

## Low Voltage Release for DD - Frame



### Features

- Trips the attached circuit breaker when the supplied voltage is lower than the release voltage
- Prevents reconnection of circuit breaker when voltage supplied is lower than latching voltage
- Fail-safe alternative to shunt trip applications
- Factory-fitted and internally connected to circuit breaker
- Quick-connect 6 mm spade terminals
- The unit is reverse polarity protected
- < 1.5 W standby power dissipation at 24 V operation

### Applications

- Battery management
- Telecommunications
- Railways
- Solar
- System automation
- Fail-safe to trip circuit breaker in distant, difficult-to-reach or unsafe environments

The low voltage release (LVR) unit is a factory-fitted module that will trip the attached circuit breaker when the supplied voltage at the LVR terminals is lower than the release voltage. The LVR can be used in applications where an alternative to a shunt trip is required. A single LVR unit is attached to the right-hand side of the circuit breaker. Two LVR units, one either side of the circuit breaker, can be connected for fail-safe applications where redundancy is necessary and each LVR can be used to monitor the same or isolated circuits.

### Approvals



## Low Voltage Release for DD - Frame

### Technical Data

Specifications	Minimum	Typical	Maximum
Latching Voltage	18 Vdc	24 Vdc	28 Vdc
Latching Current	170 mA	235 mA	280 mA
Latching Power	3 W	5.6 W	7.9 W
Latching Power Duration		400 ms	
Latching Transient Rise Time			5 ms
Holding Voltage	13 Vdc	24 Vdc	28 Vdc
Holding Current	45 mA		70 mA
Standby Power	0.7 W	1.5 W	2 W
Release Voltage	0 Vdc	10.6 Vdc	11 Vdc
Operating Temperature	-40° C		+80° C

Note: All tests performed at an ambient temperature of 25° C

Parameter	Specification
Number of Tripping Operations	In excess of 2000
Flammability	I3 - No flames, persistence at 850° C
Toxicity	F1 - Smoke index of ≤ 20 which determines the fume class
Pollution Degree	PD2 - Normally only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

### Ordering Information

To select a DD - frame with a single or double LVR unit, select 4 or 6 respectively, from Group 2 in the ordering code below.

Group 1: Frame	Code	Description	Comments
	D	DD-frame	
Group 2: Type	Code	Description	Comments
	4	Single LVR (24 Vdc)	Single LVR option (fitted to the right pole)
	6	Double LVR (24 Vdc)	Double LVR option (left & right pole)
Group 3: Mounting	Code	Description	Comments
	A	Front mount, rectangular aperture, standard (toggle) handle type	Maximum penetration depth into the product by the mounting screw is 6 mm
Group 4: Handle	Code	Description	Comments
	A	Standard (toggle) handle	
Group 5: Termination	Code	Description	Comments
	3X	Plug-in (bullet) terminal (Ø 7.80 mm X 21.5 mm)	100 A max
	4X	Flush rear screw terminal, M5 or 10 - 32	50 A max
	5X	Double quick connect terminal (0.8 mm X 6.35 mm)	30 A max
	AX	Stud terminals, M5 or 10 - 32	60 A max
	DX	Quick connect terminals (0.8 mm x 6.35 mm), top & bottom	30 A max.
	MX	Stud terminals, M6 or 1/4 - 20	100 A max
Group 6: Total Number of Poles	Code	Description	Comments
	2	Double pole - METRIC	2 poles in total consisting of: 1 x DD-frame pole + 1 x LVR pole
	3	Triple pole - METRIC	3 poles in total consisting of: 2 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 1 x DD-frame pole + 1 x LVR pole
	4	Four pole - METRIC	4 poles in total consisting of: 3 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 2 x DD-frame poles + 1 x LVR pole
	5	Five pole - METRIC	5 poles in total consisting of: 4 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 3 x DD-frame poles + 1 x LVR pole
	B	Double pole - IMPERIAL	2 poles in total consisting of: 1 x DD-frame pole + 1 x LVR pole
	C	Triple pole - IMPERIAL	3 poles in total consisting of: 2 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 1 x DD-frame pole + 1 x LVR pole
	D	Four pole - IMPERIAL	4 poles in total consisting of: 3 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 2 x DD-frame poles + 1 x LVR pole
	E	Five pole - IMPERIAL	5 poles in total consisting of: 4 x DD-frame poles + 1 x LVR pole - OR - 1 x LVR pole + 3 x DD-frame poles + 1 x LVR pole

