

General Information

All of us who have been in the position of having to bypass a UPS that is supplying a critical load know the trepidation as we operate the switches. Sooner or later something will go wrong the load will be dropped and the IT manager will go ballistic.

The Powerguard EMBS is designed to minimise the likelihood of this happening by using a pre-programmed sequence with step by step instructions displayed on an LCD screen. This makes it more straightforward to bypass the UPS or vice versa without a break in the supply to the load.

The incoming bypass supply is monitored by the control. If the bypass supply is not within a pre-set specification the changeover will be inhibited. Likewise the UPS output is also monitored and if that is out of specification the changeover back again is inhibited.

The circuit breakers are monitored and interlocked by the control and only allow sequential operation. The control voltage is 24 VDC so the operation of the circuit breakers is not affected by spikes, dips and sags on the mains supply. The 24 VDC has a dual supply fed from the bypass and the UPS output giving reliable system operation.

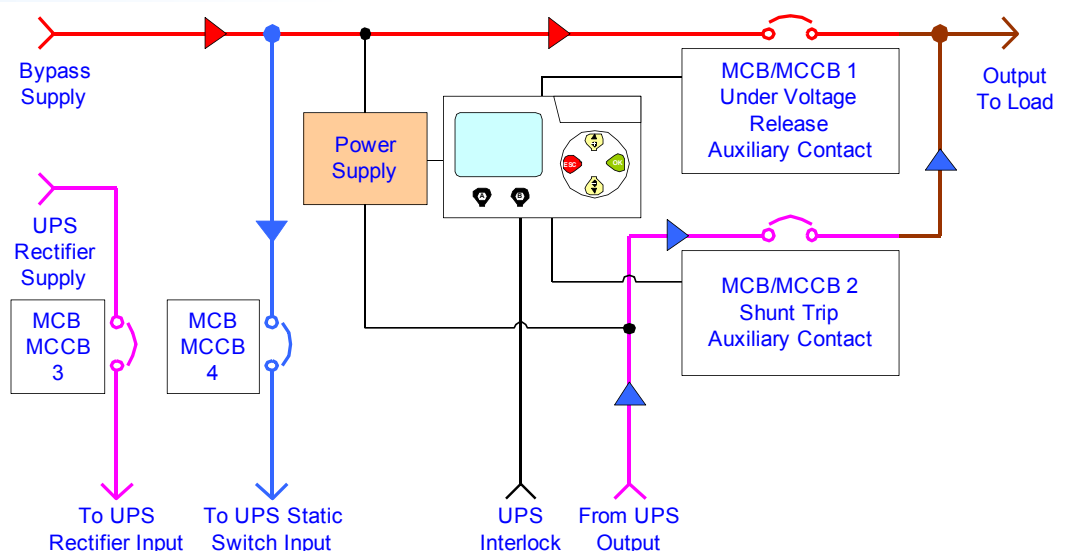
The system has a UPS interlock that prevents operation if the UPS is not in static bypass.

Operation

The simplified schematic shows the main component parts of the Powerguard EMBS.

The UPS Rectifier input is the main input to the UPS supplying the power to the output inverter and to charge the batteries.

The Bypass Supply input can be independent from or the same as the UPS Rectifier Supply.



- EASY TO OPERATE
- SAFE OPERATION
- SEQUENTIAL OPERATION
- CLEAR LCD DISPLAY
- BYPASS MONITORED
- UPS MONITORED
- DUAL POWER SUPPLY
- UPS INTERLOCK
- MICROPROCESSOR CONTROL
- HIGH QUALITY CIRCUIT BREAKERS
- INCREASED LOAD SECURITY
- HIGH IMMUNITY TO ELECTRICAL DISTURBANCE
- SINGLE OR THREE PHASE INPUT AND OUTPUT

ply. It is better to be independent but this is not always practical. The Bypass Supply input feeds the UPS Static Switch Input and the EMBS output via MCB 1.

Normal operation is with the UPS Rectifier Input

fed via MCB 3 and the UPS output through MCB 2 to the load. The path is shown in pink. The UPS will synchronise with the Bypass Supply allowing a virtually no-break switch over by the UPS static switch.

The UPS must be put into Static Switch Bypass mode before a no-break manual bypass is attempted. The path is shown by blue arrows. If the UPS has developed a fault this condition is usually automatic. The UPS sends a signal to the EMBS UPS Interlock to confirm it is in bypass. MCB 1 can be switched on to supply the load directly from the Bypass Supply. The path is shown by the red arrows. MCB 2 is automatically switched off. MCB 1 and MCB 2 are momentarily on at the same time to ensure a no-break changeover. The control ensures that the operation is done sequentially and safely.

The procedure is reversed to change back onto the UPS output.

The UPS can be isolated and serviced in safety.

Display Sequence

UPS NOT IN BYPASS The UPS must be in static switch bypass before changeovers can be allowed. This is to ensure that the UPS is not damaged and the load dropped.

BYPASS SUPPLY FAILED The system monitors each phase, single or three, on the bypass supply. If any are outside a pre-set specification the changeover is not allowed.

UPS OUTPUT FAILED The system monitors one phase on the UPS output. If it is outside a pre-set specification the changeover is not allowed.

SYSTEM OK SWITCH ON MCCB 1 OR MCCB 2 The bypass supply is in specification. The UPS is powered via MCCBs 3 & 4 and is switched on. The UPS output is live and in specification.

UPS OUTPUT FAILED SWITCH ON MCCB 1 The UPS output is not available but the load can still be powered from the bypass supply by switching on MCCB 1

BYPASS FAILED SWITCH ON MCCB 2 The Bypass is not available but the load can still be powered from the UPS output by switching on MCCB 1

UPS AND BYPASS SUPPLIES FAILED If both the Bypass and UPS output are outside the pre-set specification the load cannot be powered.

NORMAL MODE TO SWITCH TO BYPASS PRESS OK The system is in normal mode with the UPS supplying the load. To start the bypass sequence press OK.

SWITCH ON MCCB 1 OR PRESS ESC Switch on MCCB 1 to switch the load to Bypass.

BYPASS MODE TO SWITCH TO UPS PRESS OK The system is in Bypass mode with the bypass supplying the load. To start the sequence to supply the load from the UPS press OK.

SWITCH ON MCCB 2 OR PRESS ESC Switch on MCCB 2 to switch to the UPS output.

The control will automatically reset after approximately 10 seconds if a changeover is not initiated by switching an MCB/MCCB.

EMBS Range & Conclusion

The Powerguard EMBS can be supplied for any configuration of UPS installation as follows:

- Single phase in - single phase out.
- Three phase in - single phase out.
- Three phase in - three phase out.

The power ratings are from 500 VA to 1500 kVA. Powerguard recommend that all UPS installations are fitted with an EMBS.

It is very difficult to service or repair a UPS supplying a critical load where downtime is not possible.

The only safe way is to install a Powerguard EMBS.