File number	Piece number

TY-SPACE

File Number TYS-SSE-IDS

Stage mark FM

Page 12

SS-E Sun Sensor IDS

Signature

Edit ： FUSHUXIN

Proofreading ： WANG HONGQIANG

Check ： XIAO MINGGUO

Standard check： CHAIYIN

Approval ： WANGHAIJUN

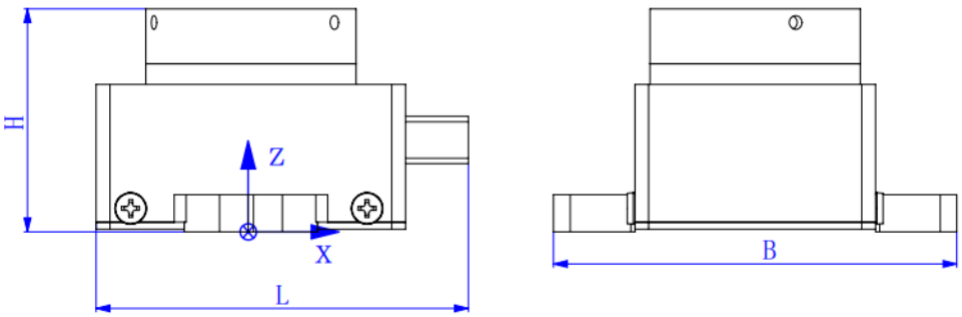
IDS 1：Performance Index

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	

Measure Accuracy	0.1″ (3σ)
FOV	88° ×104°
Update Rate	5Hz
Voltage	5V±5%
Power Ripple	100mV
Current	≤2A/5ms
Communication	RS422
Life Time	3years @500Km Orbit
Reliability	≥0.98 @ the end of 3years running

