

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	Flush installation of a device (switch, receptacle, thermostat, ...)	From 1½ in. deep up to 3 in. deep Available options: cable clamps, brackets, gangable For new or old work
Octagonal boxes	Wire connections (junction box)	3 depths available: 1½ in., 1½ in., 2⅛ in.
	Light fixture installation	Available options: cable clamps, brackets, extensions
	Temporary device installation	
4 in. Square boxes	Wire connections (junction box)	2 depths available: 1½ in., 2⅛ in.
	Flush or surface device installation (special cover required)	Available options: brackets and extensions
4⅞ in. Square boxes	Range / Dryer receptacle installation	2 depths available: 1½ in., 2⅛ in.
	Wire connections (junction box)	Available options: brackets and extensions
	Flush device installation (special cover required)	
Utility boxes	Surface installation of a device (special cover required)	2 major models available: BC-1110, BC-2020 Available options: brackets and extensions
347 V Boxes	Installation of 347 V switches for commercial / industrial lighting	Device mounting holes are ¼ in. further apart Models available for flush or surface installation
Concrete rings	Wire connections in concrete slabs	1½ in. deep to 6 in. deep
Masonry boxes	Device installation in masonry (concrete, bricks, ...) construction	2½ in. deep and 3½ in. deep From 1 to 6 gang
Pre-ganged boxes	Sturdy boxes for multiple device installation (special covers required)	2 in. deep From 2 to 6 gang
Power / Communication boxes	Installation of communication devices (cable TV, telephone, ...) side by side with power devices	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	Device Installation	Application
		Wire Connection
Flush installation	Device boxes and wall plates	Octagonal boxes and blank covers
	Square boxes and raised covers	Square boxes and blank covers
	Pre-ganged boxes and covers	
Surface installation	Utility boxes and covers	Octagonal boxes and blank covers
	Square boxes and surface covers	Square boxes and blank covers
New construction	Device boxes and wall plates	Octagonal boxes and blank covers
	Utility boxes and covers	Square boxes and blank covers
	Square boxes and covers	
Old work	Rework device boxes (special brackets)	Octagonal rework boxes (special brackets)
	Device boxes plus 820-D ("F" clips)	Octagonal extensions and blank covers
	Switch box extension	Square extensions and blank covers
	Square extension and cover	
	Utility boxes and covers	
Drywall / Wood stud	Device boxes and wall plates	Octagonal boxes and blank covers
	Square boxes and raised covers	Square boxes and blank covers
Drywall / Metal stud	Steel stud device boxes and wall plates	Steel stud octagonal boxes and blank covers
	Steel stud square boxes and raised covers	Steel stud square boxes and blank covers
Masonry / Concrete	Masonry boxes and wall plates	Concrete rings and covers
	Pre-ganged boxes and covers	
Nonmetallic sheathed cable	Device boxes with "LOOMEX" cable clamps	Octagonal boxes with "LOOMEX" cable clamps and blank covers
	Device boxes with KOs and "LOOMEX" connectors	Octagonal / Square boxes with KOs and "LOOMEX" connectors
Armoured cable	Device boxes with "BX" cable clamps	Octagonal boxes with "BX" cable clamps and blank covers
	Device boxes with KOs and "BX" connectors	Octagonal / Square boxes with KOs and "BX" connectors
Conduit / E.M.T.	Device boxes with conduit KOs and E.M.T. connectors or rigid conduit and locknuts	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 A15).

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 – 2½ 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 – 2½ in. deep
775	10	Gangable device box – 2¼ in. deep
777	11	Non-gangable rework device box – 2¼ in. deep
1004	15	Gangable device box – 3 in. deep
1018	18	Gangable device box – 3 in. deep
1100	8	Gangable device box – 1½ in. deep
1102	10	Gangable device box – 2 in. deep
1104	12.5	Gangable device box – 2½ in. deep
1110	16.5	Utility box – 1⅞ in. deep
1141	13	Utility box – 1½ in. deep
1151	18.5	Utility box – 2⅞ in. deep
1199	18.5	Utility box – 2⅞ in. deep
1204	16 / gang	347 V Gangable device box – 2½ in. deep
1304	14.5	Gangable device box – 2½ in. deep
1504	15	Non-gangable device box – 2½ in. deep
1804	18	Gangable device box – 2½ in. deep
2004	18.5	Non-gangable device box – 2¾ in. deep
2016	18.5	Non-gangable device box – 2½ in. deep
2018	13	Utility box – 1½ in. deep
2020	14	Utility box – 1⅞ in. deep
2104	12.5 / gang	Non-gangable device box – 2½ in. deep
2304	14.5	Non-gangable device box – 2½ in. deep
3004	18	Gangable device box – 3 in. deep
3102	12	Gangable device box – 2 in. deep
3104	16	Gangable device box – 2½ in. deep
4104	12.5	Power / Communication box – 2½ in. deep
4204	12.5 / gang	Power / Communication box – 2½ in. deep
4304	12.5	Power / Communication box – 2½ in. deep

