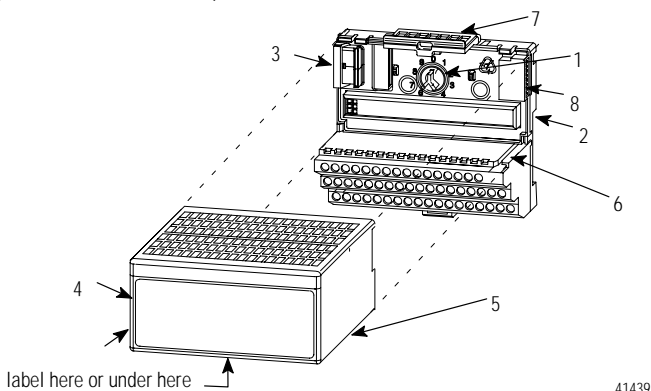




FLEX Ex 8 Output Analog Module

(Cat. No. 1797-OE8)

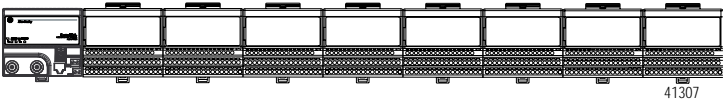


Module Installation

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

1. Rotate keyswitch (1) on terminal base unit (2) clockwise to position 4 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/ adapter. 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.



7. 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.

Electrostatic Charge

Protect the system against electrostatic charge. Post a sign near this module: **Attention! Avoid electrostatic charge.** For your convenience, a sign which can be cut out and posted is included in this installation instruction.

Removal and Insertion Under Power

ATTENTION

This module is designed so you can **remove and insert it under power**. However, take special care when removing or inserting this module 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.

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

This product is tested to meet the Council Directive 89/336/EC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2 EMC - Generic Emission Standard, Part 2 - Industrial Environment
- EN 50082-2 EMC - Generic Immunity Standard, Part 2 - Industrial Environment

This product is intended for use in an industrial environment.

Ex Directive

This product is tested to meet the Council Directive 94/9/EC (ATEX 100a) Equipment and Protective systems Intended for Use in Potentially Explosive Atmospheres by applying the following standards:

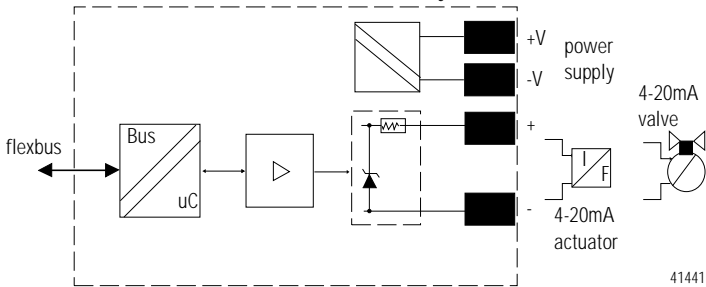
- EN50014:1992, Electrical Apparatus for Potentially Explosive Atmospheres
- EN50020:1994, Electrical Apparatus for Potentially Explosive Atmospheres - Intrinsic Safety "i"
- prEN50284:1997, Special requirements for construction, test and marking of electrical apparatus of equipment group II, category 1G

Outputs

Each output channel can operate an analog field device. **Do not apply any non-intrinsically safe signals to this module.**

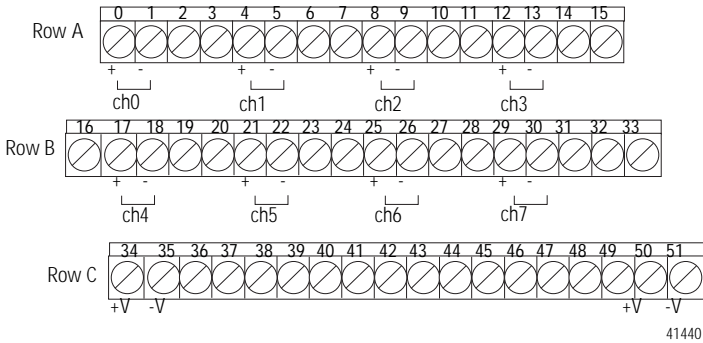
When using an intrinsically safe electrical apparatus according to EN50020, the European Community directives and regulations must be followed.

