



# Distribution transformer components

## Product guide

# Bushings



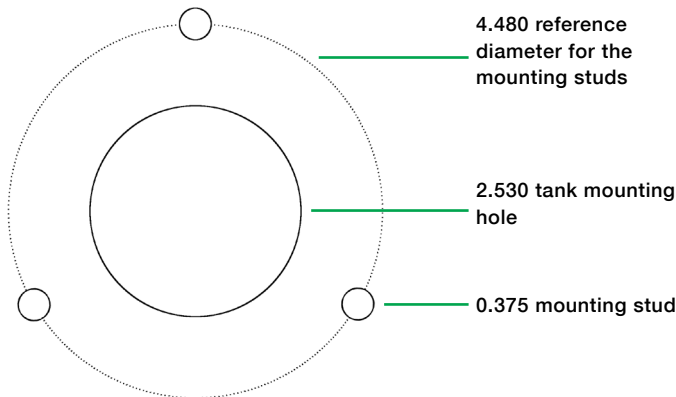
ABB offers both high voltage and low voltage bushings designed for use in pad or surface mounted transformers. The bushings insulate the current carrying conductor from the tank, allowing for termination of both the airside conductor and the transformer leads. Both the high and low voltage bushings have been designed to conform with ANSI/IEEE standards.

ABB high voltage bushing wells are molded from a glass-reinforced, high temperature nylon (HTN) resin. They are designed to mate with all bushing inserts conforming to the appropriate sections of IEEE 386-2006. In addition to the fixed stud bushing well, ABB offers a removable stud version.

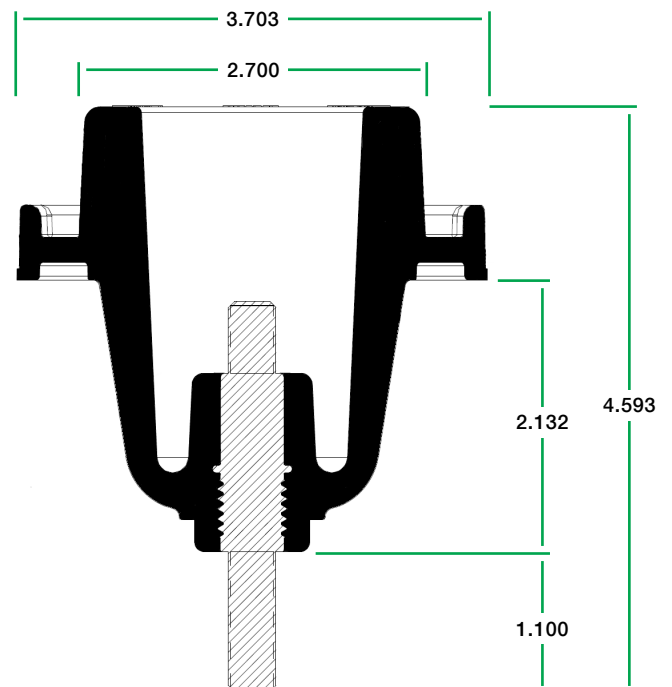
ABB one inch and five-eighths inch low voltage bushings are molded from a glass-reinforced, high temperature nylon resin. The 1.25 inch low voltage bushings are molded from a polyester resin. All of the low voltage bushings provide a spade terminal for internal connection and a threaded stud for external connection.

High voltage bushing well options	BIL (kV)	Continuous current (A)	Package quantity	Part number
Integral copper stud	150	200	48	1ZUA276301-AKC
Removable copper stud	150	200	48	1ZUA276301-AKD

