FEDERAL SIGNAL
Safety and Security Systems

AD-28X-MV

Atkinson Dynamics Intercom

Installation and Maintenance Manual

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INSTALLATION AND SERVICE INSTRUCTIONS FOR MODEL AD-28X-MV

⚠ Safety Message to Installers, Users and Maintenance Personnel

⚠ WARNING

It is important to follow all instructions shipped with this product. This device is to be installed by a trained electrician who is thoroughly familiar with the National Electrical Code and will follow NEC Guidelines as well as local codes. Marine installations shall be in accordance with Title 46, CFR, Parts 110-113.

The selection of the mounting location for the device, its controls and the routing of the wiring is to be accomplished under the direction of the facilities engineer and the safety engineer. In addition, listed below are some other important safety instructions and precautions you should follow:

- This is not a Listed emergency safety device and is not intended to be used as such.
- Read and understand all instructions before installing or operating this equipment.
- Disconnect power before connecting or doing any maintenance on this intercom.
- All effective warning speakers produce loud sounds which may cause in certain situations, permanent hearing loss. You should take appropriate precautions such as wearing hearing protection.
- After testing is complete, provide a copy of this instruction sheet to all operating personnel.
- Establish a procedure to routinely check the intercom installation for integrity and proper operation. Any maintenance must be performed by a trained electrician in accordance with NEC guidelines and local codes.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

A. General Features.

The AD-28X-MV intercom is a heavy duty, 2-way, communications device designed for industrial applications. Nominal operating voltages include 120/240VAC, 50/60Hz and 24VDC. Voltage changes for the 120/240VAC are internally switch selectable and the AC line is fused with a 1/2 amp 250 volt type GMC fuse. The unit also offers transformer isolated audio inputs and internally selectable Primary or Secondary mode configurations. A call button with remote call dry contacts is also factory supplied in the unit.

The AD-28X-MV has a Type 4X enclosure and is a UL Listed Type NM (non-monitored) signal appliance and Marine signal appliance for indoor or outdoor use and is CSA Certified. The AD-28X-MV is additionally Listed for Class I, Groups A, B, C and D, Division 2; Class II, Groups F and G, Division 2; and Class III.

Wire all circuits connected to the AD-28X-MV Intercom using Class I, Division 2 wiring methods specified in Article 501-4 (b) of the NEC.

PRIMARY MODE:

The intercom can be configured as a Primary unit (Push-to-Talk) or a Secondary unit (Push-to-Listen) by changing the MAS/SLA jumper (J2) on the printed circuit board (see Figure 6). The intercom comes from the factory set in the Primary (MAS) mode.

In the Primary mode the intercom acts as an amplifier, constantly broadcasting over its speaker any signal that it receives on the signal lines. Holding down the Listen/Talk switch changes the unit from a speaker to a microphone (see Figure 1). The intercom will now transmit over the signal lines to additional intercom(s) also set in the Primary mode. When the switch is released it will default back to the Listen or Speaker mode, allowing the user to receive any messages transmitted back to it.

SECONDARY MODE:

Some applications may require that the intercom constantly transmit (i.e. act as a microphone) as opposed to constantly receive (i.e. act as a speaker). To accomplish this the intercom must be configured in the Secondary (Push-to-Listen) mode.

To configure an intercom in the Secondary mode, perform the following steps:

⚠ WARNING

Disconnect power to the intercom before any installation, maintenance, or configuration changes are performed.

1. Move the J2 jumper on the P.C. board from the MAS to SLA position (see Figure 6). This can be done using long nose pliers, pulling the jumper off the “MAS” and center position and placing it on the “SLA” and center position.
2. An intercom configured in the Secondary mode needs to have the Listen/Talk switch default to the talk position on the cover plate (see Figure 2).

   The second change required is to rotate the position of the Talk/Listen switch. This can be accomplished by loosening the rubber boot covering the toggle switch enough to allow the toggle switch to turn 180 degrees. The dimple on the locking ring must seat itself in the locating hole (see Figure 3). The rubber boot is then tightened up against the cover plate with the toggle switch leaning to the talk position, as shown in Figure 2.

3. The third change involves the interconnect wiring. When a unit is placed in the Secondary mode it defaults to the Talk or transmit position. When hooked to a Primary unit it is necessary to override the Secondary unit in order for the Primary unit to be able to transmit. The #6 pin (remote control) on both terminal blocks (see Figure 4) must be connected between the Primary and the Secondary unit. Figures 7 to 13 contain wiring diagrams of typical intercom configurations.

REMOTE CONTROL:

Remote control is used to change the operation mode of a remote intercom from listen to talk or from talk to listen upon activation of a local intercom. The wiring diagram section illustrates Primary/Secondary Installation and Using Foot Switches Diagrams. (See figures 9, 10, and 12).

Normally open foot switches can also be connected to the Remote Control line in order to allow “hands free” operation of the listen/talk functions.

