

## FEATURES

### SET POINT INDICATION

Setpoint level clearly indicated on scale plate.

### VIBRATION RESISTANT

Robustly constructed microswitches permit switch installation on motors, diesels, compressors, etc.

### PRECISION

Well established and long proven temperature sensing methods enable precise and reliable operation largely unaffected by change in ambient temperature.

### WEATHERPROOF

Operation unaffected by salt air atmosphere, humidity or water spray.

### MARINE USE APPROVED

Type approval certification available.  
(Capillary version pending)

#### MARINE CLASSIFICATION

Pressure ranges 1, 2, 3, 4 & 9

Temperature ranges 1, 2, 3, 4 & 5

Microswitch types K, R, S & Y

have been Type Approved for marine applications by:-

Lloyds Register of Shipping

Det Norsk Veritas

Bureau Veritas

Germanische Lloyd

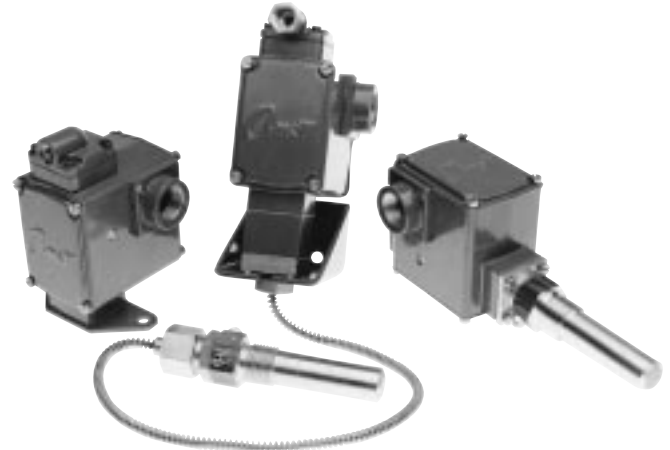
(Model 4140D only)

Polish Register of Shipping

USSR Register of Shipping

R.I.N.A.

NB: In accordance with the Classification Societies Rules a Thermowell must be used on all Temperature Switch installations for liquid sensing, in marine applications.



### Model 4140A

Combined single step Temperature and single step Pressure switch, having two microswitches, one for the Temperature setpoint and the other for the Pressure setpoint.

### Model 4140C

Single step Pressure switch with one microswitch for one Pressure setpoint.

### Model 4140D

Single step Temperature Switch with one microswitch for one temperature setpoint.

### Model 4140E

Two step Temperature Switch with two microswitches each independently adjustable providing two temperature setpoints within the limits the limits of chosen temperature range.

### Model 4140F

Two step Pressure switch with two microswitches each independently adjustable providing two Pressure setpoints within the limits of the chosen Pressure range.

## GENERAL SPECIFICATIONS

**Housing:** Diecast aluminum alloy casting with high resistance to corrosion. Removable covers at front and rear for easy access to setpoint adjustment and microswitch terminals. Fully gasketed and weatherproof to IP56.

**Vibration:** Vibration resistant up to 4G/100Hz for K type microswitch and up to 14G/100Hz for type R microswitch (reset differential higher than for type K).

**Ambient Temperature:** Suitable for installation in ambient temperature of -15 to +120 C (+5 to +248 F). The setpoint varies by less than 1% for a variation of 0 - 80°C (32 - 176 F) of ambient temperature.

**Finish:** Standard finish is dark blue enamel paint. For installations where salt air corrosion is anticipated, a corrosion protection finish (i.e., aluminum parts anodised before painting) can be provided.

**Setpoint indication** All switches are equipped with a scale plate, calibrated in °C or BAR, appropriate to the range specified. On 2-step switches the scaleplate indicates setpoint level of the 1st setpoint only.

**Pressure Sensing:** Nitrile rubber diaphragm ( BUNA-N ) with support ring fitted to aluminum or aluminum bronze pressure chamber. Maximum permitted temperature, 90°C ( 194 F ). Suitable for oil, water, air and gas sensing. When sensing sea water pressure, specify corrosion protected model which provides for an aluminum bronze pressure bonnet.

**Manual Override:** Optional feature. (Model 4140C & A only ) A manually operated push-button can be provided to mechanically override the setpoint during equipment start-up operations. When start-up is achieved, sensed pressure when slightly above the pressure setpoint, releases the override allowing the switch to function normally if pressure fails.

