Auto Recharging Dehydrating Breather Systems

GENERAL DESCRIPTION

The High Voltage Supply Auto Regenerating Dehydrating Breather Systems (ARDB) have been designed to remove moisture from the air of load tap changer tanks, conservators, sealed tanks, or control cabinets. Heaters controlled by an adjustable timer provide automatic recharging of the silica gel desiccant, eliminating the need for manual intervention. Systems can be configured for various tank (air volume) sizes and control box options.

1. Small Breather – Designed for 5000 gallons (18927 Liters) or less
2. Large Breather – Designed for 12000 gallons (45424 Liters) or less.

Any combination of breathers can be configured. Control options can accommodate a single timer or two timers for independent system operation.

CONSTRUCTION

ARDB systems are shipped with or without a control box and either one or two breather assemblies. The control box is a rainproof NEMA design that houses the timer(s). Both sizes of breathers are very similar and are constructed with a top casting, integrated heating elements, screen, condenser media, and filter vent system. A pipe fitting which threads through the side of the control panel supports the breather and also provides a passageway for the control wires, eliminating the need for electrical conduit.

Control Box

- All systems include a microchip timer/control unit that is used to control the heating/regeneration of the system.
- Timer options can be set for daily, weekly, or bi-weekly operation.
- HVS Control box is equipped with a customer terminal block to make all electrical connections simple.
- If the HVS control box is not ordered, supplied timer controller can be installed inside the transformer control box or similar.

Options

Regardless whether the control box is ordered, the timers can be ordered in 120V or 240V versions. All timers are compatible with 50/60Hz power sources.

Breather

Typical assembly involves either one or two breathers mounted on the side of an existing control panel or on the side of the HVS control box.

The top casting of the breather has plugs that are used to fill the unit with silica gel. A barb fitting and a 3/8" ID flexible hose connects to the casting, providing the source of dry air to the tap changer or conservator.

Heating elements are enclosed within the screen and are designed to provide maximum surface contact with the silica gel.

During regeneration, the moisture condenses on the condenser globe. Moisture then runs down the globe and accumulates in the bottom casting. This causes a ball valve in the bottom casting to float, allowing moisture to drip out the bottom vent. After all the moisture has drained the ball valve will re-seal against the bottom casting preventing ambient air from flowing freely through the breather (consuming excess desiccant capacity).

INSTALLATION

Breather Installation

1. Unpack breather kit and remove protective rubber hose from breather casting. Be careful to not pull or scrape the insulation from heater element wires.

2. Install breather to side of control box using the supplied conduit fittings. Breather orientation should be vertical.

Electrical Connections

Breather elements operate on either 120V or 240V AC (50/60Hz). Timers are available in 120V or 240V. Systems that are ordered with a control box are pre-wired between the terminal block and the timer(s). Installation of the input power source and connection of the breather(s) is all that is required.
Systems that do not include a control box are supplied with the timer and a terminal block for customer connections.

Note: See page 5 for schematic information.

Silica Gel

After initial installation and prior to energization of the unit, the ARDB should be filled with silica gel (desiccant) per the following steps:

1. Remove the fill plugs from the top of the casting.
2. Using a small funnel, add the desiccant. Gently tap the side of the globe to aid the silica gel in settling.

3. Reinstall the top fill plugs.
4. Remove the bottom vent by unscrewing it; making sure that ball float is retained.
5. Remove the polycarbonate globe and bottom casting by unthreading the two bottom thumbscrews from the breather. Remove any fine granules of desiccant that may have passed through the screen from the bottom casting and ball float.
6. Ensure that the float ball is free from obstructions.
7. Re-assemble the globe, bottom casting, ball float and vent on the breather assembly and hand tighten the thumbscrews.

OPERATION

During thermal cycles of the free breathing apparatus, air will be drawn into, or expelled out of the breather. The air is drawn in through the intake slots between the condensation globe and the top casting of the breather. The air flows through the silica gel to the center of the device where it is routed to the equipment.

The desiccant used in all ARDB products has been specially formulated to be an environmentally friendly moisture indicator. In normal operation, the desiccant will slowly turn from yellow to green indicating that it has become saturated with moisture. The timer settings should be adjusted to regenerate before most of the gel has been allowed to change color.

The ARDB regenerates by energizing the heater(s), which in turn dries out the silica gel. When dry, the silica gel will return to its original yellow color. Regeneration time is fixed at three hours, however, the frequency of regeneration is set by a potentiometer located on the timer.

