

L&T Solutions for Solar Application

Bringing the infinite power to you...





A technology idea often forms the foundation of innovation in a product and the success of its outcome is determined by the users' experience. Talking to customers and taking their feedback gives an assurance that the innovation would meet the expected and even aspired results. The dsine DZ range is an outcome of users' feedback that has been recorded, analysed and incorporated in its design and development journey.

About L&T Electrical & Automation

L&T Electrical & Automation (E&A) is a part of US \$17 billion Larsen & Toubro that is engaged in technology, engineering, construction, manufacturing and financial services with operations in over 30 countries worldwide. Its business comprises low and medium voltage switchgear products, electrical systems, energy meters, wiring accessories and automation solutions.

E&A's in-house design and development centre for switchgear promotes a culture of collaboration and experimentation that facilitates innovation and creation of intellectual property.

The customer-focus philosophy of E&A has led to setting up of a wide network of channel partners along with manufacturing operations in Navi Mumbai, Ahmednagar, Vadodara, Coimbatore and Mysore in India as well as in Saudi Arabia, Jebel Ali (Dubai), Kuwait, Malaysia, Indonesia and the UK.



User Centric Innovation

The dsine DZ range of Moulded Case Circuit Breakers (MCCB) is a culmination of innovation leading to 150 patents. Designed to meet the requirements of today's evolving electrical systems in modern installations, the range features significantly higher fault breaking capacities.

Considering the changing expectations of customers and a need for economical and reliable solution, we introduce dsine DZ6 – 400 A MCCB with operational voltages, Ue upto 800 V ac and significantly higher fault breaking capacities up to 200 kA at 415V.

Protection units in thermal magnetic as well as electronic versions offer comprehensive protection for all needs. Range of Advanced current, voltage, frequency, power and harmonic based protections are offered. Systems designers and Users thus, have the power to choose and implement the protection schemes suited to their needs.

Range features:

- Rated currents: 160 , 250A, 320A, 400A
- 3P/4P
- Protection using both Electronic and Thermal Magnetic based releases
- Various types of terminations
- Plug-in and Draw-out versions
- MCCBs for Motor backup protection and Switch disconnector
- Conforms to IS 60947-2, IEC 60947-2 and EN 60947-2

DZ6		
Rated Current (A)	160, 250, 320, 400	
Release	Electronic	

Release features:

- Wide range of basic & advanced protections using thermal magnetic and electronic trip unit
- Individual LEDs for fault indication
- Long time (Overload) setting starts from 0.25In for iTRP release and 0.67In for thermal magnetic release
- In-built earth fault and neutral protection
- In-built LCD display module for metering
- Battery operated display for breaker setting & viewing trip records, thus no need for external power supply
- Communicable trip units from 40A to 400A
- Available communication protocols- TCP IP, Modbus, Ethernet, IEC 61850

Release	iTRP1	iTRP2	iTRP3	iTRP4	iTRP5
Protection	LS/IN	LSIN	LSING	LSING+ Current metering	LSING+ Advanced metering & protection
Display				Yes	Yes
Communication				Yes	Yes

Salient Features:

- Double break high breaking capacity contact system
- Double insulation
- Positive isolation
- EMI/EMC compliant as per IEC-60947-2 Annex-F
- Shock and Vibration as per IEC-60947-1 Annex-Q
- Environmental Category-F as per IEC-60947-1 Annex-Q
- RoHS Compliant
- IP54 with ROH, IP40 with breaker front as per IEC-60947-1



- Wide range of termination options:
 - Direct
 - Spreaders
 - Rear terminals*
 - Box clamp*
- Plug-in and Draw-out version available[#]
- 6 cavities in the MCCB for variety of accessories
 - Auxiliary contacts 03 nos.
 - Trip Alarm Contact 01 nos.
 - Under voltage release 02 nos. or Shunt release 02 nos. or combination of Under voltage release 01 nos. and Shunt release 01 nos.

*-Applicable up to 690 V a.c. #- For details contact nearest branch office



Electronic releases:

iTRP 1

- Wide range of overload setting from 0.25In
- Adjustable trip class
- Neutral overload protection
- Short circuit setting with delay or instantaneous option
- Thermal memory defeat
- Provision for release testing