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# Low Voltage Release for DD - Frame

## Ordering Information

Code	Description	Comments	Description	Comments			
H	125 Vdc		240 / 415 V 50 / 60 Hz	3 phase multi-wire system			
J	240 Vac 50 / 60 Hz		120 / 240 V 50 / 60 Hz	3 wire centre tap supply. 120 V per phase.			
M	80 Vdc / 240 V 50 / 60 Hz	AC / DC version. With AC and DC curves.	60 Vdc				
N	80 Vdc						
Code	Description	System	Pulse Tolerance (X In)	Code	Description	System	Pulse Tolerance (X In)
AD	Long delay 50 / 60 Hz AS & Dual rated	AC and DC	8 - 10	CH	Short delay 50 / 60 Hz CS & High inrush	AC	12 - 15
BD	Medium delay 50 / 60 Hz BS & Dual rated	AC and DC	8 - 10	AS	Long delay 50 / 60 Hz	AC or DC	8 - 10
CD	Short delay 50 / 60 Hz CS & Dual rated	AC and DC	6 - 8	BS	Medium delay 50 / 60 Hz	AC or DC	8 - 10
AE	Long delay 50 / 60 Hz AH & Inertia delay	AC	28 - 35	CS	Short delay 50 / 60 Hz	AC or DC	6 - 8
BE	Medium delay 50 / 60 Hz BH & Inertia delay	AC	28 - 35	AW	Long delay 50 / 60 Hz AD & Inertia delay	AC and DC	16 - 20
CE	Short delay 50 / 60 Hz CH & Inertia delay	AC	21 - 35	BW	Medium delay 50 / 60 Hz BD & Inertia delay	AC and DC	16 - 20
AI	Long delay 50 / 60 Hz AS & Inertia delay	AC or DC	16 - 20	CW	Short delay 50 / 60 Hz CD & Inertia delay	AC and DC	12 - 15
BI	Medium delay 50 / 60 Hz BS & Inertia delay	AC or DC	16 - 20	H3	Short delay	DC	6 - 8
CI	Short delay 50 / 60 Hz CS & Inertia delay	AC or DC	12 - 15	OP	Instantaneous trip 50 / 60 Hz	AC or DC	None
AH	Long delay 50 / 60 Hz AS & High inrush	AC	16 - 20	OX	Switch 50 / 60 Hz	AC and DC	
BH	Medium delay 50 / 60 Hz BS & High inrush	AC	16 - 20				
Code	Description	Comments					
XXXX	No current, for voltage trip poles						
100M	0.1 A	Specific Ampere rating possible from 0.1 A to 300 A (80 Vdc), Single LVR 0.1 A to 250 A (80 Vdc), Double LVR 300 A (60 Vdc), Single & Double LVR					
0100	1 A						
1000	10 A						
K250	250 A						
Code	Description	Comments					
AX	Switch						
BX	Series trip (circuit breaker, current coil in series)						
CX	Relay trip current sensing, centre terminal construction, 4 terminal	Total load 100 A max					
DX	Relay trip voltage sensing, centre terminal construction, 4 terminal	See Group 12 for voltage options					
EX	Shunt trip current sensing, 3rd terminal close to load side	Total load 100 A max					
FX	Shunt trip voltage sensing, 3rd terminal close to load side	See Group 12 for voltage options					
GX	Dual control shunt trip construction, 3rd terminal close to load side	Curves AH, BH, CH, AE, BE, CE not possible. See Group 12 for voltage options (Voltage coil normally at line voltage)					
HX	Dual control relay trip construction (4 terminal)	Curves AH, BH, CH, AE, BE, CE not possible. See Group 12 for voltage options					
JX	Switch with auxiliary switch						
KX	Series trip, with auxiliary switch						
MX	Series trip, trip alarm (latch type - reversed function)						
H1	Dual control relay trip construction, fly leads for relay trip coil, with auxiliary switch	Fly leads (wire terminals) for relay trip coil (Group 13) Curves AH, BH, CH, AE, BE, CE not possible					
Code	Description	Description					
X	Not applicable						
A	DB3 - Gold tips, equally spaced terminals, 2.75 mm, (0.108") 0.1 A Max						
B	DB2 - Silver tips, equally spaced terminals, 2.75 mm, (0.108") 10 A Max						
M	Parallel bridge housing - for all parallel bridged poles						
Code	Description	Code	Description	Code	Description	Code	Description
XX	Not applicable	A3	65 Vac 50 / 60 Hz	B0	12 Vdc	B3	80 Vdc
A1	12 Vac 50 / 60 Hz	A4	110 - 125 Vac 50 / 60 Hz	B1	24 Vdc		
A2	24 Vac 50 / 60 Hz	A5	220 - 240 Vac 50 / 60 Hz	B2	48 Vdc		
Code	Description	Comments					
X	Not applicable						
B	Screw terminal, M5 or 10 - 32						
C	Quick connect terminals (0.8 mm X 6.35 mm)						
D	Flying leads (wire terminals)						
E	Stud terminal, M5 or 10 - 32						

