



*In Control*

SMC CORPORATION OF JAPAN

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# HARDWARE MANUAL

## α PneuAlpha

[www.smc-pneumatics.co.uk](http://www.smc-pneumatics.co.uk)

### Foreword

- This manual contains text, diagrams and explanations which will guide the reader in the correct installation, safe use and operation of the PneuAlpha Series and should be read and understood before attempting to install or use the unit.
- If in doubt at any stage during the installation of the PneuAlpha Series always consult a professional electrical engineer who is qualified and trained to the local and national standards. If in doubt about the operation or use of the PneuAlpha Series please consult the nearest SMC Pneumatics Regional Centre.
- This manual is subject to change without notice.

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# α PneuAlpha

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## Hardware Manual

Manual number : ECC-PNAL-HARD-B  
Manual revision : G  
Date : August 1999

## Guidelines for the safety of the user and protection of equipment

This manual is written to be used by trained and competent personnel for installation of this equipment as defined by the European directives for machinery, low voltage and EMC. A technician or engineer trained in the local and national electrical standards should perform all tasks associated with the electrical wiring of the PneuAlpha Series controllers. Throughout this manual symbols are used to highlight information relating to the user's personal safety and protection of the equipment. When any of these symbols are encountered, the associated note must be read and understood.

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Symbols are:



1) The identified danger will cause physical and property damage.



2) The identified danger could cause physical and property damage.

- Under no circumstances will SMC Corporation of Japan and its subsidiaries be liable or responsible for any consequential damage that may arise as a result of installation or use of this equipment.
- All example and diagrams shown in this manual are intended to aid understanding and do not guarantee operation. SMC Corporation of Japan will accept no responsibility for actual use of this product based on these examples.
- Due to the great variety of possible applications for this equipment, the user must assess the suitability of this product for specific applications.
- If the controller breaks for any reason, please have safety procedures in place to stop any connected equipment in a safe manner.
- Do not replace electrical parts or try to repair an PneuAlpha Series product in any way.
- Please dispose of the PneuAlpha Series product in accordance with local and national standards.

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## 1. Introduction

The simple, friendly PneuAlpha Series has been designed for use around your home, office, factory... anywhere that requires a flexible supervisory control function. Every module allows you to read signals and set outputs according to particular conditions or time settings defined by you, the user. Plus the built-in programmable display allows you to check the status of your system anytime.

Special features of the PneuAlpha Series system are:

- Direct (on-device) programming capability
- High current output capability
- Small size
- Easy access programming port
- EEPROM cassette program storage capability
- Built-in Real Time Clock as standard
- Windows based programming package, ECC-PNAL-CD ROM
- Plus a full range of support documentation and Training packages

The PneuAlpha Series is designed to be used in the following automatic applications: lighting, air conditioning, irrigation, doors, gates, simple security systems, greenhouses, air fans, etc. The Real Time Clock can be used as a power saving device to automatically turn the equipment On/Off at scheduled times.

Debug programs carefully before installing in automated equipment. The PneuAlpha Series is not designed to be used in life critical or fail safe applications.

Contact your dealer for more information.

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## 2. Hardware Specification

### 2.1 Available Models

Table 2.1: Model Table

Model	Power Supply	Input		Output		Dimensions mm (inches)	Weight kg (lbs)
		Type	Number	Type	Number		
ECC-PNAL-6MR-A	100 - 240V AC~	100 - 240V AC~	4	RELAY	2	71.2 x 90 x 55 (2.80 x 3.54 x 2.17)	0.2 (4.4)
ECC-PNAL-10MR-A			6	RELAY	4		
ECC-PNAL-10MR-D	24V DC	24V DC Sink/Source	6	RELAY	4		
ECC-PNAL-10MT-D			6	TRANSISTOR	4		
ECC-PNAL-20MR-A	100 - 240V AC~	100 - 240V AC~	12	RELAY	8	124.6 x 90 x 55 (4.91 x 3.54 x 2.17)	0.32 (0.70)*
ECC-PNAL-20MR-D	24V DC	24V DC Sink/Source	12	RELAY	8		
ECC-PNAL-20MT-D			12	TRANSISTOR	8		

\* Without Special Connection Modules

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## 2.2 Power Supply Specification

**Table 2.2: Power Supply Specifications**

Description	Code	Specification
Power Supply	ECC-PNAL-***-A	100 - 240V AC~, +10% -15%, 50 - 60 Hz
	ECC-PNAL-***-D	24V DC, +20% -15%
Maximum Momentary Power Failure	ECC-PNAL-***-A	10ms
	ECC-PNAL-***-D	5ms
In-rush Current	240V AC~ (120V AC~)	≤ 1.5 Amp (0.7 Amp)
	24 V DC	≤ 7.0 Amp
Maximum Power Consumption (without Special Connection Modules)	ECC-PNAL-6MR-A, 264V AC~	3.0 W
	ECC-PNAL-10MR-A, 264V AC~	4.0 W
	ECC-PNAL-10MR-D, 28.8V DC	3.0 W
	ECC-PNAL-10MT-D, 28.8V DC	2.0 W
	ECC-PNAL-20MR-A, 264V AC~	8.0 W
	ECC-PNAL-20MR-D, 28.8V DC	7.0 W
	ECC-PNAL-20MT-D, 28.8V DC	5.0 W