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 terminal base as shown below.



No connections allowed to terminals 2, 3, 6, 7, 10, 11, 14, 15, 19, 20, 23, 24, 27, 28, 31, 32, 36, 37, 38, 39, 46, 47, 48, 49

1. Connect the individual output wiring to (+) terminals (0, 4, 8, 12) on the 0-15 row (A) and on the 16-33 row (B) (terminals 17, 21, 25, 29) as indicated in the table below.
2. Connect the associated output to the corresponding (-) terminal (1, 5, 9, 13) on the 0-15 row (A), and on the 16-33 row (B) (terminals 18, 22, 26, 30) for each output as indicated in the following table.
3. Connect +V dc power to terminal 34 on the 34-51 row (C).
4. Connect -V to terminal 35 on the 34-51 row (C).



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.

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.

Wiring

Output	Output +	Output -	Output	Output +	Output -
Output 0	A-0	A-1	Output 4	B-17	B-18
Output 1	A-4	A-5	Output 5	B-21	B-22
Output 2	A-8	A-9	Output 6	B-25	B-26
Output 3	A-12	A-13	Output 7	B-29	B-30
+V	Terminals 34 and 50				
-V	Terminals 35 and 51				

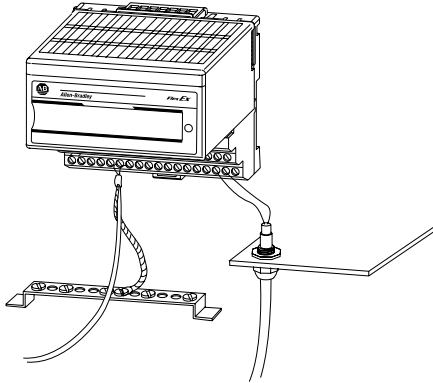
ATTENTION



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.

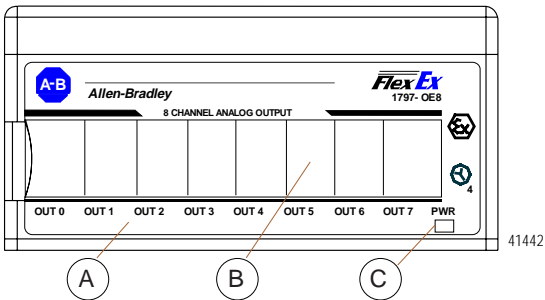
Grounding

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.



30820-M

Indicators



A = Status Indicators - flashing red = channel fault; Channel 0 indicator will turn red while power-up check is running

B = Insertable labels for writing individual input designations

C = Power Indicator = green indicates power applied to the module

Input Map (Read Words)

Bit⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
Word ↓																	
0	Flt Alm ch7	Flt Alm ch6	Flt Alm ch5	Flt Alm ch4	Flt Alm ch3	Flt Alm ch2	Flt Alm ch1	Flt Alm ch0					Diagnostic Status				
1	Res Flg	MODULE Command Response						MODULE Response Data									

Where: ch = channel

Flt Alm = Fault Alarm

Res Flg = Response Flag

Output Map (Write Words)

Bit⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
Word ↓																	
0	Out Enb	Glbl Rst	RESERVED					Dig Out ch7	Dig Out ch6	Dig Out ch5	Dig Out ch4	Dig Out ch3	Dig Out ch2	Dig Out ch1	Dig Out ch0		
1	Channel 0 Output Data																
2	Channel 1 Output Data																
3	Channel 2 Output Data																
4	Channel 3 Output Data																
5	Channel 4 Output Data																
6	Channel 5 Output Data																
7	Channel 6 Output Data																
8	Channel 7 Output Data																
9	Lo Flt Md		Flt Md ch 2-3	Flt Md ch 0-1	Alg Flt Ste ch2-3	Alg Flt Ste ch0-1	Data Format ch2-3				Data Format ch0-1						
10	Lth Md 4-7	Lth Md 0-3	Flt Md ch 6-7	Flt Md ch 4-5	Alg Flt Ste ch6-7	Alg Flt Ste ch4-5	Data Format ch6-7				Data Format ch4-5						
11	Dig Flt Ste ch7	Dig Flt Ste ch6	Dig Flt Ste ch5	Dig Flt Ste ch4	Dig Flt Ste ch3	Dig Flt Ste ch2	Dig Flt Ste ch1	Dig Flt Ste ch0	Alg Dig Md ch7	Alg Dig Md ch6	Alg Dig Md ch5	Alg Dig Md ch4	Alg Dig Md ch3	Alg Dig Md ch2	Alg Dig Md ch1	Alg Dig Md ch0	
12	Cd Flg	MODULE Command						MODULE Command Data									

