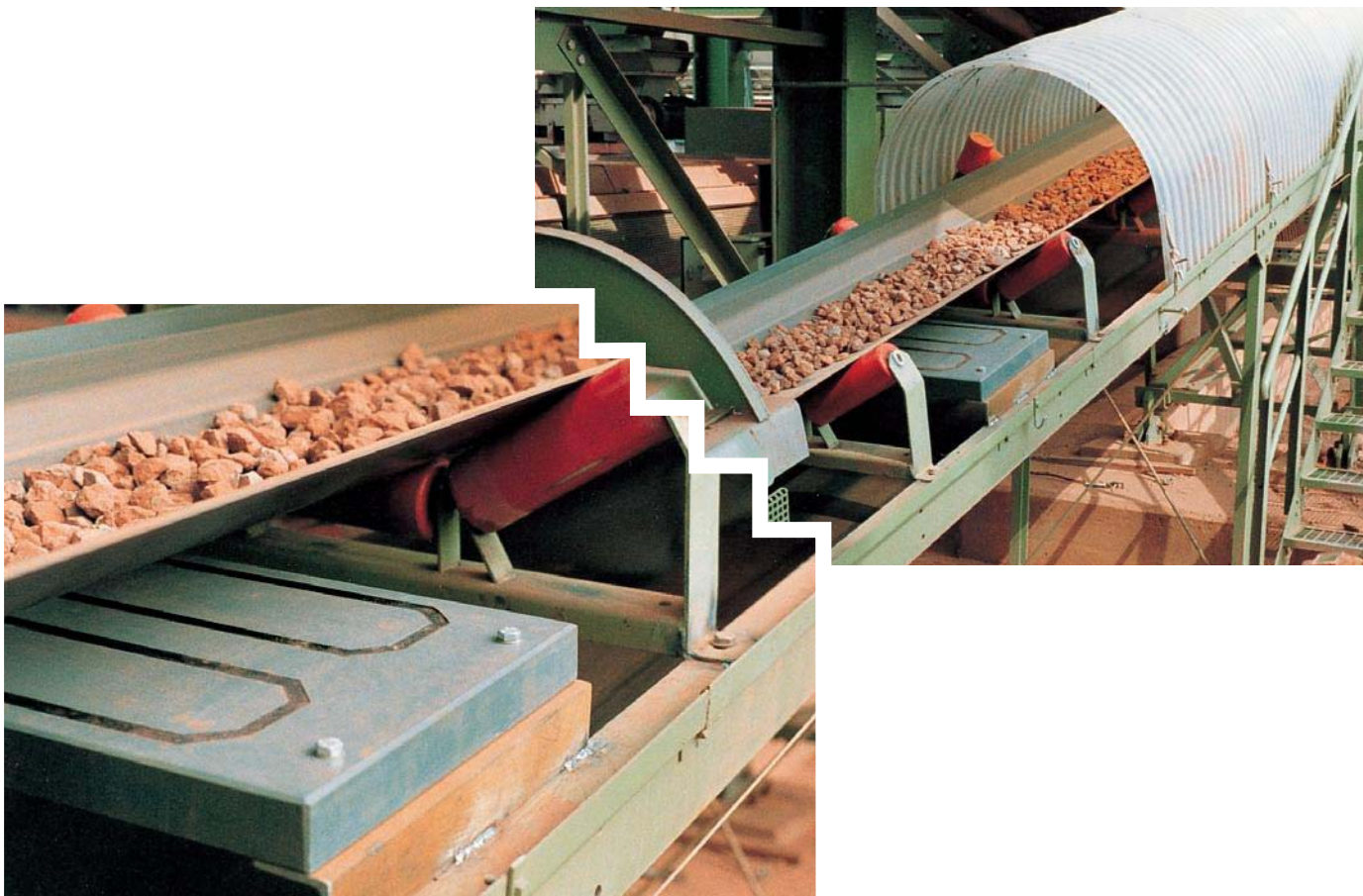


# METAL DETECTOR

**MS 08/85 SQ · SQTA**

**Protective device for crushers,  
grinders and other machines**



Fabricado **STEINERT**  
para *Latinoamericana*



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# Metal detectors SQ and SQTA

The SQ (single probe) and SQTA (tandem probe) series of metal detectors are designed to provide protection and monitoring. They are used in all situations where a warning must be given about disruptive and harmful pieces of metal in the material being conveyed. A metal detector prevents damage, avoids downtimes and produces significant savings on repair costs.

