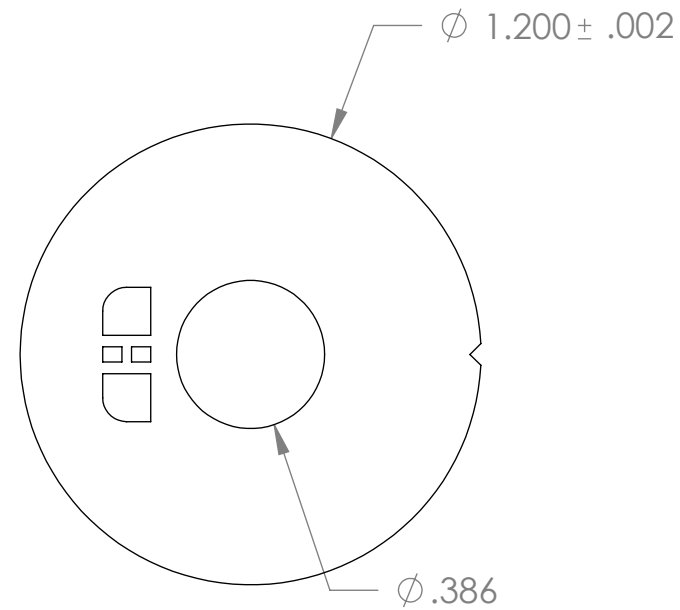
| REVISIONS |                              |       |          |
|-----------|------------------------------|-------|----------|
| REV.      | DESCRIPTION                  | DATE  | APPROVED |
| G         | As Built Current Rev level G | 02/06 | MP       |

