

# **Data Sheet** Santon X-Type switch **XC+150.20DL2E-D**

Switch disconnector for solar application according to IEC PV1 certified CCC certification pending

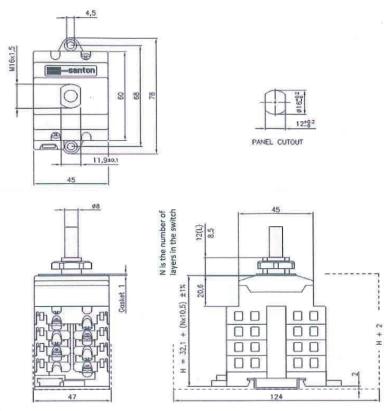




	Terminals Scheme									
Layer	Fron	t Side	Symbol	Rear	Side	Or	Po	sitio	ns	
No.	Left	Right	Symbol	Left	Right	1	2	3	4	
							_			
							-			
							-			
							-			
							-			
							-			
2	-1			-1		Х				
3	-1		_/_	-1						
		+1			+1	Χ				
1			empty							

Contacts are made in "X" marked position. Symbols for interconnection: [

Technical data	Symbol Me	erit		Unit
rated operational voltage (DC poles)	Ue		1500	V dc
rated operational current (DC poles)	le		20	A dc
rated operational voltage (DC poles)	Ue		1000	V dc
rated operational current (DC poles)	le		50	A dc
rated operational voltage (DC poles)	Ue		800	V dc
rated operational current (DC poles)	le		60	A dc
method of mounting	both bottom and	single hole moun	ting [D]	
number of DC poles			2	
utilization category DC	DC-PV1			
actuator	standard black, w	ith thread throug	h the shaft [D]	
positions	OFF at 12 hr, ON	at 3 hr [E]		
rated impulse withstand voltage	Uimp		8	kV
insulation voltage	Ui		1500	V
rated thermal current uninterrupted duty	lu		60	Α
rated short-time withstand current (1s)	Icw		750	Α
rated short-circuit making capacity	Icm		1,4	kA
rated conditional short-circuit current			5	kA
method of operation	independent mai	nual operation		
minimum required dimensions of enclosures L x W x H $^*$ (on DIN-rail H = +2mm	n) {space envelope}	12	24 x 47 x 63,6	mm
* see the drawing for the height of the switch. The number of layers N is:			3	
knob operation force		max.	1,4	mm
tightening torque terminal screws M4 , min max.		1,5	1,7	Nm
tightening torque panel mounting nut, min max.		2,0	2,5	Nm
tightening torque M3 screw in the standard black knob, min max.		0,5	0,7	Nm
ambient temperature allowed between			- 40 to + 70	°C
storage temperature allowed between			- 40 to + 80	°C
maximum relative humidity, without condensation at 20°C			90	%
pollution degree			2	
IP rating terminals			IP20	
IP rating gland of the shaft in case of single hole panel mounting			IP65	
rated operational voltage (AC poles)	Ue			V ac
rated operational current (AC poles)	le			A ac
number of AC poles (for general use)	-			
minimum required fine wire cross-section: IEC60947-1, table 9				mm²
auxiliary contact(s), AC15			No auxiliar	
auxiliary contact ratings			110 ddxilldi	, contact
weight			194	a
accessories:			194	g



In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

## Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.

- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85oC under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

#### Connection details

Description	Symbol		Values				
Rated operational current (DC poles)	le	20	50	-	-	A dc	
Required fine wire cross-section (minimal): IEC60947-1, table 9	А	4	2x6	-	-	mm²	
max power dissipation	Р	0.0	0.0	-	-	W	

The terminals, without interconnection can take copper wires up to 6 mm<sup>2</sup>.

The recommended Spade Tongue Terminals may have a maximum width of 9 mm.

For CSA and UL applications, registered Spade Tongue Terminals must be used.

The registration numbers are UL: E13288 and CSA: LR7189 (for instance type 165015 from Tyco).

	1			
Recommend Manufacturer	Type number	Wire size (AWG)	Wire size (mm²)	Color
JST	FVD2-YS4A	AWG 16 – AWG 14	1,0 – 2,5 mm²	Blue
TE connectivity	C-165012	AWG 16 – AWG 14	1,0 – 2,5 mm <sup>2</sup>	Blue
Vogt	3635c	AWG 16 – AWG 14	1,5 – 2,5 mm²	Blue
TE connectivity	C-165015	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Vogt	3652c / 3653c	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Santon (JST)	52A1256.35	AWG 8 - AWG 10	10,5mm <sup>2</sup> -16mm <sup>2</sup> *1	*2

<sup>\*1 16</sup>mm² only with fine stranded wire or two 6mm² is also possible

<sup>\*2</sup> Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00



# **Data Sheet** Santon X-Type switch **XC+150.20DL4E-D**

Switch disconnector for solar application according to IEC PV1 certified CCC certification pending

