Elektroanlagenbau Reinhausen GmbH

EAB

METAL DETECTOR

MS 04/03 QLC • QLCTA

for the stone and earth industries

EAB

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Metal detector QLC and QLCTA

Method of functioning

The control unit generates a high-frequency alternating voltage which is fed into the probe via a 75 Ohm 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 one floating changeover contact, which is 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 metal detector QLC is 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.

Application of QLC and QLCTA metal detectors:

Quarries
Lime works
Sand pits
Building material recycling
Cementworks
Recycling

Design

The metal detector consists of a probe and a control unit. The probe can be delivered as:

1. a single probe, called QLC, for the mounting under the belt
2. as a tandem probe, called QLCTA, for the mounting under and over the belt (tunnel)

The probe is compactly embedded in a solid panel made of rigid PE and is manufactured for to persists extreme operating condition as well. The installation at the conveyor belt can be done easy and quick. A single probe can be converted into a tandem probe subsequently, by simply purchasing and fitting a second probe and two spacers over the first probe.

All electrical components are built in a control cabinet. They are kept out of the probe and therefore are protected against stones falling down and are easy for servicing. All operators controls are clearly laid out on a front panel and are designed for easy gripping.

Choice

The QLC metal detector is operating with a single probe. It should be provided if burden height on the belt is not higher than 150 mm.

At a glance:

- **iron oxide and ore are ignored**
- **can be operated in the proximity of frequency converters**
- **minimum distance between probe and motors or magnets only 1 meter**
- **self-adjusting**
- **extremely simple to install**
- **both ferrous and non-ferrous metals are detected**
- **probe and control unit solidly built for immunity to vibration**
- **subsequently convertable from single probe to tandem probe**
- **height of opening can be changed subsequently**
- **favourable price**

Installed single probe QLC

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

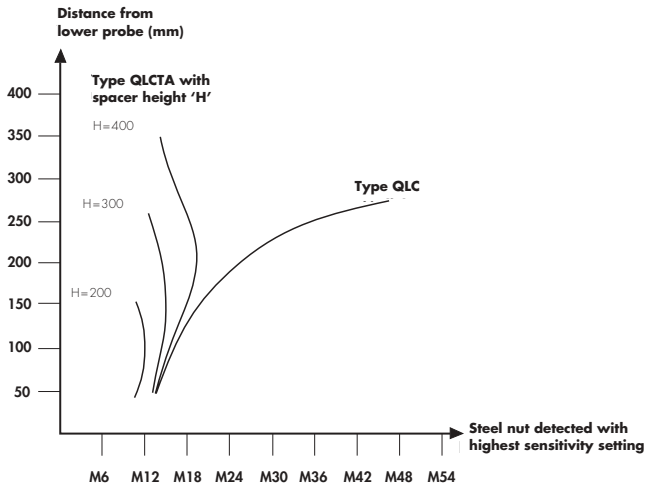
The QLCTA metal detector is operating with a tandem probe. Burden height's of much more than 150 mm can be monitored with a high and steady sensitivity (see the graph).

Sensitivity

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

The sensitivity can be continuously adjusted.

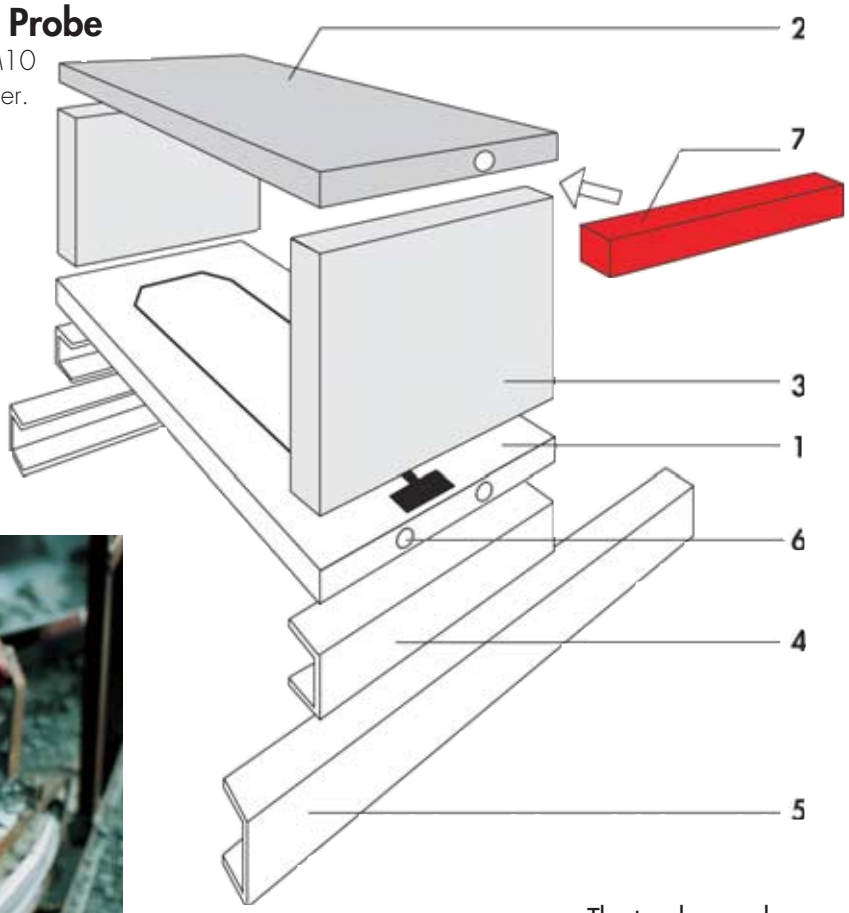
The graph shows the maximum possible sensitivity of types QLC and QLCTA. If only bigger pieces of metal should be detected, the sensitivity can be set down to a lower position.