CALL BUTTON:

Depressing the call button sends a 1 kHz tone onto the signal lines. All units listening to the line will then broadcast this signal as a call.

⚠ CAUTION

The call signal is substantially louder than normal voice messages being carried on the line. Do not depress the call switch while carrying on a conversation with someone on the system. This will subject the listener to very loud sound levels.

The volume of the call signal is affected by the volume control on the receiving unit, so if the volume is turned all the way down at a receiving station, the call signal will not be heard. To avoid this problem, the call dry contacts can be utilized to drive an external signalling device.

CALL BUTTON ACTUATED DRY CONTACTS FOR OPERATING AN EXTERNAL DEVICE:

Depressing the call button also closes a normally open dry contact rated at 0.5 A at 125VAC or 1.25 A at 24VDC. This contact can be used to trigger a remote sounder or light in order to accent the call feature. The wiring diagram illustrates how an external light or horn can be wired in to augment the call tone. (See Figure 11.)

24 VDC:

When connecting the intercom to 24VDC, either the positive (+) supply conductor must be fused at the source with a 1/2 A fuse or a power-limited power source must be used.

The AD-28X-MV is capable of sending DC power to another unit which is mounted in a remote location without local power. 24VDC is available from pins 4 and 5 of the terminal block. It can be run along with the signal lines to an intercom in a remote location. Only one unit should share the power supply of another unit in any installation.

NOTE

Connect positive (+) supply conductor to pin #4 of terminal block. Connect negative (-) supply connector to pin #5 of terminal block.

Figure 7 in the wiring diagrams section shows how two intercoms can be hooked up if no remote power is available.

SURGE PROTECTION:

Metal Oxide Varistor (MOV) devices are used to protect the audio lines and the remote control line. The intercom must have Earth Ground terminated to it to ensure surge protection.

The output amplifier of the AD-28X-MV offers full short circuit protection and overheat protection.

MODEL AD-28X-MV SPECIFICATIONS

Operating Voltage	24VDC, 120VAC and 240 VAC 50/60 Hz
Current Draw	**Voltage** **Operating** **Standby** 24VDC 260 mA 62 mA 120VAC 163 mA 70 mA 240VAC 82 mA 35 mA
Amplifier Specifications	
Frequency Response (-6 dB)	150 Hz to 12 kHz
Input Impedance	3400 Ohms
Max. Output Voltage	
Sine Wave:	
Unbalanced Output	7.5 Vrms
Square Wave:	
Unbalanced Output	9.5 Vrms
Temperature Range for Ordinary Locations	–31° F to +150° F (–35° C to +66° C)
Temperature Range for Hazardous Locations	+41° F to +149° F (+5° C to +65° C)
Fuse Type GMC-1/2	1/2 A, 250 V
Call Button Actuated Dry Contact Rating	500 mA at 12VAC 1.25 A @ 24VDC
Weight	
Shipping	10 lb, 11 oz
Net	9 lb, 4 oz
Housing Dimensions	6.5” (16.5 cm) W x 9.88" (25.1 cm) H x 3.88" (9.9 cm) D
Conduit Entrances	Dual 1/2"-14 IPS
Housing Material	Aluminum
Color	Gray
Agency Listings	
AD-28X-MV	UL (UJPX), (UJPX7), (UXPL, Marine) - For indoor or outdoor use in Class I Groups A, B, C and D, Division 2; Class II, Groups F and G, Division 2; Class III hazardous locations; Type 4X enclosure.

T-CODE AT MAXIMUM AMBIENT TEMPERATURE, °C

Hazardous Location	40° C	65° C
Class I, Division 2, Groups A, B, C, D	T6	T5
Class II, Division 2, Groups F, G	T6	T5
Class III	T6	T5

⚠ WARNING

EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

B. Unpacking.

After unpacking the Model AD-28X-MV, examine it for damage that may have occurred in transit. If the equipment has been damaged, do not attempt to install or operate it, file a claim immediately with the carrier stating the extent of the damage. Carefully check all envelopes, shipping labels and tags before removing or destroying them.

Before attempting to install the intercom, be sure that all parts listed in the KIT CONTENTS LIST have been supplied.

C. Kit Contents List.

Qty.	Description	Part Number
1	Wiring block	140A326-01
4	Screws, Phillips head	7000478-10
4	Lockwashers	7074A010
1	Resistor, 1K, 1W	101216

D. Mounting.

⚠ CAUTION

The selection of the mounting location for the device, its controls and the routing of the wiring is to be accomplished under the direction of the facilities and the safety engineer.

The intercom is intended to be mounted on any relatively flat and rigid surface by the two mounting ears on the exterior of the housing. Figure 5 is a dimensional outline drawing showing the proper mounting configuration. The two mounting ears have slots for 3/8" (M10) bolts spaced 5-5/8" to 5-7/8" (14.3 cm to 14.9 cm) apart. Hardware for mounting the intercom to the surface is left up to the installer.

