Minebea intec
The true measure

Checkweigher Synus®

The modular designed checkweigher series

GERMAN QUALITY

German Quality

> The modular designed checkweigher series Synus® allows for high-precision weight or integrity checking as well as the regulation of upstream filling systems. All model variants have a type approval which allows for use in legal metrology for Packaged Goods Regulation inspection in all European countries.

The right solution for all of these applications:

| Weighing | Fill quantity control | Statistics | Classification | Statistical process control |

Technical specifications

Checkweigher Synus®				
Weighing system	**WS 1 kg**	**WS 2 kg**	**WS 5 kg**	**WS 7 kg**
Gross weighing range (maximum load)	Up to 1000 g	Up to 2000 g	Up to 5000 g	Up to 7000 g
Smallest permissible calibration value (g)	0.1 g	0.2 g	0.5 g	1 g
Imprecision area (Ua) (mg)	From 100	From 500	From 1,500	From 2,000
Standard deviation of the measurement error (s) (mg)	From 17	From 83	From 250	From 333
	Depending on product, throughput and ambient conditions			
Throughput (item/min)	Max. 250	Max. 200	Max. 180	Max. 180
	Depending on product, permitted imprecision and ambient conditions			
Speed ranges (m/s)	0.2 to 1.5	0.2 to 1.2 0.5 to 1.5	0.2 to 1.0 0.5 to 1.4	0.2 to 1.0 0.5 to 1.4
Roller diameter (mm)	22	30		
Drives	Maintenance-free 24 V EC-motors with planetary gear Motor control short-circuit proof with temperature monitoring			
Supply voltage	115/230 V_{AC} (+10%/-15%); 50/60 Hz (L1, N, PE) switchable			
Power consumption	Approx. 500 V_A			
Operating pressure	Default setting: Pusher: approx. 3 bar Blower: approx. 5 bar			
Feed direction	From right to left or left to right (state when ordering)			
Working height (mm)	600 to 1100 (adjustable in 50 mm increments), adjustment range of the feet: ± 25 mm			
Ground clearance (mm)	100 (± 25)			
Permissible operating temperature range (°C)	0 to +40 (MID +5 to +40)			
Product temperature (°C)	–10 to +60 (WS 1 kg, belt) –40 to +80 (WS 1 kg, round belt) –30 to +80 (WS 2 to 7 kg, belt)			
Protection class	IP 54 (standard), IP 65 (optional)			
Dimensions	See dimensional drawings			
Weigher frame material	Stainless steel 1.4301			
Weight	Approx. 250 kg			
Airborne noise emitted	A-rated sound pressure level emitted < 70 dB(A)			
Screen	See 'Equipment' table			
Inputs	8/16 (optional) digital inputs, 24 V Inputs galvanically isolated via relay or optocoupler depending on use			
Outputs	8/16 (optional) digital outputs, 24 V 2 analogue outputs 0–20 mA, 0–10 V Voltage output: load impedance ≥ 2 kΩ Current output: load impedance ≤ 300 Ω Outputs galvanically isolated via relay or optocoupler depending on use			

