Voltage Transducers

NK Technologies' voltage transducers are high-performance transducers for sensing voltage in installations. They are available in an AC or DC Series and come in a variety of nominal voltages.

Features:

- AC or DC models
- Standard 4–20 mA powered output Industry standard output makes use with existing controllers, data loggers and SCADA equipment easy and reliable
- Input/Output Isolation Input and output circuitry electrically isolated for improved safety of use
- Compact DIN rail mount case Transducer housing mounts to standard DIN rail or to a flat panel

VTR SERIES AC Voltage Transducerspage 106 VTD SERIES DC Voltage Transducers.....page 108 VTD-BD SERIES DC Voltage Transducers.....page 110 VTU-OS SERIES High Voltage DC/AC Voltage Transducerspage 112 **VTU-DIN SERIES** AC or DC Voltage Transducers.....page 114







VTR SERIES AC Voltage Transducers

VTR Series AC Voltage Transducers are high-performance True RMS transducers for sensing voltage in single- and threephase installations. Applicable on circuits of 120 V, 240 V, 480 V and 600 V, the VTR Series voltage transducers provide a fully isolated, 4–20 mA output proportional to rated voltage in sinusoidal situations. Housed in a slim, compact, easy-to-install DIN rail mounted case, the VTR Series comes in a variety of voltage ranges and with four-wire terminal block connection.

Voltage Transducer Applications

True RMS Voltage Monitoring

- Detect below normal or "brown out" voltage conditions; protect against possible motor overheating.
- · Identify phase loss conditions by detecting voltage reduction in one or more phase of three-phase motor.
- · Monitor over voltage conditions associated with regenerative voltage to help in diagnosing/avoiding motor drive issues.
- Detect voltage conditions which may cause stress in or damage to soft starter components (SCRs).

Phase Loss Protection



0-24L-DIN O D GND

Voltage Transducer Features

True RMS Output

• Allows for use in situations where power supplied is poor power quality or other electrically harsh/challenging environments.

Standard 4-20 mA Loop-powered Output

• Industry standard output makes use with existing controllers, data loggers and SCADA equipment easy and reliable.

Input/Output Isolation

· Input and output circuitry electrically isolated for improved safety of use.

Compact DIN Rail Mounted Case*

• Space saving 35 mm wide enclosure mounts quickly for an attractive installation.

UL/cUL and CE Approved

Accepted worldwide.

*For information on the DIN rail accessories kit, see page 140.



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Voltage Transducer Dimensions





Voltage Transducer Connections



Line Voltage

Voltage Transduce	er Specifications
Power Supply	24 VDC loop-powered (12-40 VDC)
Input Range	120 V, 150 V, 240 V, 480 V, 500 V, 600 V
Output	4–20 mA proportional
Output Limit	24 mA
Output Loading	500 Ω
Input Maximum	130% of range
Response Time	250 ms (to 90% value)
Accuracy	1.0% FS (10–100% of range) (1% at 60 Hz, 2.5% at 50 Hz)
Isolation Voltage	UL listed to 1270 VAC, tested to 5 KV
Frequency Range	40-100 Hz
Case	UL94 V-0 Flammability Rated
Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing

Voltage Transducer Ordering Information

UL/cUL, CE

Listings

Sample Model Number: VTR1-420-24L-DIN True RMS voltage transducer with 120 V voltage range, standard 4–20 mA proportional output; 24 V loop-powered with a DIN rail compatible case.









VTD SERIES DC Voltage Transducers

VTD Series Voltage Transducers are high-performance transducers for sensing voltage in DC powered installations. Applicable for use on circuits to 600 VDC, VTD voltage transducers provide fully isolated 0–5 VDC, 0–10 VDC, and 4–20 mA outputs proportional to rated nominal voltage in DC circuits. Housed in a slim, compact, easy-to-install DIN rail mounted case, the VTD Series comes in a variety of nominal voltages.

Voltage Transducer Applications

Voltage Monitoring

- Detect below normal or "brown out" voltage conditions; protect against possible motor overheating.
- Identify conductor loss conditions by detecting voltage reduction in one motor lead.
- Monitor over voltage conditions associated with regenerative voltage to help in diagnosing/avoiding motor drive issues.
- Detect voltage conditions that may cause stress or damage to soft starter components (SCRs).

