How do scientists classify solar flares?

Scientists classify solar flares according to their X-ray brightness,in the wavelength range 1 to 8 Angstroms. Flares classes have names: A,B,C,M,and X,with A being the tiniest and X being the largest. Each category has nine subdivisions ranging from,e.g.,C1 to C9,M1 to M9,and X1 to X9.

What is a solar flare?

Solar flares are giant explosions on the sun that send energy,light,and high speed particles into space. These flares are often associated with solar magnetic storms known as coronal mass ejections (CMEs).

How many types of solar flares are there?

There are five classesof solar flares,according to NOAA. Their designation depends on the intensity of X-rays emitted. Each class letter represents a 10-fold increase in energy output,similar to the Richter scale that measures the strength of earthquakes. According to NASA,X-class flares are the most powerful solar flares.

How powerful is a solar flare?

Within each letter class there is a finer scale from 1 to 9. The most powerful flare measured with modern methods was in 2003, during the last solar maximum, and it was so powerful that it overloaded the sensors measuring it. The sensors cut out at X28.

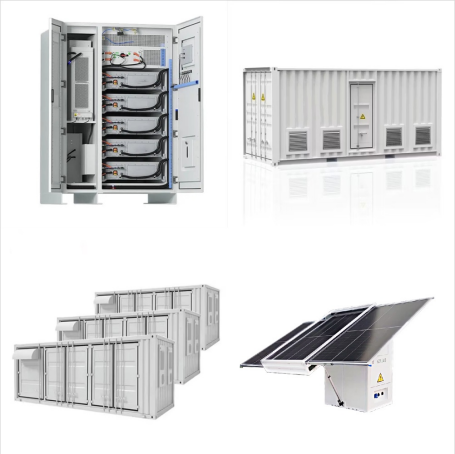
How big are solar flares?

Flares tend to come from active regions on the Sun several times the size of Earth or more. NASA's Solar Dynamics Observatory captured an image of a mid-level solar flare on March 11,2015,seen as a bright flash of light on the left side of the Sun.

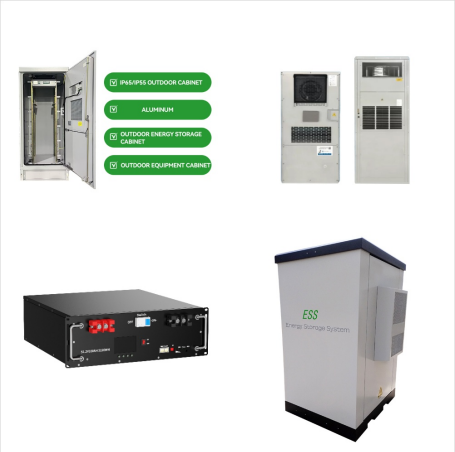
How often do solar flares occur?

These flares are often associated with solar magnetic storms known as coronal mass ejections (CMEs). The number of solar flares increases approximately every 11 years,and the sun is currently moving towards another solar maximum,likely in 2013.

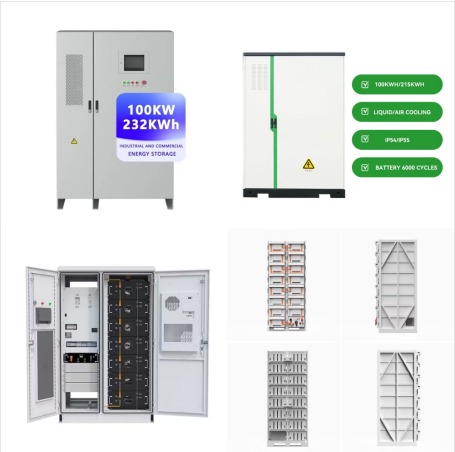
SOLAR FLARE RATING SYSTEM



Threshold distance from the Solar limb: arcsec (Note: currently Solar radius is assumed to be 975 arcsec without annual variations.) (Note: The flares within the hours prior to the filament eruption will be searched; the filament records will be added to these flares. (Note: The arbitrary interest rating varies from 1 to 5. A rating of



has already proven to be a particularly stormy month for our Sun. During the first full week of May, a barrage of large solar flares and coronal mass ejections (CMEs) launched clouds of charged particles and magnetic fields toward Earth, creating the strongest solar storm to reach Earth in two decades ??? and possibly one of the strongest displays of auroras on record in the ???



? The K-index, and by extension the Planetary K-index, are used to characterize the magnitude of geomagnetic storms. Kp is an excellent indicator of disturbances in the Earth's magnetic field and is used by SWPC to decide whether geomagnetic alerts and warnings need to be issued for users who are affected by these disturbances.