Catalogue number designation

Technical specifications

Series #: BC or CI as applicable	Cu. in.	Description
52151	21	4 in. square box – 1½ in. deep
52171	30	4 in. square box – 2⅞ in. deep
53151	21	4 in. square extension – 1½ in. deep
53171	30	4 in. square extension – 2⅞ in. deep
54151	15	4 in. octagonal box – 1½ in. deep
54171	21	4 in. octagonal box – 2⅞ in. deep
54591	72	Concrete rings – 1½ in. to 6 in. deep
55151	15	4 in. octagonal extension – 1½ in. deep
55171	21	4 in. octagonal extension – 2⅞ in. deep
56111	5	4 in. ceiling pan – ½ in. deep
72151	30	4-11/16 in. square box – 1½ in. deep
72171	42	4-11/16 in. square box – 2⅞ in. deep
73151	30	4-11/16 in. square extension – 1½ in. deep
73171	42	4-11/16 in. square extension – 2⅞ in. deep
CWB	16	Concrete wall box
mbd	21 / gang	Masonry box – 3½ in. deep
mbd-HV	22.25 / gang	347 V Masonry box – 3⅞ in. deep
mbs	14 / gang	Masonry box – 2½ in. deep
mbs-HV	20.25 / gang	347 V Masonry box – 2⅞ in. deep
OBex	5	4 in. round extension – ½ in. deep
WBF	–	Low voltage mounting bracket

Catalogue number designation

Technical specifications

... and a suffix

The suffix identifies the various features available for each series of boxes (in most cases, the suffix is strictly alphabetical).

i.e.: L is the suffix which identifies a box having:
Cable clamps for nonmetallic sheathed cable.

Catalogic	
B	Bracket (nailing style with prongs)
ER	Concrete ring extension
HV	High voltage
K	Concentric knockouts (½ in. and ¾ in.)
KSB	Concentric knockouts (½ in. and ¾ in.) and side bracket
KSS1X-1	Concentric knockouts (½ in. and ¾ in.), mounting strap for steel stud installations and integral additional support bracket. Recessed 1in., 1 gang.
KSSX	Concentric knockouts (½ in. and ¾ in.), mounting strap for steel stud installations and integral additional support bracket
KSSX-1	Concentric knockouts (½ in. and ¾ in.), mounting strap for steel stud installations and integral additional support bracket. Recessed 1in.
L	Clamps for nonmetallic sheathed cable
LA	Clamps for nonmetallic sheathed cable or armoured cable
LA-HV	Clamps for nonmetallic sheathed cable or armoured cable. High voltage.
LB	Clamps for nonmetallic sheathed cable and bracket (nailing style with prongs)
LBA	Clamps for armoured cable or nonmetallic sheathed cable and bracket (nailing style with prongs)
LD	Clamps for nonmetallic sheathed cable and "Swing-Arms" mounting device
LE	Less mounting ears
LF	Clamps for nonmetallic sheathed cable. Direct fan to box mounting.
LH	Clamps for armoured cable or nonmetallic sheathed cable. Extended sides for external nailing.
LHA	Clamps for armoured cable or nonmetallic sheathed cable. Extended sides for external nailing.
LHT	Clamps for nonmetallic sheathed cable or armoured cable. Extended sides for external nailing. Positioning tabs and 2 embossed mounting slots for internal screw installation.
LHTQ	Clamps for nonmetallic sheathed cable or armoured cable. Extended sides for external nailing. Positioning tabs and 2 embossed mounting slots for internal screw installation. Special 1 screw quick mount feature.
LHTQ-2	Clamps for nonmetallic sheathed cable or armoured cable. Extended sides for external nailing. Positioning tabs and 2 embossed mounting slots for internal screw installation. Special 1 screw quick mount feature. 2 gangs.
LHTQ-3	Clamps for nonmetallic sheathed cable or armoured cable. Extended sides for external nailing. Positioning tabs and 2 embossed mounting slots for internal screw installation. 3 gangs.
LHTQ-4	Clamps for nonmetallic sheathed cable or armoured cable. Extended sides for external nailing. Positioning tabs and 2 embossed mounting slots for internal screw installation. 4 gangs.
LLE	Clamps for nonmetallic sheathed cable or armoured cable. Less mounting ears.
LLE-2	Clamps for nonmetallic sheathed cable or armoured cable. Less mounting ears. 2 gangs.
LLE-3	Clamps for nonmetallic sheathed cable or armoured cable. Less mounting ears. 3 gangs.
LLE-4	Clamps for nonmetallic sheathed cable or armoured cable. Less mounting ears. 4 gangs.
LLEA	Clamps for armoured cable or nonmetallic sheathed cable. Less mounting ears.
LLEA-2	Clamps for armoured cable or nonmetallic sheathed cable. Less mounting ears. 2 gangs.
LMS	Clamps for nonmetallic sheathed cable or armoured cable and mounting strap.

