

Major Types of Electrical Boxes

Technical Specifications

There are 10 major types of Electrical Boxes used in Canada. All these types of boxes serve specific purposes and are offered with various features / characteristics.

Type	Purpose	Features / Characteristics
Device Boxes	<ul style="list-style-type: none"> Flush installation of a device (switch, receptacle, thermostat, ...) 	<ul style="list-style-type: none"> From 1-1/2 in. deep up to 3 in. deep Available options: cable clamps, brackets, gangable For new or old work
Octagonal Boxes	<ul style="list-style-type: none"> Wire connections (junction box) Light fixture installation Temporary device installation 	<ul style="list-style-type: none"> 3 depths available: 1/2 in., 1-1/2 in., 2-1/8 in. Available options: cable clamps, brackets, extensions
4 in. Square Boxes	<ul style="list-style-type: none"> Wire connections (junction box) Flush or surface device installation (special cover required) 	<ul style="list-style-type: none"> 2 depths available: 1-1/2 in., 2-1/8 in. Available options: brackets and extensions
4-11/16 in. Square Boxes	<ul style="list-style-type: none"> Range / Dryer receptacle installation Wire connections (junction box) Flush device installation (special cover required) 	<ul style="list-style-type: none"> 2 depths available: 1-1/2 in., 2-1/8 in. Available options: brackets and extensions
Utility Boxes	<ul style="list-style-type: none"> Surface installation of a device (special cover required) 	<ul style="list-style-type: none"> 2 major models available: BC-1110, BC-2020 Available options: brackets and extensions
347 V Boxes	<ul style="list-style-type: none"> Installation of 347 V switches for commercial / industrial lighting 	<ul style="list-style-type: none"> Device mounting holes are 1/4 in. further apart Models available for flush or surface installation
Concrete Rings	<ul style="list-style-type: none"> Wire connections in concrete slabs 	<ul style="list-style-type: none"> 1-1/2 in. deep to 6 in. deep
Masonry Boxes	<ul style="list-style-type: none"> Device installation in masonry (concrete, bricks, ...) construction 	<ul style="list-style-type: none"> 2-1/2 in. deep and 3-1/2 in. deep From 1 to 6 gang
Pre-ganged Boxes	<ul style="list-style-type: none"> Sturdy boxes for multiple device installation (special covers required) 	<ul style="list-style-type: none"> 2 in. deep From 2 to 6 gang
Power / Communication Boxes	<ul style="list-style-type: none"> Installation of communication devices (cable TV, telephone, ...) side by side with power devices 	<ul style="list-style-type: none"> Communication devices concealed within a box or not 2 gang covers required

How to Select the Right Box

Technical Specifications

The selection of the proper box for a given job, is a function of 2 major factors: the application and the type of construction.

