

The excom[®] System

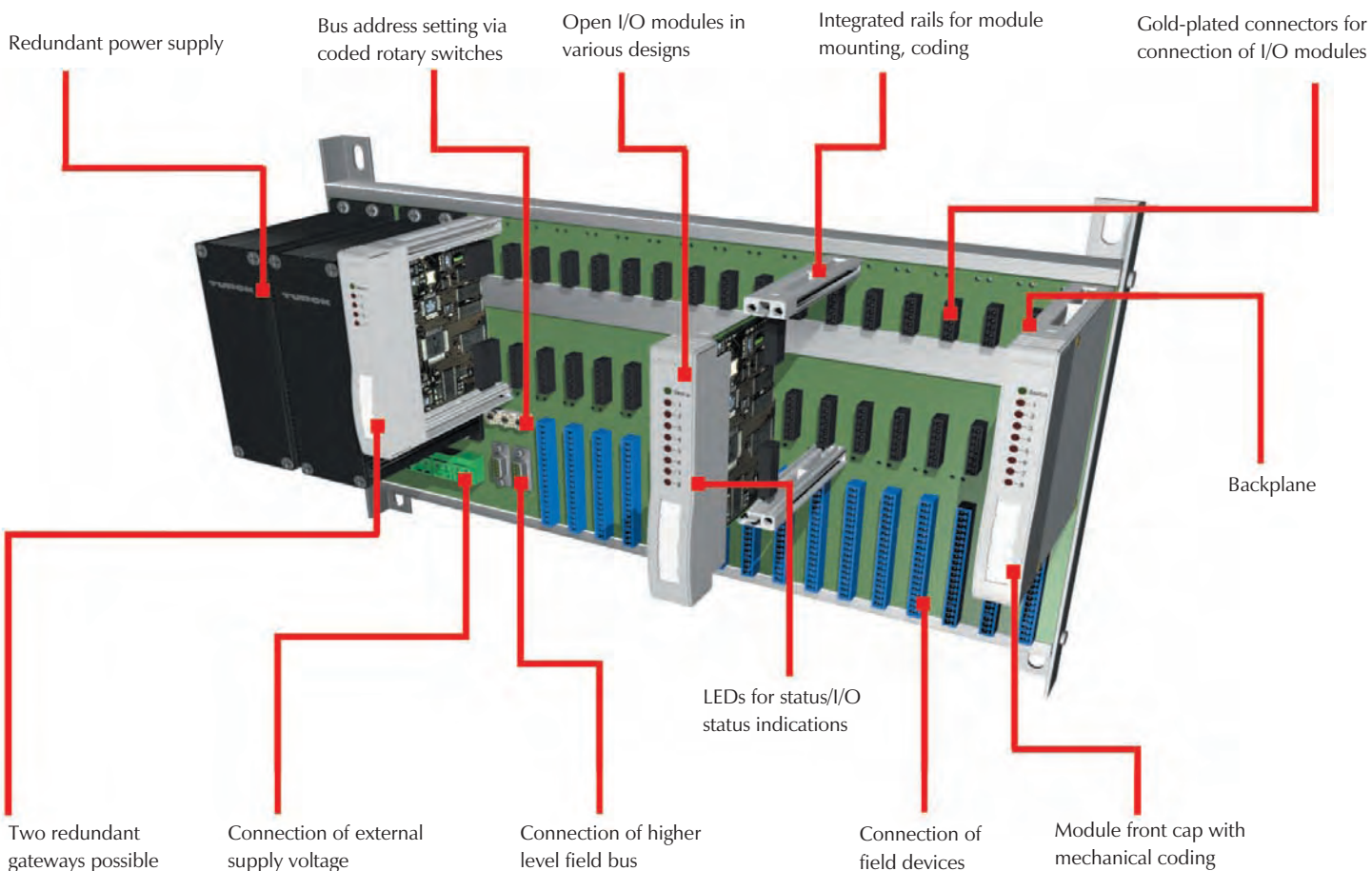
excom is a remote I/O system for use in hazardous locations. It provides PROFIBUS[®]-DP compatible I/O modules in an IP 20 protected solution for connecting discrete and analog intrinsically safe field devices. It is approved for use in Class I, Division 2 locations, and may be connected to field devices in Class I, Division 1 areas.

The modular system consists of power modules, PROFIBUS-DP communication gateways, I/O modules and a backplane rack. The backplane is available in two sizes, with support for 8 or 16 I/O modules. The larger rack (MT18...) also allows for redundant power supplies and PROFIBUS-DP gateway cards to be used. This allows a failsafe communication scheme to be used.

The I/O modules provide the interface to field devices. The backplane provides power for I/O from the mounted power supply, with no need for a separate field supply. The gateways, power supplies and I/O cards are simply plugged into the backplane rack, with all power, PROFIBUS-DP and I/O wiring separate from the removable modules. I/O modules may also be changed during operation ("hot-swapped"). The system automatically checks whether a newly inserted module matches the configuration.

The internal cycle time of the excom system is less than 5 ms for discrete signals and less than 20 ms for analog signals. Total response time of the PROFIBUS-DP system depends on the cycle time of the controller and its program, as well as the data rate of the PROFIBUS-DP system. HART values may be exchanged with supported devices via PROFIBUS-DPV1 communication.

In order to use the excom system in a hazardous area, the PROFIBUS-DP communication must be conditioned through a segment coupler. Couplers are available for both wire and fiber-optic media.

