

# *Installation Instructions*

## **FLEX Ex NAMUR Input Module**

Catalog Number 1797-IBN16

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### Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication [SGI-1.1](#) available from your local Rockwell Automation sales office or online at <http://literature.rockwellautomation.com>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.





In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

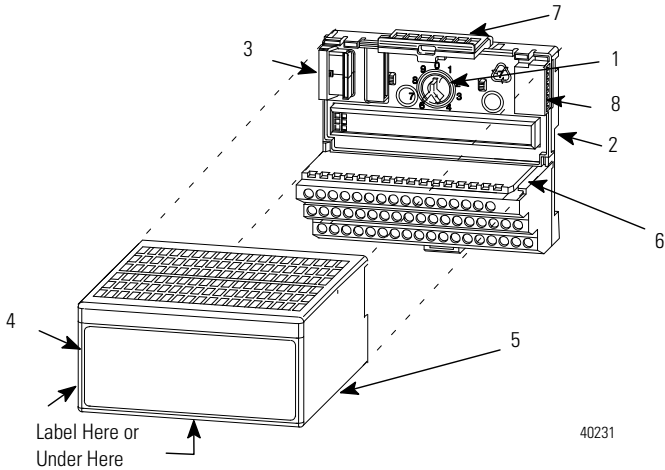
No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

<b>WARNING</b> 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
<b>ATTENTION</b> 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard and recognize the consequences.
<b>SHOCK HAZARD</b> 	Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.
<b>BURN HAZARD</b> 	Labels may be on or inside the equipment (for example, drive or motor) to alert people that surfaces may reach dangerous temperatures.

## Module Installation



### Component Identification

1	Keyswitch	5	Alignment Bar
2	Terminal Base Unit	6	Alignment Groove
3	Flexbus Connector	7	Latching Mechanism
4	Module	8	Cap Plug

This module must be used with a 1797-TB3 or -TB3S intrinsically safe terminal base unit.

**ATTENTION**

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as open-type equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

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1. Rotate keyswitch (1) on terminal base unit (2) clockwise to position 6 as required for this type of module.

**Do not change the position of the keyswitch after wiring the terminal base unit.**

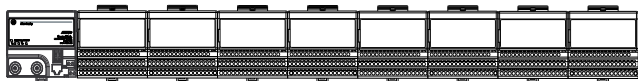
2. Make certain the flexbus connector (3) is pushed all the way to the left to connect with the neighboring terminal base/adaptor.

You cannot install the module unless the connector is fully extended.

3. Make sure the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base unit.
4. Position the module (4) with its alignment bar (5) aligned with the groove (6) on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base unit.

The module is seated when the latching mechanism (7) is locked into the module.

6. Make certain that you only connect terminal base units to other intrinsically safe system modules or adapters to maintain the integrity of the intrinsically-safe backplane.



20128-M

- Remove cap plug (8) and attach another intrinsically safe terminal base unit to the right of this terminal base unit if required.

## Installation in Zone 1

This module must not be exposed to the environment. Provide a suitable metal enclosure. This module has a protection factor of IP20.

### ATTENTION



This module cannot be used in an intrinsically safe environment after it has been exposed to non-intrinsically safe signals.

## Installation in Zone 22

When the module is installed in Zone 22, the following cabinets must be used: IVK-ISRPI-V16LC; IVK-ISRPI-V8HYW; or IVK-ISRPI-V8LC. These cabinets can be purchased from Pepperl+Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany. Information available at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

The IS-RPI cabinets (type IVK2-ISRPI-V8LC, IVK2-ISRPI-V8HYW, or IVK2-ISRPI-V16LC) ensures the basic protection for the intrinsically safe apparatus of the FLEX Ex system for use in Zone 22. It corresponds with category 3D according to RL 94/9 EG and with the type label marked with the following information:

Pepperl+Fuchs GmbH

68307 Mannheim

IVK2-ISRPI-V8LC (or IVK2-ISRPI-V8HYW or

IVK2-ISRPI-V16LC)

Ⓔ II 3 D Ex tD A22 IP54 T70 °C X

CE

Serial (manufacturing) number

Model

## Electrostatic Charge

Protect the system against electrostatic charge. Post a sign near this module:

**WARNING Avoid electrostatic charging.**

### **ADVERTÊNCIA! PREVENIR CONTRA O ACÚMULO DE CARGA ELETROSTÁTICA.**

For your convenience, a sign that can be cut out and posted is included in this installation instruction.

