

**WS Weighing Systems 1 / 2 / 5 / 7 kg
with SYNUS evaluation electronics 6 / 10 / 15**

DESCRIPTION OF THE EQUIPMENT

The WS 1 / 2 / 5 / 7 kg weighing systems with built-in infeed and outfeed belts, when used in conjunction with the SYNUS 6 / 10 / 15 evaluation electronics, combine to form a high-performance checkweigher for determining the weight or completeness of products, and for regulating upstream filling systems.

These checkweighers are approved for use in legal metrology for average weight control of prepackaged products (AWC) in a number of countries.

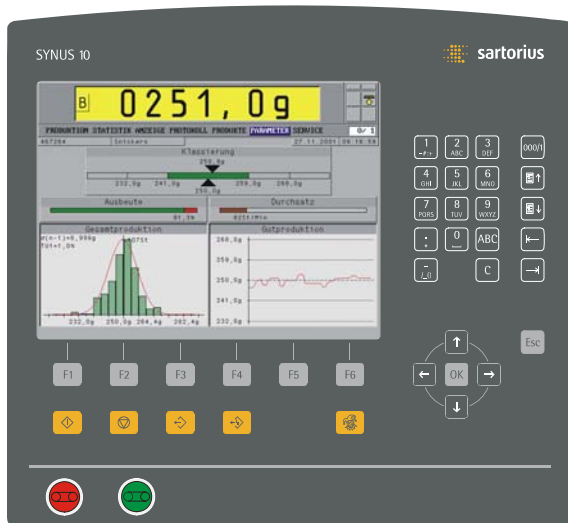
They have been issued both national type-approval certificates as automatic checkweighers and an OIML R51 certificate.

The optional trend controller can be added to regulate existing packaging or filling machines, which contributes significantly to improved efficiency of filling and helps to prevent costly overflow.

Furthermore, all SYNUS® models offer a variety of COM ports, enabling smooth, centralized integration of SYNUS® checkweighers in existing or new quality assurance systems, for 100% traceability in production monitoring. SYNUS checkweighers can also be connected over Ethernet TCP/IP to the "ProControl for Windows" network QA system from Sartorius, creating an all-inclusive bidirectional link to management functions.

An integrated printer module can be included for documentation of all relevant operating data.

The USBPrint option is a reliable, easy-to-use and – most importantly – broadly compatible option for electronic data transfer without a network.



*Illustration:
SYNUS 10 display and operating elements*

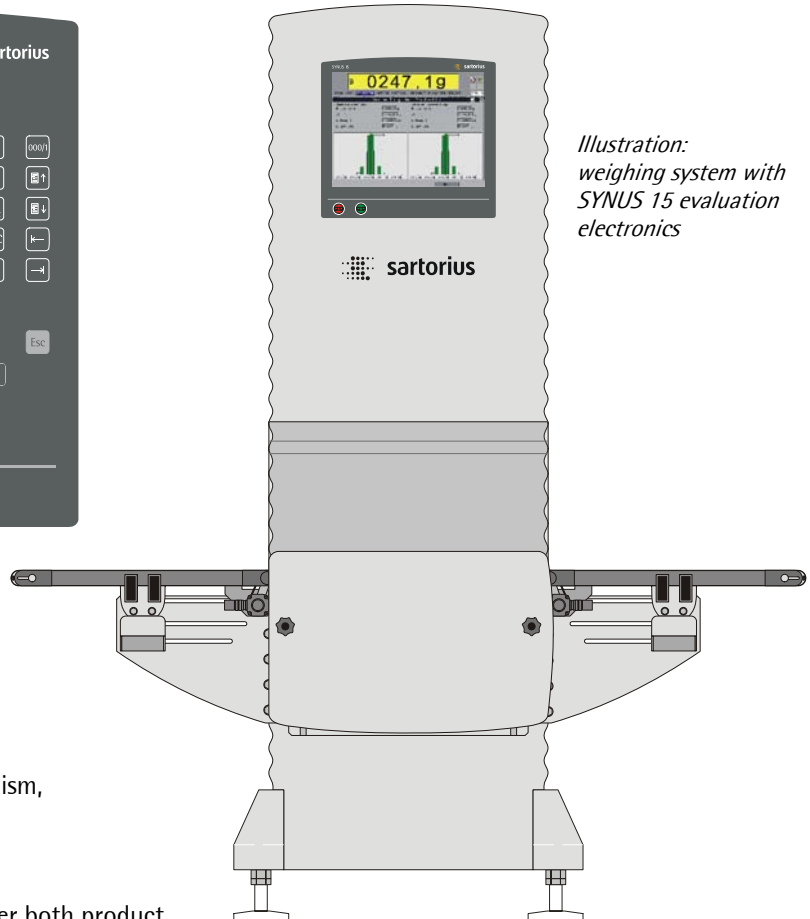
Thanks to cantilever construction of the weighing and transport system, smooth surfaces (stainless steel version), hinged and removable transport systems, and a quick-release belt detensioning mechanism, the system is particularly easy to clean and guarantees a high standard of hygiene.