## HV bushing mounting



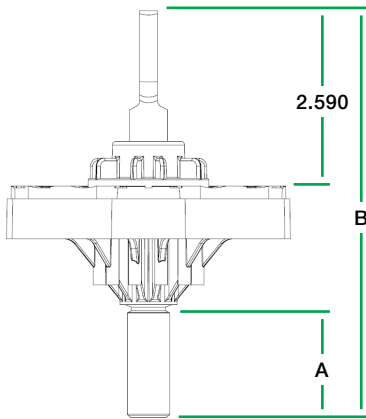
## HV bushing well key dimensions



\* Dimensions are presented in inches

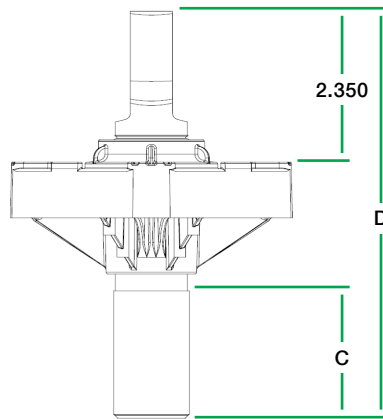
Low voltage bushing options	BIL (kV)	Continuous current (A)	Package quantity	Part number
0.625" copper standard length	30	600	48	1ZUA276301-AFC
0.625" copper extended length	30	600	48	1ZUA276301-AFD
1.000" copper standard length	30	1400	48	1ZUA276301-AGC
1.000" copper extended length	30	1400	48	1ZUA276301-AGD
1.250" copper with 1 hole	30	2083	24	2104C16G04
1.250" copper with 2 holes	30	2083	24	2104C16G07

5/8 inch low voltage bushing key dimensions



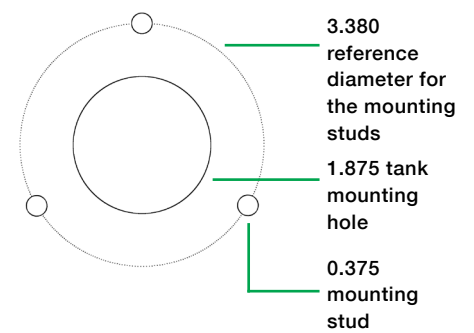
Stud style	Dimension A	Dimension B
Standard	1.500	6.000
Extended	2.110	6.620

1 inch low voltage bushing key dimensions

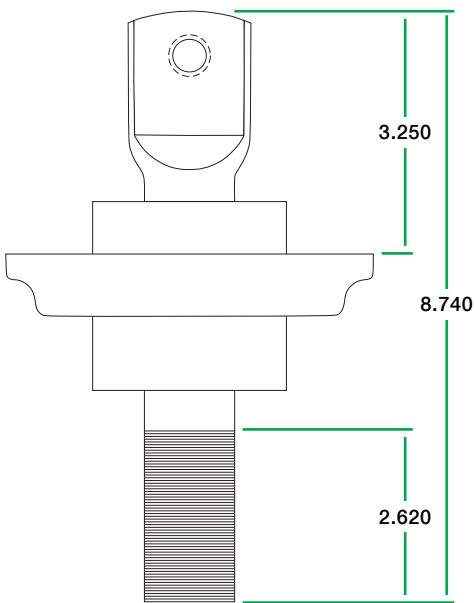


Stud style	Dimension C	Dimension D
Standard	1.750	6.330
Extended	2.520	7.100

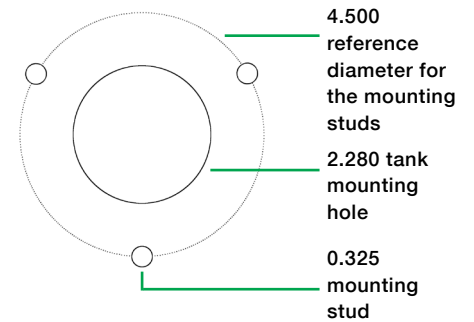
1 and 5/8 inch low voltage bushing mounting



