Fibre Glass Twiner EB - 200 S1

General

Fibre Glass Twiner EB200S1is intended for processing of glass fibres in the first twisting process. Glass fibre, wound from the drawing machine on flexible spools, is then re-wound to 32mm-high bobbins with an exactly defined build structure. During the re-winding operation, fibres are twisted in a defined manner and exact build length is measured. It is not necessary to un-spool the fibres from the final bobbins – they can be quickly torn away without any change in fibre parameters or danger of being disturbed.

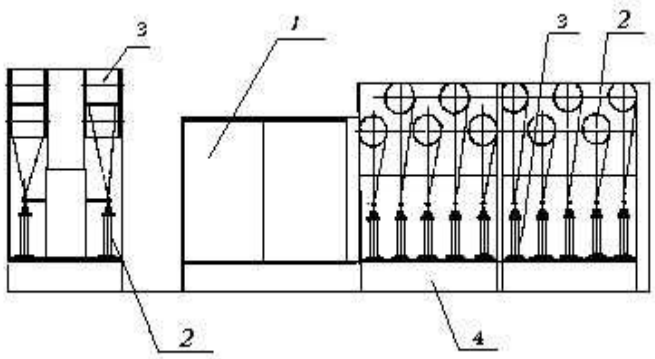
By its dimensions, the machine is considerably large and it is necessary to serve a lot of control inputs and outputs. There are one hundred twisting places (each containing a reel-off bobbin carrier and reel-on spindle) in the machine. Each twisting place must be monitored for actual lengths of re-wound fibre and responded for broken ones. Owing to this, a distributed control system has been chosen. In each of ten machine sections one ‘Slave‘ control system is provided. Each system consists of **KitV40** processor that controls and checks upon ten twisting places allotted. Motors are handled by intelligent converters and process visualisation is provided by the intelligent Term 10 terminal. The whole arrangement is controlled by the Master System, also formed by the **KitV40** processor. The Master System is located in the control section of Ring Twisting Frame. All control systems are equipped with peripheral boards of **KitV40** modular kit. Furthermore, Slave Systems contain special customer boards developed for this machine only. The Master Systems controls the machine almost exclusively by communications lines.

Twenty changeable technological processes are stored in the Master System memory, where build structures of formed bobbins, re-wound material type, build lengths, fibre twist, re-winding speed, working chamber operating temperatures and other values, are described. Using these parameters, the machine controls the build. These processes can be viewed/modified at the Term 10 display. Thus, the machine operations can be fully controlled and monitored at a high standard of comfort. Displayed parameters are divided into several groups and access to them is structurally protected by access passwords. A part of parameters is freely accessible, another one is accessible only by the process engineer and the remaining part is reserved for servicing purposes only. **KitV40** is provided with RAM battery-backed memory so as not to lose any parameters in case of power outage. Once power supply is renewed and cord manually rearranged, build operations cane be resumed. Process specifications can be changed and current process specification settings altered from the master PC. Furthermore, the system retrieves from the Master memory all statistical data on the build operation (build operation start and end times, broken fibre bobbin count, quantities of processed materials, machine failures, etc.).

Machine description:

EB-200 S1 Ring Twisting Frame - 200 S1. consists of the following parts:
1 - Drive box and controls
2 - Reel-off bobbin carrier
3 - Reel-on bobbin spindle
4 - One working section with 10 workplaces (each side containing five) Only two working sections out of ten are shown in the figure.

Drive box:



The drive-box contains these three functional assemblies:

Machine part- The main mechanical element of build formation is the spherical bolt with nut driven by the actuating motor. The nut travels up and down the ring rack that distributes the cord across the bobbin.

Motive power part- This part contains circuits of switches, circuit breakers and sources of control and operating voltages. Motor converters provide for power supply and controlling of bobbin & unwinding basket drives. One converter drives simultaneously all unwinding baskets, while the second all winding-on bobbins and the third one moves the ring rack.

Control system- The machine is equipped with the **KitV40** processor control system that communicates, over the serial interface, with three drive converters, ten subordinates control systems in working sections, intelligent rev-counter (that measures current revs of bobbin carriers), superior PC (that collects the process data) and the intelligent terminal. Through converters, the Master controls all twisting frame drives. It controls reel-off bobbin carrier revolutions as well as those of reel-on bobbin spindles and travels of the ring rack distribution the cord along the bobbin. The system communicates with the user through intelligent Term 10 terminal fitted with a graphic LCD 128x240 display and membrane keyboard. Each **KitV40** control system allotted to a separate section control the section monitors fibre breakages and measures build lengths per separate section workplaces. The master system and sectional systems are connected over a serial RS 485 communications line, while RS 232 is used for communications with converters and terminal.

Working part:

The working part consists of 10 working sections that, in turn, contain 10 workplaces per each section in a double-side arrangement. Each workplace consists of bobbin, own electromechanical drive, ‘HZ‘-type twisting set, anti-ballooning ring and contactless break stop end. Furthermore, each workplace is equipped with a three-pole switch that enables synchronised starting run of supply

bobbin and final build during manual workplace start-ups. Each section is equipped with the **KitV40** processor system that controls it and communicates with the master system. The machine working part is enclosed in an air-conditioned box with a controlled temperature level.

Technical features:

Processed fibre	glass fibre type "E"
Fibre weight	68-400 tex
Supply bobbin (bobbin carrier)	
Fixing diameter Build diameter Cop tube length Weight	300 mm 400 mm max. 320 mm max. max 11 kg
Spindle with own electric drive	
Revolution range Max. speed at build load	2 500-9 000 r. p. m. 8 kg 4 500 r. p. m. 7 kg 5 000 r. p. m. 6 kg 6 000 r. p. m.
Workplace number	100 per machine 10 per one working section
Workplace spacing	300 mm
Supply speed	40-320 m/min.
Ring rack stroke	410 mm
Build fibre cross angle	$0^0 30'$-40^0
Twist range **Twist direction**	0-250 t. p. m. right-running, left-running
Free end at the final bobbin	enabled

Conclusions

The Ring Twisting Frame is manufactured and supplied by SVV Elitex s.r.o. Electronic equipment in these machines is provided by Sofis s.r.o. The control systems are product of ***SofCon s.r.o.***., which also developed the software. This practical application of the ***SofCon s.r.o.*** system proved its versatility and reliability.