



DATASHEET

SpeedSys 200

Overspeed protection system

GAME CHANGING INNOVATION FOR SIL RATED OVERSPEED PROTECTION

SpeedSys 200 is a high-integrity overspeed protection system for rotating machinery. It delivers the core layer of protection with a compact architecture. Its small technical footprint and low-impact installation enables advanced protection to a wide range of applications. The simple and robust design meets the latest safety standards, and features easy maintenance and long proof test intervals.



ADVANCED PROTECTION FOR A WIDE RANGE OF APPLICATIONS

- Overspeed, underspeed and acceleration protection for critical and semi-critical rotating machinery
- Designed for versatility and scalable to the application
- Suitable for API 670 and API 612 applications

Typical applications include:

- Compressors and pumps
- Microturbines
- Wind turbines
- Gas- and steam turbines
- Marine applications

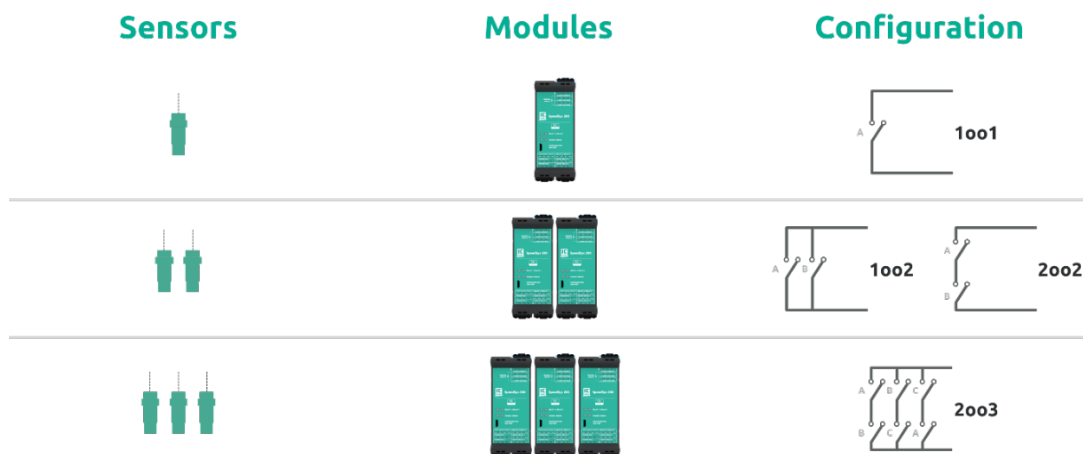
SAFETY SYSTEM BY DESIGN

- Certified SIL 2 capability
- Fast 8 ms system response time
- 2 safety relays + 1 safety analog output per module
- Suitable for all common sensor types
- External voting for redundant configurations
- Advanced self-monitoring and diagnostics
- 10 years proof test interval (typical)

VERSATILE ARCHITECTURE

Every channel is designed to work as an independent module. SIL 2 rated protection can be achieved with a single module. To maximize safety or availability, the double pole safety relays can easily be wired into various configurations.

Configuration examples



INPUT

Input channels

| | |
|----------------------|--|
| Sensor input | 3 separate sensor inputs for different sensor types Note: Only one sensor input can be used at any time |
| Frequency range | 0.025 Hz to 35 kHz |
| Measurement accuracy | 0.05 % @@TBD |

(1) Hall effect sensor

| | |
|------------------------------|---|
| Input type | 3-wire voltage input |
| Sensor power supply | 21.0 V (@ 0 mA) to 15.5 V (@ 15 mA) |
| Input range | @@TBD |
| Trigger level (programmable) | 0 V to 24 V |
| Impedance | 500 kΩ |
| Sensor monitoring | Advanced sensor monitoring |
| Note | Hall effect sensors are typically suitable for cable lengths up to 300 m. |

(2) Electromagnetic sensor (MPU)

| | |
|------------------------------|--|
| Input type | 2-wire voltage input |
| Sensor power supply | n/a |
| Input range | 20 mV _{RMS} to 80 V _{RMS} |
| Trigger level (programmable) | 0 V to 5 V |
| Impedance | 100 kΩ |
| Sensor monitoring | Open circuit detection |
| Note | Electromagnetic sensors are typically suitable for cable lengths from 30 to 300 m, depending on sensor and application design. |

(3) Proximity sensor

| | |
|------------|----------------------|
| Input type | 2-wire current input |
|------------|----------------------|

| | |
|------------------------------|--|
| Sensor power supply | 21.0 V (@ 0 mA) to 20.5 V (@ 21 mA) (@ 20 °C) 21.0 V (@ 0 mA) to 20.0 V (@ 21 mA) (@ 60 °C) |
| Input range | @@TBD |
| Trigger level (programmable) | 0.0 mA to 20.5 mA |
| Impedance | 100 kΩ |
| Sensor monitoring | Advanced sensor monitoring |
| Note | Proximity measurement chains are typically suitable for cable lengths up to 1000 m. |

