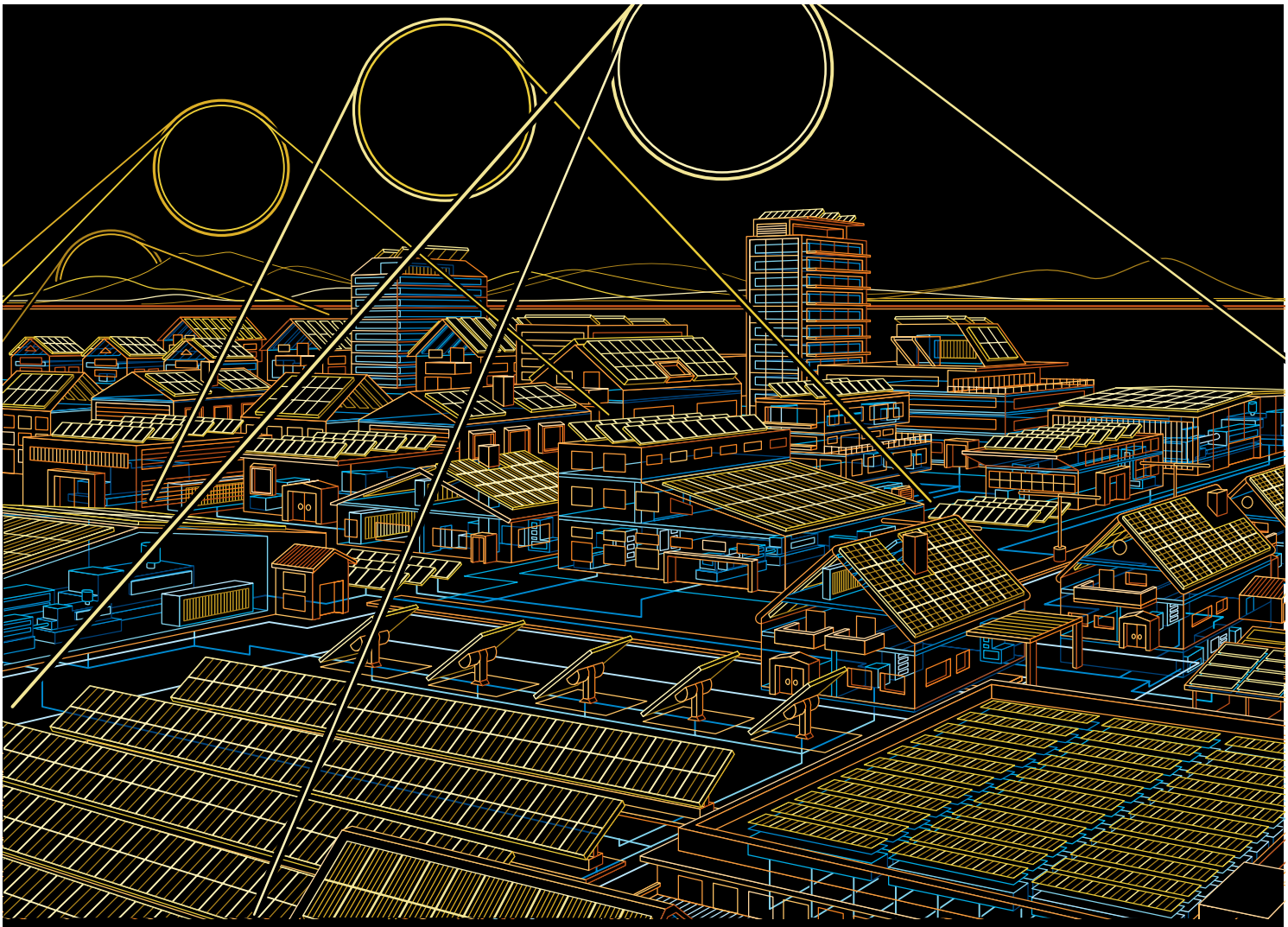

Breakers and Switches

Switches for photovoltaic applications
Switch-disconnectors
OTDC and OTDCP

Power and productivity
for a better world™

Switch-disconnectors
OTDC16...800 and OTDCP16...32

Contents

DC switch-disconnectors, front operated 16...800 A, IEC

IEC 60947





	OTDC16F2	OTDC16F3	OTDC16F4	OTDC100E02	OTDC100E11
	OTDC25F2	OTDC25F3	OTDC25F4	OTDC160E02	OTDC160E11
	OTDC32F2	OTDC32F3	OTDC32F4	OTDC200E02	OTDC200E11
				OTDC250E02	OTDC250E11
U_e [V DC]	**660**	**1000**	**1000 / 2x660**	**1000**	**1000**
I_e, DC-21B [A]	16 25 32	16 25 32	16 25 32	100 160 200 250	100 160 200 250