Edited（Date）：			WangHaijun
Signed（Date）：	Mark	Changed number	Signature, date

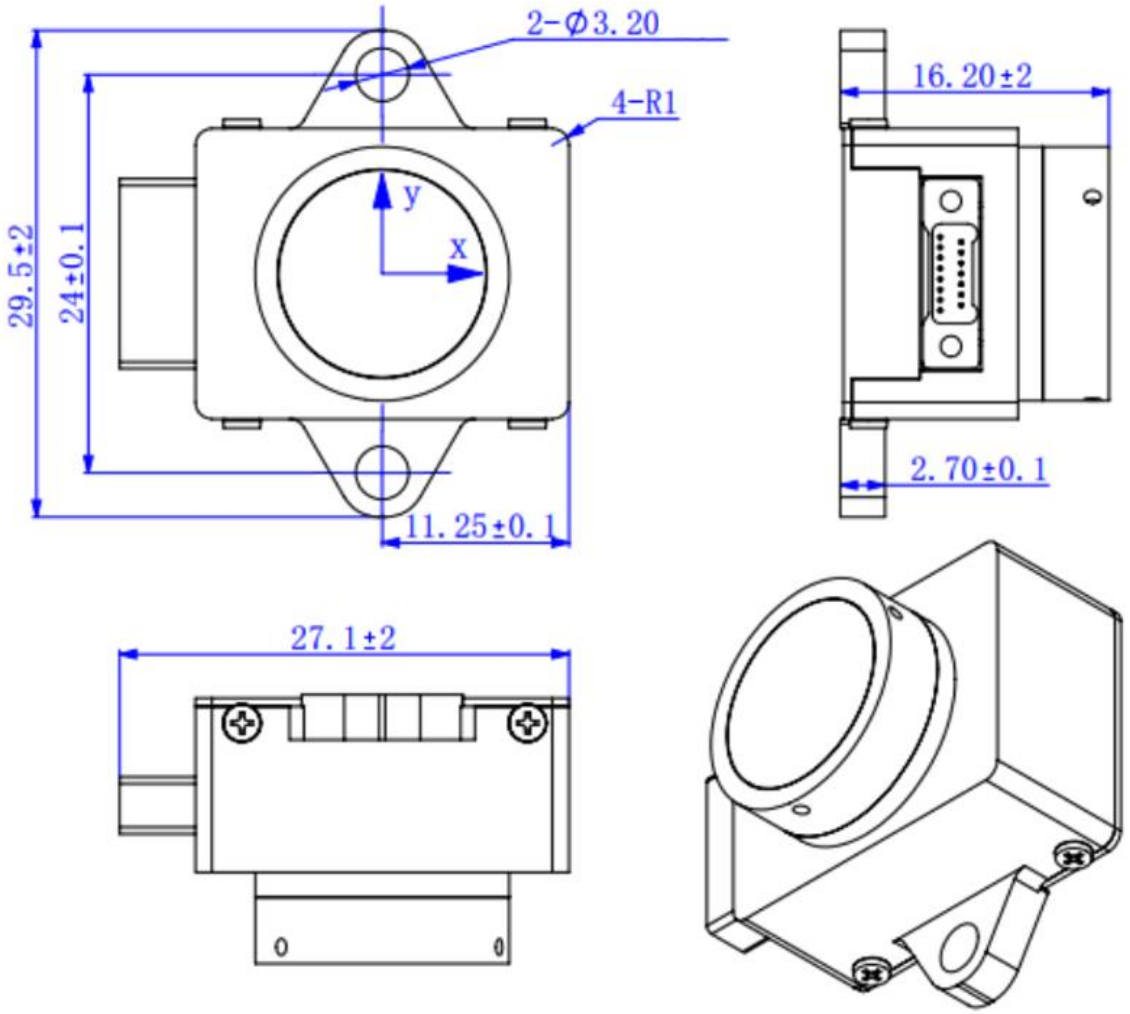
IDS 2：Mechanical Characteristics

<table>
<tr><td colspan="3" rowspan="4"></td><td>File number</td><td>TYS-SSE-IDS</td><td colspan="4"></td></tr>
<tr><td>Sub-system name</td><td></td><td colspan="4"></td></tr>
<tr><td>Device name</td><td>SS-E Sun Sensor</td><td colspan="4">Stage mark</td></tr>
<tr><td>Device code</td><td></td><td></td><td></td><td>FM</td><td></td></tr>
<tr><td colspan="3">Device weight[note] 10±5g</td><td colspan="2">Device number：1</td><td></td><td>√</td><td></td></tr>
<tr><td rowspan="4">Weight characteristics</td><td>Envelope size mm</td><td colspan="2">Envelope:29.5×27.1</td><td>Height：16.2±2</td><td></td><td>√</td><td></td></tr>
<tr><td>Centroid position mm</td><td>X：-0.7</td><td>Y：-0.0</td><td>Z：6.9</td><td></td><td>√</td><td></td></tr>
<tr><td rowspan="2">Inertia of centroid kg.mm²</td><td rowspan="2">P_X =0.5</td><td rowspan="2">P_Y =0.7</td><td rowspan="2">P_Z =0.8</td><td></td><td>√</td><td></td></tr>
<tr><td>Mea-sure-ment</td><td>Calc-ulatio-n</td><td>Esti-mate</td></tr>
<tr><td rowspan="5">Installation characteristics</td><td>Installed holes number：2</td><td colspan="2">Size of installed holes（tolerance）mm：Φ3.2±0.1</td><td>Material:2A12-T4</td><td colspan="3">Determination method（√）</td></tr>
<tr><td colspan="3">Installation contacting area mm² ：60</td><td colspan="4" rowspan="4">Note：</td></tr>
<tr><td colspan="3">Installation surface flatness ：0.1mm/100mm²</td></tr>
<tr><td colspan="3">Installation surface roughness Ra μm: 3.2</td></tr>
<tr><td colspan="3">Installation surface state：the installation area is oxidized by conduction, and the remaining area is oxidized black.</td></tr>
<tr><td colspan="8">Parameter relationship diagram (the relative relationship between the coordinate frames, position of centroid, size of device body, location of installation surface, etc.):
Note: the determination method refers to the way to determine the weight of device.
 

Note：The origin of the coordinates is located at the geometric center of the outer surface of the lower shell (see "Instrument diagram");</td></tr>
<tr><td colspan="2">Edited（Date）：</td><td></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="2">Signed（Date）：</td><td>Mark</td><td colspan="2">Changed number</td><td colspan="2">Signature, date</td></tr>
</table>

IDS 3：Instrument Diagram

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	



Note: This sketch should include body size, mounting size, mounting plane, mounting point (aperture and its tolerances, center distance and its tolerances), position tolerances for guide pins and holes, direction, location, type and number of electrical connectors , the operating hole, the lap (position and length), the registration measurement reference for calibration and testing.