OUTPUT

Safety relays

| | |
|----------------------------|---|
| Number | 2 safety relays (relay 1 & 2) |
| Type | Double pole single throw (DPST) safety relays 2 x COM and 2 x NO contacts available per relay |
| Function | User-configurable relays for overspeed, acceleration and/or underspeed limits and/or system status |
| Maximum switching capacity | 30 V _{DC} / 2 A (resistive load) 30 V _{DC} / 100 mA (inductive load) |
| Hysteresis | User-configurable |
| Safe state | Normally open (de-energized to trip) |
| SIL safety | Yes. The safety relays are part of the SIL approvals and can be used for critical machine protection applications as specified. |

Additional relays

| | |
|----------------------------|--|
| Number | 2 relays (relay 3 & 4) |
| Type | Single pole single throw (SPST) relays 1 x COM and 1 x NO contacts available per relay |
| Function | User-configurable relays for overspeed, acceleration and/or underspeed limits and/or system status |
| Maximum switching capacity | 30 V _{DC} / 2 A (resistive load) 30 V _{DC} / 100 mA (inductive load) |
| Hysteresis | User-configurable |
| Safe state | User-configurable normally open or normally closed |
| SIL safety | No. The additional relays are NOT part of the SIL approvals and cannot be used for critical machine protection applications. |

Analog output

| | |
|------------|--|
| Number | 1 analog output |
| Type | 4 to 20 mA current loop |
| Function | User-configurable range to transmit current output value equivalent to the measured speed. |
| Resolution | 14 bit |
| Accuracy | 0.1 % @@TBD |
| Safe state | Output driven to configurable out of range value |
| SIL safety | Yes. The analog output is part of the SIL approvals and can be used for critical machine protection applications as specified. |

Digital frequency output

| | |
|--------|---------------------------------|
| Number | 1 frequency output |
| Type | Digital open collector output |
| Signal | Max 24 V _{DC} / 100 mA |

Status LED indicators

| | |
|--------------------------|--|
| Relay indicators | 2 LED indicators for safety relay status |
| Power / error indicators | 2 LED indicators for power and module status |

SYSTEM

Reaction time

| | |
|--|---|
| Measurement time (T _m) | Dependent on signal frequency and averaging, typically ≤ 2 ms |
| Hardware reaction time (T _h) | ≤ 8 ms (relays) ≤ 100 ms (analog out) |
| Total reaction time (T _h + T _m) | ≤ 10 ms (relays; typical) ≤ 100 ms (analog out; typical) |

PC interface

USB-B mini for programming and status reading
(Windows® 10 proprietary software application)

Power supply input

| | |
|-----------------------------|--|
| Number | 2 redundant power supply inputs |
| Input voltage range | 24 V _{DC} (18 V _{DC} to 36 V _{DC}) |
| Current consumption | 210 mA @ 24 V _{DC} |
| Reverse polarity protection | Yes |

Heat dissipation

Maximum 5.0 W (@ 24 V_{DC})

Physical

| | |
|-------------------|--|
| Housing | Weidmüller CH20M-45 |
| Material | Polyamide (PA 66 GF 30) |
| Dimensions | 45 x 117 x 114 mm (1.77 x 4.61 x 4.49") |
| Mounting assembly | DIN rail |
| Connectors | 9 plug-in connectors with 4 contacts, screw type terminals |
| Weight | ± 350 g |

Environmental conditions

| | |
|-----------------------|-------------------------------|
| Operating temperature | -20 to 60 °C (-4 to 140 °F) |
| Storage temperature | -40 to 85 °C (-40 to 185 °F) |
| Operating humidity | 5 to 80 % RH (non-condensing) |
| Storage humidity | 5 to 85 % RH (non-condensing) |

Ingress protection

IP20 according to IEC 60529
Indoor use or use in a protective enclosure


Other

OVC II, pollution degree 2

APPROVALS

| | |
|-------------------------------|--|
| EU conformity | CE, declaration of conformity |
| US and Canada | cMETus |
| Electromagnetic compatibility | FCC 47 CFR, part 15 (according to ANSIC 63.4) EN 61326-1 and EN 61326-3 EN 55011 EN 61000-4 |
| Environmental | RoHS compliant (2011/65/EU) |
| Hazardous areas | Ex ia; intrinsic safety on sensor inputs (See chapter: Hazardous Areas) |
| Functional safety | SIL 2 capable according to IEC 61508 |
| API conformity | Suitable for compliance to API 670 and API 612 |

HAZARDOUS AREAS

| | | |
|-----------------------|--|---|
| Type of protection | Ex ia; intrinsic safety on sensor inputs | @@Ex approval pending |
| Type of approval | Ex II (1) G [Ex ia Ga] IIA (Gas) Ex II (1) G [Ex ia Ga] IIB (Gas) Ex II (1) G [Ex ia Ga] IIC (Gas) Ex II (1) D [Ex ia Da] IIIA (Dust) Ex II (1) D [Ex ia Da] IIIB (Dust) Ex II (1) D [Ex ia Da] IIIC (Dust) |  |
| Identifiers | IECExBASxx.xxxxx @@TBD BaseefaxxATEXxxxx @@TBD | |
| Important information | Certification refers to sensor input only. Refer to the certificates for specific parameters of the mode of operation and special conditions of use. | |

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