3/8-40 Nut  
1002131-004

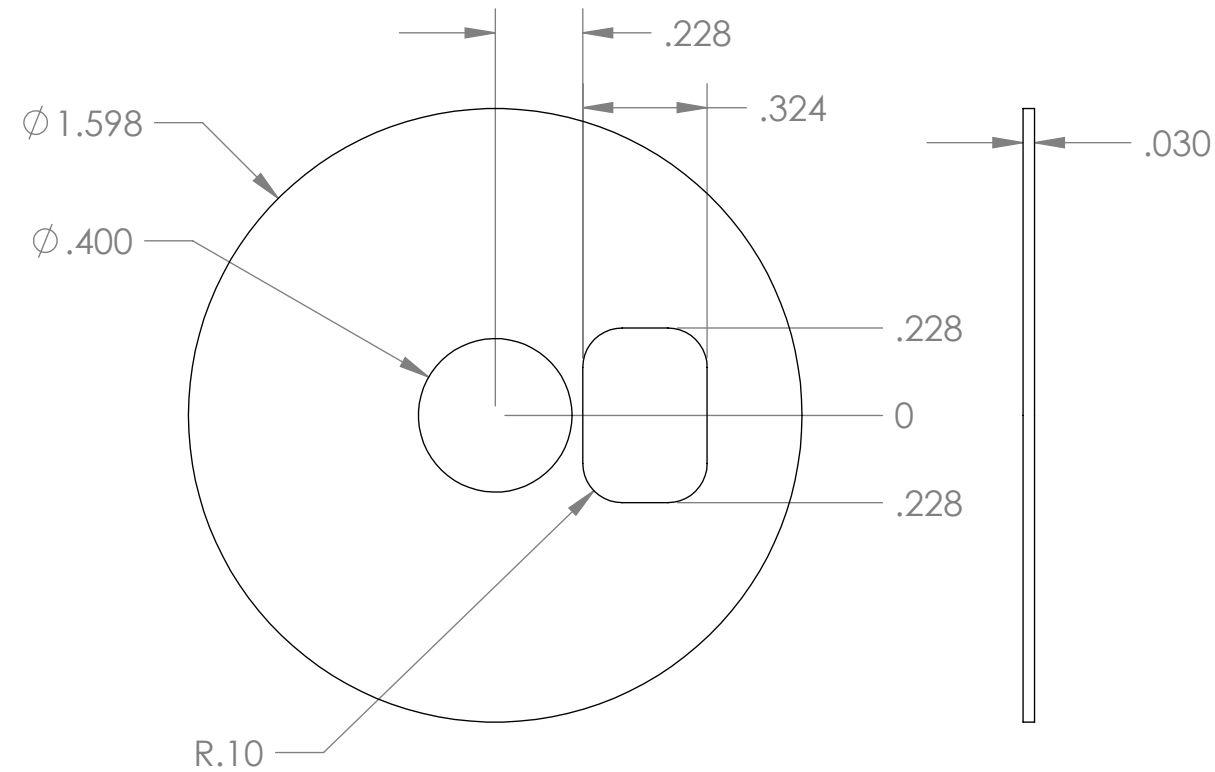


SECTION D-D  
SCALE 4 : 1

Watlow Heater Modifications  
1002115



Teflon Gasket



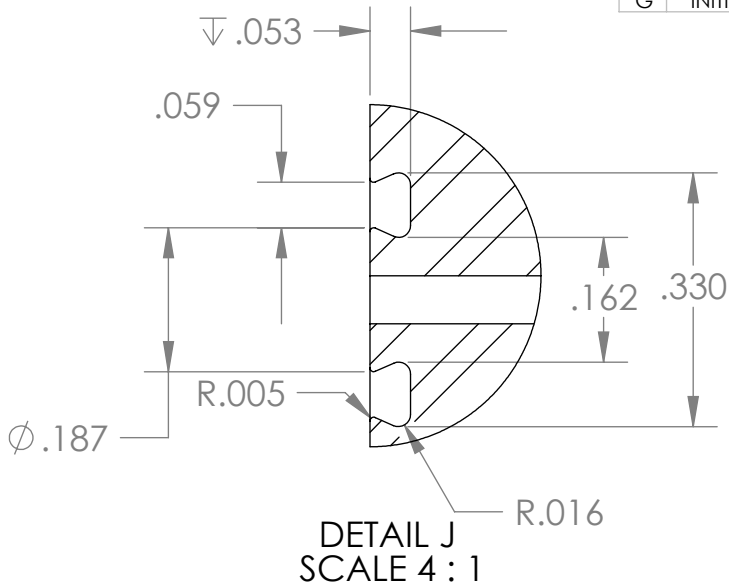
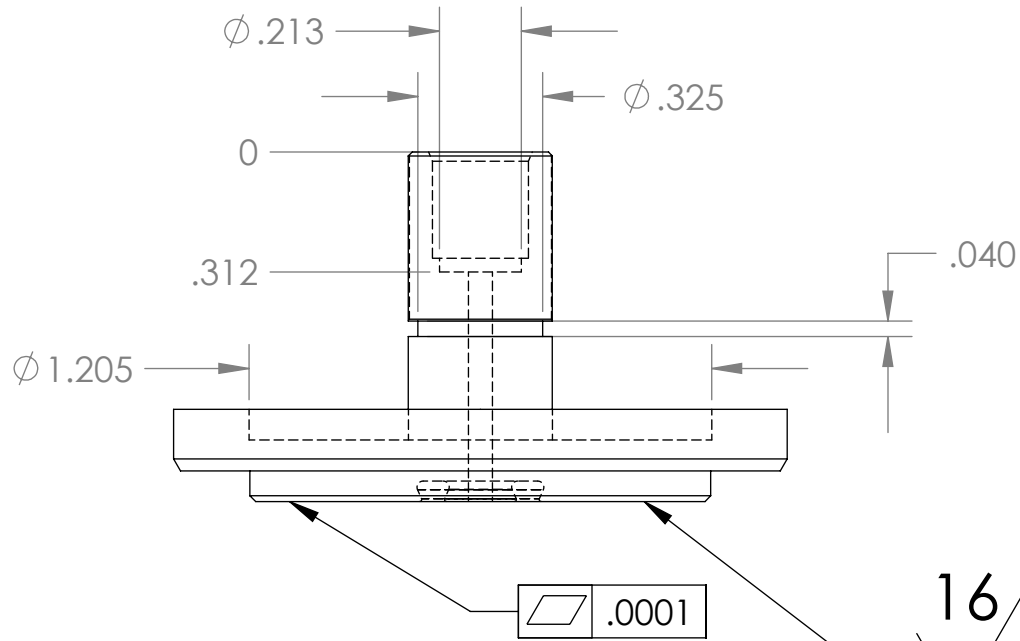
| ITEM NO. | PART NUMBER   | Material             | DESCRIPTION        | QTY. |
|----------|---------------|----------------------|--------------------|------|
| 7        | 1002131-004   | 17-4 Stainless Steel | 3/8 - 40 nut       | 2    |
| 3        | Teflon Gasket | Teflon               | Teflon Gasket      | 2    |
| 4        | 1002115 Rev C | Watlow Heater        | Watlow Heater Mods | 2    |

