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.

SIL Safety

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

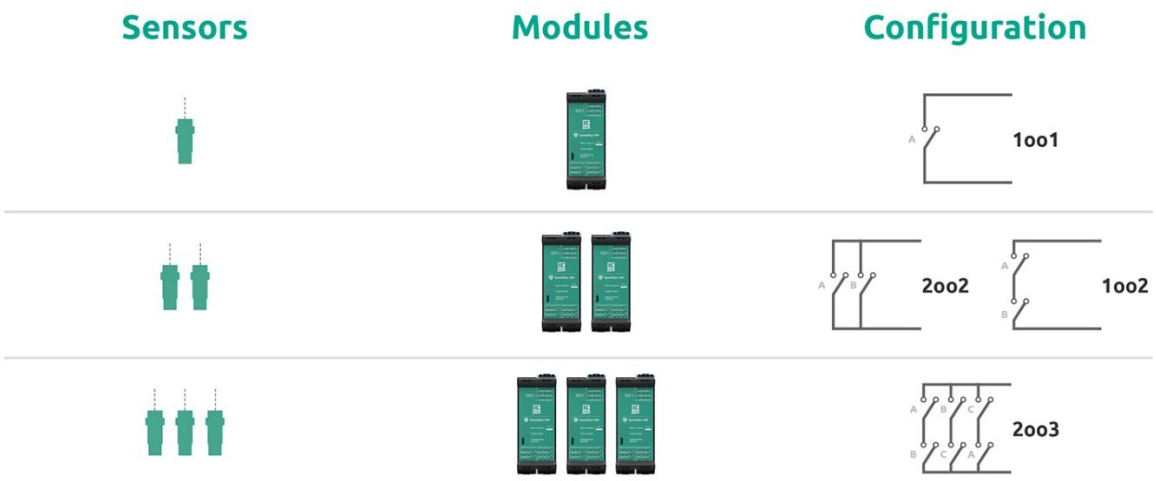
SAFETY SYSTEM BY DESIGN

- Certified SIL 2 capability
- Fast 8 ms hardware response time (relays)
- 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 %

(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	0 V to 24 V
Trigger level (programmable)	0 V to 24 V
Impedance	500 kΩ
Sensor monitoring	Open circuit detection, sensor power supply short circuit detection
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 Note: 2-wire dynamic current eddy current probe ONLY
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	0.0 mA to 21.0 mA
Trigger level (programmable)	0.0 mA to 20.5 mA
Sensor monitoring	Open circuit detection, short circuit detection
Note	Proximity sensors 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	16 bit (0 – 24 mA)
Accuracy	0.1 %
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)	Relays:	≤ 8 ms
	Analog out:	≤ 100 ms
Total reaction time (T_h + T_m)	Relays, typical:	≤ 10 ms
	Analog out, typical:	≤ 100 ms

PC interface USB-B mini for programming and status reading (Windows® 7 and higher 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})

Housing

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 Over voltage category II
Pollution degree 2

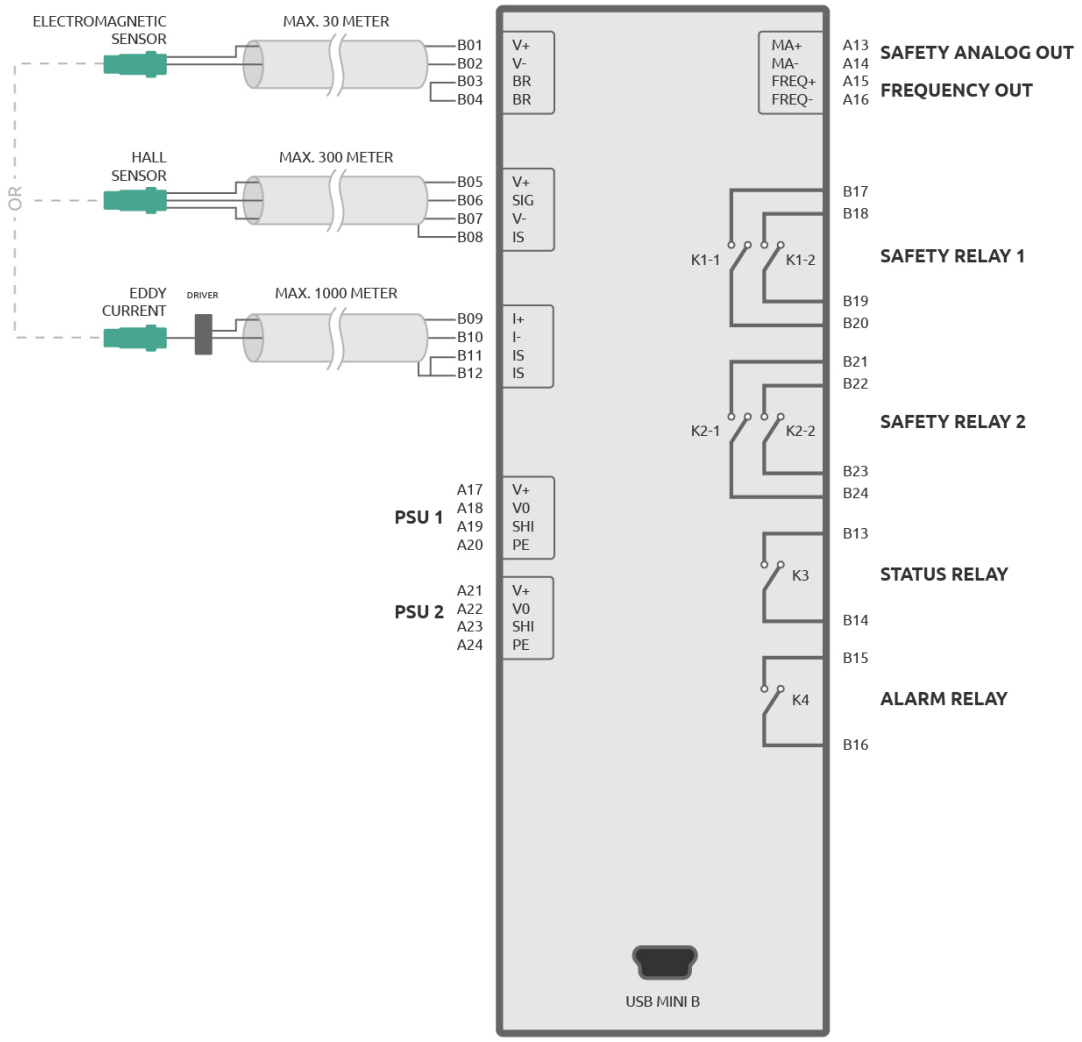
Warranty 24 months from date of invoice

APPROVALS

EU conformity	CE
UK conformity	UKCA
US and Canada conformity	cMETus
Electromagnetic compatibility	FCC 47 CFR, part 15 (according to ANSI C 63.4) EN 61326-1 and EN 61326-3-1 EN 55011
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
Approval marking	II (1)G [Ex ia Ga] IIC (Gas) II (1)D [Ex ia Da] IIIC (Dust)
Identifiers	IECEx IBE 20.0045 IBExU20ATEX1157
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.



ABOUT ISTEC

We ensure maximal value generation of your critical machinery with advanced protection and monitoring solutions. Every Istec product is designed to meet the increasing demands of industrial applications and taps into our 50 years of experience in the industry.

Our expertise is to support and maintain these critical sensors and systems in the field throughout their operational life; to increase safety, maximize machine availability and to provide new monitoring data and machine insights.

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