## Method of functioning

The control unit generates a high-frequency alternating voltage which is fed into the probe via a 75Ω coaxial cable. An electromagnetic alternating field builds up perpendicular to the probe and penetrates the belt and material being conveyed.

If a metal part enters this field eddy currents are produced by induction and they cause an increase in the energy consumption of the oscillating circuit in the control unit.

An amplifier registers this change and switches the output relay for 500 ms. The output relay has two floating changeover contacts, which are located on an easily accessible terminal strip. The "Metal signal" from the terminal strip can be further processed as required, e. g. to stop the conveyor belt or to control a PLC.

The integrated self-monitor continuously checks whether the metal detector is operating correctly.

If, for example, there is a break in the coaxial cable to the probe, or if a circuit in the control unit

fails, a second output relay, whose floating contact is also on the terminal strip, switches. The functional test button allows a "Metal signal" to be simulated. In this way the control unit connected to the metal detector can be quickly and easily tested.

EAB metal detectors SQ and SQTA are simple to install and put into operation.

After setting the required sensitivity no other adjustment or calibration is necessary. The detectors adjust themselves automatically to the particular operating conditions.

## Design

The metal detector consists of a probe and an amplifier. These two components are connected to each other by a coaxial cable. The amplifier contains the electronic components.

The few operator's controls are clearly laid out on a front panel and are designed for easy gripping. A switch cabinet door is fitted to protect the front panel.

The probe is compactly embedded in a solid panel made of rigid PVC and is manufactured to suit the belt width. It is therefore quick and easy to install at the conveyor belt. Single and tandem probes are available.

The panel-shaped single probe is fitted under the belt. The tandem probe, on the other hand, consists of 2 probe panels, one fitted under the belt and the other above the belt by means of spacers. The tandem probe is recommended in particular for deep layers of conveyed material or high sensitivity requirements.

The spacers of the tandem probe are manufactured to suit the depth of material conveyed. This arrangement can still be modified after installation by simply adapting the spacers. Similarly the single probe can be converted into a tandem probe by simply purchasing and fitting a second probe and two spacers.

## Applications of SQ and SQTA metal detectors:

- Quarries
- Lime works
- Clinker works
- Sand pits
- Cement factories
- Slag processing
- Building material recycling
- Brickworks
- Coal-burning power stations

## At a glance:

- Self-adjusting
- Extremely simple to install
- Iron oxide and ore are ignored
- Both ferrous and non-ferrous metals are detected
- Automatic self-monitoring
- Can be used in the proximity of frequency converters
- Minimum distance between probe and motors or magnets only 1 metre
- Probe and amplifier solidly built for immunity to vibration and therefore resistant to weather, dirt and impact of stones



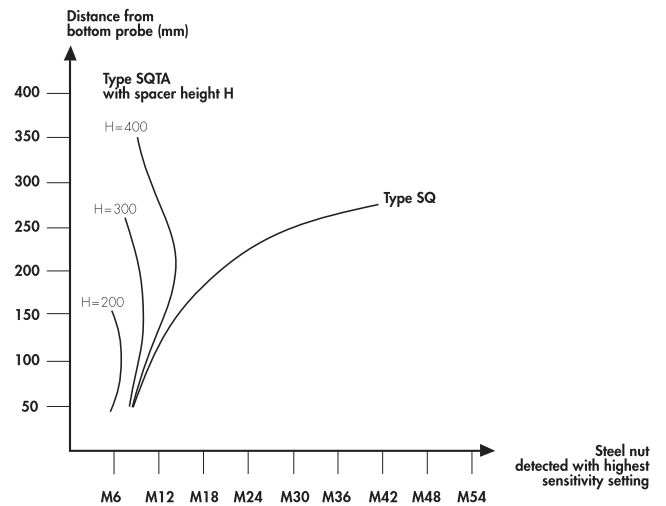
The tandem probe:  
Time-saving and simple to install above and below the belt. No need to disconnect the belt. The opening height can also be changed at a later date with relative ease.

