## [170 electric

## DD-Frame - Series Circuit Breakers



The DD-Frame is a compact yet very powerful circuit breaker. Using hydraulic-magnetic technology which ensures that breaker performance is unaffected by ambient temperature, the CBI DD-Frame series is suitable for various applications in telecom and datacom equipment. These applications include being the main breaker for battery applications, power supplies, distribution breaker for larger loads in DC branch protection, lighting control, UPS, inverters and DC power switching and in power distribution units (PDU). The DD-Frame is also available as a switch.

Due to its robustness and ability to withstand harsh environmental conditions, the DD-Frame breaker is also used in military applications, railway infrastructure, railway signalling and rolling stock and also in renewable energy solutions for protection in combiner boxes and other battery and storage applications.

## DD-Frame profile

The DD-Frame is available in various configurations and can be structured to suit specific requirements. Available in 1 to 6 poles, this robust and versatile circuit breaker comes in both AC and DC configurations with a choice of various time delay characteristics.

Among the common configurations are the front mount standard handle and flush rocker handle options. As for the termination, metric and imperial stud terminals, plug-in (bullet terminal), screw, and clamp terminal configurations are available. The breaker comes with the option of an auxiliary switch and trip alarm. Customer specific configurations, DIN rail mount and various other options are available.

The DD-Frame compact and precision circuit breaker is made of high quality thermoset material, which offers increased electrical and mechanical endurance. The self-cleaning mechanism of the contact actuators ensures that the circuit breaker contacts are kept clean and operate smoothly, offering longer life span.

## Approvals

The DD-Frame circuit breaker is CE \& CCC compliant and carries various approvals such as VDE, cURus, EAC and CCC. It is also recognised to UL1077 and UL508, and listed to UL489 and UL489A. Compliant with AS / NZS 60947-2.


## Note:

The DD-Frame replaces CBl's old version of the D-Frame, and is similar in fit and form, with enhanced features.

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## Features

- AC and DC circuit breaker
- Hydraulic-magnetic technology
- $100 \%$ rating capability independent of ambient temperature
- Up to six poles
- VDE, EAC and CCC approved, CE certified
- UL compliant (Listed / recognised)
- Ratings 0.1 A to 100 Aac and 400 Adc (Specific certifications)
- Precision tripping characteristics
- Wide range of circuits, mountings, terminations and time delays
- Two colour handle indication (Two tone flush rocker)
- Optional mid-trip indication (Standard handle)
- Optional auxiliary switch and trip alarm
- Optional remote switching (see RAU data sheet)


## DD-Frame HCR (High Current Rating)

CBI-electric: low voltage offers a higher current rated product, capable of handling current ratings up to 125 A in a single pole, 250 A in a two pole configuration, and 300 A in a three pole configuration at 60 Vdc .


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## DD-Frame - Series Circuit Breakers

## Technical Data

| Product Type | DD-Frame |
| :---: | :---: |
| Ambient Operating Temperature | $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |
| Endurance | 10000 operations; 1500 with current, 8500 without current (IEC60947-2 Clause 7.2.4.2)* 1000 operations DC, 6000 operations AC (IEC60934 Clause 9.11)* 10000 operations; 6000 with current, 4000 without current (UL489 Clause 7.1.5)* As per UL 489 or minimum of 1000 operations with current (UL489 A Clause 12)* 6000 operations with current (UL1077 Clause 22)* |
| Dielectric Strength | 1000-2000 Vac for one minute (IEC60947-2 Clause 8.3.3.3, IEC60934 Clause 9.7)* 1000 Vac plus twice the rated voltage for one minute (UL489 Clause 7.1.9, UL489A Clause 8, UL1077 Clause 23)* |
| Rated Impulse Withstand Voltage | 4 kV (IEC60947-2 Clause 8.3.3.2)* |
| Weight | 102 g per pole, 160 g with auxiliary switch (unpacked) |
| Altitude | Certification tests done at altitude $\approx 2000$ metres. Will operate at higher altitudes. |
| Shock | 100 G to MIL-STD-202G, test method 213B, test condition 1 |
| Vibration | 10 G to MIL-STD-202G test method 204D, test condition A |
| Flammability | 13 - Ignition does not persist at $850^{\circ} \mathrm{C}$ after glow wire is withdrawn with an oxygen index of $\geq 28$ |
| Toxicity | F1-Smoke index of $\leq 20$ which determines the fume class |
| Pollution Degree | PD2 - Normally only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected. |

