ROBOSCOP VTM-5000/FRAME

ROBOTIC CENTER
FOR NONDESTRUCTIVE TESTING
OF FOUNDRY PRODUCTS

flow-line serial monitoring of
geometric dimensions and structural analysis of
cast iron, steel and non-ferrous metal products

1 APPLICATION

Laser scanning and flaw detection test bench **Roboscop VTM-5000/FRAME** is a complete set for cast iron monitoring in the production line (**Roboscop VTM-5000/GAZ**), designed to manage automated ultrasonic nondestructive testing of cast iron castings structure, including workpiece thickness test and measurement of ultrasound propagation speed in the workpiece material.

Roboscop VTM-5000/FRAME provides the following methods of nondestructive testing:

- parts and units laser non-contact scanning (LS) for geometrical parameter gauging;
- measurement of ultrasonic wave propagation speed in cast iron castings;
- iron casting 3D model generation by laser scanning.

2 TECHNICAL FEATURES

General view of **Roboscop VTM-5000/FRAME** with overall dimensions isshown in **Fig.1-3** (the automatic line and the test piece are shown arbitrary).
The block diagram of **Roboscop VTM-5000/FRAME** is shown in **Fig. 3**.

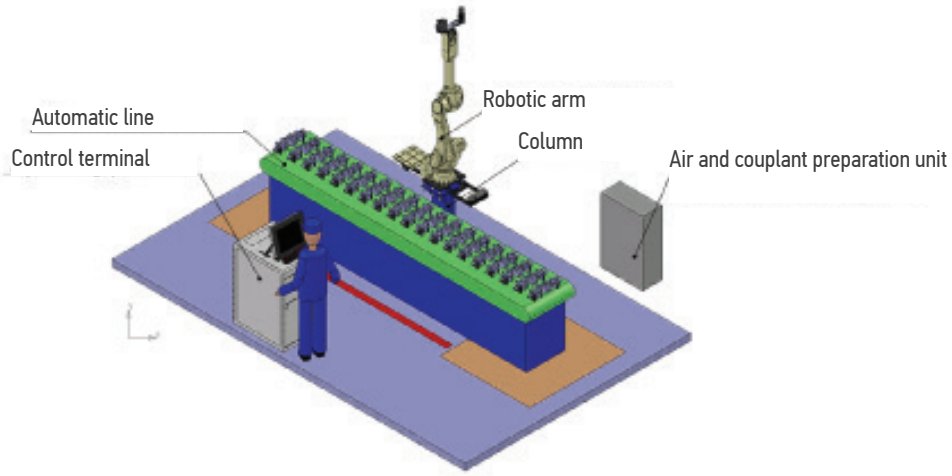
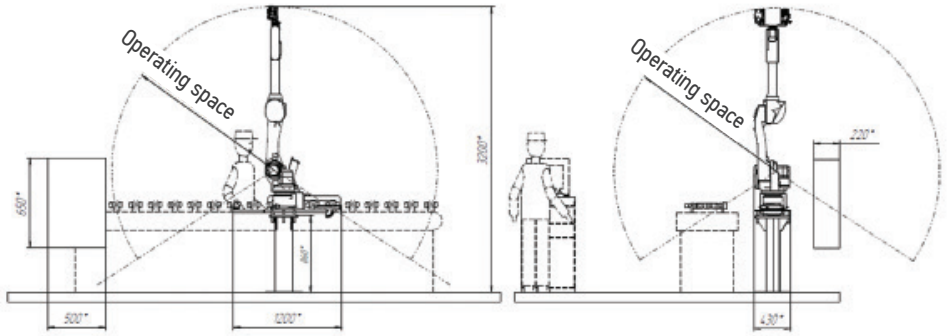


