

SmartStixä

User Manual for the DeviceNet Versions (HE400 or HE409) of:

DQM601 DQM606
 DQM701 DQM706
 DIM610 DIM710
 DIQ811 DIQ816
 DQM602

Remote I/O

For Electronic Information and EDS File, see www.SmartStix.com.

05 August 2004

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1 Technical Support

For user manual updates and technical assistance, contact Technical Support:
 North America: (317) 916-4274 Europe: (+) 353-21-4321-266
 or visit our website at www.heapq.com or visit our website at www.horner-apg.com.

2 Installation / Safety

- All applicable codes and standards need to be followed in the installation of this product.
- For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG or larger.
- For detailed installation and programming information, refer to www.odva.org. This product has a Programmer's Reference (SUP0552).



Warning: Consult user documentation.



Warning: Electrical Shock Hazard.

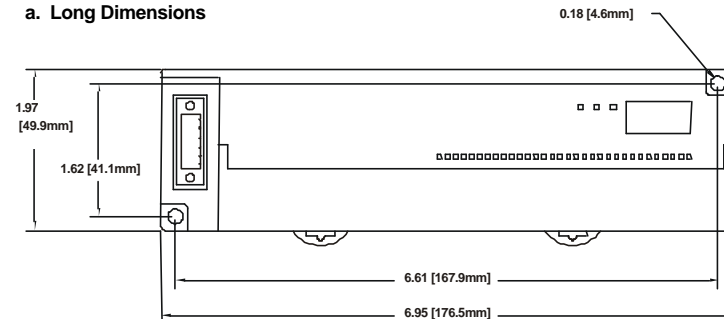
3 Model Numbers

Model Prefix	Description
HE400	DeviceNet model with non-removable terminal strip
HE409	DeviceNet model with removable terminal strip
Long or Short Dimension	Description
DIM610 (Short)	16 DC Inputs (24VDC, positive/negative logic)
DIM710 (Long)	32 DC Inputs (24VDC, positive/negative logic)
DQM601 / 606* (Short)	16 DC Outputs (24VDC, negative logic, 0.5A) (Note: If using DQM601 with a non-removable terminal strip, the output rating is 0.1A.) (* DQM606 uses positive logic.)
DQM701 / 706** (Long)	32 DC Outputs (24VDC, negative logic, 0.5A) (Note: If using DQM701 with a non-removable terminal strip, the output rating is 0.1A.) (** DQM706 uses positive logic.)
DQM602 (Long)	16 Relay Outputs (250VAC, 30VDC, 2.0A)
DIQ811 / 816*** (Long)	16 DC Inputs (24VDC, positive/negative logic) 16 DC Outputs (24VDC, negative logic, 0.5A) (Note: If using DIQ811 with a non-removable terminal strip, the output rating is 0.1A.) (*** DIQ816 uses positive logic.)

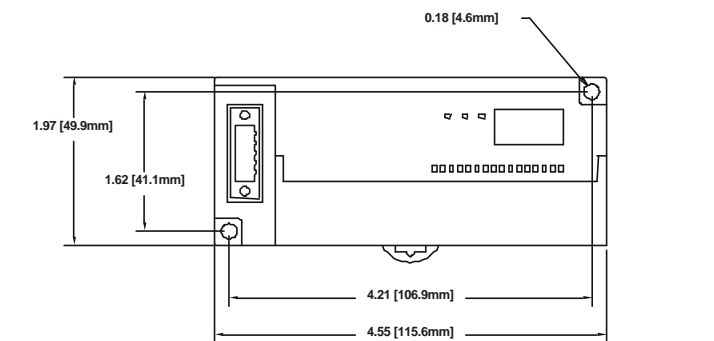
4 Dimensions

SmartStix modules come in two sizes depending upon the model number. See Section 3 to determine if a module has long or short dimensions.

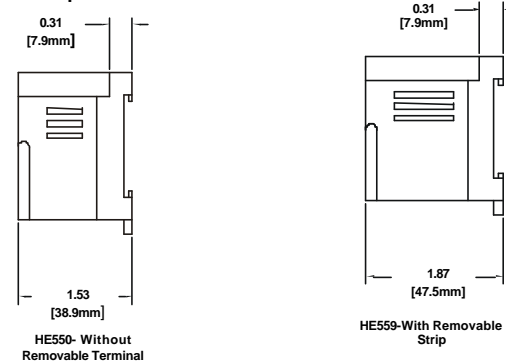
a. Long Dimensions



b. Short Dimensions



c. Terminal Strips



5 Electronic Data Sheet (ESD File)

The ESD file for the SmartStix DeviceNet I/O Block can be retrieved from the Internet at www.SmartStix.com.