* Refer to the standard for details

| Product Type | Circuit Breaker | Circuit Breaker | Circuit Breaker | Circuit Breaker |
| :---: | :---: | :---: | :---: | :---: |
| Approvals | UL489 | IEC / EN 60947-2, GB14048.2, CE | UL489A, IEC / EN 60947-2, GB14048.2, CE | $\begin{gathered} \text { UL489 A } \\ \text { IEC60947-2, CE } \end{gathered}$ |
| Number of Poles | 1, 2, 3 | 1, 2, 3, 4 | 2-5 (parallel) | 1, 2, 3 |
| Maximum Voltages | 120 Vac, $120 / 240$ Vac $240 \mathrm{Vac}, 80 \mathrm{Vdc}$ | $\begin{gathered} 240 / 415 \mathrm{Vac}, \\ 80 \mathrm{Vdc} \end{gathered}$ | 80 Vdc | 60 Vdc |
| Current Ratings | $\begin{aligned} & \text { 0.1-80 Aac, } \\ & 0.1-100 \text { Adc } \end{aligned}$ | $\begin{aligned} & \text { 0.1-60 Aac, } \\ & 0.1-100 \text { Adc } \end{aligned}$ | 110-400 A | $\begin{gathered} 125 \mathrm{~A}, 250 \mathrm{~A}, \\ 300 \mathrm{~A} \end{gathered}$ |
| Interrupting Capacity | $5 \mathrm{kA} \mathrm{(AC} \mathrm{\&} \mathrm{DC)}$ | $5 \mathrm{kA} \mathrm{(AC)}$,10 kA (DC) | $5 \mathrm{kA} \mathrm{(DC)}$ | 5 kA (DC) |
| HIC | $10 \mathrm{kA} \mathrm{(AC} \mathrm{\&} \mathrm{DC)}$ |  | $10 \mathrm{kA} \mathrm{(DC)}$ |  |


| Product Type | Circuit Breaker | Circuit Breaker | Switch |
| :--- | :---: | :---: | :---: |
| Approvals | IEC / EN 60934, CE | UL1077, cURus | UL508, IEC / EN 60947-3, CE |
| Number of Poles | $1-4$ | $1-6$ | 1,2 |
| Maximum Voltages | $240 / 415 \mathrm{Vac}, 80 \mathrm{Vdc}$ | $277 / 480 \mathrm{Vac}, 80 \mathrm{Vdc}$ | $120 / 240 \mathrm{Vac}, 240 \mathrm{Vac}$ |
| Current Ratings | $0.1 \mathrm{~A}-100 \mathrm{~A}(1 \mathrm{p})$, | $0.1 \mathrm{~A}-100 \mathrm{~A}(1 \mathrm{p})$, | 50 A |
| Interrupting Capacity | $0.1 \mathrm{~A}-70 \mathrm{~A}(2-3 \mathrm{p})$ | $0.1 \mathrm{~A}-70 \mathrm{~A}(2-4 \mathrm{p})$ |  |

Verify approvals for specific ratings in accordance with the relevant test certificate

## Aux Switch Specification

| Gold DB3 | EN61058 0.1 A @ 250 Vac \& 0.1 A @ 80 Vdc and UL1054 0.1 A @ 125/250 Vac \& 0.1 A @ 30 Vdc \& 0.3 A @ 60 Vdc |
| :--- | :--- |
| Silver DB2 | EN61058 10 A @ 250 Vac \& 0.1 A @ 80 Vdc and UL1054 10 A @ 125/250 Vac |
| Silver V4D | EN61058-1 10 A @ 250 Vac |

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## DD-Frame - Series Circuit Breakers

## Torque Table

| Description | Size | Torque Value |
| :--- | :---: | :---: |
| Front Inserts | M 3 | $0.5-0.8 \mathrm{Nm}$ |
|  | Rear Studs | $6-32$ |
| $4.4-7 \mathrm{in} / \mathrm{lbf}$ |  |  |
|  |  | $2.0-2.8 \mathrm{Nm}$ |
|  | $10-32$ | $18-24 \mathrm{in} / \mathrm{lbf}$ |
|  | M 6 | $3.5-4.0 \mathrm{Nm}$ |
| Clamp Screws (DIN Rail mounting) | $1 / 4-20$ | $30-35 \mathrm{in} / \mathrm{lbf}$ |
| Flush Rear Screws | M 3.5 | $1.2-1.5 \mathrm{Nm}$ |