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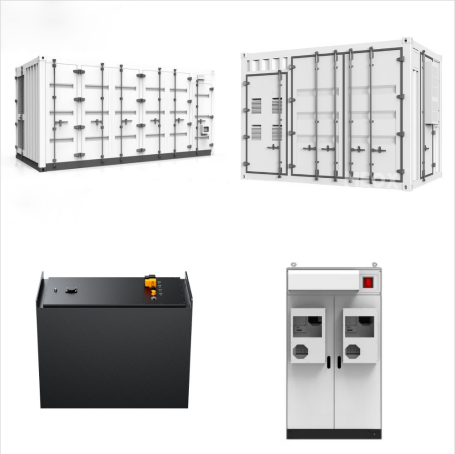
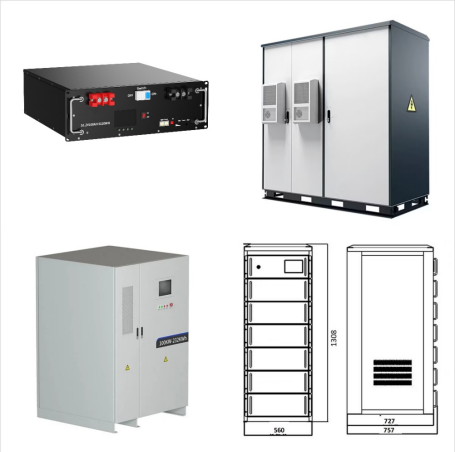


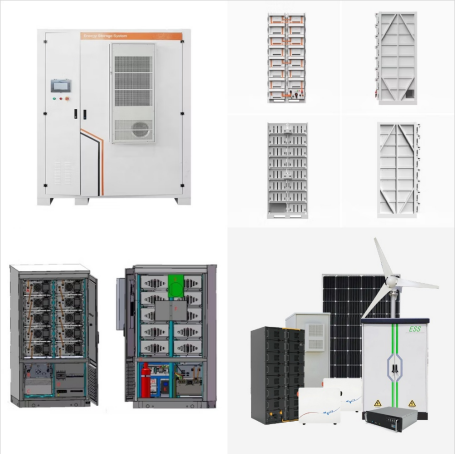
On Oct. 3, the sun released the most powerful solar flare this solar cycle, a colossal X9.05 eruption ??? and it's heading for Earth. (Image credit: NASA / SDO and the AIA, EVE, and HMI science



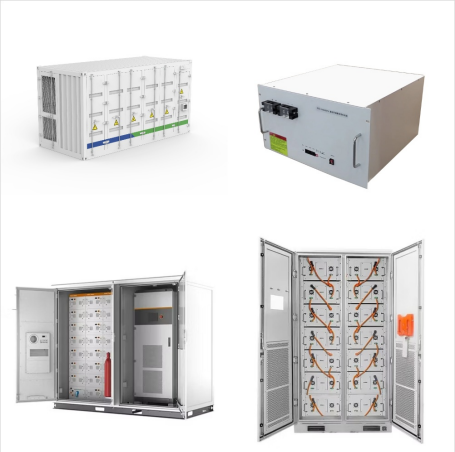
Solar Flares . A solar flare is a short-lived sudden increase in the intensity of radiation emitted in the neighborhood of sunspots. Historically it was best monitored in the H-alpha wavelength and occurs in the chromosphere, though occasionally white light flares are seen in the photosphere.

The solar soft X-ray observations from the GOES satellites now span two full Hale cycles and provide one of the best quantitative records of solar activity, with nearly continuous flare records since 1975. We present a uniform new reduction of the entire time series for 1975 to 2022 at NOAA class C1 level or above, to characterize the occurrence distribution function ???

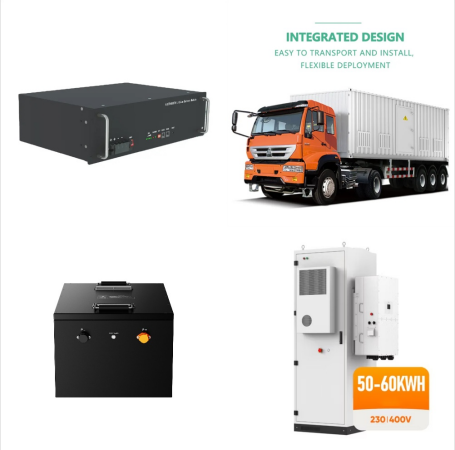
SOLAR FLARE RATING SYSTEM



B. NOAA Solar Radiation Activity Observation and Forecast. Solar radiation, as observed by NOAA GOES-18 over the past 24 hours, was below S-scale storm level thresholds. Solar Radiation Storm Forecast for Nov 09-Nov 11 2024 Nov 09 Nov 10 Nov 11 S1 or greater 15% 15% 15% Rationale