⚠ WARNING

This unit is heavy and should be mounted on a rigid surface capable of supporting the weight of the intercom.

The intercom housing has two 1/2"-14 IPS openings in the bottom. When installing the conduit to these openings, seal the threads with pipe compound or other sealing material.

⚠ WARNING

For shipboard applications, installations shall be in accordance with the United States Coast Guard, Title 46 CRF, Parts 110-113.

E. Electrical Connections.

⚠ WARNING

Do not connect wires when power is applied.

All wiring to the intercom is terminated to the terminal block provided. The terminal block plugs into a header on the PC board and is configured such that it can only plug in one way. Figure 6 shows the orientation of the wiring block and describes the function of each position.

There is one jumper shown on the PC board in Figure 6 that may need to be moved depending on the desired operation of the intercom. J2 is for configuring the intercom as either a Primary or Secondary device. The intercom is factory set in the Primary position.

There is a switch on the board to configure the operation of the board from 120VAC to 240VAC. The switch is factory set for the intercom to operate on 120VAC (see Figure 6).

See figures 7 through 13 for typical intercom configurations.

⚠ CAUTION

The Model AD-28X-MV's circuits are not nonincendive field wiring circuits except for foot switches. Wire all circuits connected to the AD-28X-MV Intercom using Class I, Division 2 wiring methods specified in Article 501-4 (b) of the NEC.

F. Service.

⚠ CAUTION

Any maintenance must be performed by a trained electrician in accordance with NEC guidelines and local codes.

1. General.

⚠ CAUTION

The call signal is substantially louder than normal voice messages being carried on the line. Do not depress the call switch while carrying on a conversation with someone on the system. This will subject the listener to very loud sound levels.

Federal Signal will service your equipment or provide technical assistance with any problems that cannot be handled locally.

Any units returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization. This R.M.A can be obtained only from the factory by calling (888) 751-1500.

At this time a brief explanation of the service requested or the nature of the malfunction, should be given.

Address all communications and shipments to:

FEDERAL SIGNAL
Service Department
2645 Federal Signal Drive
University Park, IL 60484-3167

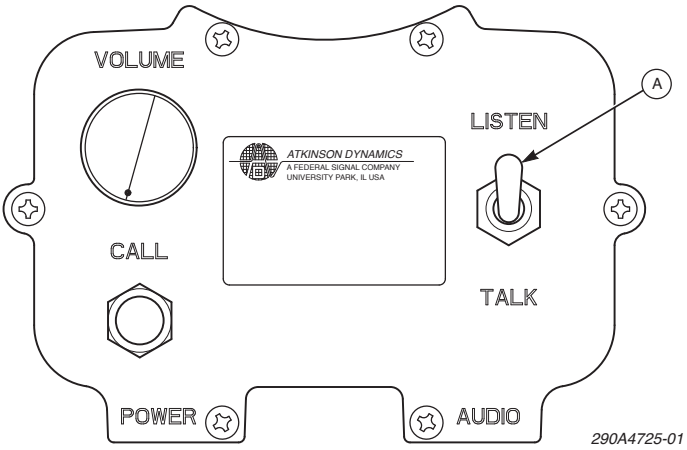
2. Replacement Parts.

⚠ WARNING

Replace fuse with GMC-1/2 only. DO NOT substitute.

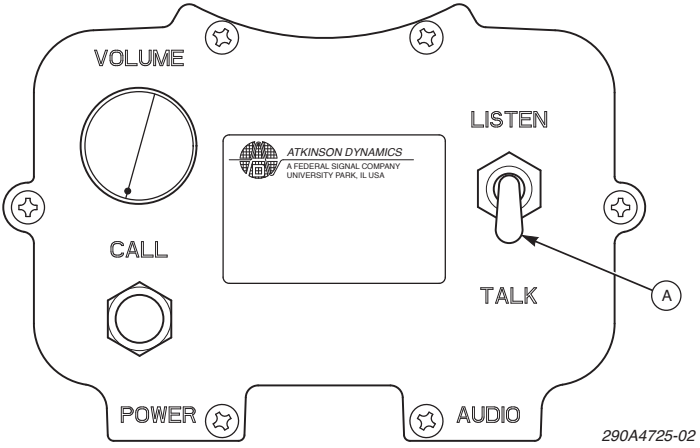
Description	Part Number
Kit, potentiometer with on/off switch	K8590236A
Kit, toggle switch	K8590298A
Kit, push button switch	K8590241A
Knob, pot	K141A129A
Rubber boot (toggle switch)	K288801A
Rubber boot (pushbutton switch)	K288697A
Rubber boot (volume control)	K288A542A
AD-28X-MV speaker/housing assy.	K8590217A
Cover gasket	K8590013B
Resistor, 1K, 1W	K101216A
Mini-jumpers	K139A209B