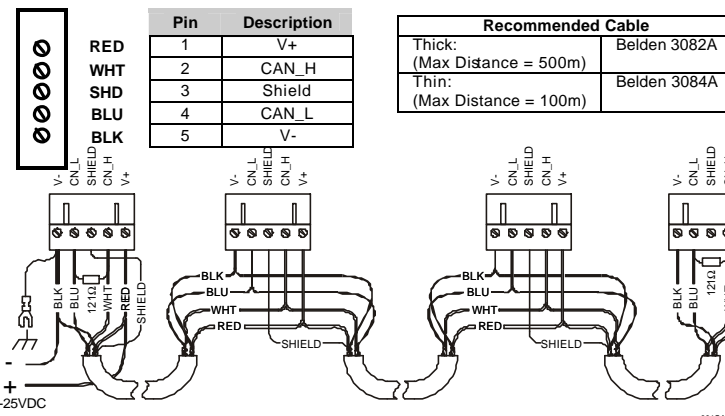
6 General Specifications

General Specifications			
Storage Temperature	-25° to 70° C	Operating and Storage Humidity	5 to 95% Non-condensing
Operating Temperature	0° to 55° C	Pollution degree	2 or lower
Atmosphere	Free from corrosive gases and excessive dust	Cooling method	Self-cooling
Vibration			
Occasional Vibration			
Frequency	Acceleration	Amplitude	Sweep Count
10 ≤ f < 57 Hz	-	0.075 mm	10 times in each direction for X,Y,Z
57 ≤ f ≤ 150 Hz	9.8 m/s ² (1G)	-	-
Continuous Vibration			
Frequency	Acceleration	Amplitude	Sweep Count
10 ≤ f < 57 Hz	-	0.035 mm	10 times in each direction for X,Y,Z
57 ≤ f ≤ 150 Hz	4.9 m/s ² (0.5G)	-	-

Shocks				
Maximum shock acceleration	147 m/s ² (15G)			
Duration Time	11 ms.			
Pulse Wave	Half sine wave pulse (3 times in each of X, Y, Z directions)			
Noise Immunity				
Square wave impulse noise	AC: ± 1,500VDC DC: ± 900VDC			
Electrostatic Discharge	Voltage: 4kV (contact discharge)			
Radiated electromagnetic field	27 – 500MHz, 10V/m			
Fast Transient Burst Noise				
Severity level	All power modules	Digital I/Os (Ue ≥ 24V)	Digital I/Os (Ue < 24 V) Analog I/Os Communication I/Os	
Voltage	2 kV	1 kV	0.25 kV	

7 Network Cable

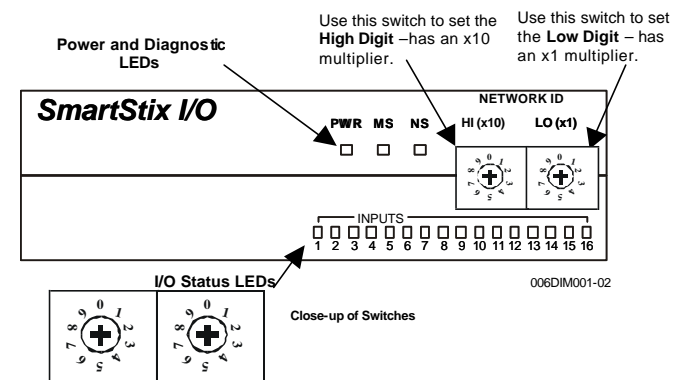
For detailed wiring information, refer to the Control Station Hardware Manual. A handy checklist is provided that covers panel box layout requirements and minimum clearances. See Section 1 for our web address.



CAN Wiring: Note: 12 - 24VDC must be supplied to the network.

8 ID Switches

DeviceNet MAC IDs are set using the decimal number system from 0 to 63. Set a unique ID by inserting a small Phillips screwdriver into the two identical switches.



9 LEDs

The Communication LEDs display the status of the communication module.