IEC 60947






	OTDC315E02	OTDC315E11	OTDC315EV12	OTDC315E22	OTDC315E33	OTDC630EPP22
	OTDC400E02	OTDC400E11	OTDC400EV12	OTDC400E22	OTDC400E33	OTDC800EPP22
	OTDC500E02	OTDC500E11	OTDC500EV12	OTDC500E22	OTDC500E33	
Ue [V DC]	**1000**	**1000**	**1500**	**1000**	**1000/1500**	**1000**
I_e, DC-21B [A]	315 400 500	315 400 500	315 400 500	315 400 500	315 400 500	630 800

DC switch-disconnectors, enclosed 16...32 A, IEC

IEC 60947






	OTDCP16SA11M	OTDCP16S11M	OTDCP16SA21M	OTDCP16S21M	OTDCP16SA22_	OTDCP16S22_
	OTDCP25SA11M	OTDCP25S11M	OTDCP25SA21M	OTDCP25S21M	OTDCP25SA22_	OTDCP25S22_
	OTDCP32SA11M	OTDCP32S11M	OTDCP32SA21M	OTDCP32S21M	OTDCP32SA22_	OTDCP32S22_
U_e [V DC]	**660**	**660**	**1000**	**1000**	**1000 / 2x660**	**1000 / 2x660**
I_e, DC-21B [A]	16 25 32	16 25 32	16 25 32	16 25 32	16 25 32	16 25 32

DC disconnect switches, front operated 16...600 A, UL*)

UL508i
File E4466875

Base or DIN-rail mounting

	OTDC16U2	OTDC16U4	OTDC16U6	OTDC16US2	OTDC16US4	OTDC16US6
	OTDC25U2	OTDC25U4		OTDC25US2	OTDC25US4	
		OTDC32U4			OTDC32US4	
Rated Voltage [V DC]	**600**	**600**	**600**	**600**	**600**	**600**
Rated current [A]	16 25	16 25 32	16	16 25	16 25 32	16

UL508i
File E4466875

Door mounting

	OTDC16UT2	OTDC16UT4	OTDC16UT6	OTDC16UST2	OTDC16UST4	OTDC16UST6
	OTDC25UT2	OTDC25UT4		OTDC25UST2	OTDC25UST4	
		OTDC32UT4			OTDC32UST4	
Rated Voltage [V DC]	**600**	**600**	**600**	**600**	**600**	**600**
Rated current [A]	16 25	16 25 32	16	16 25	16 25 32	16

UL98B
File #E354681

	OTDC100U02	OTDC100U11	OTDC100U22	OTDC100US02	OTDC100US11	OTDC100US22
	OTDC200U02	OTDC200U11	OTDC180U22	OTDC200US02	OTDC200US11	OTDC180US22
Rated Voltage [V DC]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
Rated current [A]	100 200	100 200	100 180	100 200	100 200	100 180

UL98B
File #E354681

	OTDC250U02	OTDC250U11	OTDC250U12	OTDC250U22	OTDC600UPP22
	OTDC320U02	OTDC320U11	OTDC320U12	OTDC320U22	
	OTDC400U02	OTDC400U11	OTDC400U12	OTDC400U22	
Rated Voltage [V DC]	**1000**	**1000**	**1500** **)	**1000**	**1000**
Rated current [A]	250 320 400	250 320 400	250 320 400	250 320 400	600

*) All UL listed products (except side operated) are also IEC rated up to 800 A

**) UL98B self-certified at 1500 VDC while standard only goes up to 1000 VDC

DC disconnect switches, front operated 16...600 A, UL*)

UL98B FIle #E354681				
	OTDC250US02	OTDC250US11	OTDC250US22	OTDC600USPP22
	OTDC320US02	OTDC320US11	OTDC320US22	
	OTDC400US02	OTDC400US11	OTDC400US22	
Rated Voltage [V DC]	**1000**	**1000**	**1000**	**1000**
Rated current [A]	250 320 400	250 320 400	250 320 400	600