Note: *The frequency of regeneration needed is dependent upon the humidity of the surrounding air and the loading patterns of the free breathing apparatus.*

Timer Programming

The timer is preset at the factory to have the breather energize for two hours every other week. However, the timer does offer the flexibility of being configured with any of the following:

1. Frequency of regeneration
   a. Daily
   b. Weekly
   c. Every other week

To select the frequency of operation, turn the potentiometer on the timer according to the appropriate setting as indicated on the timer label.

Note: *A regeneration cycle can be initiated immediately by a brief interruption of the power source.*

MAINTENANCE

The ARDB is essentially maintenance free, with only a few necessary checks to ensure that the unit is operating.

Annual Inspection:

CAUTION: *The surface of the ARDB is extremely hot while regenerating.*

- Visually inspect the silica gel to confirm that it is yellow in color.
- Interrupt power to the ARDB timer to re-initiate a regeneration cycle. After a few seconds, the head of the ARDB should be hot to the touch.
- Remove the bottom vent and ball float to ensure that the ball float seal area is clean and free of silica gel dust.

TROUBLESHOOTING

1) The silica gel is not yellow
   - Confirm that the float ball in the bottom of the condensation globe is not obstructed.
   - Check to ensure that the frequency of regeneration is appropriate for the environment.
   - Confirm that the timer has appropriate voltage input.

2) The silica gel is not turning green during normal operation.
   - Confirm that the pipe connecting the breather to the equipment is not obstructed.
   - Check to ensure that the frequency of regeneration is appropriate for the environment.

REPLACEMENT PARTS AND SERVICE

Please contact High Voltage Supply for parts and service at 800-338-5526 for replacement parts and/or service.