### **Removal and Insertion Under Power**

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#### **WARNING**



These modules are designed so you can **remove and insert them under power**. However, take special care when removing or inserting modules in an active process. I/O attached to any module being removed or inserted can change states due to its input/output signal changing conditions. If you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

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### **European Communities (EC) Directive Compliance**

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

#### **EMC Directive**

These products are tested to meet the Council Directive 2014/30/EU by applying the following standards:

- EN 61000-6-4:2007, Electromagnetic Compatibility (EMC) - Part 6-4: Generic Standard for Industrial Environments (Class A)
- EN 61000-6-2:2005, Electromagnetic Compatibility (EMC) - Part 6-2: Generic Standards - Immunity for Industrial Environments
- EN 61326-1:2013 (Industrial), Electrical Equipment For Measurement, Control, and Laboratory Use - Industrial EMC Requirements

## European Hazardous Location Approval

The following applies to products marked **CE** **Ex** II (1)2 G and

**CE** **Ex** II (1)D:

- Are Equipment Group II, Equipment Category (1) 2, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Annex II to Directive 2014/34/EU. See the EC Declaration of Conformity at <http://www.rockwellautomation.com/products/certification> for details.
- The type of protection is “Ex ia ib IIC T4” and “[EX iaD]” according to EN 60079-11.
- Comply to Standards EN 60079-0:2006; EN 60079-11:2007; EN 60079-26:2004, EN 61241-0:2006, and EN 61241-11:2006, reference certificate number DMT 98 ATEX E 013 X.
- Are intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapors, mists, or air/dust mixtures are likely to occur. Such locations correspond to Zone 1 or 2 classification according to ATEX directive 2014/34/EU.

## IEC Hazardous Location Approval

The following applies to products with IECEx certification:

- Are intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapors, mists, or air/dust mixtures are likely to occur. Such locations correspond to Zone 1 or 2 classification to IEC 60079-0.
- The type of protection is “Ex ia ib IIC T4” and “[EX iaD]” according to IEC 60079-11.
- Comply to Standards IEC 60079-0:2004, IEC 60079-11:2006, IEC 60079-26:2004, IEC 61241-0:2004 and IEC 61241-11:2005. Reference IECEx certificate number IECEx BVS 09.0027X.

### Special Conditions of Safe Use:

The intrinsically safe circuits (ch0 to ch15) may extend into areas with combustible dust. However it shall be ensured that the apparatus, connected to these intrinsically safe circuits, meet the requirements for category 1D respectively 2D and are marked accordingly.

All the other intrinsically safe circuits may also extend into areas with combustible dust. However it shall be ensured that the apparatus, connected to these intrinsically safe circuits, meet the requirements for category 2D and are marked accordingly.

The module may only be used with the terminal base type 1797-TB3/\* or type 1797-TB3S/\* (DMT 98 ATEX E012U)

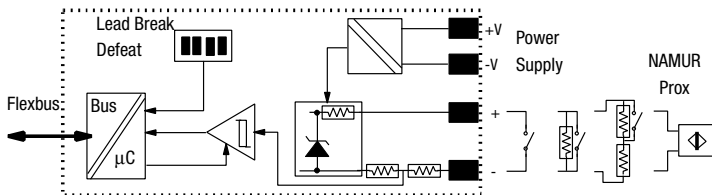
A warning label shall be installed in immediate proximity of these apparatus:  
**ATTENTION! Avoid electrostatic charging.**

### Inputs

Each input can be operated from a NAMUR sensor or a mechanical contact (if mechanical inputs are used). **Do not apply any nonintrinsically safe signals to this module.**

When using an intrinsically safe electrical apparatus according to EN50020, the European Community directives and regulations must be followed.