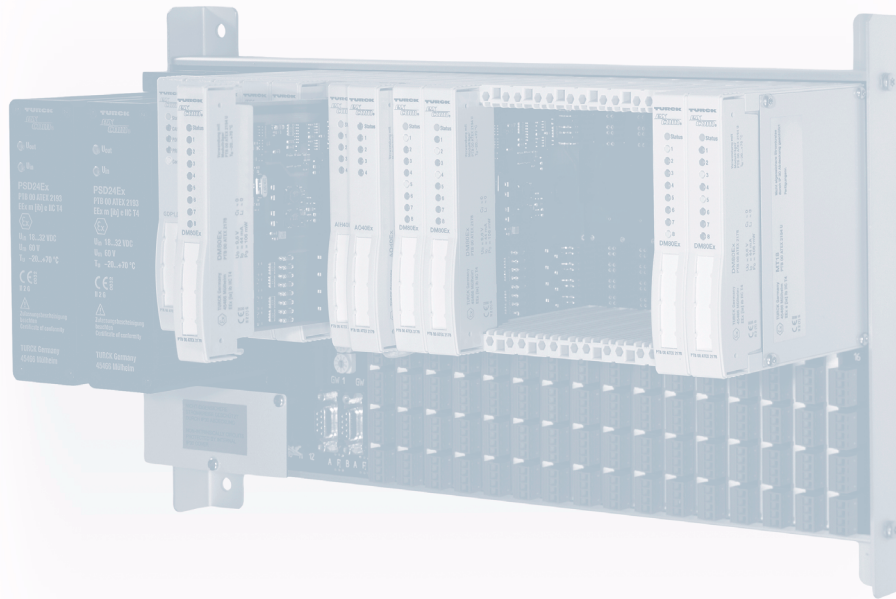


Diagnostics

The **excom** gateway provides extended PROFIBUS-DP diagnostic information, including channel-specific error indication. Each module also features LEDs for visual error indication as well as I/O status. Consult the user manual for the **excom** system for detailed information.

Addressing

The I/O modules need no user configured address since the gateway recognizes them by which backplane slot they are inserted in. The **excom** system itself needs a PROFIBUS-DP address, which is set via three rotary switches. The maximum address of the system is 125.



PROFIBUS-DP Gateway

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Various I/O Styles



Electrical

- Power Consumption: <3 W (from backplane)

Mechanical

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IP 20

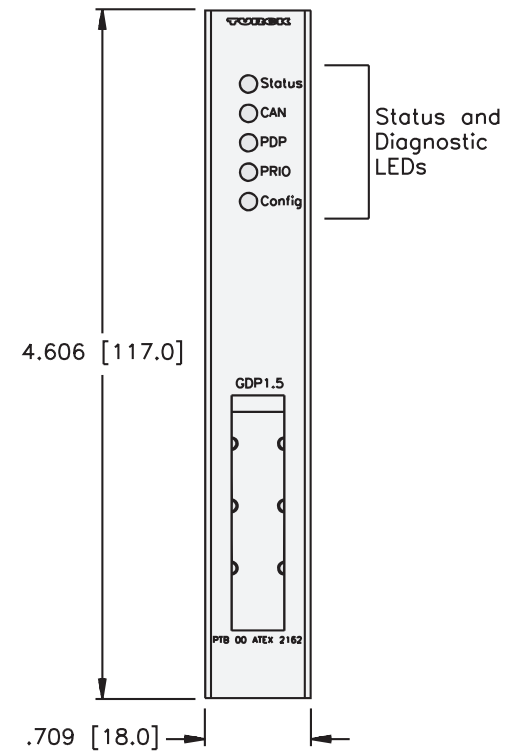
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area

Diagnostics (Physical)

- LEDs to indicate status of PROFIBUS-DP and backplane communication

GDP1.5



PROFIBUS-DP Connector



- 1 = Shield
- 3 = BUS_B
- 5 = DGnd
- 6 = +5 VDC
- 8 = BUS_A

Note: Connector is mounted to the excom backplane rack.

**4 Channel
 Discrete Input Module**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- NAMUR Inputs



Electrical

- Power Consumption: <2 W (from backplane)
- Sensor Type: NAMUR

Mechanical

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

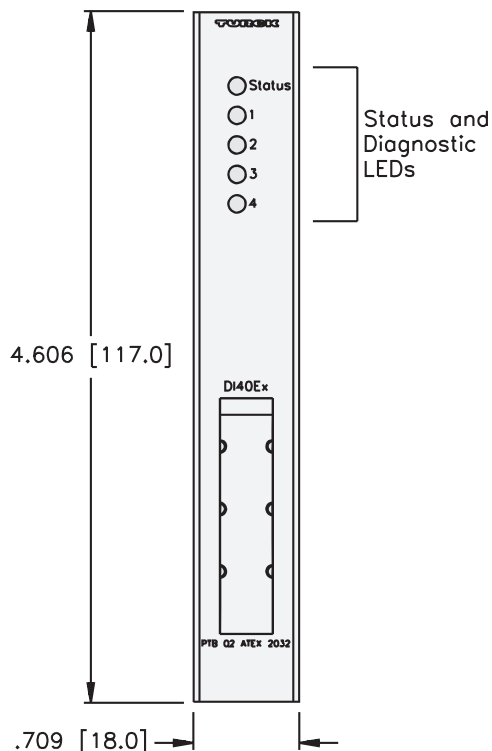
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

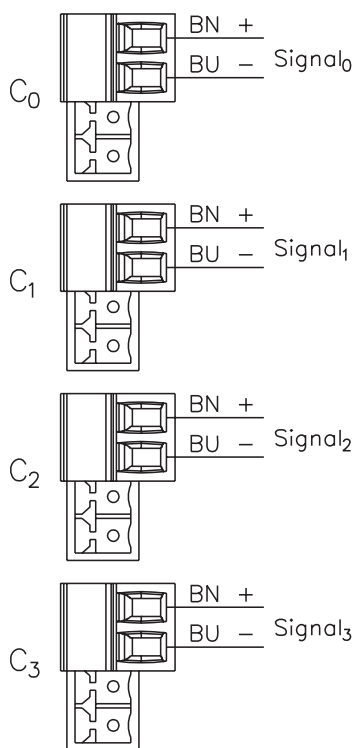
- LEDs indicate faults for each channel

DI40EX



Inputs									Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	OCD	I/O Map
DI40EX	4	0-3	E-I	1	NAMUR		X	X	1