The SYNUS evaluation electronics can take over both product classification and control of sorting and/or signaling devices. A choice of blower or pusher can be installed at the outfeed side of the checkweigher for reject removal or sorting. Depending on the product, separate sorting diverters or line dividers can also be used.

CHECKWEIGHER DESIGN

The checkweigher consists of the following components:

- Weigher frame with control cabinet
- Weigh cell
- Transport system
- Scanning unit
- Control electronics
- Reject or sorting mechanism (optional)



*Illustration:
weighing system with
SYNUS 15 evaluation
electronics*

**WS Weighing Systems 1 / 2 / 5 / 7 kg
with SYNUS evaluation electronics 6 / 10 / 15****Weigher frame with control cabinet**

Sturdy base frame made of AISI 304 stainless steel (1.4301) with IP65 protection.
The weigher frame supports an adjustable-height traverse member which is attached to the weighing and transport system. The traverse member is form-fitted and friction-locked to the sinusoidal housing side-face by means of a clamping device. Thus the working height can be adjusted over a particularly wide range in increments of 50 mm.
Threaded leveling feet are provided for fine adjustment of the height.
The display and control unit is built into the control cabinet.

Weigh cell

Monolithic EMC weigh cells developed specially for dynamic checkweighers from Sartorius, distinguished by the following features:

- Highest precision and extremely fast response times thanks to electromagnetic force compensation (EMC),
- Excellent stability, ruggedness and overload protection afforded by monolithic components,
- The latest electronics with digital signal processing for particularly effective filtering at a 2-kHz sampling rate,
- AISI 304 (1.4301) stainless steel housing.

Transport system

The product to be weighed is conveyed on infeed, weighing and outfeed belts; the transport medium is a conveyor belt (weighing belt WS 1 kg also available with circular belts). The conveyor belt frame consists of polished aluminum sections with a quick-release belt de-tensioning mechanism. Belt pulleys and drive rollers are made of polished aluminum, Ø 30 mm (WS 1 kg weighing belt: Ø 22 mm). The quick-release belt de-tensioning mechanism and hinged, removable transport system make it easy to replace belts and load platform. Infeed, weighing and outfeed belts are driven by a 24V maintenance-free EC geared motor. Power is transmitted to the weighing belt by the drive belt.

Scanning unit for weigher

The scanning unit consists of a reflex light barrier (pulsed, with LED received-signal indicators).

Scanning unit for monitoring product spacing (optional)

A second scanning unit can be installed for monitoring product spacing.

Control electronics

The computer-based display and control elements are integrated in a free-standing stainless steel housing (control cabinet) which is accessible from the rear.
The terminals for the power supply, evaluation and display electronics components, and the AC adapter with motor control are also installed in this cabinet.
The main switch and the display and control elements are installed at eye-level and easy to access.
The SYNUS 6, SYNUS 10 and SYNUS 15 evaluation electronics are available with different arrays of features (see the SYNUS 6 / 10 / 15 Evaluation Electronics table).
The On/Off switches for the conveyor belts are on the front of the evaluation electronics housing.

Touch guard (optional)

An optional polycarbonate touch guard is available to protect the weighing system from contact or drafts. If the system is approved for use in legal metrology or if it requires a small zone of indecision, the addition of this optional touch guard is strongly recommended, as the required accuracy may not be attainable otherwise.