Communication LED	Meaning
PWR	Displays status of power
MS	Displays the status of interface between communication module and CPU module
NS	Displays the status of the network of communication module

10 DeviceNet Messaging

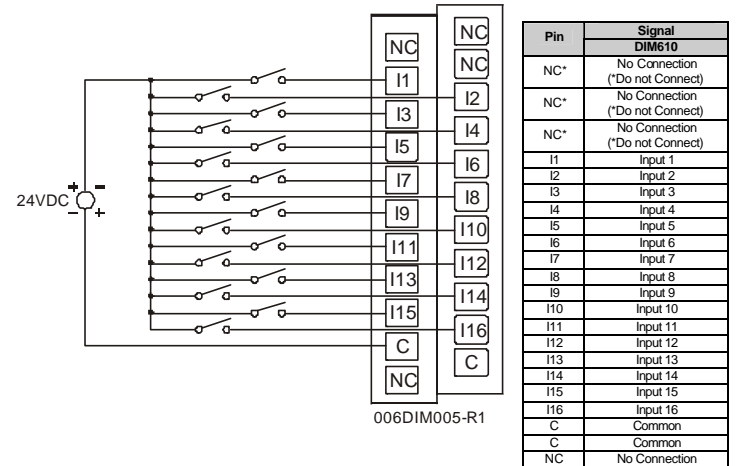
The SmartStix I/O block is considered a Group 2 Only device. It supports the Polled Connection and features an I/O Assembly of the following sizes:

	DIM610	DQM601	DIM710	DQM701	DQM602	DIQ811
Produced Bytes	2	0	4	0	0	2
Consumed Bytes	0	2	0	4	2	2

11 SmartStix Modules

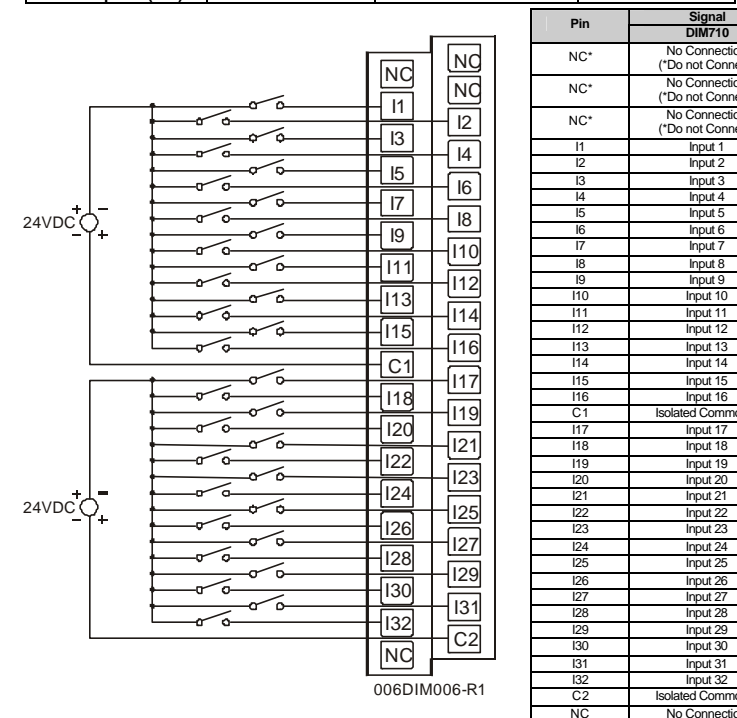
a. DIM610: 16 DC IN, Positive / Negative Logic

DIM610 Specifications			
Number of input points	16	OFF to ON Response	0 - 3ms. or less
Rated Input Current	7mA	ON to OFF Response	0 - 3ms. or less
ON Voltage Level	19VDC or less	Common Terminal	16 points / COM
OFF Voltage Level	6VDC or less	Operating Indicator	LED turns on during ON state of input
Input Characteristics	Bidirectional	External Connections	Terminal block connector (M3 x 6 screws)
Isolation Method	Photo Coupler	Altitude for use	Up to 2,000m
Internal power Consumption (mA)	200mA	Weight	5.6 oz. (159 g)



