



## SVC

### Fan speed control with frequency converter

#### General description & application

The function of the SVC device is to provide stepless fan speed control of condensers and dry coolers. The control system provides tools to reduce both unit energy consumption and noise level.

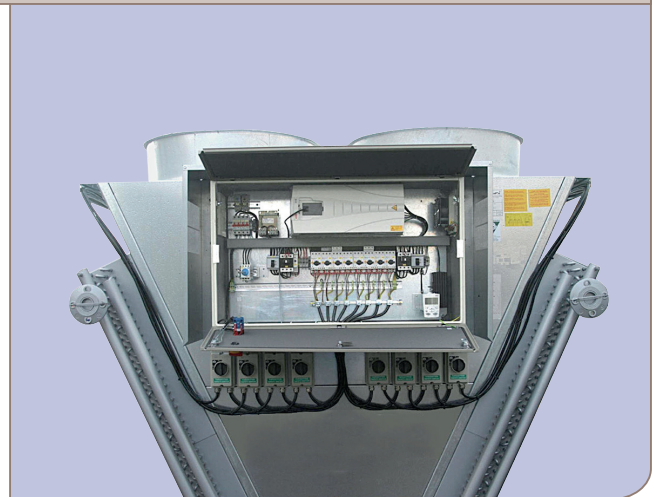
#### Features

- Available for supplies: 3/380–480 V/50/60 Hz, 3/200–240 V/50/60 Hz and limited for 3/690 V/50/60 Hz
- Control unit enclosure to protection class IP 54 (both integrated and remote installation)
- Meets requirements of EMC EN 61800-3; first environment restricted distribution present similar C2 (suitable for commercial and industrial low-voltage network)
- Integrated installation has been EMC tested and certified by SGS Fimko Ltd (an independent certification company)
- Test run and pre-configured at the factory
- All fans are controlled simultaneously
- PID-control loop

#### Functional description

The unit comprises the frequency converter and its associated electric components either enclosed in the same box (I) or with the frequency converter mounted remotely (R). Frequency converter manufacturer recommends a total maximum cable run between frequency converter and motors of 110 meters. This can be extended through the use of a sine filter, if required. Operational function will be guaranteed, but EMC classification not.

Terminals and glands are designed for copper supply cables. The supply cable is connected to the main disconnecting switch, located either on the control panel (Integrated installation, I) or on the power box (Remote installation, R) mounted on the end of the unit. Safety isolating switches for every fan can be provided as option.



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Pressure and temperature transmitters are mounted and wired at the factory (I). Wiring between the control unit and the fan motors is also installed and tested at the factory. The unit is provided with potential-free contacts for remote indication of fan failure and operation of the frequency converter by-pass.

The control unit is ready to function as soon as power is connected. The frequency converter provides PID-control of the fan speed according to the signals received from the pressure or temperature transmitters. The desired pressure or temperature value can be set from the frequency converter panel or from the Building Management System (BMS).

In external control, the frequency converter receives the fan speed information as a standard voltage or current signal. External control is particularly suited to applications where the control set points need to be altered frequently, e.g. for free cooling use or control with variable condensing pressure.

For integrated installations (I) the control unit is equipped with a heater as well as with a cooling fan for trouble-free operation under both winter and summer conditions. The unit and all its components are designed to meet requirements of EMC (electromagnetic compatibility) standard EN 61800-3. This standard defines allowable conducted and radiated disturbance emission and immunity levels.

#### Authorised agent

(IPC) Industrial Power Cooling Ltd, [www.ipcuk.com](http://www.ipcuk.com), t: 00 44 (0) 845 873 9916, [info@ipcuk.com](mailto:info@ipcuk.com)

## Standard features

- Frequency converter
- Circuit breakers for motors
- Control voltage transformer
- Automatic control fuses
- Potential-free contacts for alarms
- Thermostatically controlled panel electric heater (only for I)
- Thermostatically controlled panel cooling fan (only for I)
- Thermo insulated cabinet (only for I)
- Terminals for running permit / service running

## Options

- Automatic by-pass (BPA)  
*Includes contactors and disconnecting switches for by-passing frequency converter and 'auto/0/by-pass/frequency converter' selector switch. Automatic by-pass ensures fan operation should frequency control fail.*
- Thermal overload protection (THC)  
*Motors provided with 'Klixon' bimetallic relays, contactors and automatic fuses. Use in situations when it is suspected that cooling of motors may be marginal (e.g. high levels of fouling and high ambient temperatures). Unless specified otherwise, motors are supplied with circuit breakers for electrical overload protection.*
- Safety isolating switch for every fan (SW)
- Sinus filter (Sfil)  
*Only required for remote installations (R) if total maximum cable length between controller and unit > 110 m*

## Code description

**SVC - I - Pr - BPA**

**Options**

**Control signal\***

- Pressure transmitter  
Pr = control from 1 condenser circuit  
P2 = control from 2 condenser circuits
- Temperature transmitter  
Te = dry cooler 1 set point  
Tf = dry cooler with free cooling use, 2 set points
- External control  
ECI = direct frequency control 4...20 mA input  
ECU = direct frequency control 0...10 V input  
ECIf/ECUf as above but with free cooling use

**Installation**

- I = Connection box and control mounted in the same enclosure on the unit end.
- R = Connection box is mounted on the unit end, frequency converter mounted remotely.

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\* In the absence of project specific data, the following default values for Pr and Te control signal alternatives are used.

- Pr/P2 : 17,2 bar (gauge) equivalent to R404A, condensing temperature tR = 40 °C,
- Te : outlet liquid temperature 36 °C,
- Tf : outlet liquid temperature (free cooling) 5 °C.

The Pr or Te probe is delivered unassembled with 10 m connection cable.

## Benefits

- Reduced sound levels, no intrusive intermittent noise from starting and stopping of fans
- More stable operation of the refrigeration plant
- Optimized energy consumption, low operating cost
- Run-time equalization of fan motors, fewer bearing failures
- No electrical losses, high operation efficiency compared to e.g. phase-cutting
- Always an optimized precise unit control
- Greatly reduced fan motor power input due to continuous motor speed control
- Resonant frequencies can be easily by-passed
- Wide variety of field bus protocols
- IEC- or DIN-norm squirrel cage motors, readily available throughout the world