1



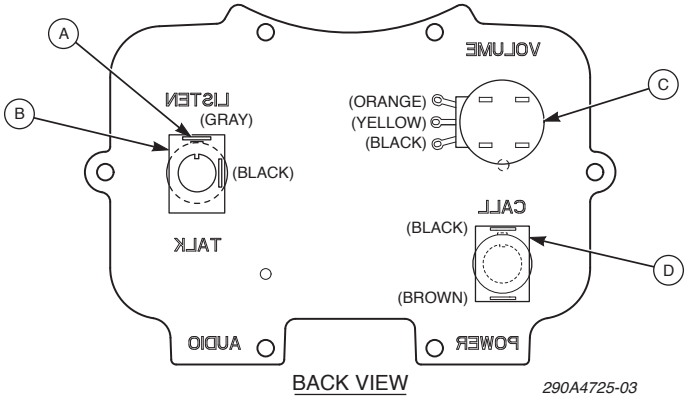
A. Push down to talk

2



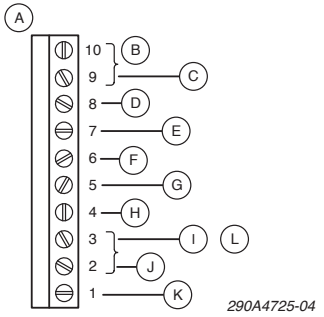
A. Push up to listen

3



A. Dimple
B. Listen/talk toggle switch
C. Volume control
D. Call push button

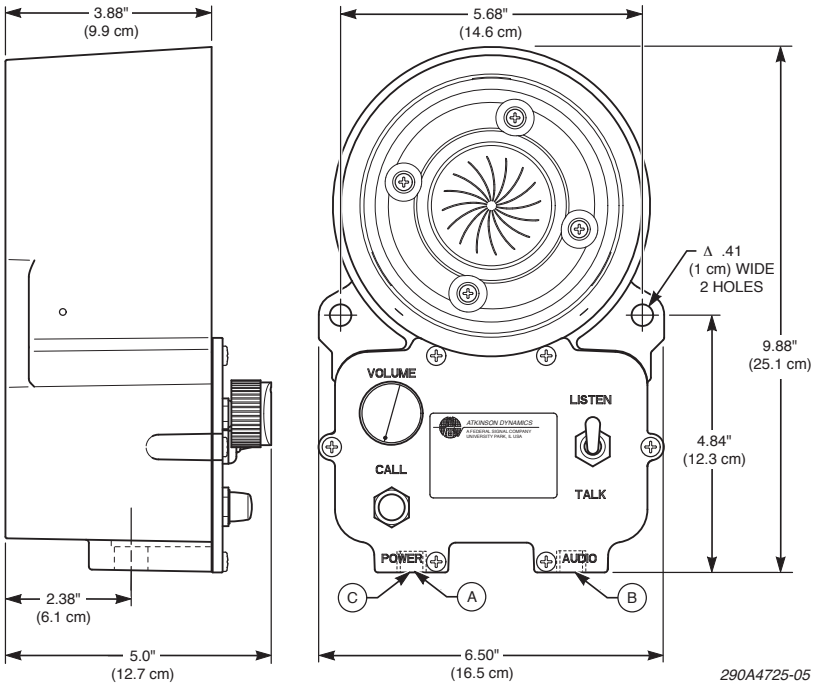
4



A. Terminal block pinout*
B. Dry contact
C. For call
D. Audio (-)
E. Audio (+)
F. Remote control
G. Ground
H. 24 VDC in/out (+)
I. Neutral
J. Hot
K. Earth ground
L. 120/240VAC in

*NOTE: Terminal Block accepts 10 - 22 AWG wire

5

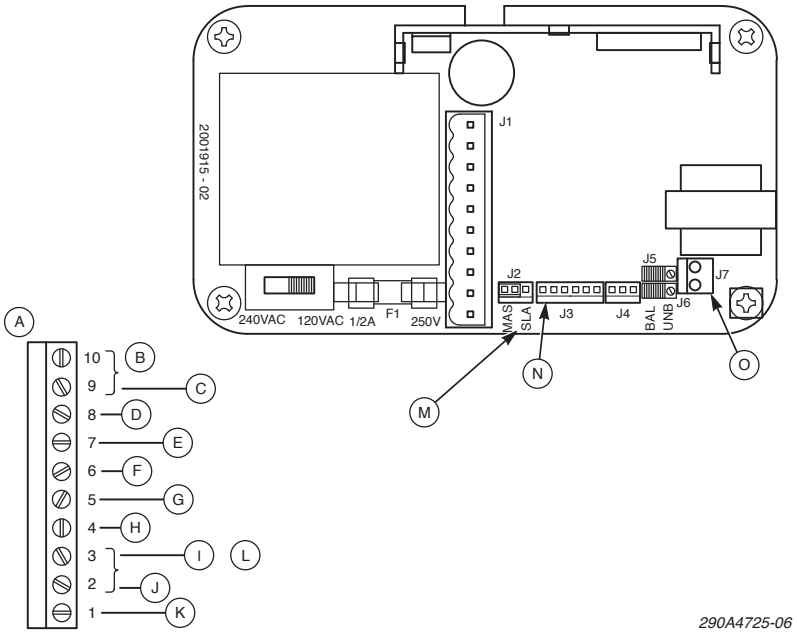


A. 1/2-14 pipe thread 2 places

B. Audio (Class 2)

C. AC input (Class 1) or DC Input/Output (Class 2)
Positive supply conductor must be fused at source with 1/2 A fuse or a power-limited source must be used.