Catalogue number designation

Technical specifications

Catalogic	
LMSA	Clamps for armoured cable or nonmetallic sheathed 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 armoured cable or nonmetallic sheathed 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
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
V	V style 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													
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	2 1/2	3	3
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
Series # BC/CI	1100	1102	425	3102	775	525	1104	1304	4104	4304	3104	1804	1004	1018
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											•			

Device boxes – available models

Technical specifications

	Non-Gangable						
Depth	3	2 ¹ / ₄	2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	2 ³ / ₄	2 ¹ / ₂
Cu. in.	18.0	11.0	12.5	14.5	15.0	18.5	25.0
Series # BC/CI	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							

Technical specifications

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Technical specifications

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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.

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

Features and benefits

- 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 Wedglock 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

Ears

CI1SCREAR/SCR



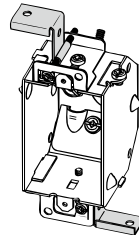
1 screw

CI2SCREAR/SCR

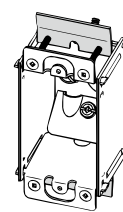


2 screw

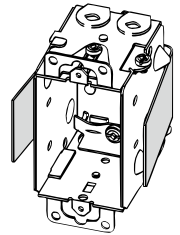
Rework mounting systems*



D



RB



LRW

* 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.

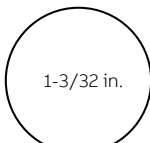
Knockouts / Pryouts

Conduit knockouts



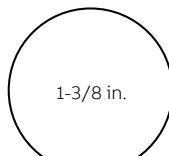
7/8 in.

1/2 in.



1-3/32 in.

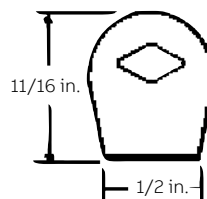
3/4 in.



1-3/8 in.

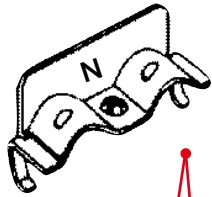
1 in.

Cable pryouts

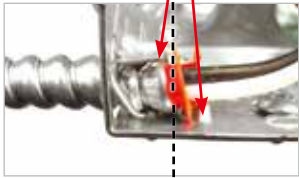


Clamps

Device boxes

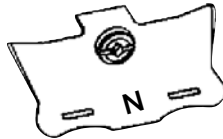


Clamp for nonmetallic sheathed cable "Loomex" and armoured cables "BX".



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.

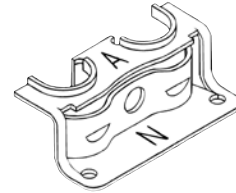
Octagonal boxes



Clamp for nonmetallic sheathed cable "Loomex".

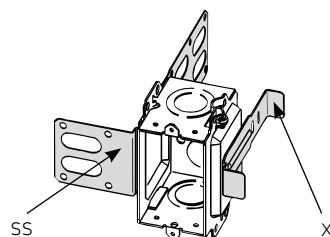
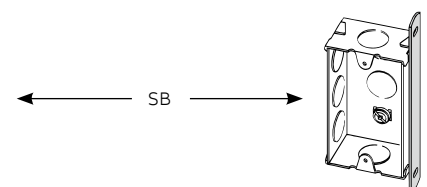
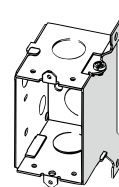
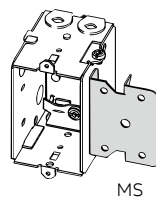
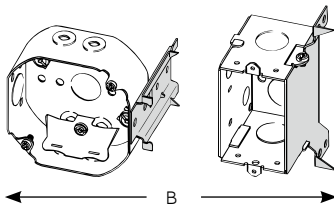


Our "LA" cable clamp:
This clamp has been designed so that the anti-short bushing and the armour butt-up against a retaining wall built into the clamp.



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

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 hickeyes

- 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.

Cubic Inch Capacity * (Milliliter)		Box Series No. (BC or CI as applicable), nonmetallic	Maximum Number of Conductors ** (with 0 or 1 wire connectors)			
			14 AWG	12 AWG	10 AWG	8 AWG
5	(81)	56111, OBEX	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, WSW, WSW-BX, WSW-N, WSW-FC, F-WSW, FWSWBX, WSW-US, F-WSW-US	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), WOCT, WOCT-FC, FWOCT, WOCT-US, F-WOCT-US	18	15	12	9
30	(491)	52171, 53171, 72151, 73151	20	17	13	10
33	(540)	2-WSW, 2-FWSW, 2WSW-US, 2-FWSW-US	22	18	14	12
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), 3-WSW, 3-FWSW	33	28	22	18
52	(853)	2304 (4 gangs), WRD, FWRD, 4-FWSW, 4-WSW	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 hickeyes
- 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.

Space for conductors in boxes

Size of Conductors AWG)	Space for conductors in boxes	
	(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