

RAMP GENERATOR



- Multiple functions
- Programmable from front
- 3-digit LED display
- NPN and PNP inputs
- Internal ramp time or external pulses
- Reset or preset function



Applications:

To convert digital signals to a time-controlled analogue signal with either internally entered up/down time or with external pulses for up/down function. • Can convert digital outputs to analogue outputs. • By connection of a 2-phase encoder as up/down pulse generator the pulses will be converted to an analogue position signal. • Especially suitable in applications, where easy 11-pole relay socket mounting is required for instance in a panel. • Possibility for readout of the analogue value of the output through the built-in display.

Technical characteristics:

General:

The 2281 is microprocessor-controlled and basic-calibrated. This means that the input and output can be programmed acc. to the requested signal range without any readjustment. Thereby a high degree of accuracy and flexibility are ensured. The user interface consists of a 3-digit display and 3 function keys in the front. The interface is used to change a function, ramp time or an output signal range.

Inputs:

6 digital inputs make it possible to choose reset, up/down functions as either NPN inputs (short circuit to gnd.) or as PNP input (+ 24 VDC). The trigger level is typically 8 VDC with a pull up/down resistance of 3.5 k Ω corresponding to a load current of 6.9 mA. Via an analogue switch the up and down inputs can be switched between input filters for a pulse length > 10 ms or > 0.5 ms. The chosen filter is the same for all up/down inputs. The 10 ms filter is used for elimination of contact-bounce. The reset inputs have a filter for pulse lengths > 30 ms. The arrow keys can be selected to work in parallel with the digital up and down inputs.

Functions:

Ramp generator with internal time measurement:

Up ramp and down ramp can be set separately in the time span 0.1...999999 s. Reset can be chosen to preset at any value between 0 and 100% output signal. The up/down time measurement starts when the time constant of the selected filter has been exceeded.

If the up/down inputs are activated simultaneously, both ramps will be activated and the outputs rise/fall with the difference of the times.

Ramp generator with external pulses:

Up ramp and down ramp can be adjusted separately with a number of pulses between 1 and 15,615,744. The entered number of pulses (max. 60999) are multiplied by the prescaler which can assume values between 1 and 256. Reset can be chosen to preset at any value between 0% and 100% output signal. The pulse length must be longer than the time constant of the selected filter. If the up/down inputs are activated simultaneously both input pulses will be scanned and the output will rise/fall with the difference of the pulses. In case of supply drop-out the position will be remembered when the prescaler is 1.

Ramp generator for 2-phase encoder:

The ramp pulses are set to a value between 1 and 15,615,744. The entered number of pulses (max. 60999) is multiplied by the prescaler which can assume values between 1 and 256. The pulse length must be longer than the time constant of the selected filter.

When the encoder is turned in one direction the output rises compared to the set number and pulses, when the encoder is turned in the opposite direction the output falls proportionally.

The reset can be chosen to preset at any value between 0% and 100% output signal. By activating reset for instance in a 50% position an auto-calibration of the measuring system is obtained. In case of supply drop-out the position will be remembered when the prescaler is 1.

Output:

Analogue standard current output of 0/4...20 mA or, with JP3 off, 0/2...10 mA. The output span can be set to any value within the standard ranges with a max. offset of 50% of the max. value and a minimum span of 5 mA. Restart after a supply drop-out can be chosen to generate either the reset value or the value which the output had just before the supply drop-out. Maximum load is 600 Ω / 12 VDC. By short-circuit of pins 3 and 2 the output current is converted to a standard voltage of 0/0.2...1 VDC, 0/2...10 VDC or special VDC dependent on the size of R65. The voltage signal is available between pins 2 and 1. See hardware programming for correct choice.

An overrange can be defined thereby enabling the output to exceed the selected signal range by $\pm 3\%$ within the limit of 0...20.5 mA.

Electrical specifications:

Specifications range:

(@: -20°C to +60°C)

Common specifications:

Supply voltage.....	24 VDC $\pm 20\%$
Internal consumption.....	2.4 W
Max. consumption.....	2.7 W
Signal / noise ratio.....	Min. 60 dB
Up ramp time.....	0.1...999999 s
Down ramp time.....	0.1...999999 s
External pulses.....	1...15,615,744
Response time	< 60 ms
Signal dynamics, output.....	16 bit
Calibration temperature.....	20...28°C
Temperature coefficient.....	< $\pm 0.01\%$ of span/°C
Linearity error	< $\pm 0.1\%$ of span
Effect of supply voltage change.....	< $\pm 0.005\%$ of span/%V

