taneously to the both sides (e.g. the duplex data exchange) has been made up 5.0 gigabits per second. This new "USB 3.0" standard is being supported only by the new "Windows 7" operating system (OS).

Thus, the new "Windows 7" operating system (OS) realization will be permitted to carry out the new qualitative and quantitative conversion to the productive systems (PS) of the present generation hardware control and software control devices of the graphics and the data processing (DP) with the high levels performance of the reliability and efficiency meat system component composition designing at the meat products production with the specified food and biological parameters.

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THE THYRISTOR TRANSDUCERS WITH THEIR CAPACITIVE SWITCHING

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The thyristor inverters with the capacitors in the power circuit are designed for the electronic welding apparatuses, the plasmatrons power sources and so on. All these inverters are efficient and functional only in the limited load range, that is the essential defect, and this is restricted by their use range. In particular, such inverters are non – serviceable at the idle running and in the small loads range. It should be noted, it is talked on the inverters on the reverse – blocking thyristors, which are being blocked at the natural current fall down to the zero, or they are needed the reinforced switching [1]. The thyristor inverters of such type, which have been suggested earlier, for the load range extension are used the additional block, having provided the latitudinal and pulse control of the load current in the wide range [2]. The linear external characteristics are needed for the stable work of the welding load. So, it is quite possible to provide the linear external characteristics in the power sources of the inverter type with the capacitors in the in the power circuit at the latitudinal and pulse control, having only the 2 – 3 – multiple stress factor [1], that results in the proportional increase of the apparatus rated capacity. Besides, the two parallel circuits presence of the switching capacitor (SC) recharge, inevitably, results in the constant component appearance in the transformer current, which has been described in the [2] diagram, that it is needed the considerable increase of the transformer overall dimensions, in order to avoid its saturation. The new diagram of the thyristor inverter with the capacitors in the power circuit has been suggested in [3], and it has been given in the figure 1. The suggested apparatus diagram is consisted in the 1 ÷ 4 thyristor bridge, having connected to the direct current (DC) diagonal to the power source 5, having shunted by the filter capacitor 6. The primary winding 7 of the transformer 8 has been inserted into the 1 ÷ 4 thyristor bridge of the alternating current (AC) diagonal, sequentially, with the switching capacitor 9. The secondary winding 10, sequentially, with the load current sensor 11 has been connected to the diode rectifier 12, the direct current (DC) outputs of which have sequentially been connected to the choke 13 to the load 14. Besides, the apparatus is contained the expansion range control block 15 and the control system 16, having made with the latitudinal and pulse control, and having closed by the negative feedback along the current by the signal from the above – mentioned load current sensor 11, having connected to the corresponding control system input 16, the corresponding outputs of which are connected to the thyristors' driving points of the 1 ÷ 4 thyristor bridge.

The expansion range control block 15 has been made by the principle of the transmission, having accumulated in the electromagnetic energy inductance from the source to the receiver, and it, moreover, is contained, as the electric power source, the additional winding 17 of the transformer 8, having connected to the diode bridge 18, the direct current (DC) diagonal of which has been shunted by the smoothing capacitor 19 and the voltage sensor 20. Besides, the above – mentioned the direct current (DC) diagonal of the diode bridge 18 has been loaded on, sequentially, the joining circuit from the current sensor 21, the inductance 22, and also the transistor switch 23, having connected to the direction of the conducting current. The corresponding filter capacitor 6 outputs have been connected to, in parallels, the transistor switch 23 through the pick – off diode 24. The driving point of the transistor switch 23 has been connected to the microcontroller 25 output of this switch control. The corresponding microcontroller 25 inputs have been connected to the current sensor 21 output and also to the differential amplifier 26 output, the direct input of which has been connected to the voltage sensor 20 output, but the inverting input has been connected to the load current sensor 11 output.

Firstly, the circuits are absent, which are in parallels of the primary winding 7 of the transformer 8, in the suggested apparatus, that is provided the constant component absence in the above – mentioned winding. Secondly, it is being observed the I_d / f = const ratio, where f – the inverter frequency, I_d – the load current, at the load current increase, that it is provided the linearity and the high rigidity of the external characteristics at the voltage control at the expense of the power source.