Reject and sorting mechanisms (optional)

A blower device (puff-away) or pusher can be mounted on the outfeed belt to serve as an ejector. Ejection mechanisms in the form of blow-out nozzles, pushers, ejecting arms and switches (tilting conveyor) and sorting mechanisms in the form of sorting diverters and line dividers are available for installation on existing local downstream handling equipment.
The choice of reject / sorting mechanism(s) depends on the product, the throughput rate and the particular application.

SPECIFICATIONS

	WS 1 kg	WS 2 kg	WS 5 kg	WS 7 kg
Weighing capacity (max. cap.)	0 g to 1 000 g	0 g to 2 000 g	0 g to 5 000 g	0 g to 7 000 g
Working range	5 g to 900 g	5 g to 1 800 g	10 g to 4 500 g	20 g to 6 300 g
Smallest permissible verification scale interval	0.1 g	0.2 g	0.5 g	1 g
Zone of indecision (Ua)	from 100 mg	from 500 mg	from 2 g	from 2 g
Standard deviation attributable to measurement error (s)	from 17 mg	from 83 mg	from 333 mg	from 333 mg
	(depends on product, throughput and ambient conditions)			
Throughput	max. 250 pc/min	max. 200 pc/min	max. 180 pc/min	max. 180 pc/min
	(depends on product, permissible zone of indecision and ambient conditions)			
Transport speed	0.2 ... 1.5 m/s	0.2 ... 1.2 m/s 0.5 ... 1.5 m/s	0.2 ... 1.0 m/s 0.5 ... 1.4 m/s	
Center-to-center distance	310 mm	300 mm / 350 mm / 400 mm / 450 mm / 500 mm (see dimensions and "Equipment Versions" table)		
Belt width	40 mm / 80 mm / 120 mm / 160 mm (ZB / AB 150 mm)	150 mm / 200mm / 300 mm		
	(see "Equipment Versions" table)			
Roller diameter	22 mm	30 mm		
Transport medium	Circular belt or belt	Belt		
	(see "Equipment Versions" table)			
Drives	Maintenance-free 24V EC motors with planetary gear train. Motor control is short-circuit proof with temperature monitoring.			
Input supply voltage	230 V _{AC} (+ 10 %/ - 15 %); 50/60 Hz (L1, N, PE)			
Power consumption	approx. 500 VA			
Conveying direction	right to left or left to right (indicate when placing order)			
Working height	600 mm to 1100 mm (in 50-mm steps), leg-adjusting range: ± 25 mm			
Floor clearance	100 mm (± 25 mm)			
Temperature range	0° C to + 40° C (32 °F to 104 °F)			
Protection	IP 54 (standard feature), IP 65 (optional upgrade)			
Machine safety	Meets the requirements of EC Directive 89/392/EEC (machinery); Manufacturer's Declaration as per Appendix I B.			
Dimensions	see scale drawings			
Weight	approx. 250 kg			

WS Weighing Systems 1 / 2 / 5 / 7 kg
with SYNUS evaluation electronics 6 / 10 / 15

WS 1 kg VERSIONS

- AA / TL** Center-to-center distance (AA) / Load platform length (TL) [mm]
- BB** Belt width [mm]
- Circular belt or belt version
- Circular belt version
- Belt version

BB x AA / TL [mm]		
Infeed belt	Weighing belt	Outfeed belt
150 X 300 / 330 ■	40 X 310 / 332 ■	150 X 300 / 330 ■
150 X 300 / 330 ■	80 X 310 / 332 ●	150 X 300 / 330 ■
150 X 300 / 330 ■	120 X 310 / 332 ●	150 X 300 / 330 ■
150 X 300 / 330 ■	160 X 310 / 332 ○	150 X 300 / 330 ■
Total length (GL) 1000 mm		

WS 2 / 5 / 7 kg VERSIONS

- AA / TL** Center-to-center distance (AA) / Load platform length (TL) [mm]
for infeed, weighing and outfeed belts
- BB** Belt width [mm]
- GL** Total length [mm]
- Belt version

BB	BB / TL [mm]				
	300 / 330	350 / 380	400 / 430	450 / 480	500 / 530
150	■	■	■	■	■
200	■	■	■	■	■
300	-	■	■	■	■
GL	1000	1150	1300	1450	1600