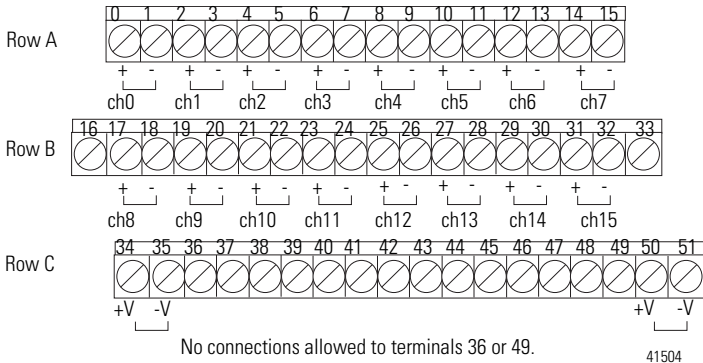
The channels in this module are electrically connected to each other.





## Wiring to a 1797-TB3 or -TB3S Terminal Base Unit

Connect wiring to the 1797-TB3 or 1797-TB3S terminal base unit as shown below.



1. Connect the individual input wiring to (+) terminals (0, 2, 4, 6, 8, 10, 12, 14) on the 0 to 15 row (A) and on the 16 to 33 row (B) (terminals 17, 19, 21, 23, 25, 27, 29, 31) as indicated in the table below.
2. Connect the associated input to the corresponding (-) terminal (1, 3, 5, 7, 9, 11, 13, 15) on the 0 to 15 row (A), and on the 16 to 33 row (B) (terminals 18, 20, 22, 24, 26, 28, 30, 32) for each input as indicated in the table below.
3. Connect +V dc power to terminal 34 on the 34 to 51 row (C).
4. Connect -V to terminal 35 on the 34 to 51 row (C).

### WARNING



Make certain that you power this module with an intrinsically safe power supply. Do not exceed the values listed in the specifications for this module. If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

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5. If continuing power to the next terminal base unit, connect a jumper from terminal 50 (+V) on this base unit to terminal 34 on the next base unit.
6. If continuing common to the next terminal base unit, connect a jumper from terminal 51 (-V) on this base unit to terminal 35 on the next base unit.

### Wire the Module

Input	Input Source	Input Signal	Input	Input Source	Input Signal
Input 0	A-0	A-1	Input 8	B-17	B-18
Input 1	A-2	A-3	Input 9	B-19	B-20
Input 2	A-4	A-5	Input 10	B-21	B-22
Input 3	A-6	A-7	Input 11	B-23	B-24
Input 4	A-8	A-9	Input 12	B-25	B-26
Input 5	A-10	A-11	Input 13	B-27	B-28
Input 6	A-12	A-13	Input 14	B-29	B-30
Input 7	A-14	A-15	Input 15	B-31	B-32
+V	Terminals 34 and 50				
-V	Terminals 35 and 51				

Terminals 16, 33, 40, 41, 42, 43, 44, and 45 are connected to chassis ground.

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#### ATTENTION

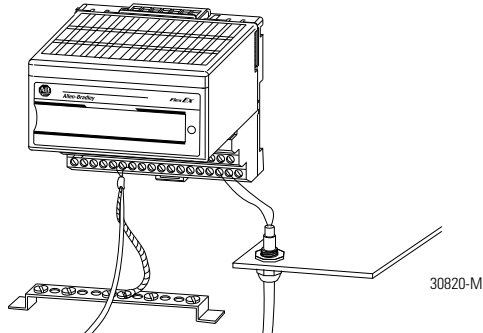


Do not use the unused terminals on this terminal base unit. Using these terminals as supporting terminals can result in damage to the module and/or unintended operation of your system.

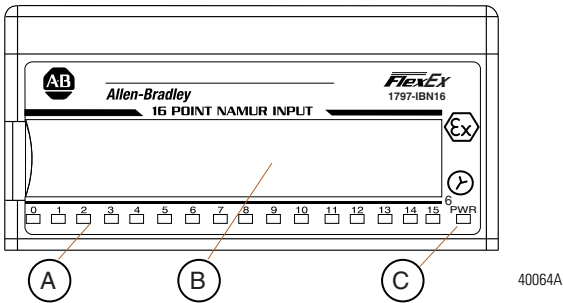
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## Grounding

All I/O wiring must use shielded wire. Shields must be terminated external to the module, such as bus bars and shield-terminating feed throughs.