E-I



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	n-1	(Data from modules to the left)							
	n	Data from next discrete modules				I-3	I-2	I-1	I-0
	n+1	(Data from modules to the right)							

**4 Channel
 Discrete Output Module**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Selectable Output Power



Electrical

- Power Consumption: <4.5 W (from backplane)
- Output Voltage: 16 or 24 VDC (depending on terminals used)

Mechanical

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP 20

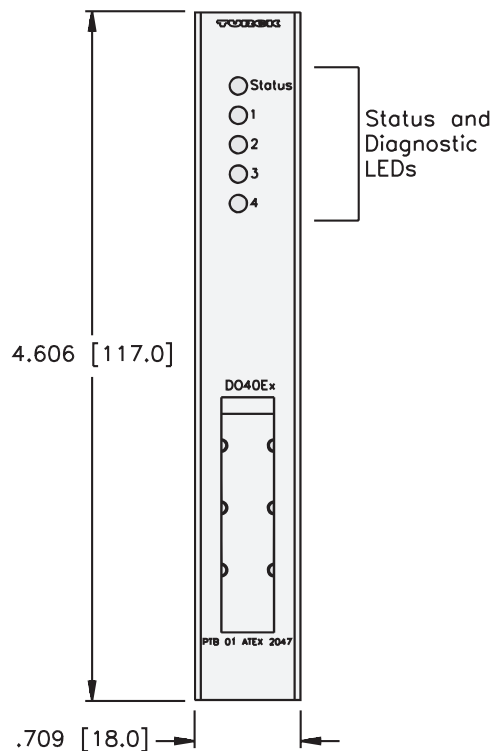
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

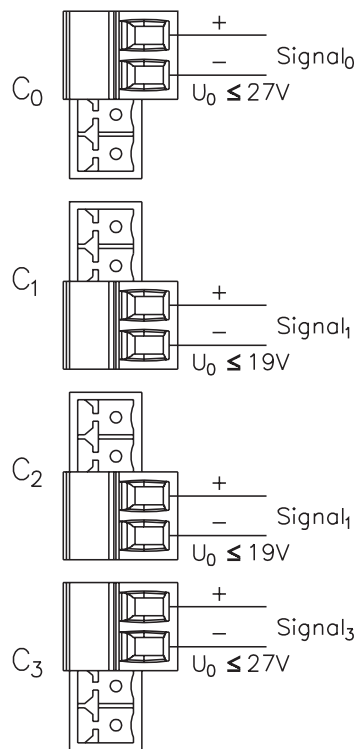
- LEDs indicate faults for each channel

DO40EX



Outputs								Data
Part Number	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
D040EX	4	0-3	E-O	1	45 mA (@12 V)	X	X	1

E-O



Note: Each output can be used in either the 19 or 27 V mode

I/O Data Map 1

Out	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n-1	(Data for modules to the left)								
n	Data for next discrete modules				0-3	0-2	0-1	0-0	
n+1	(Data for modules to the right)								

8 Channel Discrete Input/Output Module

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Channels can be Input or Output



DM80EX

Electrical

- Power Consumption: <2 W (from backplane)
- Input Type: NAMUR or dry contact
- Output Voltage: 8 VDC

Mechanical

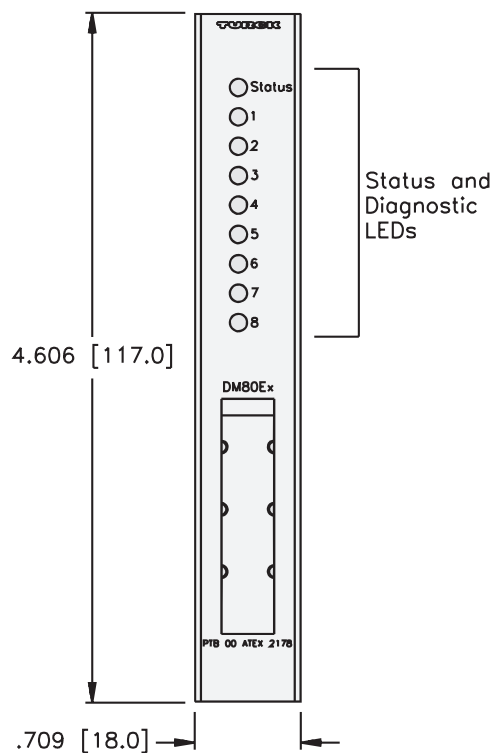
- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP 20

Diagnostics (Logical)

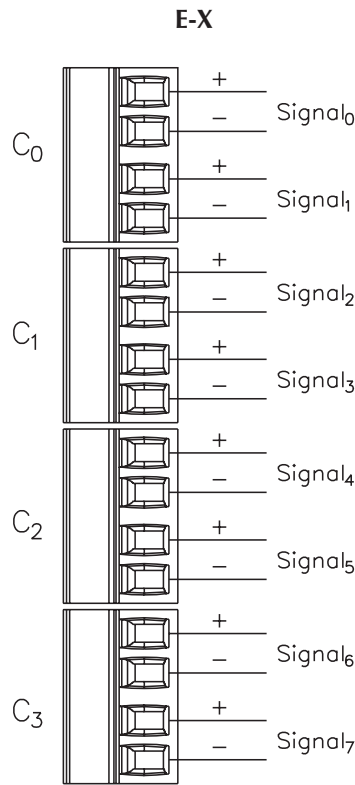
- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