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**Table 2.2: Power Supply Specifications**

Description	Code	Specification
Typical Power Consumption (without Special Connection Modules)	ECC-PNAL-6MRA, 240V AC	I/O all On - 2.5 W, I/O all Off - 1.5 W
	ECC-PNAL-6MR-A, 120V AC	I/O all On - 2.0 W, I/O all Off - 1.2 W
	ECC-PNAL-10MR-A, 240V AC	I/O all On - 3.0 W, I/O all Off - 1.5 W
	ECC-PNAL-10MR-A, 120V AC	I/O all On - 2.5 W, I/O all Off - 1.2 W
	ECC-PNAL- 10MR-D, 24V DC	I/O all On - 2.0 W, I/O all Off - 0.3 W
	ECC-PNAL-10MT-D, 24 DC	I/O all On - 2.0 W, I/O all Off - 0.3 W
	ECC-PNAL-20MR-A, 240V AC	I/O all On - 5.0 W, I/O all Off - 1.5 W
	ECC-PNAL-20MR-A, 120V AC	I/O all On - 4.0 W, I/O all Off - 1.2 W
	ECC-PNAL-20MR-D, 24V DC	I/O all On - 5.0 W, I/O all Off - 0.3 W
	ECC-PNAL-20MT-D, 24V DC	I/O all On - 5.0 W, I/O all Off - 0.3 W

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## 2.3 Input Specification

**Table 2.3: AC Input Specifications**

Description	AC Input Specification
Input Voltage	100 - 240V AC~, +10% -15%, 50 - 60 Hz
Input Current	0.24mA / 240V AC~
Input Impedance	≥ 800 kOhms
OFF to ON/ ON to OFF	80V/40V
Response Time	50ms + - 20ms / 120V AC~ (50ms + - 40ms/ 100 - 240V AC~)
Isolation Circuit	None
Operation Indication	Liquid Crystal Display

**Table 2.4: DC Input Specifications**

Description	Sink ("- Common)	Source ("+" Common)
Input Voltage	24V DC +20% -15%	24V DC +20% -15%
Input Current	5.0 mA	5.0 mA
OFF to ON/ ON to OFF	Current: ≥ 4.3mA / ≤ 1.1 mA Voltage: ≤ 4V / ≥ 18V	Voltage: ≥ 18V / ≤ 4V
Response Time (I01 - I08)	10 - 20 ms	10 - 20 ms
Response Time (I09 - I12)	20 - 40 ms	20 - 40 ms
Isolation Circuit	None	None
Operation Indication	Liquid Crystal Display	

Note 1 - Current leakage from the sensors connected to the inputs might provide enough current to turn the controller On. Do not use two wire sensors.

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**Table 2.5: Analog Input Specifications**

Description	Analog Input Specification
ECC-PNAL-10M*-D	6 Channels: I01 - I06
ECC-PNAL-20M*-D	8 Channels: I01 - I08
Analog Input Range	0 - 250
Resolution	10000/250 mv
Conversion Speed	10 ms
Input Voltage	0 - 10V DC
Input Impedance	150 kOhm or higher
Overall Accuracy	+/- 5% (0.5V DC)
Offset/Gain	Offset Value = 0 at 0V DC Gain Value: 0 - 10V = 0 - 250 These default values can be changed in the Offset FB
Temperature Drift	+/- 3 LSB

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2.4 Output Specification

Table 2.6: Relay Output Specifications

Description	Relay Specification
Switched Voltage	250V AC~ or less, 30V DC or less
Rated Current	8A/point (10A/point for 110V AC~ outputs)
Contact Life Cycle / Resistance Load	100,000 Cycles at 8 Amps / 240V AC~ or 24V DC 30,000 Cycles at 10 Amps / 110V AC~
Minimum Load	50mW (10mA at 5V DC)
Response Time	10ms or less
Operation Indication	Liquid Crystal Display
Isolation Circuit	By Relay

Table 2.7: Transistor Output Specifications (Source Type only)

Description	Transistor Specification
Switched Voltage	5 - 24V DC (+20%, -5%)
Rated Current / points	1A / point (8 - 24V DC), 0.1A / point (5 - 8V DC)
Minimum Load	1.0mA
Max. Inductive Load	1A / 24V DC (24 W)
Max. Lamp Load	0.125 A / 24V DC (3.0 W)
Response Time On/Off, Off/On (approx)	≤ 1 ms
Open Circuit Current Leakage	≤ 0.1mA / 24V DC
Operation Indication	Liquid Crystal Display
Isolation Circuit	None