*) All UL listed products (except side operated) are also IEC rated up to 800 A

DC disconnect switches, side operated 100...400 A, UL

UL-types UL98B FIle #E354681				
	OTDC100U20S	OTDC250U20S	OTDC100US20S	OTDC250US20S
	OTDC200U20S	OTDC320U20S	OTDC200US20S	OTDC320US20S
		OTDC400U20S		OTDC400US20S
Rated voltage [V DC]	**1000**	**1000**	**1000**	**1000**
Rated current [A]	100 200	250 320 400	100 200	250 320 400

Switches for photovoltaic applications
Up to 1500 VDC

OTDC16...32 - Simply efficient

OTDC from 16…32 Amperes have various DC voltage ratings within the same footprint area. Thanks to its modular design the rated operational voltage can be scaled according to your needs, up to 1000 V.

- Reliable PV systems at a wide voltage range

OTDC switch-disconnectors can be DIN rail or screw mounted. Tunnel terminals capture fine stranded wires and they are wide enough to allow wires up to 16 mm^2. Short-circuit bars are pre-installed as standard.

- Simple and fast installation

OTDC16…32 is also available in a plastic enclosure, suitable for outdoor use. Enclosed OTDCP is made of material resistant to UV light and water exposure. The enclosure has a high degree of protection, IP65. Cover interlock and padlockable handle ensure safe usage.

OTDC16…32 switches, with or without enclosure, meet the standard's thermal requirements, even in exceptionally high operating ambient temperatures. The power losses are very low, maximizing the efficiency.

- Suitable for warm locations
- Maximum energy efficiency of PV systems

OTDC100...800 - Switches for single and multi circuit disconnecting

OTDC has been designed for DC applications and tested beyond requirements.

- Reliable DC breaking power at all current levels

As a result of symmetric pole design, the connections are independent of polarity. The user can make the connections in both ways.

- Simplicity in installation

OTDC is the only DC switch in the market that has visible contacts. The operation of the switch is not vulnerable to voltage peaks and it is independent of the user (quick make-quick brake).

- Safe and reliable operation

Thanks to a modular design and the use of ABB's connection kits, OTDC adapts to different installation requirements: single or multicircuit, 1500 VDC, side operation or combined outputs up to 1500 A.

- Superior flexibility

Technical data
OTDC16...800 and OTDCP16...32

Technical data according to IEC 60947 for switch-disconnectors OTDC16...250

Switch size				OTDC16F	OTDC25F	OTDC32F	OTDC16U	OTDC25U	OTDC32U	OTDC100E	OTDC160E	OTDC200E	OTDC250E
Rated insulation voltage U_i	Pollution degree 2		V	1250 [1]	1250 [1]	1250[1]	1250 [1]	1250 [1]	1250 [1]				
	Pollution degree 3		V	1000 [1]	1000 [1]	1000[1]	1000 [1]	1000 [1]	1000 [1]	1000	1000	1000	1000
Dielectric strength	50 Hz 1 min		kV	6	6	6	6	6	6				
Rated impulse withstand voltage			kV	8	8	8	8	8	8	12	12	12	12
Rated thermal current I_{th}	In open air, normal conditions [2]		A	25	32	45	40	50	63	100	160	200	250
	In enclosure 40°C		A	25	32	45	32	40	50	100	160	200	250
	In enclosure 60°C		A	25	32	32	25	32	40	100	160	200	200
...with minimum cable or bar cross section	Cu		mm²	4	6	10	4	6	10	35	70	95	120
Rated operational current / poles in series DC-21B	500	One circuit	V							100 / 1	160 / 1	200 / 1	250 / 1
	660	One circuit	V	16/2	25/2	32/2	16/2	25/2					
		Two circuits	V	25/2	25/2	32/2	16/2	25/2	32/2				
	1000	One circuit	V	10/2	16/2	20/2	10/2 [4]	16/2 [4]		100 / 2	160 / 2	200 / 2	250 / 2
			V	16/3	25/3	32/3							
		Two circuits	V	10/2	16/2	20/2	10/2 [4]	16/2 [4]	20/2 [4]	100 / 2	160 / 2	200 / 2	250 / 2
		Three circuits	V				10/2 [4]						
Rated short-time withstand current, 1000 V, 1 s	R.M.S. -value I_{pv}		kA	0,4	0,6	0,8	1,0	1,0	1,0	5	5	5	5
Rated short circuit making capacity, 1000 V	Peak value I_{cm}		kA							5	5	5	5
	Max. distance from switch frame to nearest busbar / cable support		mm							150	150	150	150
Rated conditional short-circuit current I_p (r.m.s.)	I_p (r.m.s.), 1000 V		kA				10	10	10				
	Max fuse size, gPV		A				80	80	80				
Power loss / pole	At rated current		W	0,15	0,3	0,5	0,1	0,2	0,35	2	4	6	9,5
Terminal cable size	Cu		mm²	2.5...16	2.5...16	2.5...16	2.5...16	2.5...16	2.5...16				
Terminal bolt size	Metric thread diameter × length		mm							M8x25	M8x25	M8x25	M8x25
Terminal tightening torque	Counter torque required		Nm							15-22	15-22	15-22	15-22