**WS Weighing Systems 1 / 2 / 5 / 7 kg
with SYNUS evaluation electronics 6 / 10 / 15**

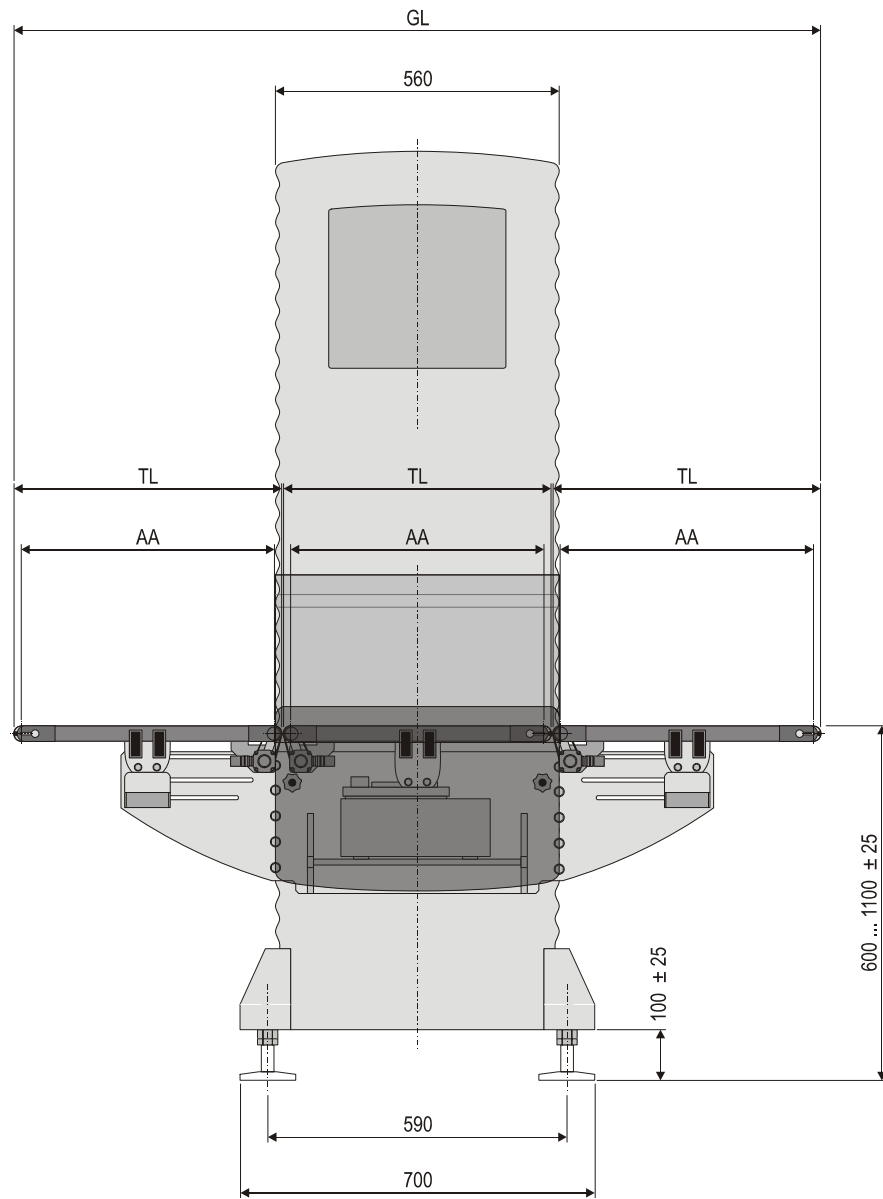
SYNUS 6 / 10 / 15 EVALUATION ELECTRONICS