## Indicators



A = Status Indicators

yellow - individual input present;

flashing red - channel fault;

solid red - module did not pass powerup check (channel 0 is solid red while Powerup check is running)

B = Insertable labels for writing individual input designations

C = Power Indicator - green indicates power applied to module

### Input/Output Mapping

Dec. Bit	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>09</b>	<b>08</b>	<b>07</b>	<b>06</b>	<b>05</b>	<b>04</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>00</b>
Oct. Bit	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>07</b>	<b>06</b>	<b>05</b>	<b>04</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>00</b>
Read 0	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Read 1	F15	F14	F13	F12	F11	F10	F9	F8	F7	F6	F5	F4	F3	F2	F1	F0
Read 1	Input 15 Counter															
Write 0			CF	CR			FC				Input Filter - Ch 12...15		Input/Alarm Filter - Ch 0...11			

Where: I = Input

F = Fault Alarm for an individual channel

CF = Counter Fast - Filter time constant or bypass, depending on setting (when input 15 is in counter mode) -  
0 = normal, 1 = fast

CR = Counter Reset- Resets the counter value in read word 1 when input 15 is in counter mode.  
0 = normal, 1 = reset

FC = Fault mode or Counter mode - determines content of read word 1 (counter value of input 15, or fault data of individual channel). 0 = counter, 1 = fault data - wire off or short circuit detect

### Set Input Filter Times

You can select the input filter time constant for each group of channels (channels 00 to 11 or channels 12 to 15).

For example, to set a filter time constant of 5 ms for a dc input module, set bits 05, 04, 03, 02, 01, and 00 as shown below.

Dec.	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
0:010											1	0	0	1	0	0

=44 Octal  
or 36 Decimal

FT = 12 to 15  
(14 to 17)

FT = 00 to 11  
(00 to 13)

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## Input Filter Times

Bits			Description	Maximum Filter Time
<b>02</b>	<b>01</b>	<b>00</b>	<b>Filter Times 00...11 (00...13)</b>	
<b>05</b>	<b>04</b>	<b>03</b>	<b>Filter Times 12...15 (14...17)</b>	
0	0	0	Filter Time 0 (default)	1 ms
0	0	1	Filter Time 1	1 ms
0	1	0	Filter Time 2	2 ms
0	1	1	Filter Time 3	3 ms
1	0	0	Filter Time 4	5 ms
1	0	1	Filter Time 5	9 ms
1	1	0	Filter Time 6	17 ms
1	1	1	Filter Time 7	33 ms

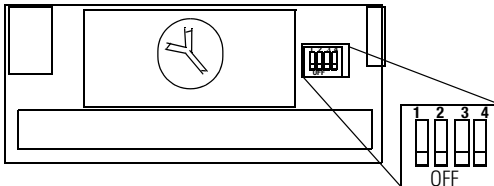
Bits 00...02 also control the filter times of all 16 fault alarm bits of read word 1 when module is in fault mode.

## Set the Fault Detect Switch

A switch, located on the backside of the module, lets you select the action of the module when a fault (wire off or short circuit) is detected. Switch position 1 determines the action for channels 0 to 3, position 2 for channels 4 to 7, position 3 for channels 8 to 11, and position 4 for channels 12 to 15.

Set the switch:

- OFF to disable fault detection for the selected channels.
- ON to enable fault detection for the selected channels.



### **Repair**

This module is not field-repairable. Any attempt to open this module will void the warranty and IS certification. If repair is necessary, return this module to the factory.

## Specifications

### 1797-IBN16 16 NAMUR Input Module

Attribute	Value
Number of inputs	16 (1 group of 16), nonisolated, sinking
IS input type	Ex ia IIB/IIC T4, AEx ia IIC T4, Class I, II, III Division 1 Group A-G T4
IS module type	Ex ib IIB/IIC T4, AEx ib IIC T4, Class I, Division 1 Group A-D T4
Input type	NAMUR compatible
ON-state current	2.1 mA
OFF-state current	1.2 mA
Hysteresis	0.2 mA
Input frequency	1000 Hz max
Input pulse width	>500 $\mu$ s on or off
Max load voltage	U/V = 7.5V DC
Short circuit current	I = 7.5 mA
Short circuit threshold	I > 6 mA
Lead breakage threshold	I < 0.35 mA
Input delay times OFF to ON ON to OFF	1 ms, 2 ms, 3 ms, 5 ms, 9 ms, 17 ms, 33 ms 1 ms, 2 ms, 3 ms, 5 ms, 9 ms, 17 ms, 33 ms 1 ms default - selectable thru output image table (see Setting Input Filter Times)
Indicators (field side indication, customer device driven)	16 yellow status indicators 16 red fault indicators 1 green module power indicator