Fig. 1



Side view Front view

Fig. 2

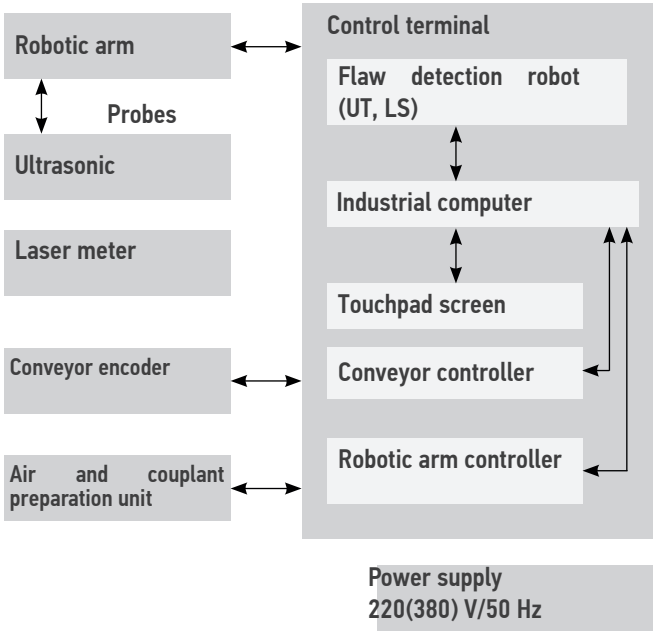


Fig. 3 Block scheme ROBOSCOP VTM-5000/FRAME

2.1 The main technical features of **Roboscop VTM-5000/FRAME** are presented in **Table 1**

Table 1

Features	Values
Supported nondestructive testing methods: geometric parameters laser measurement ultrasonic	 + +
Probe travel speed, m / s	0 ÷ 1,0
Operating mode setting time, minutes, not more	15
Control, display and information processing means (industrial computer, general control terminal, touchpad screen)	+
Sound and light flaw detection alarming	+
Control terminal protection class	IP 67
Self-diagnosis system	+
Automatic couplant supply system	+
Couplant type	oil
One part test time, min, not more	1
Continuous operating time, hours per day, at least:	24
Mean time between failures, h, not less	10000
Safery earthing	+
Operating temperature, °C	от + 10°C до + 40°C
Relative humidity (at 35 °C), not more than	95%
Power supply parameters - mains voltage, V - frequency, Hz	 380/220 50 ± 1
Maximum power consumption, kW, max	4,0
Control terminal overall dimensions (length, width, height), mm	600x900x1700
Overall dimensions length × width × height of the mechanical part (without the control terminal), mm, not more	1000x1000x2100
Total weight of all equipment, kg, not more	1000

2.2 Laser scanning channel parameters **Roboscop VTM-5000/FRAME** are shown **in Table 2.**

Table 2

Features	Values
Operating range of measured distances in the direction of a laser beam, mm	100÷350
Geometric parameters measurement tolerance (depending on the measured range in the direction of laser radiation), %	±0,1
Basic coordinate system (number of measurement coordinates)	XoZ (2)
Wavelength, nm	660
Data refresh rate, profiles / second, not less than	400
Ultrasonic testing by contact and non-contact method	+
Automatic gain control (AGC) to maintain the desired sensitivity rate of ultrasonic channels	+
Automatic acoustic contact check	+
Full automatic reset time, minutes, max	5
Measuring range of signal amplitudes at the receiver input, dB	67 ÷ 107
Absolute tolerance of threshold indicator setting (dead zone), dB	± 0,3
Absolute tolerance of signal amplitude measurement at a receiver input, dB	± 0,5

Features	Values
Temporary instability of a threshold indicator level for 8 hours of operation, dB	± 0,5
Nominal values of excitation pulses amplitude at 50 Ohms, V	75; 150; 225
Reference tolerance of amplitude pulse setting, %	± 20%
Half wave duration of the drive pulse generator (DPG), ns	12 ÷ 1250
Referense tolerance setting of DPG half-wave duration, %	± 10%
Setting discreteness of DPG pulse duration	12,5
Rulse repetition frequency of DPG, Hz, not less	1000
Maximum sensitivity at 5 MHz with a signal-to-noise ratio of 6 dB, mV	150
Receiver bandwidth at minus 3 dB, MHz	1 ÷ 10
Receiver sensitivity setting range, dB, not less than	90
Number of points to fit a distance-amplitude compensation (DAC) curve	256

3 DELIVERY SET

- Industrial robotic arm, pc.....1
- Tray for SO3R.....1
- Probe changer, pc.....1
- High-frequency connecting block, pc.....1
- Robotic armd ajustable mounting column, pc.....1
- UT probes, pc.....1
- Control terminal, pc.....1
- Cassette for probes and reference blocks.....1
- NDT reference block set.....1
- Operating and technical documentation.....1
- Packing.....3

4 RELIABILITY

Life span is not less than **10 years**.
Mean life before overhaul (update) is not less than **5 years**.

5 WARRANTY

Guarantee service life is **18 months** since the delivery date, excluding consumables (connecting cables and probes).
Guarantee storage time is **6 months**.