STANDARD EQUIPMENT	SYNUS		
	6	10	15
AISI 304 (1.4301) stainless steel housing, IP65 protection	■	■	■
6.4" flat-screen TFT color display and keypad	■	□	□
10.4" flat-screen TFT color display and keypad	□	■	□
15" touch-screen TFT color display	□	□	■
Weight readout: choice of gross, net or differential weight	■	■	■
Operational display: distribution, yield, throughput, average value chart, large weight readout	■	■	■
Operating mode: classifying weigher with AWC evaluation / 3-way sorting or 4 user-definable available class delimiters / 3-way or 5-way sorting	■	■	■
Batch operation	■	■	■
5-way classification	■	■	■
Pulse-controlled sorting	■	■	■
Automatic zero-setting	■	■	■
Statistics	■	■	■
Documentation	■	■	■
Product memory for 200 products	■	■	■
Program-controlled belt speed	■	■	■
Inputs for "Hide weigher" control signal, event counter	■	■	■
Self-monitoring function; error reports	■	■	■
Auxiliary functions: external zeroing prompt, test pack, dialogs for diagnostics and service	■	■	■
Data stored in battery-backed memory	■	■	■
Choice of languages for program dialogs; user-selected	■	■	■

OPTIONS	SYNUS		
	6	10	15
Documentation using thermal strip-printer module (IP65-protected)	■	■	■
Documentation using external printer	■	■	■
Trend controller with display	■	■	■
Approval for use in legal metrology	■	■	■
Multiple statistics	□	■	■
Multiple statistics with scanning unit	□	■	■
Individual-weight output interface for external analysis and connection to SQS systems	■	■	■
Field bus interfaces: Profibus, DeviceNet	■	■	■
Data communication: Ethernet, TCP/IP, SPCfWin client, XML client/server	■	■	■
FDA 21 CFR Part 11	□	■	■
USBPrint	■	■	■
Incoming Inspection	□	■	■
5 classifying outputs with pulse output or signal maintaining logic for control of LEDs or external counters	■	■	■
Monitoring of average weight and repetitive rejections (only with 3-way sorting)	■	■	■
Way-pulse controlled sorting	■	■	■
Package length and distance monitoring	■	■	■
Filling spout monitoring	□	■	■
Automatic sampling	□	■	■
Volume evaluation	■	■	■

**WS Weighing Systems 1 / 2 / 5 / 7 kg
with SYNUS evaluation electronics 6 / 10 / 15**

SPECIFICATIONS		SYNUS		
		6	10	15
ELECTRICAL CONNECTION	24 V _{DC} , + 10% /- 15%; approx. 32 W, power supply from weighing system control cabinet	■	■	■
INPUTS	Activate test pack, hide weigher, event counter, external zeroing prompt; inputs electrically isolated by opto-electronic coupler; power supply: 24 V _{DC} , I _{max} = 6 mA (< + 5 V ⇔ signal = 0, > + 14 V ⇔ signal = 1)	■	■	■
OUTPUTS	Weigher ready, 3-way/5-way sorting, total counter, outputs electrically isolated by opto-electronic coupler U _{DC} = + 18 ... + 30 V, I _{max} = 0.5 A; fault signaling output electrically isolated by relay contact: 250 V _{AC} / 5 A	■	■	■
SERIAL INTERFACE	CANopen (for weigh cell)	■	■	■
TEMPERATURE RANGE	0° C to + 40° C (32 °F to 104 °F)	■	■	■
OPTIONS		SYNUS		
		6	10	15
ANALOG INPUTS	0 - 20 mA, 0 - 10 V - Voltage input: impedance 100 kΩ	<input type="checkbox"/>	■	■
ANALOG OUTPUTS	0 - 20 mA, 0 - 10 V - Voltage output: burden ≥ 2 kΩ - Current output: burden ≤ 300 Ω	■	■	■
SERIAL COM PORTS	RS-422 / RS-232 / current loop	■	■	■
PRINTER (THERMAL STRIP-PRINTER MODULE)	Thermal printer in AISI 304 (1.4301) stainless steel housing, paper roll and internal take-up roller, resolution: 384 dots per line, 42 characters per line, printing speed: 480 lines per sec, text and graphic modes, IBM compatible Dimensions: 140 x 266 x 140 mm (W x H x D) Weight: approx. 2.7 kg Type of protection: IP65	■	■	■
TYPE-APPROVAL CERTIFICATE	Certified in accordance with OIML R51	■	■	■



Dimensions

AA / TL / GL (see "Equipment Versions" table)

WS	BB	X1	X2
1 kg	40	420	217
	80		
	120		
	160		
2 / 5 / 7 kg	150	420	217
	200	435	192
	300	495	242