DD-Frame Series Circuit Breakers
Ordering Information


* Note: For RAU (D5 \& D7) long codes, please refer to RAU data sheet


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| Group 8: Time Delay Characteristics (Pulse Tolerance @ 10 ms ) | Code | Description | System | Pulse Tolerance ( X In) | Code | Description | System | Pulse Tolerance ( X In) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | AD | Long delay $50 / 60 \mathrm{~Hz}$ 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 <br> BS \& Dual rated | AC and DC | 8-10 | AS | Long delay $50 / 60 \mathrm{~Hz}$ | AC or DC | 8-10 |
|  | CD | Short delay 50 / 60 Hz CS \& Dual rated | AC and DC | 6-8 | BS | Medium delay $50 / 60 \mathrm{~Hz}$ | AC or DC | 8-10 |
|  | AE | Long delay $50 / 60 \mathrm{~Hz}$ AH \& inertia delay | AC | 28-35 | CS | Short delay $50 / 60 \mathrm{~Hz}$ | AC or DC | 6-8 |
|  | BE | Medium delay 50 / 60 Hz <br> BH \& inertia delay | AC | 28-35 | AW | Long delay $50 / 60 \mathrm{~Hz}$ $A D$ \& inertia delay | AC and DC | 16-20 |
|  | CE | Short delay $50 / 60 \mathrm{~Hz}$ CH \& inertia delay | AC | 21-35 | BW | Medium delay $50 / 60 \mathrm{~Hz}$ 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 $50 / 60 \mathrm{~Hz}$ 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 |
|  | Cl | Short delay $50 / 60 \mathrm{~Hz}$ CS \& inertia delay | AC or DC | 12-15 | OP | Instantaneous trip $50 / 60 \mathrm{~Hz}$ | AC or DC | None |
|  | AH | Long delay $50 / 60 \mathrm{~Hz}$ AS \& high inrush | AC | 16-20 | OX | Switch $50 / 60 \mathrm{~Hz}$ | AC and DC |  |
|  | BH | Medium delay 50 / 60 Hz <br> BS \& high inrush | AC | 16-20 |  |  |  |  |
| Group 9: Main Circuit Current | Code | Description |  |  |  |  |  |  |
|  | XXXX | No current, for voltage trip poles |  |  | CommentsSpecific A rating possible from 0.1 A - 400 A |  |  |  |
|  | 100 | 1 A |  |  |  |  |  |  |
|  | 1000 | 10 A |  |  |  |  |  |  |
|  | K400 | 400 A |  |  |  |  |  |  |
| Group 10: Circuit Configuration (Circuit Breaker's Internal Construction) | Code | Description |  |  | Comments |  |  |  |
|  | AX | Switch |  |  |  |  |  |  |
|  | BX | Circuit breaker (series trip current sensing) |  |  |  |  |  |  |
|  | DX | Switch with relay trip, voltage sensing - centre terminal construction ( 4 terminal) |  |  | Select the type of termination on group 13 |  |  |  |
|  | GX | Circuit breaker with dual control - shunt trip construction - 3rd terminal close to load side (3 terminal) |  |  | Circuit breaker to handle main current, secondary coil activates remote trip; select type of termination on group 13 |  |  |  |
|  | HX | Circuit breaker with dual control - relay trip construction (4 terminal) |  |  | Select the type of termination on group 13 |  |  |  |