- LEDs indicate faults for each channel



Part Number	Inputs								Outputs						Data	
	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
DM80EX	8	0-3	E-X	2	NAMUR		X	X	8	0-3	E-X	2	~4 mA	X	X	1



I/O Data Map 1

In	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	n-1	(Data from modules to the left)							
	n	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	n+1	(Data from modules to the right)							

4 Channel Analog Input Modules

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- HART Capability



Electrical

- Power Consumption: <3.5 W (from backplane)
- Input Type: 2-wire (AI(H)40EX) or 4-wire (AI(H)41EX) sensors

Mechanical

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

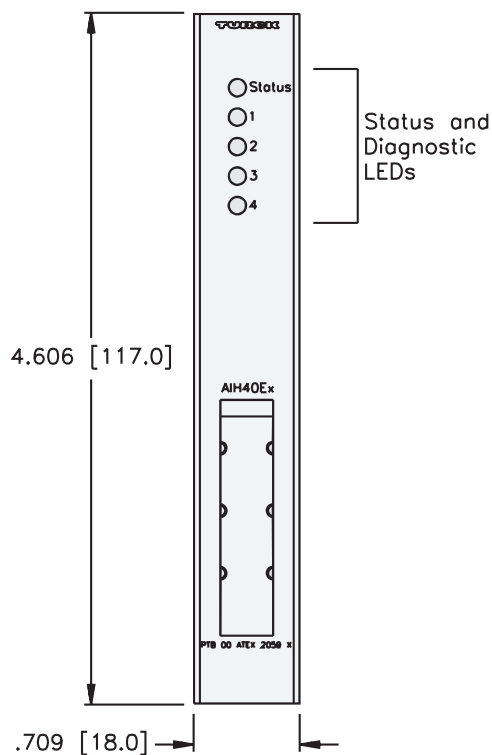
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

- LEDs indicate faults for each channel

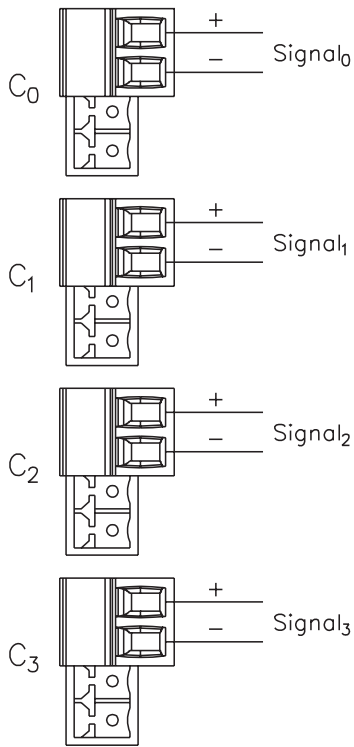
- AI40EX**
- AIH40EX**
- AI41EX**
- AIH41EX**



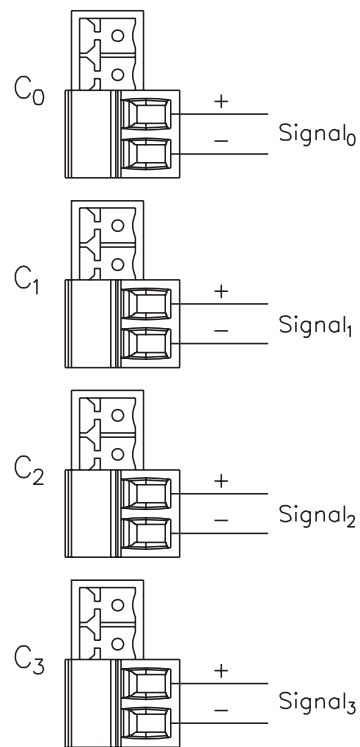
Inputs	Data
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Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Individual Diagnostics	Wire-Break Detection	HART Compatible	I/O Map
AI40EX	4	0-3	E-AI2	1	0/4 to 20 mA	X	X		1
AI41EX	4	0-3	E-AI4	1	0/4 to 20 mA	X	X		1
AIH40EX	4	0-3	E-AI2	1	0/4 to 20 mA	X	X	X	1
AIH41EX	4	0-3	E-AI4	1	0/4 to 20 mA	X	X	X	1

E-AI2



E-AI4



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	n-1	(Data from modules to the left)							
	n	Channel 0, MSB							
	n+1	Channel 0, LSB							
	n+2	Channel 1, MSB							
	n+3	Channel 1, LSB							
	n+4	Channel 2, MSB							
	n+5	Channel 2, LSB							
	n+6	Channel 3, MSB							
	n+7	Channel 3, LSB							
	n+8	(Data from modules to the right)							

Note: Default data map shown. More data is returned if HART variables are used. Consult product user manual for details.