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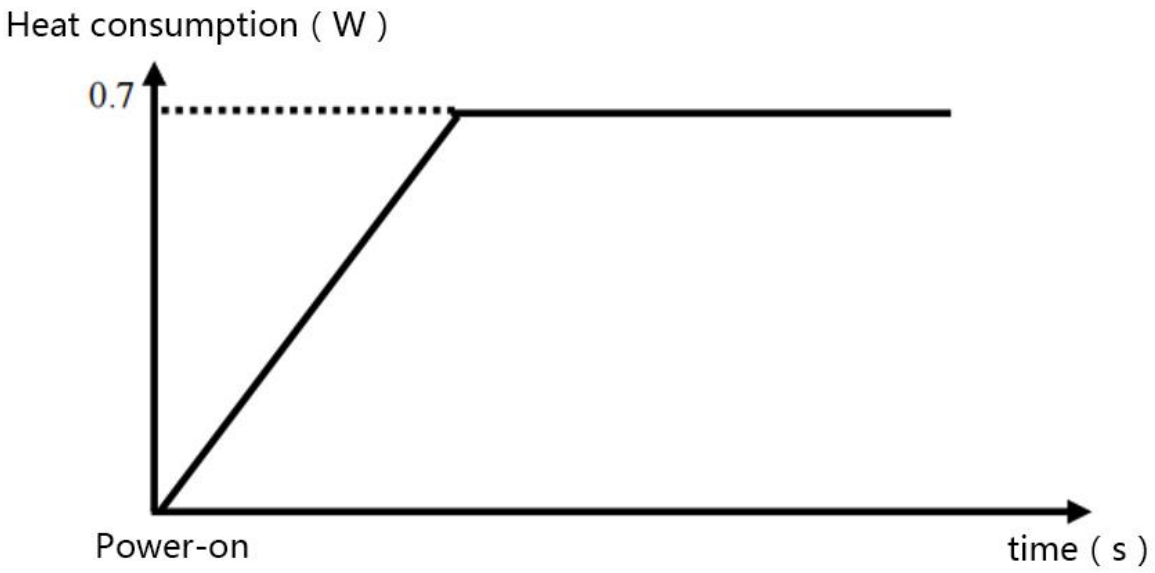
IDS 4：Thermal characteristics

	File number	TYS-SSE-IDS					
	Sub-system name						
	Device name	SS-E Sun Sensor	Stage mark				
	Device code				FM		

Surface (except for mounting surface)	Aluminum alloy（2A12-T4）	Note: The inner surface of the baffle is treated with ultra black coating，ε_H：≥0.85，α_S：≥0.96
	Outside surface treatment: Black anodized	
	ε_H：≥0.85	
	α_S：≥0.96	

Start temperature ℃：-30~+45	Installation contacting area mm^2 ： 40	Heat capacity J/K：10
Operating temperature range ℃：-40~+45		Operating relative humidity range： / %
Storage temperature range ℃：-40~+45		Storage relative humidity range：/ %
Operating state heat consumption W：0.7±0.1（per device）		Preparing state heat consumption W：0（per device）

Description:



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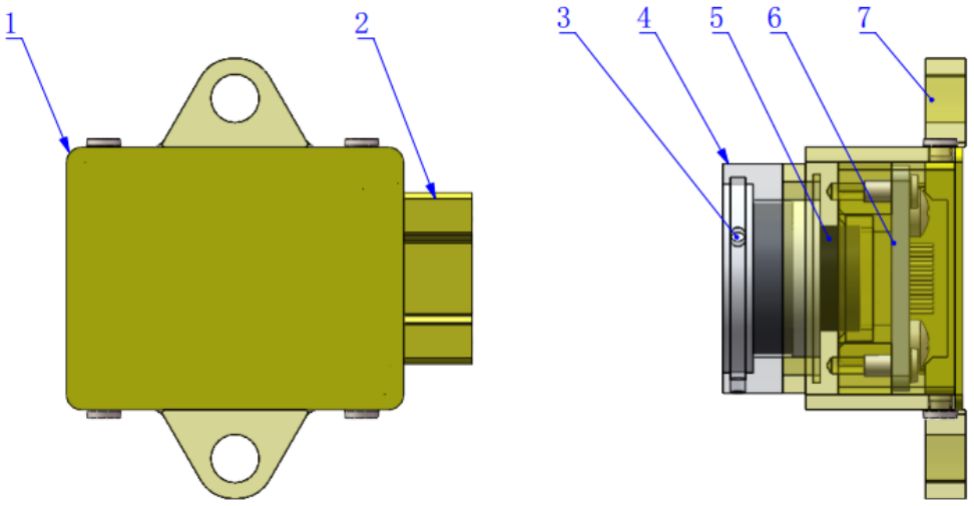
IDS 5：Thermal Diagram

