FM Hazardous Area Approvals
Fisher™ FIELDVUE™ DVC6200 Series
Digital Valve Controllers

Hazardous Area Approvals and Special Instructions
for “Safe Use” and Installations in Hazardous Locations

Certain nameplates may carry more than one approval, and each approval may have unique installation/wiring
requirements and/or conditions of “safe use”. These special instructions for “safe use” are in addition to, and may
override, the standard installation procedures. Special instructions are listed by approval type.

Note
This information supplements the nameplate markings affixed to the product and the DVC6200 Series quick start guide
(D103556X012), available from your Emerson sales office or Local Business Partner, or at Fisher.com.
Always refer to the nameplate itself to identify the appropriate certification.

WARNING
Failure to follow these conditions of “safe use” could result in personal injury or property damage from fire or explosion
and area re-classification.

Explosion-proof, Dust-Ignition proof, Non-Incendive, Suitable for Use
DVC6200 and DVC6205 Series (HART HW1 & HW2, SIS, FOUNDATION Fieldbus, PROFIBUS)

XP: Class I, Division 1, Groups B,C,D
DIP: Class II, III, Division 1, Groups E,F,G
NI: Class I, Division 2, Groups A,B,C,D
S: Class II, III, Division 2, Groups F,G
Class I Zone 1 AEx d IIC
Class I Zone 2 Ex nC IIC
T5 Ta = 80°C, T6 Ta = 75°C
Type 4X, IP66
DVC6215 Remote Mount

XP: Class I, Division 1, Groups A,B,C,D
DIP: Class II, III, Division 1, Groups E,F,G
NI: Class I, Division 2, Groups A,B,C,D
S: Class II, III, Division 2, Groups F,G
Class I Zone 1 AEx d IIC
Class I Zone 2 Ex nA IIC
T4 Ta = 125°C, T5 Ta = 90°C, T6 Ta = 75°C
Type 4X, IP66

Intrinsically Safe and Nonincendive Field Wiring

Intrinsic Safety
IS Class I, II, III Division 1 Groups A,B,C,D,E,F,G
Class I Zone 0 AEx ia IIC
Class I Zone 2 AEx ic IIC
Nonincendive Field Wiring
NI Class I Division 2 Groups A,B,C,D
Type 4X, IP66
Intrinsically safe or Nonincendive Field Wiring when connected per control drawing GE42819, as shown in the following figures

DVC6200 HW2 and DVC6200 SIS
Intrinsically Safe ......................................................... figure 1 and 15
Intrinsically Safe or Nonincendive Field Wiring ........................................... figure 2 and 15

DVC6205, DVC6205 SIS, and DVC6215 Remote Mount
Intrinsically Safe ......................................................... figure 3 and 15
Intrinsically Safe or Nonincendive Field Wiring ........................................... figure 4 and 15

DVC6200f and DVC6200p
Entity Fieldbus Loop: Intrinsically Safe ........................................... figure 5 and 15
Entity Fieldbus Loop: Intrinsically Safe or Nonincendive Field Wiring ........... figure 6 and 15
FISCO Installations: Intrinsically Safe ........................................... figure 7 and 15
FISCO Installations: Intrinsically Safe or Nonincendive Field Wiring ........... figure 8 and 15

DVC6205f, DVC6205p, and DVC6215 Remote Mount
Entity Fieldbus Loop: Intrinsically Safe ........................................... figure 9 and 15
Entity Fieldbus Loop: Intrinsically Safe or Nonincendive Field Wiring ........... figure 10 and 15
FISCO Installations: Intrinsically Safe ........................................... figure 11 and 15
FISCO Installations: Intrinsically Safe or Nonincendive Field Wiring ........... figure 12 and 15

DVC6200 HW1
Intrinsically Safe ......................................................... figure 13 and 15
Intrinsically Safe or Nonincendive Field Wiring ........................................... figure 14 and 15

