

## Production equipment in factories

► How do you maintain the productivity of your factory during a voltage dip?

Auto-restart

**1** A plastic container manufacturer is holding its monthly production meeting.

Aug Sep Oct Nov

Worker: Why did our productivity of plastic containers drop last month?

Manager: I remember that all our production machines stopped on the 25th of last month. I have no idea why that happened.'

**2** One day later:

On the 25th of last month, all our production machines suddenly stopped. Our production was interrupted and we lost a lot of time restarting the machines manually after tripping. Do you know what caused this?

Manager

CLP Engineer: This was caused by an inevitable voltage dip. In such cases, some mitigation solutions can be used to reduce the downtime of your production lines.

**3**

Worker: Please recommend some methods of improvement.

Manager: OK! Let's carry out a joint study and site investigation.

CLP Engineer

**4** After site investigation:

CLP Engineer: Your production machines are very sensitive to voltage dips.

Manager

**5** Recommended solutions:

To be able to resume normal operation within a few seconds after tripping due to a voltage dip, you should apply an auto-restart scheme to each machine for automatic restart.

CLP Engineer

**6** After modification...

Manager: After applying an auto-restart scheme, high productivity can be maintained even if a voltage dip occurs.

Different types of production machines have different constraints, so they need to be studied case by case. If you have any power quality queries about your production machines, please contact us at 2678 2678 to carry out a joint study and site investigation.

**Try our Consultancy Service on Power Quality now!**

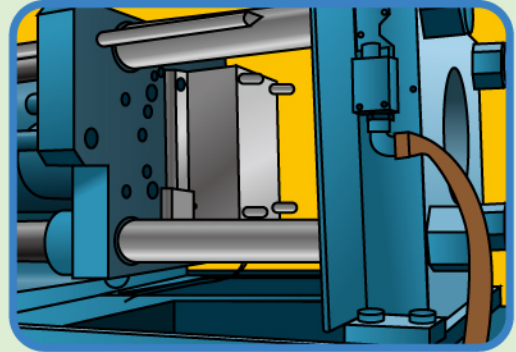
## Want to know more...

Computerized production machines are very sensitive to voltage dips and may suddenly stop during voltage dips. This may cause the production process to be halted, long time required for restoration of normal operations, adversely affecting the productivity and competitiveness of the company.

### Computerized Production Machines

Reasons for tripping during voltage dips:

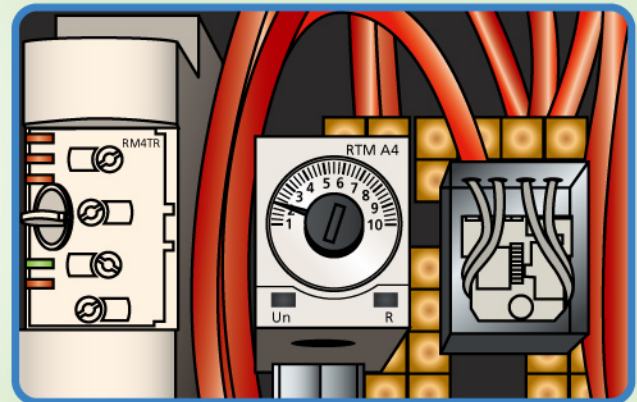
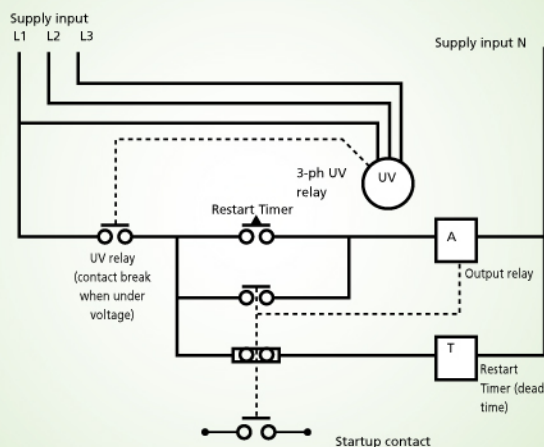
- Contactors and control relays drop off.
- No time delay from phase monitoring relay causes tripping.
- Variable speed drives (VSD) and programmable logic controllers (PLC) are tripped off.



### Recommendations:

- Add an external auto-restart scheme (Figure 1) to initiate the post-voltage-dip auto-restart operation of the machines.
- Enable auto-restart feature of VSD to automatically perform undervoltage detection clearance and re-starting attempt.

External Auto-restart Scheme schematic diagram



**Figure 1. Simplified connection diagram of external auto-restart scheme**

An auto-restart scheme is a cost-effective solution for the production process which allows a short stoppage.

Customers should specify to manufacturers that a 'ride-through' capability should be incorporated in new equipment or machinery so that the impact of voltage dips can be reduced. Please also refer to international voltage dip immunity standards such as SEMI F47, IEC 61000-4-34, -4-11 and ITIC Curve to verify the ride-through capability of any new equipment procured.

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