1.25 inch low voltage bushing key dimensions and mounting



1.25 inch low voltage bushing mounting



\* Dimensions are presented in inches

# Fuse holders

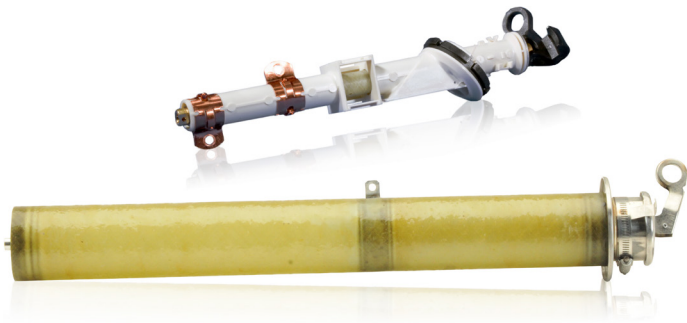


ABB offers two types of fuse holders - the Type K™ and the DO-III™ fuse holder. Both fuse holders are designed for use in pad-mounted transformers. The fuse holders are available in a variety of ratings and configurations which are detailed on the next few pages.

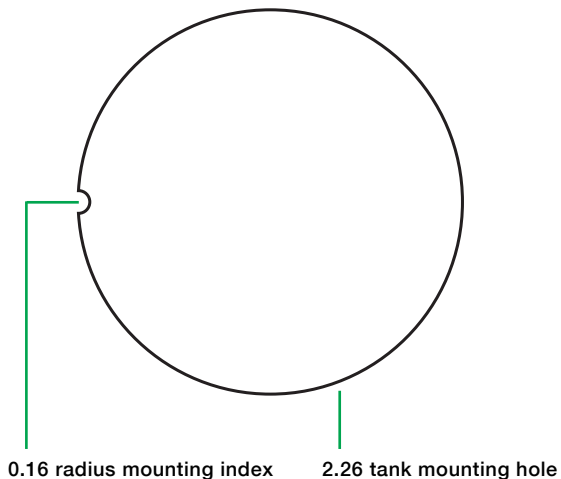
The ABB DO-III fuse holder is a draw-out, load-break expulsion fuse holder. It is intended to protect the distribution system in the event of an internal transformer fault, secondary fault, or severe overload when used with properly coordinated expulsion fuses. The DO-III fuse holder is designed for use at voltages up to 23 kV (line-to-ground) and 150 kV BIL.

The fuse holder works in conjunction with ABB DO-III fuse links which can be found on page 6 of this guide.

## DO-III fuse holder standard options

Vent hole	Check valve	Cartridge	Silver plating	Package quantity	Part number
x		x		144	1C10775G01
	x	x		144	1C10775G02
x	x	x		144	1C10775G03
x			x	144	1C10775G04
x		x	x	144	1C10775G06
	x	x	x	144	1C10775G07
	x		x	144	1C10775G08
x	x	x	x	144	1C10775G09
x	x			144	1C10775G20

## DO-III mounting



## DO-III fuse holder accessories

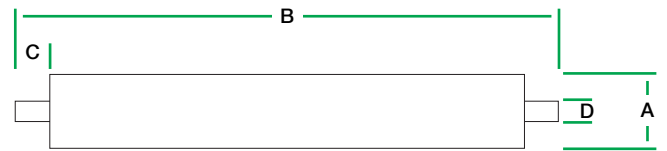
Description	Package quantity	Part number
Cartridge with end plug	72	1B11142G01
Silver plated cartridge with end plug	72	1B11142G02
Puller assembly, cartridge, and end plug	36	1C10765G01
Puller assembly	36	1C10765G02
Puller assembly, silver plated cartridge, and end plug	36	1C10765G03
Mounting nut and gasket	250	1C10775G05
Drip shield	250	1C10880H01
End plug	250	3A33981H01
Gasket	250	6457A49H09

\* Dimensions are presented in inches

The Type K current limiting fuse canister provides an air-insulated receptacle for general purpose current limiting fuses used in pad-mounted or submersible transformers such as the Hi-Tech Trans-Guard™ FX fuse. The Type K fuse holder features dead front construction, hermetic sealing, self-aligning spring contacts and stainless steel, corrosion-resistant components. Additionally, the canister can be welded or clamped onto the transformer tank.

The Type K fuse holder allows the operator easy access to the current limiting fuse for inspection or replacement. The table below provides the maximum fuse dimensions suitable for use in the Type K canister.