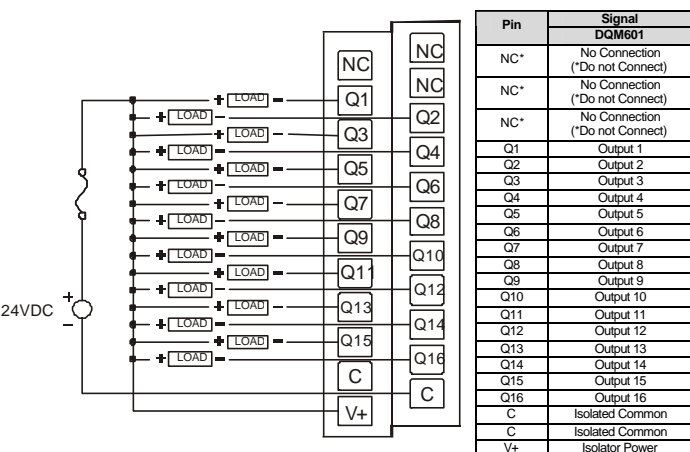
b. DIM710: 32VDC IN, Positive / Negative Logic

DIM710 INPUTS			
Number of input points	32	OFF to ON Response	0 - 3ms. or less
Rated Input Current	7mA	ON to OFF Response	0 - 3ms. or less
ON Voltage Level	19VDC or less	Common Terminal	16 points / COM
OFF Voltage Level	6VDC or less	Operating Indicator	LED turns on during ON state of input
Input Characteristics	Bidirectional	External Connections	Terminal block connector (M3 x 6 screws)
Isolation Method	Photo Coupler	Weight	8.36oz. (237 g)
Internal power Consumption (mA)	300		

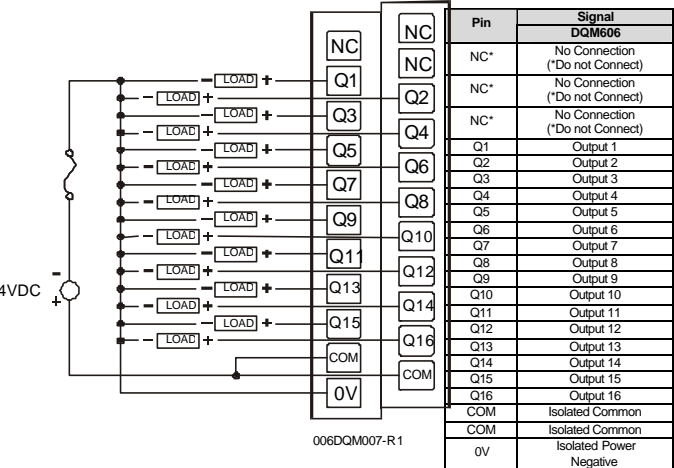


c. **DQM601: 16 DC OUT, Negative Logic**
DQM606: 16 DC OUT, Positive Logic

DQM601 / DQM606 Outputs		External Power Supply	Voltage	24VDC ± 10%(ripple voltage: 4Vp-p or less)
Number of output points	16			
Commons per Module	1	OFF to ON Response	2ms.	2ms.
Operating Voltage	24VDC			
Rated Load Voltage	24VDC	ON to OFF Response	2ms.	
Max. Load Current per channel	DQM 601A	Output Type	DQM 601	Sinking
	DQM601B / DQM606			
OFF Leakage Current	0.1mA or less	Common Method	16 points / COM	
Max. Inrush Current per channel	DQM 601	Operating Indicator	LED turns on during ON state of output	
	DQM 606		External connections	Terminal block connector (M3 x 6 screws)
Maximum Voltage Drop during ON circuit	1.5VDC(0.5A)	Isolation methods	Photo Coupler	
Internal power Consumption (mA)	280	Weight	DQM601	5.7 oz. (161g)
			DQM606	6.7 oz. (191g)



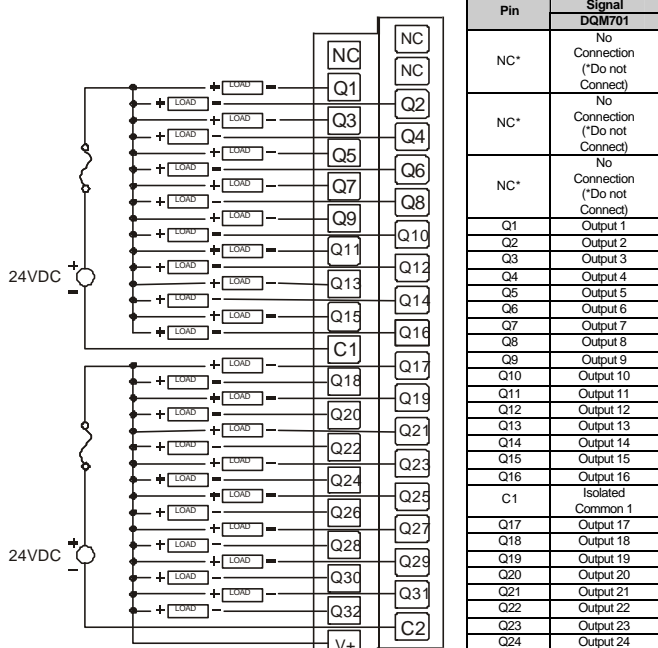
Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
C	Isolated Common
C	Isolated Common
V+	Isolator Power



Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
COM	Isolated Common
COM	Isolated Common
0V	Isolated Power Negative

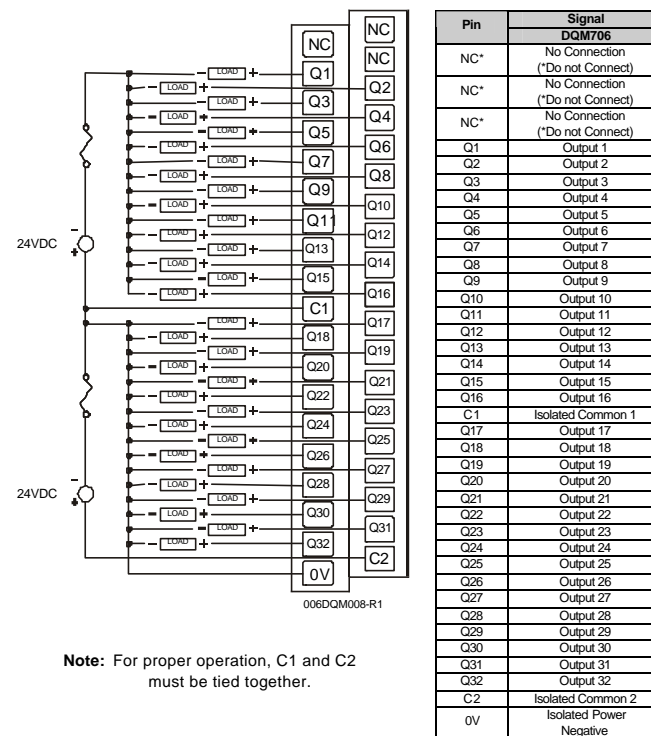
d. **DQM701: 32 DC OUT, Negative Logic**
DQM706: 32 DC OUT, Positive Logic

DQM701 / 706 Outputs		External Power Supply	Voltage	24VDC ± 10%(ripple voltage: 4Vp-p or less)
Number of output points	32			
Commons per Module	2	OFF to ON Response	2ms.	2ms.
Operating Voltage	24VDC			
Rated Load Voltage	24VDC	ON to OFF Response	2ms.	
Max. Load Current per channel	DQM 701	Output Type	DQM 701	Sinking
	DQM 706			
OFF Leakage Current	0.1mA or less	Common Method	16 points / COM	
Max. Inrush Current per channel	DQM 701	Operating Indicator	LED turns on during ON state of output	
	DQM 706		External connections	Terminal block connector (M3 x 6 screws)
Maximum Voltage Drop during ON circuit	1.5VDC(0.5A)	Isolation methods	Photo Coupler	
Internal power Consumption (mA)	DQM701	Weight	DQM701	8.47 (240g)
	DQM706		DQM706	10.22 (290g)



Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
C1	Isolated Common 1
C1	Output 17
Q18	Output 18
Q19	Output 19
Q20	Output 20
Q21	Output 21
Q22	Output 22
Q23	Output 23
Q24	Output 24
Q25	Output 25
Q26	Output 26
Q27	Output 27
Q28	Output 28
Q29	Output 29
Q30	Output 30
Q31	Output 31
Q32	Output 32
C2	Isolated Common 2
V+	Isolator Power

Note: For proper operation, C1 and C2 must be tied together.