References

1. L.T. Magazinnik, "The Single – Phase Power Sources of the Inverter Type with the Capacitors in the Power Circuit". The Electromechanics. The

News of the Institutes of Higher Education, № 6, Novocherkassk town. 2003, p.p. 21…24;

2. O.G. Bulatov, A.I. Tzarenko, V.D. Polyakov, "The Thyristor and Condensing Power Sources for the Electrotechnology". – M.: The EnergoAtom-Publishing House, 1989 – p. 200;

3. "The Thyristor Inverter with the Capacitors in the Power Circuit". The Patent of the Russian Federation № 2334346 dated from 20.09.2008, the author Magazinnik L.T.

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THE THYRISTOR CONVERTERS' PREVENTIVE PROTECTION

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The thyristor converters have already been found the wide application in the various electro – technological installations, which are needed the energy batching constancy at the loading variations. Such loadings examples can be served the ion nitriding furnaces, the electroarc vaporizers for the metal deposition and so on. The transistor and condensing converters of bridge – type are usually applied for the powers, which are more, than 15 kwt.

The protection system of such converter is contained the voltage sensor on the direct current diagonal of the thyristor bridge, having connected with the pick – off signal comparator and to the reference voltage signal, and the above – mentioned comparator is connected with the control input of the thyristor switch off [1] through the pulse – duration selector in series connection, and the switching on pulse former.

The insufficient protection reliability from the overloads at the thyristors' switching disturbance is the general shortcoming of the above – mentioned converters.

The new protection diagram, having eliminated this shortcoming, has already been developed in [2], and it has been presented in the Fig.1. The diagram is contained the thyristor bridge 1 – 4 with the dispensing capacitor 5 in the alternating current diagonal, having connected in series with the loading 6, and the thyristor current switch off 7. The loading 6 jointly with the common – anodes of the thyristor bridge 1 – 4, e.g. with the thyristors anodes 1 and 4, and it has been shunted by the first bypass diode 8. The loading 6 jointly with the thyristor current switch off 7 has been shunted by the second bypass diode 9, having connected with the anode and the power supply minus $U_п$. The standard control system 10 has been connected by its outlets to the corresponding control inputs of the thyristor bridge 1 – 4 and the thyristor current switch off 7. The protection system has been made in a form of the triple – wound transformer 11, the first winding 12 of which has been included between the power supply plus $U_п$ and the common – anodes of the thyristor bridge 1 – 4, and that the number of turns of the second winding 13 is twofold, than the number of turns of the first winding 12, and all these windings have been included from the opposite sides towards to each other. The centerpoint of the second winding 13 is divided the whole indicated winding into the first and the second half – windings with the same number of turns, and it has been formed one of the conclusions of the alternating current diagonal of the thyristor bridge 1 – 4. The third winding 14 of the above – mentioned transformer 11 has been connected with the switching off pulse former 15, the outlet of which has been connected with the control input of the thyristor current switch off 7.

The suggested diagram is being functioned by the following way.

The current of the power supply $U_п$ must be passed through the first winding 12 and the whole of the second winding 13 of the triple – wound transformer 11, at the switching breakdown, for example, at the simultaneous unblanking of the thyristors 1 and 3. This current will not be exceeded the magnetization current, e.g. the short circuit will be, practically, locked out, while the triple – wound transformer 11 is being saturated. It is quite enough to choose the parameters of the triple – wound transformer 11 such ones, in order the time of its saturation would be quite equal to the break time of the thyristor current switch off 7, on which the disconnection signal is being got from the third winding 14 through the switching off pulse former 15 in the emergency operation. And the similar situation takes its place at the short circuit through the thyristors 2 and 4. In this case, the magnetization current is being passed only through the first winding 12 of the triple – wound transformer 11. For all this, we note, as the turnoff time of the thyristor current switch off 7 is not much (e.g. only tens of microseconds), then the dimensions of the triple – wound transformer 11 are too small, and its further connection into the power circuit of the thyristor and condensing converter is not quite the drawback. At each disconnection of the thyristor current switch off 7, the demagnetization of the triple – wound transformer 11 takes its place at the return of the electromagnetic energy of the loading into the power supply plus $U_п$, e.g. the triple – wound transformer 11 is being applied by the full hysteresis loop, but the suggested protection is quite non – inertial, and it is also limited the current at the insignificant level.

Thus, the diagram (Fig.1) has been permitted to be excluded the comparator, having had in the analogous converters, and, the main thing, the pulse – duration selector and, the next best thing, to provide the operation velocity and the protection high – level reliability. And all the more, the suggested in [2] solu-