6



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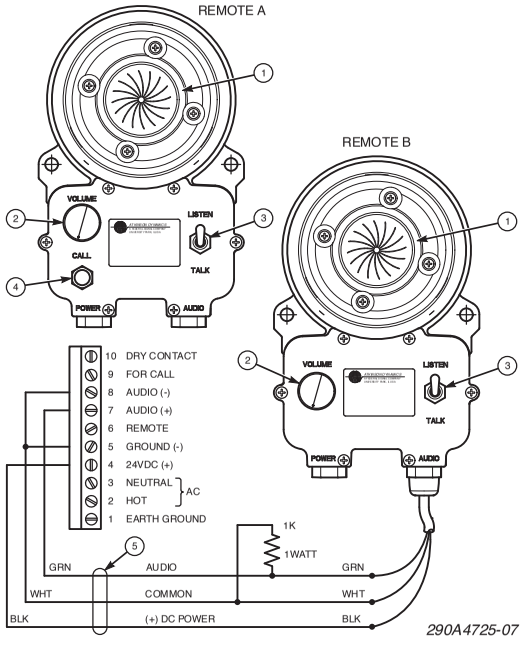
A. Terminal block pinout
B. Dry contact
C. For call
D. Audio (-)
E. Audio (+)
F. Remote control
G. Ground
H. 24VDC in/out
I. Neutral
J. Hot
K. Earth ground
L. 120/240VAC-in
M. Primary Secondary
N. To control panel
O. Speaker plug



Operating Principle:

- When one talks, all intercoms will hear.
- To talk to other stations, press the talk/listen switch and speak into the speaker/microphone.

Release talk switch to listen.

NOTES:

1. Speaker/Microphone
2. Off/On/Speaker Volume Control
3. Talk/Listen Switch
4. “Call” Tone Switch
5. 3-conductor/16-22 gauge cable. Use shielded cable in electrically noisy areas. Ground one end of the shield to “earth” ground. Ground chassis of DC unit to ground.

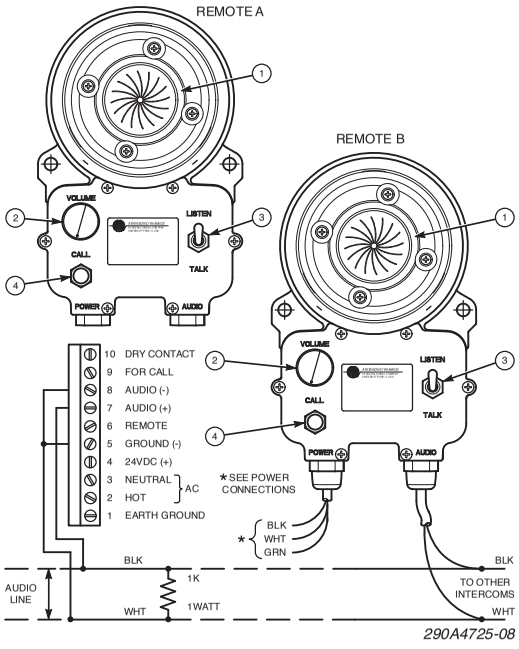
Power	Remote A	Remote B
120V 50/60Hz	AD-28X-MV	--
22-30VDC	AD-28X-MV	AD-56-1
240V 50/60Hz	AD-28X-MV	--

POWER CONNECTIONS (Remote B):

BLK	+DC Power	12/24V Models
WHT	Common	12/24V Models

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- 16–20 gauge low voltage audio cable. Twisted pair not required.
- Shielded audio cable not required unless operating in high electromagnetic fields. Ground one end of the shield to earth ground.
- Audio and power cables are not supplied with AD-28X-MV.



Operating Principle:

- When one talks, all intercoms will hear.
- To talk to other stations, press the talk/listen switch and speak into the speaker/microphone.

Release talk switch to listen.

