

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.

If the supply voltage polarity is incorrectly applied, the LVR unit is protected and will not operate until the supply voltage is connected correctly.

Approvals



Pending



Pending



Approved



Pending



Certified



Pending



Pending

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Technical Data

Specifications	Minimum	Typical	Maximum
Latching Voltage	18 Vdc	24 Vdc	28 Vdc
Latching Current	170 mA	235 mA	280 mA
Latching Power	3.06 W	5.64 W	7.90 W
Latching Power Duration	380 ms	400 ms	420 ms
Latching Transient Rise Time	<0.01 ms		5 ms
Holding Voltage	13 Vdc	24 Vdc	28 Vdc
Holding Current	45 mA	-	70 mA
Standby Power	0.69 W	1.44 W	1.96 W
Release Voltage	0 Vdc	10.6 Vdc	11 Vdc
Operating Temperature	-40° C		+80° C
Humidity	35% RH	-	85% RH

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	Code	Description	Comments
Group 1: Frame	D	DD-frame	
Group 2: Type	Code	Description	Comments
	4	Single LVR (24 Vdc)	Single LVR option (fitted to the right pole) available up to 5 pole max
	6	Double LVR (24 Vdc)	Double LVR option (left & right pole) available up to 5 pole max
Group 3: Mounting	Code	Description	Comments
	A	Front mount, rectangular aperture, standard (toggle) handle type	Warning: 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
	2X	Plug-in (bullet) terminal (Ø 6.25 mm X 21.5 mm)	50 A max
	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	100 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.
	LX	Clamp terminals, top & bottom	30 A max.
	MX	Stud terminals, M6 or 1/4-20	100 A max
	V1	Stud terminals (M6 or ¼ - 20), for single bridged unit	
	V2	Plug-in (bullet) terminals (Ø 7.80 mm X 21.5 mm), for single bridged unit	
	W1	Stud terminals (M6 or ¼ - 20), for multi pole bridged unit	
	W2	Plug-in (bullet) terminals (Ø 7.80 mm X 21.5 mm), for multi pole bridged unit	
X1	Bridge terminal for 2 pole parallel construction width M8 nut for lug (on M6 or ¼-20 stud terminal)		

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Ordering Information

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					
Group 7: Rated Voltages and Frequency - Main Circuit	Code	Description	Comments	Description	Comments			
	H	125Vdc		Q	240 / 415V 50 / 60 Hz 3 phase multi-wire system			
	J	240Vac 50 / 60 Hz		R	277 / 480V 50 / 60 Hz 3 phase multi-wire system			
	K	277V 50 / 60 Hz		S	120 / 240V 50 / 60 Hz 3 wire centre tap supply, 120V per phase.			
	L	80Vdc / 277V 50 / 60 Hz	AC / DC version. With AC and DC curves.	V	60Vdc			
	M	80Vdc / 240V 50 / 60 Hz	AC / DC version. With AC and DC curves.	Z	Special - specify			
	N	80Vdc						
Group 8: Time Delay Characteristics (Curve Details); Pulse Tolerance at 10 ms	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				
Group 9: Rated Current (Main Circuit) Examples only - Specific Amp Rating Possible	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 (80Vdc), Single LVR 0.1 A to 250 A (80Vdc), Double LVR 300 A (60Vdc), Single & Double LVR					
	0100	1 A						
	1000	10 A						
	K250	250 A						
Group 10: Circuit Configuration (circuit breaker's internal construction)	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.					
Group 11: Auxiliary and Alarm Switches	Code	Description	Comments					
	X	Not applicable						
	A	Gold tips, equally spaced terminals, 2.75 mm, (0.108") 0.1 A Max						
	B	Silver tips, equally spaced terminals, 2.75 mm, (0.108") 10 A Max						
	M	Parallel bridge housing - for all parallel bridged poles						

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Ordering Information

Group 12: Voltage and Current Ratings for Dual Control, Shunt and Relay Trip Construction	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		
Group 13: Terminal Options for Dual Control, Shunt and Relay Coils	Code	Description			Comments			
	X	Not applicable						
	B	Screw terminal, M5 or 10 - 32			50 A max			
	C	Quick connect terminals (0.8 mm X 6.35 mm)			30 A max			
	D	Flying leads (wire terminals)			15 A max			
	E	Stud terminal, M5 or 10 - 32			60 A max			
Group 14: Voltage for Rocker Handle	Code	Description			Comments			
	X	Not applicable						
Group 15: Terminal for Illuminated Rocker	Code	Description			Comments			
	X	Not applicable						
Group 16: Handle Colour	Code	Description			Comments			
	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						
Group 17: Marking	Code	Description			Comments			
	D	I – O and ON - OFF			For products requiring VDE & UL approvals			
Group 18: Mounting Orientation for Marking	Code	Description			Comments			
	V	Vertical (standard mounting, line at the top)						
Group 19: Front Plate Marking and Test Button	Code	Description			Comments			
	A	Standard marking, standard handle			I – O and ON - OFF and ampere rating			
Group 20: Inter-phase Barrier and Terminal Cover	Code	Description	Comments		Code	Description	Comments	
	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		
Group 21: Approvals (Product Normally Approved to)	Code	Description			Comments			
	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)			
	Z	No third party approvals						
Group 22: Safety Marks	Code	Description			Comments			
	X	Not applicable						
	C	CCC / CRCC			For products exported to People's Republic of China			