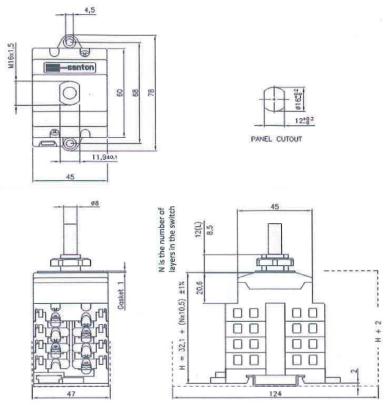




	Terminals Scheme									
Layer	Fron	t Side	Symbol	Rear	Side	Or	Po	sitic	ns	
No.	Left	Right	Symbol	Left	Right	1	2	3	4	
						_	_	_	L	
						H	H	H	H	
						-	H	-	H	
						H	H	H	H	
	-								H	
						-	H	-	H	
									Н	
									H	
5	+2			+2		Х				
4	+Z	-2		+Z	-2	X				
	-1	-2		-1	-2	Х				
3	-1		_/_	-1		Х				
		+1			+1	X				
1			empty							

Contacts are made in "X" marked position. Symbols for interconnection: [

Ue Ie Ue Ie Ue Ie Doc-PV1	n and single hole mo	1500 20 1000 50 800 60	V dc A dc V dc A dc V dc A dc
Ue le Ue le both botton	n and single hole mo	1000 50 800 60	V dc A dc V dc
le Ue le both botton	n and single hole mo	50 800 60	A dc V dc
Ue le both botton	n and single hole mo	800 60	V dc
le both botton	n and single hole mo	60	
both botton	n and single hole mo		A dc
	n and single hole mo	unting [D]	
DC-PV1		unting [D]	
DC-PV1		4	
standard bla	ack, with thread thro	ugh the shaft [D]	
OFF at 12 h	r, ON at 3 hr [E]		
Uimp		8	kV
Ui		1500	V
lu		60	Α
lcw		750	Α
Icm		1,4	kA
		5	kA
independen	t manual operation		
space envelo	ope}	124 x 47 x 84,6	mm
		5	
	max.	1,4	mm
	1,5	1,7	Nm
	2,0	2,5	Nm
	0,5	0,7	Nm
		- 40 to + 70	°C
		- 40 to + 80	°C
		90	%
		2	
		IP20	
		IP65	
Ue			V ac
le			A ac
			mm²
		No auxilian	v contact
		110 daxillar	Contact
_		254	g
		234	g
	standard bla OFF at 12 h Uimp Ui lu lcw lcm independer (space envelor	standard black, with thread thro OFF at 12 hr, ON at 3 hr [E] Uimp Ui lu lcw lcm independent manual operation {space envelope}  max. 1,5 2,0 0,5	standard black, with thread through the shaft [D]  OFF at 12 hr, ON at 3 hr [E]  Uimp



In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

# Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.

- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85oC under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

### **Connection details**

Description	Symbol		Values					
Rated operational current (DC poles)	le	20	50	-	-	A dc		
Required fine wire cross-section (minimal): IEC60947-1, table 9	А	4	2x6	-	-	mm²		
max power dissipation	Р	0.0	0.0	-	-	W		

The terminals, without interconnection can take copper wires up to 6  $\mbox{mm}^{2}.$ 

The recommended Spade Tongue Terminals may have a maximum width of 9 mm.

For CSA and UL applications, registered Spade Tongue Terminals must be used.  $\label{eq:csa}$ 

The registration numbers are UL: E13288 and CSA: LR7189 (for instance type 165015 from Tyco).

Recommend Manufacturer	Type number	Wire size (AWG)	Wire size (mm²)	Color
JST	FVD2-YS4A	AWG 16 – AWG 14	1,0 – 2,5 mm²	Blue
TE connectivity	C-165012	AWG 16 – AWG 14	1,0 – 2,5 mm <sup>2</sup>	Blue
Vogt	3635c	AWG 16 – AWG 14	1,5 – 2,5 mm²	Blue
TE connectivity	C-165015	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Vogt	3652c / 3653c	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Santon (JST)	52A1256.35	AWG 8 - AWG 10	10,5mm <sup>2</sup> -16mm <sup>2</sup> *1	*2

<sup>\*1 16</sup>mm² only with fine stranded wire or two 6mm² is also possible

<sup>\*2</sup> Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00



# **Data Sheet** Santon X-Type switch **XC+150.20DL6E-D**

Switch disconnector for solar application according to IEC PV1 certified CCC certification pending

