

AMS 6300 SIS & API 670 Compliance

API 670 – Overview

The API670 Standard is written as a purchasing guideline for machinery protection systems and sensors. The API670 standard was developed by the American Petroleum Institute for the oil and gas industry. API670 is not a safety or system certification agency. There are no API670 compliance certificates, **there is no API670 regulated compliance**, there is only API670 alignment and API670 alignment is self-claimed. What we have with API670 is a large list of specification guidelines that are generally accepted as a reasonable approach to deploying a well thought out protection system. While API670 is not a certifying standard, many insurance companies will reference API670 alignment as a criteria for insurance coverage of an asset.



The API 670 standard covers a lot of material from sensors to sensor cabling to sensor monitoring systems to relay based shutdown systems. The standard also covers how the protection system is deployed and some of the types of measurements it should make and how fast it should react to critical situations. In an effort to cover every aspect of machinery protection systems you will find that the creators of this standard went as far as specifying how big an accelerometer should be and what size threads would be used to connect it to a surface. The point I'm trying to make here is that the intention of the authors of this standard are sometimes apt and sometimes arbitrary.

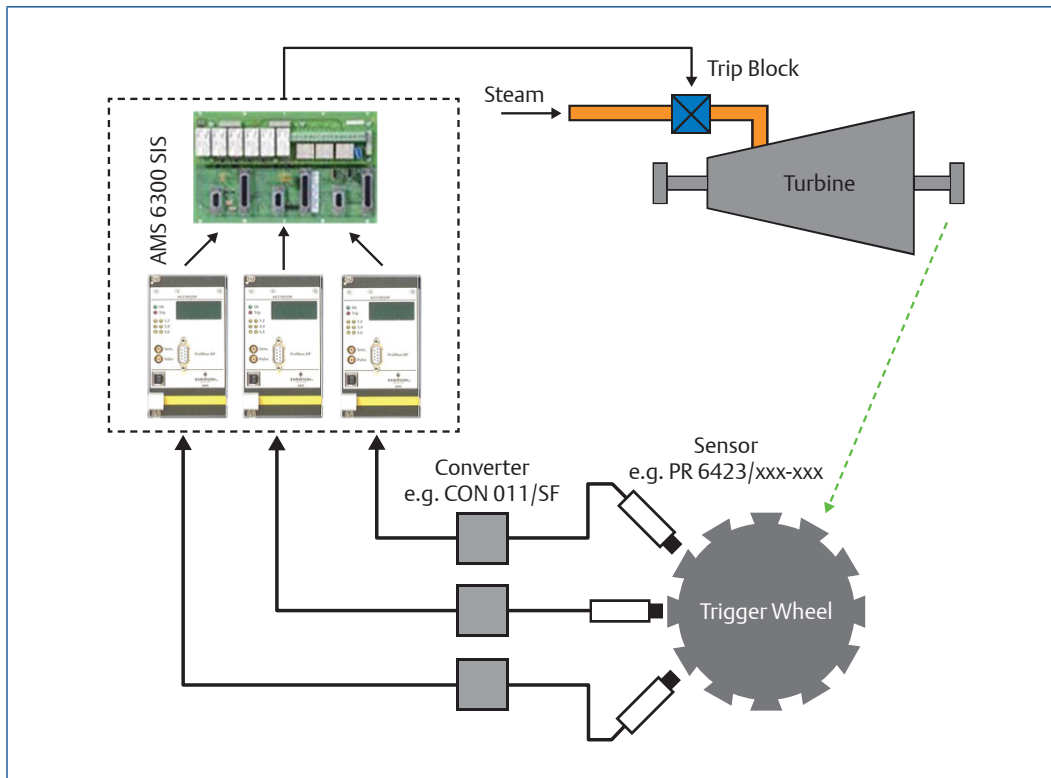
The current API670 specification is the 5th edition published in November 2014. This newest 5th edition specification has 12 chapters and 17 Annex's covering 244 working pages. The 4th edition had only 96 working pages. With this increase in size the API670 specification has added some complexity and created some redundancy and so stating alignment with the specification is complicated. Specifications for protection system components are spread over several chapters.

This white paper will attempt to reduce this complication and address the main issues you are likely to encounter. The API670 specifications can be distilled to a few key specifications for sensors and monitors.

Also Keep in mind that when a shutdown protection system component or sensor variance from the API670 specification is accepted then the component or sensor is considered aligned with the specification for that customer. This is the case for all parts of API670, if you state the variance and the variance is accepted then the API670 specification is satisfied for that situation.

AMS 6300 SIS, API 670 Compliance

According to the API670 5th edition; a machinery protection system (MPS) is the system that measures operating conditions on a machine and alarms on machine condition levels that exceed set points. This MPS consists of the sensors, sensor cables and instrumentation to power the sensors and instrumentation to measure and compare the sensors signals to set points. The API670 5th edition added a new category to machinery protection, it added the Emergency Shutdown System (ESD). The ESD is the system that stops the machine based on data from the MPS or other monitoring systems. This ESD functionality may be a simple or programmable set of relays. Prior to the 5th edition it was assumed that the MPS and the ESD were one and the same system.



While the AMS 6300 SIS may have a few exceptions with the 100's of API670 specifications, Emerson asserts that regarding the most frequently mentioned specifications listed on the next page, the AMS 6300 SIS is in 100% alignment with the intent of the API670 5th edition. For all of the other many API 670 specifications not covered in this summary document Emerson will supply a detailed response as requested. Please contact your Emerson sales team to submit specific requests for clarification.

Note	API 670	Description	AMS 6300 SIS
1	4.2.2	Humidity: 0 - 95%, non- condensing	✓
2	4.5.4 Table 1	System Operating Temperature Range: -20° to 65°C (0° to 150°F)	✓
3	4.5.4 Table 1	Monitor Accuracy for Overspeed: ± 0.1% of setpoint	✓
4	4.6.1	Physical and electrical interchangeability	✓
5	4.8.1	Independence from control system	✓
6	4.8.2	No Wireless technologies for protective functions	✓
7	4.9.2 Table 2	Allowable Usage of Wireless Technology	✓
8	4.9.3	System shall comply with EN 61000-6-2 electromagnetic radiation immunity requirements	✓
9	4.10 & 7.2	Power Supply requirements	✓
10	4.11.1	Safety Instrumented System requirements	✓
11	4.11.3	Minimum requirements for System features and functions	✓
12	4.11.4	System Signal processing functions and outputs	✓
13	4.11.5	System alarm and shutdown functions	✓
14	4.11.6	Single Circuit failure behavior	✓
15	4.11.7	System status Indication	✓
16	4.12 & 7.3	System Output Relays	✓
17	4.15	Grounding	✓
18	4.16	System Security, Safeguards, Self-tests & Diagnostics	✓
19	4.17	Reliability	✓
20	8.1	General requirements for Overspeed detection systems	✓
21	8.2	Accuracy	✓
22	8.3	Segregation	✓
23	8.4.1	Number of circuits and alarm logic	✓
24	8.4.2	System output relays	✓
25	8.4.3	Inputs, Outputs and Configuration	✓
26	8.4.4	Response time and verification	✓
27	Annex J	Electronic Overspeed Detection System Considerations	✓
28	Annex O	Overspeed	✓

Notes:

- 9. Power supply for AMS 6300 SIS is 19 to 32 V DC.
- 11. Comply with this requirement, but without time synchronization.
- 18. Comply with this requirement, but without Storage of alarms.

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