Where: ch = channel

Dig Out = Digital Output

Lo Flt Md = Local Fault Mode

Flt Md = Fault Mode

Alg Flt Ste = Analog Fault State

Lth Md = Latch Mode

Dig Flt Ste = Digital Fault State

Alg Dig Md = Analog/Digital Mode

Out Enb = Output Enable

Glbl Rst = Global Reset

Data Format Control

Data Format				Range	Resolution	Full Range	Interpretation	Data Table Value	Count per mA
0	0	0	0	0-20mA	0.1% of 0-20mA	0-22mA	0-22mA	0-22000	1000
0	0	0	1	0-20mA	0.2% of 0-20mA	0-22mA	0-110%	0-11000	500
0	0	1	0	0-20mA		0-20mA	not assigned		
0	0	1	1	0-20mA	0.03% of 0-20mA	0-20mA	unsigned integer	0-65,535	3276
0	1	0	0	4-20mA	0.1% of 4-20mA	2-22mA	2-22mA	2000-22000	1000
0	1	0	1	4-20mA		4-20mA	not assigned		
0	1	1	0	4-20mA		4-20mA	not assigned		
0	1	1	1	4-20mA	0.03% of 4-20mA	4-20mA	unsigned integer	0-65,535	4095
1	0	0	0	0-20mA		0-20mA	not assigned		
1	0	0	1	0-20mA		0-20mA	not assigned		
1	0	1	0	0-20mA		0-20mA	not assigned		
1	0	1	1	0-20mA	0.28% of 0-20mA	0-22mA	D/A count	0-8000	363
1	1	0	0	4-20mA			not assigned		
1	1	0	1	4-20mA	0.16% of 4-20mA	3-21mA	-6.25 to +106.25%	-625 to +10625	625
1	1	1	0	4-20mA	0.16% of 4-20mA	2-22mA	-12.5 to +112.5%	-1250 to +11250	625
1	1	1	1	4-20mA		4-20mA	not assigned		

Field Descriptions

Analog/Digital Output Mode	<p>Selects if the channel acts as a normal analog output or as a switched digital output.</p> <p>Analog Output Mode will follow the Analog Data Format selected.</p> <p>Digital Output Mode will output 0mA = OFF, 22mA = ON if the Fault Mode is 0 = disable. Digital Output Mode will output 2mA = OFF, 22mA = ON if the Fault Mode is 1 = wire off fault detection enabled.</p> <p>Range: 0 = normal analog output, 1 = switched digital output.</p>
Analog Output Data	<p>Specifies the value of the analog output data to the module. Specific format is controlled by Module Data Format Control parameter. This data is used when the channel is in analog output mode.</p>
Digital Output Data	<p>Specifies the value of the digital output data to the module. This data is used when the channel is in digital output mode.</p> <p>Range: 0 = output, 0mA = OFF, 1 = 22mA = ON if the Fault Mode is 0 = disable. 0 = output, 2mA = OFF, 1 = 22mA = ON if the Fault Mode is 1 = wire off fault detection enabled.</p>
Global Reset	<p>This bit acts to reset all outputs to accept normal system output data. It acts in conjunction with the Latch Retry parameter. If any channel faults occur, the Latch Retry parameter can be set to cause the fault to be latched and the output to go to its safe state value.</p> <p>This is an edge triggered signal. It must first be set to the "1" state, reset will then occur on the "1" to "0" transition.</p>
Output Enable	<p>Signals module that communications has been interrupted to the network. Output modules should execute their fault routine or go to safe state.</p> <p>On power-up, the module remains OFF, 0mA out.</p> <p>After normal power-up, this bit must be set to a "1" by user program to begin normal module functioning. If the bit is reset to "0" by a communication fault, the module should use the information contained in the Module Safe State data until the value is set to "1", when normal function continues.</p>
Analog Fault State	<p>Determines how module reacts to faults when channel is used in analog normal mode.</p> <p>Range: 0 = go to minimum value of data range, 1 = go to maximum value of data range, 2 = hold last state, 3 = 50% of data range.</p>