## Sensitivity

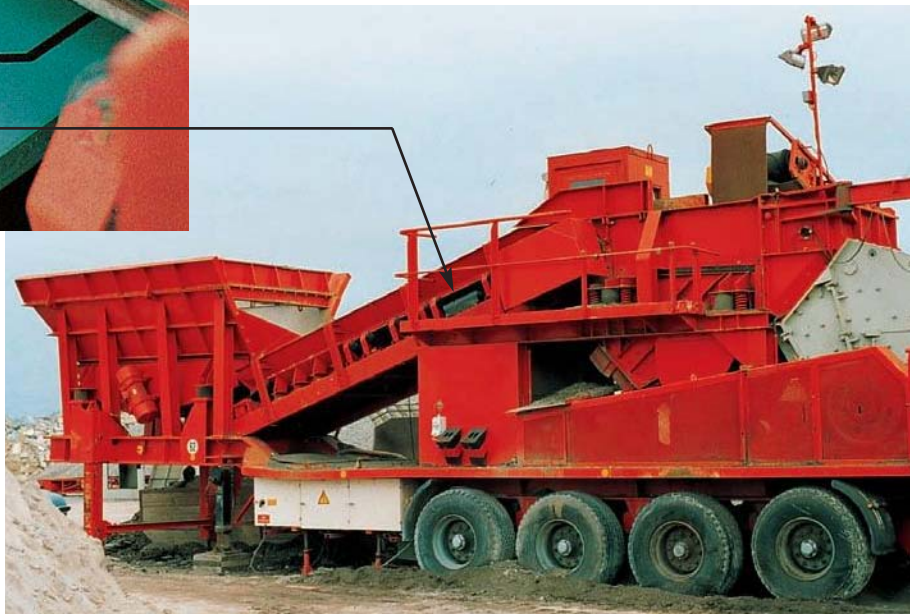
The sensitivity determines the minimum size of metal parts which can be detected.

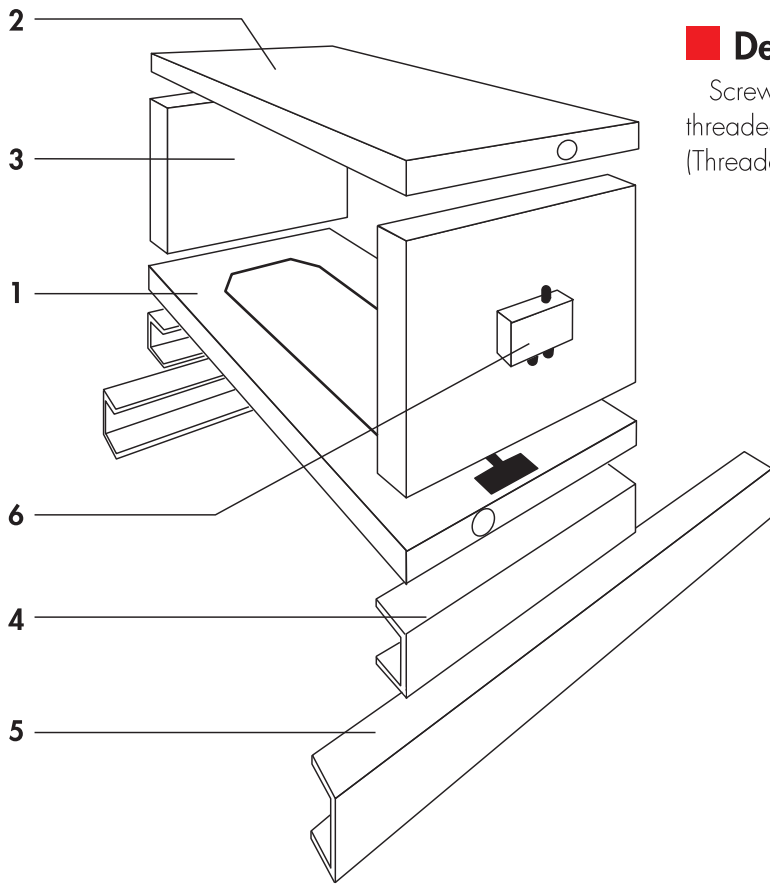
Depending on the individual model and the sensitivity setting, metal parts down to the size of M6 nuts or the size of excavator teeth are detectable.

The graph opposite shows the sensitivity of types SQ and SQTA.



The compact probe design is ideal for use in mobile building material recycling plants.