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2.5 General Specification

Table 2.8: Environmental and Electrical Specifications

Description	Specification
Programming Method	Function Block
Program Capacity	64 Function Blocks or 1500 bytes
Program Storage	Built in EEPROM (no battery backup required) or optional EEPROM cassette
Device Backup	20 Days at 25 °C (by capacitor)
RTC Backup	20 Days at 25 °C (by capacitor)
RTC Accuracy	5 seconds / day
Operating Temperature	0 - 55 °C
Storage Temperature	(-30) - 70 °C
Vibration Resistance - Direct Mounting	Conforms to IEC 68-2-6; 10-57 Hz: 0.15 mm Constant Amplitude 57-150 Hz: 19.6 m/s <sup>2</sup> Acceleration Sweep Count for X,Y,Z: 10 times (80 minutes in each direction)
Vibration Resistance - DIN Rail mounting	Conforms to IEC 68-2-6; 10-57 Hz: 0.075 mm Constant Amplitude 57-150 Hz: 9.8 m/s <sup>2</sup> Acceleration Sweep Count for X,Y,Z: 10 times (80 minutes in each direction)
Shock Resistance	Con forms to IEC 68-2-27: 147m/s <sup>2</sup> Acceleration, Action Time: 11 ms 3 times in each direction X,Y, and Z
Noise Immunity	1000Vpp, 1 microsecond, 30 - 100 Hz, tested by noise simulator
Humidity	35 - 85% Relative Humidity, no condensation
Dielectric withstand voltage	3750V AC > 1 min per EN60730-1 between the following points: Power/Input Terminals and Relay Output Terminals Relay Output Terminal and Relay Output Terminal All Terminals and the DIN 43880 Control box or equivalent

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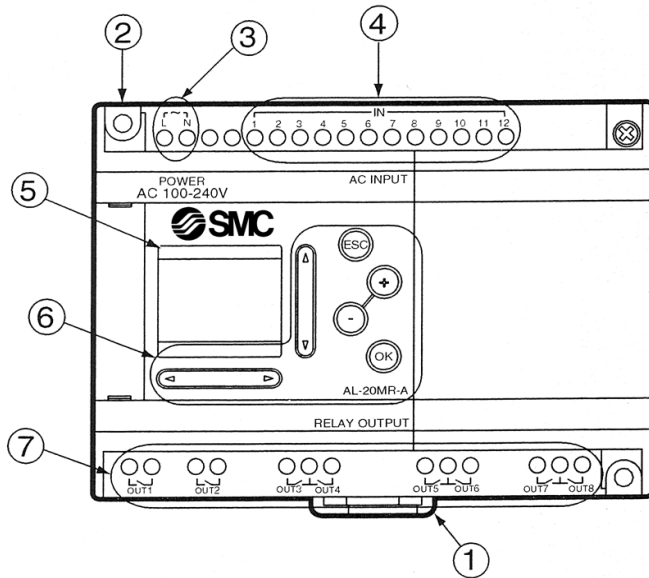
**Table 2.8: Environmental and Electrical Specifications**

Description	Specification
Insulation Resistance	7 Mohm at 500V DC per EN60730-1 between the following points: Power/Input Terminals and Relay Output Terminals Relay Output Terminal and Relay Output Terminal All Terminals and the DIN 43880 Control box or equivalent
Type of Action	EN 60730-1, Section 6.4.3 - Type 1C (Relay Output)
Type of Action	EN 60730-1, Section 6.4.3 - Type 1Y (Transistor Output)
Software Class	EN 60730-1, Section H6.18 - Class A
Construction of Control	EN 60730-1, Section 6.15 - Incorporated Control
Whether the Control is electric	EN 60730-1, Section H2.5.7 - Electric Control
Safety Class	II
Pollution Control	For use in normal pollution situations
Grounding	None
Electrical Isolation	Reinforced primary/secondary insulation
Operation Ambience	To be free of corrosive gases. Dust should be minimal.
Protection	IP 20
Certifications	CE, UL/cUL
Certifications	TÜV (AL-10MT-D, AL-10MR-D)
Complies with	UL 508 EN60730-1 EN61010-1 EN50081-1 EN50082-1 EN50082-2
Liquid Crystal Display	Will display 4 lines of ten characters per line, Program Run On/Off mode, Password Protection, Image Table, and Function Blocks during programming.

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### 3. Installation



**Table 3.1: Front Panel Layout**

Ref.	Item Description
1	DIN -RAIL Mounting Clips
2	Mounting hole, Dia. 4.2 mm
3	Power Terminals
4	Input Terminals
5	Liquid Crystal Display
6	Operation keys
7	Output Terminals

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#### 3.1 DIN RAIL Mounting

Units can be snap mounted to 35mm DIN rail (DIN EN 50022). To release pull the spring loaded clips away from the rail and slide the unit off and up.

#### 3.2 Termination at Screw Terminals

Cables terminating at a screw terminal should be fitted with insulated crimp terminals.

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### 3.3 Installation Mounting Notes



The PneuAlpha Series' safe design means the user can install it almost anywhere but the following points should be taken into consideration.

Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration. Do not place in water or let water leak onto the controller.

Do not allow debris to fall inside the unit during installation.