**1797-IBN16 16 NAMUR Input Module**

<b>Attribute</b>	<b>Value</b>
Output (intrinsically safe) (16 pin male and female flexbus connector)	$U_i \leq 5.8V$ DC $I_i \leq 400$ mA $L_i =$ Negligible $C_i =$ Negligible
Isolation path Input to power supply Input to flexbus Input to input Power supply to flexbus	Isolation Type Galvanic to DIN EN 60079-11 Galvanic to DIN EN 60079-11 None Galvanic to DIN EN 60079-11
Power supply (+V, -V intrinsically safe)	$U_i \leq 9.5V$ DC $I_i \leq 1$ A $L_i =$ Negligible $C_i =$ Negligible
Module field-side power consumption	2.8 W
Power dissipation	2.8 W
Thermal dissipation	Max 9.6 BTU/hr
Module location	Cat. No. 1797-TB3 or 1797-TB3S Terminal Base Unit
Conductor wire size	4 mm <sup>2</sup> (12 gauge) stranded max 1.2 mm (3/64 in.) insulation max
Dimensions	46 mm x 94 mm x 75 mm (1.8 in. x 3.7 in. x 2.95 in.)
Weight	200 g (approximate)
Keyswitch Position	6



**Environmental**

<b>Attribute</b>	<b>Value</b>
Temperature, operating	-20...70 °C (-4...+158 °F)
Temperature, nonoperating	-40...85 °C (-40...185 °F)
Relative humidity	5...95% noncondensing
Vibration	Tested 2 g @ 10...500 Hz per IEC68-2-6
Shock, operating	Tested to 15 g peak acceleration, 11(+1) ms pulse width
Shock, nonoperating	Tested to 15 g peak acceleration, 11(+1) ms pulse width

**Agency Certification**

<b>Attribute</b>	<b>Value</b>
CENELEC	II (1) 2G Ex ib[ia] IIC T4 II (1) D [Ex iaD]
U, C-UL	Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III hazardous Locations. Class I, Zone 1, AEx ib[ia] IIC T4.
FM	Intrinsically safe Class I, Div 1, Groups A, B, C, D, T4. Associated Apparatus with intrinsically safe Connections Class I, II, III, Div 1, Groups A--G Intrinsically safe Class I, Zone 1, AEx ib[ia] IIC T4.
IECEX	[Zone 0] Ex ib[ia] IIC T4 [Ex iaD]
INMETRO	BR-Ex ia/ib IIB/IIC T4

**Certificate of Conformity**

<b>Attribute</b>	<b>Value</b>
CENELEC	DMT 98 ATEX E013 X
U, C-UL	UL, C-UL File Number E197983

## Certificate of Conformity

Attribute	Value
FM	FM Certificate Number 3009806
INMETRO	05/UL-BRAE-0012X
IECEX	IECEX BVS 09.0027X

## Entity Parameters

### CE/CENELEC I/O Entity Parameters (Each Channel)

	Protection	Group	Allowed Capacitance	Allowed Inductance	$L_0/R_0$ Ratio
$U_0 \leq 14.5V$ $I_0 \leq 15 mA$ $P_0 < 40 mW$ Characteristic: linear	Ex ia	IIB	1 $\mu F$	10 mH	2.6 mH/ $\Omega$
	Ex ia	IIC	300 nF	2 mH	0.65 mH/ $\Omega$

### UL, C-UL I/O Entity Parameters

If this product has the UL/C-UL mark, it has been designed, evaluated, tested, and certified to meet the following standards:

- UL 913, 1988, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III Division 1, Hazardous (Classified) Locations
- UL 1203, Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
- UL 2279, Electrical Equipment for Use in Class I, Zone 0, 1, and 2 Hazardous (Classified) Locations
- UL 61010, UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements
- CSA C22.2 No. 157-92, Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