Special Conditions of Safe Use

- When product is used with natural gas as the pneumatic medium, the maximum working pressure of the natural gas supply shall be limited to 10 bar (145 psi).
- When product is used with natural gas as the pneumatic medium the product shall not be permitted in a Class I, Division 2, Group A, B, C, D location without the proper venting installation per the manufacturer's instruction manual.
- The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
- Part of the enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.
Figure 1. FM Loop Schematics—FIELDVUE DVC6200 HW2 and DVC6200 SIS

INTRINSICALLY SAFE

HAZARDOUS LOCATION

DVC6200, DVC6200S
(HW2 CONSTRUCTION)

LOOP TERMINALS

Vmax = 30 VDC
Imax = 130 mA
Pi = 1.0 W
Ci = 15 nF
**Li = 0.35 mH

OUTPUT TERMINALS

Vmax = 28 VDC
Imax = 100 mA
Pi = 1.0 W
Ci = 15 nF
Li = 0.50 mH

WITH I/O PACKAGE
T5 (Tamb) ≤ 80°C
T6 (Tamb) ≤ 61°C

WITHOUT I/O PACKAGE
T5 (Tamb) ≤ 80°C
T6 (Tamb) ≤ 74°C

NOTE 7

NOTE 9

NON-HAZARDOUS LOCATION

FM APPROVED BARRIER

NOTE 1, 3, 4, 5, 6

FM APPROVED BARRIER

NOTE 1, 3, 4, 5, 6

NOTE 1, 3, 4, 5, 6

POWER MAY BE APPLIED TO EITHER THE LOOP TERMINALS OR OUTPUT TERMINALS OR TO BOTH SETS OF TERMINALS AT THE SAME TIME

UNITS WITHOUT THE I/O PACKAGE WILL NOT HAVE “OUTPUT TERMINALS” AVAILABLE FOR CONNECTION

** Li = 0.15 mH WHEN THE AUX TERMINALS ARE NOT USED OR NOT PROVIDED

SEE NOTES IN FIGURE 15

GX4293 Sheet 11, Rev C
INTRINSICALLY SAFE OR
NONINCENDIVE FIELD WIRING

HAZARDOUS LOCATION

DVC6200, DVC6200S
(HW2 CONSTRUCTION)

LOOP TERMINALS

V_{\text{max}} = \text{N/A}
I_{\text{max}} = 130 \text{ mA}
C_{\text{i}} = 15 \text{ nF}
* \* L_{\text{i}} = 0.55 \text{ mH}

OUTPUT TERMINALS

V_{\text{max}} = \text{N/A}
I_{\text{max}} = 100 \text{ mA}
C_{\text{i}} = 15 \text{ nF}
L_{\text{i}} = 0.50 \text{ mH}

WITH OR WITHOUT
I/O PACKAGE

T_{5} (T_{\text{amb}}) \leq 80^\circ \text{C}
T_{6} (T_{\text{amb}}) \leq 75^\circ \text{C}

NON-HAZARDOUS LOCATION

FM APPROVED BARRIER
OR
NONINCENDIVE CIRCUIT

NOTE 1, 3, 4, 5, 6

FM APPROVED BARRIER
OR
NONINCENDIVE CIRCUIT

NOTE 1, 3, 4, 5, 6

* * L_{\text{i}} = 0.15 \text{ mH WHEN THE AUX
TERMINALS ARE NOT USED OR
NOT PROVIDED

POWER MAY BE APPLIED TO
EITHER THE LOOP TERMINALS OR
OUTPUT TERMINALS OR TO BOTH
SETS OF TERMINALS AT THE SAME
TIME

UNITS WITHOUT THE I/O PACKAGE
WILL NOT HAVE “OUTPUT
TERMINALS” AVAILABLE FOR
CONNECTION

SEE NOTES IN FIGURE 15
Figure 3. FM Loop Schematics—FIELDVUE DVC6205, DVC6205 SIS, and DVC6215