|  | KX | Circuit breaker with auxilairy switch |  |  |  |  |  |  |
|  | LA | Circuit breaker with mid trip handle |  |  | Handle goes to mid point when electrically tripped |  |  |  |
|  | LB | Circuit breaker with mid trip handle and aux switch |  |  | Handle goes to mid point when electrically tripped |  |  |  |
|  | LX | Circuit breaker with mid trip handle and trip alarm |  |  | Handle goes to mid point when electrically tripped and send a trip alarm |  |  |  |
|  | MX | Circuit breaker with trip alarm, but NO MID trip (Reversed function - Latchtype) |  |  | Handle goes to OFF position when tripped and send a trip alarm |  |  |  |
| Group 11: <br> Auxiliary and Alarm Switches Types \& Options <br> (Refer to Aux switch specification on page 3) | Code | Description |  |  | Comments |  |  |  |
|  | A | Gold tips, equally spaced terminals, $2.75 \mathrm{~mm}\left(0.108^{\prime \prime}\right)$ - DB3 |  |  | Not available on Rail mount |  |  |  |
|  | B | Silver tips, equally spaced termials, $2.75 \mathrm{~mm}\left(0.108^{\prime \prime}\right)$ - DB2 |  |  | Not available on Rail mount |  |  |  |
|  | C | Silver tips, offset terminals, $4.75 \mathrm{~mm}\left(0.189^{\prime \prime}\right)$ - V4D |  |  | Not available on Rail mount |  |  |  |
|  | K | Silver tips, equally spaced terminals, $2.75 \mathrm{~mm}\left(0.108^{\prime \prime}\right)$ Microswitch Reversed - Link from the load side of the citcuit breaker to the C (Common) contact of the Aux switch - DB2 |  |  | OPTION K Aux switch terminal not cropped |  |  |  |
|  | L | Silver tips, offset terminals, 4.75 mm ( $0.108^{\prime \prime}$ ) Link from the load side of the circuit breaker to the NC (Normally close) - V4D |  |  | OPTION LAux switch terminal not cropped |  |  |  |
|  | M | Parallel bridge housing - for all parallel bridge poles |  |  | Use this code for ALL parallel bridged products |  |  |  |
|  | N | Silver tips, equally spaced terminals, 2.75 mm ( $0.108^{\prime \prime}$ ) Link from the load side of the circuit breaker to the NC (Normally close) - DB2 |  |  | OPTION N Aux switch terminal not cropped |  |  |  |
|  | P | Silver tips, equally spaced terminals, 2.75 mm ( $0.108^{\prime \prime}$ ) Microswitch Reversed - Link from the load side of the circuit breaker to the C (Common) contact of the Aux switch - DB2 |  |  | OPTION A; NC (Normally close) terminal cropped |  |  |  |
|  | R | Silver tips, equally spaced terminals, 2.75 mm ( $0.108^{\prime \prime}$ ) Link from the load side of the circuit breaker to the NO (Normally open) contact of the Aux switch - DB2 |  |  | OPTION I; NC (Normally close) terminal cropped |  |  |  |
|  | X | Not applicable |  |  |  |  |  |  |