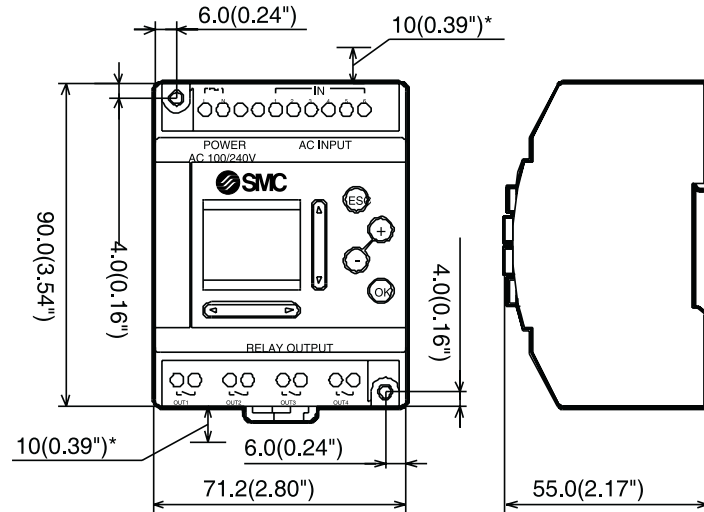
Keep as far as possible from high-voltage cables and power equipment.

The PneuAlpha Series Controller must be installed in cabinets which are designed for the assembly of devices complying to DIN 43880 or in a control box.

Use size M4 screws when mounting by screw holes.

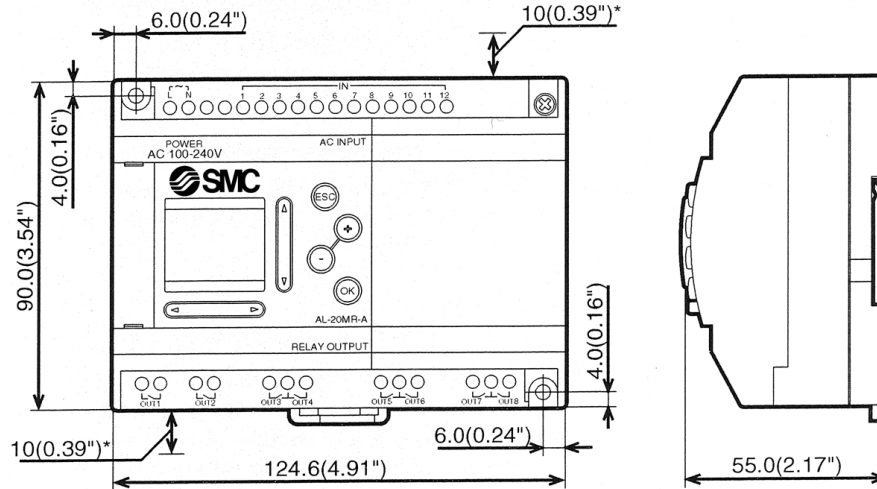
The connectors must be covered to prevent injury from contact with "live" wires.

\* Leave a minimum of 10mm of space for ventilation between the top and bottom edges of the PneuAlpha Series Controller and the enclosure walls.



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Do not disassemble the PneuAlpha Series Controller. Refer to the Memory Cassette Manual when changing the Memory Cassette.



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## 4. Wiring

### 4.1 Installation Wiring Notes



The wiring of PneuAlpha Series has been designed to be safe and easy. A technician or engineer trained in the local and national electrical standards should perform all tasks associated with the electrical wiring of the PneuAlpha Series controllers. Do not perform any wiring operations when the Power is On.

- Input and output cables should not be run through the same multicore cable or share the same wire.
- Do not lay input/output cables near high voltage power cables.

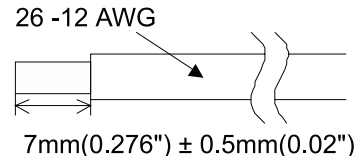
Allow for voltage drop and noise interference with input/output lines used over an extended distance. Please use wire that is properly sized for the current load.

### 4.2 Wire Size and Specifications



Wire the Inputs and Outputs using 26 - 12 AWG wire (0.13 mm<sup>2</sup> - 3.31 mm<sup>2</sup>). Strip the wire to a length of 7 ± 0.5 mm (0.250 - 0.300 inches). Please unscrew the terminal to its widest position before inserting a wire. Insert the wire completely into the terminal to ensure that a proper connection can be made. Insert the wire into the terminal and tighten enough to keep the wire from pulling free. To avoid damaging the wire, do not exceed a maximum torque of 0.5 N·m (5 kgf·cm). Please do not use tin, solder, or any other substance on the stripped wire that might cause the wire strand to break.

The terminals will accept a 3mm flathead screw driver.



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### 4.3 Power Supply

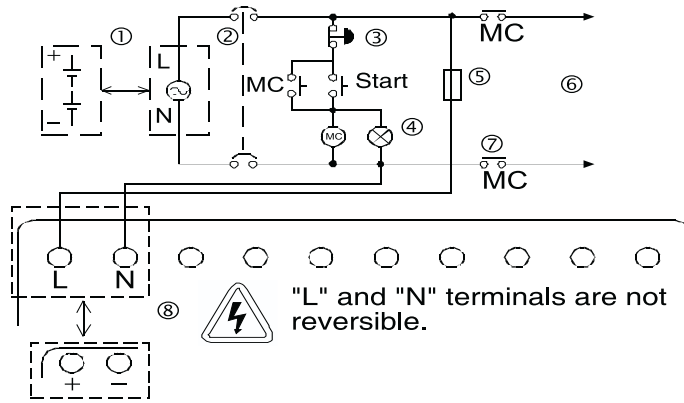


When wiring AC supplies the “Live” cable should be connected to the “L” terminal and the “Neutral” cable should be connected to the “N” terminal. Do NOT connect the “Live” wire to the “N” terminal, the user might receive a dangerous shock on powerup.