**INTRINSICALLY SAFE**

**HAZARDOUS LOCATION**

**FIELD WIRING TERMINAL BOX**

**DVC6205 (HW2 CONSTRUCTION) WITH OR WITHOUT I/O PACKAGE**

**DVC6205**

- Vmax = 30 VDC
- Imax = 226 mA
- Pl = 1.4 W
- Cl = 50 nF
- Li = 0.55 mH

**NOTE 1, 3**

- T4 (Tamb) ≤ 125°C
- T5 (Tamb) ≤ 95°C
- T6 (Tamb) ≤ 80°C

**WITH I/O PACKAGE**

- T5 (Tamb) ≤ 80°C
- T6 (Tamb) ≤ 61°C

**WITHOUT I/O PACKAGE**

- T5 (Tamb) ≤ 80°C
- T6 (Tamb) ≤ 74°C

**OUTPUT TERMINALS**

- Vmax = 28 VDC
- Imax = 100 mA
- Pl = 1.0 W
- Cl = 15 nF
- Li = 0.50 mH

**NOTE 7**

**FIELDWIRING TERMINAL BOX**

**LOOP TERMINALS**

- Vmax = 30 VDC
- Imax = 130 mA
- Pl = 1.0 W
- Cl = 15 nF
- **Li = 0.55 mH**

**NOTE 1, 3, 4, 5, 6**

**CLASS I ZONE 0 AEx ia IIC**

**I.S. CL I,II,III DIV 1 GP ABCDEFG**

**REMOTE FIELD WIRING TERMINAL BOX**

**REMOTE TERMINALS**

- Voc = 30 VDC
- Isc = 21.2 mA
- Po = 160 mW
- Ca = 55 nF
- La = 78 mH

**NOTE 1, 3, 4, 5, 6**

**NON-HAZARDOUS LOCATION**

**FM APPROVED BARRIER**

- Vmax = 30 VDC
- Imax = 100 mA
- Pl = 1.0 W
- Cl = 15 nF
- **Li = 0.50 mH**

**NOTE 1, 3, 4, 5, 6**

**CLASS I ZONE 0 AEx ia IIC**

**I.S. CL I,II,III DIV 1 GP ABCDEFG**

**T5 (Tamb) ≤ 95°C**

**T6 (Tamb) ≤ 80°C**

**T5 (Tamb) ≤ 74°C**

**WITH I/O PACKAGE**

- T5 (Tamb) ≤ 80°C
- T6 (Tamb) ≤ 74°C

**WITHOUT I/O PACKAGE**

- T5 (Tamb) ≤ 80°C
- T6 (Tamb) ≤ 74°C

**POWER MAY BE APPLIED TO EITHER THE LOOP TERMINALS OR OUTPUT TERMINALS OR TO BOTH SETS OF TERMINALS AT THE SAME TIME**

**UNITS WITHOUT THE I/O PACKAGE WILL NOT HAVE “OUTPUT TERMINALS” AVAILABLE FOR CONNECTION**

**NOTE 9**

**Li = 0.15 mH WHEN THE AUX TERMINALS ARE NOT USED OR NOT PROVIDED**

**SEE NOTES IN FIGURE 15**

GE42819 Sheet 12, Rev. C
Figure 4. FM Loop Schematics—FIELDVUE DVC6205, DVC6205 SIS, and DVC6215

INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING

HAZARDOUS LOCATION

NOTE 1, 3, 4, 5, 6

DVC6205 (HW2 CONSTRUCTION) WITH OR WITHOUT I/O PACKAGE

FIELD WIRING TERMINAL BOX

LOOP TERMINALS

Vmax = N/A
Imax = 130 mA
Pi = N/A
Cl = 15 nF
Li = 0.55 mH

NOTE 7

OUTPUT TERMINALS

Vmax = N/A
Imax = 100 mA
Pi = N/A
Cl = 15 nF
Li = 0.50 mH

NOTE 1, 3, 4, 5, 6

REMOTE FIELD WIRING TERMINAL BOX

CLASS I ZONE 2 AEx ic IIC
N.I. CL I DIV 2 GP ABCD

DVC6215

Vmax = 30 VDC
Imax = 226 mA
Pi = 1.4 W
Cl = 50 nF
Li = 0.55 mH

T4 (Tamb) ≤ 125°C
T5 (Tamb) ≤ 95°C
T6 (Tamb) ≤ 80°C

NOTE 1, 3

NON-HAZARDOUS LOCATION

FM APPROVED BARRIER OR NONINCENDIVE CIRCUIT

NOTE 1, 3, 4, 5, 6

FM APPROVED BARRIER OR NONINCENDIVE CIRCUIT

NOTE 1, 3, 4, 5, 6

WITH OR WITHOUT I/O PACKAGE

T5 (Tamb) ≤ 80°C
T6 (Tamb) ≤ 75°C

POWER MAY BE APPLIED TO EITHER THE LOOP TERMINALS OR OUTPUT TERMINALS OR TO BOTH SETS OF TERMINALS AT THE SAME TIME.