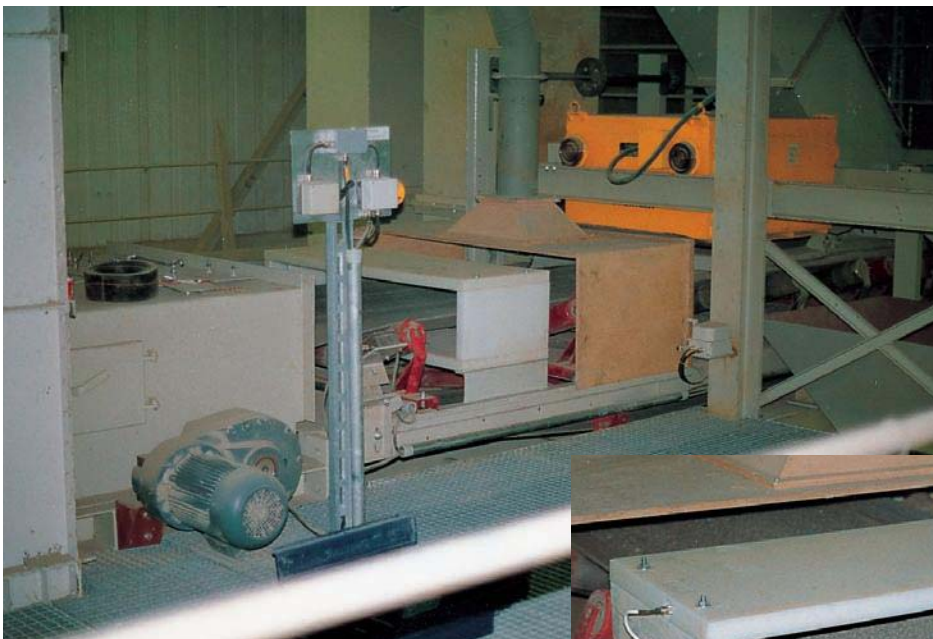




## ■ Design of the SQTA tandem probe

Screw parts 1 – 4 together tightly with four M10 threaded rods. Weld parts 4 + 5 to each other. (Threaded rods are supplied with the probe.)

- 1 bottom probe
- 2 upper probe
- 3 spacer
- 4 steel section
- 5 conveyor frame
- 6 terminal box

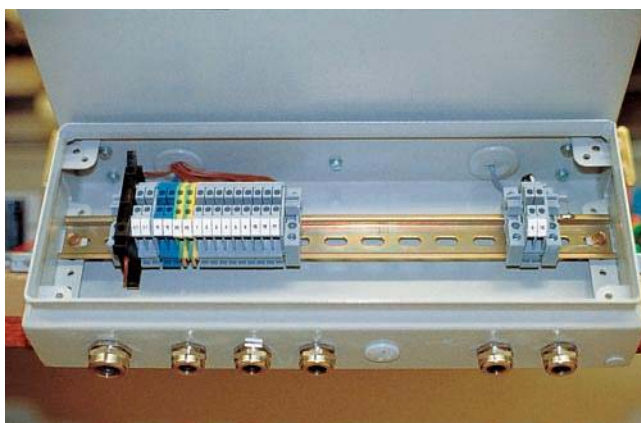


Clinker monitoring in the cement industry with a high temperature-resistant tandem probe. The metal detector operates perfectly in spite of the proximity of the electromagnetic separator and the conveyor belt motor.

# The SQ control unit



The self-adjusting electronics are housed in a robust metal switch cabinet. The switch cabinet is designed with IP 55 enclosure protection and is suitable for on-site installation. The switch cabinet door opens to give access to the few operator's controls, such as power switch, functional test switch, sensitivity regulator and measuring-point selector. The door can be fitted with a cylinder lock to prevent unauthorized readjustment of the sensitivity. The measuring-point selector allows different points in the electronic circuitry to be indicated on the built-in measuring instrument. Thus, in case of technical difficulties, EAB can often identify the cause by telephone and arrange for very rapid remedial action.

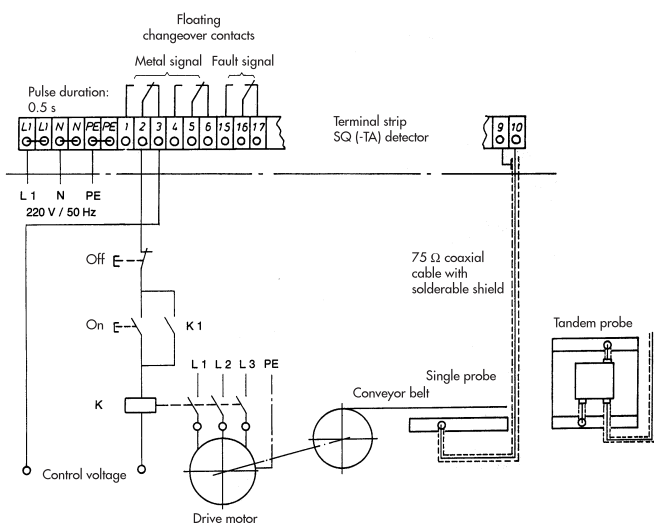


High-quality components ensure reliability and long service life. For example, the power switch and output relays have gold-plated contacts. The separate and easily accessible terminal strip permits straightforward and tidy electrical connection.