iTRP1			
LS/IN			
Rated Current	16A - 800A		
Frame	DZ1 / DZ2 / DZ6 / DZ7		
OverLo	oad (Phase)		
Current Setting Ir (Ir = x In)	0.25 to 1 x In (in step of 0.05)		
Time delay, Tr (Inverse)	10s at 6Ir, 3s at 6Ir , 10s at 7.2 Ir,		
	3s at 7.2Ir		
Protection Mode	ON/OFF		
Thermal Memory	ON/OFF		
OverLoa	ad (Neutral)		
Current Setting In (In = x Ir)	In (In = x Ir) OFF / 1.0 x Ir		
Time delay, Tr (Inverse)	As per Overload Curve Setting		
Protection Mode	ON/OFF		
Sho	rt Circuit		
Current Setting Isd (Isd = x Ir)	1.5 to 12 x Ir (in step of 0.5)		
Time delay, Tsd	As per I ² T curve /150ms		
I ² T	ON/OFF		
or Instantaneous			
Current Setting li (li = x ln)	1.5 to 12 x ln (in step of $\overline{0.5}$)		

iTRP 2

- Wide range of overload setting from 0.25In
- Adjustable trip class
- Neutral overload protection
- Short circuit setting with delay
- Adjustable Instantaneous setting
- Separate LED for fault indication
- Thermal memory defeat
- Provision for release testing

iTRP2		
LSIN		
Rated Current	160 - 400A	
Frame	DZ6	
Ove	erLoad (Phase)	
Current Setting Ir (Ir = x In)	0.25 to 1 x In (in step of 0.05)	
Time delay, Tr (Inverse)	10s at 6Ir	
Protection Mode	ON/OFF	
Thermal Memory	ON/OFF	
Ove	rLoad (Neutral)	
Current Setting In (In = x Ir)	OFF / 0.5/ 1.0/ 2.0 x Ir	
Time delay, Tr (Inverse)	As per Overload Curve Setting	
Protection Mode	On/OFF	
2	Short Circuit	
Current Setting Isd (Isd = x Ir)	1.5, 3.0, 4.5, 5.5, 6.0, 7.0, 8.5, 10	
Time delay, Tsd	100ms/200ms	
I ² T	ON/OFF	
Protection Mode	ON/OFF	
Instantaneous		
Current Setting Ii (Ii = x In)	6 & 12 In	
Protection Mode	ON/OFF	

iTRP 3

- Wide range of overload setting from 0.25In
- Adjustable trip class
- Neutral overload protection
- Short circuit setting with delay
- Adjustable Instantaneous setting
- Separate LED for fault indication
- In-built earth fault protection
- Thermal memory defeat
- Provision for release testing

iTRP3			
LSING			
Rated Current	160 - 400A		
Frame	DZ6		
Ove	erLoad (Phase)		
Current Setting Ir (Ir = x In)	0.25 to 1 x In (in step of 0.05)		
Time delay, Tr (Inverse)	10s at 6Ir		
Protection Mode	ON/OFF		
Thermal Memory	ON/OFF		
Ove	rLoad (Neutral)		
Current Setting In (In = x Ir)	OFF / 0.5/ 1.0/ 2.0 x Ir		
Time delay, Tr (Inverse)	As per Overload Curve Setting		
Protection Mode	ON/OFF		
S	hort Circuit		
Current Setting Isd (Isd = x Ir)	1.5, 3.0, 4.5, 5.5, 6.0, 7.0, 8.5, 10		
Time delay, Tsd	100ms/200ms		
I ² T	ON/OFF		
Protection Mode	ON/OFF		
In	stantaneous		
Current Setting Ii (Ii = x In)	6 & 12 In		
Protection Mode	ON/OFF		
	Earth Fault		
Current Setting Ig (Ig = x In)	0.2, 0.4, 0.5, 0.7		
Time delay, Tg	100ms/200ms		
Protection Mode	ON/OFF		

Technical Datasheet

Туре		DZ6-400Y	
Current Range In(A)		160/250/320/400	
Release		Electronic	
Poles		3P/4P	
Impulse Withstand Voltage Uimp(kV)		8	
Rated Operational Voltage Ue(VAC)		800	
(MAX) @ 50/60Hz			
Rated Insulation Voltage Ui(V)		1000	
Utilization Category		A	
Standard		IS 60947-2, IEC 60947-2,EN 60947- 2	
Rated Short Circuit Breaking Capacity Icu(kA) @ 800V		36	
Rated Short Circuit Breaking Capacity Ics(kA) @ 800V		30	
1:5-	Mechanical	20000	
Life	Electrical @ 415 V AC	8000	
	Electrical @ 800 V AC	4000	
Making Capacity (kA)		75.6	
Operating Frequency (Hz)		50/60	
Fingerproof Terminals		YES	
Suitable for isolation		YES	
IP Class		IP20/IP40 from front	
Pollution Degree		III	
Load-line bias		NO	
Ambient temperature		-5°C to 55°C	
Storage temperature		-15° C to 70°C	
Mounting positions in vertical plane		Vertical and 90° both directions	
Dimensions(W*H*D)(mm)	3 Pole	120*205*105	
	4 Pole	160 *205*105	
Weight(kg) 3P/4P		3.5/4.5	
	Auxiliary Contact	03 Aux	
Internal	Trip Alarm Contact	01 TAC	
	Shunt Release	02 UV or 02 Shunt or 1UV+1Shunt	
	Under Voltage Release		
	Rotary Operating	✓	
External	Mechanism(Direct/Extended)		
	Mechanical Interlock Kit	✓	
	Spreader Terminals	✓	