Type of Construction	APPLICATION	
	Device Installation	Wire Connection
Flush Installation	<ul style="list-style-type: none"> • Device boxes and wall plates • Square boxes and raised covers • Pre-ganged boxes and covers 	<ul style="list-style-type: none"> • Octagonal boxes and blank covers • Square boxes and blank covers
Surface Installation	<ul style="list-style-type: none"> • Utility boxes and covers • Square boxes and surface covers 	<ul style="list-style-type: none"> • Octagonal boxes and blank covers • Square boxes and blank covers
New Construction	<ul style="list-style-type: none"> • Device boxes and wall plates • Utility boxes and covers • Square boxes and covers 	<ul style="list-style-type: none"> • Octagonal boxes and blank covers • Square boxes and blank covers
Old Work	<ul style="list-style-type: none"> • Rework device boxes (special brackets) • Device boxes plus 820-D ("F" clips) • Switch Box Extension • Square extension and cover • Utility boxes and covers 	<ul style="list-style-type: none"> • Octagonal rework boxes (special brackets) • Octagonal extensions and blank covers • Square extensions and blank covers
Drywall / Wood Stud	<ul style="list-style-type: none"> • Device boxes and wall plates • Square boxes and raised covers 	<ul style="list-style-type: none"> • Octagonal boxes and blank covers • Square boxes and blank covers
Drywall / Metal Stud	<ul style="list-style-type: none"> • Steel stud device boxes and wall plates • Steel stud square boxes and raised covers 	<ul style="list-style-type: none"> • Steel stud octagonal boxes and blank covers • Steel stud square boxes and blank covers
Masonry / Concrete	<ul style="list-style-type: none"> • Masonry boxes and wall plates • Pre-ganged boxes and covers 	<ul style="list-style-type: none"> • Concrete rings and covers
Nonmetallic Sheathed Cable	<ul style="list-style-type: none"> • Device boxes with "LOOMEX" cable clamps • Device boxes with KOs and "LOOMEX" connectors 	<ul style="list-style-type: none"> • Octagonal boxes with "LOOMEX" cable clamps and blank covers • Octagonal / Square boxes with KOs and "LOOMEX" connectors
Armoured Cable	<ul style="list-style-type: none"> • Device boxes with "BX" cable clamps • Device boxes with KOs and "BX" connectors 	<ul style="list-style-type: none"> • Octagonal boxes with "BX" cable clamps and blank covers • Octagonal / Square boxes with KOs and "BX" connectors
Conduit / E.M.T.	<ul style="list-style-type: none"> • Device boxes with conduit KOs and E.M.T. connectors or rigid conduit and locknuts 	<ul style="list-style-type: none"> • Octagonal / Square boxes with conduit KOs and E.M.T. connectors or rigid conduit and locknuts

The selection is also guided by the physical dimensions of the box and, to a certain extent, by some personal preferences.

Physical dimensions: In a flush installation, the depth of the box is limited by the wall thickness. The cubic capacity of the box is also a major factor to consider. According to the C.E.C., only a limited number of conductors are allowed inside a box of a given cubic capacity (see maximum wire fill chart on page A11).

Personal preferences: Device boxes are available either gangable or non-gangable. Gangable means that two or more boxes can be joined together, on the job site, to create a multi-gang box as required. Most boxes are also available with or without brackets.

Boxes with brackets are usually installed with screws running through the bracket mounting holes. There are numerous types of brackets either to satisfy a specific need (steel stud bracket or rework bracket) or simply because of personal preferences.

Boxes without brackets are usually nailed from the outside of the box or screwed in place from the inside.

Catalogue Number Designation

Technical Specifications

Most boxes have a 2 part Catalogue Number: a PREFIX...

The prefix identifies the Series' number, which indicates the type of box, its physical dimensions, as well as the properties of each series.

i.e.: **BC1104** is the prefix which identifies a:

- Device / Box Gangable — 2-1/2 in. deep (12.5 cu. in.)

Series #: BC or CI as applicable	Cu. in.	Description
425	10	• Gangable Rework Device Box — 2 in. deep
525	12.5	• Gangable Rework Device Box — 2-1/2 in. deep
775	10	• Gangable Device Box — 2-1/4 in. deep
777	11	• Non-gangable Rework Device Box — 2-1/4 in. deep
1004	15	• Gangable Device Box — 3 in. deep
1018	18.0	• Gangable Device Box — 3 in. deep
1100	8	• Gangable Device Box — 1-1/2 in. deep
1102	10	• Gangable Device Box — 2 in. deep
1104	12.5	• Gangable Device Box — 2-1/2 in. deep
1110	16.5	• Utility Box — 1-7/8 in. deep
1141	13	• Utility Box — 1-1/2 in. deep
1151	18.5	• Utility Box — 2-1/8 in. deep
1199	18.5	• Utility Box — 2-1/8 in. deep
1204	16 / gang	• 347 V Gangable Device Box — 2-1/2 in. deep
1304	14.5	• Gangable Device Box — 2-1/2 in. deep
1504	15	• Non-gangable Device Box — 2-1/2 in. deep
1804	18	• Gangable Device Box — 2-1/2 in. deep
2004	18.5	• Non-gangable Device Box — 2-3/4 in. deep
2016	18.5	• Non-gangable Device Box — 2-1/2 in. deep
2018	13	• Utility Box — 1-1/2 in. deep
2020	14	• Utility Box — 1-7/8 in. deep
2104	12.5 / gang	• Non-gangable Device Box — 2-1/2 in. deep
2304	14.5	• Non-gangable Device Box — 2-1/2 in. deep
3004	18	• Gangable Device Box — 3 in. deep
3102	12	• Gangable Device Box — 2 in. deep
3104	16	• Gangable Device Box — 2-1/2 in. deep
4104	12.5	• Power / Communication Box — 2-1/2 in. deep
4204	12.5 / gang	• Power / Communication Box — 2-1/2 in. deep
4304	12.5	• Power / Communication Box — 2-1/2 in. deep

