

Limit Value Switch for Frequency Input Sinusoidal Signal



- Straightforward application
- Suitable for severe operating conditions
- Compact construction
- Switching point freely adjustable by drum scale
- Anti-tamper seal for drum scale
- Frequency ranges to suit customer requirements
- Provision made for fine adjustment of measuring range
- Meets high EMC-requirements
- Volt-free output as normally closed contact or normally open contact
- Open-circuit or closed-circuit variants available
- Open-circuit devices with integrated push button to simulate an increased sensor signal for test functions without critical machine loading
- Operating characteristics displayed by integrated LEDs
- Flame-inhibiting and self-extinguishing body
- Suitable tachogenerators are available (NORIS devices GE...)



Limit Value Switch
RFJ5.../RFS5.../RFG5...



Limit Value Switch RFJ5.../RFS5.../RFG5...

Method of Operation

Limit value switches of the series 5 are designed to monitor and process electric measured variables.

Working principle: When the actual value of the measuring signal supplied reaches the setpoint, the built-in relay will operate. The switching status of the relay contact may, for instance, be monitored or individually processed by a machine controller.

Details

- Designed to monitor a sinusoidal frequency signal
- Suitable to evaluate outputs of speed pickups; AC-tachogenerators with various signal amplitudes
- Suitable to evaluate outputs of NORIS tachogenerators, GE...-series via RFG5...
- Factory-set maximum range frequency adjustment between 50 Hz and 10 kHz (maximum range frequency is 100 % of drum scale)
- Trimming potentiometer for re-adjustment of measuring range
- Switching point setpoint adjustable by means of drum scale from 5 ... 100 %
- Lowest switching point:
50 Hz (RFx500...), 100 Hz (RFx501...), 1,000 Hz (RFx502...)

To avoid triggering errors the frequency full range set in factory must be the highest frequency of the measuring chain, the set point will be done in a ratio to the full range.

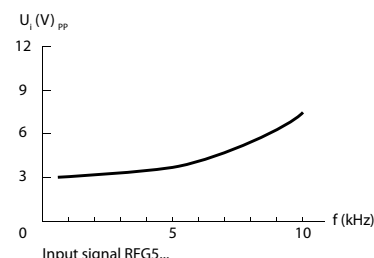
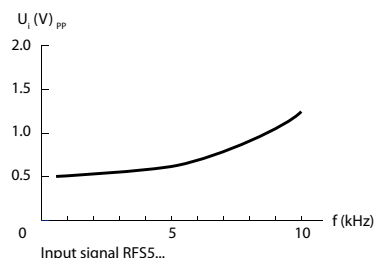
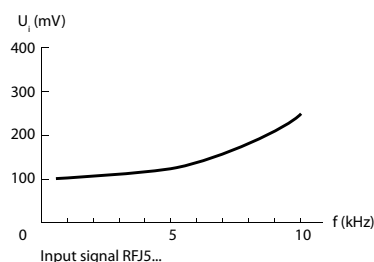
Integrated Test Button for Test Purposes

Open-circuit devices have a test button integrated for testing purposes. As long as this button is kept pressed, the preselected limit value is decreased by approx. 15%. This enables safety functions, such as an overspeed trip to be tested without it being necessary to run the machine in the critical range.

Volt-free Relay Contact, Closed-circuit or Open-circuit Version

A volt-free relay contact is provided as a normally closed or normally open contact for outputting and further processing. In addition, there is a choice between closed-circuit and open-circuit devices.

In the case of closed-circuit devices, the output relay is pulled up in the normal state of operation with the operating voltage applied. It drops off upon the limit-value being exceeded or if the operating voltage fails. In the open-circuit variant, the output relay pulls up when the limit-value is exceeded with the operating voltage applied. Failure of the voltage will not result in any switching function below the switching point.