Design of the QLCTA Tandem Probe

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

1 lower probe
2 upper probe
3 spacer
4 steel section
5 conveyor frame
6 electrical connection
7 PVC-strip for to enlarge the aperture height subsequently



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.

The metal detector operates perfectly on such condition as well.

The QLC control unit

The self-adjusting electronics are housed in a robust metal switch cabinet. The switch cabinet is designed with IP 55 or 65 enclosure protection and is suitable for on-site installation.The door can be fitted with a cylinder lock to prevent unauthorized readjustment of the sensitivity. The selector switch and LED-indicator allow to check the static adjustment and to see the reaction on tramp metals. Thus, in case of technical difficulties, EAB can often identify the cause by telephone.

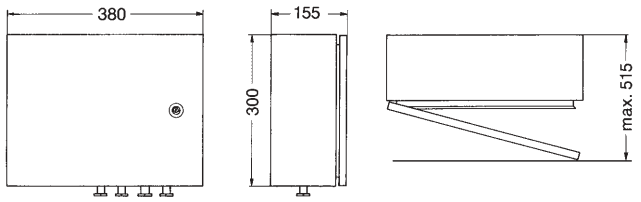
High-quality components ensure reliability and long durability. A wide range power supply allows a simple connection to nearly all usual line voltages. The separate and easily accessible terminal strip permits straightforward and tidy electrical connection.

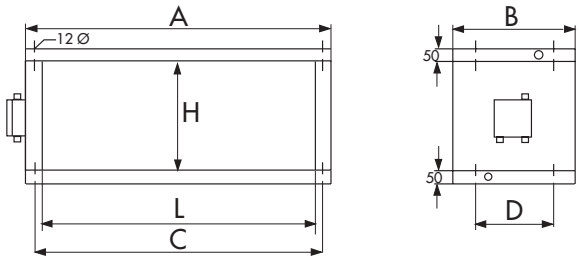
The unit can be integrated into an existing plant control system without any extra components. An On and Off button and a contactor for controlling the conveyor belt motor are generally existing in the plant control system. The output relay for the metal signal can be switched between normally relaxed and normally activated mode. Optionally the control box can be executed with signal lamps showing "Operation" and "Metal Alarm". The acknowledgement is then carried out with a push button on the panel.

Technical Data

QLC control unit

Supply voltage	100–240 V ±10 %, 50–60 Hz
Power input	15 VA
belt speed	0,1-4,0 m/s (other speeds upon request)
Permissible ambient temperature	-20 °C to +55 °C
Input	1 coaxial cable, probe
Output	
Metal signal	1 relay with 1 potential free nc/no-contacts for 230 V AC/5 A ohmic load; choice of normally relaxed mode or normally activated mode
Housing	German protective device classifiction IP 55, sheet steel, treated by electrophoresis dip primer coating color: RAL 7035 grey
Installation	wall-mounting
Weight	9 kg
Dimensions	see dimension diagramm
Other data	on request





We reserve the right to make modifications in accordance with the continuous technical improvement.

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.

Single-probe system

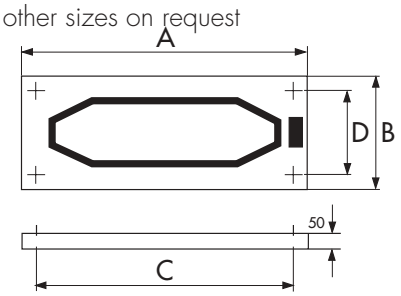
Type MS 04/03 QLC xxx
Belt width

The complete design consists of:	1 QLC control unit, 1 probe, 10 m coaxial cable with plug, (75 ohm surge impedance), installation accessories
Installation	50 mm clearance between belt and probe, unless otherwise specified

Sizes:

Nominalprobe size	Dimensions in mm A	B	C	D	For belt up to	Weight kg
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

A lot of other sizes on request



Tandem-probe system

Type MS 04/03 QLCTA xxx
Belt width

The complete design consists of	1 QLC control unit, 2 probe plates, 2 spacers, 10 m coaxial cable with plug (75 ohm surge impedance), installation accessories
Installation	above and below the belt, 50 mm clearance between belt and lower probe, unless otherwise specified

Sizes:

Nominalprobe Size	Dimensions in mm A	B	C	D	L	For belt width up to	Weight kg
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