EMC immunity influence

< $\pm 0.5\%$

Relative air humidity	< 95% RH (non-cond.)
Dimensions (HxWxD)	84.5 x 35.5 x 80.5 mm (excl. pins)
Tightness	IP 50
Weight	120 g

Electrical specifications - INPUT:

Digital input:

Up / down inputs:

NPN	Pull up 24 VDC / 6.9 mA
PNP	Pull down 0 VDC / 6.9 mA
Pulse width, programmable	>10 ms / > 0.5 ms
Input frequency (max.).....	50 Hz / 1 kHz

Reset inputs:

NPN	Pull up 24 VDC / 6.9 mA
PNP	Pull down 0 VDC / 6.9 mA
Pulse width.....	> 30 ms
Input frequency (max.).....	16 Hz

Electrical specifications - output:

Current output:

Signal range	0...20 mA
Min. signal range (span)	5 mA
Max. offset.....	50% of selec. max. value
Load (max.).....	20 mA / 600 Ω / 12 VDC
Load stability	< $\pm 0.01\%$ of span/100 Ω
Current limit	20.5 mA

Voltage input via an internal shunt:

Signal range	0...10 VDC
Min. signal range (span)	250 mV
Max. offset.....	50% of selec. max. value
Load (min.).....	500 k Ω
Voltage limit	10.25 VDC

Observed authority requirements: Standard:

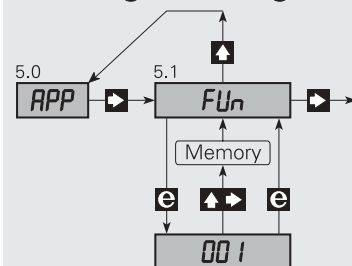
EMC 89/336/EEC, Emission	EN 50 081-1, EN 50 081-2
Immunity	EN 50 082-2, EN 50 082-1
Emission and immunity	EN 61 326

Of span = Of the presently selected range

Routing diagram

If no buttons are pressed for a period of 2 minutes,
display returns to stage 0.0