| BILL OF MATERIALS     |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               |                           |         |           |                               |                                                                                                                                                                                                                                                                     |              |
|-----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|---------------|---------------------------|---------|-----------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Shop / Q.C.           |                  | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                                                                                                                                                                                                                                                      |                     |                      |               | APPROVALS                 |         | DATE      |                               | <div>Monterey Bay Aquarium Research Institute</div> <div>MBARI</div> <div>7700 Sandholdt RD.</div> <div>Moss Landing, CA 95039</div> <div>PH: (831) 775-1700</div> <div></div> |              |
| Inspector             |                  | 1 PLACE DIM<br>±1/16                                                                                                                                                                                                                                                                                                                            | 2 PLACE DIM<br>±.02 | 3 PLACE DIM<br>±.005 | ANGLES<br>±1° | DRAWN<br>Jason Feldman    | 9/27/00 |           |                               |                                                                                                                                                                                                                                                                     |              |
| Shop Foreman          |                  | 1. DIMENSIONS ARE IN INCHES<br>2. DIMENSION LIMITS HELD AFTER PLATING.<br>3. REMOVE BURRS AND SHARP EDGES .015 MAX.<br>4. MACHINED FILLET RADII .0150-.030.<br>5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005<br>6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE. |                     |                      |               | ENGINEER<br>Jason Feldman | 9/27/00 |           |                               |                                                                                                                                                                                                                                                                     |              |
| Engineer              |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | CHECKED                   |         |           |                               |                                                                                                                                                                                                                                                                     |              |
| NEXT ASSY Description | NEXT ASSY Number |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT NO.<br>701312     |         |           |                               |                                                                                                                                                                                                                                                                     |              |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT<br>ESP 2G         |         |           |                               |                                                                                                                                                                                                                                                                     |              |
| Application           |                  | DO NOT SCALE DRAWING                                                                                                                                                                                                                                                                                                                            |                     |                      |               | WEIGHT                    |         |           |                               | Sample Heater Assembly                                                                                                                                                                                                                                              |              |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               |                           |         | SIZE<br>B | DWG. NO.<br>1002131           |                                                                                                                                                                                                                                                                     | REV.<br>G    |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               |                           |         | SCALE 2:1 | CAD FILE: MECH ENG ON TORNADO |                                                                                                                                                                                                                                                                     | SHEET 4 OF 6 |