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- Device / Box Gangable — 2-1/2 in. deep (12.5 cu. in.)

Series #: BC or CI as applicable	Cu. in.	Description
52151	21	<ul style="list-style-type: none"> • 4 in. Square Box — 1-1/2 in. deep
52171	30	<ul style="list-style-type: none"> • 4 in. Square Box — 2-1/8 in. deep
53151	21	<ul style="list-style-type: none"> • 4 in. Square Extension — 1-1/2 in. deep
53171	30	<ul style="list-style-type: none"> • 4 in. Square Extension — 2-1/8 in. deep
54151	15	<ul style="list-style-type: none"> • 4 in. Octagonal Box — 1-1/2 in. deep
54171	21	<ul style="list-style-type: none"> • 4 in. Octagonal Box — 2-1/8 in. deep
54521 / 54591	see page A44	<ul style="list-style-type: none"> • Concrete Rings — 1-1/2 in. to 6 in. deep
55151	15	<ul style="list-style-type: none"> • 4 in. Octagonal Extension — 1-1/2 in. deep
55171	21	<ul style="list-style-type: none"> • 4 in. Octagonal Extension — 2-1/8 in. deep
56111	5	<ul style="list-style-type: none"> • 4 in. Ceiling Pan — 1/2 in. deep
72151	30	<ul style="list-style-type: none"> • 4-11/16 in. Square Box — 1-1/2 in. deep
72171	42	<ul style="list-style-type: none"> • 4-11/16 in. Square Box — 2-1/8 in. deep
73151	30	<ul style="list-style-type: none"> • 4-11/16 in. Square Extension — 1-1/2 in. deep
73171	42	<ul style="list-style-type: none"> • 4-11/16 in. Square Extension — 2-1/8 in. deep
CWB	16.0	<ul style="list-style-type: none"> • Concrete wall box
gsb	see page A54	<ul style="list-style-type: none"> • Pre-ganged Box — 2 in. deep
mbd	21 / gang	<ul style="list-style-type: none"> • Masonry Box — 3-1/2 in. deep
mbd-HV	22.25 / gang	<ul style="list-style-type: none"> • 347 V Masonry Box — 3-3/8 in. deep
mbs	14 / gang	<ul style="list-style-type: none"> • Masonry Box — 2-1/2 in. deep
mbs-HV	20.25 / gang	<ul style="list-style-type: none"> • 347 V Masonry Box — 2-3/8 in. deep
OBex	5	<ul style="list-style-type: none"> • 4 in. Round Extension — 1/2 in. deep
WBF	—	<ul style="list-style-type: none"> • Low Voltage Mounting Bracket

Catalogue Number Designation
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Catalogue Number Designation

