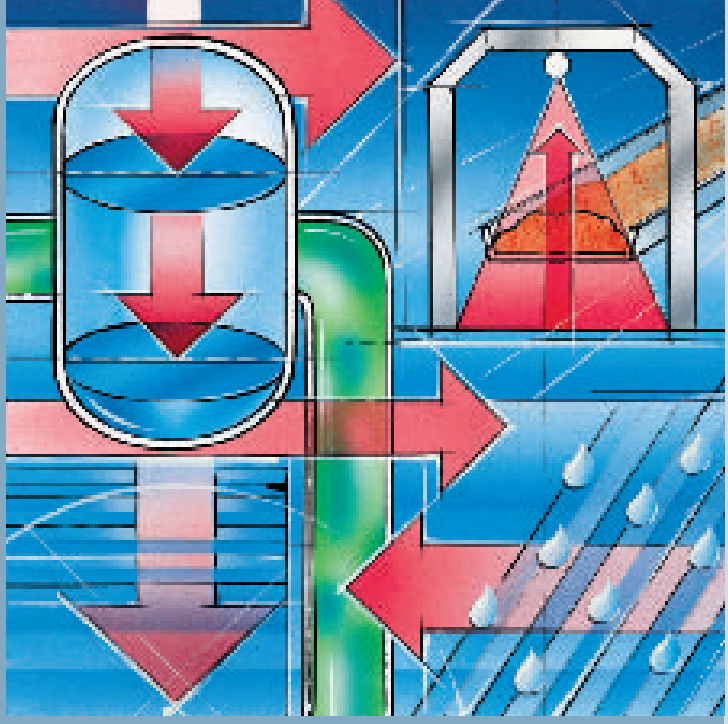
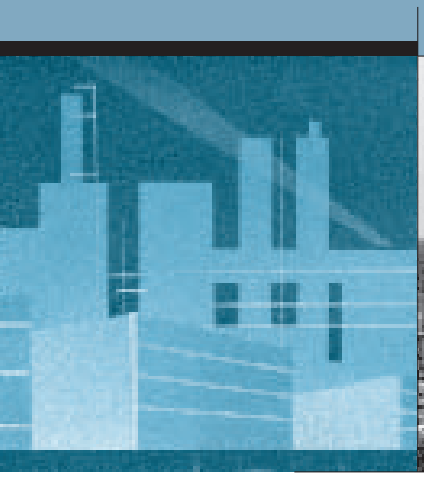


CR Series of Shielding Containers

LB 7440, LB 7442, LB 7444

PROCESS CONTROL

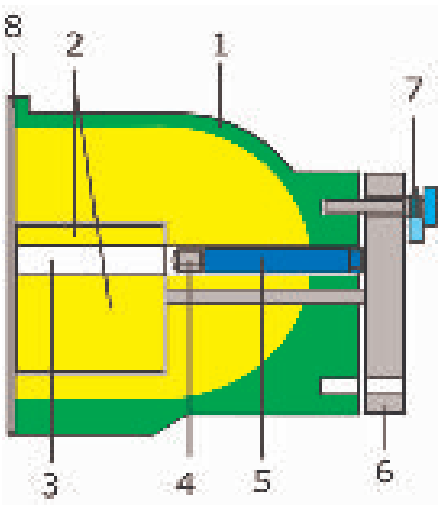


BERTHOLD TECHNOLOGIES

Shieldings for Point Sources

Encapsulated radioactive sources are used for industrial applications. The radioactive substance is contained in a tightly sealed stainless steel Source Capsule, sometimes with several walls. The Source Capsule is mounted in a shielding Housing using a Source Holder. This shielding must meet several criteria:

- The radiation must be shielded to a safe level for the operating personnel.
- The radiation outlet channel must be lockable for transport and during installation.
- The source capsule must be protected from both mechanical damage and from environmental influences.



1 Housing
2 Lockable Shutter
3 Radiation beam outlet
4 Source Capsule
5 Source Holder
6 Handle
7 Padlock
8 Cover plate

The shielding container consists of a cast-steel lead-filled Housing. A rotary Lockable Shutter is provided to close the radiation outlet channel. The shutter is rotated by a Handle which is secured in the open or closed position by a padlock.* The Source Holder is protected against unauthorised access by the Handle.

The shielding container has a mounting flange. The models LB 7440 and LB 7442 also have a mounting pad with tapped holes for bracket mounting.

The models with suffix "F" are used for level measurements, having a larger radiation outlet diameter.

The models with suffix "D" are used for density measurements, having a smaller diameter for the radiation beam.

