PLUTON TURN ON THE FUTURE

FANS AUTOMATIC CONTROL CABINET, TYPE **SHSAUV**

METRO

FANS AUTOMATIC CONTROL CABINET, TYPE SHSAUV

Fans automatic control cabinet, type ShSAUV, is provided for control of metro main fans and other facilities fans.

ShSAUV provides:

- fan acceleration / stop with set rate and current limiting;
- operation in steady mode with set rotation speed;
- variation of speed and direction of fan rotation;
- motor protection;
- louvers control.

It operates together with actuation (auxiliary) devices, temperature and other sensors of controlled fan; supports operation modes both with one and several louvers; has motor winding warming connection circuit.

ShSAUV can be installed in underground facilities of airshafts and metro tunnels, and is resistant to external influence of climatic factors.

BENEFITS

- limiting of starting current: the current depends on fan acceleration rate and the load torque, and does not exceed 1.2 of the rated one;
- controlled acceleration (stop): acceleration (stop) time is regulated; this makes it possible to reduce the time of transition from one mode to another (“intake” - “exhaust”, “exhaust” - “intake”) by several times;
- regulation of fan rotation speed (seven preset speeds, which values can be changed during adjustment);
- changing of fan productivity without adjusting the angle of impeller blades rotation, making its maintenance easier;
- significant saving of electricity: under 60 % performance of the rated electricity, its consumption is 27 % of that which is consumed in non-regulated mode;
- possibility to switch at fan rotating motor.

DESIGN GENERAL DATA

Structurally ShSAUV is a one-sided maintenance metal cabinet with an opening front door with viewing window.

Monitoring and alarm controls are located on the swing frame inside the cabinet. “Stop” button to stop the fan and light switch are located on the cabinet door. Power supply, load, monitoring and control circuits are input through cable glands at the bottom of the cabinet. Air inside the cabinet is heated by built-in fan heaters.

Cabinet cooling is forced by fan mounted on the cabinet door.

ShSAUV cabinet overall dimensions and weight vary depending on rated power (Pnom) of controlled fans, e.g. ShSAUV 37, 45 and 55 kW are produced with dimensions 800 x 2000 x 600 (W x H x D). Approximate weight is 300 kg.

SHSAUV STRUCTURE

Fans automatic control system consists of the following functional systems:

- power circuit;
- operational control, indication and alarm system;
- system for monitoring and provision of microclimate inside the cabinet.

ShSAUV power section includes **input device, input filter, frequency converter with machine dU/dt-filter, actuating and auxiliary devices control circuit.**

Frequency converter is used to supply the fan main drive motor, providing start, brake, motor reverse, motor current (load) limiting.

Machine dU/dt–filter is used to remove overvoltage and improve the form of motor voltage.

Actuating devices control circuits are used to control fan auxiliary drives (louvers, blades, straightener, etc.), to protect servo drives against short circuits and overloads.

Operational control, indication and alarm system is used to switch on intake or exhaust, to switch off the fan, to control the fan louvers, to send ShSAUV condition alarms in local and remote modes.

PROTECTIONS

Frequency converter microprocessor control system ensures protection against:

- short circuit;
- earth fault;
- overload;
- overvoltage;
- network voltage drop or phase failure;

- motor shaft seizure;
- converter and motor overheating;
- motor slow operation.

OPERATION MODE

ShSAUV provides three fans control modes:

- remote automatic control (RAC);
- local automatic control (LAC);
- local manual control (LMC).

Control mode selection is made by three-position switch, located on swing frame inside the cabinet.

Automatic control of ventilation unit mechanisms (fan main drive and actuators drives) is made in automatic modes (RAC, LAC).

Separate control of fan main drive and actuators drives is made in LMC mode. Furthermore, smooth setting of fan rotation speed in the range of 1/50 is possible in LMC mode.

All this is very useful during commissioning and maintenance, motor and fan mechanics checking.

Fan control and automatic control system condition alarms in RAC mode can be made both by means of digital signals (terminals “Remote control” and “Remote signaling”) and via RS-485 interface with Modbus protocol (two channels: main and backup). There is significant saving of cable products in case of control and signaling via RS-485 interface, as all ShSAUV are combined into one network and an interface cable (2 conductors) is used to communicate with them.