## MICROSWITCH DETAILS

**Terminations:** Terminal connection details are specified on the inside of the terminal cover plate next to the microswitch fitted. All microswitch types have common, normally open and normally closed screw terminal markings and can be wired to provide make or break action on rising or falling setpoints.

**Current Rating:** The table opposite details maximum current rating (AMPS) for the standard type K microswitch. For details of current ratings of alternative switch types, consult Factory.

**Temperature Probe** The stem extension is fabricated from stainless steel and is fitted in a wax filled element (temp ranges 1 -5) encased in a bronze sheaf.

The slip coupling adapters are zinc plated.

For sensing temperatures in sea water circuits a thermowell is 17.5 BAR (250 psi).

The maximum pressure on 1/2 inch thermowell types is a 105 BAR (1500 psi) (except codes K & L\*).

The maximum pressure on 3/4 inch thermowell types is 207 BAR (3000 psi).

The maximum temperature admissible at the probe (see tables) should not be exceeded.

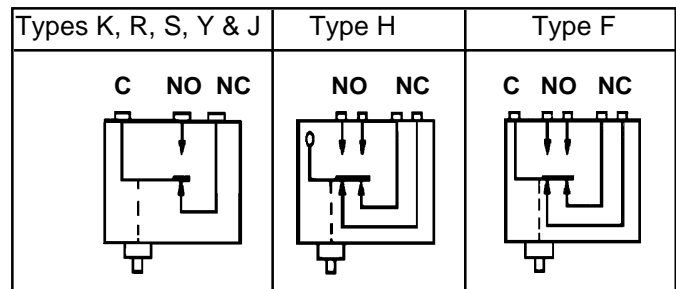
**Temperature Range 6:** (Fixed thermowell only)

To achieve accurate and reliable switch action at high temperatures between 120-250 °C / 248-482°F (temperature range 6) specially constructed switches are supplied employing a bimetallic disc assembly.

This construction is available at 80 mm stem length only, and must be supplied with a thermowell ( code K or L) since the thermowell acts as a thrust pad for the mechanical movement created by thermal expansion as the sensed temperature rises.

The maximum pressure on thermowells used on temperature range 6 is 69 BAR (1000 psi).

## MICROSWITCH SCHEMATICS



| Voltage | AC        |           | DC        |           |
|---------|-----------|-----------|-----------|-----------|
|         | Resistive | Inductive | Resistive | Inductive |
| 15      |           |           | 15.0      | 10.0      |
| 30      |           |           | 5.0       | 5.0       |
| 50      |           |           | 1.25      | 1.25      |
| 75      |           |           | 0.25      | 0.30      |
| 150     | 15.0      | 15.0      | 0.75      | 0.05      |
| 250     | 15.0      | 15.0      | 0.50      | 0.03      |
| 380     | 15.0      | 5.0       | 0.25      |           |
| 480     | 15.0      | 4.0       |           |           |

# MODEL CODING

Letters other than EE, indicate that a model is constructed to special requirements, and other code letters may be invalid. Consult AMOT representative for full specification details

Model 4140 **A** **K** **1** **H** **1** **2** **C** **E** **4** **EE**

| Basic Model                                  |          |
|--|----------|
| Combined Press. & Temp. Single Step Pressure | <b>A</b> |
| Single Step Temperature                      | <b>C</b> |
| Dual Step Temperature                        | <b>D</b> |
| Dual Step Pressure                           | <b>E</b> |
|  | <b>F</b> |

| Microswitch Type<br>(all are Single Pole, Double Throw)                                     |                                  |
|---|----------------------------------|
| Double  | <b>H</b>                         |
| Low Reset differential  | <b>K</b>                         |
| High vibration/shock resistance as R, but gold plate contacts as K, but gold plate contacts | <b>R</b><br><b>S</b><br><b>Y</b> |

| Manual Override and Finish                   | Code     |
|--|----------|
| Standard finish without manual override      | <b>1</b> |
| Corrosion protection without manual override | <b>3</b> |

| Conduit thread type<br>(Via bonnet with female Thread) | Code            |                     |
|--|-----------------|---------------------|
|  | Standard Finish | Corrosion Protected |
| No bonnet fitted                                       | <b>A</b> or     | <b>A</b>            |
| 1/2 inch NPT   | <b>C</b> or     | <b>M</b>            |
| <b>PG 13.5</b>   | <b>E</b> or     | <b>P</b>            |
| <b>M20 x 1.5 mm</b>                                    | <b>H</b> or     | <b>S</b>            |
| PG 9   | <b>V</b> or     | <b>W</b>            |