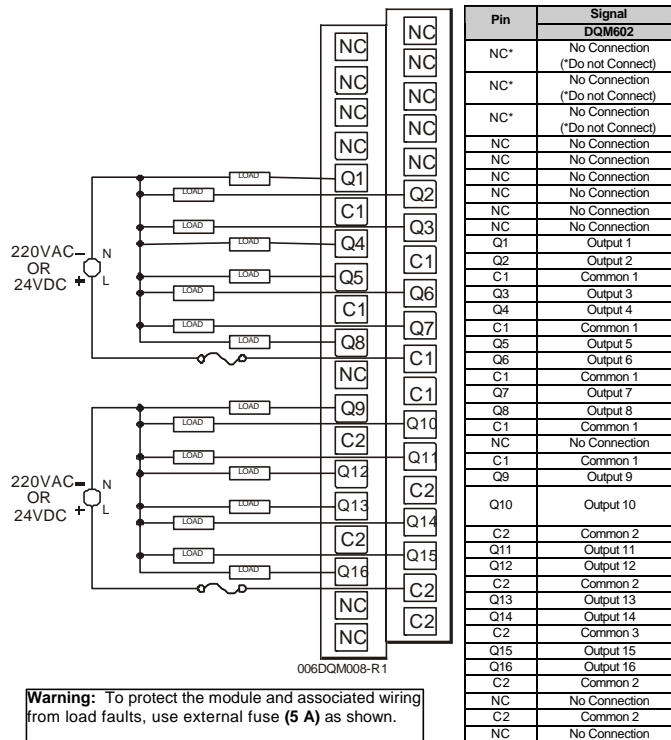


Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
C1	Isolated Common 1
Q17	Output 17
Q18	Output 18
Q19	Output 19
Q20	Output 20
Q21	Output 21
Q22	Output 22
Q23	Output 23
Q24	Output 24
Q25	Output 25
Q26	Output 26
Q27	Output 27
Q28	Output 28
Q29	Output 29
Q30	Output 30
Q31	Output 31
Q32	Output 32
C2	Isolated Common 2
0V	Isolated Power Negative

Note: For proper operation, C1 and C2 must be tied together.

e. **DQM602: 16 RELAY OUTPUTS**

DQM602 Relay Outputs			
Number of output points	16	Maximum Load Current (resistive)	2.0A per channel
Commons per Module	2	OFF to ON Response	10ms. Max.
Rated Load Voltage	24VDC, 220VAC	ON to OFF Response	12ms. Max.
Minimum load voltage / current	5VDC / 1mA	Output Type	N.O.
Internal power Consumption (mA)	550mA	Weight	9.91oz. (281 g)



Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
NC	No Connection
NC	No Connection
NC	No Connection
NC	No Connection
NC	No Connection
NC	No Connection
NC	No Connection
Q1	Output 1
Q2	Output 2
C1	Common 1
Q3	Output 3
Q4	Output 4
C1	Common 1
Q5	Output 5
Q6	Output 6
C1	Common 1
Q7	Output 7
Q8	Output 8
C1	Common 1
C1	Common 1
Q9	Output 9
Q10	Output 10
C2	Common 2
Q11	Output 11
Q12	Output 12
C2	Common 2
Q13	Output 13
Q14	Output 14
C2	Common 3
Q15	Output 15
Q16	Output 16
C2	Common 2
NC	No Connection
C2	Common 2
NC	No Connection

Warning: To protect the module and associated wiring from load faults, use external fuse (5 A) as shown.

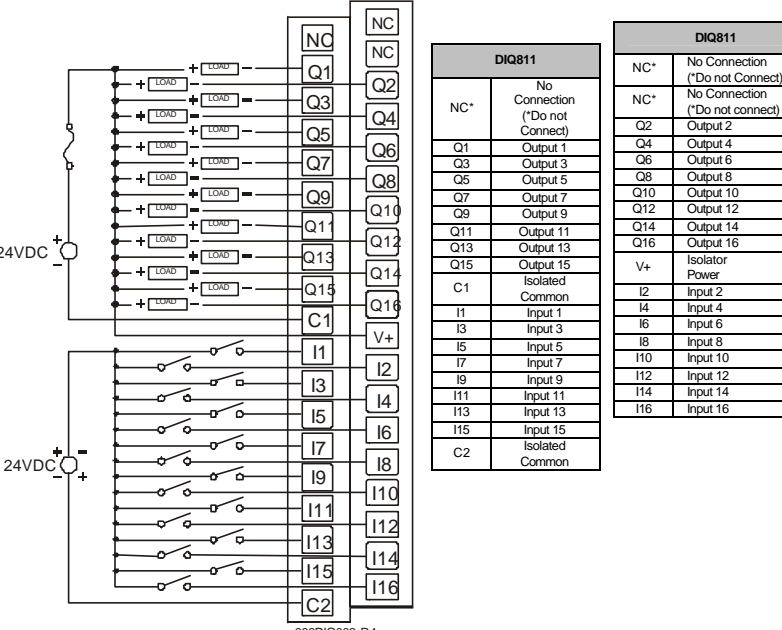
Warning: Connecting high voltage to any I/O pin may cause high voltage to appear at other I/O pins.