Digital Fault State	Determines how module reacts to faults when channel is used in digital mode. Range: 0 = reset, 1 = hold last state.
Fault Mode	Selects whether the channel pair fault detection is enabled or disabled. There is a 100Hz (10ms) filter for wire-off/lead-break detection. Range: 0 = disable, 1 = wire-off fault detection enabled.
Latch Retry Mode	Latch Retry determines channel operation under wire-off fault conditions. These bits control the action of two channel groups - channels 0-3 and/or channels 4-7. When a channel fault occurs, the channel fault alarm will be set (if enabled) and the safe state mode will be enabled. If retry is selected, the channel will periodically try to reestablish proper output. If latch is selected, the fault will be latched until a Global Reset is issued. Range: 0 = retry, 1 = latch.
Local Fault Mode	This parameter determines how the Module Safe State will be used for bus communication and internal module faults. This parameter sets this characteristic for the module. Range: 0 = fault states activated by bus communication faults, 1 = fault states activated by any failure (bus communications, etc.).

Cooperative Operation of the ControlNet Ex Adapter and FLEX Ex Output Modules

The ControlNet Ex adapter (1797-ACNR15) combined with FLEX Ex output module provides a two-tier fault state mechanism. It is important to consider and understand the operation of this mechanism when designing your system.

Two sets of programmable fault states are available, one each in the adapter and output module. This two-tier method is meant to give you a wider fault coverage compared with normal methods.

Adapter Operation

Network Communication Monitoring

The adapter is the primary monitor of network activity. If it detects loss of network communication, it can be configured to:

- continue writing the last valid received data to the module (hold last state)
- apply local module safe states¹
- write a programmable fault state value to the module, depending upon the module type²

This mechanism primarily targets fault behavior for loss of network communication.

Program Mode Behavior

The adapter also monitors the state of the controlling processor or scanner. Two states can be detected: run mode and program mode (idle).

When program mode is detected, the adapter can be configured to:

- continue writing the last valid received data to the module (hold last state)
- apply local module safe states to zero¹
- write a programmable fault state value to the module, depending upon the module type²

1 This selection could be shown as "Reset Outputs" but its action is "Apply Local Module Safe States".

2 This option is only available in some adapters.

FLEX Ex Output Module Operation

Flexbus Communication Monitoring

The module monitors flexbus communication activity and the state of its Output Enable bit. If it detects loss of flexbus communication activity or the Output Enable bit transitioning to 0, it can be programmed to:

- continue writing the last valid received data to the outputs (hold last state)
- reset the outputs
- write the local module fault state value to the output, depending upon the module type

This mechanism primarily targets fault behavior for loss of backplane communication.

Power-Up State Behavior

The system and modules use the Output Enable bit at system power-up. The power-up state of the Output Enable bit is 0 and must be transitioned to 1 through application program control to initialize activity of a module's outputs.




Before the Output Enable bit is transitioned to 1, module outputs remain off. Once the initial power-up and application-program control transitions the Output Enable bit to 1, and module output activity begins, subsequent transitions of the Output Enable bit by any source will cause the output module to apply the local module fault state.