Technical Data

Series RFJ5.../RF55.../RF55...		
Connection	Supply voltage	$U_o = 12 \dots 32 V_{DC}$; $U_r = 24 V_{DC}$
	Ripple	$< 20\% U_o$
	Power consumption	Approx. 50 mA @ $24V_{DC}$
	Reverse voltage protection	Integrated
	Overvoltage	2.5 times U_r up to 2 ms
	Voltage drops	100 % up to 10 ms
	Connection contact	DIN 46244: flat connector, gold-plated A6.3 x 0.8
Input	Galvanic isolation	Between input signal and supply voltage
	Input signal	Sinusoidal signal, NORIS tachogenerator GE
	Input overloading	RFJ5... up to 30 V, RF55... and RF55... up to 90 V
	Input resistance	RFJ5... approx. 10 k Ω , RF55... approx. 30 k Ω , RF55... approx. 15 k Ω
Output	Output contact	Volt-free NOC or NCC, closed circuit or open circuit
	Max. switching capacity	30 W (1 A at $30 V_{DC}$; 0.5 A at $60 V_{DC}$); 40 W (0.2 A at $220 V_{AC}$)
	Switching point	Adjustable on tamper-proof drum scale between 5 ... 100 %
Environmental influences	Operating temperature	-20 °C ... +70 °C
	Climatic test	DIN IEC 60068-T2-30
	Storage temperature	-45 °C ... +85 °C
	Vibration resistance	DIN IEC 60068-T2-6: 15 g increased strain, characteristic 2 (10 ... 100 Hz)
	Shock resistance (impact)	DIN IEC 60068-T2-27: 300 m/s ² with 18 ms dwell time
	Degree of protection	DIN EN 60529: body IP20; terminals IP00
	ESD	IEC 61000-4-2: ± 8 kV
	Electromagnetic field	IEC 61000-4-3: 10 V/m f=10 kHz ... 2.000 MHz, 80% AM @ 1 kHz 10 V/m f=900 \pm 5 MHz, 50% AM @ 200 Hz 10 V/m f=1,800 MHz \pm 5 MHz, 50% AM @ 200 Hz
	Burst	IEC 61000-4-4: ± 2 kV supply; ± 1 kV sensor
	Surge	IEC 61000-4-5: sym. ± 1 kV ($R_s=2 \Omega$); asym. ± 2 kV ($R_s=2 \Omega$)
	HF-interference	IEC 61000-4-6: 3 V _{pp} f=0.01 ... 100 MHz, 80% AM @ 1 kHz
	LF-interference	IEC 60553: 3 V _{pp} 0.05 ... 10 kHz
	Interference field intensity	Basis CISPR 16-1, 16-2 reduced characteristic
Mech. quantities	Case material	Thermoplastic polyester, green
	Mounting	Snap-fit on G-channel TS32 or top-hat channel TS35
	Installation position	Any
	Weight	55 g
Other	Reproducibility	$< \pm 0.2\%$
	Linearity of scale	$< \pm 1.5\%$
	Hysteresis	Approx. 1.5 %
	Test button function	Switching point lowered by approx. 15 % (only open-circuit devices)
	Accuracy class	IEC 51-1: 1.5 %
	Temperature sensitivity	$< \pm 0.1\%$ per 10 °K
	Voltage sensitivity	$< \pm 0.1\%$ for 10 % change in supply voltage
Reaction time	f=50 Hz/0.25 s; f=100 Hz/0.2 s; f=1 kHz/0.1 s; f=10 kHz/50 ms	
Approvals	Approvals	CE
	Applied standards	DIN EN 61000-6-2, DIN EN 61000-6-4, DIN EN 50155
	Fire protection class	V0

Type Code

R FJ 5 01 - A2 (e. g. RFJ501-A2)

