

## Smooth-start systems

Our company designs and manufactures cabinet-mounted electrical systems that are capable to ensure smooth and consecutive start in multi-motor arrangements with automatic transfer to the mains voltage. Such systems can also be equipped with remote control devices.

To solve the problems of motors smooth start, the relevant devices are used manufactured by ABB, General Electric, DanFoss, Siemens, Solcon and others.

### ADVANTAGES

Smooth start offers advantages over conventional starting systems: first of all, ease of installation, maximum current and torque limitations, no incremental rotational speed change as in conventional systems.

Increased performance and reliability in case the smooth starters are used.

Smooth start and shutdown of the motor increases the drive systems service life, prevents shocks in the transmission and adjoining parts of the mechanism. This reduces the downtime associated with the inspection and repair of equipment and increases the service life of the latter.

Improved performance of acceleration / deceleration.

With the start based on voltage "curve" or, alternatively, on use of current limiting, acceleration matches with the load in a planned way. In case of high friction loads in the mechanism "impulse" start can be used.

Braking can be carried out via disconnecting the power supply, smooth shutdown or DC supply into the stator winding of the motor. Thus, the user has enough options for each specific case.

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| Motor protection   |
| The smooth starter protects the motor against overload, input or output phase loss, rotor blocking, thyristor fault, etc.  |
| Digital technology   |
| The control system uses a highly specialized microcontroller where the signals are processed digitally. Thus, the instability problems in the analog signals processing are eliminated, and the high accuracy level is achieved. |
| The Main board is made using surface-mount device (SMD) technology increasing system reliability.  |
| High level of protection   |
| The device design prevents access to the power supply buses. The control signals are optically isolated. Differentiated levels of protection prevent the impact of external negative factors                                     |
| Easy start-up for operation  |
| These devices have quite a variety of applications. Setting-up is easy, the selection of multiple options allows for optimum integration of the devices into existing systems.   |
| Simple operation   |
| Trouble codes are displayed on the screen by means of seven-segment indicators, which at any time allows you to monitor the device current status and quickly diagnose equipment during fault detection.                         |

| Standard start                              |                   |                   |                  |            | Smooth start      |
|---|-------------------|-------------------|------------------|------------|-------------------|
|   | Direct connection | autotransformer   | stator resistors | star-delta |                   |
| % of starting current (on line)             | 100%              | 30-40 or 64 %     | 58-70%           | 33%        | Set<br>Max 90%    |
| Starting torque %                           | 100%              | 30-40 or 64 %     | 33-49%           | 33%        | Set<br>Max 90%    |
| Number of steps at the start                | 1                 | 4.3 or 2          | 3 or 2           | 2          | Continuously      |
| Number of cable cores attached to the motor | 3                 | 3                 | 3                | 6          | 3                 |
| Overload in line                            | 5 In              | 1.5-2.1 or 3.2 In | 3-3.5 In         | 1.65 In    | Set<br>Max 4-7 In |
| Starting Pause                              | None              | None              | None             | Yes        | None              |