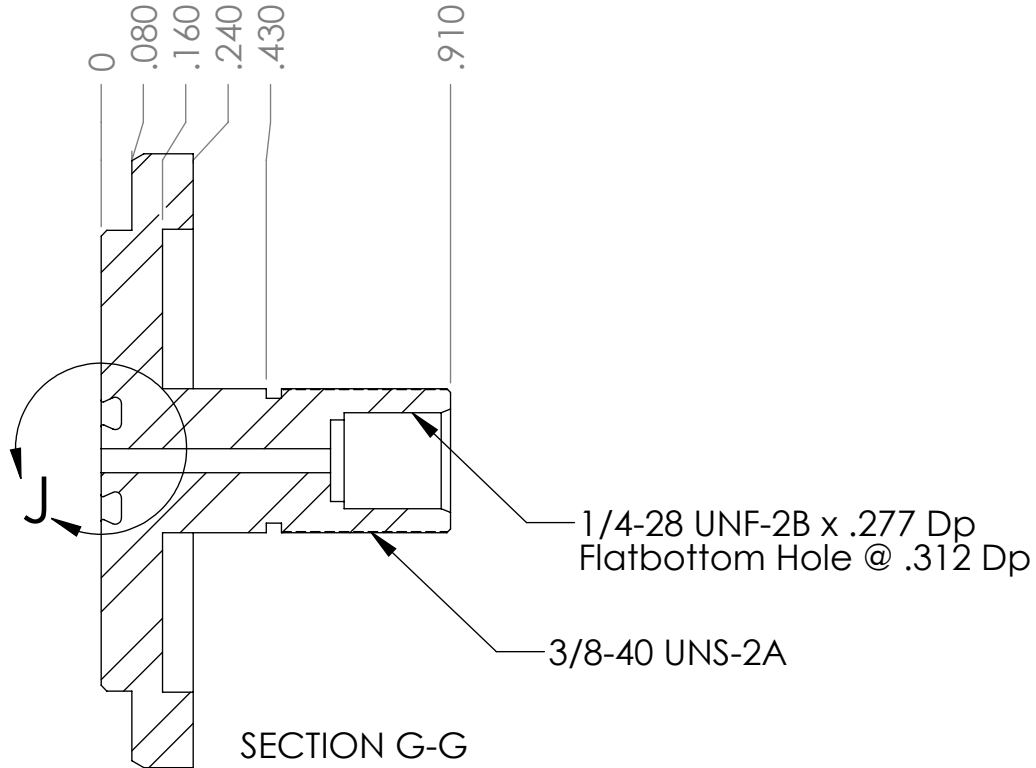
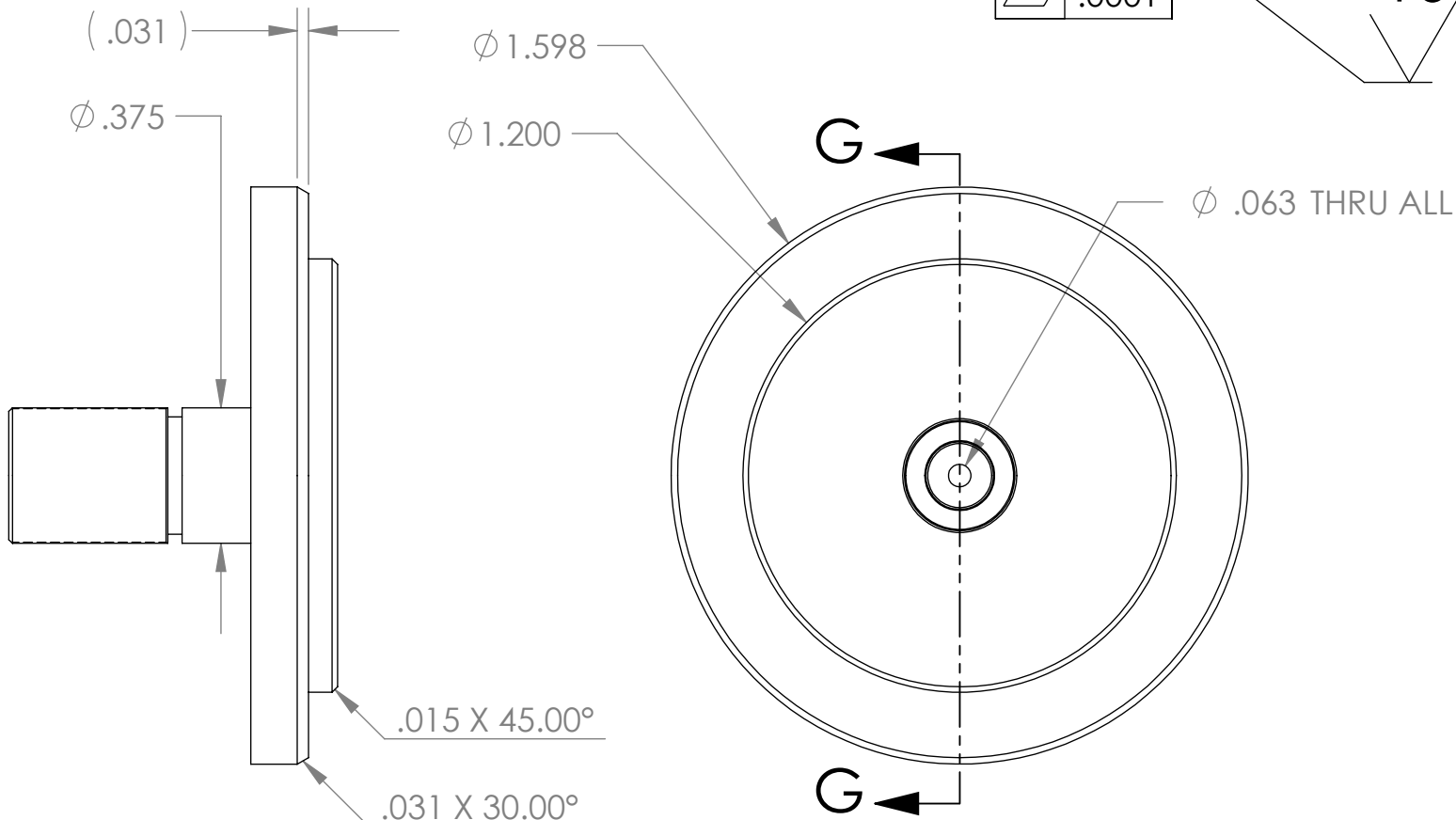
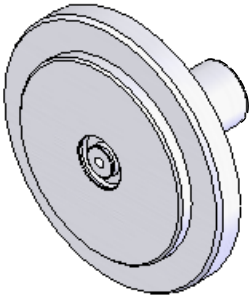
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# P-200181-06 Conductive Mount