The unit can be integrated into an existing plant control system without any extra components. An On and Off button and a contactor for the conveyor belt motor are generally present.

The output relay for the metal signal can be switched between normally relaxed and normally activated mode.

On request an extended terminal strip can be supplied, which permits direct connection of a flashing warning light, an alarm horn or a marking device.



Electrical connections of the metal detector with suggested "belt stop" connection.

## Service

Comprehensive pre-purchase advice without any obligation.

Expert customer service with no red tape.

On request installation supervision and commissioning of the metal detector will be performed by EAB and an all-in quotation will be provided in advance.

Manufactured  
for

**STEINERT**  
ELEKTROMAGNETBAU



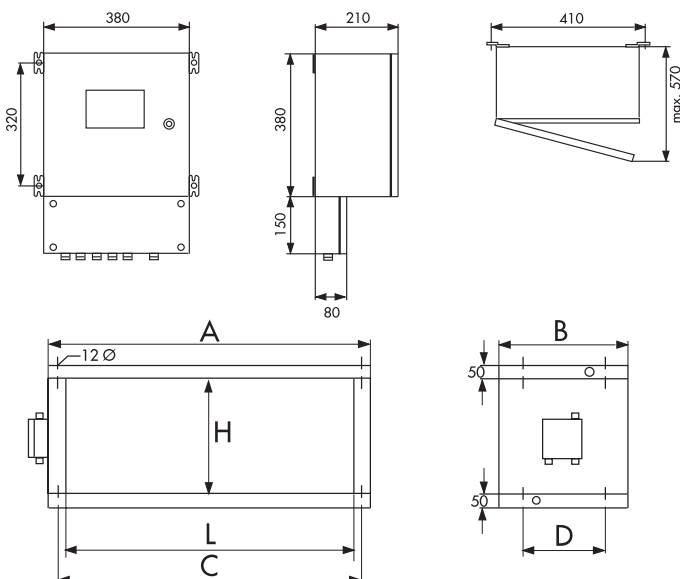
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# Technical data

## ■ SQ control unit

Supply voltage	230 V ± 10 %/50 Hz
Power input	15 VA
Permitted belt speed	0.1 to 4 m/s (other speeds on request)
Permitted ambient temperature	-20 °C to +55 °C
Inputs	1 coaxial cable, probe
Outputs	
Metal signal	1 Siemens cradle relay with 2 floating changeover contacts, switching capacity 230 V, 6 A resistive load, switchable between normally relaxed mode and normally activated mode
Fault signal	1 Siemens cradle relay with 1 floating changeover contact, switching capacity 230 V, 6 A resistive load
Housing	IP 55 enclosure protection, sheet steel with electrophoretic dip-coating, colour RAL 7032 grey
Installation	Wall-mounting
Weight	18 kg
Dimensions	see dimension diagram

Adaption for other modes of operation possible by consultation.



We reserve the right to make modifications in line with our policy of continuous technical improvement.

## ■ Single-probe system

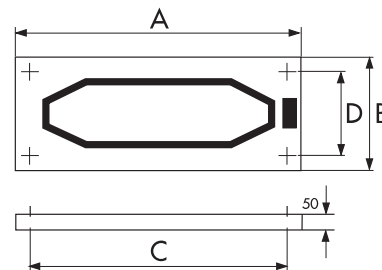
Type MS 08/85 SQ xxx

└ Belt width

Unit comprises	1 SQ control unit, 1 probe, 1 x 10 m coaxial cable with plug, installation accessories
Installation	50 mm below the belt, unless otherwise specified

Nominal probe size	Dimensions in mm				For belt widths up to	Weight kg
	A	B	C	D		
500	700	400	640	260	500	18
650	850	400	790	260	650	23.6
800	1000	400	940	260	800	28
1000	1250	500	1170	300	1000	43.5
1200	1500	500	1420	300	1200	52

Other sizes on request



## ■ Tandem-probe system

Type MS 08/85 SQTA xxx

└ Belt width

Unit comprises	1 SQ control unit, 2 probe panels, 2 spacers with 1 terminal box, 1 x 10 m coaxial cable, installation accessories
Installation	above and below the belt, 50 mm clearance between belt and bottom probe, unless otherwise specified

Nominal probe size	Dimensions in mm					For belt widths up to	Weight kg
	A	B	C	D	L		
500	700	400	640	260	600	500	46
650	850	400	790	260	750	650	57
800	1000	400	940	260	900	800	66
1000	1250	500	1170	300	1150	1000	100
1200	1500	500	1420	300	1400	1200	118

H = according to requirement · Other sizes on request