UNITS WITHOUT THE I/O PACKAGE WILL NOT HAVE "OUTPUT TERMINALS" AVAILABLE FOR CONNECTION.

** Li = 0.15 mH WHEN THE AUX TERMINALS ARE NOT USED OR NOT PROVIDED

SEE NOTES IN FIGURE 15

GE42819 Sheet 12, Rev. C
**Figure 5.** FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, Entity Fieldbus Loop

**INTRINSICALLY SAFE**

<table>
<thead>
<tr>
<th>HAZARDOUS LOCATION</th>
<th>NON-HAZARDOUS LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVC6200F, DVC6200FS</td>
<td>FM APPROVED BARRIER</td>
</tr>
<tr>
<td>DVC6200P, DVC6200PS</td>
<td>FM APPROVED BARRIER</td>
</tr>
</tbody>
</table>

Vmax = 24 VDC
Imax = 380 mA
Pi = 1.4 W
Ci = 5 nF
Li = 0 mH

**NOTE 1, 3, 4, 5, 6**

T4 (Tamb) ≤ 80°C
T5 (Tamb) ≤ 77°C
T6 (Tamb) ≤ 62°C

**NOTE 7**

SEE NOTES IN FIGURE 15

**Figure 6.** FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, Entity Fieldbus Loop

**INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING**

<table>
<thead>
<tr>
<th>HAZARDOUS LOCATION</th>
<th>NON-HAZARDOUS LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVC6200F, DVC6200FS</td>
<td>FM APPROVED BARRIER</td>
</tr>
<tr>
<td>DVC6200P, DVC6200PS</td>
<td>FM APPROVED BARRIER</td>
</tr>
</tbody>
</table>

Vmax = 30 VDC
Imax = N/A
Pi = N/A
Ci = 5 nF
Li = 0 mH

**NOTE 8**

T5 (Tamb) ≤ 80°C
T6 (Tamb) ≤ 75°C

**NOTE 7**

SEE NOTES IN FIGURE 15
Figure 7. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, FISCO Installations

INTRINSICALLY SAFE

HAZARDOUS LOCATION

CLASS I ZONE 0 AEx ia IIC
I.S. CL.II,I,III DIV 2 GP ABCDEFG

DVC6200F, DVC6200FS
DVC6200P, DVC6200PS

FM APPROVED FISCO DEVICE

FISCO FIELD DEVICE

T4 (Tamb) ≤ 80 °C
T5 (Tamb) ≤ 77 °C
T6 (Tamb) ≤ 62 °C

FM APPROVED FISCO TERMINATOR

FM APPROVED POWER SUPPLY
(Ex ia IIC)

NOTE 2, 3, 4, 5, 6

NON-HAZARDOUS LOCATION

NOTE 9

Figure 8. FM Loop Schematics—FIELDVUE DVC6200f and DVC6200p, FISCO Installations

INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING

HAZARDOUS LOCATION

CLASS I ZONE 2 AEx ic IIC
N.I. CL I DIV 2 GP ABCD

DVC6200F, DVC6200FS
DVC6200P, DVC6200PS

FM APPROVED FISCO DEVICE

FISCO FIELD DEVICE

T5 (Tamb) ≤ 80 °C
T6 (Tamb) ≤ 75 °C

FM APPROVED FISCO TERMINATOR

FM APPROVED POWER SUPPLY
(Ex ic IIC minimum)

NOTE 2, 3, 4, 5, 6

SEE NOTES IN FIGURE 15

GE42819 Sheet 4, Rev. F
Figure 9. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, Entity Fieldbus Loop