Technical Specifications

Catalogic

- LMSA Clamps for nonmetallic sheathed cable or armoured cable and mounting strap
- LN Clamps for nonmetallic sheathed cable or armoured cable. Staked nails.
- LRB Clamps for nonmetallic sheathed cable or armoured cable and pivoting ends for “rework” installation
- LRE Clamps for nonmetallic sheathed cable or armoured cable. Recessed ears.
- LRW Clamps for nonmetallic sheathed cable or armoured cable and spring mounting device for installation in finished walls
- LSBA Clamps for armoured cable or nonmetallic sheathed cable and side bracket
- LSSA1X-1 Clamps for armoured cable or nonmetallic sheathed cable, mounting strap for steel stud installations and integral additional support bracket. Recessed 1 in.
- LSSA-2X Clamps for armoured cable or nonmetallic sheathed cable, mounting strap for steel stud installations and integral additional support bracket. 2 gangs.
- LSSA-3X Clamps for armoured cable or nonmetallic sheathed cable, mounting strap for steel stud installations and integral additional support bracket. 3 gangs.
- LSSAX Clamps for armoured cable or nonmetallic sheathed cable, mounting strap for steel stud installations and integral additional support bracket
- LSSAX-HV Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket. High voltage.
- LSSAX-1 Clamps for armoured cable or nonmetallic sheathed cable, mounting strap for steel stud installations and integral additional support bracket. Recessed 1 in.
- LSSX Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket
- LSS2X Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket. 2 gangs.
- LSS3X Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket. 3 gangs.
- LSSX-1 Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket. Recessed 1 in.
- LSS1X-1 Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket.
Recessed 1 in. 1 gang box.
- LSS2X-1 Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket.
Recessed 1 in. 2 gang box.
- LSS3X-1 Clamps for nonmetallic sheathed cable or armoured cable, mounting strap for steel stud installations and integral additional support bracket.
Recessed 1 in. 3 gang box.
- LX Self-locking spring clamps for nonmetallic sheathed cable
- LV V style bracket
- P Partition
- R Utility box extension
- SB Side bracket
- SSX Mounting strap for steel stud installations and integral additional support bracket
- SSX-HV Mounting strap for steel stud installations and integral additional support bracket. (Mounting ears spaced for high voltage devices)
- SSX-1 Mounting strap (offset for 2 x 1/2 in. drywall thicknesses) for steel stud installations and integral additional support bracket.
- VB Vapour barrier
- 1/2 1/2 in. conduit knockouts
- 1 1 in. conduit knockouts

When joined together, they identify a particular box and nothing else.

Therefore, **BC2104-LX** represents a non-gangable device box, 2-1/2 in. deep with self-locking clamps for nonmetallic sheathed cable.

Device Boxes – Available Models

Technical Specifications

		Gangable														Non-Gangable						
Depth		1 1/2	2	2	2	2 1/4	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3	2 1/4	2 1/2	2 1/2	2 1/2	2 3/4	2 1/2	
Cu. in.		8.0	10.0	10.0	12.0	10.0	12.5	12.5	14.5	12.5	12.5	16.0	18.0	15.0	18.0	18.0	11.0	12.5	14.5	15.0	18.5	25.0
Series # BC/CI		1100	1102	425	3102	775	525	1104	1304	4104	4304	3104	1804	1004	1018	3004	777	2104	2304	1504	2004	4204
Conduit Knockouts	Basic Model		✓	✓				✓						✓								
	B							✓														
	K							✓														
	KSSX											✓										✓
	KSS1X-1											✓										
	LE							✓														
	SB		✓					✓														
	SSX				✓								✓									
Nonmetallic Sheathed Cable Clamps (Loomex, NMD90)	L	✓	✓	✓		✓	✓	✓		✓				✓								
	LB							✓						✓								
	LD					✓																
	LH	✓										✓	✓	✓		✓					✓	
	LHT							✓														
	LHTQ								✓				✓			✓			✓			
	LLE	✓																	✓		✓	
	LHTQ-2/LLE-2																		✓			
	LHTQ-3/LLE-3																		✓			
	LHTQ-4/LLE-4																		✓			
	LMS								✓											✓		
	LN																		✓			
	LRB																✓					
	LRE	✓																				
	LRW								✓													
	LSSX												✓	✓			✓		✓			✓
	LSS2X																		✓			
LSS3X																		✓				
LSSX-1																✓						
LSS1X-1																		✓				
LSS2X-1																		✓				
Armoured Cable Clamps (BX, AC90)	LX																	✓			✓	
	LA							✓		✓												
	LBA							✓														
	LHA							✓				✓	✓	✓							✓	
	LLEA																		✓			
	LLEA-2																		✓			
	LMSA								✓													
	LSBA								✓													
	LSSAX				✓								✓	✓					✓		✓	✓
	LSSA-2X																		✓			
	LSSA-3X																		✓			
	LSSAX-1																✓					✓
	LSSA1X-1												✓									

Features, Brackets, Clamps, Knockouts

Technical Specifications

IBERVILLE® steel boxes and covers are manufactured from hot dipped galvanized steel sheet. Hot dipped galvanizing is one of the most effective methods of protecting bare steel from corrosion. This zinc coating is uniformly distributed both inside and outside the box, and not only protects the surface of the steel but also sacrifices itself through galvanic action to prevent corrosion at edges, holes (plain or tapped) and possible scratches. The use of hot dipped galvanized steel sheet ensures full zinc protection for all **IBERVILLE®** steel boxes and covers.