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Using the LVR Unit

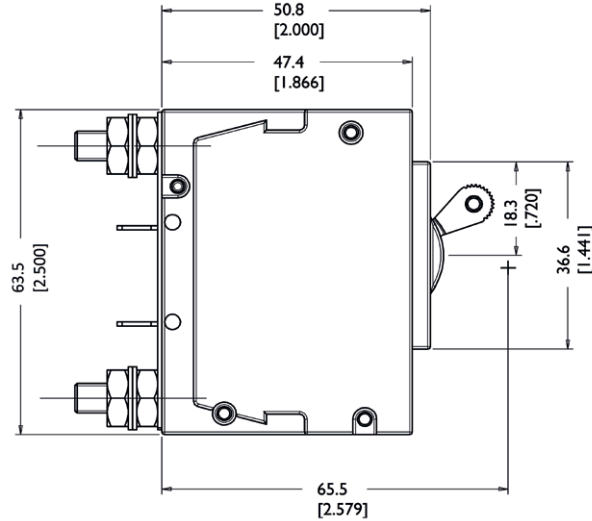
The LVR unit has three states of operation: latching, holding and release. These states are determined by the voltage applied to its terminals, where the positive is connected to “V+” and the common to “COM”.

The LVR supply voltage must be reset to the latching voltage each time the circuit breaker is switched off or tripped. Only then can the circuit breaker be switched on. The LVR will not interfere with the circuit breaker’s operation, while the LVR supply voltage is within the holding voltage limits. Once the LVR supply voltage drops to or lower than the release voltage, the LVR will trip the attached circuit breaker. To re-latch the circuit breaker, the LVR supply voltage must be reset.

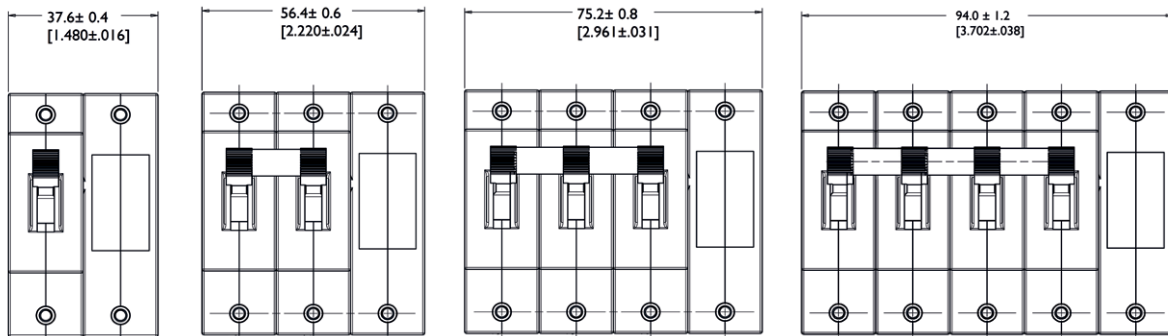


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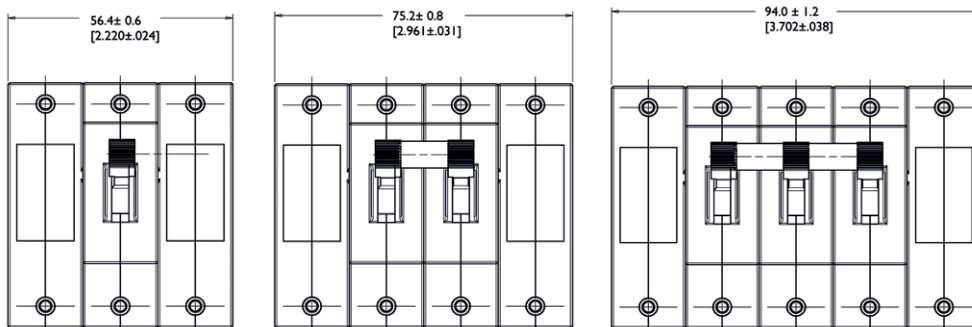
Dimensional Drawings



Single LVR Configuration



Double LVR Configuration



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AUSTRALIA

CBI-electric: Australia
27 Wedgewood Rd, Hallam
Victoria 3803 Australia
Tel: +61 3 8752 9300
Fax: +61 3 9796 5407
Email: sales@cbi-electric.com.au
Website: www.cbi-electric.com.au

SOUTH AFRICA

CBI-electric: low voltage
Tripswitch Drive Elandsfontein
Gauteng South Africa
Tel: +27 11 928 2000
Fax: +27 11 392 2354
Email: cbi@cbi-electric.com
internationalsales@cbi-electric.com
Website: www.cbi-lowvoltage.co.za

USA

CBI-electric: North America
35 E. Uwchlan Ave Suite 328
Exton PA 19341 USA
Tel: +1 610 524 9949
Fax: +1 610 524 9945
E-mail: info@cbibreakers.com
Website: www.cbibreakers.com