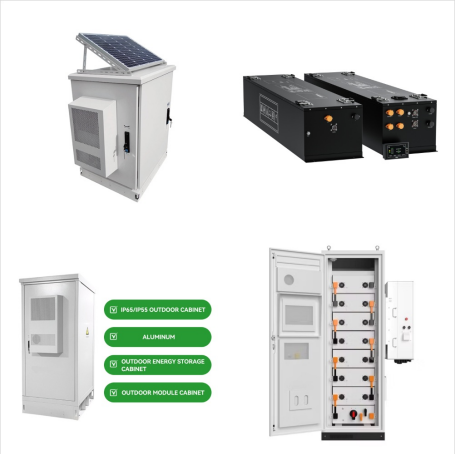


In the Solar System, A solar flare from a sunspot region associated with this activity and preceding this period produced the then largest flare detected during the Space Age at about X20 (the first event to saturate spaceborne monitoring instruments, this was exceeded in 2003) but was directed away from Earth. With a NOAA rating of G5

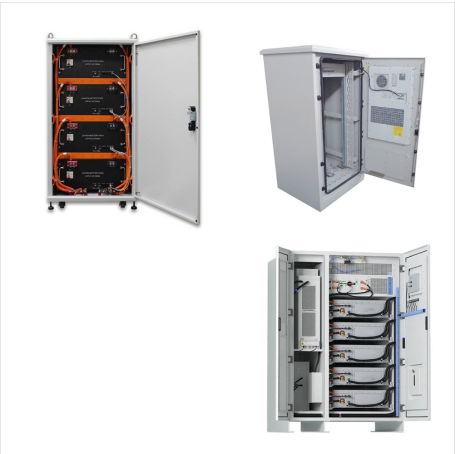


The largest explosions in the solar system get rewarded for their sheer brawn with a fitting, sci-fi-sounding name: X-class. Made visible to us by sun-observing satellites, these solar flares are awesome to watch. Loops of solar material???called plasma???leap off the sun's surface and expand to 10 times the size of Earth. The biggest flares can produce as much energy as a ???

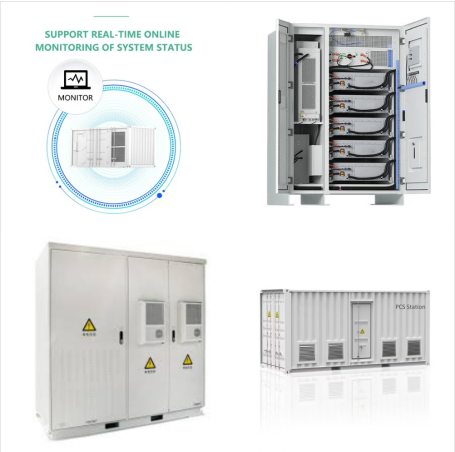
SOLAR FLARE RATING SYSTEM



Ranking of a solar flare is based on its x-ray output. Flares are classified according to the order of magnitude of the peak burst intensity (I) measured at the earth in the 0.1 to 0.8 nm wavelength band as follows: Peak, 0.1 to 0.8 nm band : Class (Watts/square metre) B: I < 10-6 : C:

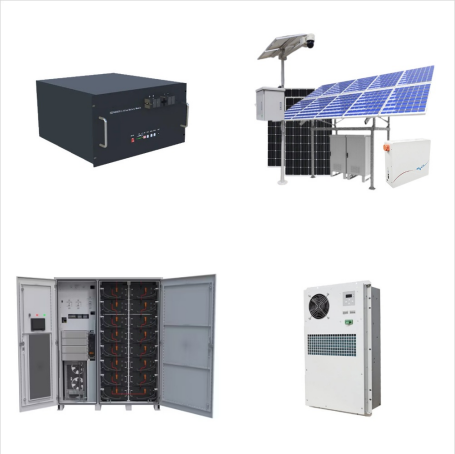


Solar flare activity is characterized by different classification systems, both in optical and X-ray ranges. The most generally accepted classifications of solar flares describe important parameters of flares such as the maximum of brightness of the flare in the optical range ??? (H_{alpha }) flare class (change from F to B), area of the flare in (H_{alpha }) (change ???