When wiring DC supplies the “positive” cable should be connected to the “+” terminal and the negative cable should be connected to the “-” terminal. On no account should the power supply terminals be connected to any other terminal on the unit. DC Power Supply units should be capable of providing 4 Amperes of current to the controller.

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### 4.4 Recommended Power Input Wiring Diagram



**Table 4.1: Recommended Power Wiring**

Ref.	Item Description
1	Power Supply: AC~:100-240V 50-60Hz DC: 24V
2	Circuit Isolation Device
3	Emergency Stop
4	Power On Pilot Indicator
5	Circuit protection device - limit to 1.0 Amps
6	Power Supply for AC loads
7	Magnetic Switch Contact
8	PneuAlpha Base Unit

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4.5 AC Input Wiring

4.5.1 AC Input Wiring Diagram

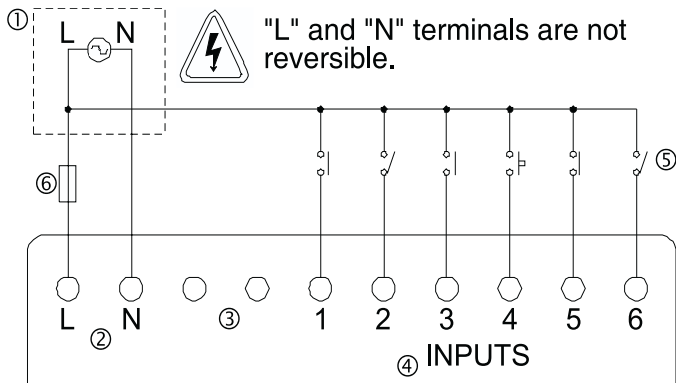


Table 4.2: AC Input Typical Wiring

Ref.	Item Description
1	AC Power Supply, 100 - 240V AC~ 50 - 60 Hz
2	AC Power Terminals
3	Unused Terminals
4	Input Terminals
5	Digital Input Switches
6	Circuit Protection Device - Limit to 1.0 Amps

### 4.6 Wiring Diagrams for the Sink/Source Terminals

#### 4.6.1 Source ("+" Common) Input Wiring Diagram

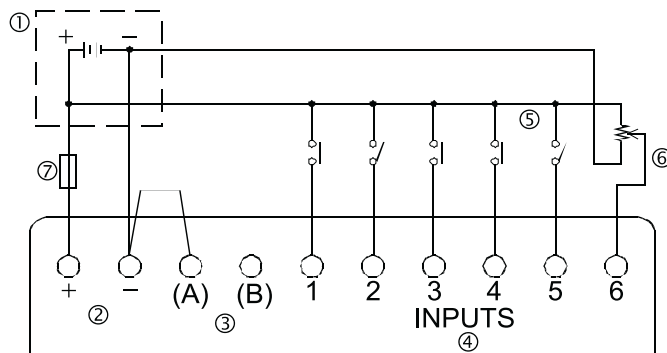
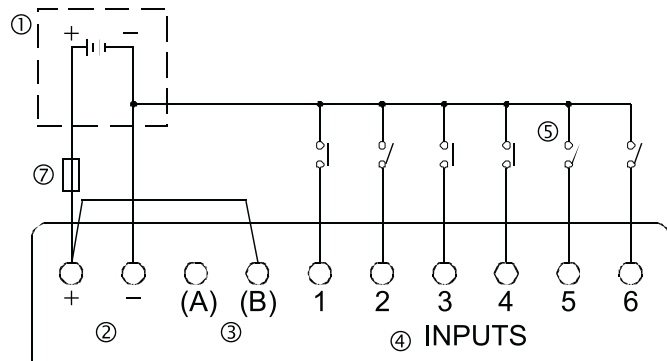


Table 4.3: Sink/Source Input Wiring

Ref.	Item Description
1	DC Service Supply, 24V DC
2	DC Power Terminals
3	Sink/Source Input Wiring Terminals
4	Input Terminals
5	Sensor Input Switches
6	Analog Input
7	Circuit Protection Device - Limit to 1.0 Amps

