Installation diagram FCx4

POWER SUPPLY
Non IS Terminals
max 250Vrms

SIGNAL DATA INPUT/OUTPUT
"IS" or "ia" if installed in Zone 1 or Division 1.
In Zone 1 or Division 1 intrinsically safe supply required

SENSOR SIGNALS
Connection between sensor and associated FCT4 transmitter

ORDINARY LOCATION GENERAL PURPOSE
ATEX: -
IECEx: -

HAZARDOUS LOCATION
Zone 2/21
Division 2 & ZN 2/21
ATEX: II 3 G & II 2 D
IECEx: Gc & Db
US:  I / 1 / 2 / ABCD & DIP / II,III / 1 / EFG
     I / 2 / AEx nA & I / 21 AEx tb
CDN: I / 2 / ABCD & II,III / 1 / EFG
     I / 2 / Ex nA & I / 21 Ex tb

HAZARDOUS LOCATION
Zone 1/21
Division 1 & ZN 1/21
ATEX: II 1/ (1) G & II 2 (1) D
     II 2/1 G & II 2 D
     II 2 (1) G & II 2 (1) D
IECEx: Gb/Ga (Ga) & Db (Da)
     Gb/Ga & Db
     Gb (Ga) & Db (Da)
US:  XP-IS I / 1 / 1 / ABCD & DIP / II,III / 1 / EFG
     I / 1 / AEx ia mb tb & I / 21 / AEx ia ma tb
CDN: XP-IS I / 1 / ABCD & DIP / II,III / 1 / EFG
     I / 1 / Ex ia mb tb & I / 21 / Ex ia ma tb

ABB Automation Products GmbH

Installation diagram FCB
3KXF000028G0009
Notes: ATEX & IECEx application
1. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO ATEX/IECEx APPROVED INTRINSICALLY SAFE DEVICES WITH ENTITY PARAMETERS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN: Uo OR Voc OR Vt < V MAX; Io OR Ioc OR It < I MAX; Ca OR Co > Ci + Ccable; La OR Lo > Li + Lcable; Po < Pi.

2. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN Zone 21/22 ENVIRONMENTS.

3. CONTROL EQUIPMENT CONNECTED TO THE ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc WITH RESPECT TO EARTH.

4. INSTALLATION SHOULD BE IN ACCORDANCE WITH THE RELEVANT INTERNATIONAL OR NATIONAL REGULATIONS „INSTALLATION OF INTRINSICALLY SAFE FOR HAZARDOUS LOCATIONS” REGULATIONS.

5. THE CONFIGURATION OF ASSOCIATED APPARATUS MUST BE ATEX or IECEx APPROVED UNDER ENTITY CONCEPT.

6. ASSOCIATED APPARATUS MANUFACTURER’S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.

7. THE ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURE’S INSTALLATION DIAGRAM

8. SELECTED ASSOCIATED APPARATUS MUST BE THIRD PARTY LISTED AS PROVIDING INTRINSICALLY SAFE CIRCUITS FOR THE APPLICATION. IT MUST MEET THE REQUIREMENTS LISTED IN TABLE OF THIS INSTALLATION DIAGRAM:

Notes: US and Canadian application
1. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO FM AND/OR CSA APPROVED INTRINSICALLY SAFE DEVICES WITH ENTITY PARAMETERS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN: Uo OR Voc OR Vt < V MAX; Io OR Ioc OR It < I MAX; Ca OR Co > Ci + Ccable; La OR Lo > Li + Lcable; Po < Pi.

2. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN CLASS II AND III ENVIRONMENTS.

3. CONTROL EQUIPMENT CONNECTED TO THE ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc WITH RESPECT TO EARTH.

4. INSTALLATION FOR U.S. AND CANADIAN APPROVED EQUIPMENT SHOULD BE IN ACCORDANCE WITH ANSI/ISA RP12.6 „INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS“; THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) SECTIONS 504, 505 AND THE CANADIAN ELECTRICAL CODE (C22.1-02).