4 Channel Analog Output Modules

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- HART Capability



Electrical

- Power Consumption: <3.5 W (from backplane)
- Output Type: 0/4...20 mA actuators

Mechanical

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

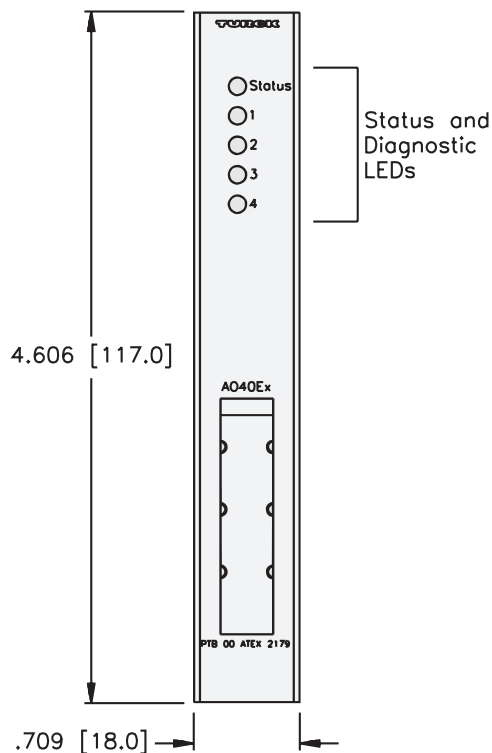
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

- LEDs indicate faults for each channel

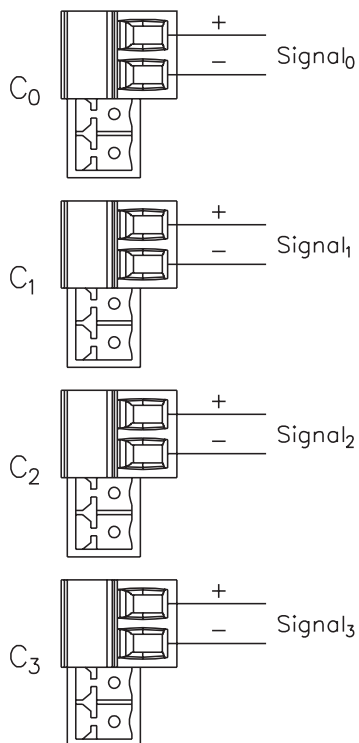
AO40EX
AOH40EX



Outputs

Part Number	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	HART Compatible	I/O Map
A040EX	4	0-3	E-AO	1	0/4 to 20 mA	X	X		1
A0H40EX	4	0-3	E-AO	1	0/4 to 20 mA	X	X	X	1

E-AO



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Out	n-1	(Data for modules to the left)							
	n	Channel 0, MSB							
	n+1	Channel 0, LSB							
	n+2	Channel 1, MSB							
	n+3	Channel 1, LSB							
	n+4	Channel 2, MSB							
	n+5	Channel 2, LSB							
	n+6	Channel 3, MSB							
	n+7	Channel 3, LSB							
	n+8	(Data for modules to the right)							

**8 Channel
 Frequency/Counter Input
 Module**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Pulse Count or Frequency Measurement



Electrical

- Power Consumption: <1.5 W (from backplane)
- Input Type: Pulse count or frequency measurement of NAMUR sensor

Mechanical

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP 20

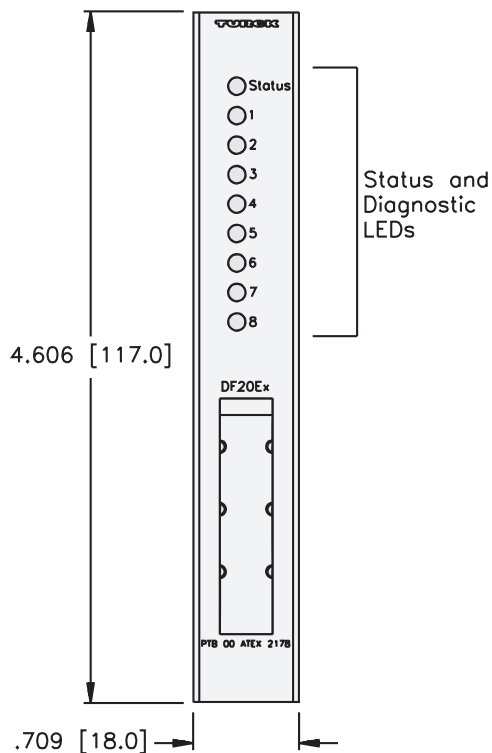
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

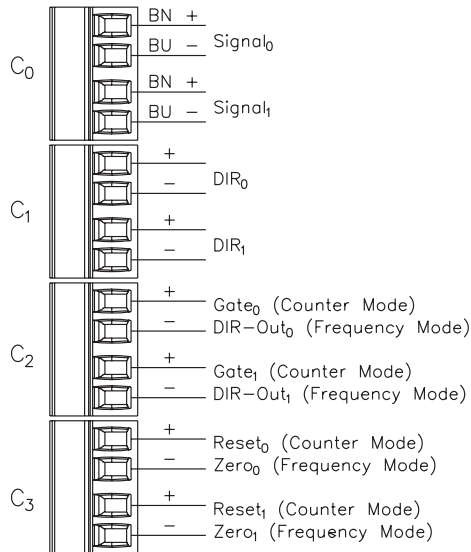
- LEDs indicate faults for each channel

DF20EX



Inputs										Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	I/O Map	
DF20EX	2	0-3	E-F	2	Frequency/Counter		X	X	1	

E-F



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
In	n-1	(Data from modules to the left)								
	n	S-0	OV-0*	SIGN-0	Channel 0 (MS bits)					
	n+1	Channel 0								
	n+2	Channel 0								
	n+3	Channel 0 (LSB)								
	n+4	S-1	OV-1*	SIGN-1	Channel 1 (MS bits)					
	n+5	Channel 1								
	n+6	Channel 1								
	n+7	Channel 1 (LSB)								
	n+8	(Data from modules to the right)								
	* OV is used in counter mode only									

4 Channel Temperature Input Module

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Thermocouple or RTD Inputs



TI40EX

Electrical

- Power Consumption: <3 W (from backplane)
- Input Type: PT100, PT1000, NI100 2-, 3- or 4-wire RTDs
 Type B, E, J, K, L, N, R, S, T Thermocouples