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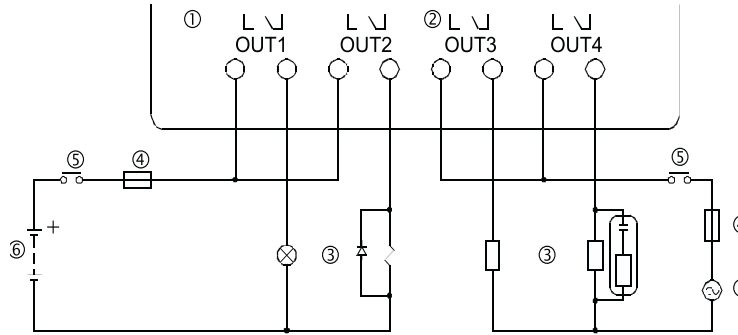
#### 4.6.2 Sink ("- Common) Input Wiring Diagram



### 4.7 Output Relay and Transistor Wiring

#### 4.7.1 Relay Output Wiring Diagram (AC and/or DC)

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**Table 4.4: Relay Output Wiring**

Ref.	Item Description
1	PneuAlpha Base Unit
2	Mutually exclusive outputs
3	Output Devices
4	Circuit Protection Device - Limit to 10 Amps per every four output terminals used.
5	Emergency Stop
6	DC Power Supply
7	AC Power Supply



4.7.2 Transistor Output (Source or “+” Common Only) Wiring Diagram

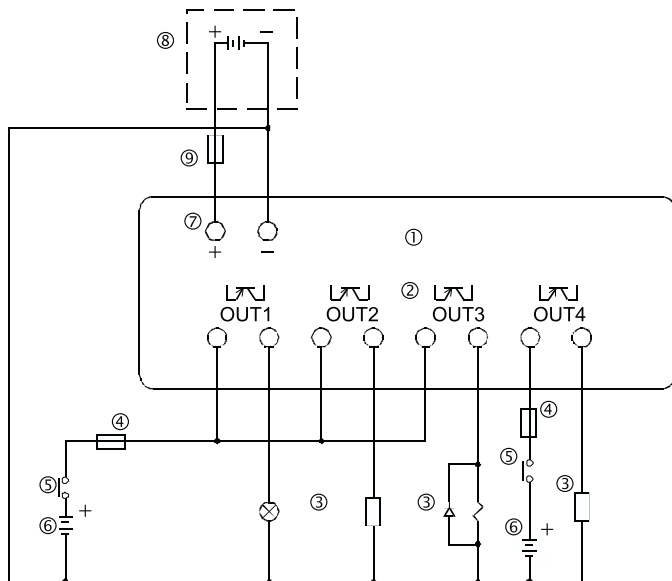


Table 4.5: Transistor Output Wiring

Ref.	Item Description
1	PneuAlpha Base Unit
2	Output Terminals
3	Output Devices
4	Circuit Protection Device - See Table 4.6 for Specifications
5	Emergency Stop
6	DC Power Supply for output
7	Power Terminal
8	DC Power Supply, 24V DC
9	Circuit Protection Device - Limit to 1.0 Amps

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Table 4.6: Transistor Output Circuit Protection Table

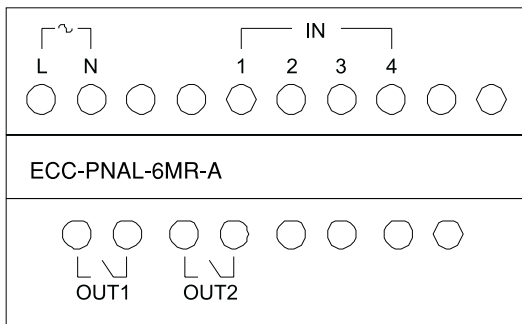
Circuit Voltage	Circuit Protection (Fuse)
5 Volt	≤ 0.3 Amps per Circuit
12 Volt	≤ 2.0 Amps per Circuit
24 Volt	≤ 2.0 Amps per Circuit

Volt	Output Terminal Notes
5	Each circuit can contain from one output terminal up to every output terminal.
12-24	Each circuit can contain from one output terminal up to every output terminal.
5,12,24	Using any combination of 5 Volt, 12 Volt, and 24 Volt outputs can be accomplished on the same PneuAlpha Series Controller if separate circuits are used for each voltage level.

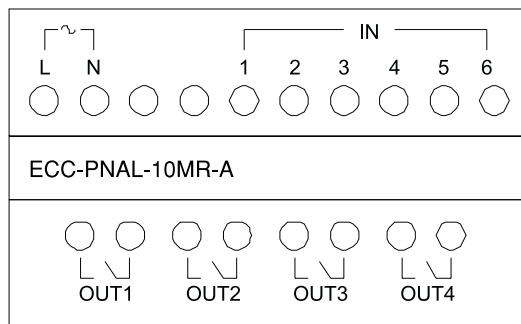
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### 5. α PneuAlpha Series Terminal Layout