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### Ordering Information

<b>Group 14:</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	X	Future use			
<b>Group 15: Customer Specific</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	X	Not applicable			
	S	Customer Specific			
<b>Group 16: Handle Colour</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	X	Not applicable			
	B	Black handle, white marking			
	G	Green handle, white marking			
	W	White handle, black marking			
	R	Red handle, white marking			
	Y	Yellow handle, black marking			
<b>Group 17: Marking</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	X	Not applicable			
	D	I – O and ON - OFF			
<b>Group 18: Mounting Orientation for Marking</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	1	Breaker mounted in Vertical Axis with LINE at the BOT-TOM, Marking reads left to right - normal horizontal			
	V	Breaker mounted in Vertical Axis with LINE at the TOP, Marking reads left to right - normal horizontal			
	2	Breaker mounted in Horizontal Axis with LINE at the RIGHT HAND SIDE,			
	H	Breaker mounted in Horizontal Axis with LINE at the LEFT HAND SIDE,			
	X	Not Applicable			
<b>Group 19: Front Plate Marking and Test Button</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	A	Standard marking on standard toggle handle	I – O and ON - OFF and ampere rating		
<b>Group 20: Inter-phase Barrier and Terminal Cover</b>	<b>Code</b>	<b>Description</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>
	X	Not applicable	4	Z inter-phase barrier & terminal cover	Inter-phase barriers and terminal covers may be required for multi-pole products with UL listed and UL recognised approvals. See DD-frame Technical Guide.
	1	Terminal cover (s)	A	Small inter-phase barrier	
	2	Small inter-phase barrier & terminal cover	B	Large inter-phase barrier	
	3	Large inter-phase barrier & terminal cover	C	Z inter-phase barrier	
<b>Group 21: Approvals (Product Normally Approved to)</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	1	CUR, UL recognised (UL 1077), IEC / EN 60934, CSA, VDE, CE	UL 1077, normally IEC / EN 60934		
	2	CUL, UL listed (UL 489), CSA, IEC / EN 60947-2, VDE, CE	UL 489, normally IEC / EN 60947-2		
	3	UL listed (UL 489A), IEC / EN 60947-2, VDE, CE	DC (telecommunication)		
<b>Group 22: Safety Marks</b>	<b>Code</b>	<b>Description</b>	<b>Comments</b>		
	X	Not applicable			
	C	CCC / CRCC	For products exported to People's Republic of China		

