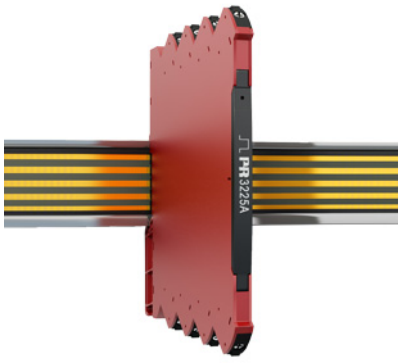
PERFORMANCE MADE SMARTER



## Universal frequency converter

# 3225

– Input: NAMUR, NPN, PNP, Tacho, TTL & S0
– Output: Universal mA / V or relay
– 2.5 KVAC isolation
– DIP-switch or display programmable
– Power supply 16.8 VDC…31.2 VDC

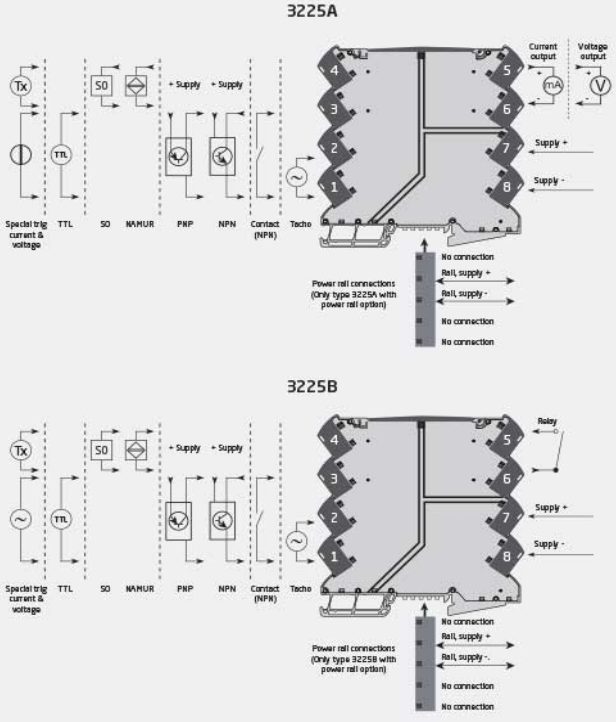
**Functional highlights**
- Measures frequencies up to 100 kHz.
- Active current output.
- Buffered voltage output 10 VDC.
- 2-point process calibration.
- User-programmable trigger levels -0.05…6.5 V and sensor supply 5…17 V.
- NAMUR sensor error detection.
- Output relay with windows, setpoint and latch functionality.
- Simulation of process value during commissioning / maintenance.
- Fast response time, with simultaneous sensor error detection (PATENTED).
- All terminals are over-voltage protected, polarity protected and short-circuit protected.

**Technical highlights**
- Accuracy < 0.06% / span.
- Response time < 30 ms.
- 2.5 kVAC, 3-port galvanic isolation.
- Wide ambient temperature range -25...70°C.
- NAMUR NE21, NE43.

**Programming**
- Easy configuration via DIP switches.
- Factory calibrated in all selectable measurement ranges.
- Configuration, monitoring, and diagnostics using PR 4500 detachable communication interfaces via the PR 4590 ConfigMate.
- All programming can be password protected.
- Scrolling help text in 7 languages.

**Mounting**
- Units can be mounted side by side, horizontally and vertically, without air gap on a standard DIN rail, even at 70°C ambient temperature.
- Units can be supplied separately or installed on PR 9400 power rail.
- The narrow 6.1 mm housing allows up to 163 units per meter.

## Applications



## Order

| Type | Version | | | |
|---|---|---|---|---|
| 3225 | Universal frequency converter , analog output | : A | With power rail connector / terminals | : - |
| | Universal frequency converter, alarm relay output | : B | Supplied via terminals | : -N |

Example: 3225B-N (Universal frequency converter, alarm relay output, supplied via terminals)

## Environmental Conditions

| | |
|---|---|
| Operating temperature | -25°C to +70°C |
| Storage temperature | -40°C to +85°C |
| Calibration temperature | 20...28°C |
| Relative humidity | < 95% RH (non-cond.) |
| Protection degree | IP20 |
| Installation in | Pollution degree 2 & meas. / overvoltage cat. II |