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-OE8	
Number of Outputs	8 single-ended, non-isolated
IS Output Type	EEx ia IIB/IIC T4, AEx ia IIC T4, Class I, II, III Division 1 Groups A-G T4
IS Module Type	EEx ib IIB/IIC T4, AEx ib IIC T4, Class I Division 1 Groups A-D T4
Resolution	13 bit
Transfer Characteristics Accuracy at 20°C (68°F) Temperature Drift	0.1% of output signal range 0.010%/C of output signal range
Load Range Current Voltage Available at 22mA Load	0-22mA >11V 0-500Ω @ 22mA
Data Format	Configurable
Step Response to 99% of FS	4ms
Indicators	8 red fault indicators 1 green power
Output (Intrinsically Safe) (16 pin male and female flexbus connector)	$U_i \leq 5.8V$ dc $I_i \leq 400mA$ $L_i =$ Negligible $C_i = \leq 1.35\mu F$
Isolation Path Output to Power Supply Output to Flexbus Output to Output Power Supply to Flexbus	Isolation Type Galvanic to DIN EN50020 Galvanic to DIN EN50020 None Galvanic to DIN EN50020
Power Supply (+V, -V Intrinsically Safe)	$U_i \leq 9.5V$ dc $I_i \leq 1A$ $L_i =$ Negligible $C_i =$ Negligible
Module Field-Side Power Consumption	6.3W
Power Dissipation	5.4W
Thermal Dissipation	18.4 BTU/hr
Module Location	Cat. No. 1797-TB3 or -TB3S Terminal Base Unit
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 1.2mm (3/64in) insulation maximum
Dimensions	46 x 94 x 75mm (1.8 x 3.7 x 2.95in)
Weight	200g (approximately)
Keyswitch Position	4

Specifications - 1797-OE8 (Continued)

Environmental Conditions	
Operational Temperature	-20 to +70°C (-4 to +158°F)
Storage Temperature	-40 to +85°C (-40 to +185°F)
Relative Humidity	5 to 95% noncondensing
Shock	Tested to 15g peak acceleration, 11(+1)ms pulse width
Operating	Tested to 15g peak acceleration, 11(+1)ms pulse width
Non-Operating	Tested 2g @ 10-500Hz per IEC68-2-6
Vibration	
Agency Certification	
CENELEC	II (1) 2G EEx ia/ib IIB/IIC T4
UL, C-UL	Class I Division 1 & 2 Groups A-D T4 Class I Zone 1 & 2 AEx ib/[ia] IIC T4
FM	Class I Division 1 Groups A-D T4 Class I Zone 1 AEx ib/[ia] IIC T4
Certificates	
CENELEC	DMT 00 ATEX E 042 X 
UL, C-UL	UL Certificate Number 99.19699 c  US Class I Division 1 Hazardous
FM	FM Certificate Number 3009806 

CE, CENELEC I/O Entity Parameters

Signal output (+ to -) for ch 0 to ch 7
(terminals: 0-1; 4-5; 8-9; 12-13; 17-18; 21-22; 25-26; 29-30)

	Protection	Group	Allowed Capacitance	Allowed Inductance
U ₀ = 21V I ₀ = 100mA P ₀ = 520mW	EEx ia	IIB	1.27μF	8mH
		IIC	188nF	2mH
If concentrated capacitance and/or inductance are available, use the following values.	EEx ia	IIB	295nF	10mH
		IIC	70nF	2mH

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:

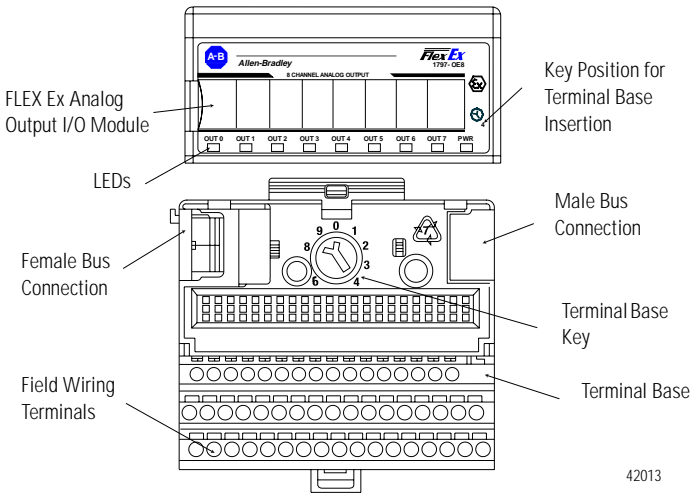
- UL 913, 1988, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III Division 1, Hazardous (Classified) Locations
- UL 1203, Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
- UL 2279, Electrical Equipment for Use in Class I, Zone 0, 1, and 2 Hazardous (Classified) Locations
- UL 508, Industrial Control Equipment
- 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