Warning: Wiring the line side of the AC source to loads connected to outputs 0 through 15 and the neutral side of the AC source to the output common(s) would create a Negative Logic condition, which may be considered an unsafe practice.

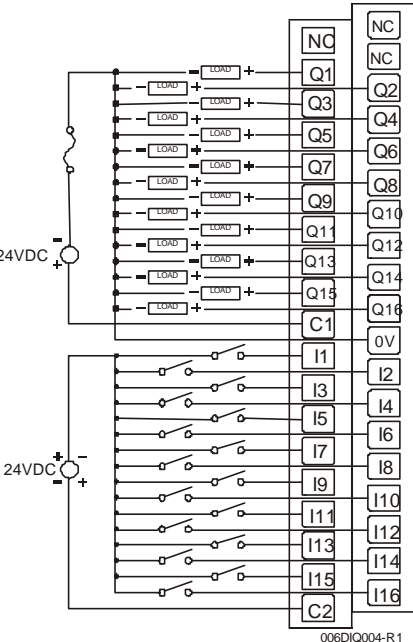
f. **DIQ811: 16 DC IN, Positive/Negative / 16 DC OUT, Negative Logic**
DIQ816: 16 DC IN, Positive / 16 DC OUT, Positive Logic

DIQ811 / 816 IN			
Number of input points	16	OFF to ON Response	0 - 3ms. or less
Rated Input Current	7mA	ON to OFF Response	0 - 3ms. or less
ON Voltage Level	19VDC or less	Common Terminal	16 points / COM
OFF Voltage Level	6VDC or less	Operating Indicator	LED turns on during ON state of input
Input Characteristics	Bidirectional	External Connections	Terminal block connector (M3 x 6 screws)
Isolation Method	Photo Coupler		

DIQ811 / 816 OUT				
Number of output points	16	External Power Supply	24VDC ± 10%(ripple voltage: 4Vp-p or less)	
Commons per Module	1	OFF to ON Response	2ms.	
Operating Voltage	24VDC			
Rated Load Voltage	24VDC	ON to OFF Response	2ms.	
Max. Load Current per channel	DIQ 811	Output Type	DIQ811	Sinking
	DIQ 816		DIQ816	Sourcing
Max. Inrush Current per channel	DIQ 811	DIQ811	0.4A, 10ms.	
			DIQ816	1A, 10ms
OFF Leakage Current	0.1mA or less	Common Method	16 points / COM	
Internal power Consumption (mA)	DIQ811	Weight	DIQ811	8.40 oz. (238 g)
			DIQ816	DIQ816



Pin	Signal
NC*	No Connection ("Do not Connect")
NC*	No Connection ("Do not Connect")
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
V+	Isolator Power
C1	Isolated Common
I2	Input 2
I1	Input 1
I3	Input 3
I4	Input 4
I5	Input 5
I6	Input 6
I7	Input 7
I8	Input 8
I9	Input 9
I10	Input 10
I11	Input 11
I12	Input 12
I13	Input 13
I14	Input 14
I15	Input 15
I16	Input 16
C2	Isolated Common



DIQ816		DIQ816	
NC*	No Connection ("Do not Connect")	NC*	No Connection ("Do not Connect")
Q1	Output 1	Q2	Output 2
Q3	Output 3	Q4	Output 4
Q5	Output 5	Q6	Output 6
Q7	Output 7	Q8	Output 8
Q9	Output 9	Q10	Output 10
Q11	Output 11	Q12	Output 12
Q13	Output 13	Q14	Output 14
Q15	Output 15	Q16	Output 16
C1	Isolated Common	0V	Isolated Ground
I1	Input 1	I2	Input 2
I3	Input 3	I4	Input 4
I5	Input 5	I6	Input 6
I7	Input 7	I8	Input 8
I9	Input 9	I10	Input 10
I11	Input 11	I12	Input 12
I13	Input 13	I14	Input 14
I15	Input 15	I16	Input 16
C2	Isolated Common		