This range of products is designated "CR" and features improved resistance to corrosion:

- Sturdy cast steel housing
- Radiation outlet channel cover plate, made from stainless steel.
- Lockable Shutter, connecting shaft and Handle made of stainless steel.
- Tungsten source holder.
- Lockable by means of a padlock in a stainless steel locking device.

Options

■

Pneumatic shutter mechanism which is fail safe if pressure drops. (Option I)**

■

Indication of the shutter position using a limit switch or proximity initiators. (Option II).

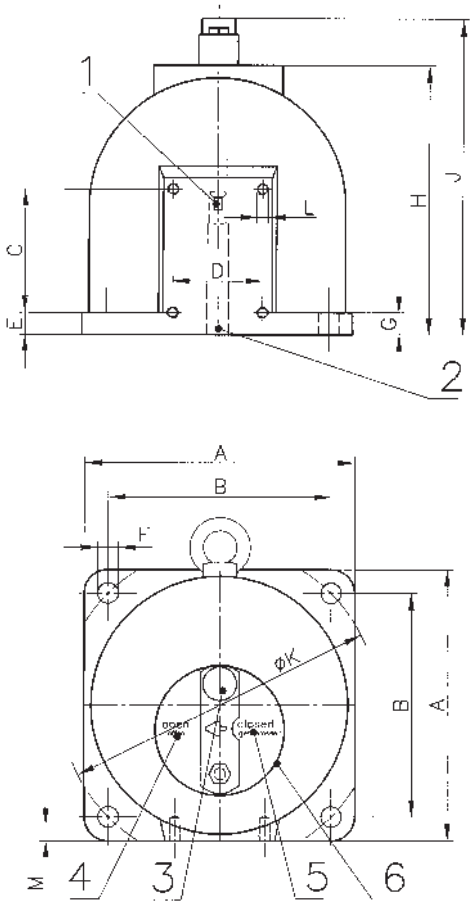
…for extreme conditions

A rubber cover with a Perspex window for viewing the locking mechanism for use in exceptionally dirty, polluted and corrosive environments. (Option III)

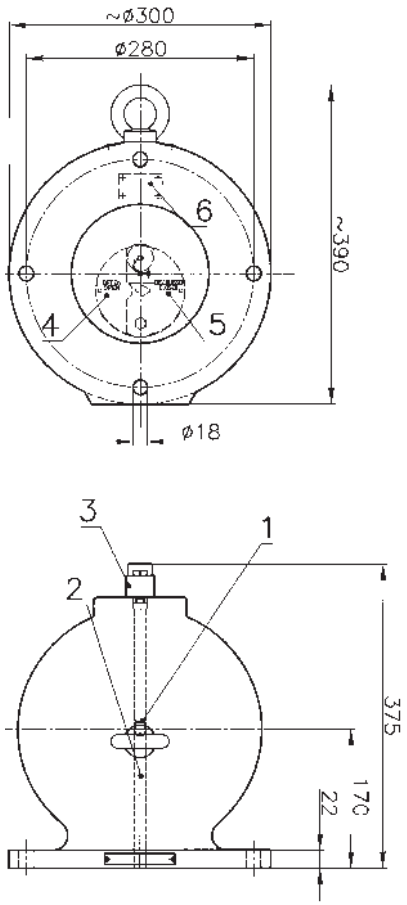
* In some countries, the handle may not be locked in the open position.
** Option I is not available in the USA.

Dimensions

LB 7440/LB 7442

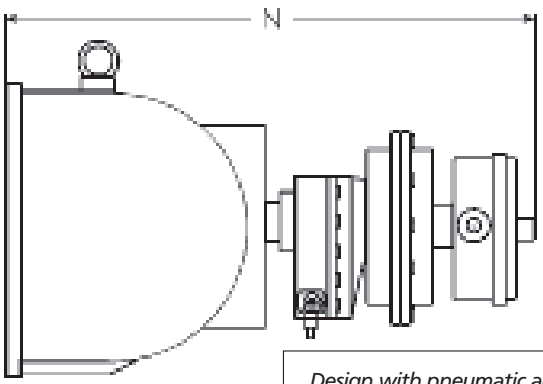


LB 7444



1 Point Source *2 Radiation beam outlet* *3 Padlock* *4 Position OPEN* *5 Position CLOSED* *6 Name plate*

Model	A	B	C	D	E	F Ø	G	H	J	K Ø	L	M	N ca.	Flange DIN 2501 4 holes	Weight approx. kg
LB 7440	180	141.5	75	60	15	18	20	172	200	200	M8	12	390	ND 125, PN 6	31
LB 7442	240	198	130	80	20	18	20	240	270	280	M10	14	460	ND 200, PN 6	81
LB 7444													570	ND 200, PN 6	170