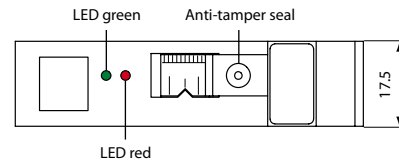
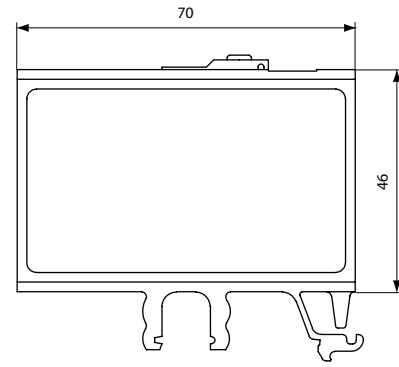
1 2 3 4 5

1	Device and series (Standard variants, other available on customer request)	2	Input signal
R	Limit value switch	FJ	Frequency input for sinusoidal signal 100 mV _{pp} ... 10 V _{pp}
		FS	Frequency input for sinusoidal signal 500 mV _{pp} ... 30 V _{pp}
		FG	Frequency input for sinusoidal signal 6 V _{pp} ... 200 V _{pp}

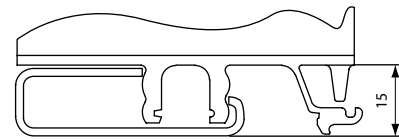
3	Type series	4	Input range f_B/upper-range frequency f_E/switching point f_S
5	Type 5	00	$f_B=10 \dots 100$ Hz; $f_E=50 \dots 100$ Hz; $f_S=50 \dots 100$ Hz mit $f_S \leq f_E$
		01	$f_B=20 \dots 1,000$ Hz; $f_E=100 \dots 1,000$ Hz; $f_S=100 \dots 1,000$ Hz mit $f_S \leq f_E$
		02	$f_B=200 \dots 10,000$ Hz; $f_E=1,000 \dots 10,000$ Hz; $f_S=1,000 \dots 10,000$ Hz mit $f_S \leq f_E$

5	Variant
R1	Output contact as NCC in closed circuit
R2	Output contact as NOC in closed circuit
A1	Output contact as NCC in open circuit
A2	Output contact as NOC in open circuit

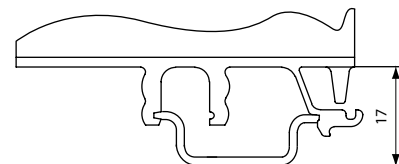
Dimensions, Connection, Diagram



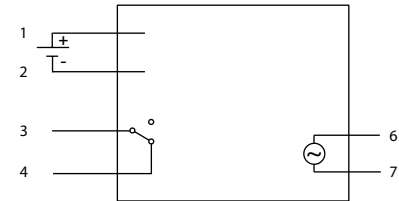
G-channel TS32 to DIN EN 50035



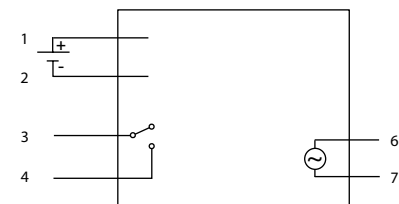
Top-hat channel TS35 to DIN EN 50022



Connection NCC RFx5...-...1



Connection NOC RFx5...-...2



Relais position and LED code

	3/4 RFx5 ...-A1	3/4 RFx5 ...-A2	3/4 RFx5 ...-R1	3/4 RFx5 ...-R2	LED green	LED red
f < limit value	x	-	-	x	x	-
f > switching point	-	x	x	-	x	x

x = contact closed/LED lighting
- = contact open/LED off
o = LED flashing

Standard Variants

Frequency version	00	01	02
NCC in closed circuit	RFx500-R1	RFx501-R1	RFx502-R1
NOC in closed circuit	RFx500-R2	RFx501-R2	RFx502-R2
NCC in open circuit	RFx500-A1	RFx501-A1	RFx502-A1
NOC in open circuit	RFx500-A2	RFx501-A2	RFx502-A2

x is to be replaced with range J, S or G of input signal
Please state upper range frequency in case of order.