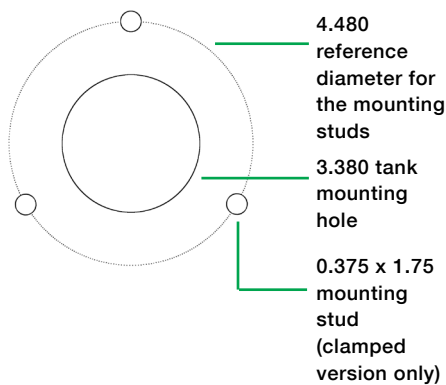
Voltage class (kV)	Maximum diameter A	Maximum length B	Terminal length C	Terminal diameter D
8.3	2.25	10.2	1.05	0.625
15.5	2.25	14.4	1.05	0.625
23	2.25	17.3	1.05	0.625



The Type K canister is available in three different voltage classes and is either welded into place or clamped.

Type K canister options				
Voltage (kV)	BIL (kV)	Package quantity	Part number - welded	Part number - clamped
8.3	95	24	4260079-904	4260079-901
15.5	125	24	4260079-905	4260079-902
23	125	24	4260079-906	4260079-903

#### Type K mounting



Type K accessories		
Description	Package quantity	Part number
Mounting clamp	24	9820A33H01
Gasket	48	1210221-021
Fuse holder adapter 8.3 kV to 15.5 kV	5	1260140000-002
Fuse holder adapter 8.3 kV to 23 kV	5	1260140000-003
Fuse holder adapter 15.5 kV to 23 kV	5	1260140000-001

\* Dimensions are presented in inches

# Fuses



Safety, including the protection of people and property, is at the forefront of today's business. Fuses offer a simple and cost effective solution to some of the risk associated with electric distribution. The fuses listed in the next few pages are intended for use under oil in distribution equipment.

ABB offers a variety of expulsion fuses. Both ABB protective links and draw-out fuses offer protection to the distribution system should an internal transformer fault occur. ABB's draw-out expulsion fuses also offer some protection for overload and secondary faults. Isolation links, though not true fuses with an interrupting rating, are used to protect those who work on transformers from connecting into a faulted circuit.

ABB draw-out fuses are designed for use in ABB's DOIII type fuse holder, but are interchangeable with most draw-out fuse holders on the market today. These fuses are available in three different configurations for a wide array of current ratings. The draw-out fuses are generally limited to 24.94 kV line-to-line grounded Y. However, when paired with a current limiting fuse the voltage rating can be extended slightly.

ABB isolation links are not fuses in the sense that they are not designed to interrupt current. However, isolation links are intended to be used in conjunction with draw-out expulsion fuses to prevent the unintentional re-energization of a faulted transformer. In the table below use the current rating and fuse type to locate the needed draw-out expulsion fuse and associated isolation link part numbers in the right two columns.

Draw-out fuses				
Current rating (Amperes)	Fuse type	Package quantity	Draw-out fuse part number	Optional isolation link part number
6	current sensing	20	1B11143G04	1C11130G01
10	current sensing	20	1B11143G06	1C11130G02
15	current sensing	20	1B11143G08	1C11130G02
25	current sensing	20	1B11143G10	1C11130G03
40	current sensing	20	1B11143G12	1C11130G03
65	current sensing	20	1B11143G14	1C11130G05
100	current sensing	20	1B11143G16	1C11130G05
140	current sensing	20	1B11143G17	1C11130G05
3	dual sensing	20	1B11144G03	1C11130G01
8	dual sensing	20	1B11144G05	1C11130G02
15	dual sensing	20	1B11144G08	1C11130G03
25	dual sensing	20	1B11144G10	1C11130G05
50	dual sensing	20	1B11144G12	1C11130G06
65	dual sensing	20	1B11144G14	1C11130G07
5	dual element	20	1B11145G03	1C11130G01
6	dual element	20	1B11145G04	1C11130G01
8	dual element	20	1B11145G05	1C11130G02
12	dual element	20	1B11145G06	1C11130G02
15	dual element	20	1B11145G07	1C11130G02
25	dual element	20	1B11145G09	1C11130G03
40	dual element	20	1B11145G11	1C11130G03
50	dual element	20	1B11145G12	1C11130G03