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	

Diagram：



1－Lower case　　2－Connector
3－coated glass　　4－coating glass frame
5－Lens　　6－internal circuit board
7－upper case

The structure of　SS-E Sun Sensor is shown as above,
The power distribution is:1,circuit board: about 0.7W;

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IDS 6：Power

	File number	TYS-SSE-IDS			
	Sub-system name				
	Device name	SS-E Sun Sensor	Stage mark		
	Device code			FM	

Working mode (long term/short term/others）	Long term	Single non-long-term power-up working hours S		Device number	1

Voltage V	Voltage stability %	Ripple voltage mV （P-P）	Device starting current characteristics （peak/duration）	Power W
5	5%	100	＜2A/5ms	0.7±0.1

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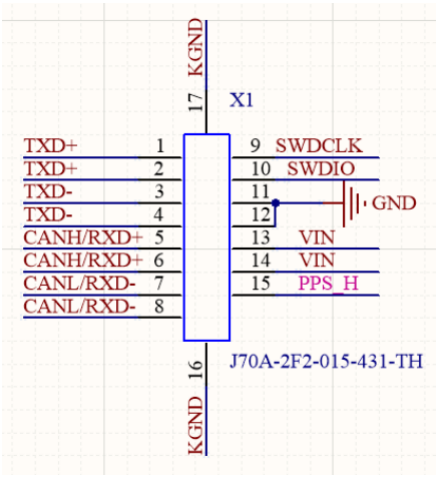
IDS 7: Electrical Connector Contact Assignment

	File number	TYS-SSE-IDS			
	Sub-system name				
	Device name	SS-E Sun Sensor	Stage mark		
	Device code			FM	

Name (by function)	XK04-01	Electrical connector P/N	J70A-2F2-015-431-TH	Needle / Hole	Hole

Contact number	Signal (function) description	Voltage/V	Current/A	Polar	Remarks (shielded / twisted)
15	PPS_H			PPS Receive +	
13,14	VIN	5V		Power	
11,12	GND	0V		Power Ground	two-point two-wire
1,2	TXD+			422Transmit+	two-point two-wire
3,4	TXD-			422Transmit-	two-point two-wire
7.8	CANL/RXD-			422 Receive+	two-point two-wire
5.6	CANH/RXD+			422 Receive-	
9	SWDCLK				Internal use, prohibit external use
10	SWDIO				



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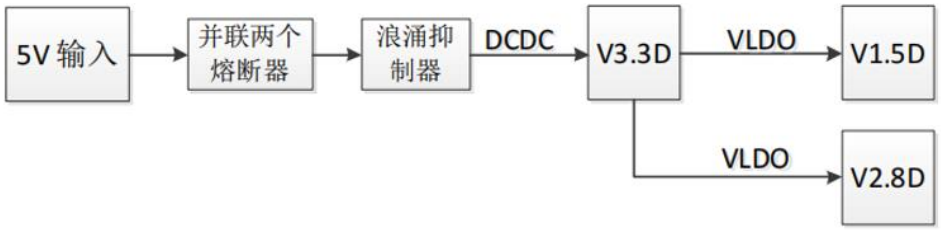
IDS 8: Electrical Interface Features-Power

	File number	TYS-SSE-IDS	
	Sub-system name		
	Device name	SS-E Sun Sensor	Stage mark
	Device code		FM

Interface signal	Power supply
Signal characteristics	5V power and the ground are two-point two-wire.
Interface Circuit	
Explanation	