* IB   infeed belt
  OB outfeed belt

The results that can be achieved in practice, e.g. for the standard deviation of the measurement error or the throughput, depend on the respective application and must therefore not be understood as absolute values. The precise design of the supplied machine is defined in the order confirmation.
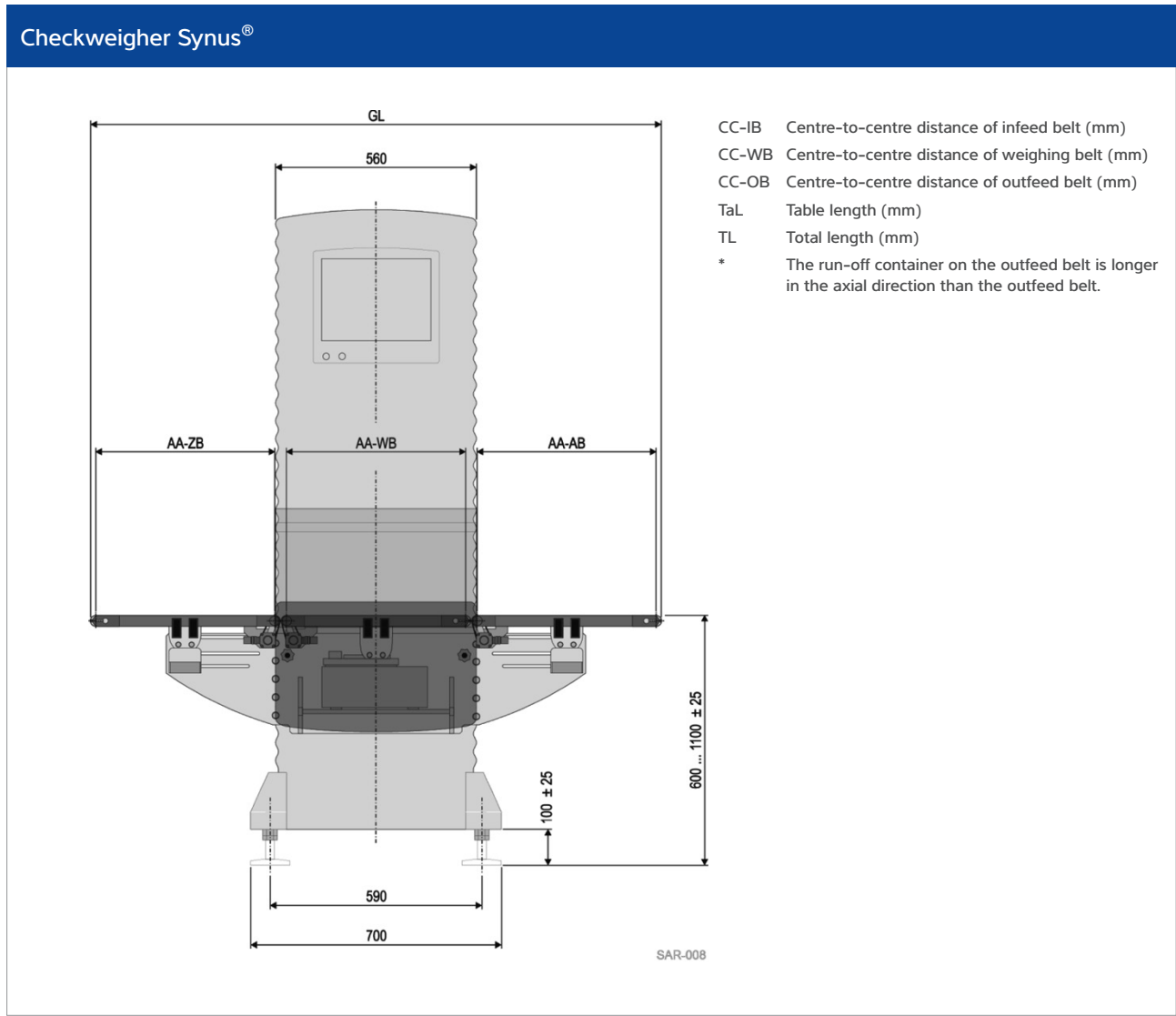
Equipment

Feature, function	Variants available, description
Checkweigher type	SYNUS® 10/SYNUS® 15
Weighing system	WS 1 kg, WS 2 kg, WS 5 kg, WS 7 kg
Dialogue PC	SYNUS 10: TFT colour 10,4`, key operation SYNUS 15: TFT colour 15,0`, touchscreen
Weight display	Gross, net or differential weight, switchable
Operational display	Distribution, yield, throughput, average value chart, large weight display, switchable
Transfer bridge	Only in WS 1 kg
Reject system	Blower or pusher, activated via customer's separation systems
Emergency stop switch	Installed in PC panel
Fill level monitoring/run-off container	Output isolated from the voltage with clear light
Light barrier	Reflection light barrier, laser reflection light barrier
Operating modes classification	– Classifying weigher with Packaged Goods Regulation evaluation, freely selectable classification limits, x 3/5 sorting – Classifying weigher with Packaged Goods Regulation evaluation with repetitive rejection and monitoring of average value
Classifying display x 3/5	– Signal light x 3 – Signal light x 5 – Outputs isolated from the voltage – Outputs isolated from the voltage with signal light x 3 – Outputs isolated from the voltage with signal light x 5
Counting function	Total counter, preselection counter
Interfaces	– Ethernet – Ethernet/IP – Profibus – DeviceNET – RS422 – RS232 – Current Loop – Profinet – Interface for individual weight output for external assessment and connection to SQC system All interfaces stated here are reaction-free and do not have to be protected.
Data transfer	
Individual weight	Serial interface RS422, RS232 or 20 mA
Computer Factory-Bus TCP/IP	XML client, XML server, XML client and XML server, prepared for: - SPC@Remote - SPC@Enterprise - SPCfWIN with XML server
Fieldbus	Profibus-DP, DeviceNET, Profinet, Ethernet/IP
Data backup in the event of power failure	
Monitoring functions	
Compressed air monitoring	Output isolated from the voltage, belt stop
Separation monitoring	Output isolated from the voltage
Incorrect weight	Output isolated from the voltage with belt stop
Package length/interval monitoring	Via additional light barrier
Control functions	
Integrity checking with moving average	
Measuring accuracy check	
Automatic sampling	
Volume evaluation	– Digital input – Without air buoyancy correction – With air buoyancy correction
Event counter	Digital input
External error message	Digital input
Feeder/batch x 3/x 5 sorting	Digital input
Total counter/preselection counter	Digital input
Fault	Digital input
Trend controller	– 3-point controller with +/-control signal – 3-point controller with pulse package – Integral controller, 0–20 mA/0–10 V
21CFR Part 11	Specifications as per FDA model (Food and Drug Administration)