DZ6-400 AS ISOLATOR:

Dsine DZ MCCBs for isolator application offer solution for switching various loads such as UPS, battery banks, etc. with many advantages. These MCCBs differ from regular MCCBs only in terms of absence of protection trip units. These MCCBs can be used for following applications for isolation purpose:

- For local isolation: such as very close to motor load
- Incoming of any sub-distribution
- As an isolator for bus coupler
- As an automatic switch
- For switching applications of motors with VFDs, soft starters

Isolator application MCCBs are always backed up by short circuit protection device to protect the downstream loads/installations against short circuit. Following advantages are offered by isolator MCCBs:

- Suitable for positive isolation
- Available with 3P and 4P versions
- Can be used with under voltage protection
- Remote tripping though shunt release
- Motor operated MCCBs
- Status Feedback possible

Following are the specifications of isolator application MCCBs:

Frame		DZ6-400SD
Rated operational		400
current(A), le		
Poles		3,4
Utilisation category		AC22A/AC23A
Standard		IEC 60947-3
Rated operational voltage Ue(V)	(AC) 50-60Hz	800
Rated Insulation Voltage Ui(V)	(AC) 50-60Hz	1000
Rated impulse withstand voltage Uimp(kV)		8
Rated making capacity Icm(kA)	Min(Disconnector only)	7.95
	Max(with automatic circuit breaker on supply side)	75.6
Rated short time	For 1 s	5.35
withstand current Icw(kA)	For 3 s	5.35
Weight 3P/4P (kg)		4.2/5.6

Altitude Correction Factors

Altitude does not significantly affect circuit breaker characteristics up to 2000m.

Above this altitude, it is necessary to take into account the decrease in the dielectric strength and cooling capacity of air.

Altitude may reduce Rated Impulse Withstand and Insulation Voltage too.

Altitude Correction Factors			
Altitude (m)	Rated Continuous Current (In)	Rated Voltage (V)	
2000 & below	1.00	1.00	
2500	0.99	0.95	
4000	0.95	0.80	

Ambient Temperature Correction



Derating Factor at various Ambient Temperatures (I1)			
Upto 40°C	50°C	60°C	70°C
1	1	0.95	0.85

Overall Dimensions (mm)



Overall Dimensions with Spreader Links (mm)





Panel Cutout (mm)



Mandatory for Ue = 690V AC - Y Version and Ue > 690V AC - All Versions



For Door Flush Mounting



FOR SPREADER LINK

	Х	Y
3P	310	150
4P	390	150

FOR DIRECT LINK

	Х	Y
3P	220	150
4P	260	150

Current-Limiting Curve for d sine-DZ6 @ 800V



Energy-Limiting Curve for d sine-DZ6 @ 800V



Electrical Standard Products (ESP) Offices:

HEAD OFFICE L&T Business Park, Tower 'B' / 3rd Floor Saki Vihar Road, Powai Mumbai 400 072 Tel: 022-67053229 Fax: 022-67051112 e-mail: cic@LNTEBG.com

BRANCH OFFICES 501, Sakar Complex I Opp. Gandhigram Rly. Station Ashram Road Ahmedabad 380 009 Tel: 079-66304006-11 Fax: 079-66304025 e-mail: esp-ahm@LNTEBG.com

38, Cubbon Road, P. O. Box 5098 Bengaluru 560 001 Tel: 080-25020100 / 25020324 Fax: 080-25580525 e-mail: esp-blr@LNTEBG.com

131/1, Zone II Maharana Pratap Nagar **Bhopal 462 011** Tel: 0755-3080511 / 05 / 08 / 13 / 17 / 19 Fax: 0755-3080502 e-mail: esp-bho@LNTEBG.com

Plot No. 559, Annapurna Complex Lewis Road **Bhubaneswar 751 014** Tel: 0674-6451342 / 2436690 / 2436696 Fax: 0674-2537309 e-mail: esp-bsr@LNTEBG.com

Aspire Towers, 4th Floor Plot No. 55, Phase-I Industrial & Business Park **Chandigarh-160 002** Tel: 0172-4646840 / 41 / 42 / 46 / 53 Fax: 0172-4646802 Email: esp-chd@LNTEBG.com

L&T Construction Campus TC-1 Building, II Floor Mount-Poonamallee Road Manapakkam Chennai 600 089 Tel: 044-2270 6800 Fax: 044-22706940 e-mail: esp-maa1@LNTEBG.com

