

# f/I - f/f CONVERTER



- Programmable f/I converter
- Programmable decimal divider / decimal multiplier
- Programmable frequency generator
- Relay output as option
- Fixed programming as option
- Supply voltage 24 VDC



## General:

In the programmable version, the 2255 f/I - f/f converter is configured to the requested function by means of a menu-driven dialogue with keys and a display in the front. Typical signalling devices may be pulse generators, for instance flow meters, tacho-generators or inductive sensors.

**The f/I function** is used for frequency to current / voltage conversion within the frequency range from 0.001 Hz to 20 kHz and for speed control with the digital output as a frequency watch.

**The f/f function** is used for division or multiplication of pulses and as a buffer for fast pulse trains.

Max. input frequency 20 kHz.

Max. output frequency 1 kHz.

**The frequency generator function** is for instance used as a time base or a clock generator. Max. output frequency 20 kHz. The 2255 can be delivered pre-configured according to specifications, please see the options index.

## Technical characteristics:

### Input:

Programmable input for connexion of standard pulse generator.

Input filter may be selected for a pulse width > 0.02 ms/max. 20 kHz, or > 10 ms/max. 50 Hz.

At contact input, the filter for 10 ms/50 Hz should be used.

### Auxiliary supplies:

(selected at input configuration)

#### NAMUR supply:

8 VDC  $\pm 0.5$  V / 8 mA for supply of NAMUR sensors.

#### S0 Supply:

15 VDC. I<sub>max</sub>. 25 mA. I<sub>min</sub>. (800  $\Omega$  load) 10 mA.

#### Special supply:

As option special voltage supplies within the range 5...15 VDC / 30 mA.

## Outputs:

**Standard current output** (pin 3) programmable within the range 0...20 mA.

Min. span 5 mA. Max. span 20 mA.

Max. offset of 50% of the max. value.

Current limit: Max. 26 mA.

Standard voltage output (pin 2) is obtained by leading the current signal through an internal shunt resistor.

With internal dipswitches, a 50  $\Omega$  or a 500  $\Omega$  shunt resistor is selected, which results in a voltage output of 0...250 mV and 0 / 0.2...1 V (50  $\Omega$ ), and 0...2.5 V and 0 / 2...10 V (500  $\Omega$ ).

With a special internal shunt resistor, units with other output voltages can be delivered (max. 12 VDC).

Current and voltage signals refer to the supply gnd. but if both signals are used simultaneously, only the voltage signal has gnd. as reference.

**NPN pulse output** (option) for relay, electromechanical counter or equivalent load. The output is current-limited to 130 mA with a PTC resistor.

**The relay output** (option) with change-over contact. 300 VA, max. 150 VRMS, 2 A. Max. DC load at 24 VDC is 1 A.

### Status indication:

2255 is equipped with 3 status indicators in the front.

f in: Indicates active input (inactive at the NPN input).

Input frequencies > 50 Hz are shown by a fixed light.

Dig. output: Indicates active output.

Error: Indicates sensor error at NAMUR input.

## Electrical specifications:

### Specifications range:

(@: -20°C to +60°C)

#### Common specifications:

Supply voltage.....	24 VDC $\pm 20\%$
Internal consumption .....	2.4 W
Isolation, test / operation .....	1400 VAC/150 VAC
Warm-up time.....	1 min.
Signal / noise ratio.....	Min. 60 dB
Signal dynamics, output.....	16 bit
Response time (programmable) .....	60 ms to 999 s + period time
Calibration temperature.....	20...28°C
Temperature coefficient.....	$< \pm 0.01\%$ of span / °C
Linearity error .....	$\leq \pm 0.1\%$ of span
Effect of supply voltage change .....	$< 0.005\%$ of span / VDC

#### Auxiliary voltages:

NAMUR supply.....	8 VDC $\pm 0.5$ VDC / 8 mA
S0 supply .....	15 VDC / 25 mA
Special (acc. to order) .....	5...15 VDC / 30 mA

EMC immunity influence .....

< $\pm 0.5\%$
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Humidity .....	< 95% RH (non-cond.)
Dimensions (HxWxD).....	80.5 x 35.5 x 84.5 mm
Tightness.....	IP50
Weight .....	125 g

#### Input:

##### General:

Measurement range .....	0...20 kHz
Min. measurement range .....	0.001 Hz
Low cut off .....	0.001 Hz
Max. offset.....	90% of selec. max. value
Min. pulse width .....	25 $\mu$ s

#### NAMUR input:

Trig-level LOW .....	$\leq 1.2$ mA
Trig-level HIGH .....	$\geq 2.1$ mA
Input impedance .....	1000 $\Omega$

#### Sensor error detection:

Short-circuit.....	$\geq 7.0$ mA
Breakage .....	$\leq 0.2$ mA
Response time .....	$\leq 400$ ms

#### Tacho input:

Trig-level LOW .....	$\leq 100$ mV
Trig-level HIGH .....	$\geq 200$ mV
Input impedance .....	$\geq 100$ k $\Omega$
Max. input voltage.....	80 VAC pp