DC Voltage Transducer Control



 For additional Application Examples, go to www.nktechnologies.com/applications



Voltage Transducer Features

Accurate Output

 Several ranges available for your application, from 0–15 VDC to 0–600 VDC.

Standard Current and Voltage Sensor Outputs

 Industry standard outputs makes use with existing controllers, data loggers and SCADA equipment easy and reliable.

Input/Output Isolation

• Input and output circuitry electrically isolated for improved safety of use.

Compact DIN Rail Mounted Case*

• Space saving 35 mm wide enclosure mounts quickly for an attractive installation.

UL/cUL and CE Approved

• Accepted worldwide.

*For information on the DIN rail accessories kit, see page 140.



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Voltage Transducer Dimensions





Voltage Transducer Connections



Power Supply 24 VAC/DC (20–45 DC, 22–38 VAC) Input Range 15 V, 25 V, 50 V, 150 V, 300 V, 600 VDC Power Consumption <2 VA Output -4–20 mA (capped at 24 mA max.) -0–5 VDC (capped at 5.75 VDC) -0–10 VDC (capped at 11.5 VDC) Output Loading -4–20 mA output: <500 Ω -0–5/10 VDC output: >10 KΩ Response Time 250 ms (90% step change) Accuracy <1% Isolation Voltage UL listed to 1270 VAC, tested to 5 KV Frequency Range DC Case UL94 V-0 Flammability Rated EMC/Immunity EN50081-1, EN50082-2 Ripple <1% (peak to peak) Environmental -4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing Listings UL/cUL, CE	-	
Input Range15 V, 25 V, 50 V, 150 V, 300 V, 600 VDCPower Consumption<2 VAOutput•4-20 mA (capped at 24 mA max.) •0-5 VDC (capped at 5.75 VDC) •0-10 VDC (capped at 11.5 VDC)Output Loading•4-20 mA output: <500 Ω •0-5/10 VDC output: >10 KΩResponse Time250 ms (90% step change)Accuracy<1%Isolation VoltageUL listed to 1270 VAC, tested to 5 KVFrequency RangeDCCaseUL94 V-0 Flammability RatedEMC/ImmunityEN50081-1, EN50082-2Ripple<1% (peak to peak)Environmental-4 to 122°F (-20 to 50°C) 0-95% RH, non-condensingListingsUL/cUL, CE	Power Supply	24 VAC/DC (20-45 DC, 22-38 VAC)
Power Consumption<2 VAOutput·4-20 mA (capped at 24 mA max.) ·0-5 VDC (capped at 5.75 VDC) ·0-10 VDC (capped at 11.5 VDC)Output Loading·4-20 mA output: <500 Ω ·0-5/10 VDC output: >10 KΩResponse Time250 ms (90% step change)Accuracy<1%Isolation VoltageUL listed to 1270 VAC, tested to 5 KVFrequency RangeDCCaseUL94 V-0 Flammability RatedEMC/ImmunityEN50081-1, EN50082-2Ripple<1% (peak to peak)Environmental-4 to 122°F (-20 to 50°C) 0-95% RH, non-condensingListingsUL/cUL, CE	Input Range	15 V, 25 V, 50 V, 150 V, 300 V, 600 VDC
Output $\cdot 4-20 \text{ mA} \text{ (capped at 24 mA max.)}$ $\cdot 0-5 \text{ VDC} \text{ (capped at 5.75 VDC)}$ $\cdot 0-10 \text{ VDC} \text{ (capped at 11.5 VDC)}$ Output Loading $\cdot 4-20 \text{ mA output: <500 }\Omega$ $\cdot 0-5/10 \text{ VDC output: >10 K}\Omega$ Response Time250 ms (90% step change)Accuracy<1%Isolation VoltageUL listed to 1270 VAC, tested to 5 KVFrequency RangeDCCaseUL94 V-0 Flammability RatedEMC/ImmunityEN50081-1, EN50082-2Ripple<1% (peak to peak)Environmental $-4 \text{ to } 122^{\circ}\text{F} (-20 \text{ to } 50^{\circ}\text{C})$ $0-95\% \text{ RH, non-condensing}$ ListingsUL/cUL, CE	Power Consumption	<2 VA
Output Loading•4–20 mA output: <500 Ω •0–5/10 VDC output: >10 KΩResponse Time250 ms (90% step change)Accuracy<1%Isolation VoltageUL listed to 1270 VAC, tested to 5 KVFrequency RangeDCCaseUL94 V-0 Flammability RatedEMC/ImmunityEN50081-1, EN50082-2Ripple<1% (peak to peak)Environmental-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensingListingsUL/cUL, CE	Output	 4-20 mA (capped at 24 mA max.) 0-5 VDC (capped at 5.75 VDC) 0-10 VDC (capped at 11.5 VDC)
Response Time250 ms (90% step change)Accuracy<1%	Output Loading	• 4–20 mA output: <500 Ω • 0–5/10 VDC output: >10 KΩ
Accuracy<1%Isolation VoltageUL listed to 1270 VAC, tested to 5 KVFrequency RangeDCCaseUL94 V-0 Flammability RatedEMC/ImmunityEN50081-1, EN50082-2Ripple<1% (peak to peak)Environmental-4 to 122°F (-20 to 50°C) 0-95% RH, non-condensingListingsUL/cUL, CE	Response Time	250 ms (90% step change)
Isolation Voltage UL listed to 1270 VAC, tested to 5 KV Frequency Range DC Case UL94 V-0 Flammability Rated EMC/Immunity EN50081-1, EN50082-2 Ripple <1% (peak to peak)	Accuracy	<1%
Frequency Range DC Case UL94 V-0 Flammability Rated EMC/Immunity EN50081-1, EN50082-2 Ripple <1% (peak to peak)	Isolation Voltage	UL listed to 1270 VAC, tested to 5 KV
Case UL94 V-0 Flammability Rated EMC/Immunity EN50081-1, EN50082-2 Ripple <1% (peak to peak) Environmental -4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing Listings UL/cUL, CE	Frequency Range	DC
EMC/Immunity EN50081-1, EN50082-2 Ripple <1% (peak to peak)	Case	UL94 V-0 Flammability Rated
Ripple <1% (peak to peak) Environmental -4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing Listings UL/cUL, CE	EMC/Immunity	EN50081-1, EN50082-2
Environmental -4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing Listings UL/cUL, CE	Ripple	<1% (peak to peak)
Listings UL/cUL, CE	Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
	Listings	UL/cUL, CE