The ABB protective link is an oil-immersed, expulsion type fuse designed for use in the high voltage circuit of distribution equipment. Protective links are available in a variety of fuse sizes and voltage ranges up to 34.5 kV line-to-line grounded Y. In most applications today, the protective link is used in series with a partial range or back-up current limiting fuse such as the Hi-Tech Trans-Guard™ family of current limiting fuses.

The standard offering for the 15 kV protective link featured below includes a long lead. This product is also offered with a short lead or for block mounting. Please contact ABB for details.

<b>Protective links</b>					
<b>Current rating (Amperes)</b>	<b>Fuse curve</b>	<b>Package quantity</b>	<b>Part number through 15 kV</b>	<b>Part number through 23 kV</b>	<b>Part number through 34.5 kV</b>
4.5	2	10	592B581G01	779C667G01	345B995G21
6.2	3	10	592B581G02	779C667G02	345B995G29
7	3A	10	592B581G11	779C667G03	345B995G22
8.2	4	10	592B581G06	779C667G08	345B995G33
11	5	10	592B581G03	779C667G04	345B995G23
13	5A	10	592B581G12	779C667G09	345B995G24
16	6	10	592B581G04	779C667G05	345B995G28
21	7	10	592B581G05	779C667G06	345B995G25
24	7A	10	592B581G13	779C667G33	345B995G34
30	8	10	592B581G07	779C667G07	345B995G26
49	9	10	592B581G08	779C667G34	345B995G27
71	10	10	592B581G09	779C667G35	345B995G31
102	11	10	592B581G14	779C667G36	345B995G32
160	12	10	592B581G31	Not available	Not available
230	13	10	592B581G32	Not available	Not available

# Switches



ABB distribution transformer tap changers and dual voltage switches are de-energized, rotary type switches suitable for use in both pole and pad-mounted transformers. Tap changers are available that can handle up to 200 kV BIL and 150 amps, while dual voltage switches are available that can handle up to 125 kV BIL and 150 amps. The switches are configurable with many options including the number of decks, termination choices, handle styles, and dial plate designations. These switches were designed and tested in accordance with IEEE standard C57.12.00-2000.

ABB distribution tap changers and dual voltage switches feature a wide range of configurations. To select a standard switch, please refer to the following tables and locate the appropriate ratings and requirements.

For other configurations not listed in these tables, please contact your ABB representative.

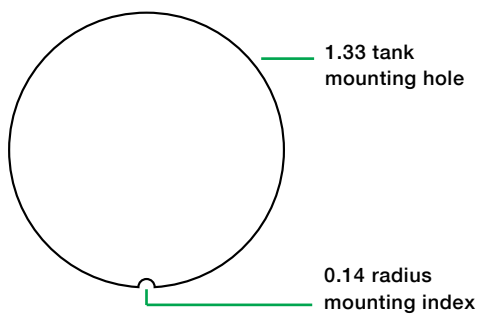
Dual voltage (DV)					
Number of decks	Current rating (Amperes)	Stationary contacts description	Moving contact description	Package quantity	DV switch part number
1	100	#12-10 Crimp   short	Rolling	75	609C176G05
1	100	#12-10 Crimp   0°	Rolling	75	609C176G09
1	100	#12-10 Crimp   45°	Rolling	75	609C176G15
1	100	#12-10 Crimp   90°	Rolling	75	609C176G16
1	150	0.25" bolt hole   45°	Rolling	75	609C176G12
1	150	0.25" bolt hole   90°	Rolling	75	609C176G11
1	150	0.25 - 20 stud   45°	Rolling	75	609C176G13
1	150	0.25 - 20 stud   90°	Rolling	75	609C176G08
2	100	#12-10 Crimp   short	Rolling	50	609C177G09
2	100	#12-10 Crimp   0°	Rolling	50	609C177G05
2	100	#12-10 Crimp   45°	Rolling	50	609C177G15
2	100	#12-10 Crimp   90°	Rolling	50	609C177G16
2	150	0.25" bolt hole   45°	Rolling	50	609C177G12
2	150	0.25" bolt hole   90°	Rolling	50	609C177G11
2	150	0.25 - 20 stud   45°	Rolling	50	609C177G13
2	150	0.25 - 20 stud   90°	Rolling	50	609C177G08
3	100	#12-10 Crimp   short	Rolling	25	609C181G12
3	100	#12-10 Crimp   0°	Rolling	25	609C181G05
3	100	#12-10 Crimp   45°	Rolling	25	609C181G15
3	100	#12-10 Crimp   90°	Rolling	25	609C181G16
3	150	0.25" bolt hole   45°	Rolling	25	609C181G08
3	150	0.25" bolt hole   90°	Rolling	25	609C181G11
3	150	0.25 - 20 stud   45°	Rolling	25	609C181G13
3	150	0.25 - 20 stud   90°	Rolling	25	609C181G09