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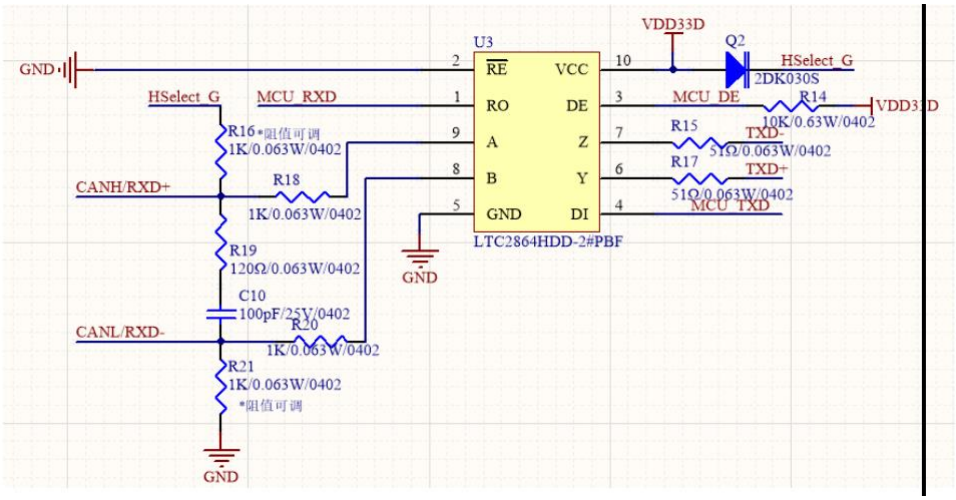
IDS 9：Electrical Interface Features-RS422

	File number	TYS-SSE-IDS	
	Sub-system name		
	Device name	SS-E Sun Sensor	Stage mark
	Device code		FM

Interface signal	Digital signal, RS422.
Signal characteristics	422 communication baud rate: 115200bps; two-point two-wire
Interface circuit	
Explanation	

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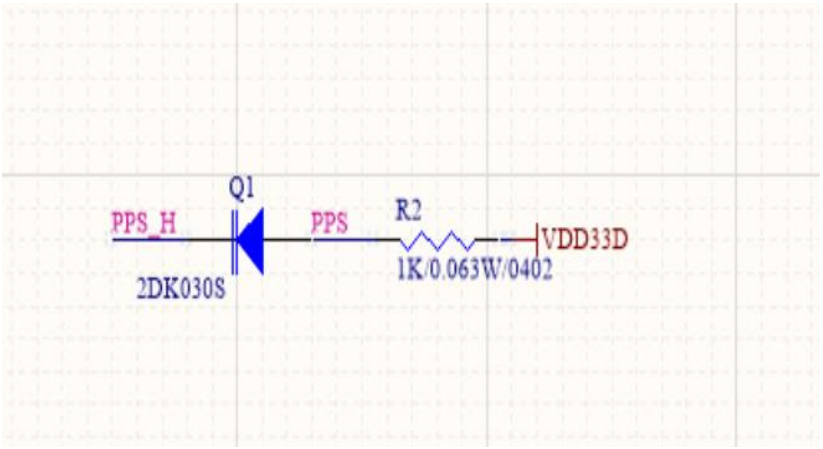
IDS 10：Electrical Interface Features-Second pulse (single)

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	

Interface signal	Second pulse
Signal characteristics	@ single second pulse, the second integer is aligned by the lower edge, and the negative pulse width is 1ms.
Interface circuit	Seconds pulse circuit 
Explanation	

