1 Introduction
This publication details the connection of Alpha Wire Company, 2- and 12-core CSA-approved cables to the AZ20 probe and remote transmitter system. The procedure must be carried out by a trained technician and in conjunction with the AZ20 installation manuals, IM/AZ20P and IM/AZ20E. See Section 3, page 3 for cable specifications.

2 Cable connections

2.1 Probe transmitter connections
Referring to IM/AZ20P-EN, Section 4.3.1, connect the 2- and 12-core cables to the probe transmitter’s terminal block – see Table 2.1 for cable color details.

<table>
<thead>
<tr>
<th>Terminal / Cable color</th>
<th>Tag ID</th>
<th>Tx connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-core cable part no. 5562C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violet</td>
<td>ACJC</td>
<td>Pt1000 cold junction compensation</td>
</tr>
<tr>
<td>Slate</td>
<td>ACJC</td>
<td>Pt1000 cold junction compensation</td>
</tr>
<tr>
<td>Red</td>
<td>Cell +</td>
<td>Oxygen input (+ve)</td>
</tr>
<tr>
<td>Black</td>
<td>Cell –</td>
<td>Oxygen input (–ve)</td>
</tr>
<tr>
<td>Green</td>
<td>TC+</td>
<td>Thermocouple (+ve)</td>
</tr>
<tr>
<td>White</td>
<td>TC –</td>
<td>Thermocouple (–ve)</td>
</tr>
<tr>
<td>Light yellow (Sleeved screens)</td>
<td>SCN</td>
<td>Screens 1 and 2 (Screens 1 and 2 must be connected for correct operation)</td>
</tr>
</tbody>
</table>

2-core cable part no. 5382C

<table>
<thead>
<tr>
<th>Terminal / Cable color</th>
<th>Tag ID</th>
<th>Tx connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>H</td>
<td>Oven</td>
</tr>
<tr>
<td>Black</td>
<td>H</td>
<td>Oven</td>
</tr>
</tbody>
</table>

2.2 Probe AutoCal connections

Note. This section is applicable only to probes fitted with AutoCal.

Referring to IM/AZ20P-EN, Section 4.3.2, connect the 12-core cable to the probe’s AutoCal terminal block – see Table 2.2 for cable color details.

<table>
<thead>
<tr>
<th>Terminal / Cable color</th>
<th>Tag ID</th>
<th>AutoCal connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-core cable part no. 5562C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>PS2</td>
<td>Pressure switch gas 2</td>
</tr>
<tr>
<td>White / Black</td>
<td>PS COM</td>
<td>Pressure switch common</td>
</tr>
<tr>
<td>Orange</td>
<td>PS1</td>
<td>Pressure switch gas 1</td>
</tr>
<tr>
<td>Brown</td>
<td>SV1</td>
<td>Solenoid valve gas 1</td>
</tr>
<tr>
<td>White / Brown</td>
<td>SV COM</td>
<td>Solenoid valve common</td>
</tr>
<tr>
<td>Blue</td>
<td>SV2</td>
<td>Solenoid valve gas 2</td>
</tr>
</tbody>
</table>

Table 2.1 Probe transmitter connections

Table 2.2 Probe AutoCal connections
### 2.3 Remote transmitter connections

Referring to IM/AZ20E-EN, Section 4.4, connect the 2- and 12-core cables to the remote transmitter – see Table 2.3 for cable color details.