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 1

Wiring Method	Channel	Terminals	V_{OC} (V)	I_{SC} (mA)	V_t (V)	I_t (mA)	Groups	C_a (μ F)	L_a (mH)
1 and 2	Any one channel e.g. ch0	0(+), 1(-)	21.0	100.0	-	-	A, B, IIC	0.08	2.0
							C, E, IIB	0.24	8.0
							D, F, G, IIA	0.64	16.0



42013

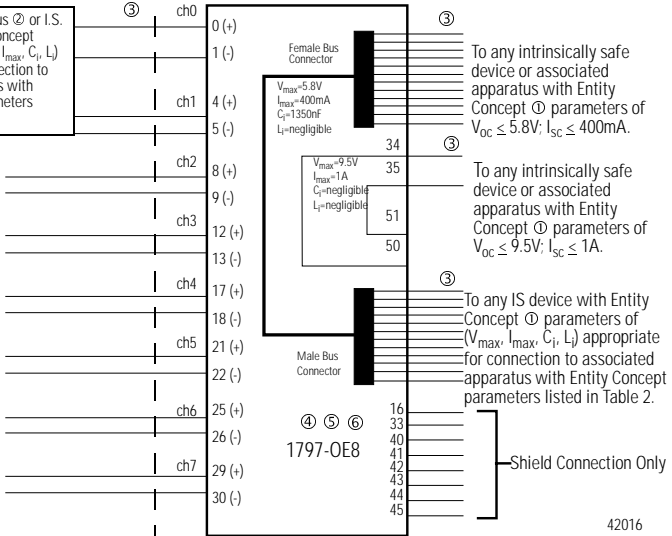
IMPORTANT

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

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

Any Simple Apparatus ② or I.S. device with Entity Concept parameters ① (V_{max} , I_{max} , C_i , L_i) appropriate for connection to associated apparatus with Entity Concept parameters listed in Table 1.



To any intrinsically safe device or associated apparatus with Entity Concept ① parameters of $V_{oc} \leq 5.8V$; $I_{sc} \leq 400mA$.

To any intrinsically safe device or associated apparatus with Entity Concept ① parameters of $V_{oc} \leq 9.5V$; $I_{sc} \leq 1A$.

To any IS device with Entity Concept ① parameters of (V_{max} , I_{max} , C_i , L_i) appropriate for connection to associated apparatus with Entity Concept parameters listed in Table 2.

Shield Connection Only

42016

Table 2

Terminals	V_i (V)	I_i (mA)	Groups	C_a (μF)	L_a (μH)
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_i and I_i 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.

② Simple apparatus is defined as a device which neither generates nor stores more than 1.2V, 0.1A, 20 μJ , or 25mW.

- 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-OE8, must be used with terminal base 1797-TB3 or 1797-TB3S.
- ⑤ Terminals 2, 3, 6, 7, 10, 11, 14, 15, 19, 20, 23, 24, 27, 28, 31, 32, 36-39, and 46-49 shall not be connected.
- ⑥ **WARNING:** Substitution of components may impair intrinsic safety.
AVERTISSEMENT: La substitution de composant peut compromettre la sécurité intrinsèque.

FM I/O Entity Parameters

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

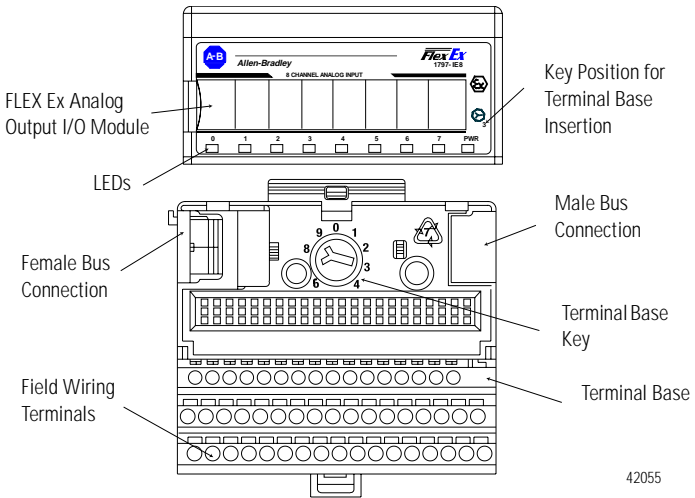
- FM C1. No.3600:1998, Electrical Equipment for Use in Hazardous (Classified) Locations General Requirements
- FM C1. No.3610:1999, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III Division 1 Hazardous (Classified) Locations
- FM C1. No.3615:1989, Explosionproof Electrical 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_{OC} (V)	I_{SC} (mA)	V_t (V)	I_t (mA)	Groups	C_a (μ F)	L_a (mH)
1 and 2	Any one channel e.g. ch0	0(+), 1(sig)	21.0	100.0	-	-	A, B	0.20	3.5
							C, E	0.60	10.5
							D, F, G	1.60	28.0