- The monolithic EMFC load cells used, which were developed specifically for dynamic checkweighing, are characterised by ultimate precision, an extremely short weighing time, optimum stability, robustness and overload protection.
- State-of-the-art electronics with the latest signal processor technology allow for particularly effective filtering thanks to the extraordinarily high scanning rate of 2 kHz (0.5 ms).
- The modular structure even allows for a change in the conveyor height, as well as the machine's running direction on site in just a few hours.
- All Synus® models offer a range of options to make production monitoring and data assessment easier.
- To minimise downtimes, all models have innovative conveyor belt changing devices as well as a conveyor belt emergency system.
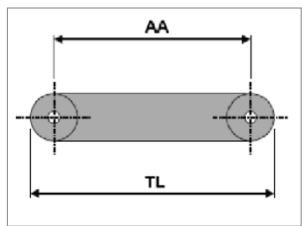
Technical diagrams

CC-IB   Centre-to-centre distance of infeed belt (mm)
CC-WB   Centre-to-centre distance of weighing belt (mm)
CC-OB   Centre-to-centre distance of outfeed belt (mm)
TaL   Table length (mm)
TL   Total length (mm)
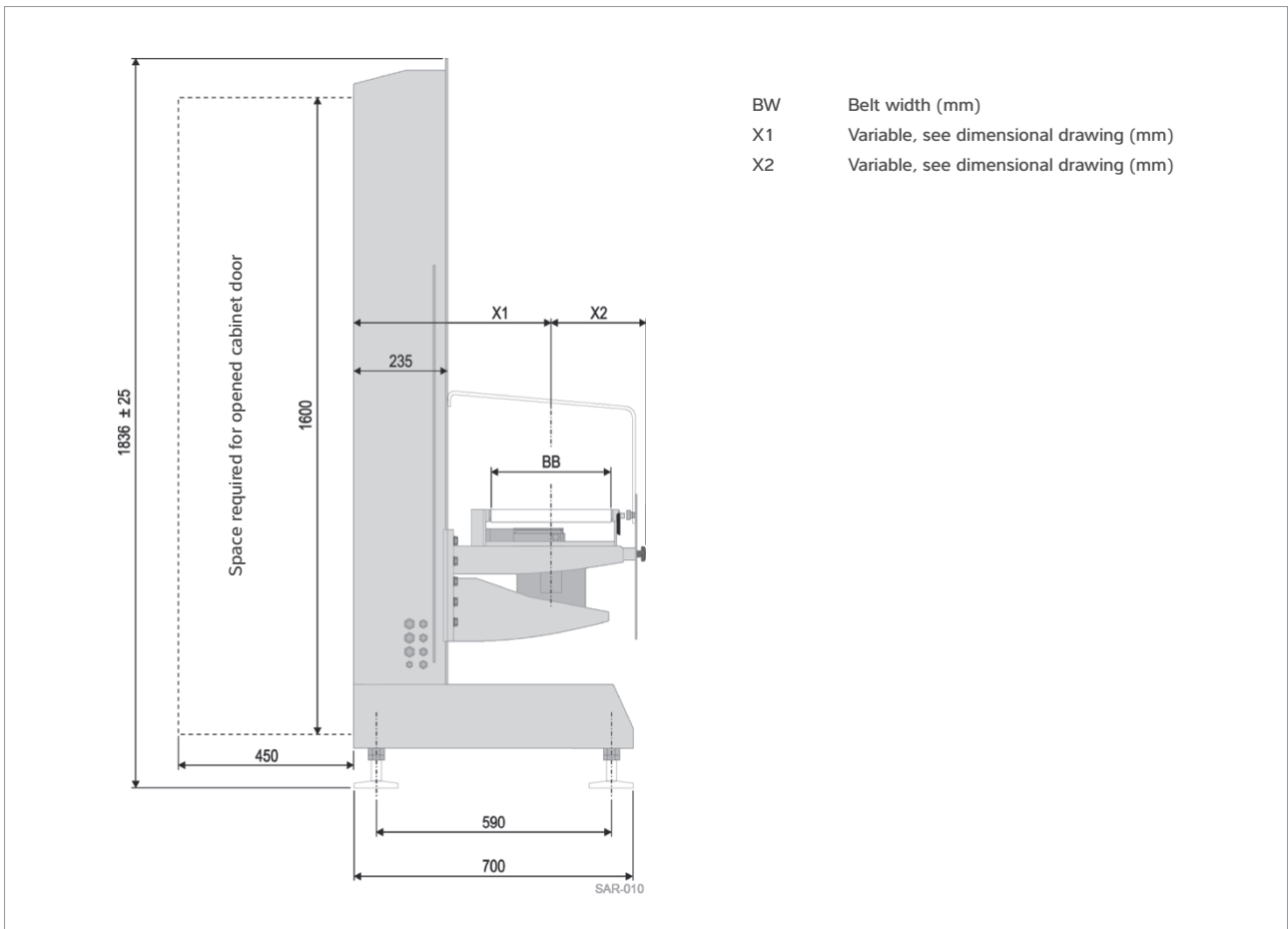*   The run-off container on the outfeed belt is longer in the axial direction than the outfeed belt.