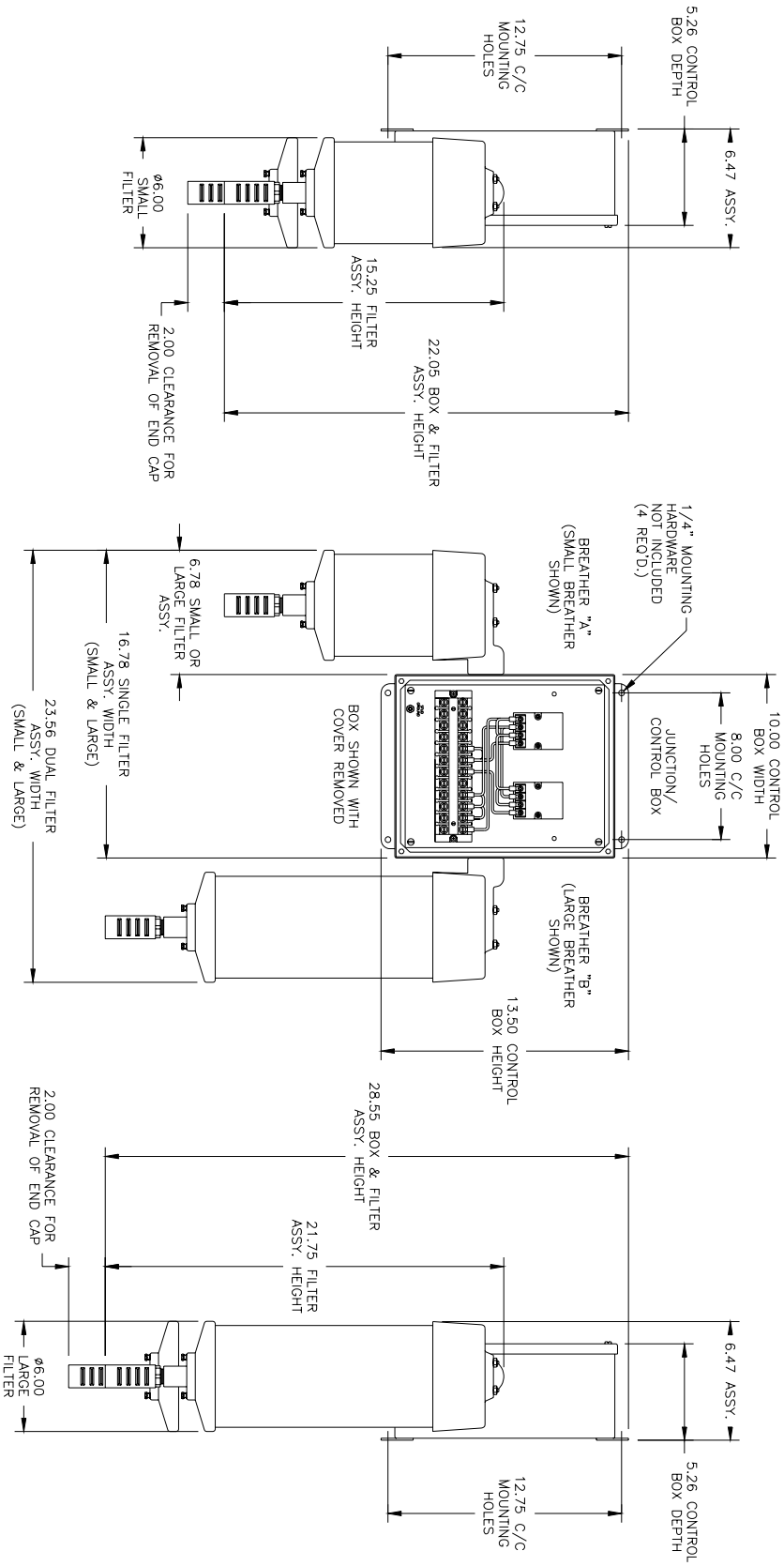

Figure 1 – Typical Dimensions for small or large breather

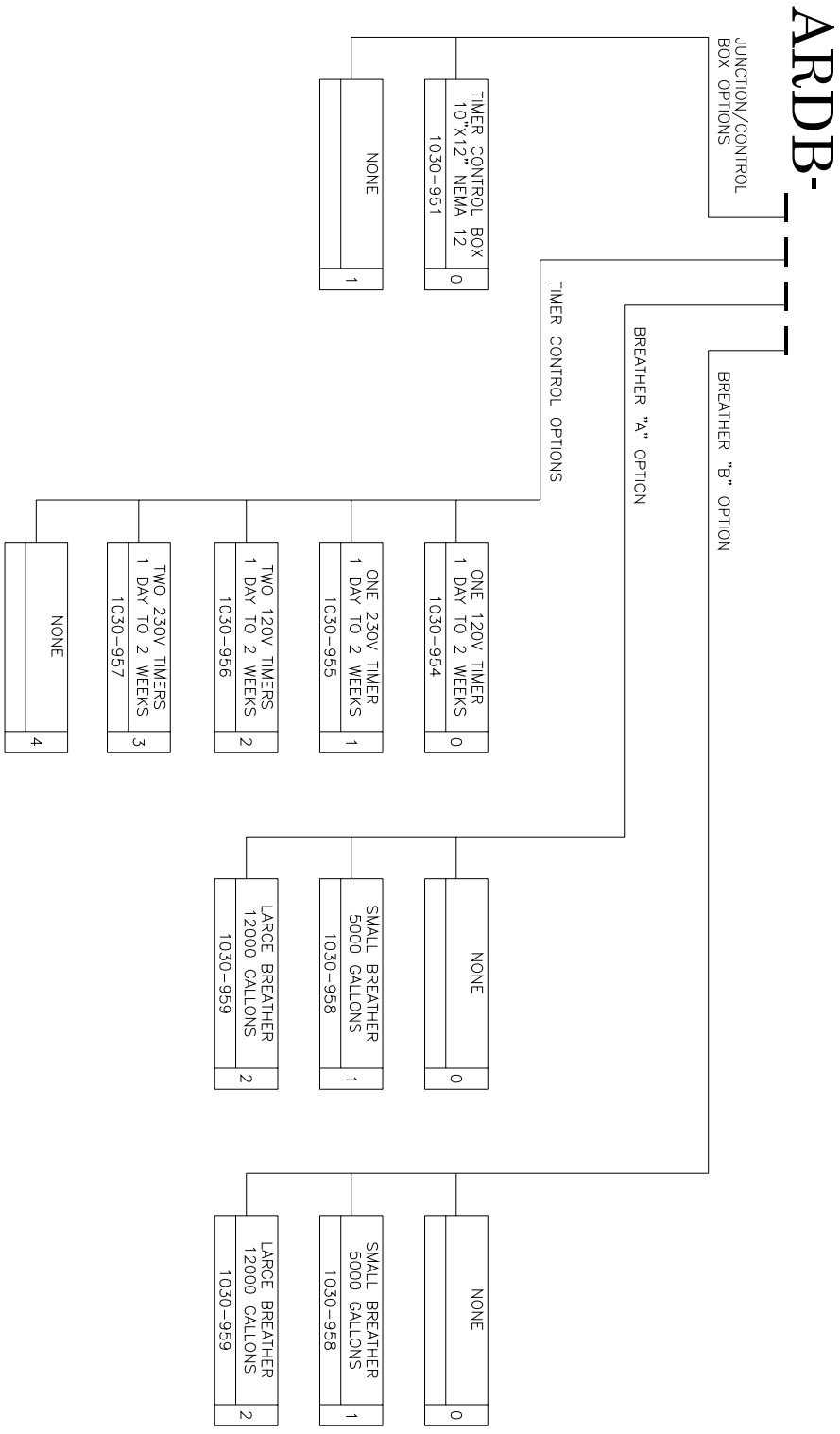

Figure 2 – Standard available configurations; contact