<table>
<thead>
<tr>
<th>Terminal number</th>
<th>Tag ID</th>
<th>Connection type</th>
<th>Cable color</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-core cable part no. 5382C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>Heater</td>
<td>Red</td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>Heater</td>
<td>Black</td>
</tr>
<tr>
<td>12-core cable part no. 5562C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SCN</td>
<td>Screen</td>
<td>Screen</td>
</tr>
<tr>
<td>4</td>
<td>T / C –</td>
<td>Thermocouple (–ve)</td>
<td>White</td>
</tr>
<tr>
<td>5</td>
<td>T / C+</td>
<td>Thermocouple (+ve)</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>ACJC</td>
<td>PT1000 cold junction compensation</td>
<td>Slate</td>
</tr>
<tr>
<td>7</td>
<td>ACJC</td>
<td>PT1000 cold junction compensation</td>
<td>Violet</td>
</tr>
<tr>
<td>8</td>
<td>CELL –</td>
<td>Oxygen input (–ve)</td>
<td>Black</td>
</tr>
<tr>
<td>9</td>
<td>CELL +</td>
<td>Oxygen input (+ve)</td>
<td>Red</td>
</tr>
<tr>
<td>10</td>
<td>PS2</td>
<td>Pressure switch – gas 2</td>
<td>Yellow</td>
</tr>
<tr>
<td>11</td>
<td>P COM</td>
<td>Pressure switch – common</td>
<td>White / Black</td>
</tr>
<tr>
<td>12</td>
<td>PS1</td>
<td>Pressure switch – gas 1</td>
<td>Orange</td>
</tr>
<tr>
<td>13</td>
<td>SV2</td>
<td>Solenoid valve – gas 2</td>
<td>Blue</td>
</tr>
<tr>
<td>14</td>
<td>SV COM</td>
<td>Solenoid valve – common</td>
<td>White / Brown</td>
</tr>
<tr>
<td>15</td>
<td>SV1</td>
<td>Solenoid valve – gas 1</td>
<td>Brown</td>
</tr>
</tbody>
</table>

Table 2.3 Remote transmitter connections
3 CSA-approved cable specifications

3.1 Alpha 2-core cable part no. 5382C

ALPHA WIRE COMPANY
CUSTOMER PRODUCT SPECIFICATION

Part Number: 5382C
Page 1 of 1 Pages

<table>
<thead>
<tr>
<th>Issue:</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue Date:</td>
<td>1/29/2008</td>
</tr>
<tr>
<td>Effective Date:</td>
<td>3/1/2008</td>
</tr>
</tbody>
</table>

A. Construction

1) Component 1
   a) Conductor
      18 (16/30) AWG TC
   b) Insulation
      0.016" Wall, Nom. PVC
(1) Color Code
   Alpha Wire Company Color Code D

<table>
<thead>
<tr>
<th>Cond</th>
<th>Core</th>
<th>Diameters (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Core</td>
<td>2 X 1 COND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Cable Assembly
   a) Twists: 6.9 Twists/foot (min)
   b) Core Wrap
      Nonwoven Polyester Tape, 25% Overlap, Min.
3) Shield
   a) Foil Direction
      Foil Facing In
   b) Drain Wire
      18 (16/30) AWG TC
4) Jacket
   a) Color(s)
      Slate, Black, Yellow, Orange, Blue, Green, Red, Sand Beige, White
   b) Ripcord
      1 End 810 Denier Nylon
   c) Print
      ALPHA WIRE™ PN 5382C 2C 18 AWG
      XTRAGUARD 1 XTREME PERFORMANCE FOR XTREME
      ENVIRONMENTS • SHIELDED 105C (UL) TYPE CM OR AWM
      2484 VV-1 --- LXXXXX CSA 105C TYPE CMG FT4
      CE = ROHS <SEQ FOOTAGE>

   * = Factory Code

B. Industry Approvals

1) UL
   a) Component 1
      AWM/STYLE 1569
      105°C / 300 V RMS
   b) Overall
      AWM/STYLE 2484
      80°C / 300 V RMS
     CM
     105°C
     VV-1

2) CSA International
   CMG
   105°C
   FT4

3) EU Directive 2002/95/EC (RoHS):
   All materials used in the manufacture of this part are in compliance with EU
   Directive 2002/95/EC regarding the restriction of use of certain hazardous
   substances in electrical and electronic equipment. Consult Alpha Wire’s web site
   for compliance Date of Manufacture.

4) California Proposition 65:
   The outer surface materials used in the manufacture of this part meet the
   requirements of California Proposition 65.

5) CE:
   LVD 73/23/EEC Amendment 93/68/EEC

C. Physical & Mechanical Properties

1) Temperature Range
   -20 to 105°C
2) Bend Radius
   10X Cable Diameter
3) Pull Tension
   38 Lbs, Maximum
4) Sunlight Resistance
   Yes

D. Electrical Properties
   (For Engineering purposes only)

1) Voltage Rating
   300 V RMS
2) Capacitance
   57 pF/ft @1 kHz, Nominal Conductor to Conductor
3) Ground Capacitance
   103 pF/ft @1 kHz, Nominal
4) Characteristic Impedance
   40 Ω
5) Inductance
   0.18 µH/ft, Nominal

Although Alpha Wire Company ("Alpha") makes every reasonable effort to ensure their accuracy at the time of publication, information and specifications described herein are subject to errors or omissions and to changes without notice, and the listing of such information and specifications does not ensure product availability. Alpha provides the information and specifications herein on an "AS IS" basis, with no representations or warranties, whether express, statutory or implied. In no event shall Alpha be liable for any damages (including consequential, indirect, incidental, special, punitive, or exemplary) whatsoever, even if Alpha has been advised of the possibility of such damages, whether in an action under contract, negligence or any other theory, arising out of or in connection with the use, or inability to use, the information or specifications described herein.