- CSA C22.2 No. 30-M1986, Explosion-Proof Enclosures for Use in Class I Hazardous Locations
- CSA-E79-0-95, Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements
- CSA-E79-11-95, Electrical Apparatus for Explosive Gas Atmospheres, Part 11: Intrinsic Safety “i”
- CSA C22.2 No. 14-95, Industrial Control Equipment

**Table 1**

Wiring Method	Channel	Terminals	$V_{oc}$ (V)	$I_{sc}$ (mA)	$V_t$ (V)	$I_t$ (mA)	Groups	$C_a$ ( $\mu$ F)	$L_a$ (mH)
1 and 2	Any one channel (for example, ch0)	0(+), 1(-)	14.5	15	-	-	A, B	0.3	80.0
							C, E	0.9	320.0
							D, F, G	2.4	640.0

**Wiring Methods**

- Wiring method 1 - Each channel is wired separately.
- Wiring method 2 - Multiple channels in one cable, providing each channel is separated in accordance with the National Electric Code (NEC) or Canadian Electric Code (CEC).

**Table 2**

Terminals	$V_t$ (V)	$I_t$ (mA)	Groups	$C_a$ ( $\mu$ F)	$L_a$ ( $\mu$ H)
Male Bus Connector	5.8	400	A-G	3.0	3.0

① The entity concept allows interconnection of intrinsically safe apparatus with associated apparatus not specifically examined in combination as a system when the approved values of  $V_t$  and  $I_t$  of the associated apparatus are less than or equal to  $V_{oc}$  and  $I_{sc}$  or  $V_{max}$  and  $I_{max}$  of the intrinsically safe apparatus and the approved values of  $C_a$  and  $L_a$  of the associated apparatus are greater than  $C_i + C_{cable}$  and  $L_i + L_{cable}$  respectively for the intrinsically safe apparatus.

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- ② Simple apparatus is defined as a device which neither generates nor stores more than 1.2V, 0.1 A, 20 mJ, or 25 mW.
- ③ Wiring methods must be in accordance with the National Electric Code, ANSI/NFPA 70, Article 504 and 505 or the Canadian Electric Code CSA C22.1, Part 1, Appendix F. For additional information refer to ANSI/ISA RP12.6.
- ④ This module, 1797-IBN16, must be used with terminal base 1797-TB3 or 1797-TB3S.
- ⑤ Terminals 36 to 39, and 46 to 49 shall not be connected.

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**WARNING**

Substitution of components may impair intrinsic safety.



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**AVERTISSEMENT**

La substitution de composant peut compromettre la sécurité intrinsèque.

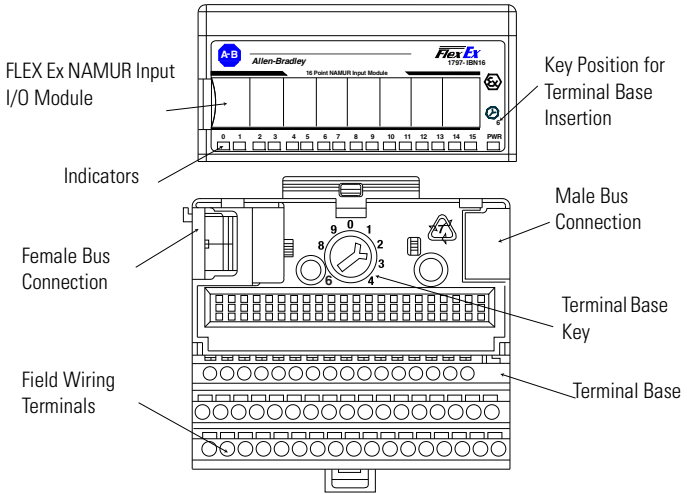


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**IMPORTANT**

For detailed certification information, refer to the FLEX Ex System Certification Reference Manual, publication 1797-6.5.6.