[1] When used with external handle. For use with direct mounted handle, see installation instruction.

[2] Normal conditions defined in IEC 60947-1-6.1

[3] 1000 V with all the poles connected in series, 600 V with 2 poles in series

[4] U and UT types only. (Not applicable for US nor UST.)

Technical data according to IEC 60947 for switch-disconnectors OTDC315...800

Switch size				OTDC315E	OTDC400E	OTDC500E	OTDC630E	OTDC800E
Rated insulation voltage U_i	Pollution degree 2		V	1500	1500	1500	1500	1500
	Pollution degree 3		V	1500	1500	1500	1500	1500
Rated impulse withstand voltage			kV	12	12	12	12	12
Rated thermal current I_{th}	In open air, normal conditions [5]		A	315	400	630	630	800
	In enclosure 40°C		A	315	400	550	630	800
	In enclosure 60°C		A	315	400	440	630	680
...with minimum cable or bar cross section	Cu		mm^2	185	240	240	2x185	2x240
Rated operational current / poles in series	1000	One circuit	V	315/2	400/2	500/2	630/2	800/2
		Two circuits	V	315/2	400/2	500/2		
		Three circuits	V	315/2	400/2	500/2		
	1500	One circuit	V	315/3	400/3	500/3		
			V	315/4	400/4	500/4		
		Two circuits	V	315/3	400/3	500/3		
Rated short-time withstand current, 1000 V, 1 s	R.M.S. -value I_{cw}		kA	10	10	10	10	10
Rated short circuit making capacity, 1000 V	Peak value I_{cm}		kA	10	10	10	10	10
Power loss / pole	At rated current		W	6	9,7	15,1	29,1	40
Terminal bolt size	Metric thread diameter × length		mm	M 10x30	M 10x30	M 12x40	M 12x40	M 12x40
Terminal tightening torque	Counter torque required		Nm	30-44	30-44	50-75	50-75	50-75

[5] Normal conditions defined in IEC 60947-1-6.1

[6] 1000 V with all the poles connected in series, 600 V with 2 poles in series

Technical data according to IEC 60947 for enclosed switch-disconnectors OTDCP

Switch size		A	OTDCP16	OTDCP25	OTDCP32
Rated insulation voltage	Pollution degree 2	V	1250	1250	1250
	Pollution degree 3	V	1000	1000	1000
Dielectric strength	50 Hz 1 min	kV	6	6	6
Rated impulse withstand voltage		kV	8	8	8
Rated impulse withstand voltage	In enclosure 40°C	A	25	32	45
DC-20	In enclosure 60°C	A	25	32	32
Rated operational current / poles in series	660 V	A	16/2	25/2	32/2
DC-21B	1000 V	A	16/3	25/3	32/3
	2x660 V [9]	A	16/4	25/4	32/4
Rated short-time withstand current, 1000 V, 1 s	R.M.S. -value I_{cw}	kA	0.4	0.6	0.8
Power loss / pole	At rated current	W	0.15	0.3	0.5

[9] 1000 V with all the poles connected in series, 600 V with 2 poles in series

Technical data
OTDC16...600

Technical data in accordance to UL508I for photovoltaic disconnect switches OTDC16...32U

Suitable For Use in Photovoltaic Systems in Accordance With Article 690 of the NEC.