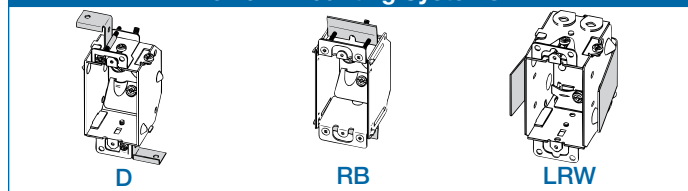
Ears



IBERVILLE® steel boxes incorporate numerous features which result in boxes rugged enough to stand up against the severest abuse.

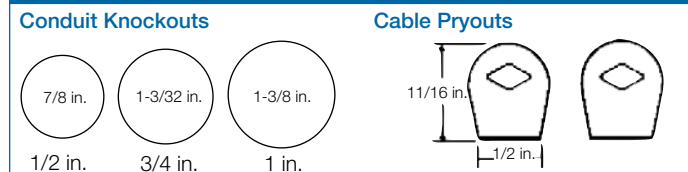
- Pre-set positioning tabs for perfectly aligned installation
- Formed stabilizing embosses, which prevent rocking and will not flatten under the impact of a hammer
- The Wedgelock system, which locks sides even tighter together when installed
- Diamond shaped pryouts, for easy removal
- Loomex cable clamps, with supporting legs that maintain elevation for easier cable entry
- Combination "slot / Robertson head" screws, which allow the use of more than one type of screwdriver
- Large pan head ground screws above two wire retainers
- Various types of brackets for different applications

Rework Mounting Systems*



* C.E.C. 2012 Rule 12-3010 (2)
Where ganged sectional boxes are used, they shall be secured to metal supports or to wooden boards at least 19 mm thick that are rigidly secured to the structural units.

Knockouts / Pryouts



Clamps



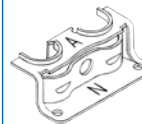
Device Boxes

Clamp for nonmetallic sheathed cable "Loomex".

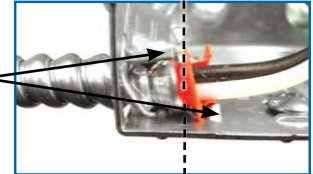


Octagonal Boxes

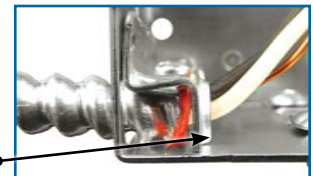
Clamp for nonmetallic sheathed cable "Loomex".



Clamp for armored cable "BX" & nonmetallic sheathed cable "Loomex".

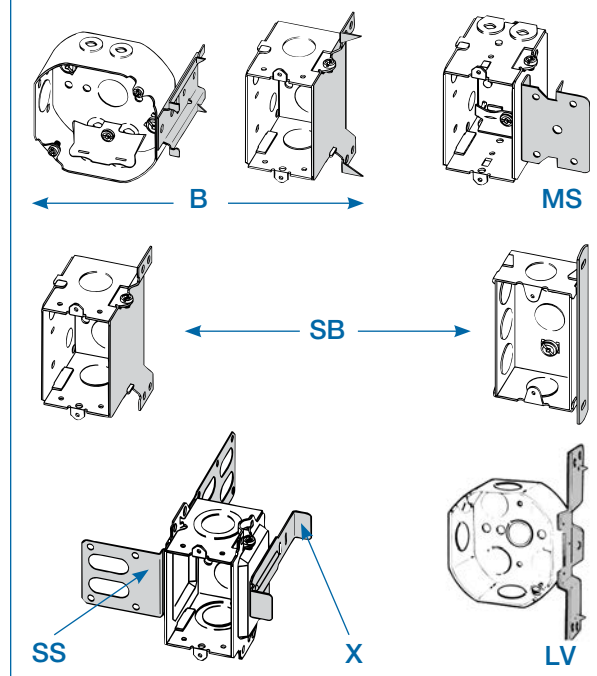


Our "LA" cable clamp: This clamp has been designed so that the anti-short bushing and the armour butt-up against a retaining wall built into the clamp.