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**ATTENTION**

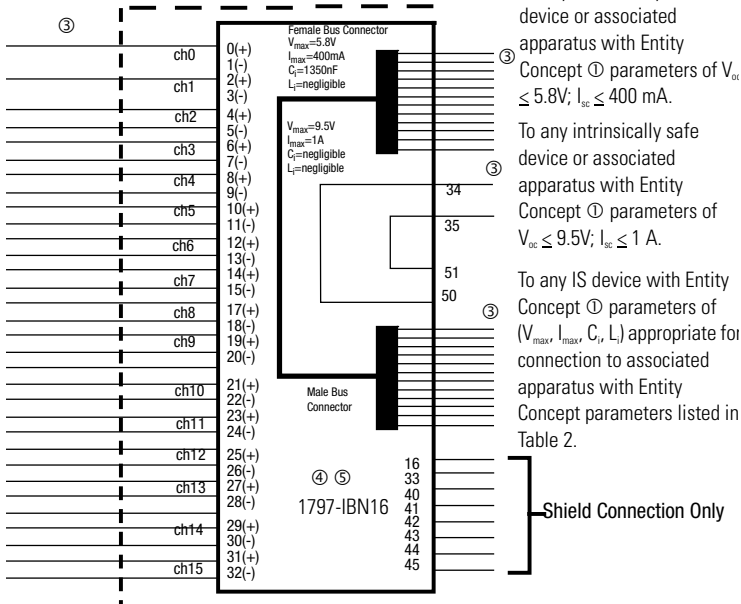


A terminal base may or may not have an I/O module installed.

Hazardous (Classified) Location  
 Class I, Zones 0, 1, & 2 Groups IIC, IIB, IIA  
 Class I, Div. 1 & 2 Groups A, B, C, D  
 Class II, Div. 1 & 2 Groups E, F, G  
 Class III, Div. 1 & 2

Any Simple Apparatus ② or I.S. device with Entity Concept parameters ① ( $V_{max}$ ,  $I_{max}$ ,  $C_r$ ,  $L_r$ ) appropriate for connection to associated apparatus with Entity Concept

Hazardous (Classified) Location  
 Class I, Zones 1 & 2 Groups IIC, IIB, IIA  
 Class I, Div. 1 & 2 Groups A, B, C, D



## FM I/O Entity Parameters (Each Channel)

If this product has the FM mark, it has been designed, evaluated, tested and certified to meet the following standards:

- FM C1. No 3600:1998, Electrical Equipment for Use in Hazardous (Classified) Locations General Requirements
- FM C1. No 3610:1999, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III Division 1 Hazardous (Classified) Locations
- FM C1. No 3615:1989, Explosionproof Electrical Equipment General Requirements
- FM C1. No 3810:1989, 1995, Electrical and Electronic Test, Measuring and Process Control Equipment
- ANSI/NEMA 250, 1991, Enclosures for Electrical Equipment

## Wiring Methods

- Wiring method 1 - Each channel is wired separately.
- Wiring method 2 - Multiple channels in one cable, providing each channel is separated in accordance with the National Electric Code (NEC).

**Table 1**

Wiring Method	Channel	Terminals	V <sub>oc</sub> (V)	I <sub>sc</sub> (mA)	V <sub>t</sub> (V)	I <sub>t</sub> (mA)	Groups	C <sub>a</sub> (μF)	L <sub>a</sub> (mH)
1 and 2	Any one channel (for example, ch0)	0(+), 1(-)	14.5	15	-	-	A, B	0.3	80.0
							C, E	0.9	320.0
							D, F, G	2.4	640.0

Table 2

Terminals	$V_t$ (V)	$I_t$ (mA)	Groups	$C_a$ ( $\mu$ F)	$L_a$ ( $\mu$ H)
Male Bus Connector	5.8	400	A-G	3.0	3.0

- ① The entity concept allows interconnection of intrinsically safe apparatus with associated apparatus not specifically examined in combination as a system when the approved values of  $V_{oc}$  and  $I_{sc}$  or  $V_t$  and  $I_t$  of the associated apparatus are less than or equal to  $V_{max}$  and  $I_{max}$  of the intrinsically safe apparatus and the approved values of  $C_a$  and  $L_a$  of the associated apparatus are greater than  $C_i + C_{cable}$  and  $L_i + L_{cable}$  respectively for the intrinsically safe apparatus. The internal capacitances  $C_i$  of the terminal base must be taken into account to verify the intrinsic safety.
- ② Simple apparatus is defined as a device which neither generates nor stores more than 1.2V, 0.1 A, 20  $\mu$ J, or 25 mW.
- ③ Wiring methods must be in accordance with the National Electric Code, ANSI/NFPA 70, Article 504 and 505. For additional information refer to ANSI/ISA RP12.6.
- ④ This module, 1797-IBN16, must be used with terminal base 1797-IB3 or 1797-IB3S.
- ⑤ Terminals 36 to 39, and 46 to 49 shall not be connected.