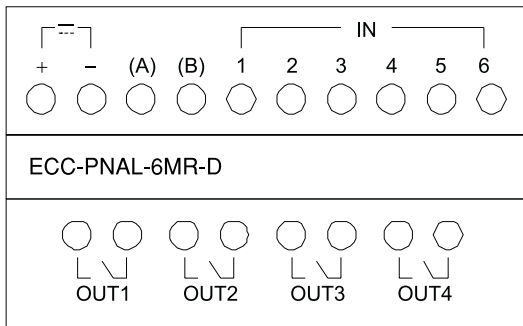
ECC-PNAL-6MR-A, AC Input, Relay Output



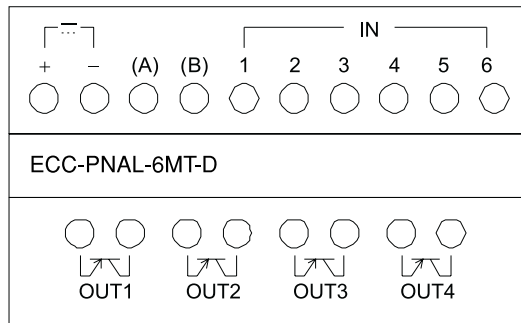
ECC-PNAL-10MR-A, AC Input, Relay Output



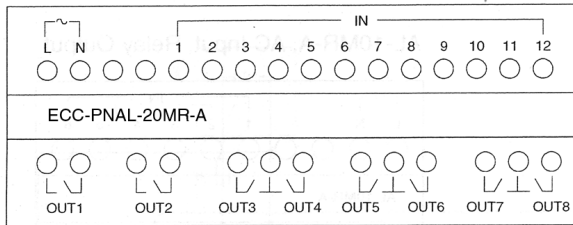
ECC-PNAL-10MR-D, DC Input, Relay Output



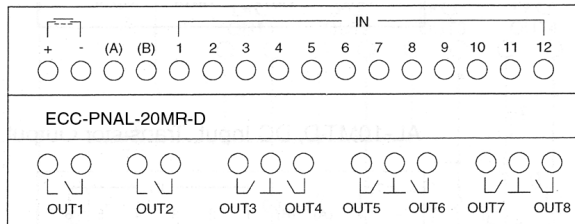
ECC-PNAL-10MT-D, DC Input, Transistor Output



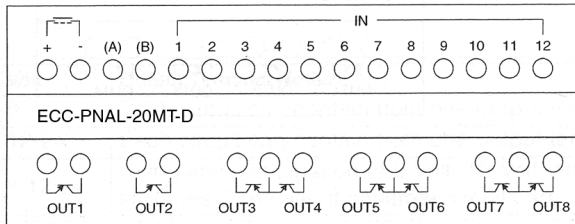
ECC-PNAL-20MR-A, AC Input, Relay Output



ECC-PNAL-20MR-D, AC Input, Relay Output



ECC-PNAL-20MT-A, DC Input, Transistor Output



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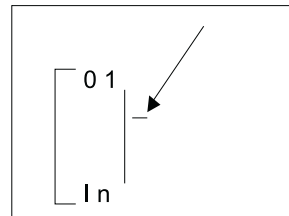
## 6. How to Use PneuAlpha Series Controllers - Getting Started

PneuAlpha Series controllers use Function Block Programming. In this style of programming, Function Blocks are connected together to build a program. There are five types of blocks that can be placed in your program: System Inputs, front panel Key, System M bits, Function Blocks, and System Outputs.

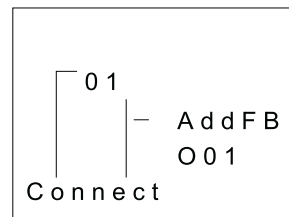
A screen showing the date, time, and image table (input and output status) will show when the controller is turned On. Hit any key to proceed to the Top Menu. Enter the ProgEdit mode with the OK key to begin programming.

### 6.1 Connecting Two Blocks

Function Blocks (FB) are connected by joining an output pin to an unused input pin. The arrow is pointing to the output pin. The output pin is always shown on the right side of the function blocks. Unused Input pins are shown as ">" while used input pins show as a solid triangles. Press the right arrow button to move the screen to the right until the output pin is flashing. Use the "+" key to connect or "add" a FB. The "-" key will disconnect two devices.

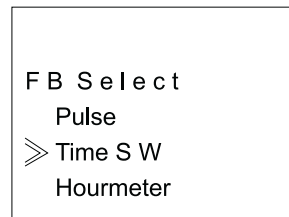


Press the "+" key. The FB options available for connection appear on the right of the screen. Use the Up and Down arrows to move to the desired device to add. The current choice will be blinking. A "Connect" prompt will appear on the top or bottom of the screen. Choose the desired connecting block with the OK key



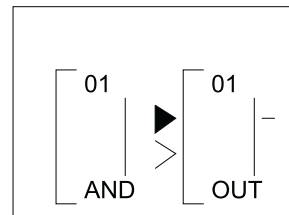
Inputs, Keys, M bits, Function Blocks, and Outputs will automatically show whenever they can be connected. Function Blocks must be added during the course of programming.

To add a new FB, select AddFB. The AddFB menu will show the list of twenty-two function blocks (see function block descriptions at the end of this chapter). Choose the appropriate block with the OK key.



Choose an open (“>”) input pin and enter OK. The “connect” prompt should disappear from the screen - the two function blocks are now connected!

Output pins can be connected to multiple input pins but input pins can have only one connection.