**INTRINSICALLY SAFE**

HAZARDOUS LOCATION

NON-HAZARDOUS LOCATION

---

NOTE 1, 3

T4 (Tamb) ≤ 125°C

T5 (Tamb) ≤ 95°C

T6 (Tamb) ≤ 80°C

FM APPROVED

ENTITY DEVICE

NOTE 9

T4 (Tamb) ≤ 80°C

T5 (Tamb) ≤ 77°C

T6 (Tamb) ≤ 62°C

FM APPROVED

BARRIER

---

NOTE 7

NOTE 1, 9

Voc = 24 VDC

Isc = 44 mA

Po = 330 mW

Ca = 121 nF

La = 30 mH

DVC6215

Vmax = 30 VDC

Imax = 226 mA

Pi = 1.4 W

Ci = 50 nF

Li = 0.55 mH

DVC6205f, DVC6205p

Vmax = 24 VDC

Imax = 380 mA

Pi = 1.4 W

Ci = 5 nF

Li = 0 mH

DVC6205f, DVC6205p

Voc = 30 VDC

Isc = 44 mA

Po = 330 mW

Ca = 121 nF

La = 30 mH

DVC6205f, DVC6205p

Vmax = 30 VDC

Imax = N/A

Pi = N/A

Ci = N/A

Li = N/A

---

NOTE 1

NOTE 3

NOTE 4

NOTE 5

NOTE 6

T4 (Tamb) ≤ 125°C

T5 (Tamb) ≤ 95°C

T6 (Tamb) ≤ 80°C

T4 (Tamb) ≤ 80°C

T5 (Tamb) ≤ 77°C

T6 (Tamb) ≤ 62°C

---

SEE NOTES IN FIGURE 15

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Figure 10. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, Entity Fieldbus Loop

**INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING**

HAZARDOUS LOCATION

NON-HAZARDOUS LOCATION

---

NOTE 1

NOTE 7

T4 (Tamb) ≤ 125°C

T5 (Tamb) ≤ 95°C

T6 (Tamb) ≤ 80°C

T5 (Tamb) ≤ 80°C

T6 (Tamb) ≤ 75°C

FM APPROVED

ENTITY DEVICE

NOTE 8

FM APPROVED

BARRIER

OR

NONINCENDIVE CIRCUIT

---

NOTE 1

NOTE 3

NOTE 4

NOTE 5

NOTE 6

SEE NOTES IN FIGURE 15

---

Voc = 30 VDC

Isc = 44 mA

Po = 330 mW

Ca = 121 nF

La = 30 mH

FM APPROVED

ENTITY DEVICE

NOTE 9

FM APPROVED

BARRIER

OR

NONINCENDIVE CIRCUIT

---

Voc = 30 VDC

Isc = 380 mA

Po = 330 mW

Ca = 121 nF

La = 30 mH

FM APPROVED

BARRIER

OR

NONINCENDIVE CIRCUIT

---

T4 (Tamb) ≤ 125°C

T5 (Tamb) ≤ 95°C

T6 (Tamb) ≤ 80°C

T5 (Tamb) ≤ 80°C

T6 (Tamb) ≤ 75°C

NOTE 1

NOTE 3

NOTE 4

NOTE 5

NOTE 6

---

SEE NOTES IN FIGURE 15
Figure 11. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, FISCO Installations

**INTRINSICALLY SAFE**

<table>
<thead>
<tr>
<th>HAZARDOUS LOCATION</th>
<th>NON-HAZARDOUS LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS I ZONE 0 AEx ia IIC</td>
<td>CLASS I ZONE 0 AEx ia IIC</td>
</tr>
<tr>
<td>I.S. CI,II,III DIV 1 GP ABCDEFG</td>
<td>I.S. CI,II,III DIV 1 GP ABCDEFG</td>
</tr>
</tbody>
</table>