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### Using the LVR Unit

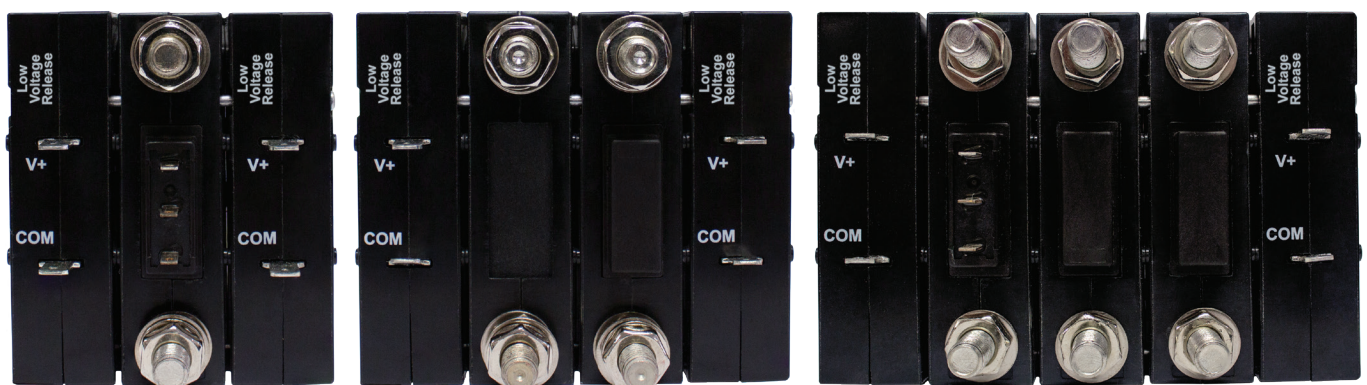
The LVR unit has four states of operation: latch, holding, release and reset. These states are determined by the voltage applied to its terminals, where the positive is connected to “V+” and the common to “COM”.

The LVR must be latched before the circuit breaker can be switched on. To latch the LVR, a voltage within the Latching Voltage range must be applied to the LVR. Once latched, the LVR current reduces to the holding value. The LVR will not interfere with the circuit breaker's operation, provided the applied voltage remains in the Holding Voltage range.

When the LVR supply voltage reduces to the Release Voltage, the LVR will trip the attached circuit breaker. If the breaker has tripped (either due to over-current or by the LVR), the LVR supply voltage must be power cycled to reset the LVR, before the breaker can be relatched.

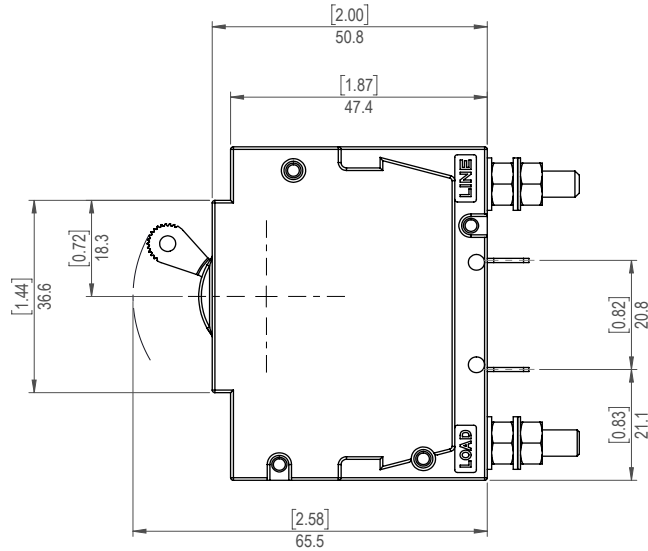
To reset the LVR, the supply voltage has to be cycled to zero and the Latching Voltage reapplied. To latch the LVR, the supply must be applied suddenly, as per the Latching Transient Rise Time, to initiate the latching action i.e. a slow rise of the LVR supply voltage will not initiate a latching action.