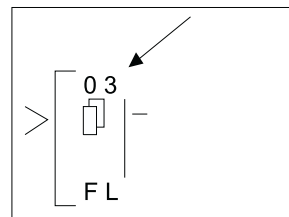


## 6.2 Accessing Blocks

When the FB number is flashing, use the “+” and “-” keys to scroll through adjacently numbered blocks.

Ex. Input number 03 flashing on the display. Pressing the “+” key will move the screen to Input number 04. Inputs, Outputs, Keys, and Memory bits can be accessed in this manner.

Function Blocks will perform the same operation but will scroll only through the Function Blocks that have been added to the program.



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### 6.3 Setting Function Block Parameters

Some Function Blocks have parameters that need to be set. These parameters include Time (T), elapsed time (t), Set Repetitions (N), actual repetitions (n), Set/Reset Priority and more.

Use the arrow keys to move to the FB. When the FB number is flashing, enter OK twice to enter the FB Setup mode. Adjust the options to fit the program requirements (refer to Key Operations Table 6.1). *Enter all the necessary data on each screen before using the OK button to accept.*

Some FB have multiple option screens available. Use the ESC key to move to a higher screen without saving the contents to system memory. When finished entering data, use the ESC button to return to higher screen levels until the main programming screen is shown again.

```
B 0 3 : F L
      O n T i m e
T =      0 . 0 s
t =      0 . 0 s
```

### 6.4 Exiting, Running, and Stopping the Program

Use the ESC button to enter the Edit Menu (the ESC button might have to be pressed more than once) and use the Exit option to leave ProgEdit.

```
E d i t M e n u
P r o g S i z e
>> J u m p
N e w F B
E x i t
M n e m o n i c
```

Use the Run option to begin the program. Confirm with OK. When the program is running the front screen is shown with the time, date, and image table.

Press any key to enter the Top Menu where the Stop option is located. Enter this option to Stop the program and confirm with OK.

Other options that can be selected include:

ClockSet - Set the Real Time Clock. s

Language - Choose English, Japanese, German, French, Italian, or Spanish

```
T o p M e n u
R u n
P r o g E d i t
>> P r o g C l e a r
C l o c k S e t
L A N G U A G E
O t h e r s . . .
```

ProgClear - Deletes everything in program memory, programs and data!

Others - Gives more Options for a Version Check, Password Protection, Summer Time Change Schedule, Modem Initialization, and Menu Key operation.

**Table 6.1:Key Number and Basic Operation**

Key number	Main Key Function
K01	OK: acceptance of data entry, menu options, program choices
K02	ESC: cancel current operation, move to higher screen or menu
K03	"+": connect function blocks, move to higher numbered blocks, increment values
K04	"-": disconnect function blocks, move to lower numbered blocks, decrement values
K05	Up (▲): scroll to higher number numbered items (keys, FB, Inputs, Outputs, etc.)
K06	Down (▼): scroll to lower numbered items (keys, FB, Inputs, Outputs, etc.)
K07	Right (▶): move to the right on the LCD display, FB program or Jump command
K08	Left (◀): move to the left on the LCD display, FB program or Jump command

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**Table 6.2: Function Block Description**

Function Block	Byte	Description
AND	19	Output On when all Inputs are On, Unused inputs considered On
OR	19	Output On when at least one input On, Unused inputs considered Off
XOR	13	Exclusive OR; Output On when only One of Two Inputs is On
NAND	19	Not AND; Output Off only when all Inputs On, Unused inputs considered On

**Table 6.2: Function Block Description**

Function Block	Byte	Description
NOR	19	Not OR; Output Off when at least one Input is On, Unused inputs considered Off
NOT	10	Inverts a signal; changes an Off to an On and vice versa
BOOLEAN	*	Logic equation using AND, OR, XOR, and NOT
SET/RESET	14	Latch a relay in SET or RESET position, give Set or Reset priority
DELAY	19	Delay a signal on the Rising, Falling, or both Edges
ONE SHOT	17	Send a single pulse; Time or Input signal based, Reset pin available
PULSE	10	Send a Pulse on the Rising, Falling, or both Edges
FLICKER	19	Send a pulse train; On/Off times, repetitions, duration, or continuous operation
ALT	13	Output alternates turning On or Off with each input pulse
COUNTER	16	Count upwards on pulses, can reset at an input value or signal
U/D COUNTER	22	Up and Down Counter with Preset Input and Clear functions
COMPARE	17	Compare two values for <, >, =, <=, >=, <> (Analog, Direct Set, or FB values)
TIME SWITCH	*	Use the RTC to turn output On/Off; Calendar or weekly schedule
OFFSET GAIN	22	Manipulate Analog Values; $y = A/B * x + C$ ; Set High and Low Limit Values
DISPLAY	*	Display Messages or Data on the LCD display
ZONE COMPARE	20	Compare a value to a range of values (Analog, Direct Set, or FB values)
SCHMITT TRIGGER	19	Turn an Input On at the High Value and Off at the Low Value (or vice versa)
HOURLY METER	19	Records the accumulated time an Output or Input signal has been ON
System Outputs	10	Controls External Devices through Relays and Transistors.

\*Number of bytes varies with input data.

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ECC-PNAL-HARD-B

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Specifications are subject  
to change without notice.