Fig. 4. The new converter

Fig. 5. The old converter

Highlights — original, not the traditional circuit techniques have allowed, in contrast to the best world analogues to achieve more efficient conversion and energy management and thereby achieve:

— increase the conversion efficiency of at least 91...93 % reduction in size of 2,5 times and 6 times the weight — from 45 kg. up to 7,5 kg;

— due to small size transducer block is installed in a compartment of the contactor and working in a comfortable environment.

The advantages of the converter:

— reduce energy electrified by 25...30 %;

With nominal (long) of currents load of 150 A — cycle unit uptime (PV) is 100 %, with a higher current 200A-PV=80 %, and at 220A-PV=70 %, which higher than that of the existing units in 1,5...2,5 times;

— high reliability and durability of the unit, which is provided by the lack of heat load from the electric systems;

— high precision (0,7...1 %) to maintain the output characteristics;

— the presence of auto — express — fault diagnosis for fast error detection and repair;

— increase in the rate of technical readiness in 1,5...2 times;

— module- block design provides high- speed and maintainability fix the problem (no more than 15 min.);

— significant reduction in material and labor costs for maintenance;

— improved safety and comfort in the cabin by the quiet operation of the converter.

All the development, further research is needed to improve them, as well as the organization of production for their release and widespread adoption.

LASER THERAPEUTIC DEVICE «QUANTRON-LASER»

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«QUANTRON-Laser» — small-sized digital two-channel therapeutic device of new generation which is used for: Treatment of number of diseases by means of low-intensive laser radiation of semiconductor lasers influencing the appropriate zones (tissue, organs, nerve endings); The scientific-research works in the laser medicine sphere.

The fields of application and main characteristics:

— Dermatology (dermatoses, erosive-ulcerous lesions of the skin, neurodermites, herpes, etc.)

— Otorhinolaryngology (an external otitis, an inflammation of the middle ear, a chronic tonsillitis, a chronic pharyngitis, a maxillary sinusitis)

— Stomatology (mucous membrane of the mouth cavity and parodontium diseases, stomatitises, alveolitises, maxillofacial fracture)

— Neurology (lumbago, plexitises, trifacial neuralgias)

— Gynecology (a salpingitis, a bartholinitis, a cervical erosion and pseudoerosion, colitis's, cervicitises and a vulva pruritus, nipple cracks, etc.)

— Urology (an acute and chronic prostatitis, an acute epididymitis, an acute and chronic pyelonephritis)

— Proctology (a hemorrhoids, anal fissures)

— Cardiovascular diseases (an ischemic disease of the heart, a hypertonic disease)

— Locomotor system diseases (an osteochondrosis deformans, epicondylitises, bursitis's, tendovaginitises, a nonspecific polyarthritis, calcaneal spurs)

— General physiotherapy and reflex therapy

The device enables to do intravenous and percutaneous irradiation of blood.

Basic technical CHRACTERISTICS

Wavelengths of the semiconductor laser source radiation, nm	Red	Infrared
	650	870±20
Power of the radiation at the main light guide outlet (a steady-state value), mW	0/25/50/75/100	0/2/6/9/12
Fixed frequencies of the laser-beam amplitude modulation, Hz	0 (continuous wave) 9,4/300/1000	
Programmed frequency action regime, Hz	0,5-10000	
Procedure setting-up time, min/sec	0sec-99min59 sec	
Modulation depth, % of the constant component of the signal	25/50/75/100	
Power consumption, W	≤5	
Supply voltage	220V, 50 Hz	
Laser hazard class	3	
Overall size, mm	250×150×90	

Functions of the program error indication and functions of the procedure parameters visual inspection (on each channel) are built-in.

Both, independent and combined modes of laser' operations are possible (the latter is secured by the use of the special uniting light guide).

The main interface provides for the connection of full set of flexible and hard fiber-optical extensions for physiotherapy.

The most efficient treatment is achieved both by constant and variable component of modulated optical signal (by selection of an appropriate modulation depth).

The built-in treatment programs of a number of diseases (gynecology, otolaryngology, neurology, urology, dermatology, etc.) facilitate work medical personal.