67, Appuswamy Road Post Bag 7156 Opp. Nirmala College **Coimbatore 641 045** Tel: 0422-2588120 / 1 / 5 Fax: 0422-2588148 e-mail: esp-cbe@LNTEBG.com

1&2, Vijay Park, Main Chakrata road Opp: Anandam, Ballupur Chowk **Dehradun 248001** Tel: 9582252411 Khairasol, Degaul Avenue **Durgapur 713 212** Tel: 0343-2540448 / 2540449 / 2540443 Fax: 0343-2540442 e-mail: esp-dgp@LNTEBG.com

5, Milanpur Road, Bamuni Maidan **Guwahati 781 021** Tel: +91 8876554410 / 8876554417 Fax: 361-2551308 e-mail: esp-ghy@LNTEBG.com

II Floor, Vasantha Chambers 5-10-173, Fateh Maidan Road **Hyderabad 500 004** Tel: 040-67015052 Fax: 040-23296468 e-mail: esp-hyd@LNTEBG.com

Monarch Building, 1st Floor D-236 & 237, Amrapali Marg Vaishali Nagar Jaipur 302 001 Tel: 0141-4385914 to 18 Fax: 0141-4385925 e-mail: esp-jai@LNTEBG.com

Akashdeep Plaza, 2nd Floor P. O. Golmuri Jamshedpur 831 003 Jharkhand Tel: 0657-2312205 / 38 Fax: 0657-2341250 e-mail: esp-jam@LNTEBG.com

Skybright Bldg; M. G. Road Ravipuram Junction, Ernakulam **Kochi 682 016** Tel: 0484-4409420 / 4 / 5 / 7 Fax: 0484-4409426 e-mail: esp-cok@LNTEBG.com

3-B, Shakespeare Sarani **Kolkata 700 071** Tel: 033-42005982 Fax: 033-22821025 / 7587 e-mail: esp-ccu@LNTEBG.com

A28, Indira Nagar, Faizabad Road Lucknow 226 016 Tel: 0522-4929905 / 04 Fax: 0522-2311671 e-mail: esp-Lko@LNTEBG.com

No: 73, Karpaga Nagar, 8th Street K. Pudur **Madurai 625 007** Tel: 0452-2567405 / 2561068 / 2561657 Fax: 0452-2567552 e-mail: esp-mdu@LNTEBG.com L&T Business Park, Tower 'B' / 5th Floor Saki Vihar Road, Powai **Mumbai 400 072** Tel: 022-67052874 / 2737 / 1156 Fax: 022-67051112 e-mail: esp-bom@LNTEBG.com

12, Shivaji Nagar North Ambajhari Road **Nagpur 440 010** Tel: 0712-2260012 / 6606421 Fax: 2260030 / 6606434 e-mail: esp-nag@LNTEBG.com

32, Shivaji Marg P. O. Box 6223 **New Delhi 110 015** Tel: 011-41419514 / 5 / 6 Fax: 011-41419600 e-mail: esp-del@LNTEBG.com

L&T House P. O. Box 119 191/1, Dhole Patil Road **Pune 411 001** Tel: 020-66033395 / 66033279 Fax: 020-26164048 / 26164910 e-mail: esp-pnq@LNTEBG.com

Crystal Tower, 4th Floor, G. E. Road Telibandha **Raipur - 492 006** Tel: 0771-4283214 e-mail: esp-raipur@LNTEBG.com

3rd Floor Vishwakarma Chambers Majura Gate, Ring Road **Surat 395 002** Tel: 0261-2473726 Fax: 0261-2477078 e-mail: esp-sur@LNTEBG.com

Radhadaya Complex Old Padra Road Near Charotar Society **Vadodara 390 007** Tel: 0265-6613610 / 1 / 2 Fax: 0265-2336184 e-mail: esp-bar@LNTEBG.com

Door No. 49-38-14/3/2, 1st floor, NGGO's Colony, Akkayyapalem, **Visakhapatnam - 530 016** Tel: 0891-2791126 / 2711125 Fax: 0891-2791100 e-mail: esp-viz@LNTEBG.com

Product improvement is a continuous process. For the latest information and special applications, please contact any of our offices listed here Product photographs shown are for representative purpose only.





A brand of Larsen & Toubro Limited

L&T Electrical & Automation, Electrical Standard Products Powai Campus, Mumbai 400 072

Customer Interaction Center (CIC)

BSNL / MTNL (toll-free): 1800 233 5858 Reliance (toll-free): 1800 200 5858 Tel: 022 6774 5858 Email: cic@Lntebg.com Web: www.Lntebg.com

Regd. Office: L&T Electrical & Automation, L&T House, N. M. Marg, Ballard Estate, Mumbai - 400 001, INDIA. CIN: L99999MH1946PLC004768