711 Lidgetwood Ave Elizabeth, NJ 07207-0711
Toll Free 1-800-52 ALPHA • T: 1-908-925-8000 • F: 908-925-5411 • Email: info@alphawire.com
www.alphawire.com

Endura AZ20 | Combustion oxygen monitor | Connecting CSA-approved cables | INF12/104-EN  3
### 3. CSA-approved cable specifications

**ALPHA WIRE COMPANY**  
**CUSTOMER PRODUCT SPECIFICATION**

<table>
<thead>
<tr>
<th>Part Number: 5382C</th>
<th>Issue:</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page 2 of 1 Pages</td>
<td>Issue Date:</td>
<td>1/29/2008</td>
</tr>
<tr>
<td></td>
<td>Effective Date:</td>
<td>3/4/2008</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6) Conductor DCR</td>
<td>7.2 Ω/1000ft @20°C, Nominal</td>
<td></td>
</tr>
<tr>
<td>7) OA Shield DCR</td>
<td>6.1 Ω/1000ft @20°C, Nominal</td>
<td></td>
</tr>
</tbody>
</table>

**E. Other**

1) Packaging  
   a) 1000 FT  
   b) 500 FT  
   c) 100 FT  
   d) Bulk (Made-to-order)

---

Although Alpha Wire Company ("Alpha") makes every reasonable effort to ensure their accuracy at the time of publication, information and specifications described herein are subject to errors or omissions and to changes without notice, and the listing of such information and specifications does not ensure product availability.

Alpha provides the information and specifications herein on an "AS IS" basis, with no representations or warranties, whether express, statutory or implied. In no event will Alpha be liable for any damages (including consequential, indirect, incidental, special, punitive, or exemplary) whatsoever, even if Alpha has been advised of the possibility of such damages, whether in an action under contract, negligence or any other theory, arising out of or in connection with the use, or inability to use, the information or specifications described herein.

711 Lidgenwood Ave Elizabeth, NJ 07207-0711  
Toll Free 1-800-52 ALPHA • T: 1-908-925-8000 • F: 908-925-5411 • Email: info@alphawire.com  
www.alphawire.com
3.2 Alpha 12-core cable part no. 5562C

ALPHA WIRE COMPANY
CUSTOMER PRODUCT SPECIFICATION

Part Number: 5562C  
Issue: 10  
Page 1 of 1 Pages  
Issue Date: 1/29/2008  
Effective Date: 3/1/2008

A. Construction

1) Component 1
   a) Conductor  
      12 X 1 COND  
      20 (7/28) AWG TC
   b) Insulation  
      0.010" Wall, Nom. PVC, Semi Rigid
      Color Code Alpha Wire Company Color Code E
      
<table>
<thead>
<tr>
<th>Color Code</th>
<th>Color</th>
<th>Code</th>
<th>Color</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 BLACK</td>
<td>6 YELLOW</td>
<td>09</td>
<td>SLATE</td>
<td></td>
</tr>
<tr>
<td>02 BROWN</td>
<td>6 GREEN</td>
<td>10</td>
<td>WHITE</td>
<td></td>
</tr>
<tr>
<td>03 RED</td>
<td>7 BLUE</td>
<td>11</td>
<td>WHITE/BLACK</td>
<td></td>
</tr>
<tr>
<td>04 ORANGE</td>
<td>8 TAN</td>
<td>12</td>
<td>WHITE/BROWN</td>
<td></td>
</tr>
</tbody>
</table>

2) Cable Assembly
   12 Components Cabled
   a) Twists:
      4.4 Twists/foot (min)
   b) Core Wrap
      Nonwoven Polyester Tape, 25% Overlap, Min.