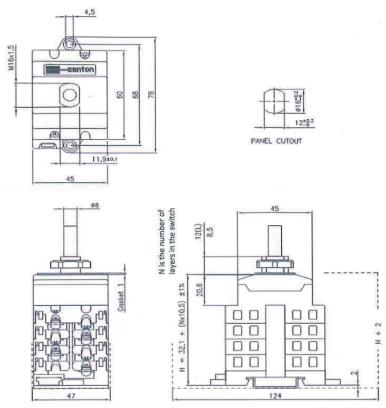




Terminals Scheme									
Layer	Fron	t Side	Symbol	Real	Side	Or	Ро	sitic	ns
No.	Left	Right	Symbol	Left	Right	1	2	3	4
								_	
								H	
								-	
								-	
7	-3			-3		Х			
6		+3	_/_		+3	Х			
5	+2	.5		+2	.5	Х			
4		-2			-2	Х			
3	-1	_	_/_	-1	_	Х			
2		+1			+1	Х			
1			empty			Ė			

Contacts are made in "X" marked position. Symbols for interconnection: [

Technical data	Symbol M	lerit		Unit
rated operational voltage (DC poles)	Ue		1500	V dc
rated operational current (DC poles)	le		20	A dc
rated operational voltage (DC poles)	Ue		1000	V dc
rated operational current (DC poles)	le		50	A dc
rated operational voltage (DC poles)	Ue		800	V dc
rated operational current (DC poles)	le		60	A dc
method of mounting	both bottom and	d single hole mour	nting [D]	
number of DC poles			6	
utilization category DC	DC-PV1			
actuator	standard black,	with thread throug	gh the shaft [D]	
positions	OFF at 12 hr, Of	N at 3 hr [E]		
rated impulse withstand voltage	Uimp		8	kV
insulation voltage	Ui		1500	V
rated thermal current uninterrupted duty	lu		60	Α
rated short-time withstand current (1s)	lcw		750	А
rated short-circuit making capacity	Icm		1,4	kA
rated conditional short-circuit current			5	kA
method of operation	independent ma	nual operation		
minimum required dimensions of enclosures L x W x H* (on DIN-rail H = $\pm 2$	2mm) {space envelope}	12	4 x 47 x 105,6	mm
* see the drawing for the height of the switch. The number of layers N is:			7	
knob operation force		max.	1,4	mm
tightening torque terminal screws M4 , min max.		1,5	1,7	Nm
tightening torque panel mounting nut, min max.		2,0	2,5	Nm
tightening torque M3 screw in the standard black knob, min max.		0,5	0,7	Nm
ambient temperature allowed between			- 40 to + 70	°C
storage temperature allowed between			- 40 to + 80	°C
maximum relative humidity, without condensation at 20°C			90	%
pollution degree			2	,-
IP rating terminals			IP20	
IP rating gland of the shaft in case of single hole panel mounting			IP65	
rated operational voltage (AC poles)	Ue		05	V ac
rated operational current (AC poles)	le			A ac
number of AC poles (for general use)	10			71 40
minimum required fine wire cross-section: IEC60947-1, table 9				mm²
auxiliary contact(s), AC15			No auxiliar	
auxiliary contact(s), ACI5			INO duxiildi	y contact
			245	
weight accessories:	-		315	g



In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

# Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.

- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85oC under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

### **Connection details**

Description	Symbol		Values					
Rated operational current (DC poles)	le	20	50	-	-	A dc		
Required fine wire cross-section (minimal): IEC60947-1, table 9	А	4	2x6	-	-	mm²		
max power dissipation	Р	0.0	0.0	-	-	W		

The terminals, without interconnection can take copper wires up to 6  $\mbox{mm}^{2}.$ 

The recommended Spade Tongue Terminals may have a maximum width of 9 mm.

For CSA and UL applications, registered Spade Tongue Terminals must be used.  $\label{eq:csa}$ 

The registration numbers are UL: E13288 and CSA: LR7189 (for instance type 165015 from Tyco).

Recommend Manufacturer	Type number	Wire size (AWG)	Wire size (mm²)	Color
JST	FVD2-YS4A	AWG 16 – AWG 14	1,0 – 2,5 mm²	Blue
TE connectivity	C-165012	AWG 16 – AWG 14	1,0 – 2,5 mm <sup>2</sup>	Blue
Vogt	3635c	AWG 16 – AWG 14	1,5 – 2,5 mm²	Blue
TE connectivity	C-165015	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Vogt	3652c / 3653c	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Santon (JST)	52A1256.35	AWG 8 - AWG 10	10,5mm <sup>2</sup> -16mm <sup>2</sup> *1	*2

<sup>\*1 16</sup>mm² only with fine stranded wire or two 6mm² is also possible

<sup>\*2</sup> Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00



**Data Sheet** Santon X-Type switch **XC+150.20DL8E-D** 

Switch disconnector for solar application according to IEC PV1 certified CCC certification pending