| Pressure Connection<br>(Via bonnet with female Thread) | Code            |                     |
|--|-----------------|---------------------|
|  | Standard Finish | Corrosion Protected |
| 1/8 in BSPTr   | <b>1</b> or     | <b>4</b>            |
| 1/8 in NPT   | <b>2</b> or     | <b>5</b>            |
| 1/8 in BSPPL   | <b>3</b> or     | <b>6</b>            |
| Temperature Switch                                     | <b>0</b>        | <b>0</b>            |

| Temperature Range Deg C - Rising |                  |          |                  |
|----------------------------------|------------------|----------|------------------|
| Code                             | Fixed Stem       | Code     | Capillary        |
| <b>1</b>                         | <b>16 - 54</b>   | <b>1</b> | <b>15 - 40</b>   |
| <b>2</b>                         | <b>49 - 71</b>   | <b>2</b> | <b>38 - 63</b>   |
| <b>3</b>                         | <b>66 - 87</b>   | <b>3</b> | <b>60 - 85</b>   |
| <b>4</b>                         | <b>83 - 104</b>  | <b>4</b> | <b>80 - 105</b>  |
| <b>5</b>                         | <b>99 - 123</b>  | <b>5</b> | <b>100 - 125</b> |
| <b>*6</b>                        | <b>120 - 250</b> | <b>6</b> | <b>120 - 250</b> |
| <b>0</b>                         | Pressure Switch  | <b>7</b> | <b>-30 - 30</b>  |

\* A Thermowell (Code K or L) must be used with any switch specified for Temp. range 6. Only K, Y or Q microswitches may be used for Temp. range 6.

| Code     | Temperature stem adaptor   |
|----------|--|
| <b>A</b> | No adaptor fitting   |
| <b>B</b> | <b>Slip coupling, 1/2 in BSPPL</b>                                     |
| <b>C</b> | Slip coupling, 1/2 in NPT  |
| <b>E</b> | <b>Thermowell, 1/2 in BSPPL, Alum. bronze</b>                          |
| <b>G</b> | <b>Thermowell 3/4 in BSPPL, Alum. bronze</b>                           |
| <b>H</b> | Thermowell 3/4 in BSPPL, <b>Stainless steel</b>                        |
| <b>K</b> | <b>Thermowell 1/2 in BSPPL</b> Alum. bronze and for temp. range 6 only |
| <b>L</b> | Thermowell 1/2 in NPT  |
| <b>M</b> | Thermowell in NPT Alum, bronze   |
| <b>A</b> | Pressure Switch  |
|          | Type <b>G, H, J, K</b> , are 80 mm stems only                          |

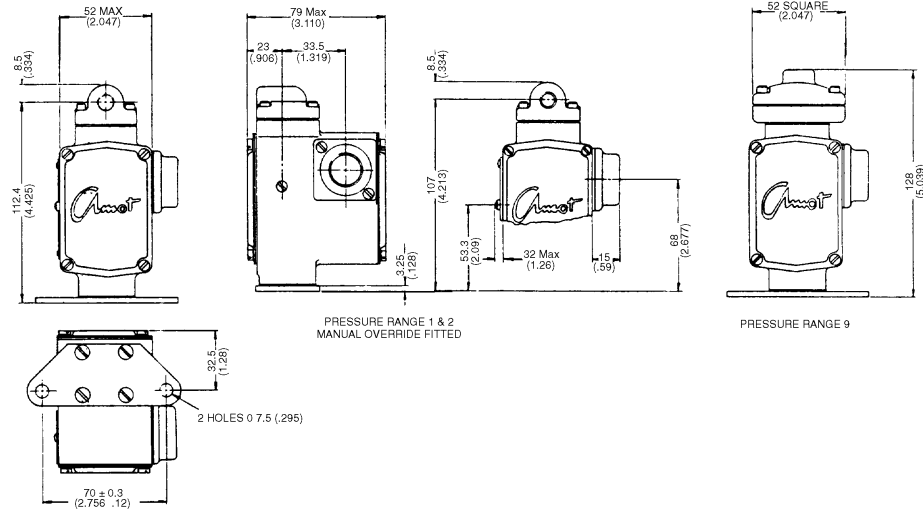
| Code     | Temperature stem length  |
|----------|--|
| <b>C</b> | <b>80 mm</b>   |
| <b>E</b> | 40 mm  |
|          | <b>Capillary Lengths</b>   |
| <b>A</b> | Pressure Switch  |
|          | (70 mm and 130 mm stems available for Temperature ranges 1-5 only) |