| REVISIONS |                 |       |          |
|-----------|-----------------|-------|----------|
| REV.      | DESCRIPTION     | DATE  | APPROVED |
| G         | INITIAL RELEASE | 06/08 | MP       |



O-Ring:  
2-008



| ITEM NO.              | PART NUMBER      | DESCRIPTION                                                                                               | MATERIAL                          | QTY.                |                                                                                       |              |
|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------|---------------------------------------------------------------------------------------|--------------|
| 5                     | P- 200181-06-    | Conductive Mount                                                                                          | Titanium Ti-6Al-4V (Grade 5), STA | 2                   |                                                                                       |              |
| BILL OF MATERIALS     |                  |                                                                                                           |                                   |                     |                                                                                       |              |
| Shop / Q.C.           |                  | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                | APPROVALS                         | DATE                |                                                                                       |              |
| Inspector             |                  | 1 PLACE DIM ±1/16                                                                                         | 2 PLACE DIM ±.02                  | 3 PLACE DIM ±.005   | ANGLES ±1°                                                                            |              |
| Shop Foreman          |                  | 1. DIMENSIONS ARE IN INCHES                                                                               |                                   |                     |                                                                                       |              |
| Engineer              |                  | 2. DIMENSION LIMITS HELD AFTER PLATING.                                                                   |                                   |                     |                                                                                       |              |
|                       |                  | 3. REMOVE BURRS AND SHARP EDGES .015 MAX.                                                                 |                                   |                     |                                                                                       |              |
|                       |                  | 4. MACHINED FILLET RADII .0150-.030.                                                                      |                                   |                     |                                                                                       |              |
|                       |                  | 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005                                       |                                   |                     |                                                                                       |              |
|                       |                  | 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE. |                                   |                     |                                                                                       |              |
| NEXT ASSY Description | NEXT ASSY Number | PROJECT NO. 701312                                                                                        |                                   |                     |  |              |
|                       |                  | PROJECT ESP                                                                                               |                                   |                     |                                                                                       |              |
|                       |                  | WEIGHT                                                                                                    |                                   |                     |                                                                                       |              |
| Application           |                  | DO NOT SCALE DRAWING                                                                                      |                                   | Sample Heater Assy. |                                                                                       |              |
|                       |                  |                                                                                                           |                                   | SIZE B              | DWG. NO. 1002131                                                                      | REV. G       |
|                       |                  |                                                                                                           |                                   | SCALE 2:1           | CAD FILE: MECH ENG ON TORNADO                                                         | SHEET 5 OF 6 |