Mechanical

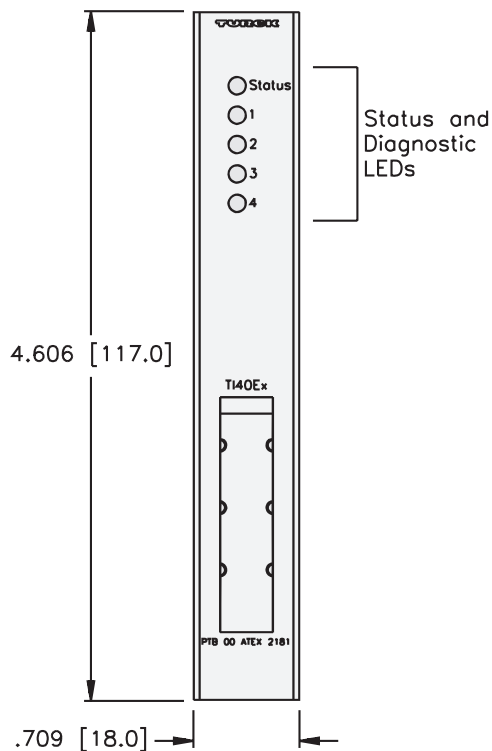
- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

Diagnostics (Logical)

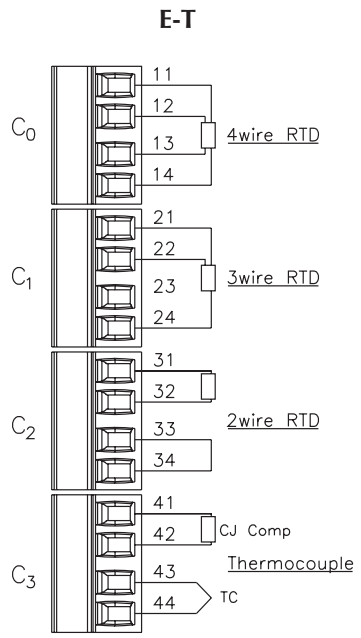
- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

Diagnostics (Physical)

- LEDs indicate faults for each channel



Inputs									Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	I/O Map
TI40EX	4	0-3	E-T	1	TC / RTD		X	X	1



Note: Each channel may be used in any of the four example forms shown.

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	n-1	(Data from modules to the left)							
	n	S-0	Channel 0, MSB						
	n+1	Channel 0, LSB							
	n+2	S-1	Channel 1, MSB						
	n+3	Channel 1, LSB							
	n+4	S-2	Channel 2, MSB						
	n+5	Channel 2, LSB							
	n+6	S-3	Channel 3, MSB						
	n+7	Channel 3, LSB							
	n+8	(Data from modules to the right)							

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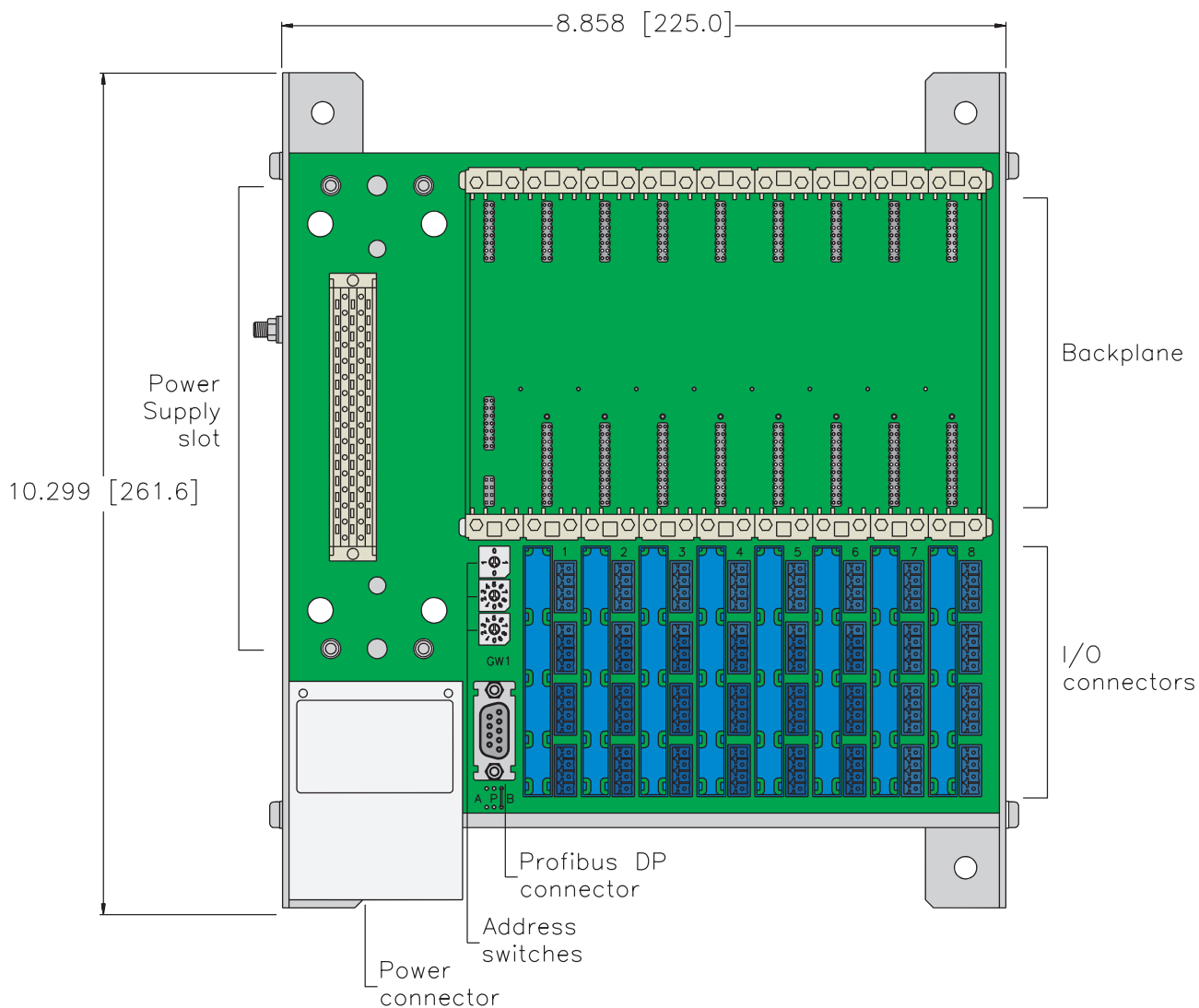
Backplane Racks