#### NPN / PNP input:

Trig-level LOW .....	$\leq 4.0$ V
Trig-level HIGH .....	$\geq 7.0$ V
Input impedance .....	Typ. 3.48 k $\Omega$

#### TTL input:

Trig-level LOW .....	$\leq 1.2$ VDC
Trig-level HIGH .....	$\geq 1.7$ VDC
Input impedance .....	100 k $\Omega$

#### S0 input:

Trig-level LOW .....	$\leq 4.5$ mA
Trig-level HIGH .....	$\geq 6.2$ mA

#### Analogue output:

##### Current output:

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

##### Voltage output through internal shunt:

Signal range .....	0...10 VDC
Min. signal range .....	250 mV
Max. offset.....	50% of selec. max. value
Load (min.).....	500 k $\Omega$

#### NPN output:

Max. current .....	130 mA
Max. voltage.....	28 VDC

#### f/f converter output:

Signal range .....	0...1000 Hz
Min. pulse width .....	500 $\mu$ s
Max. pulse width .....	999 ms
Max. duty cycle .....	50%

#### Frequency generator:

Pulse width	
f < 50 Hz .....	Min. 10 ms Max. 999 s
f $\geq 50$ Hz .....	50% duty cycle

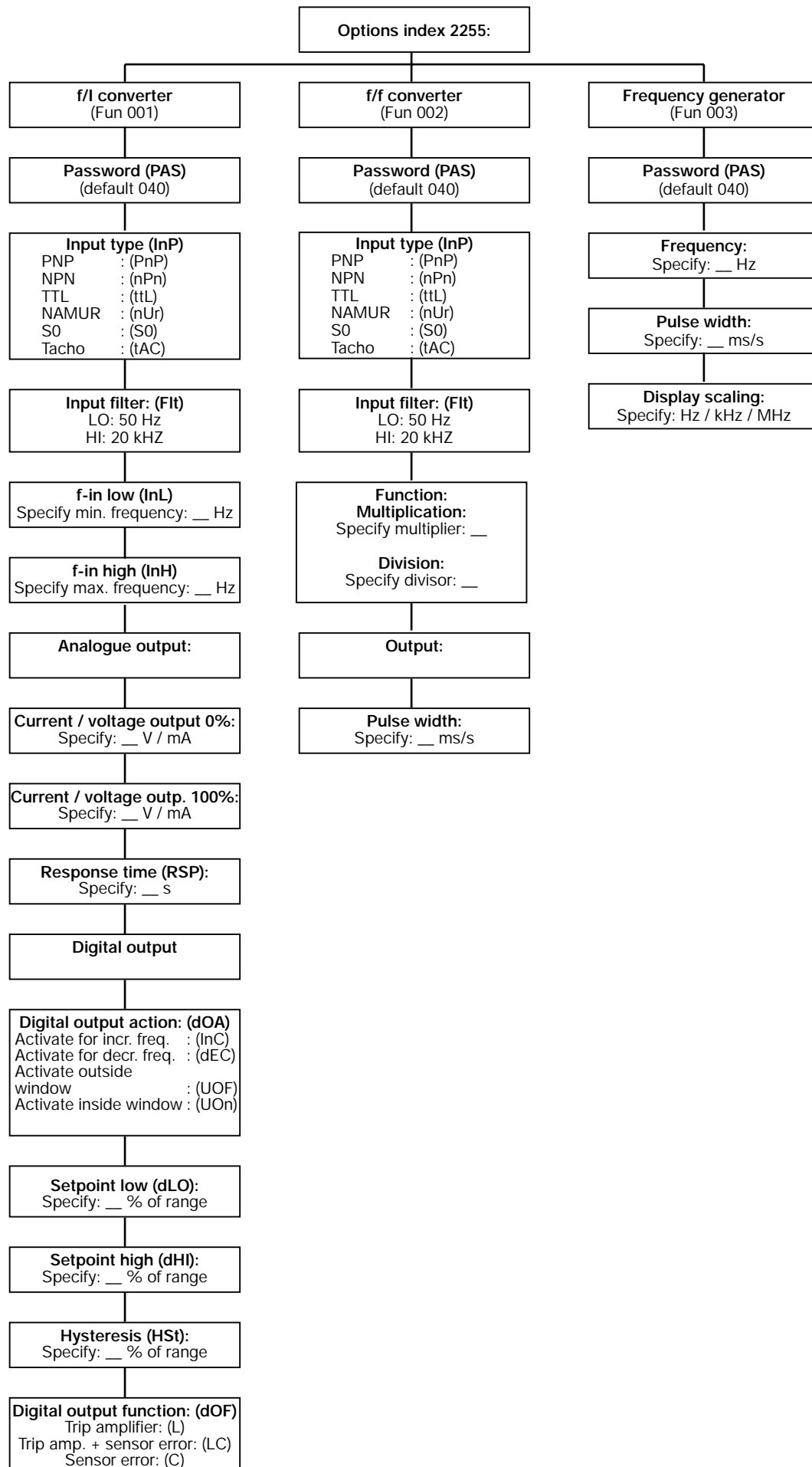
#### Relay output:

Max. frequency .....	20 Hz
Max. voltage.....	150 VRMS
Max. AC current .....	2 A
Max. AC power.....	300 VA
Max. load at 24 VDC .....	1 A

#### 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
LVD 73/23/EEC.....	EN 61 010-1

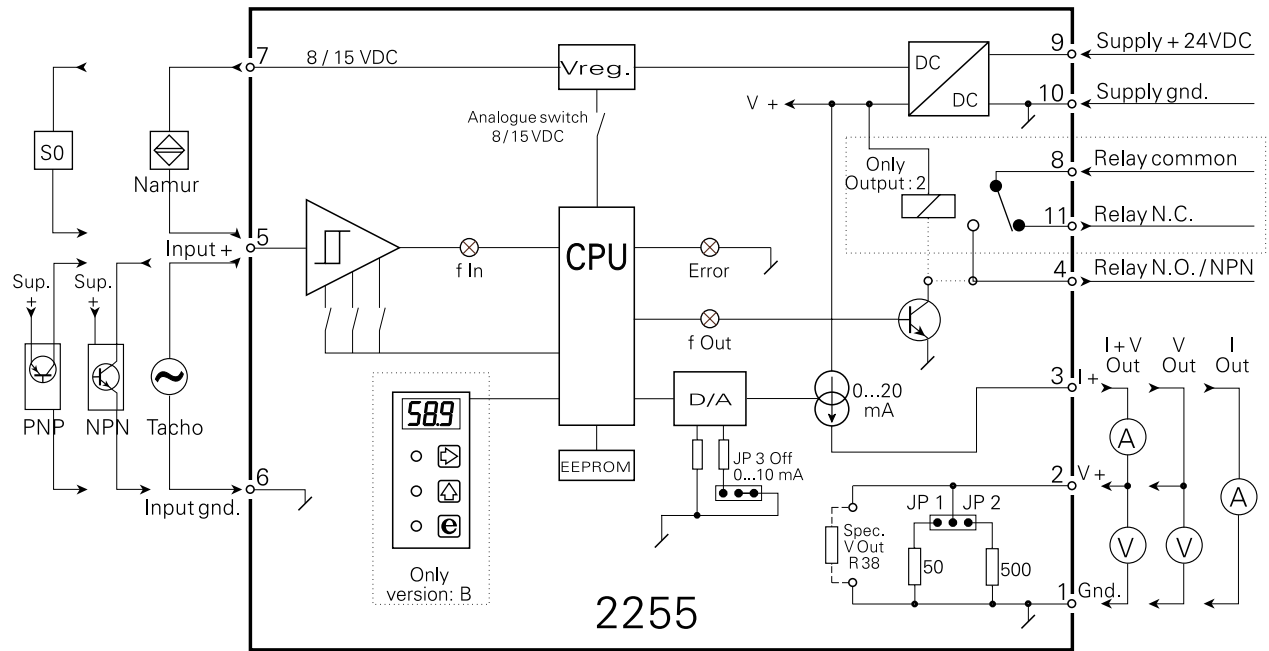
Of span = Of the presently selected range



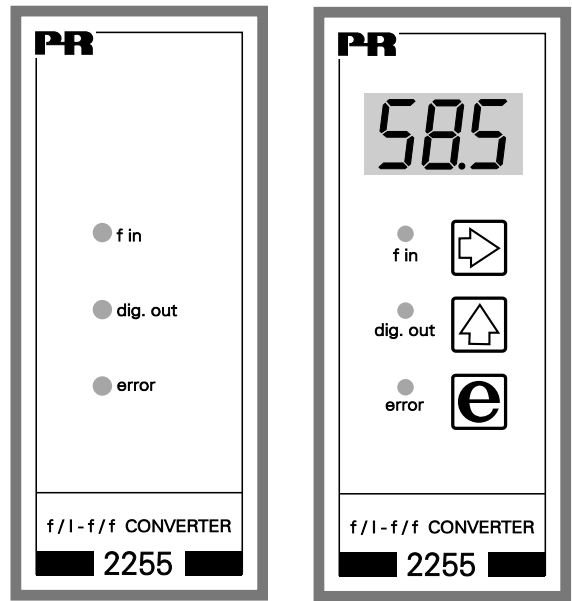
Order: 2255

Type	Version		Output	
2255	Fixed	: A	Analogue + NPN output	: 1
	Programmable	: B	Analogue + relay output	: 2

Block diagram:



Front layout:



Fixed

Programmable

Analogue output programming:

Output range	JP3	JP2	JP1
0...10 mA (current only)	OFF	-	-
0...20 mA (current only)	ON	-	-
0...10 mA / 0...0.5 V	OFF	OFF	ON
0...20 mA / 0...1.0 V	ON	OFF	ON
0...10 mA / 0...5.0 V	OFF	ON	OFF
0...20 mA / 0...10.0 V	ON	ON	OFF
Special voltage output: (Resistor R38 mounted)	ON or OFF	OFF	OFF