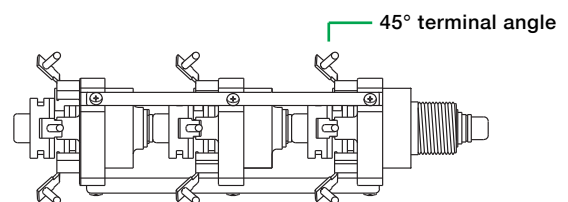
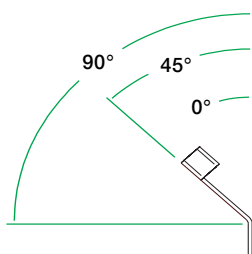
Tap changer (TC)

Number of decks	Current rating (Amperes)	Stationary contacts description	Moving contact description	Package quantity	TC switch part number
1	100	#12-10 Crimp   short	Wiping	75	1C11075G02
1	100	#12-10 Crimp   0°	Wiping	75	1C11075G01
1	100	#12-10 Crimp   45°	Wiping	75	1C11075G03
1	100	#12-10 Crimp   90°	Wiping	75	1C11075G04
1	150	0.25" bolt hole   45°	Rolling	75	609C175G12
1	150	0.25" bolt hole   90°	Rolling	75	609C175G07
1	150	0.25 - 20 stud   45°	Rolling	75	609C175G13
1	150	0.25 - 20 stud   90°	Rolling	75	609C175G08
2	100	#12-10 Crimp   short	Rolling	50	609C227G09
2	100	#12-10 Crimp   0°	Rolling	50	609C227G18
2	100	#12-10 Crimp   45°	Rolling	50	609C227G15
2	100	#12-10 Crimp   90°	Rolling	50	609C227G16
2	150	0.25" bolt hole   45°	Rolling	50	609C227G12
2	150	0.25" bolt hole   90°	Rolling	50	609C227G11
2	150	0.25 - 20 stud   45°	Rolling	50	609C227G13
2	150	0.25 - 20 stud   90°	Rolling	50	609C227G14
3	100	#12-10 Crimp   short	Rolling	25	609C178G12
3	100	#12-10 Crimp   0°	Rolling	25	609C178G05
3	100	#12-10 Crimp   45°	Rolling	25	609C178G15
3	100	#12-10 Crimp   90°	Rolling	25	609C178G16
3	150	0.25" bolt hole   45°	Rolling	25	609C178G09
3	150	0.25" bolt hole   90°	Rolling	25	609C178G14
3	150	0.25 - 20 stud   45°	Rolling	25	609C178G13
3	150	0.25 - 20 stud   90°	Rolling	25	609C178G11