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Redundant Communication Option

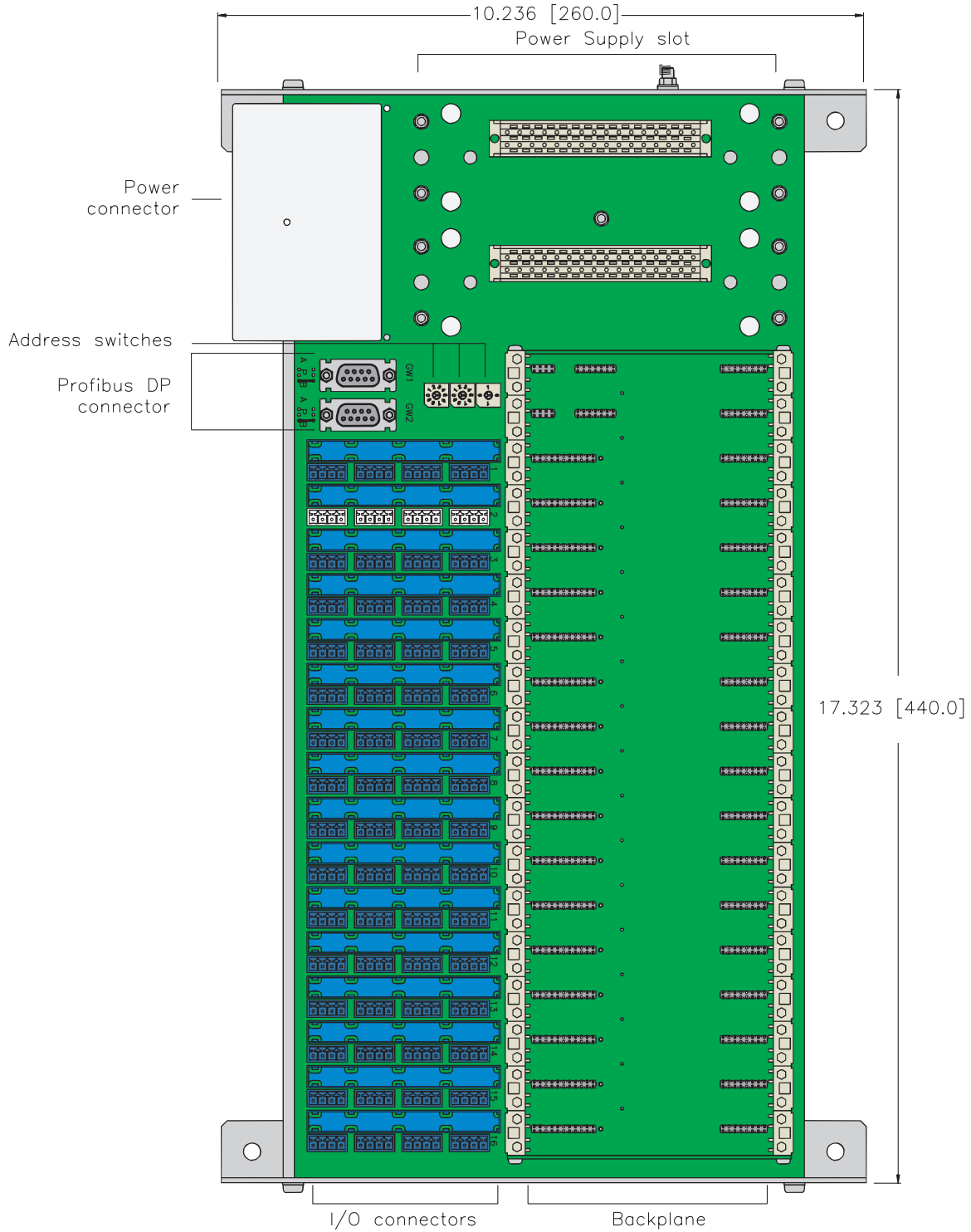


Excom Racks				
Part Number	I/O Slots	Redundancy	Connector Type	FM Approval
MT9/FM	8		Screw Terminal	X
MT9-R024	8		Screw Terminal	Pending
MT18-R024	16	X	Screw Terminal	Pending

MT9/FM
MT18-R024



MT18..



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PSD24EX



- Power Supply Module (24 VDC in) for Excom Rack

Electrical

- Power Consumption: 75 W
- Power Output: 60 W
- Voltage Input: 18...33 VDC

Mechanical

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP50

Diagnostics (Physical)

- LEDs indicate status of power supply



BM1



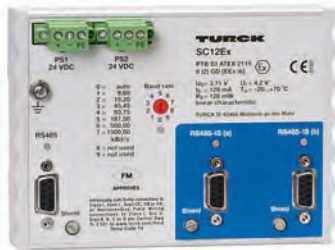
- Blank Cover for Unused *excom* Slots

Image	Part Number	Description
	<p>D9T-RS485</p>	<p>D9 PROFIBUS-DP connector for use in safe areas.</p>
	<p>D9T-RS485IS</p>	<p>D9 PROFIBUS-DP connector for use in hazardous (FM Div 2) areas.</p>
	<p>D9T-RS485PG</p>	<p>D9 PROFIBUS-DP connector with programming port for use in safe areas</p>
	<p>MODEX-FILTER</p>	<p>Capacitor to improve power up performance and operational safety of <i>excom</i></p>

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**PROFIBUS-DP
 IS Couplers**

- Redundant Communication
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Fiber Optic or Copper Media



Electrical

- Voltage In: 18 to 32 VDC
- Current Consumption: <100 mA (OC11...), <200 mA (SC12...)