| Code     | Pressure range, bar, min, falling to max. raising |
|----------|---|
| <b>1</b> | <b>0.28 - 3.5</b>                                 |
| <b>2</b> | <b>3.45 - 6.9</b>                                 |
| <b>3</b> | <b>6.9 - 21.0</b>                                 |
| <b>4</b> | <b>9.0 - 34.5</b>                                 |
| <b>9</b> | <b>0.10 - 1.65</b>                                |
| <b>0</b> | Temperature Switch                                |
|          | (above as for K microswitch)                      |

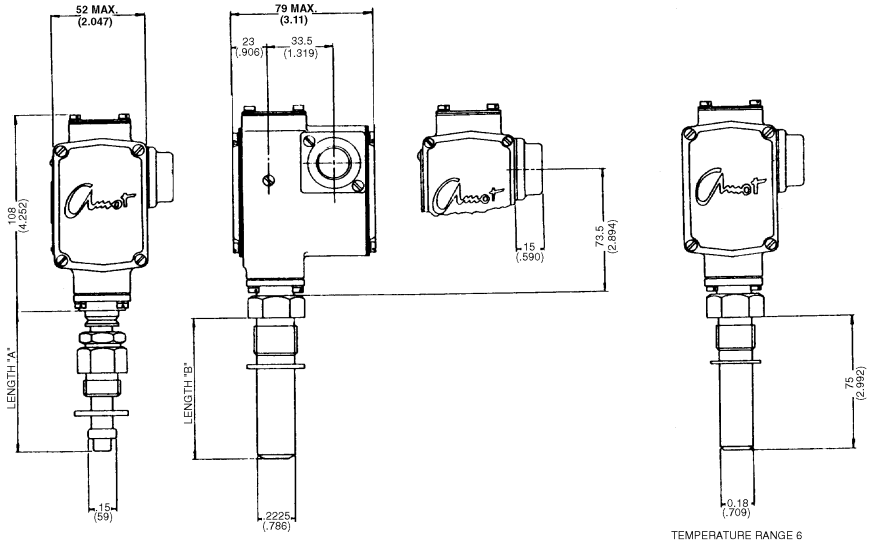
Notes: AMOT Preferred standards are as indicated in **Bold** type. Order for Fast delivery.

# DIMENSIONS

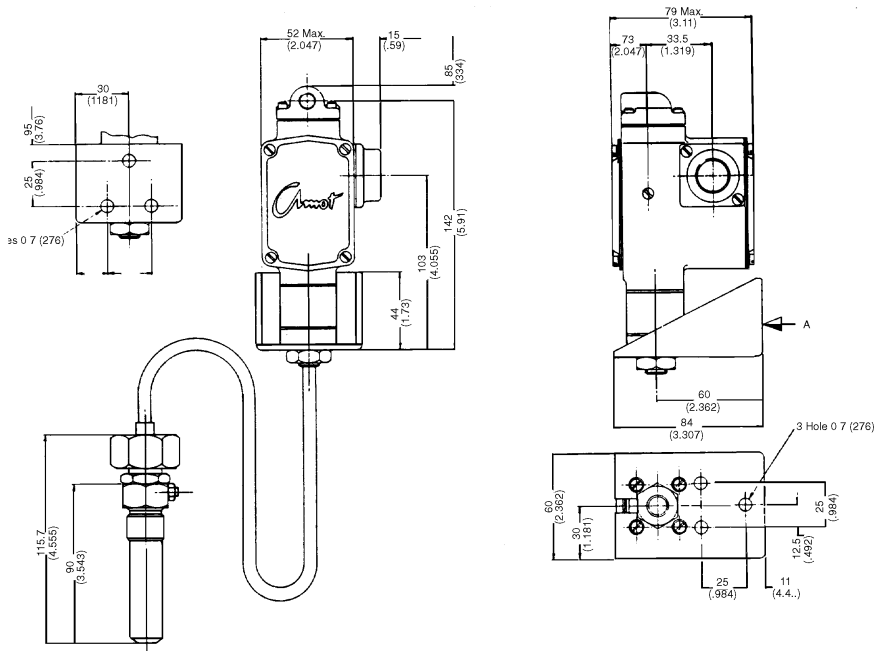
## 4140C & Pressure Switches



## 4140D & E Temperature Switches



## 4140D & E with Capillary



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