Voltage Transducer Ordering Information

Voltage Transducer Specifications

Sample Model Number: VTD1-420-24U-DIN DC voltage transducer with 25 V range, standard 4–20 mA proportional output; 24 V externally powered with a DIN rail compatible case.



(1) Nomina	al Range
0	0-15 VDC
1	0-25 VDC
2	0-50 VDC
3	0-150 VDC
4	0-300 VDC
5	0-600 VDC

(2) Output Type

005	0-5 VDC
010	0-10 VDC
420	4–20 mA

(3) Supply Voltage

24U 24 VAC/DC external power supply

(4) Mounting

DIN DIN rail compatible



Test & Evaluation Units for OEMs Free program expedites evaluation process. See page 3 for details.





VTD-BD SERIES **DC Voltage Transducers**

VTD-BD Series Voltage Transducers are high-performance transducers for sensing voltage in DC powered installations. Applicable for use on circuits to 600 VDC, VTD-BD voltage transducers provide a fully isolated +/-5 VDC or +/-10 VDC output signal in response to DC voltages that change polarity. Housed in an easy-to-install DIN rail or panel mount case, the VTD-BD Series comes in a variety of ranges to suit many primary voltages.

Voltage Transducer Applications

Voltage Monitoring

- Detect below normal or "brown out" voltage conditions; protect against possible motor overheating.
- Identify conductor loss conditions by detecting voltage reduction in one motor lead.
- Monitor over voltage conditions associated with regenerative voltage to help in diagnosing/avoiding motor drive issues.
- Detect voltage conditions that may cause stress in or damage to soft starter components (SCRs).

DC Voltage Transducer



Voltage Transducer Features

Wide Input Range Selection

 Six ranges of input voltages to best fit your requirements, from +/- 0-15 VDC to +/- 0-600 VDC.

+/-5 VDC or +/-10 VDC Sensor Powered Outputs

 Industry standard outputs makes use with existing controllers, data loggers and SCADA equipment easy and reliable.

Input/Output Isolation

• Input and output circuitry electrically isolated for improved safety of use.

DIN Rail or Panel Mount Case*

• Enclosure mounts quickly for an attractive installation.

*For information on the DIN rail accessories kit, see page 140.



provides a change in output signal polarity when the monitored voltage polarity reverses. Positive on upper right terminal creates a positive output signal; positive on upper left terminal creates a negative output signal.

 For additional Application Examples, go to www.nktechnologies.com/applications





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Voltage Transducer Dimensions



__ 3.38″ -85.8mm

Voltage Transducer Connections

_____ 4.39″ 111.5mm







RoHS2

Test & Evaluation Units for OEMs Free program expedites evaluation process. See page 3 for details.

Voltage Transducer Specifications

Power Supply	24 VAC/DC (22–26V)
Input Range (+/-)	15 V, 25 V, 50 V, 150 V, 300 V, 600 VDC
Input Impedance	>160ΚΩ
Power Consumption	<2VA
Output	• +/-5 VDC • +/-10 VDC
Output Impedance	>10K Ω
Response Time	500 ms (10–90% step change)
Accuracy	1.0% of FS
Isolation Voltage	2500 V
Frequency Range	DC
Case	UL94 V-0 Flammability Rated
Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings	UL/cUL, CE pending

Voltage Transducer Ordering Information

Sample Model Number: VTD0-010-24U-BD-OS DC voltage transducer with 15 V range, +/-10 VDC proportional output; 24 V externally powered, bidirectional output with a DIN rail compatible case.



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VTU-OS SERIES High Voltage DC/AC Voltage Transducer

VTU-OS Series Voltage Transducers provide very high accuracy and safety in a panel or DIN rail mounted case. The one sensor design can measure DC or AC circuit voltages to 1200 volts, and produce an analog signal directly proportional to the voltage connected. A very valuable tool to spot issues with power generation (conventional and alternative sources) like brownouts and phase loss. The voltage will be present on the line side of a disconnect even when the breaker or switch is open.

Voltage Transducer Applications

Photovoltaic Panels

• Connecting panel outputs in series increases the voltage sent from the panels to the load up to 1200 volts DC. The VTU is designed to measure this safely.

Water Delivery and Treatment

• Measure the AC voltage to pumps and aerators and shut them down if the supplied voltage falls to a dangerous level.

Cranes and Lifting Apparatus

• DC motors are used to lift, place and position heavy objects, as they have full torque capacity at zero speed. Use a voltage transducer to be sure that the field windings have voltage to keep the motor speed under control.

VTU-OS Measures Both AC and DC Voltages





Voltage Transducer Features

Industry Standard Output Options

- 4-20 mA, 0-5 and 0-10 VDC.
- Compatible with most automation and control systems.
- Output proportional to RMS voltage.

Externally Powered

• 24 VAC or DC with low power consumption.

Simple Conductor Termination

- Primary circuit uses self-tightening terminals.
- Power supply and output terminals are finger-safe.

Panel or DIN Rail Mount Options*

- If a DIN rail is not available, use the screw mounting option to attach to a back panel.
- Power supply is isolated from input and output.

UL/cUL Approved, CE Pending

· Accepted worldwide.

*For information on the DIN rail accessories kit, see page 140.







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Voltage Transducer Dimensions

OS Case



-	c us
Power Supply	24 VAC/DC (22–26 VAC or DC)
Input Range	0–800, 1000 or 1200 VAC or DC
Power Consumption	< 2VA
Output	• 4–20 mA • 0–5 VDC • 0–10 VDC
Output Loading	• 4–20 mA: <400 Ω • 0–5/10 VDC: >100 KΩ
Response Time	100 ms
Accuracy	<1% FS
Isolation Voltage	UL listed to 1270 VAC, tested to 5 KV
Frequency Range	0–400 Hz
Case	UL94 V-0 Flammability Rated
Environmental	-4 to 122 ° F (-20 to 50° C) 0–95% RH, non-condensing
Listings	UL/cUL, CE pending

Voltage Transducer Ordering Information

Voltage Transducer Specifications

Sample Model Number: VTU10-420-24U-OS AC or DC voltage transducer, 0–1000 V primary, 4–20 mA secondary, 24 VAC/DC power, DIN or panel mount case.



(3) Supply Voltage

24U 24 VAC/DC external power supply

(4) Case Style

OS DIN rail or panel mounting case

Voltage Transducer Connections



Test & Evaluation Units for OEMs Free program expedites evaluation process. See page 3 for details.

OEMs





VTU-DIN SERIES AC or DC Voltage Transducers

VTU-DIN Series Voltage Transducers are high-performance True RMS transducers for sensing voltage in single, three-phase or DC installations. Housed in a slim, compact, easy-to-install DIN rail mounted case, these transducers come in a variety of voltage ranges. The VTU-DIN measures AC or DC voltage from 0–15 to 0–600 V and provides an industry standard output proportional to connected voltage in alternating current circuits with sinusoidal or non-sinusoidal (variable frequency) applications or direct current circuits.

Voltage Transducer Applications

True RMS or DC Voltage Monitoring

- Detect below normal or "brownout" voltage conditions; protect against possible motor overheating.
- Identify phase loss conditions by detecting voltage reduction in one or more phase of three-phase motor.
- Monitor over voltage conditions associated with regenerative voltage to help in diagnosing/avoiding motor drive issues.
- Detect voltage conditions that may cause stress or damage to soft starter components (SCRs).

Phase Loss Detection





Voltage Transducer Features

Zero to 5 KHz Measurement

 Allows for use in situations where power supplied is non-sinusoidal such as VFD applications, poor power quality installations or other electrically harsh/challenging environments.

Standard Outputs

 Industry standard outputs makes use with existing controllers, data loggers and SCADA equipment easy and reliable.

Compact DIN Rail Mount Case*

• Space saving 35 mm wide enclosure mounts quickly for an attractive installation.

UL/cUL and CE Approved

· Accepted worldwide.

*For information on the DIN rail accessories kit, see page 140.

Voltage Transducers





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Voltage Transducer Dimensions





Voltage Transducer Connections

AC/DC Voltage (primary)



Power Supply	24 VAC or DC external power (Not isolated from the output)
Power Consumption	<2 VA
Input	0–15, 25, 50, 60, 120, 150, 240, 300, 400, 500, 600 V, AC or DC
Output	 4–20 mA proportional (capped at 31 mA max.) 0–5 VDC 0–10 VDC
Response Time	500 ms (to 90% value)
Accuracy	<1% error
Loading	• 4–20 mA output: <400 Ω • 0–5/10 VDC output: >50 KΩ
Isolation Voltage	2500 VAC
Frequency Range	0 Hz–5 KHz
Case	UL94 V-0 Flammability Rated; noncorrosive thermoplastic
Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings	UL/cUL, CE

Voltage Transducer Specifications

Voltage Transducer Ordering Information

Sample Model Number: VTUE-420-24U-DIN AC/DC voltage transducer with 120 V range, standard 4–20 mA proportional output; 24 VAC/DC externally powered with a DIN rail compatible case.



(1) Range

А	0–15 V
В	0–25 V
С	0–50 V
D	0–60 V
E	0-120 V
F	0–150 V
G	0-240 V
Н	0-300 V
1	0-400 V
J	0-500 V
К	0-600 V

) Output	Туре
420	4–20 mA
005	0-5 VDC
010	0-10 VDC
420 205 210	4-20 mA 0-5 VDC 0-10 VDC

(3) Power Supply

24U	24 VAC/DC external
	power supply

(4) Mounting

DIN
DIN



Test & Evaluation Units for OEMs Free program expedites evaluation process. See page 3 for details.