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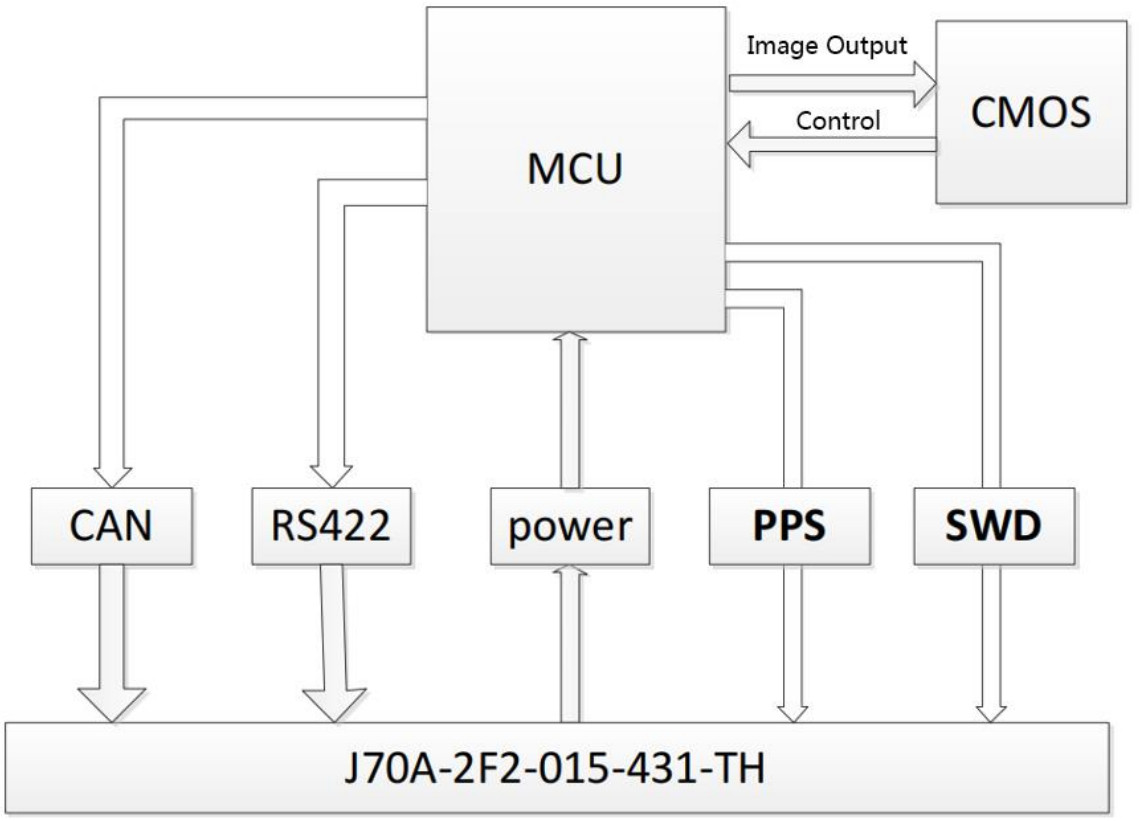
IDS 11：Circuit and Interface Schematics

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	

Simplified diagram：



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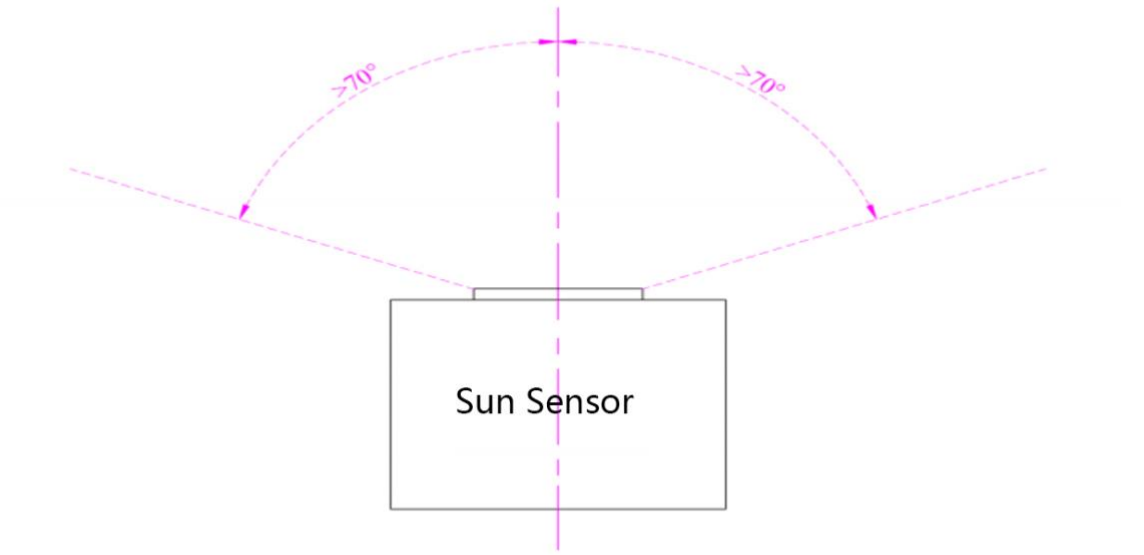
IDS 12：Installation requirements

	File number	TYS-SSE-IDS				
	Sub-system name					
	Device name	SS-E Sun Sensor	Stage mark			
	Device code				FM	



Be sure: Nothing sheltered in the field of view: the circular cone of 140° around the top of the Baffle.

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