MAIN TECHNICAL DATA

Name of parameter	Unit	Value
Input supply voltage (Uin), three-phase, with earthed or insulated neutral	V	380 +10/-15 %
Input voltage frequency	Hz	50(60) ± 2 %
Periodicity of connection to network	-	1 per minute or rarer
Rated output voltage (Unom), three-phase	V	380 ± 2 %, but not more then Uin
Rated frequency (Fnom) of output voltage	Hz	50 (60) ± 1%
Rated power (Pnom) of controlled fans	kW	from 15 to 160
Current overload	-	1,5 Inom –1 min within 10 min
Output voltage regulation range	V	0 – Uin
Output frequency regulation range	Hz	0,5 - 50(60)
Efficiency, minimum	-	0.95
Network current harmonic distortion factor, maximum	%	5
Protection level in accordance with IEC 60529	-	IP54
Service lifetime, minimum	years	15
Average recovery time, maximum	min.	40
Interference immunity	-	satisfies all standards requirements

OPERATION CONDITIONS

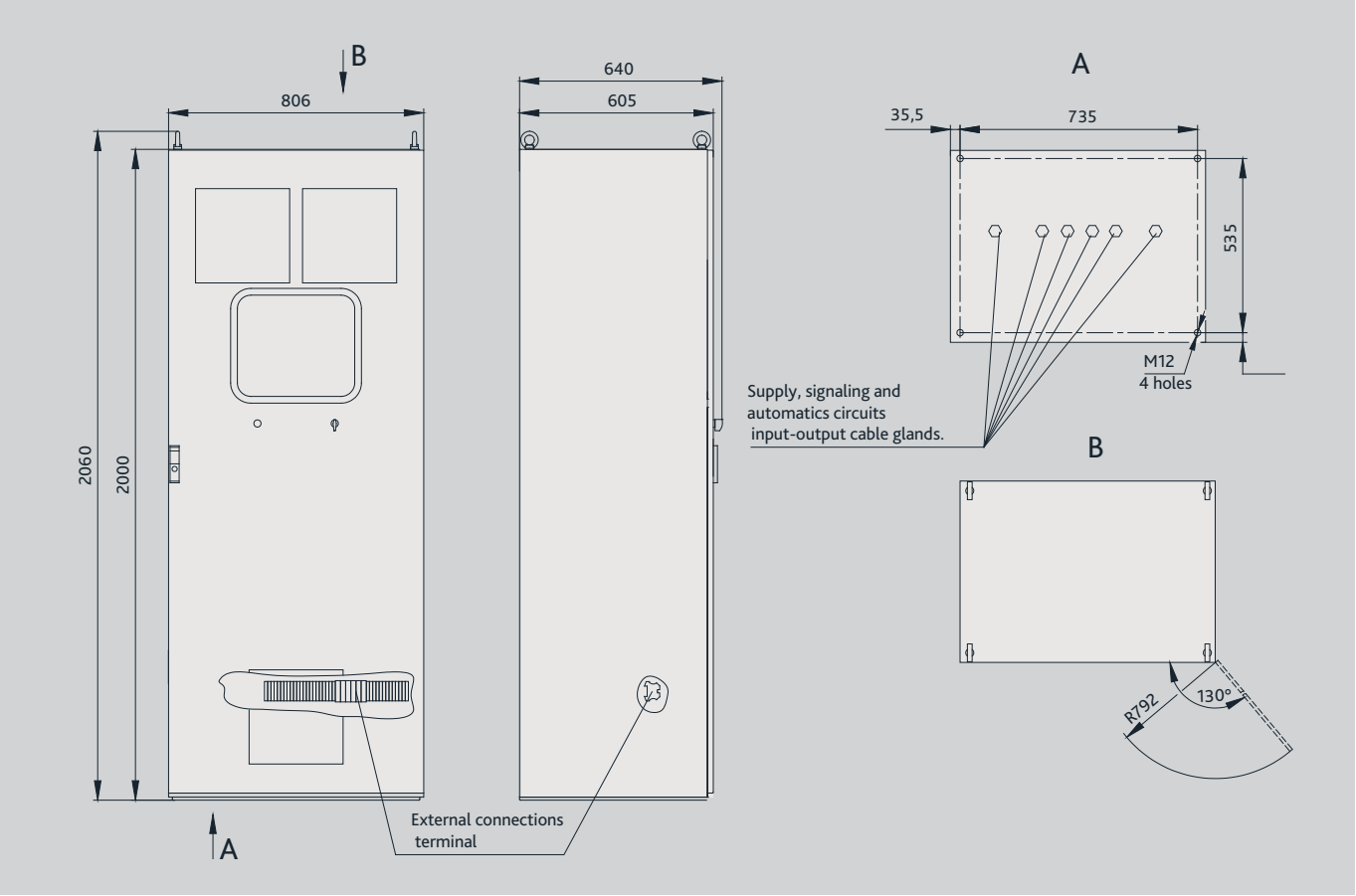
Name of parameter	Unit	Value
Height above sea level	m	up to 1000
Operation temperatures range	°C	- 30 °C ...+30 °C
Storage temperatures range	°C	- 40 °C...+60 °C
Upper value of relative humidity at 25 °C	%	98
Environment	-	Explosion-proof, not containing chemical active gas and vapor in concentration that destroy insulation.

TYPE DESIGNATION

ShSAUV – X M 3

Sh	cabinet
S	system
A	automatic
U	control
V	fan
X	fan drive capacity, kW
M	modernized
3	design

OUTLINE DRAWING



E-mail: info@pluton.ua
www.pluton.ua