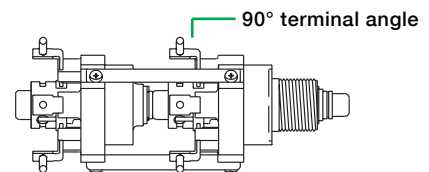
De-Energized switch mounting



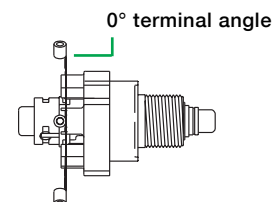
Terminal angle options



3 Decks



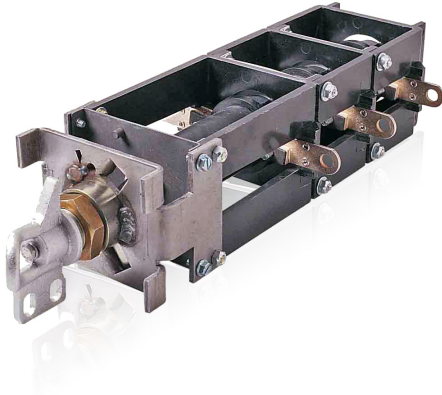
2 Decks



1 Deck

\* Dimensions are presented in inches

# Switches



The ABB LBOR-II switch is a manually operated, two position, load make or break, oil immersed, rotary switch. It is designed for use with distribution transformers (pad-mounted or submersible) and self contained distribution switchgear.

With a smaller mounting envelope than most switches on the market today, the LBOR-II switch has been designed to save you money. The reduced envelope allows for smaller equipment that requires less oil and steel to manufacture.

ABB LBOR II switches feature a wide range of configurations. To select a switch, please refer to the tables below and locate the appropriate ratings, then select a style number for the required mounting configuration. If interlock hardware kits are required for a nut mount switch, please order the suitable style without hardware and add the interlock hardware kit, style 3A33949G02.

For non-standard configuration options that are not listed in these tables, please contact your ABB representative.

## LBOR-II ordering information

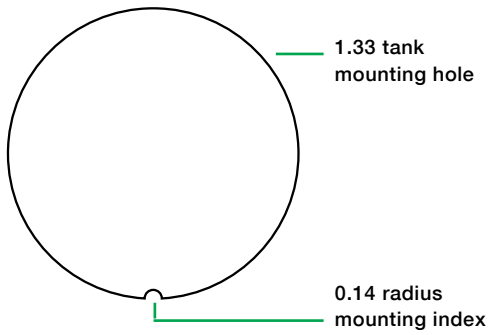
One deck				Style numbers				
Continuous current (A)	BIL (kV)	Maximum voltage (L-G kV)	Mounting orientation	Weld-in without hardware	Weld-in with standard hardware	Weld-in with interlock hardware	Nut mounting with hardware	Nut mounting without hardware
300	95	8.9	Wall	272D914G01	272D914G11	272D914G14	L095NC3001	L095JC3001
300	150	21.9	Wall/Cover	272D913G01	272D913G11	272D913G14	L150NC3001	L150JC3001
400	150	15.5	Wall/Cover	272D923G01	272D923G11	272D923G14	L150NC4001	L150JC4001

Two deck				Style numbers				
Continuous Current (A)	BIL (kV)	Maximum voltage (L-G kV)	Mounting orientation	Weld-in without hardware	Weld-in with standard hardware	Weld-in with interlock hardware	Nut mounting with hardware	Nut mounting without hardware
300	95	8.9	Wall	272D914G02	272D914G12	272D914G15	L095NC3002	L095JC3002
300	150	21.9	Wall/Cover	272D913G02	272D913G12	272D913G15	L150NC3002	L150JC3002
400	150	15.5	Wall/Cover	272D923G02	272D923G12	272D923G15	L150NC4002	L150JC4002