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| Group 12: <br> Voltage and Current Ratings for Dual Control, Shunt and Relay Trip Construction | Code | Description ${ }^{\text {a }}$ Code | Description | Code | Description | Code | Description |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | XX | Not applicable | $65 \mathrm{Vac} 50 / 60 \mathrm{~Hz}$ | B0 | 12 Vdc | B3 | 80 Vdc |
|  | A1 | $12 \mathrm{Vac} 50 / 60 \mathrm{~Hz}$ A4 | $\begin{gathered} 110-125 \mathrm{Vac} \\ 50 / 60 \mathrm{~Hz} \end{gathered}$ | B1 | 24 Vdc | Recommended pulse duration: <br> 20 ms to 40 ms |  |
|  | A2 | $24 \mathrm{Vac} 50 / 60 \mathrm{~Hz}$ A5 | $\begin{gathered} 220-240 \mathrm{Vac} \\ 50 / 60 \mathrm{~Hz} \end{gathered}$ | B2 | 48 Vdc |  |  |
| Group 13: <br> Terminal Options for Dual Control, Shunt and Relay Coils | Code | Description |  | Comments |  |  |  |
|  | X | Not applicable |  |  |  |  |  |
|  | B | Screw terminal, M5 or 10-32 |  |  |  |  |  |
|  | C | Quick connect terminals ( $0.8 \mathrm{~mm} \times 6.35 \mathrm{~mm}$ ) |  |  |  |  |  |
|  | D | Flying leads (wire terminals) |  |  |  |  |  |
|  | E | Stud terminal, M5 or 10-32 |  |  |  |  |  |  |  |
| Group 14: RMU | Code | Description |  | Comments |  |  |  |
|  | X | Not applicable |  |  |  |  |  |
| Group 15: Customer Specific | Code | Description |  |  |  |  |  |
|  | X | Not applicable |  |  |  |  |  |  |  |
|  | S | Customer Specific Product |  |  |  |  |  |  |  |
| Group 16: Handle Colour | Code | Description |  | Comments |  |  |  |
|  | X | No handle |  | Comments |  |  |  |
|  | B | Black handle, white marking |  | Not applicable on the two tone version |  |  |  |
|  | G | Green handle, white marking |  |  |  |  |  |
|  | W | White handle, black marking |  |  |  |  |  |
|  | R | Red handle, white marking |  |  |  |  |  |
|  | Y | Yellow handle, black marking |  |  |  |  |  |  |  |
| Group 17: Handle Markings | Code | Description |  |  |  |  |  |
|  | X | No handle (n/a) |  | Comments |  |  |  |
|  | D | I- O and ON - OFF |  | For products requiring VDE \& UL approvals |  |  |  |
|  | H | I- O and ON - OFF and ampere rating |  |  |  |  |  |
|  | 1 | Push-to-reset and ampere rating |  | Group 3 option S only. Group 4 options Q or R only. Flush rocker or two tone rocker handle. |  |  |  |
| Group 18: Mounting Orientation for Marking | Code | Description |  | Code | Description |  | Comments |
|  | X | No handle ( $\mathrm{n} / \mathrm{a}$ ) |  | H | Horizontal (line at the left) |  | If the breaker needs to be reverse fed, the printing will be upside down and codes 1 or 2 should be selected. |
|  | 1 | Vertical (reverse mounting, line at the bottom) |  | V | Vertical (standard mounting, line at the top) |  |  |
|  | 2 | Horizontal (line at the right) |  |  |  |  |  |
| Group 19: <br> Front Plate Marking and Test Button | Code | Description | Comments | Code | Description |  | Comments |
|  | 1 | Standard marking, with test button, standard handle | Test button for mechanical trip | A | Standard marking, standard handle |  | I- O and ON - OFF and ampere rating |
|  | 2 | No marking, with test button, rocker handle | Test button for mechanical trip | B | No marking, rocker handle |  |  |
| Group 20: Inter-phase Barrier and Terminal Cover | Code | Description | Comments | Code | Description |  | Comments |
|  | X | Not applicable |  | A | Inter-phase barrier - small |  | 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) |  | B | Inter-phase barrier - large |  |  |
|  | 2 | Inter-phase barrier \& terminal cover - small |  | C | Inter-phase barrier - Z type large |  |  |
|  | 3 | Inter-phase barrier \& terminal cover - large |  | D | Inter-phase barrier - Z type small |  |  |
|  | 4 | Inter-phase barrier \& terminal cover - Z type |  |  |  |  |  |
| Group 21: <br> Approvals <br> (Product Normally <br> Approved to) | Code | Description |  | Comments |  |  |  |
|  | 1 | CUR, UL recognised UL1077, IEC / EN 60934, CE |  | Normally UL1077 and / or IEC / EN 60934 |  |  |  |
|  | 2 | CUL, UL listed UL489, IEC / EN 60947-2, CE |  | Normally UL489 and / or IEC / EN 60947-2 |  |  |  |
|  | 3 | UL listed (UL489A), IEC / EN 60947-2, CE |  | DC (telecommunication) |  |  |  |
| Group 22: Safety Marks | Code | Description |  | Comments |  |  |  |
|  | x | Not applicable |  |  |  |  |  |
|  | C | GB14048.2 / GB 17701 |  | CCC |  |  |  |

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## DD-Frame - Series Circuit Breakers

Outline Dimensions: Panel Cutout Standard Handle


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Outline Dimensions: Panel Cutout Standard Handle



PLUG IN
TERMINAL HOLE

| PLUG IN TYPE SIZE | A | B | C | D |
| :--- | :---: | :---: | :---: | :---: |
| PLUG IN SMALL (6.25mm DIA) | $27.3[1.075]$ | $21.5[.846]$ | $6.25[.246]$ | $6.40[.252]$ |
| PLUG IN LARGE (7.80mm DIA) | $24.3[.957]$ | $16.4[.646]$ | $7.80[.307]$ | $7.95[.313]$ |
| PLUG IN SMALL-SHORTER (6.25mm | $21.3[.839]$ | $15.6[.614]$ | $6.25[.246]$ | $6.40[.252]$ |

AUSTRALIA

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