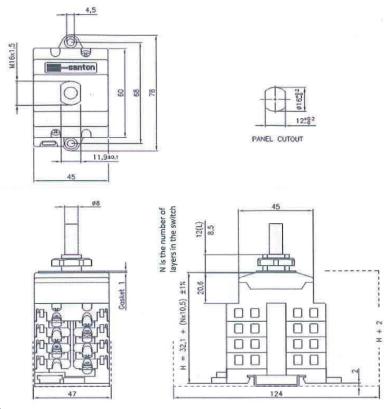




Terminals Scheme									
Layer	Fron	t Side	Symbol	Rear Side		On Positions			
No.	Left	Right		Left	Right	1	2	3	4
									_
_						.,			
9	+4		_/_	+4		X			
8		-4	-/-		-4	Х			
7	-3		-/-	-3		Χ			
6		+3	-/-		+3	Χ			
5	+2		_/_	+2		Χ			
4		-2	-/-		-2	Χ			
3	-1		_/_	-1		Χ			
2		+1	-/-		+1	Χ			
1			empty						

Contacts are made in "X" marked position. Symbols for interconnection: [

Technical data	Symbol	Merit		Unit
rated operational voltage (DC poles)	Ue		1500	V dc
rated operational current (DC poles)	le		20	A dc
rated operational voltage (DC poles)	Ue		1000	V dc
rated operational current (DC poles)	le		50	A dc
rated operational voltage (DC poles)	Ue		800	V dc
rated operational current (DC poles)	le		60	A dc
method of mounting	both botto	m and single hole mou	nting [D]	
number of DC poles			8	
utilization category DC	DC-PV1			
actuator	standard bl	lack, with thread throu	igh the shaft [D]	
positions	OFF at 12 h	nr, ON at 3 hr [E]		
rated impulse withstand voltage	Uimp		8	kV
insulation voltage	Ui		1500	V
rated thermal current uninterrupted duty	lu		60	Α
rated short-time withstand current (1s)	lcw		750	Α
rated short-circuit making capacity	Icm		1,4	kA
rated conditional short-circuit current			5	kA
method of operation	independe	nt manual operation		
minimum required dimensions of enclosures L x W x H* (on DIN-rail H = +2mm	) {space envel	ope} 12	24 x 47 x 126,6	mm
* see the drawing for the height of the switch. The number of layers N is:			9	
knob operation force		max.	1,4	mm
tightening torque terminal screws M4, min max.		1,5	1,7	Nm
tightening torque panel mounting nut, min max.		2,0	2,5	Nm
tightening torque M3 screw in the standard black knob, min max.		0,5	0,7	Nm
ambient temperature allowed between			- 40 to + 70	°C
storage temperature allowed between			- 40 to + 80	°C
maximum relative humidity, without condensation at 20°C			90	%
pollution degree			2	
IP rating terminals			IP20	
IP rating gland of the shaft in case of single hole panel mounting			IP65	
rated operational voltage (AC poles)	Ue			V ac
rated operational current (AC poles)	le			A ac
number of AC poles (for general use)	-			
minimum required fine wire cross-section: IEC60947-1, table 9				mm²
auxiliary contact(s), AC15			No auxiliar	
auxiliary contact ratings			140 ddxilldi	y contact
auxiliary contact rutiligs				
weight	_		384	g



In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

# Maintenance

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- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85oC under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

### **Connection details**

Description	Symbol	Values				Unit
Rated operational current (DC poles)	le	20	50	-	-	A dc
Required fine wire cross-section (minimal): IEC60947-1, table 9	А	4	2x6	-	-	mm²
max power dissipation	Р	0.0	0.0	-	-	W

The terminals, without interconnection can take copper wires up to 6 mm<sup>2</sup>.

The recommended Spade Tongue Terminals may have a maximum width of 9 mm.

For CSA and UL applications, registered Spade Tongue Terminals must be used.  $\label{eq:csa}$ 

The registration numbers are UL: E13288 and CSA: LR7189 (for instance type 165015 from Tyco).

Recommend Manufacturer	Type number	Wire size (AWG)	Wire size (mm²)	Color
JST	FVD2-YS4A	AWG 16 – AWG 14	1,0 – 2,5 mm²	Blue
TE connectivity	C-165012	AWG 16 – AWG 14	1,0 – 2,5 mm <sup>2</sup>	Blue
Vogt	3635c	AWG 16 – AWG 14	1,5 – 2,5 mm <sup>2</sup>	Blue
TE connectivity	C-165015	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Vogt	3652c / 3653c	AWG 12 - AWG 10	3,0 - 6,0 mm <sup>2</sup>	Yellow
Santon (JST)	52A1256.35	AWG 8 - AWG 10	10,5mm <sup>2</sup> -16mm <sup>2</sup> *1	*2

<sup>\*1 16</sup>mm² only with fine stranded wire or two 6mm² is also possible

<sup>\*2</sup> Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00