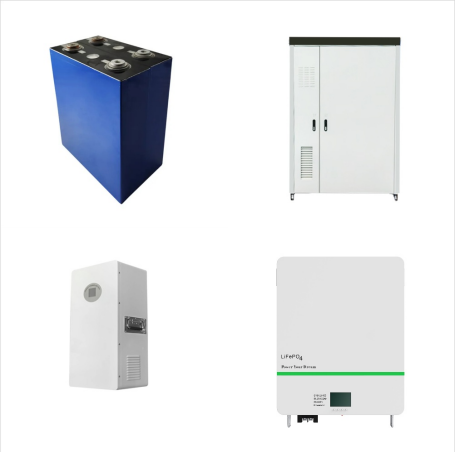


The X-class flares and coronal mass ejections seen in May transformed the interplanetary medium as they flung out material across the solar system. Solar Orbiter detected a huge spike in ions

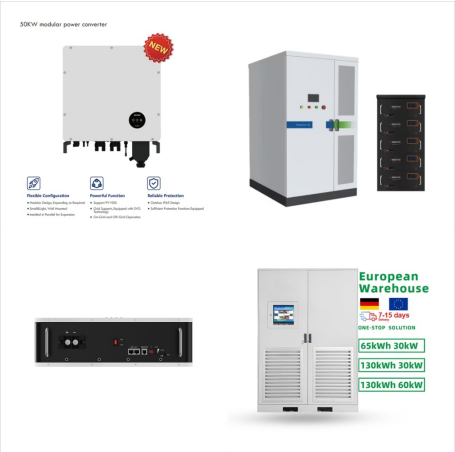
SOLAR FLARE RATING SYSTEM



Learn how scientists classify solar flares by their X-ray brightness, from A to X, with A being the weakest and X being the strongest. Find out what types of flares can trigger radio blackouts and radiation storms on Earth and how SID space weather monitors can detect them.

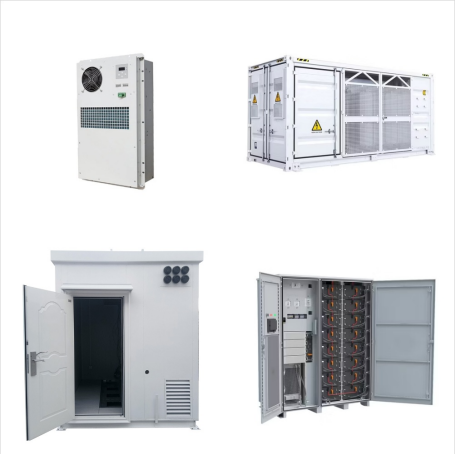


Billions of tons of sun stuff can billow out into the solar system, crossing the 150 million kilometers to Earth's orbit in anywhere from about 14 hours to a few days. In 1972, a solar flare knocked out long-distance telephone lines in Illinois, ???

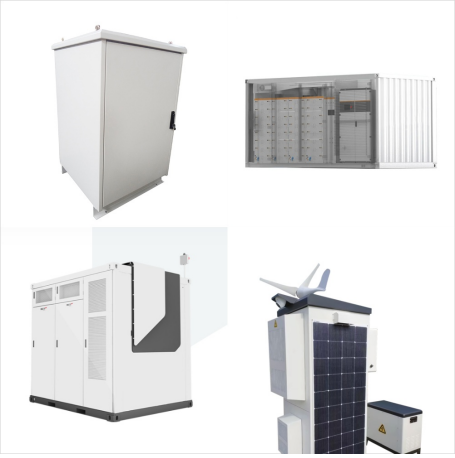


That solar flare produced the largest and fastest rise in carbon-14 ever recorded. the National Oceanic and Atmospheric Administration uses the Geomagnetic Storms scale to measure the strength of these solar eruptions. The "G scale" has a rating from 1 to 5 with G1 being minor and G5 being extreme. that can shield vulnerable equipment

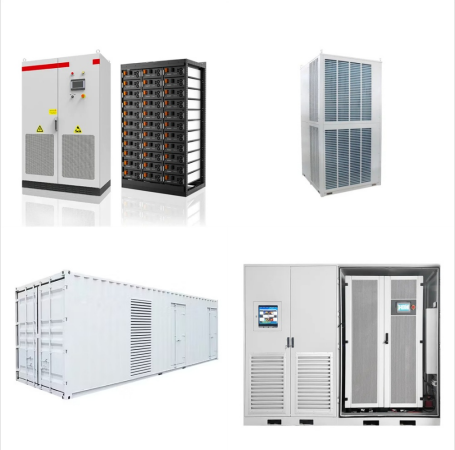
SOLAR FLARE RATING SYSTEM



Billions of tons of sun stuff can billow out into the solar system, crossing the 150 million kilometers to Earth's orbit in anywhere from about 14 hours to a few days. In 1972, a solar flare knocked out long-distance telephone lines in Illinois, for example. In 1989, a flare blacked out most of Quebec province, cutting power to roughly 6



On May 14, 2024, the Sun emitted a strong solar flare. This solar flare is the largest of Solar Cycle 25 and is classified as an X8.7 flare. X-class denotes the most intense flares, while the number ???



Within each class, numbers from 1 to 10 (and beyond for X-class) indicate the relative strength of the flare. Powerful solar flares like the one released this morning can often be accompanied by a