

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society of Mechanical Engineers (ASME)
  - .1 ASME B40.100-2005, Pressure Gauges and Gauge Attachments.
  - .2 ASME B40.200-2008, Thermometers, Direct Reading and Remote Reading.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-14.4-M88, Thermometers, Liquid-in-Glass, Self Indicating, Commercial/Industrial Type.
  - .2 CAN/CGSB-14.5-M88, Thermometers, Bimetallic, Self-Indicating, Commercial/Industrial Type.
- .5 Green Seal Environmental Standards (GS)
  - .1 GS-11-11, Standard for Paints and Coatings.
  - .2 GS-36-11, Standard for Commercial Adhesives.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's instructions, printed product literature and data sheets for thermometers and pressure gauges and include product characteristics, performance criteria, physical size, finish and limitations.
  - .3 Shop Drawings:
    - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Newfoundland and Labrador, Canada.
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1.2 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
(Cont'd)

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- .4 Certificates:
  - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Test and Evaluation Reports:
  - .1 Submit certified test reports for thermometers and pressure gauges from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .6 Sustainable Design Submittals:
  - .1 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
  - .2 Building Energy and Water Consumption: submit Measurement and Verification Plan following IPMVP for monitoring end-uses including but not limited to:
    - .1 Air heat recovery cycle.
    - .2 Building-related process energy systems and equipment.
    - .3 Indoor water risers.
  - .3 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
  - .4 Regional Materials: submit evidence that project incorporates 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

1.3 DELIVERY,  
STORAGE AND  
HANDLING

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- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
  - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory
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| 1.3 DELIVERY,<br>STORAGE AND<br>HANDLING<br><u>(Cont'd)</u> | .2 | (Cont'd)<br>packaging, labelled with manufacturer's name<br>and address.   |
|   | .3 | Storage and Handling Requirements:<br>.1 Store thermometers and pressure gauges<br>indoors in dry location and in accordance with<br>manufacturer's recommendations in clean, dry,<br>well-ventilated area.<br>.2 Store and protect thermometers and<br>pressure gauges from nicks, scratches, and<br>blemishes.<br>.3 Replace defective or damaged materials<br>with new. |
|   | .4 | Develop Construction Waste Management Plan<br>related to Work of this Section and in<br>accordance with Section 01 35 21 - LEED<br>Requirements.   |
|   | .5 | Packaging Waste Management: remove for reuse<br>or return of pallets, crates, padding,<br>banding, and packaging materials as specified<br>in Construction Waste Management Plan in<br>accordance with Section 01 74 21 -<br>Construction/Demolition Waste Management and<br>Disposal and Section 01 35 21 - LEED<br>Requirements.   |

## PART 2 - PRODUCTS

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| 2.1 GENERAL<br><u>                    </u> | .1 | Design point to be at mid-point of scale or<br>range.  |
|  | .2 | Ranges: as indicated.  |
| 2.2 DIRECT READING<br><u>THERMOMETERS</u>  | .1 | Industrial, variable angle type,<br>mercury-free, liquid filled, 125 mm scale<br>length: to CAN/CGSB-14.4 ASME B40.200.<br>.1 Resistance to shock and vibration. |
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2.3 REMOTE READING THERMOMETERS .1 100 mm diameter mercury-free liquid filled activated dial type: to CAN/CGSB-14.5 ASME B40.200, accuracy within one scale division, brass movement, stainless steel capillary, stainless steel spiral armour, stainless steel bulb and polished brass case for wall mounting.

2.4 THERMOMETER WELLS .1 Copper pipe: copper or bronze.  
.2 Steel pipe: brass or stainless steel.

2.5 PRESSURE GAUGES .1 112 mm, dial type: to ASME B40.100, Grade 2A, stainless steel bourdon tube having 0.5% accuracy full scale unless otherwise specified.  
.2 Provide:  
.1 Snubber for pulsating operation.  
.2 Diaphragm assembly for corrosive service.  
.3 Gasketed pressure relief back with solid front.  
.4 Bronze stop cock.  
.5 Oil filled for high vibration applications.

### PART 3 - EXECUTION

3.1 EXAMINATION .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.  
.1 Visually inspect substrate in presence of Departmental Representative.  
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.  
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative

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- 3.2 GENERAL .1 Install thermometers and gauges so they can be easily read from floor or platform.  
.1 If this cannot be accomplished, install remote reading units.
- .2 Install between equipment and first fitting or valve.
- 3.3 THERMOMETERS .1 Install in wells on piping. Include heat conductive material inside well.
- .2 Install in locations as indicated.
- .3 Install wells for balancing purposes.
- .4 Use extensions where thermometers are installed through insulation.
- 3.4 PRESSURE GAUGES .1 Install in locations as follows:  
.1 Suction and discharge of pumps.  
.2 Upstream and downstream of PRV's.  
.3 Upstream and downstream of control valves.  
.4 In other locations as indicated.
- .2 Install gauge cocks for balancing purposes, elsewhere as indicated.
- .3 Use extensions where pressure gauges are installed through insulation.
- 3.5 NAMEPLATES .1 Install engraved lamicoid nameplates in accordance with Section 23 05 53.01 - Mechanical Identification, identifying medium.
- 3.6 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.  
.1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and
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3.6 CLEANING                      .2    Final Cleaning: (Cont'd)  
      (Cont'd)                      equipment in accordance with Section 01 74 11  
   - Cleaning.

- .3    Waste Management: separate waste materials  
      for reuse and recycling in accordance with  
      Section 01 74 21 - Construction/Demolition  
      Waste Management and Disposal and Section  
      01 35 21 - LEED Requirements.  
      .1    Remove recycling containers and bins  
            from site and dispose of materials at  
            appropriate facility.

3.7 PROTECTION                      .1    Protect installed products and components  
   from damage during construction.  
  
   .2    Repair damage to adjacent materials caused by  
   thermometer and gauge installation.