3) Shield:
   Alum/Mylar Tape, 25% Overlap, Min.
   a) Foil Direction
      Foil Facing In
   b) Drain Wire
      20 (7/28) AWG TC

4) Jacket
   0.063" Wall, Nom., PVC
   a) Color(s)
      Slate, Black, Yellow, Orange, Blue, Green, Red, Sand Beige, White
   b) Ripcord
      1 End 810 Denier Nylon
   c) Print
      ALPHA WIRE® PIN 5562C 12C 20 AWG
      XTRAQUARD 1. XTREME PERFORMANCE FOR XTREME
      ENVIRONMENTS - SHIELDED 105C (UL) TYPE CM OR AWM
      2343 VW-1 --- LLLLLLX CSA 105C TYPE CMG FT4
      CE ROHS <SEQ FOOTAGE>
      * = Factory Code

   [Note: Product may have c(UL) or CSA markings depending upon plant of manufacture.]

B. Industry Approvals

1) UL
   a) Component 1
      AWM/STYLE 10002  
      105°C / 300 VRMS
   b) Overall
      AWM/STYLE 2343  
      80°C
      CM  
      105°C
      VW-1

2) CSA International
   CMG  
   105°C

3) EU Directive 2002/95/EC(RoHS):
   All materials used in the manufacture of this part are in compliance with EU
   Directive 2002/95/EC regarding the restriction of use of certain hazardous
   substances in electrical and electronic equipment. Consult Alpha Wire's web site
   for compliance Date of Manufacture.

4) California Proposition 65: The outer surface materials used in the manufacture of this part meet the
   requirements of California Proposition 65.

5) CE:
   LVD 73/23/EEC Amendment 93/68/EEC

C. Physical & Mechanical Properties

1) Temperature Range
   -20 to 105°C

2) Bend Radius
   10X Cable Diameter

3) Pull Tension
   114 Lbs, Maximum

4) Sunlight Resistance
   Yes

D. Electrical Properties
   (For Engineering purposes only)

1) Voltage Rating
   300 VRMS

2) Capacitance
   40 pF/ft @1 kHz, Nominal Conductor to Conductor

3) Ground Capacitance
   72 pF/ft @1 kHz, Nominal

4) Inductance
   0.17 μH/ft, Nominal

Although Alpha Wire Company ("Alpha") makes every reasonable effort to ensure their accuracy at the time of publication, information and specifications described herein are subject to errors or omissions and to changes without notice, and the listing of such information and specifications does not ensure product availability.

Alpha provides the information and specifications herein on an "AS IS" basis, with no representations or warranties, whether express, statutory or implied. In no event will Alpha be liable for any damages (including consequential, indirect, incidental, special, punitive, or exemplary) whatsoever, even if Alpha has been advised of the possibility of such damages, whether in an action under contract, negligence or any other theory, arising out of or in connection with the use, or inability to use, the information or specifications described herein.

711 Lidgerwood Ave Elizabeth, NJ 07207-0711
Toll Free 1-800-52 ALPHA • T: 1-908-925-8000 • F: 908-925-5411 • Email: info@alphawire.com
www.alphawire.com

Endura AZ20 | Combustion oxygen monitor | Connecting CSA-approved cables | INF12/104-EN 5
### ALPHA WIRE COMPANY
CUSTOMER PRODUCT SPECIFICATION

<table>
<thead>
<tr>
<th>Part Number: 5562C</th>
<th>Issue: 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page 2 of 1 Pages</td>
<td>Issue Date: 1/29/2008</td>
</tr>
<tr>
<td></td>
<td>Effective Date: 3/1/2008</td>
</tr>
</tbody>
</table>

5) Conductor DCR 10.3 Ω/1000ft @20°C, Nominal  
6) OA Shield DCR 8.3 Ω/1000ft @20°C, Nominal

**E. Other**

1) Packaging  
   a) 1000 FT  
   b) 500 FT  
   c) 100 FT  
   d) Bulk(Made-to-order)

---

Although Alpha Wire Company ("Alpha") makes every reasonable effort to ensure their accuracy at the time of publication, information and specifications described herein are subject to errors or omissions and to changes without notice, and the listing of such information and specifications does not ensure product availability.

Alpha provides the information and specifications herein on an "AS IS" basis, with no representations or warranties, whether express, statutory or implied. In no event will Alpha be liable for any damages (including consequential, indirect, incidental, special, punitive, or exemplary) whatsoever, even if Alpha has been advised of the possibility of such damages, whether in an action under contract, negligence or any other theory, arising out of or in connection with the use, or inability to use, the information or specifications described herein.