Design with pneumatic actuator and limit switch

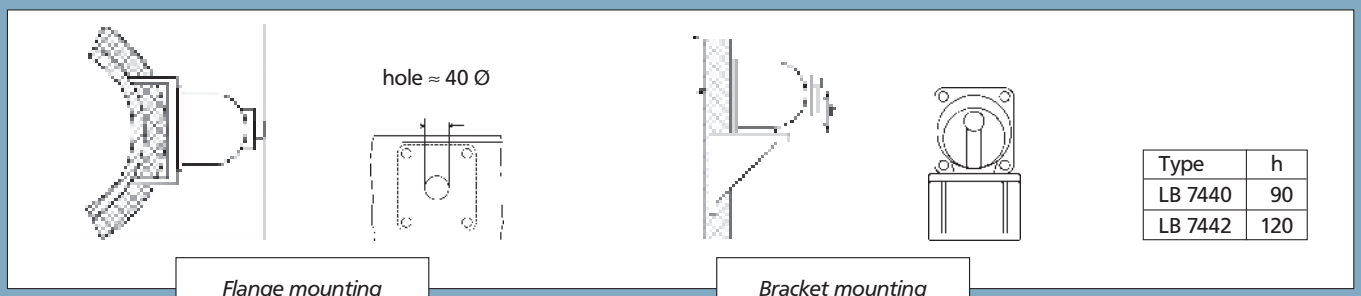
Data for Pneumatic Shutter Operation and Indicator Contacts	
Compressed Air min. 4 x 10^5 Pa (4 bar) max. 7 x 10^5 Pa (7 bar) Connection: G 1/8	**Indication OPEN/CLOSED** **Option IIa:** IP 65 2 contacts (OPEN/CLOSED) max. 250 V AC, 1A, 48 V DC, 1A
Air Quality Clean (as used for pneumatic tools), Free of oil	**Option IIb:** 2 contacts (OPEN/CLOSED) max. 250 V AC, 1A, EEx e II T6
Temperature range: -20 °C to + 80 °C	**Option IIc:** 2 proximity switches. Intrinsically safe power supply required.

Technical Data

Model	LB 7440 CR		LB 7442 CR		LB 7444 CR	
Shielding thickness (mm lead) approx.	67		97		132	
		Part Nr.		Part Nr.		Part Nr.
Angle of radiation beam approx.	LB 7440 F 16°	37625	LB 7442 F 11°	37627	LB 7444 13°	37628
	LB 7440 D 11°	37624	LB 7442 D 7°	37626		
Shielding thickness approx.	67 mm lead		97 mm lead		117 mm lead, 15 mm tungsten	
Attenuation factor approx.						
For ^{60}Co	30		180		1 800	
For ^{137}Cs	700		16 000		650 000	
Dose rates D (µSv/h) at 1 m distance from the surface of the shielding						
With ^{60}Co	$D = 1.1 \times 10^{-2} \times A$ (MBq)		$D = 1.7 \times 10^{-3} \times A$ (MBq)		$D = 1.5 \times 10^{-4} \times A$ (MBq)	
With ^{137}Cs	$D = 1.4 \times 10^{-4} \times A$ (MBq)		$D = 5.4 \times 10^{-6} \times A$ (MBq)		$D = 1.1 \times 10^{-7} \times A$ (MBq)	
Dose rates D (µSv/h) at 30 cm distance from the surface of the shielding						
With ^{60}Co	$Do = 7 \times 10^{-2} \times A$ (MBq)		$Do = 1 \times 10^{-2} \times A$ (MBq)		$Do = 9 \times 10^{-4} \times A$ (MBq)	
With ^{137}Cs	$Do = 7 \times 10^{-4} \times A$ (MBq)		$Do = 3.1 \times 10^{-5} \times A$ (MBq)		$Do = 7.3 \times 10^{-7} \times A$ (MBq)	
Dose rate Do (µSv/h) at the surface of the shielding						
With ^{60}Co	$Do = 1.6 \times A$ (MBq)		$Do = 0.14 \times A$ (MBq)		$Do = 8 \times 10^{-3} \times A$ (MBq)	
With ^{137}Cs	$Do = 1.6 \times 10^{-2} \times A$ (MBq)		$Do = 0.43 \times 10^{-3} \times A$ (MBq)		$Do = 6.5 \times 10^{-6} \times A$ (MBq)	
Operating temperature	max. 200 °C		max. 200 °C		max. 200 °C	

Licence: NRC, for operation in USA, without pneumatic shutter mechanism

Installation examples



Subject to changes without notice

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