factory for specific needs

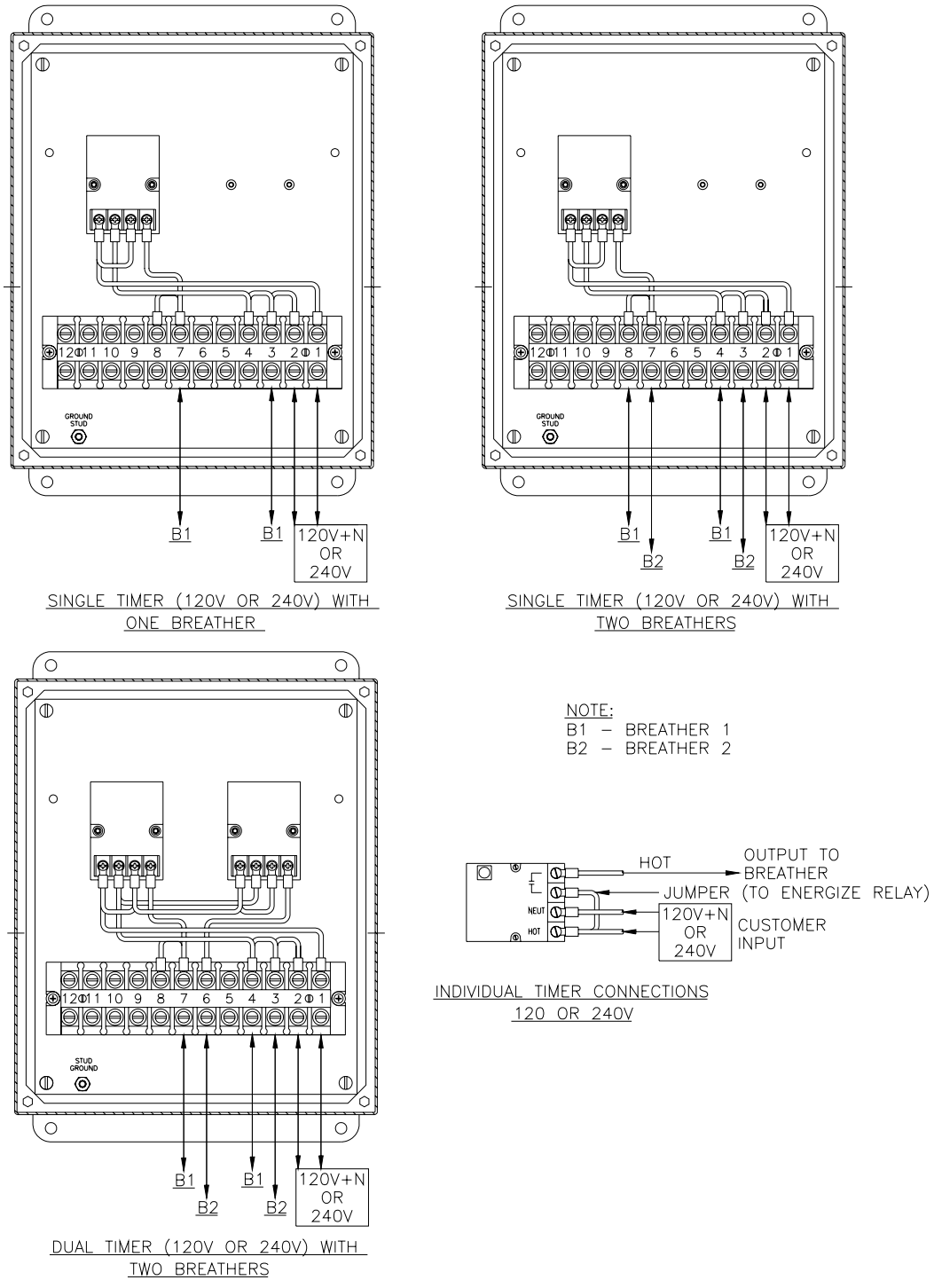

Figure 3 - Typical installation wiring configurations.
NOTE: All wiring between timers and terminal block is supplied.