**WARNING**

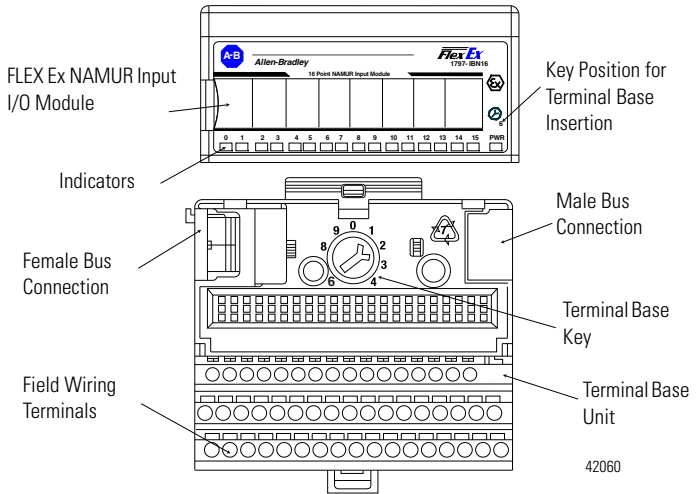
Substitution of components may impair intrinsic safety.

**AVERTISSEMENT**

La substitution de composant peut compromettre la securite intrinseque.







**ATTENTION**

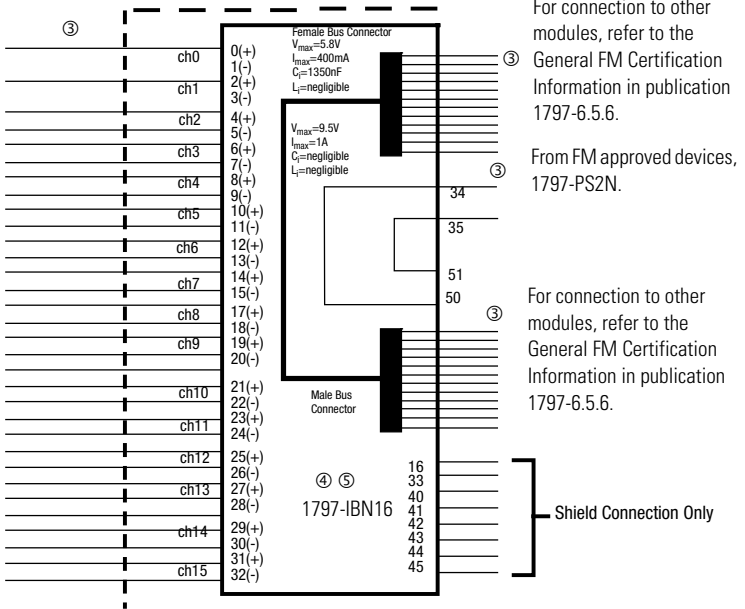


A terminal base may or may not have an I/O module installed.

Hazardous (Classified) Location  
 Class I, Zone 0 Group IIC  
 Class I, Div. 1 Groups A, B, C, D  
 Class II, Div. 1 Groups E, F, G  
 Class III, Div. 1

Hazardous (Classified) Location  
 Class I, Zone 1 Group IIC  
 Class I, Div. 1 Groups A, B, C, D

Any Simple Apparatus ② or FM approved device with Entity Concept parameters ① ( $V_{max}$ ,  $I_{max}$ ,  $C_i$ ,  $L_i$ ) appropriate for connection to associated apparatus



**WARNING Avoid electrostatic charging.**  
**ADVERTÊNCIA! PREVENIR CONTRA O ACÚMULO**  
**DE CARGA ELETROSTÁTICA.**

## Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At <http://support.rockwellautomation.com>, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

## Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running.

United States	1.440.646.3434 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

## New Product Satisfaction Return

Rockwell tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning, it may need to be returned.

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

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