Our dual usage boxes feature retaining flanges built into the bottom of the spacer, that in unison with the cable clamp, hold the anti-short bushing in place and prevent the armour from penetrating into the box.

Brackets



Maximum Wire Fill Chart

Technical Specifications

The Canadian Electrical Code specifies that the maximum number of conductors to be contained in a box is determined by the following factors:

- The total volume of the box assembly (box, extension, raised cover)
- The size (AWG) of the insulated conductors
- The presence of one or more fixture studs or hickey
- The number of wire connectors in the box
- The presence and thickness of flush devices mounted on a single strap

The table below indicates the maximum number of conductors allowed in a box containing 0 or 1 wire connectors and no fixture stud, hickey or flush device.

Space for conductors in boxes		
Size of Conductors (AWG)	Usable space required for each Insulated Conductor (cu. in.) (cu. cm.)	
14	1.50	24.6
12	1.75	28.7
10	2.25	36.9
8	2.75	45.1
6	4.50	73.7

			Maximum Number of Conductors ** (with 0 or 1 wire connectors)			
Cubic Inch Capacity * (Milliliter)		Box Series No. (BC or CI as applicable)	14 AWG	12 AWG	10 AWG	8 AWG
5	(81)	56111, 0BEX	3	2	2	-
8	(131)	1100	5	4	3	2
10	(163)	425, 775, 1102	6	5	4	3
11	(180)	777	7	6	4	4
12	(197)	3102	8	6	5	4
12.5	(204/gang)	525, 1104, 2104, 4104, 4204, 4304	8	7	5	4
13	(213)	1141, 2018	8	7	5	4
14	(229/gang)	2020, MBS	9	8	6	5
14.5	(237)	1304, 2304	9	8	6	5
15	(245)	1004, 1504, 54151, 55151	10	8	6	5
16	(262/gang)	1004-LB, 1204, 3104	10	9	7	5
16.5	(270)	1110, 1110-HV	11	9	7	6
18	(295)	1018, 1804, 3004, 54521	12	10	8	6
18.5	(303)	1151, 1199, 2004	12	10	8	6
20.25	(331/gang)	MBS-HV	13	11	9	7
21	(344/gang)	52151, 53151, 54171, MBD	14	12	9	7
22.25	(364/gang)	MBD-HV	14	12	9	8
24	(393)	54531	16	13	10	8
25	(410)	2104 (2 gangs)	16	14	11	9
27	(442)	2304 (2 gangs)	18	15	12	9
30	(491)	52171, 53171, 72151, 73151	20	17	13	10
36	(590)	54551	24	20	16	13
37.5	(614)	2104 (3 gangs)	25	21	16	13
39.5	(647)	2304 (3 gangs)	26	21	17	17
42	(688)	54561, 72171, 73171	28	24	18	15
50	(819)	2104 (4 gangs)	33	28	22	18
52	(853)	2304 (4 gangs)	34	29	23	18

* When a single strap device is more than 1 in. thick, reduce box capacity by: 5 cu. in. x thickness of device.

** The maximum number of conductors shown in the table must be reduced in each of the following cases:

- One conductor, if the box contains one or more fixture studs or hickey
- One conductor for every additional pair of wire connectors (1 conductor for 2 or 3 wire connectors, 2 conductors for 4 or 5 wire connectors...)
- Two conductors for each single strap flush device up to 1 in. thick
- 1 cu. in. = 16.4 milliliter = 16.4 cubic centimeter
- 1 cubic centimeter = 1 milliliter = 0.061 cu. in.