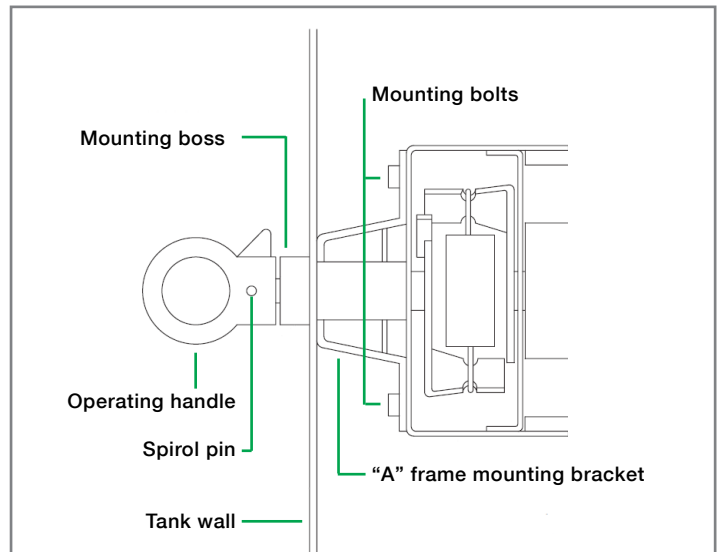
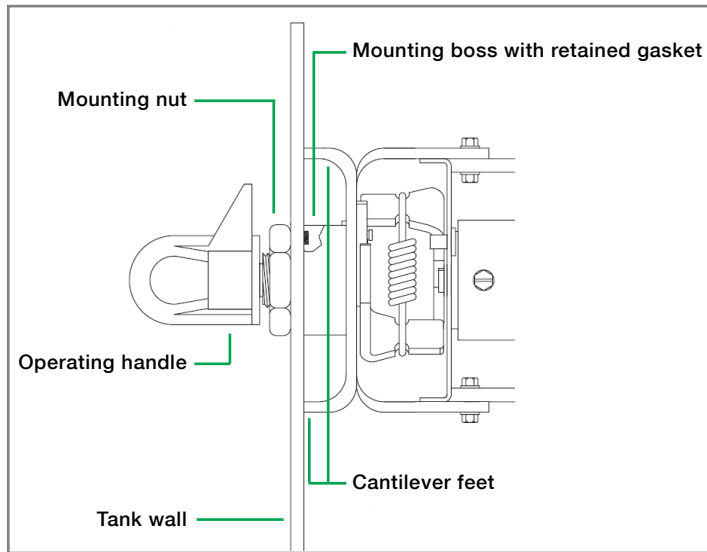
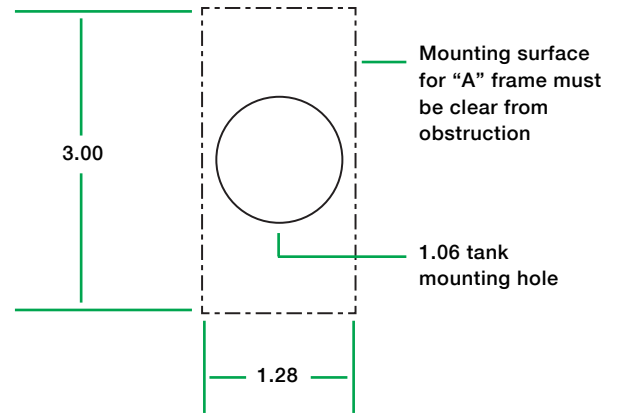
Three deck				Style numbers				
Continuous current (A)	BIL (kV)	Maximum voltage (L-L kV)	Mounting orientation	Weld-in without hardware	Weld-in with standard hardware	Weld-in with interlock hardware	Nut mounting with hardware	Nut mounting without hardware
300	95	15.5 Grd-Y	Wall	272D914G03	272D914G13	272D914G16	L095NC3003	L095JC3003
300	150*	38 Grd-Y	Wall/Cover	272D913G03	272D913G13	272D913G16	L150NC3003	L150JC3003
400	150*	27 Grd-Y	Wall/Cover	272D923G03	272D923G13	272D923G16	L150NC4003	L150JC4003

\* Per IEC 265-1 the BIL rating for these styles is 180 kV

**LBOR nut mounting**



**LBOR weld-in mounting**



\* Dimensions are presented in inches

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