Front view

	CC–IB	CC–WB	CC–OB
WS 1 kg	300/350/400/450/500	310	300*/350*/400/450/500
	Total length TL = CC-IB + CC-WB + CC-OB + 90		
WS 2/5/7 kg	300/350/400/450/500	300	300*/350*/400/450/500
	350/400/450	350	350*/400/450/500
	500	350	400/450/500
	400/450/500	350	500
	400/450/500	400	400/450/500
	450/500	450	450/500
	500	500	500
	Total length TL = CC-IB + CC-WB + CC-OB + 100		

Measurement chart, front view

Infeed belt

All dimensions in mm

Side view

	BW	X1	X2
WS 1 kg	40	420	215
	80	420	215
	120	420	215
	160	420	215
WS 2/5/7 kg	150	420	215
	200	445	190
	300	495	240

Measurement chart, side view

BW   Belt width (mm)
X1   Variable, see dimensional drawing (mm)
X2   Variable, see dimensional drawing (mm)

All dimensions in mm

Variants

WS 1 kg

BW x CC (mm)		
Infeed belt ■	Weighing belt	Outfeed belt ■
150 x 300/350/400/450/500	40 x 310 ■	150 x 300*/350*/400/450/500
	80 x 310 ●	
	120 x 310 ●	
	160 x 310 ○	

WS 2/5/7 kg

CC (mm)			
BW (mm)	Infeed belt ■	Weighing belt ■	Outfeed belt ■
150	300/350/400/450/500	300	300*/350*/400/450/500
	350/400/450	350	350*/400/450
	500	350	500
	400/450/500	400	400/450/500
	450/500	450	450/500
	500	500	500
200	300/350/400/450/500	300	300*/350*/400/450/500
	350/400/450	350	350*/400/450
	500	350	500
	400/450/500	400	400/450/500
	450/500	450	450/500
	500	500	500
300	350/400/450	350	350*/400/450
	500	350	500
	400/450/500	400	400/450/500
	450/500	450	450/500
	500	500	500

CC Centre–to–centre distance (mm)   BW Belt width (mm)   ● Round belt or belt design
○ Round belt design   ■ Belt design   * The run–off container on the outfeed belt is longer in the axial direction than the outfeed belt.

The outfeed belt must be at least CC = 400 mm if the machine is ordered in the following design:

■ Weighing belt CC = 300, 310 or 350 mm and

■ separation monitoring and

■ run–off container incorrect weight

The products and solutions presented in this data sheet make major contributions in the following sectors:
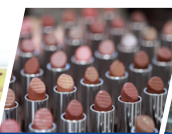

Food and beverages | Pharmaceutical | Chemistry | Agribusiness | Cosmetics | Building materials | Recycling | Machinery (OEM)