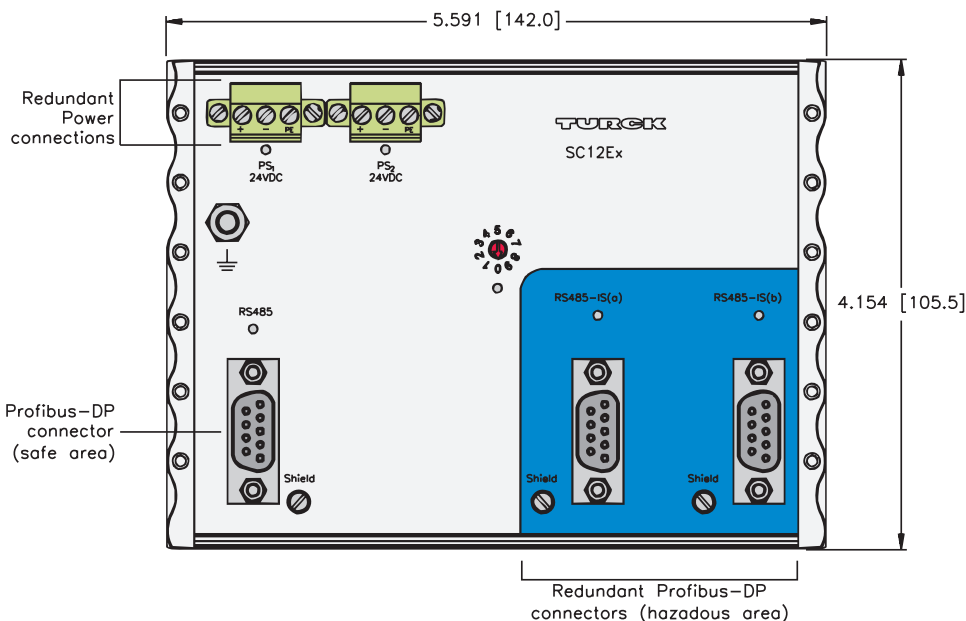
Mechanical

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

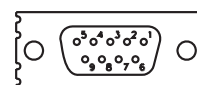
Diagnostics (Physical)

- LEDs indicate status of power and PROFIBUS-DP communication

OC11EX/2G
OC11EX/3G
SC12-EX



SC12-EX shown

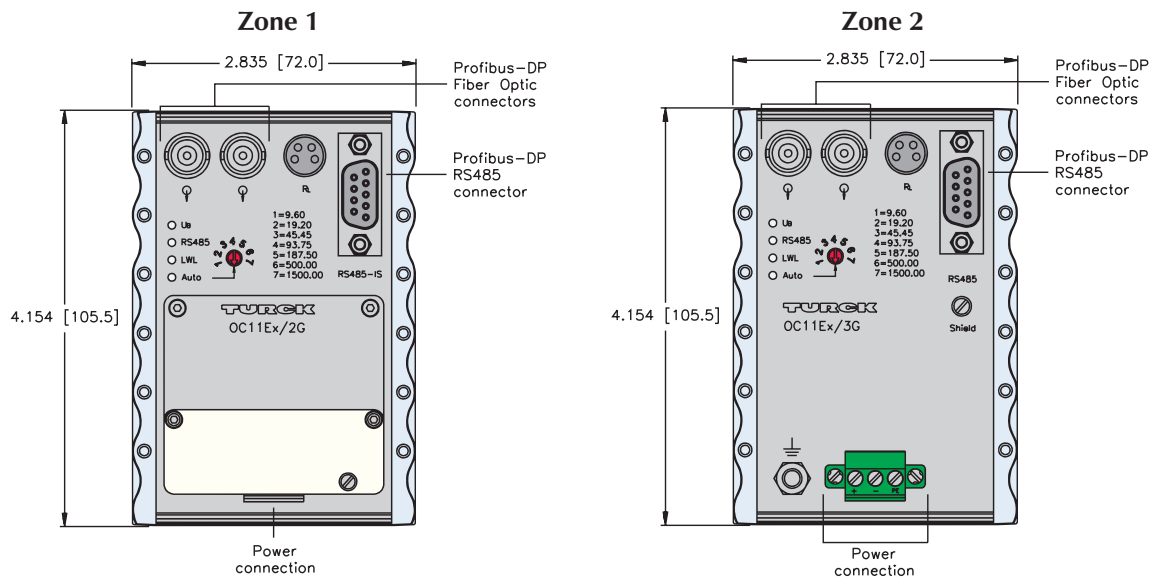


- 1=Shield
- 3=BUS_B
- 5=DGND
- 6=+VDC
- 8=BUS_A

Note: For fiber optic communication the part number CABLE LWL-2ST/SY-*M (where * is the length in meters) must be used.

Part Number	Classification	Connection
OC11EX/2G	Zone 1	Fiber
OC11EX/3G	Zone 2	Fiber
SC12-EX		Copper

Note: For fiber-optic communication the part number CABLE LWL-2ST/SY-*M (where * is the length in meters) must be used.



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