NOTES:

1. Speaker/Microphone
2. Off/On/Speaker Volume Control
3. Talk/Listen Switch
4. “Call” Tone Switch

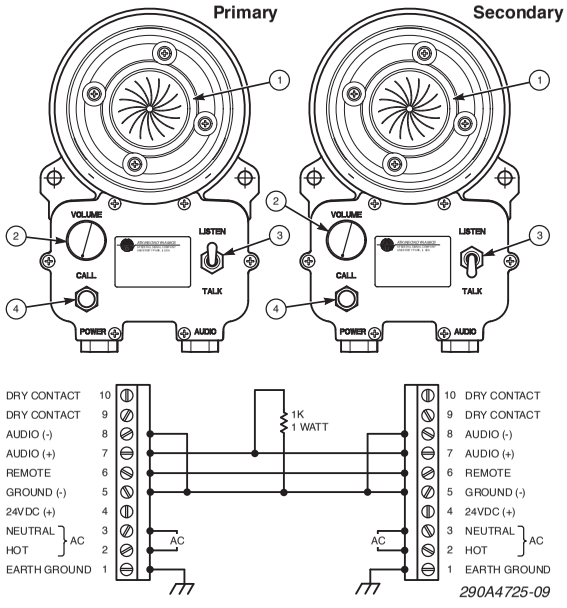
Power	Remote A	Remote B
12-18VDC	--	AD-26A
120V 50/60Hz	AD-28X-MV	AD-27A
22-30VDC	AD-28X-MV	AD-56A
240V 50/60Hz	AD-28X-MV	AD-57A

POWER CONNECTIONS (Remote B):

BLK	+DC Power	12/24V Models
	HOT	120/240V Models
WHT	Common	12/24V Models
	Neutral	120/240V Models
GRN	Earth Ground	120/240V Models only

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- 16–20 gauge low voltage audio cable. Twisted pair not required.
- Shielded audio cable not required unless operating in high electromagnetic fields. Ground one end of the shield to earth ground.
- Audio and power cables are not supplied with AD-28X-MV.



Operating Principle:

- Primarys normally listen to Secondary.
- Secondary talks to Primary hands-free, without having to press a talk switch.
- When any Primary talks, Secondary hears. Other Primarys will hear.
- To talk into Primary, press talk switch and speak into speaker/microphone. Release talk switch to listen.

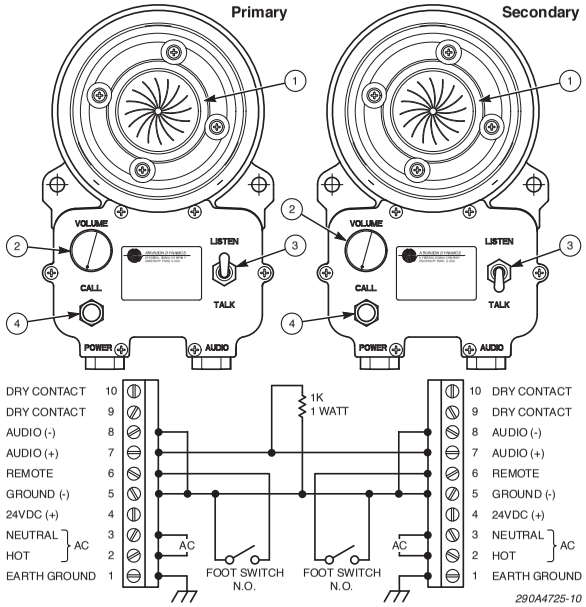
NOTES:

1. Speaker/Microphone
2. Off/On/Speaker volume control
3. Press-to-talk Switch
4. “Call” Tone Switch

Power	Primary	Secondary
120V 50/60Hz	AD-28X-MV	AD-28X-MV
22-30VDC	AD-28X-MV	AD-28X-MV
240V 50/60Hz	AD-28X-MV	AD-28X-MV

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- Audio and power cables are not supplied with AD-28X-MV.
- In this installation the Primary is constantly broadcasting audio from the Secondary. Pushing the listen/talk switch on either unit forces the Secondary into the listen mode and the Primary into the talk mode. The MAS/SLA jumper J2, located on the P.C. board inside the Secondary, must be placed in the SLA mode for this operation. See Secondary MODE on page 2 and figures 2 and 6.



Operating Principle:

- Primarys normally listen to Secondary.
- Secondary talks to Primary hands-free, without having to press a talk switch.
- When any Primary talks, Secondary hears. Other Primarys will hear.
- To talk into Primary, press talk switch and speak into speaker/ microphone. Release talk switch to listen.

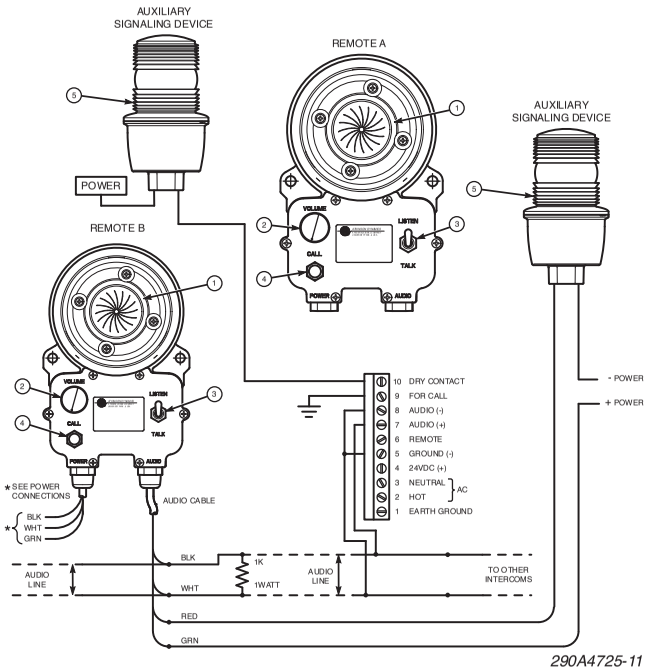
NOTES:

1. Speaker/Microphone
2. Off/On/Speaker volume control
3. Press-to-talk Switch
4. “Call” Tone Switch

Power	Primary	Secondary
120V 50/60Hz	AD-28X-MV	AD-28X-MV
22-30VDC	AD-28X-MV	AD-28X-MV
240V 50/60Hz	AD-28X-MV	AD-28X-MV

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- Audio and power cables are not supplied with AD-28X-MV.
- In this installation the Primary is constantly broadcasting audio from the Secondary. Pushing the listen/talk switch on either unit forces the Secondary into the listen mode and the Primary into the talk mode. The MAS/SLA jumper J2, located on the P.C. board inside the Secondary, must be placed in the SLA mode for this operation. See SECONDARY MODE on page 2 and figures 2 and 6.
- Using normally open, simple contact closure foot switches (customer supplied) allows for total hands-free operation of the listen/talk functions.



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Operating Principle:

- When one talks, all intercoms will hear.
- To talk to other stations, press the talk/listen switch and speak into the speaker/microphone. Release talk switch to listen.
- Pressing the call button on remote A or B provides a contact closure for an attention-getting auxiliary signaling device, e.g. a strobe light.

NOTES:

1. Speaker/Microphone
2. Off/On/Speaker Volume Control
3. Listen/Talk Switch
4. "Call" Tone Switch
5. Customer-Supplied Auxiliary Signaling Device (e.g., strobe light)

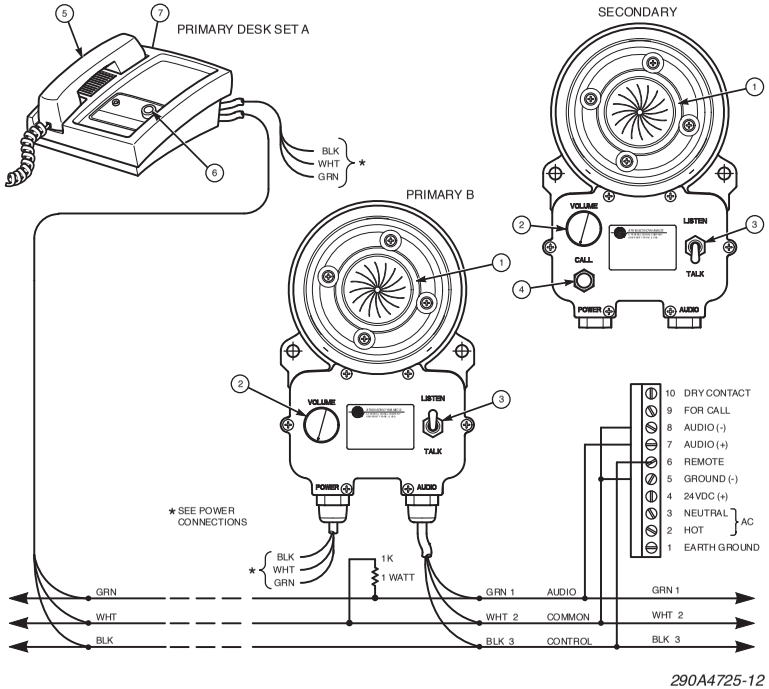
Power	Remote A	Remote B
12-18VDC	--	AD-26-3
120V 50/60Hz	AD-28X-MV	AD-27-3
22-30VDC	AD-28X-MV	AD-56-3
240V 50/60Hz	AD-28X-MV	AD-57-3

POWER CONNECTIONS (Remote B):

BLK	+DC Power	12/24V Models
	HOT	120/240V Models
WHT	Common	12/24V Models
	Neutral	120/240V Models
GRN	Earth Ground	120/240V Models only

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- 16–20 gauge low voltage audio cable. Twisted pair not required.
- Shielded audio cable not required unless operating in high electromagnetic fields. Ground one end of the shield to earth ground.
- Audio and power cables are not supplied with AD-28X-MV.
- The dry contacts can be used to switch an auxiliary audible or visual signaling device when the call button is depressed. The maximum ratings for the dry contacts are 0.5 amps @ 125VAC and 1.25 amps @ 24VDC. This method assures a call is received even when the volume on one of the intercoms is turned all the way down.



