

Technical Data

Control cabinet	Window for inside monitor	
	Drawer for keyboard and mouse	
	Protection class IP 54	
	Dimensions	600 x 1600* x 600 mm (23.6 x 63* x 23.6"), (W x H x D)
		<small>*) If integrated in the control cabinet row of a complete system, the height is 2000 mm (78.7") or 2100 mm (82.7")</small>
SXGA monitor	Screen diagonal	17"
	Mains voltage	100-240 V, 50/60 Hz
	Connected load	230 V ±10%, 50/60 Hz, 120 VA
	Weight	18 kg (39.6 lbs)
Image processing system	Type	Industrial PC
	Height	18 cm (7.1") (4 HU)
	Width	48 cm (19" plug-in)
	Video input	VIDEO signal (CCIR / NTSC selectable)
	Video output	VGA signal
	Connected load	230 V ± 10%, 50/60 Hz, 180 VA
	Weight	20 kg (44 lbs)
	Full image resolution	738 x 570 pixel (CCIR)
	Memory depth	8 bit (16 bits with integration)
	Hard disk (capacities depending on availability)	
	3.5" diskette drive	
	CD-RW drive	

SEIFERT SABA 3000 P

Image Evaluation System for Unattended Radioscopic Inspection



Overview

The universal analysis of complex radioscopic images in batch inspection of safety-relevant parts is a monotonous and strenuous task whose outcome depends on many subjective factors.

SABA 3000 P is a third-generation image evaluation system to be applied in fully automatic, unattended flaw detection and flaw analysis of cast parts.

By its universal nature the PC-based SABA 3000 P can be adapted to other inspection tasks as well, such as fully automatic completeness checks and measurements of various patterns, e.g. areas, sizes and distances.

Options

Result-Dependent Test Extension:
To each test position can be assigned further result-dependent test positions whose number is subject to the number of classified test regions.

Description

The SABA 3000 P image evaluation system communicates with a program-mable GE Inspection Technologies X-ray Inspection System via serial interface or digital lines.

If the radioscopic system includes a recognition facility for parts and/or moulds, SABA 3000 P will receive the recognition outcome and determine the inspection program accordingly. The necessary test parameters will then be given to the PLC.

Due to the smooth interaction of PLC and SABA 3000 P the two tasks of positioning and image acquisition are highly optimized and distinct from the image evaluation task.

The image processing software detects flaws according to given criteria and arrives at a mode-specific test decision either immediately (First Error) or at the end of the entire inspection run. The test decision triggers a sorting routine via PLC.

SABA 3000 P features a simple protocol system. For each tested type it statistically records data on the number of tested parts. The statistical counters can be reset after entry of a password.

If required, the test results can be transferred to PRODAT, a separate protocol system, for processing and statistical analysis.

Both the test parameters of the radioscopic system and the instructions for the image processor are part-specific. They must be established in the so-called set-up mode through parameterization not only to ensure a test sensitivity sufficiently high to meet a customer's test specifications, but also to prevent false detections. The parameterization process is completely menu-controlled. It requires little knowledge of the system, but inspection experience is a must.

The SABA 3000 P image evaluation system can be adapted to all those parts with a defined structure whose radioscopic image can be evaluated visually as well.

Deviations in structure that exceed the usual casting tolerances cause false detections. Thus, in the set-up mode, systematic deviations in structure such as variations on patterns have to be assigned a part number of their own.

Non-systematic deviations in structure such as burrs, flashes and seams have to be removed through adequate fettling.

Visual Re-Analysis / Re-Decision

The operator can visually monitor critical test situations. When all test positions have been processed by SABA 3000 P, each REJECT image is displayed for visual re-analysis so that the operator can either override or confirm the initial SABA 3000 P decision.

Recursive Parameterization

All REJECT positions can be stored by SABA 3000 P. The images thus stored can be checked and their parameterization be adjusted by the operator. This function can also be performed by an off-line SABA image evaluator if system down-times are to be avoided.

The combination of radioscopic facility and SABA 3000 P image evaluator constitutes an autonomous inspection system that under routine conditions performs without any operator control.

During operation, the performance of the inspection system is periodically checked by an image quality test and a positioning test.

The image quality test checks the entire image-generating chain by comparing a particular live image with a stored reference image.

The positioning test aligns the handling system in a given position to produce a certain test pattern which has to fulfill definite criteria.

As long as the test results remain within a given tolerance range, routine inspection continues. If they exceed the upper or lower limits, an error message causes discontinuation of the inspection process.

Delivery Scope

Basic equipment

- 1 19" plug-in unit with image processing hardware consisting of
 - Dual XEON $\geq 2,0$ GHz)
 - 512 MB RAM, Network adapter card,
 - Hard disk (min. 20 MB), FD drive,
 - CD-RW drive, Keyboard and mouse
- 1 SXGA control monitor 43 cm (17")
- 1 Set connecting cables

- 1 SABA 3000 P operation program consisting of
 - Communication
 - Flaw detection
 - Classification
 - Recursive parameterization
 - Visual re-analysis / re-decision
- 1 Parameter set for 1 test sample

Options

- Result-dependent test extension
- SABA 2000 XRC (X-ray Character Recognition)
- Integrated measurement functions
- Video-optical positioning