5. THE CONFIGURATION OF ASSOCIATED APPARATUS MUST BE FM AND/OR CSA APPROVED UNDER ENTITY CONCEPT.

6. ASSOCIATED APPARATUS MANUFACTURER’S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.

7. THE ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURE’S INSTALLATION DIAGRAM

8. SELECTED ASSOCIATED APPARATUS MUST BE THIRD PARTY LISTED AS PROVIDING INTRINSICALLY SAFE CIRCUITS FOR THE APPLICATION. IT MUST MEET THE REQUIREMENTS LISTED IN TABLE OF THIS INSTALLATION DIAGRAM:
Allowed I/O connections and OPTION CARD handling:

- **CO1 passive**
  - Current OUT 1 (on Board)

- **CO1 active**
  - Current OUT 1 (on Board)

- **DO1 passive**
  - Digital OUT 1 (on Board)

- **DO2 passive**
  - Digital OUT 2 (on Board)

- **ABB (passive)**
  - Uco +
  - 52 -
  - 21 +

- **CUSTOMER (active)**
  - LOAD

- **ABB (active)**
  - Uco +
  - 52 -
  - 21 +

  **WARNING**: Uco should only be used for "ON-Board" Current Out!

- **CUSTOMER (active)**
  - LOAD

- **ABB (passive)**
  - 41 +
  - 42/52-
  - 51 +

- **CUSTOMER (active)**
  - LOAD

---

*Abbreviation: FCx4*
Allowed I/O connections and OPTION CARD handling:

- Digital OUT 1 (on Board)
- Digital OUT 2 (on Board)
- Active Supply (Option Card) (SLOT 1)

**ABB (passive)**

- V1 +
- V2 -
- max 30mA

**ABB (active)**

- A1 +
- 41 +
- 42/S2-
- 51 -

**CUSTOMER (passive)**

**WARNING!**

V1/V2 should only be used even for 41/42 or 51/S2, but never for both together.
Allowed I/O connections and OPTION CARD handling:

- **Digital OUT 3 (Option Card) (SLOT 2)**
- **Active Supply (Option Card) (SLOT 1)**
- **ABB (active)**
  - V1 +
  - V1 -
  - max. 30mA
- **ABB (passive)**
  - V2 +
  - V2 -

- **DO3 active**
- **DO3 passive**

- **CUSTOMER (active)**
- **LOAD**

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Page 5 of 10
Allowed I/O connections and OPTION CARD handling:

- Current OUT 2 (Option Card) [SL OT 2]
- Active Supply (Option Card) [SL OT 1]
- Current OUT 1 (Option Card) [SL OT 2/3/4] OR [SL OT 1/3, 1/2]
- ABB (passive) [V3+, V4-]
- ABB (active) [V1+, V2-]
  max. 50mA
- CUSTOMER (passive)
- LOAD

Allowed I/O connections and OPTION CARD handling:

- CO2 active
- LOAD
- LOAD

Abbottx (passive) [V3+, V4-]
- ABB (active) [V1+, V2-]
  max. 50mA
- CUSTOMER (active)
- LOAD
Allowed I/O connections and OPTION CARD handling:

- Digital IN 1 (Option Card) (SLOT 2)
  - DI active
  - DI passive
- Active Supply (Option Card) (SLOT 1)
- Digital IN 1 (Option Card) (SLOT 2) or (SLOT 3/4)
- Current OUT 3 (Option Card) (SLOT 1/2)
  - CO3 passive
- ABB (passive)
  - V1 +
  - V4 -
  - max. 50mA
- ABB (active)
  - V1 +
  - V2 -
  - V1 -
  - V2 +
- CUSTOMER (passive)
- LOAD
- CUSTOMER (active)
- LOAD

**Installation diagram FCB**

ABB Automation Products GmbH
Zone 2/21 & Division 2

Model code
- FCa4cY0
- FCa4cA2
- FCa4cF2

HART Communication

<table>
<thead>
<tr>
<th>Indication</th>
<th>Abbr.</th>
<th>Status</th>
<th>Option</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Active or Passive</td>
<td>Chosen Option depending on Model Number (MN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If &quot;or&quot; occurs Terminal depends on MN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indication</th>
<th>Abbr.</th>
<th>Status</th>
<th>Option</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>GP</td>
<td>Ex nA / NI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U_{nom}</td>
<td>I_{nom}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U_{nom}</td>
<td>I_{nom}</td>
</tr>
</tbody>
</table>