DVC6215

- Vmax = 30 VDC
- Imax = 226 mA
- Pi = 1.4 W
- Ci = 50 nF
- Li = 0.55 mH

DVC6205f, DVC6205p

- Voc = 17.75 VDC
- Isc = 44 mA
- Po = 330 mW
- Ca = 121 nF
- La = 30 mH

FM APPROVED FISCO DEVICE

T4 (Tamb) ≤ 125°C
T5 (Tamb) ≤ 95°C
T6 (Tamb) ≤ 80°C

FM APPROVED FISCO TERMINATOR

NOTE 2, 3

SEE NOTES IN FIGURE 15

GE42819 Sheet 10, Rev. D

Figure 12. FM Loop Schematics—FIELDVUE DVC6205f, DVC6205p, and DVC6215, FISCO Installations

**INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING**

<table>
<thead>
<tr>
<th>HAZARDOUS LOCATION</th>
<th>NON-HAZARDOUS LOCATION</th>
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<tr>
<td>CLASS I ZONE 2 AEx ic IIC</td>
<td>CLASS I ZONE 2 AEx ic IIC</td>
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<tr>
<td>N.I. CI DIV 2 GP ABC</td>
<td>N.I. CI DIV 2 GP ABC</td>
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</tbody>
</table>

DVC6215

- Vmax = 30 VDC
- Imax = 226 mA
- Pi = 1.4 W
- Ci = 50 nF
- Li = 0.55 mH

DVC6205f, DVC6205p

- Voc = 17.5 VDC
- Isc = 44 mA
- Po = 330 mW
- Ca = 121 nF
- La = 30 mH

FM APPROVED FISCO DEVICE

T4 (Tamb) ≤ 125°C
T5 (Tamb) ≤ 95°C
T6 (Tamb) ≤ 80°C

FM APPROVED FISCO TERMINATOR

NOTE 2, 3

SEE NOTES IN FIGURE 15

GE42819 Sheet 10, Rev. D
Figure 13. FM Loop Schematic—FIELDVUE DVC6200 HW1

**INTRINSICALLY SAFE**

HAZARDOUS LOCATION | NON-HAZARDOUS LOCATION

CLASS I ZONE 0 AEx ia IIC
I.S. CLASS I,II,III DIV 1 GP ABCDEFG

DVC6200, DVC6200S

Vmax = 30 VDC
Imax = 226 mA
Pi = 1.4 W
Ci = 5 nF
Li = 0.55 mH

T5 (Tamb) \(\leq 80^\circ C\)
T6 (Tamb) \(\leq 75^\circ C\)

NOTE 9

SEE NOTES IN FIGURE 15

Figure 14. FM Loop Schematic—FIELDVUE DVC6200 HW1

**INTRINSICALLY SAFE OR NONINCENDIVE FIELD WIRING**

HAZARDOUS LOCATION | NON-HAZARDOUS LOCATION

CLASS I ZONE 2 AEx ic IIC
N.I. CL I DIV 2 GP ABCD

DVC6200, DVC6200S

Vmax = N/A
Imax = 226 mA
Pi = N/A
Ci = 5 nF
Li = 0.55 mH

T5 (Tamb) \(\leq 80^\circ C\)
T6 (Tamb) \(\leq 75^\circ C\)

NOTE 8

SEE NOTES IN FIGURE 15
THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (Vmax or Ui), THE CURRENT (Imax or Ii), AND THE POWER (Pmax or Pi) OF THE INTRINSICALLY SAFE APPARATUS MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc or Uo), AND THE CURRENT (Isc or Io), AND THE POWER (Po) DEFINED BY THE ASSOCIATED APPARATUS. IN ADDITION, THE SUM OF THE MAX UNPROTECTED CAPACITANCE (Ci) AND MAX UNPROTECTED INDUCTANCE (Li), INCLUDING THE INTERCONNECTING CABLE CAPACITANCE (Ccable) AND CABLE INDUCTANCE (Lcable) MUST BE LESS THAN THE ALLOWABLE CAPACITANCE (Ca) AND INDUCTANCE (La) DEFINED BY THE ASSOCIATED APPARATUS. IF THE ABOVE CRITERIA IS MET, THEN THE COMBINATION MAY BE CONNECTED.