42055

IMPORTANT

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

Hazardous (Classified) Location
 Class I, Zones 0 Groups IIC, IIB, IIA
 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, Zones 1 Groups 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_a , L_a) appropriate for connection to associated apparatus with Entity Concept parameters listed in Table 1.

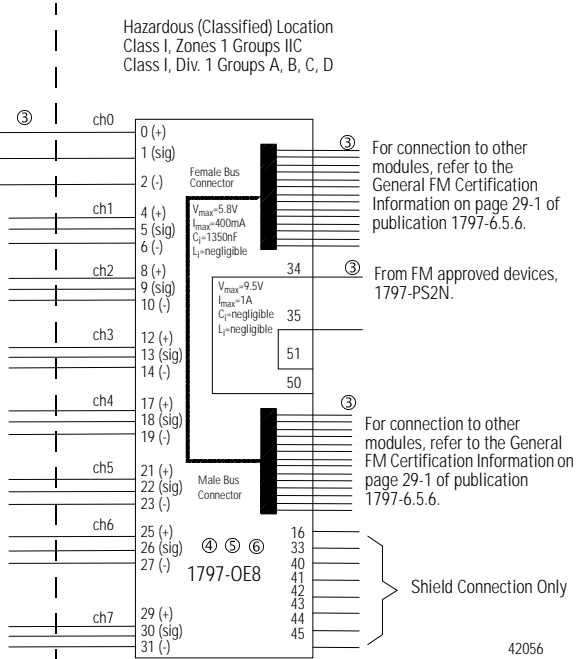


Table 2

Terminals	V_t (V)	I_t (mA)	Groups	C_a (μ F)	L_a (μ 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 $C_1 + C_{cable}$ and $L_1 + L_{cable}$ respectively for the intrinsically safe apparatus.

② Simple apparatus is defined as a device which neither generates nor stores more than 1.2V, 0.1A, 20 μ J, or 25mW.

- 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-OE8, must be used with terminal base 1797-TB3 or 1797-TB3S.
 - ⑤ Terminals 2, 3, 6, 7, 10, 11, 14, 15, 19, 20, 23, 24, 27, 28, 31, 32, 36-39, and 46-49 shall not be connected.
 - ⑥ **WARNING:** Substitution of components may impair intrinsic safety.
-

IMPORTANT

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

Attention: Avoid electrostatic charge.

Notes:

Notes:

Reach us now at www.rockwellautomation.com

Wherever you need us, Rockwell Automation brings together leading brands in industrial automation including Allen-Bradley controls, Reliance Electric power transmission products, Dodge mechanical power transmission components, and Rockwell Software. Rockwell Automation's unique, flexible approach to helping customers achieve a competitive advantage is supported by thousands of authorized partners, distributors and system integrators around the world.

Americas Headquarters, 1201 South Second Street, Milwaukee, WI 53204, USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444
European Headquarters SA/IV, avenue Hermann Dieroux, 46, 1180 Brussels, Belgium, Tel: (32) 2 663 06 00, Fax: (32) 2 663 06 40
Asia Pacific Headquarters, 27/F Citicorp Centre, 16 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2987 4788, Fax: (852) 2508 1846



Publication 1797-5.3 - February 2001

Supersedes Publication 1797-5.3 - September 1999

PN 957395-62

© 2001 Rockwell International Corporation. Printed in USA