### On board

<table>
<thead>
<tr>
<th>Current Output 1</th>
<th>CO1</th>
<th>A</th>
<th>On board Power Supply</th>
<th>31/U_{CO}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Output 1</td>
<td>CO1</td>
<td>P</td>
<td></td>
<td>31/32</td>
</tr>
<tr>
<td>Digital Output 1</td>
<td>DO1</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>41/42 and V1/V2</td>
</tr>
<tr>
<td>Digital Output 1</td>
<td>DO1</td>
<td>P</td>
<td></td>
<td>41/42</td>
</tr>
<tr>
<td>Digital Output 2</td>
<td>DO2</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>51/52 and V1/V2</td>
</tr>
<tr>
<td>Digital Output 2</td>
<td>DO2</td>
<td>P</td>
<td></td>
<td>51/52</td>
</tr>
</tbody>
</table>

### Option Cards (OC)

<table>
<thead>
<tr>
<th>Current Output 2</th>
<th>CO2</th>
<th>A</th>
<th>With OC Active Supply</th>
<th>V1/V2 and V3/V4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Output 2</td>
<td>CO2</td>
<td>P</td>
<td></td>
<td>V1/V2 or V3/V4</td>
</tr>
<tr>
<td>Current Output 3</td>
<td>CO3</td>
<td>P</td>
<td></td>
<td>V1/V2 or V3/V4</td>
</tr>
<tr>
<td>Digital Output 3</td>
<td>DO3</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>V1/V2 and V3/V4</td>
</tr>
<tr>
<td>Digital Output 3</td>
<td>DO3</td>
<td>P</td>
<td></td>
<td>V1/V2 or V3/V4</td>
</tr>
<tr>
<td>Digital Input 1</td>
<td>DI1</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>V1/V2 and V3/V4</td>
</tr>
<tr>
<td>Digital Input 1</td>
<td>DI1</td>
<td>P</td>
<td></td>
<td>V1/V2 or V3/V4</td>
</tr>
</tbody>
</table>

- **GP**
  - U_{nom}: Value in V
  - I_{nom}: Value in mA

- **Ex nA / NI**
  - U_{nom}: Value in V
  - I_{nom}: Value in mA

- **Current Output 1**
  - CO1: Active
  - CO1: Passive

- **Current Output 2**
  - CO2: Active
  - CO2: Passive

- **Digital Output 1**
  - DO1: Active
  - DO1: Passive

- **Digital Output 2**
  - DO2: Active
  - DO2: Passive

- **Digital Input 1**
  - DI1: Active
  - DI1: Passive

- **Terminal**
  - On board Power Supply 31/U_{CO}
  - On board Power Supply 31/32
  - With OC Active Supply 41/42 and V1/V2
  - With OC Active Supply 41/42
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52

- **Option Cards (OC)**
  - With OC Active Supply V1/V2 and V3/V4
  - With OC Active Supply V1/V2 or V3/V4
  - With OC Active Supply V1/V2 and V3/V4
  - With OC Active Supply V1/V2 or V3/V4
  - With OC Active Supply V1/V2 and V3/V4
  - With OC Active Supply V1/V2 or V3/V4
  - With OC Active Supply V1/V2 and V3/V4
  - With OC Active Supply V1/V2 or V3/V4
  - With OC Active Supply V1/V2 and V3/V4
  - With OC Active Supply V1/V2 or V3/V4

- **Digital Output 3**
  - DO3: Active
  - DO3: Passive

- **Digital Input 1**
  - DI1: Active
  - DI1: Passive

- **Terminal**
  - On board Power Supply 31/U_{CO}
  - On board Power Supply 31/32
  - With OC Active Supply 41/42 and V1/V2
  - With OC Active Supply 41/42
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52