## Mechanical specifications

| | |
|---|---|
| Dimensions (HxWxD) | 113 x 6.1 x 115 mm |
| Weight approx. | 70 g |
| DIN rail type | DIN EN 60715/35 mm |
| Wire size | 0.13...2.5 $mm^2$ / AWG 26...12 stranded wire |
| Screw terminal torque | 0.5 Nm |

## Common specifications

**Supply**

| | |
|---|---|
| Supply voltage | 16.8...31.2 VDC |
| Fuse | 400 mA SB / 250 VAC |
| Max. required power | ≤ 1.2 W |
| Max. power dissipation | 0.65 W |

**Isolation voltage**

| | |
|---|---|
| Isolation voltage, test / working | 2.5 kVAC / 300 VAC (reinforced) |

**Response time**

| | |
|---|---|
| Response time (0...90%, 100...10%) | ≤ 30 ms |

**Auxiliary supplies**

| | |
|---|---|
| Sensor supply limitation | 23 mA, 5…17 V |
| Signal dynamics, output | 18 bit |
| Long term stability, current, 1yr / 5yr @ 25°C | ≤ 0.058% / ≤ 0.101% |
| Long term stability, voltage, 1yr / 5yr @ 25°C | ≤ 0.032% / ≤ 0.058% |
| Accuracy | See manual for details |
| EMC immunity influence | < ±0.5% of span |
| Extended EMC immunity: NAMUR NE21, A criterion, burst | < ±1% of span |

## Input specifications

**Frequency input**

| | |
|---|---|
| Frequency range | 0.001 Hz to 100 kHz |
| Time range, time function | 10 µs to 999.9 s |
| Max. frequency / min. pulse width, with input filter ON | 75 Hz / 8 ms |

**Sensor specifications**

| | |
|---|---|
| Tacho, trig-level LOW / HIGH | ≤ -50 mV / ≥ +50 mV |
| NPN / PNP, trig-level LOW / HIGH | ≤ 4.0 V / ≥ 7.0 V |
| TTL, trig-level LOW / HIGH | ≤ 0.8 V / ≥ 2.0 V |
| S0, trig-level LOW / HIGH | ≤ 2.2 mA / ≥ 9.0 mA |
| NAMUR, trig-level LOW / HIGH | ≤ 1.2 / ≥ 2.1 mA |

**Special voltage / current input**

| | |
|---|---|
| User-programmable trig-levels | -0.05...6.50 V |
| User-programmable trig-levels | 0.0...10.0 mA |

## Output specifications

**Current output**

| | |
|---|---|
| Signal range, active | 0...23 mA |
| Programmable signal ranges | 0 / 4...20 mA |
| Load (@ current output) | ≤ 600 Ω |
| Load stability | ≤ 0.001% of span / 100 Ω |
| Response time, programmable | 0.0...60.0 s |
| Sensor error indication | 0 / 3.5 / 23 mA / none |
| Current limit | ≤ 28 mA |

**Voltage output**

| | |
|---|---|
| Signal range | ≤ 11.5 VDC |
| Programmable signal ranges | 0...1; 0…5; 0...10; 0.2...1; 2…10 VDC |
| Load (@ voltage output) | ≥ 10 kΩ |
| Response time, programmable | 0.0...60.0 s |

**Relay output**

| | |
|---|---|
| Relay functions | Setpoint, Window and Latch |
| Hysteresis | 0...100% |
| ON and OFF delay | 0...3600 s |
| Power On delay | 0...9999 s |
| Sensor error reaction | Break / Make / Hold |
| Max. voltage | 250 VAC / VDC |
| Max. current | 2 A |
| Max. AC power | 500 VA |
| Max. DC current, resistive load ≤ 30 VDC | 2 ADC |
| Max. DC current, resistive load > 30 VDC | See manual for details |

## Observed authority requirements

| | |
|---|---|
| EMC | 2014/30/EU & UK SI 2016/1091 |
| LVD | 2014/35/EU & UK SI 2016/1101 |
| RoHS | 2011/65/EU & UK SI 2012/3032 |
| ATEX | 2014/34/EU & UK SI 2016/1107 |

## Approvals

| | |
|---|---|
| ATEX | KEMA 10ATEX0147 X |
| IECEx | KEM 10.0068X |
| UL | UL 61010-1 |
| CCC | Pending |