If the supply voltage polarity is incorrectly applied, the LVR unit is protected and will not operate until the supply voltage is connected correctly. The LVR supply terminals are electrically isolated from the attached circuit breaker's terminals and can therefore be powered from an independent supply.

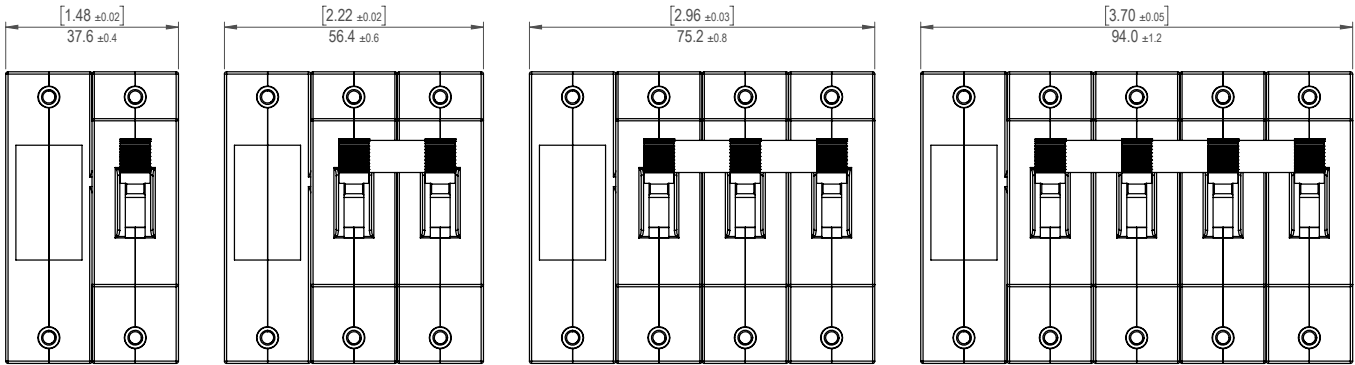


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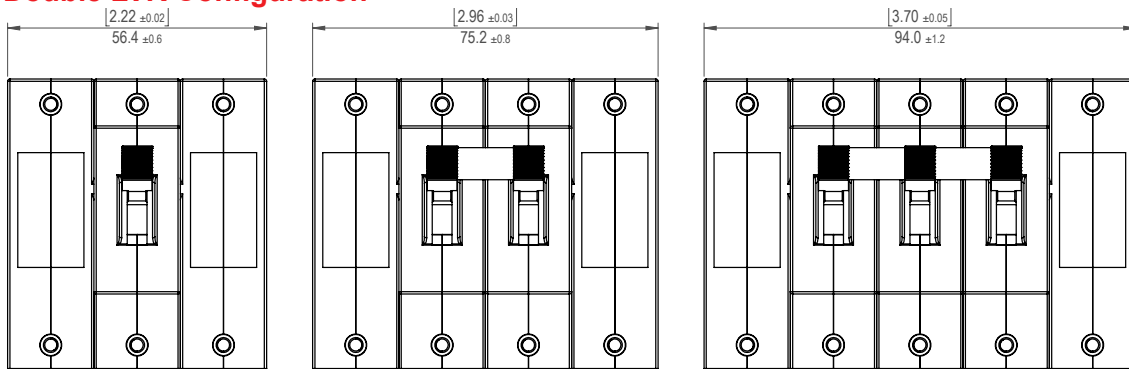
### Dimensional Drawings



### Single LVR Configuration



### Double LVR Configuration



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