- **Terminal**
  - On board Power Supply 31/U_{CO}
  - On board Power Supply 31/32
  - With OC Active Supply 41/42 and V1/V2
  - With OC Active Supply 41/42
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52

- **Terminal**
  - On board Power Supply 31/U_{CO}
  - On board Power Supply 31/32
  - With OC Active Supply 41/42 and V1/V2
  - With OC Active Supply 41/42
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52

- **Terminal**
  - On board Power Supply 31/U_{CO}
  - On board Power Supply 31/32
  - With OC Active Supply 41/42 and V1/V2
  - With OC Active Supply 41/42
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52 and V1/V2
  - With OC Active Supply 51/52
  - With OC Active Supply 51/52
### HART Communication

#### Model Code

- **FCa4cA1**
- **FCa4cF1**

#### Installation Diagram

**Diagram Reference:** FCB

**Document Reference:** 3KXF000028G0009

**Date:** 02.04.2015

**Status:** FBu

#### Indicator Table

<table>
<thead>
<tr>
<th>Indication</th>
<th>Abbr.</th>
<th>Status</th>
<th>Option</th>
<th>Terminal</th>
<th>Operating Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>On board</td>
<td></td>
</tr>
<tr>
<td>Current Out 1</td>
<td>CO1</td>
<td>A</td>
<td>On board Power Supply</td>
<td>31/U CO</td>
<td>0,2 30 115 815 10 5 5 0,08 0,08</td>
</tr>
<tr>
<td>Current Out 1</td>
<td>CO1</td>
<td>P</td>
<td>On board Power Supply</td>
<td>31/32</td>
<td>0,2 -30 -115 -815 -27 -5 0,08 0,08</td>
</tr>
<tr>
<td>Digital Output 1</td>
<td>DO1</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>41/42 and V1/V2</td>
<td>30 0,1 27,8 30 119 30 826 225 20 29 29 0,22 0,22</td>
</tr>
<tr>
<td>Digital Output 1</td>
<td>DO1</td>
<td>P</td>
<td>With OC Active Supply</td>
<td>41/42</td>
<td>0,1 -30 -30 -225 27 -5 -0,08</td>
</tr>
<tr>
<td>Digital Output 2</td>
<td>DO2</td>
<td>A</td>
<td>With OC Active Supply</td>
<td>51/52 and V1/V2</td>
<td>30 0,1 27,8 30 119 30 826 225 20 29 29 0,22 0,22</td>
</tr>
<tr>
<td>Digital Output 2</td>
<td>DO2</td>
<td>P</td>
<td>With OC Active Supply</td>
<td>51/52</td>
<td>0,1 -30 -30 -225 27 -5 -0,08</td>
</tr>
</tbody>
</table>

#### Option Cards (OC)

| Current Out 2 | CO2 | A | With OC Active Supply | V1/V2 and V3/V4 | 0,1 27,8 30 119 30 826 225 29 117 0,4 |
| Current Out 2 | CO2 | P | With OC Active Supply | V1/V2 or V3/V4 | 0,1 -30 -68 -510 -45 -59 -0,27 |
| Current Out 3 | CO3 | P | With OC Active Supply | V1/V2 or V3/V4 | 0,1 -30 -68 -510 -45 -59 -0,27 |
| Digital Input 1 | DI1 | A | With OC Active Supply | V1/V2 and V3/V4 | 0,1 27,8 30 119 3,45 826 25,8 17 31 0,4 |
| Digital Input 1 | DI1 | P | With OC Active Supply | V1/V2 or V3/V4 | 0,1 -30 -3,45 -25,8 -13 -16 -0,27 |
Summary of model numbers, option cards and the corresponding customer connections / terminals

Safety Warning:
The option card AS (Active Supply) is only suitable for use with internal option cards. The use of external circuits is not allowed.

Sicherheitshinweis: Die Optionskarte AS (Active Supply) ist nur für die Verwendung mit internen Optionskarten geeignet. Der Einsatz mit externen Schaltkreisen ist nicht erlaubt.