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Operating Principle:

- Primarys normally listen to Secondary.
- Secondary talks to Primary hands-free, without having to press a talk switch.
- When any Primary talks, Secondary hears. Other Primarys will hear.
- To talk into Primary, press talk switch and speak into speaker/microphone. Release talk switch to listen.

NOTES:

1. Speaker/Microphone
2. Off/On/Speaker volume control
3. Press-to-talk Switch
4. “Call” Tone Switch
5. Desk Set speaker (microphone is mounted on handset)
6. Desk Set speaker volume control
7. Handset earpiece volume control (mounted on back of case)

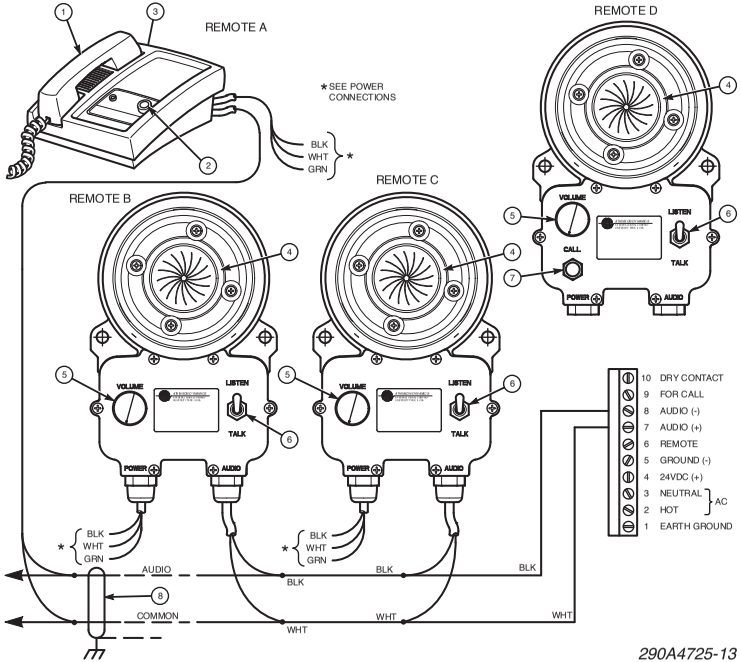
Power	Primary A	Primary B	Secondary
12–18VDC	AD-26CT	AD-26C	--
120V 50/60Hz	AD-27CT	AD-27C	AD-28X-MV
22-30VDC	--	AD-56C	AD-28X-MV
240V 50/60Hz	--	AD-57C	AD-28X-MV

POWER CONNECTIONS (PRIMARY A & B):

BLK	+DC Power	12/24V Models
	HOT	120/240V Models
WHT	Common	12/24V Models
	Neutral	120/240V Models
GRN	Earth Ground	120/240V Models only

Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- Audio and power cables are not supplied with AD-28X-MV.
- In this installation the Primarys are constantly broadcasting audio from the Secondary. Pushing the listen/talk switch on any unit forces the Secondary into the listen mode and the Primary into the talk mode. The MAS/SLA jumper J2, located on the P.C. Board inside the Secondary, must be placed in the SLA mode for this operation See SECONDARY MODE on page 2 and figures 2 and 6.



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Reminders:

- Before installing remote intercoms, precautions should be taken to prevent feedback between two or more remotes in close proximity and acoustically reflective areas.
- 16–20 gauge low voltage audio cable. Twisted pair not required.
- Shielded audio cable not required unless operating in high electromagnetic fields. Ground one end of the shield to earth ground.
- Audio and power cables are not supplied with AD-28X-MV.

Operating Principle:

1. When one intercom talks, all of the intercoms will hear.
2. For Remotes B, C, or D to talk to other stations, press the talk/listen switch and speak into the speaker/microphone. Release talk switch to listen.
3. For Remote A to talk to other stations, press PTT-button on handset and talk into handset microphone.

POWER	REMOTE A	REMOTES B & C	REMOTE D
12VDC	AD-26T	AD-26	
120V 50/60Hz	AD-27T	AD-27	AD-28X-MV
240V 50/60Hz	AD-57T	AD-57	AD-28X-MV
22-30VDC	AD-56T	AD-56	AD-28X-MV

POWER CONNECTIONS (REMOTE A, B, & C):

BLK	+DC POWER	12/24V Models
	HOT	120/240V Models
WHT	Common	12/24V Models
	Neutral	120/240V Models
GRN	Earth Ground	120/240V Models only

NOTES:

1. Desk Set speaker (microphone is mounted on handset)
2. Desk Set speaker volume control
3. Handset earpiece volume control (mounted on back of case)
4. Speaker/Microphone
5. Off/On/Speaker volume control
6. Talk/Listen switch
7. “Call” Tone Switch
8. 3-conductor/16-22gauge cable. Use shielded cable in electrically noisy areas. Ground one end of the shield to “earth” ground. Ground chassis of DC unit to ground.

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