

# Automatic Load Bank Controls

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This information is general in nature and intended to give the reader an overview of the issues involved. Specific recommendations can only be made after a review of the equipment involved, installation parameters, applicable codes and national standards by competent personnel. Please consult Avtron Loadbank, Inc. with comments or questions about the information contained herein.



**AUTOMATIC CONTROLS** can be provided on load banks to facilitate the regular maintenance exercising of power sources. Maintaining a minimum load on a generator set is critical to the proper operation and continues serviceability of the generator set and may be required by the manufacturer for continuation of the warranty. These automatic controls may include systems to apply and remove load bank elements to maintain a minimum load, start and stop cooling blowers, or remove the load bank from the power source in the event of a power failure. The load bank may be a part of the load which includes building load or may be the entire load used for exercising the generator set. Automatic controls can allow for the unattended operation of the generator set during exercise periods. These automatic systems are described below.

### **LOAD DUMP**

The most basic control, load dump, provides for an automatic removal of the load bank from the power source if the commercial utility fails. In this case a simple closed contact in an automatic transfer switch or other external device which opens when the power fails can be used to drop the load bank. This simple circuit can be used for other situations that require the load bank be controlled in one step by an external control. The load dump circuit is standard on all Avtron non-portable load banks, (radiator or free standing pad mount).

### **AUTOMATIC LOAD CONTROLLER**

The automatic load controller utilizes a load sensing current transformer and monitor which will sense power source load changes and adjust the load bank to maintain a minimum load on the power source. In a typical installation the automatic load controller current transformer will sense the building load and, based on the controller time delay and pickup settings add and subtract load bank elements. The automatic load controller may also be used to provide start and stop control for the load bank cooling air blower(s) for complete unattended operation.

### **CURRENT TRANSFORMER**

The current transformer is placed around the output of the power source downstream from the load bank. It must be located so that it only monitors the load going to the building. It must not be placed in a location where it will sense the load going to the load bank itself. If the current transformer is placed so that it senses the load bank load it will not function properly and the load will be unstable.

### **CONTROLLER**

The controller is provided with adjustments for five load steps with independent set points for load step pickup and drop out as well as timing functions. The controller set points are coordinated with the generator set and load bank capacity and individual load steps.

For instance if we have a 1000 KW generator set and we wish to run the generator with no less than 50% of load we need a 500 KW load bank. A 500 KW load bank would be provided with 50, 50, 100, 100, and 200 KW load steps. Load bank steps are added from smallest to largest and removed in the reverse order. The controller set points must be adjusted sequentially. Each load step set point is interlocked with the previous load step.



With no building load the load bank will apply its full rating, 500 KW, to the generator set to provide the 50% load requirement. As the building load increases the automatic load controller will sense the increased load and when building load reaches 50 KW the controller will remove a 50 KW load bank step from the generator. The actual load on the generator set will have increased to 550 KW then been reduced to 500 KW when the load bank controller removed the 50 KW step. As the building load again increases the load bank controller will drop a 100 KW load step when the building load increases to 300 KW. This sequence repeats until all load steps have been removed.

If the building load decreases the load bank controller will sense that reduction and add load steps in the reverse order to again maintain the minimum load. If the building load continues to be reduced the load bank controller will again remove steps to maintain the target 50% load.

It is important to coordinate the generator set capacity, the load bank capacity and load steps as well as the load bank controller to assure the proper operation of the total system. The desired target load is also a critical piece of information for the correct application of the automatic load controller.

The proper application of an automatic load controller will allow for the unattended operation of the power system and load bank while maintaining the minimum design load on the power system. The control system can start and stop the load bank cooling blower to allow for the automatic operation with a programmed clock exerciser in the automatic transfer switch of building automation system.

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