Vmax or Ui ≥ Voc or Uo Imax or Ii ≥ Isc or Io Pmax or Pi ≥ Po Ci + Ccable ≤ Ca Li + Lcable ≤ La

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR THE INTERCONNECTION IS THAT THE VOLTAGE (Vmax OR Ui), CURRENT (Imax OR Ii), AND POWER (Pmax OR Pi), WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE, CONSIDERING FAULTS, MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc OR Uo), CURRENT (Isc OR Io), AND POWER (Po) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF AND 10 uH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE (Uo OR Voc OR Vt) OF THE ASSOCIATED APPARATUS HAS TO BE LIMITED TO THE RANGE OF 9 V TO 17.5 VDC. ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT FOR A LEAKAGE CURRENT OF 50 uA FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS A GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO CONNECT THE DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

LOOP RESISTANCE R': 15 TO 150 ohms/km
INDUCTANCE PER UNIT LENGTH L: 0.4 TO 1 mH/km
CAPACITANCE PER UNIT LENGTH C: 80 TO 200 nF/km
C' = C LINE/LINE + 0.5 LINE/SCREEN, IF BOTH LINES ARE FLOATING OR
C' = C LINE/LINE + C LINE/SCREEN, IF THE SCREEN IS CONNECTED TO ONE LINE.
LENGTH OF SPLICE: < 1 m (T-BOX MUST ONLY CONTAIN TERMINAL CONNECTIONS WITH NO ENERGY STORAGE CAPABILITY)
LENGTH OF SPUR CABLE: < 30 M
LENGTH OF TRUNK CABLE: < 1 km

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE: R = 90 TO 100 ohms AND C = 0 TO 2.2 uF.

NOTE, A BUILT-IN TERMINATOR IS INCLUDED IN THE FIELD SIDE AND A SELECTABLE TERMINATOR IS AVAILABLE ON THE HOST SIDE.

THE NUMBER OF PASSIVE DEVICES CONNECTED TO THE BUS SEGMENT IS NOT LIMITED IN THE FISCO CONCEPT FOR INTRINSICALLY SAFE REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF THE LENGTH OF THE TRUNK CABLE AND ALL SPUR CABLES), THE INDUCTANCE AND CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ANSI/ISA RP12.6.01.
MAXIMUM SAFE AREA VOLTAGE SHOULD NOT EXCEED 250 Vrms.
RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN ONE OHM.
LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTIONS.
IF HAND-HELD COMMUNICATOR OR MULTIPLEXER IS USED, IT MUST BE FM APPROVED WITH ENTITY PARAMETERS AND INSTALLED PER THE MANUFACTURER'S CONTROL DRAWINGS.
Figure 15. Notes for FM Loop Schematics

CONTINUED

FOR NONINCENDIVE APPLICATION, E.G. CLASS I DIVISION 2 OR AEx ic, PLEASE NOTE THE FOLLOWING:

HART MODELS

DURING NORMAL OPERATION, THE VOLTAGE OF THE FIELD WIRING CIRCUIT CONNECTED TO THE DIGITAL VALVE CONTROLLER IS CONTROLLED BY THE DIGITAL VALVE CONTROLLER ITSELF. THEREFORE, THE LIMITING FACTOR IS THE MAXIMUM CURRENT, Imax OR i, WHICH MUST NOT BE EXCEEDED.

FIELDBUS/PROFIBUS MODELS

DURING NORMAL OPERATION, THE CURRENT OF THE FIELD WIRING CIRCUIT CONNECTED TO THE DIGITAL VALVE CONTROLLER IS CONTROLLED BY THE DIGITAL VALVE CONTROLLER ITSELF. THEREFORE THE LIMITING FACTOR IS THE MAXIMUM VOLTAGE, Vmax OR Ui, WHICH MUST NOT BE EXCEEDED.

CAUTION/WARNING

THE APPARATUS ENCLOSURE CONTAINS ALUMINUM AND IS CONSIDERED TO CONSTITUTE A POTENTIAL RISK OF IGNITION BY IMPACT AND FRICTION. AVOID IMPACT AND FRICTION DURING INSTALLATION AND USE TO PREVENT RISK OF IGNITION.