

We design and manufacture the following control panels for co-generation purposes:

### **MANUAL STARTING PANEL**

#### **Operating Principle:**

This panel primarily provides protection to the engine and generator. The generator set is manually started (eg. key-switch, pushbutton, etc). As part of the control circuit the generator set has a run down period (this is applicable to all turbo machines).

For more information and options regarding speed control, engine protection and alarms as well as visible measurements please contact us.

### **AUTOMATIC LOAD TRANSFER PANEL**

#### **Operating Principle:**

The voltage sensing unit monitors the status of the main (normal) supply. When the main supply fails (the supply is interrupted on all or one of the phases) the control circuit will automatically react by starting the backup generator set (after an adjustable delay period).

A second adjustable timer will allow the diesel engine to warm up, before closing the contactor and thus connecting the load.

When the voltage sensing unit detects that the main (normal) supply has been restored and after an adjustable surveillance period has run out, the generator contactor opens and the main contactor closes to connect the load to the normal supply.

Note that a mechanical interlocking mechanism is used to ensure that only one of the two contactors (i.e. generator and main contactor) may be closed at any given time.

After a Cool down period (also adjustable) the Generator set will shut down.

As an option we can provide a test switch that will manually start this sequence when required.

For more information on options regarding generator control, engine protection and alarms as well as visible measurements please contact us.

## **AUTO SYNCHRONIZING PANEL**

### **Operating Principle:**

We'll normally provide the Auto Synchronizing panel when it is required that more than one generator operates in parallel; it is thus necessary to synchronize the supplies from the different generator sets in order to increase the source capacity.

The voltage sensing unit monitors the status of the main (normal) supply. When the main supply fails (the supply is interrupted on all or one of the phases) the control circuit will automatically react by starting the backup generator sets simultaneously (after an adjustable delay period). A second adjustable timer will allow the diesel engines to warm up.

Once the auto synchronizing relay has detected that the generator supplies are synchronized the motorized moulded case circuit breakers or contactors will close and supply a common busbar. The control circuit will now close the motorized change over switch (or breaker/contactors) connecting the load to the common busbar.

Electronic load sharing units will monitor the load and will select the number of generator sets required to supply the load. During low load demands extra generator sets will shut down to save fuel and when the demand increases more generator sets are started and synchronized and reconnected to provide the increasing demand. As an optional function VAR controllers may be added to control the reactive power (power factor).

When the voltage sensing unit detects that the main (normal) supply has been restored and after an adjustable surveillance period has run out, the motorized generator breakers opens and the main breaker closes to connect the load to the normal supply.

Note that a mechanical interlocking mechanism is used to ensure that only one of the two supplies (i.e. generator or normal supply) may supply the at any given time.

After a Cool down period (also adjustable) the Generator set will shut down.

For more information and options regarding generator control, synchronizing, load control, engine protection and alarms as well as visible measurements please contact us.