Switch size				OTDC16U	OTDC25U	OTDC32U
UL Listed			Standard	UL 508I	UL 508I	UL 508I
Rated ambient temperature			°C	...+60	...+60	...+60
Rated current /poles in series		600 V	One circuit	16/2	25/2	
			Two circuits	16/2	25/2x2	32/2x2
			Three circuits	16/2		
Short circuit rating			kA, 600 V	5	5	5
			Protection type	RK5 Fuse	RK5 Fuse	RK5 Fuse
Wire range			MCM	12-6 AWG	12-6 AWG	12-6 AWG
Technical data according to IEC 60947			See IEC table for type	OTDC16U	OTDC25U	OTDC32U

Technical data in accordance to UL98B for photovoltaic disconnect switches OTDC100...600U

Suitable For Use in Photovoltaic Systems in Accordance With Article 690 of the NEC.

Switch size			OTDC100U	OTDC200U	OTDC250U	OTDC320U	OTDC400U	OTDC600U
UL Listed		Standard	UL 98B	UL 98B	UL 98B	UL 98B	UL 98B	UL 98B
Rated ambient temperature		°C	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50
Rated current /poles in series	1000 V	One circuit	100/2	200/2	250/2	320/2	400/2	600/2
		Two circuits	100/2	180/2	250/2	320/2	400/2	
	1500 V [7]	One circuit			250/3	320/3	400/3	
Short circuit rating		kA, 1000 V	5	5	10	10	10	10
		Protection type	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker
Wire range		MCM	#4-300	#4-300	#2 – 600	#2 – 600	#2 – 600	#2 – 600
Technical data according to IEC 60947		See IEC table for type	OTDC160E	OTDC250E	OTDC315E	OTDC400E	OTDC500E	OTDC630E

[7] For 4 pole switches (double circuit use), the current rating at 1000 VDC is 180 A.

[8] 1500 V ratings are not within the scope of UL98B. 1500 V values are self-certified and tested at 1500 V, based on corresponding 1000 V UL98B guidelines.

Type designation key

OTDC16...32, IEC

OTDC	16	F	3
1	2	3	4

1	Brand
OTDC	ABB DC switch-disconnector brand
2	**Switch size**
16…32	16, 25 and 32 Amperes
3	**Mounting/construction**
F_	Base mounted, IEC
U_	Base mounted, UL508i
US_	Base mounted, UL, factory mounted jumpers
UT	Door mounted, UL
UST	Door mounted, UL, factory mounted jumpers
FT	Door mounted, IEC
4	**Number of poles**
2	Two poles
3	Three poles
4	Four poles
6	Six poles

OTDC100...800, IEC and UL98B

OTDC	200	U	S	11	K
1	2	3	4	5	6

1	Brand
OTDC	ABB DC switch-disconnector brand
2	**Switch size**
100…800	100…800 Amperes
3	**Voltage and standard**
E	1000 VDC, IEC
U	1000 VDC, UL98B
4	**Short circuit links**
blank	Short circuit links not included
V	Factory mounted short circuit link, 1500 VDC
S	Pre-mounted short circuit links, single wire breaking
PP	Pre-mounted connection bars, supply and load side parallel
5	**Number of poles**
11	Two poles, mechanism between the poles
02, 20	Two poles, mechanism at the end of the switch
12	Three poles, mechanism between the poles
22	Four poles, mechanism between the poles
04, 40	Four poles, mechanism at the end of the switch
33	Six poles, mechanism between the poles
6	**Included handle**
_	none
P	external handle
K	direct mount, front operation
S	direct mount, side operation

OTDCP16...32, IEC

OTDC	P	16	S	11	M	D
1	2	3	4	5	6	7

1	Brand
OTDC	ABB DC switch-disconnector brand
2	**Enclosure material**
P	Plastic
3	**Switch size**
16…32	16, 25 and 32 Amperes
4	**Selector handle color**
S	Black
SA	Red-yellow
5	**Contact configuration**
11, 12, 22	See connection diagrams in pages 16-17
6	**Cable entries**
M	Threaded knock-out M20
M16	Threaded knock-out M16
U	Blank cable entries
UM	Black top cable entry and threaded knockout M20 bottom cable entry
M16	Threaded knockouts: M16 top cable entry and M20 bottom cable entry
7	**Connection options**
_	Single circuit use
D	Double circuit use