Programming

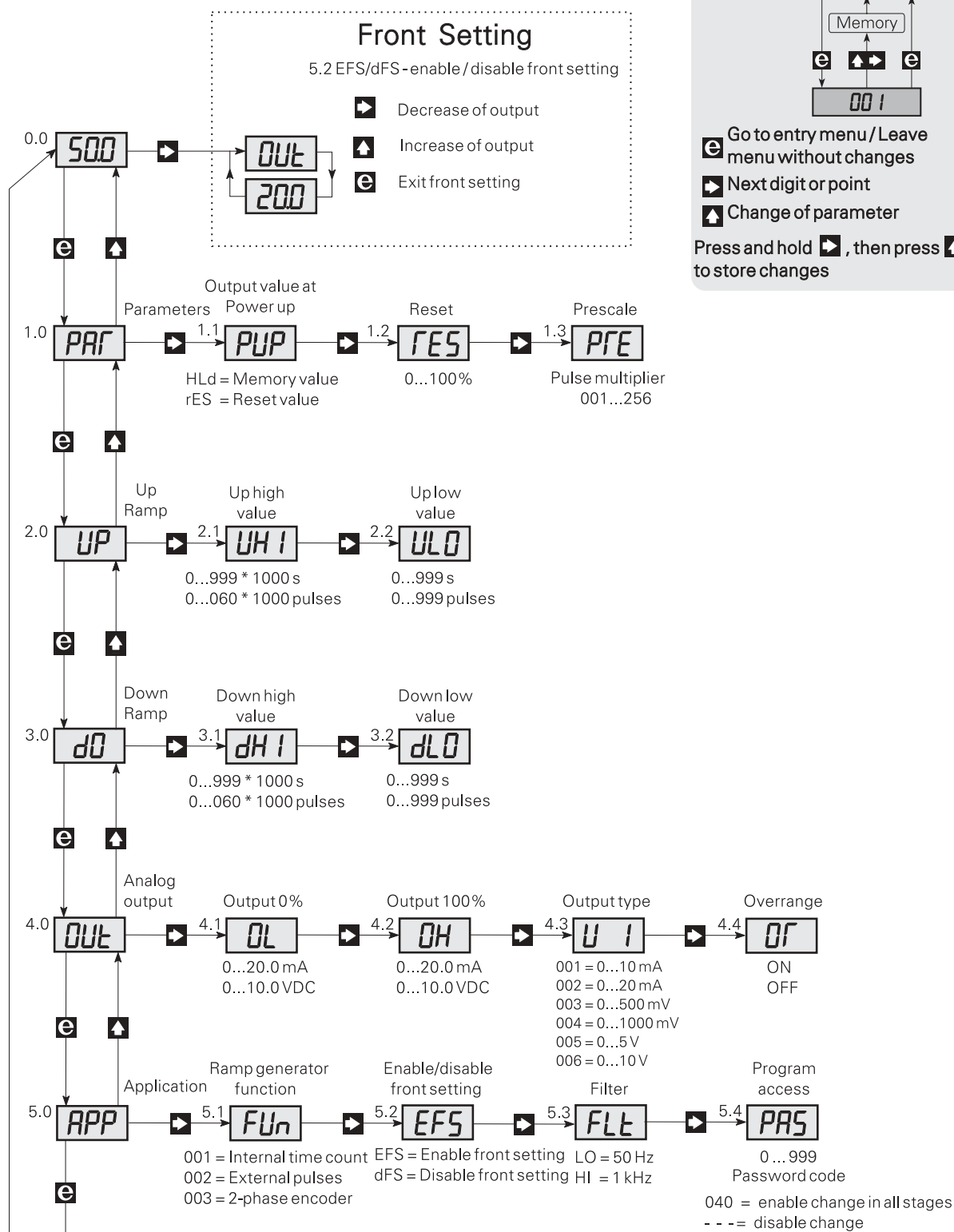


e Go to entry menu/Leave menu without changes

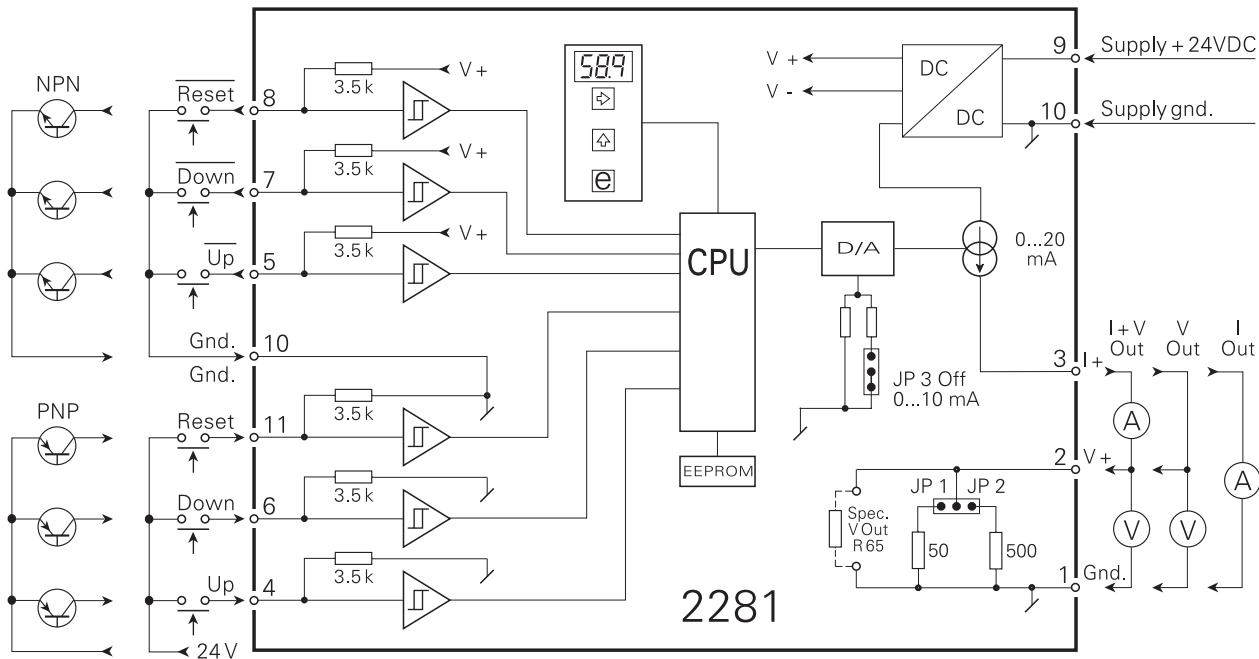
▶ Next digit or point

▲ Change of parameter

Press and hold **▶**, then press **▲** to store changes



Block diagram:



Hardware programming:

JP1	JP2	JP3	Output	MENU 4.3
OFF	OFF	OFF	0...10 mA	1
OFF	OFF	ON	0...20 mA	2
ON	OFF	OFF	0...500 mV	3
ON	OFF	ON	0...1000 mV	4
OFF	ON	OFF	0...5 V	5
OFF	ON	ON	0...10 V	6

Front layout:

