tyco
Electronics

# Paladin and Integra Transducers

*a vital part of your world*

ENERGY DIVISION

# Paladin and Integra Transducers

*An extensive range of high specification transducers providing measurement, isolation and conversion of electrical parameters into industry standard DC output signals, RS232 and Modbus.*

*Integra 1560 and 1580 multi function digital metering and transducer systems provide high accuracy <0.2% measurement and communication of up to 50 major electrical and power quality parameters, including true RMS system values, power quality data and THD measurement up to 31st harmonic. Transducers are configurable via a software package or an optional menu driven display unit.*

*The Paladin range of DIN rail transducers protect against high voltage and overload, and are resistant to vibrations in harsh electrical environments. Transducers offer multiple analogue outputs from a single housing, and class 0.5 and 0.2 measurement of most electrical parameters, including true RMS sensing.*

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Extensive range
High accuracy
True RMS measurement
THD measurement and power quality data
Pulsed, analogue and digital outputs

## Benefits

Cost saving remote metering
DIN rail or base mounted options
Efficient monitoring, control and protection of expensive power assets

## Applications

Switchgear
Distribution systems
Generator sets
Control panels
Energy management
Building management
Utility power monitoring
Process control
Motor control

## Approvals

UL, CSA and BV

# Integra Digital Metering and Transducer Systems

*Integra 1560 and 1580 multi function transducers provide high accuracy <0.2% measurements and communicate up to 50 major electrical and power quality parameters, including true RMS system values, power quality data and total harmonic distortion (THD) measurement up to the 31st harmonic. The range includes the rail mounted 1560 DIN version and the 1580 variant with a base plate for surface mounting. Both transducers meet the same high technical specifications and incorporate pulsed, analogue and digital communication outputs. Transducers are fully programmable through a Windows based software configuration package, enabling remote commissioning and monitoring via building management systems. Alternatively, an optional menu driven display unit can be used to configure and monitor up to 32 measured parameters.*

## Features

Measure and communicate of up to 50 electrical and power parameters

High accuracy of <0.2%

THD measurement and power quality data

True RMS measurement

Pulsed, analogue and digital outputs

Modbus and Lonworks interface options

Fully programmable VT and CT ratios

Configurable via software or menu driven interface

## Benefits

Replaces multiple single function transducers

DIN rail or base mounted options

Local or remote configuration and monitoring via building management systems

ANSI style local or remote LED display option

Monitoring, control and protection of expensive power assets

## Applications

Switchgear

Distribution systems

Control panels

Energy management

Building management

Utility power monitoring

Process control

Motor monitoring

## Approvals

UL file no. E200300

CSA pending

## Operation

The multi function Integra 1560 and 1580 transducers offer uncomplicated operation and high accuracy <0.2% measurement of three phase voltage, current, frequency, watts, VAr, VA, energy, power factor and total harmonic distortion measurement of both phase and system, current and voltage. A simple Windows based software package is provided to configure the transducer. Once configured, up to 50 electrical and power quality variables can be simultaneously input into building management systems via pulsed, analogue or digital communication options. Status may also be monitored via a PC through a software package.

Alternatively, an optional menu driven display unit can be used to configure and monitor up to 32 measured parameters including three phase voltage and current, and system watts, VAr, VA, power factor, energy and total harmonic distortion. The Integra Display unit panel can be permanently mounted next to the transducer or simply connected at times when configuration, adjustment and/or status information is required.

## Accuracy

Integra transducers utilize true RMS measurement techniques up to the 31st harmonic, providing <0.2% accuracy. An exceptional tolerance to high harmonic frequencies is achieved from the robust frequency detection method, which is able to lock the fundamental frequency onto any phase. High integrity measurements are possible where the system approximates CT current in the absence of voltage signals.

## System Input

Designed for all low, medium and high voltage switchgear and distribution systems, the Integra 1560 and 1580 offer programmable VT and CT ratio capability. Direct connection up to 480V AC with 5A CT inputs is standard, and 1A CT inputs are optional.

## System Outputs

### Pulsed outputs

Integra transducers offer optional pulsed outputs enabling retransmission of kW.Hr and kVAr.Hr time based parameters. Outputs are pulsed at a rate proportional to the measured kW.h active energy, with pulse width and rate easily programmable either locally or remotely. Output relays have a fully insulated volt free contacts, with connection via screw clamp terminals.

### Analogue outputs

Up to four analogue outputs may be included, enabling onward transmission of linear parameters with industry standard analogue signalling. Each analogue channel can be assigned to one of 47 measured parameters with the output span fully adjustable to suit customer requirements, and can be configured to operate in normal, reverse, threshold or constant current modes. Analogue outputs share a common return which is galvanically isolated from non-analogue output terminals.

Crompton INSTRUMENTS

## Digital Communications

### RS485 Modbus RTU

Integra 1560 and 1580 transducers offer up to two RS485 communication ports for direct connection to SCADA systems using the Modbus RTU protocol, or optionally a single Johnson Controls Metasys NII protocol. Remote monitoring enables the user to record system parameters in real time, using high resolution numbers. The Modbus protocol establishes the format for the master query by placing it into the device address. The slave response is also constructed using the Modbus protocol; it contains fields confirming the action taken, data to be returned, and an error-checking field. The Modbus option includes function 8 subfunction 0, which provides return query data diagnostic support and the ability to change Modbus word order to suit user requirements.

### Lonworks interface

The Lonworks interface option is designed to conform to LonMark Interoperability Guidelines version 3.2. This ensures Integra transducers can be integrated into a single control network without requiring a custom node or network tool development.

### Software Configuration

Configuration of up to 50 measured parameters, outputs, pulsed relays, current and power demands are easily programmed through a Windows style user interface which can be installed on any PC running Windows 95, NT or 2000. The transducer is connected to a PC's COM port via an RS485/RS232 converter.

The configuration software allows the user to load and save configuration settings to and from a PC hard disk, and to send and retrieve settings from the transducer. Settings can be saved for later use and can be copied from one Integra to another.

Status information is usually communicated into a building management system, but can also be monitored through configuration software. The software interrogates the selected transducer every few seconds to obtain data, which can be viewed on a dedicated measurements page.

### Programmable Display Unit Option

As an alternative to the standard software configuration package, voltage and current transformer ratios, communication options and power measurement parameters can be configured via the optional menu driven Integra display unit.

A simple two button interface on the front panel of the unit allows display of 32 major electrical and power quality parameters. To prevent unauthorised access to the product configuration settings, all set-up screens can be protected by an optional customer programmable password.

Once configured, the status of each parameter can be viewed by scrolling through 13 screens, featuring a 3 line, 4 digit LED display. The unit requires an independent auxiliary power supply and thus may be positioned either locally, or remotely from the transducer at a distance limited only by the communication restrictions of RS485.

### Measurement and communication

Up to 50 electrical and power quality parameters can be measured and input into building management systems or viewed through the software configuration package via a PC.

Volts L1-N, L2-N, L3-N
Volts L1-L2, L2-L3, L3-L1
System volts L-N (average)
System volts L-L (average)
Current line 1, 2 and 3
System current (average)
Current sum
Current demand
Current maximum demand
Neutral current
System frequency
watts 1, 2 and 3
System watts (sum)
Watts demand (import)
Watts maximum demand (import)
Watt-hours (import)
VAr 1, 2 and 3
System VAr (sum)
VAr-hours (import)
VA 1, 2 and 3
System VA (sum)
Power factor 1, 2 and 3
System power factor (average)
Phase angle 1, 2 and 3
System phase angle (average)
THD volts 1, 2 and 3
THD system volts (mean)
THD amps 1, 2 and 3
THD system amps (mean)

## Measurement and display

Up to 32 electrical and power quality measurements can be configured and monitored on the DIS-1540 optional display unit. These parameters appear in the following order.

1 System volts
System current
System kW

2 System volts THD %
System current THD %

3 Volts L1 – N (4 wire only)
Volts L2 – N (4 wire only)
Volts L3 – N (4 wire only)

4 Volts L1 – L2
Volts L2 – L3
Volts L3 – L1

5 Volts Line 1 THD %
Volts Line 2 THD %
Volts Line 3 THD %

6 Current L1
Current L2
Current L3

7 Current Line 1 THD %
Current Line 2 THD %
Current Line 3 THD %

8 Neutral current (4 wire only)
Frequency
Power factor

9 kVAr
kVA
kW

10 kW Hr (7 digit resolution)

11 kVAr Hr (7 digit resolution)

12 kW demand
Current demand

13 kW maximum demand
Current maximum demand

## Programmable Parameters

*Integra 1560 and 1580 transducers can be programmed via the RS485 communications port by using the configuration software for a Windows based PC, or by using the optional programmable Integra display unit.*

| Parameter | Range |
|---|---|
| Password: | 4 digit, 0000 - 9999 |
| Primary current: | max 9999A (360-MW max**) |
| VT primary: | 400kV (360MW max**) |
| Secondary voltage: | nominal system voltage |
| | ** maximum VT and CT ratios are limited so the combination of primary voltage and current does not exceed 360MW at 120% of relevant input |
| Demand integration time: | 8, 15, 20, 30 minutes |
| Reset: | max demand & active energy registers |
| Pulse output duration: | 60, 100, 200 ms |
| Pulse rate divisors: | 1, 10, 100, 1000 |
| RS485 interface baud rate: | 2.4, 4.8, 9.6, 19.2kB |
| RS485 parity: | odd / even / no, 1 or 2 stop bits |
| Modbus address: | 1 - 247 |
| Analogue outputs: | user definable parameters & ranges |

## Specifications

| Input | |
|---|---|
| Nominal input voltage: | 57.7 – 277V L-N, 100 – 480V L-L |
| Max continuous input voltage: | 120% of nominal |
| Max short duration input voltage: | 2 x for 1 second, repeated 10 times at 10 second intervals |
| System VT ratios (primary): | any value up to 400kV ** |
| Nominal input voltage burden: | < 0.2 VA |
| Nominal input current: | 5A (1A option) |
| System CT primary values: | 9999: 5A or 9999: 1A max 360MW ** |
| Max continuous input current: | 120% nominal |
| Max short duration current input: | 20 x for 1 second, repeated 5 times at 5 second intervals |
| Nominal input current burden: | < 0.6 VA |
| | ** maximum VT and CT ratios are limited so the combination of primary voltage and current does not exceed 360MW at 120% of relevant input |
| **Outputs** | |
| RS485 communications: | two wire half duplex |
| Baud rates: | 2400, 4800, 9600, 19200 |
| Pulsed: | clean contact SPNO, 100V DC 0.5A max |
| Pulse duration: | 60, 100 or 200 milliseconds |
| Pulsed outputs: | up to 6 |
| Analogue outputs: | up to 4 |
| **Auxiliary** | |
| Standard nominal supply voltage: | 100 – 250V, AC or DC<br>(85 – 287V, AC absolute)<br>(85 – 312V, DC absolute) |
| AC supply frequency range: | 45 – 66Hz |
| AC supply burden: | 6VA |
| Optional auxiliary DC supply: | 12 – 48V, DC<br>(10.2 – 60V, DC absolute) |
| DC supply burden: | 6 VA |

*continued*

## Specifications continued

| Measuring ranges | |
|---|---|
| Voltage: | 80 – 120% of nominal (functional 5 – 120%) |
| Current: | 5 – 120% of nominal (functional 5 – 20%) |
| Frequency: | 45 – 66Hz |
| Power factor: | 0.8 capacitive – 1 – 0.8 inductive |
| THD: | Up to 31st harmonic 0% – 40% |
| Energy: | 7 digit resolution |
| **Reference conditions** | |
| Ambient temperature: | 23°±1°C |
| Input frequency: | 50 or 60Hz ±2% |
| Input waveform: | sinusoidal (distortion factor < 0.005) |
| Auxiliary supply voltage: | nominal ±1% |
| Auxiliary supply frequency: | nominal ±1% |
| AC auxiliary supply waveform: | sinusoidal (distortion factor < 0.05) |
| Magnetic field of origin: | terrestrial flux |
| **Accuracy** | |
| Voltage: | ±0.17% of range |
| Current: | ±0.17% of range |
| Frequency: | 0.15% of mid frequency |
| Power: | ±0.2% of range |
| Power factor: | 1% of unity |
| Reactive power (VAr): | ±0.5% of range |
| Apparent power (VA): | ±0.2% of range |
| THD: | ±1% |
| Neutral current: | ±0.95% of range |
| Energy: | KWh 1% IEC1036 |
| KVArh: | 2% |
| Temperature coefficient: | voltage & current typical: 0.013%/°C<br>watts typical: 0.018%/°C |
| Update time: | 1 second for display, 250 ms for optional digital port |
| Analogue output: | ±0.2% |
| **Enclosure** | |
| Enclosure style: | DIN rail or base mounted |
| Compliant with: | UL E200300 and IEC 1010/BSEN 61010-1 |
| Material: | Polycarbonate |
| Terminals: | Shrouded screw clamp |
| Dielectric voltage: | Tested at 3.25kV RMS 50Hz for 1 minute between all electrical circuits |
| Operating temperature: | -20 to +60°C |
| Storage temperature: | -30 to +80°C |
| Relative humidity: | 0 – 90% non condensing |
| Warm-up time: | 1 minute |
| Shock: | 30g in 3 planes |
| Vibration: | 10 – 55Hz, 0.15mm amplitude |
| DIN rail transducer dimensions: | 5.5" high* x 3.72" wide x 3.72" deep<br>139.6mm high x 94.4mm wide x 94.4mm deep<br>*Excluding connectors |
| Base mounted transducer dimensions: | 5.2" high* x 3.74" wide x 5.24" deep<br>131.5mm high x 95mm wide x 133.5mm deep<br>*Excluding connectors |
| Transducer display dimensions: | 4.31" high x 4.31" wide x 2.9" deep<br>109.4mm high x 109.4mm wide x 73.7mm deep |
| Panel cut out (display): | 4.06" (103mm) diameter, 4 stud positions |

## Accuracy Definition

Error changes due to quantity variations as described in IEC688:1992 section 6.
THD accuracy based on a typical harmonic profile.

## Sample order code

INT-1564-M-5-M-120

Integra 1560 transducer, 3 phase 4 wire, DIN rail mounted, 241 to 480 V L-L nominal input voltage, 5 A CT input, auxiliary supply 100 – 250 V AC or DC, one relay pulsed output and two RS485 Modbus communication ports.

## Ordering Codes

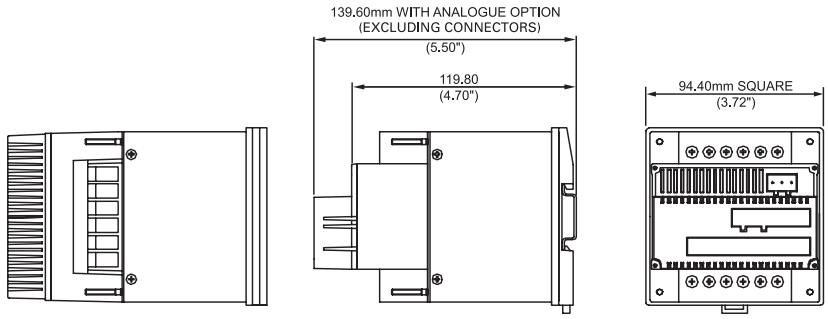
| Ordering code key | Product configuration | |
|---|---|---|
| INT-1561-*-5-**-option-*** | Integra 1560 single phase 5A CT input, DIN rail | |
| INT-1562-*-5-**-option-*** | Integra 1560 single phase 3 wire 5A CT input, DIN rail | |
| INT-1563-*-5-**-option-*** | Integra 1560 3 phase 3 wire 5A CT input, DIN rail | |
| INT-1564-*-5-**-option-*** | Integra 1560 3 phase 4 wire 5A CT input, DIN rail | |
| INT-1581-*-5-**-option-*** | Integra 1580 single phase 5A CT input, base mount | |
| INT-1582-*-5-**-option-*** | Integra 1580 single phase 3 wire 5A CT input, base mount | |
| INT-1583-*-5-**-option-*** | Integra 1580 3 phase 3 wire 5A CT input, base mount | |
| INT-1584-*-5-**-option-*** | Integra 1580 3 phase 4 wire 5A CT input, base mount | |
| ***Input voltage suffix** | | |
| L | 57.7 – 139V L-N<br>114 – 278V L-L (57.7 – 139V L-N)<br>100 – 240V L-L (57.7 – 139V L-N) | 1561 & 1581<br>1562 & 1582<br>1563,4 & 1583,4 |
| M | 140 – 277V L-N<br>279 – 480V L-L (140 – 240V L-N)<br>241 – 480V L-L (140 – 277V L-N) | 1561 & 1581<br>1562 & 1582<br>1563,4 & 1583,4 |
| ****Auxiliary supply suffix** | | |
| L | 12 – 48V DC | |
| M | 100 – 250V AC/DC | |

| Communications | Pulsed / relay outputs | RS485 interface Modbus or Johnson Controls Metasys NII | Lonworks interface | Analogue outputs |
|---|---|---|---|---|
| 010 | | 1 | | |
| 011 | | 1 | | 1 |
| 012 | | 1 | | 2 |
| 013 | | 1 | | 3 |
| 014 | | 1 | | 4 |
| 020 | | 2 | | |
| 021 | | 2 | | 1 |
| 022 | | 2 | | 2 |
| 023 | | 2 | | 3 |
| 024 | | 2 | | 4 |
| 040 | | 1 | 1 | |
| 110 | 1 | 1 | | |
| 111 | 1 | 1 | | 1 |
| 112 | 1 | 1 | | 2 |
| 113 | 1 | 1 | | 3 |
| 114 | 1 | 1 | | 4 |
| 120 | 1 | 2 | | |
| 121 | 1 | 2 | | 1 |
| 122 | 1 | 2 | | 2 |
| 123 | 1 | 2 | | 3 |
| 124 | 1 | 2 | | 4 |
| 210 | 2 | 1 | | |
| 211 | 2 | 1 | | 1 |
| 212 | 2 | 1 | | 2 |
| 220 | 2 | 2 | | |
| 221 | 2 | 2 | | 1 |
| 222 | 2 | 2 | | 2 |
| 410 | 4 | 1 | | |
| 411 | 4 | 1 | | 1 |
| 412 | 4 | 1 | | 2 |
| 420 | 4 | 2 | | |
| 421 | 4 | 2 | | 1 |
| 422 | 4 | 2 | | 2 |
| 610 | 6 | 1 | | |
| 611 | 6 | 1 | | 1 |
| 612 | 6 | 1 | | 2 |
| 620 | 6 | 2 | | |
| 621 | 6 | 2 | | 1 |
| 622 | 6 | 2 | | 2 |

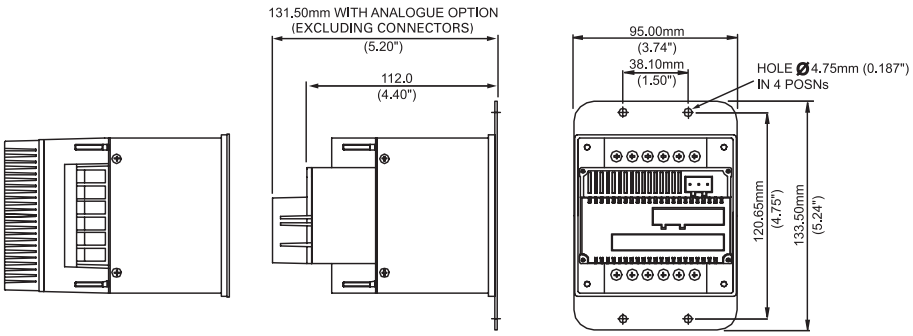
| ***Analogue output range | |
|---|---|
| 0 | No output |
| 1 | 0-20 mA, 10 V compliance (user configurable as 4-20 mA)<br>Available for up to 3 output channels only |
| 2 | 0-1 mA, 10 V compliance |
| 3 | -1/0/+1 mA, 10 V compliance |
| 4 | 0-5 mA, 10 V compliance |
| 6 | 0-10 mA, 10 V compliance |

# Dimensions

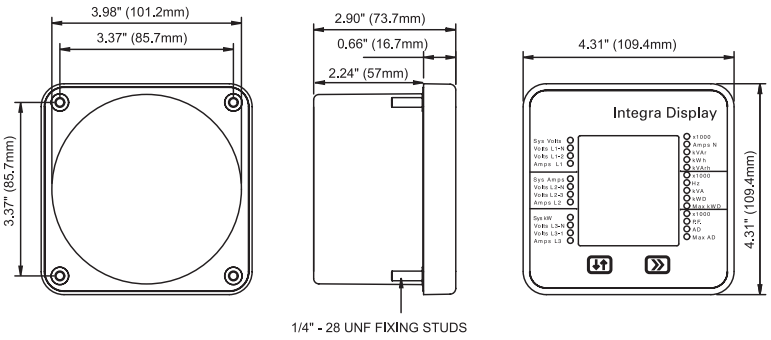
## Integra 1560 DIN Rail Mounted Transducer



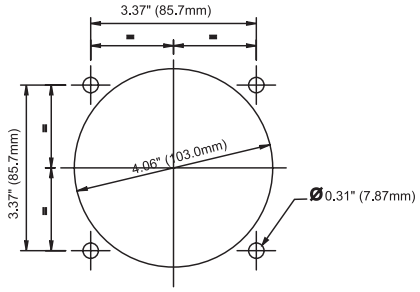

## Integra 1580 Base Mounted Transducer




## Optional Remote Display (for use with Integra 1560 or 1580 Transducer)



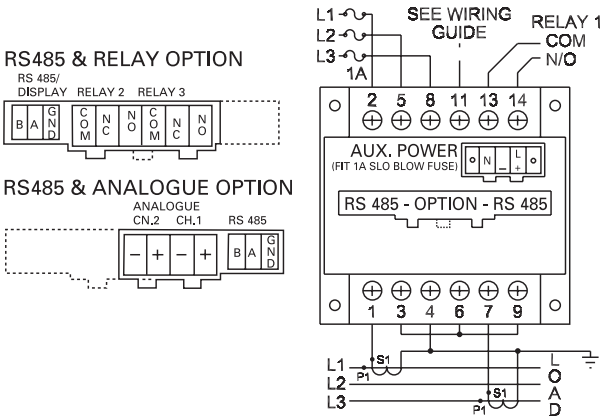

## Optional Remote Display Panel Cut-Out



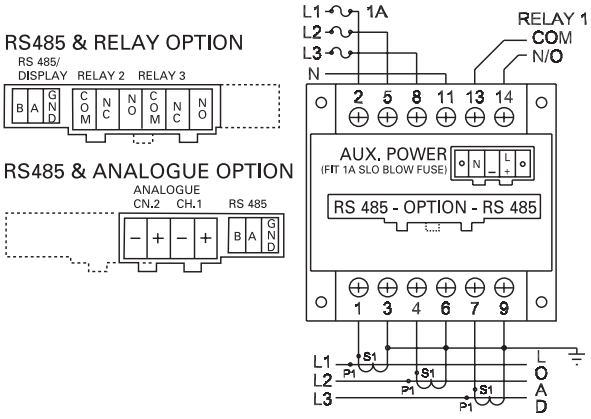
## Wiring

Input connections are made directly to shrouded screw clamp terminals. Terminals for both current and voltage connections accept two #9 AWG (3mm2) solid or stranded wires. There are screw clamp connectors for auxiliary power, pulsed and analogue options. Connectors offer retained wire protection leaves for one #10 AWG (2.5mm2) solid or stranded wire. Digital interface connects via a screw clamp connection with wire protection leaves and is sized to accept one #14 AWG (1.5mm2) solid or stranded wire.

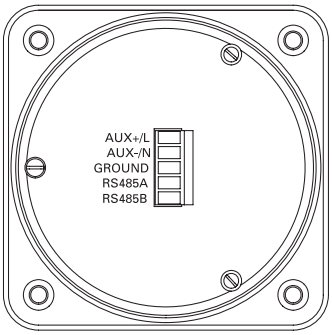
### 1560/1580 - 3 Phase 3 Wire Unbalanced Load




### 1560/1580 - 3 Phase 4 Wire Unbalanced Load




### DIS-1540 Remote Display




## Auxiliary Supply

The Integra family should ideally be powered from a dedicated supply, either 100 – 250V AC or DC (85V – 280 AC absolute or 85 – 312V DC absolute) or 12-48V DC (10.2 – 60V DC absolute). However, all Integra devices may be powered from a signal source, if in the working range of the chosen auxiliary supply.

## Fusing

It is recommended that all voltage lines be fitted with 1 amp fuses.

## Safety / Ground Connections

For safety reasons, all CT secondary connections should be grounded in accordance with local regulations.

# Paladin Transducers 250 Series Class 0.5

*An extensive range of Class 0.5 transducers providing measurement, isolation and conversion of electrical parameters into industry standard DC output signals. The range offers protection against high voltage and overload, and resistance to vibration in harsh electrical environments. Transducers offer multiple analogue outputs in a single housing, and individual measurement of most electrical parameters.*

## Introduction

Crompton transducers can be used for measuring most electrical parameters. The following transducers can be supplied:

- AC and DC current and voltage.
- Active, reactive and apparent power.
- Frequency.
- Power factor and phase angle.
- Integrating current for maximum demand indication and alarm control.
- Suppressed zero voltage for monitoring a narrow voltage range.
- Tap position on a high voltage transformer.
- Temperature transmitters for thermocouples and resistance thermometer detectors (RTD's).
- Resistance (slidewire) transmitters.

## Safety Features

Crompton transducers and transmitters are designed for use in harsh electrical environments and feature:

- High protection against overload - 20 x rated current for 1 second.
- High degree of mechanical shock and vibration resistance.
- Protection against high voltage.
- Inputs, outputs and power supply are galvanically isolated from one another (excluding resistance transmitters).

## Application

- Measurement of most electrical parameters.
- Conversion to standard d.c. output signals.
- Outputs suitable for indication, PLCs.
- For use in control cabinets, switchboards, motor control centres, generating sets, energy management & building management systems.

## Ordering Information

When ordering please specify:

1. Product catalogue number.
2 Current and/or voltage.
3. Frequency.
4. Auxiliary voltage AC or DC
5. Optional calibration at 30°C.
6. For power products:
   a. VT & CT ratios.
   b. System configuration i.e. single phase, 3 phase 3 or 4 wire, balanced or unbalanced load.
7. For slide wire transmitter quote R1, R2 and R3. See page G9.
8. National specification indicated by 7th digit in the product number.

## Features

Extensive range
High accuracy 0.5%
Up to 3 analogue outputs in one housing
Zero and span adjustments
DIN rail mounting
Single and 3 phase systems
Flame retardant cases
Screw clamp terminals

## Benefits

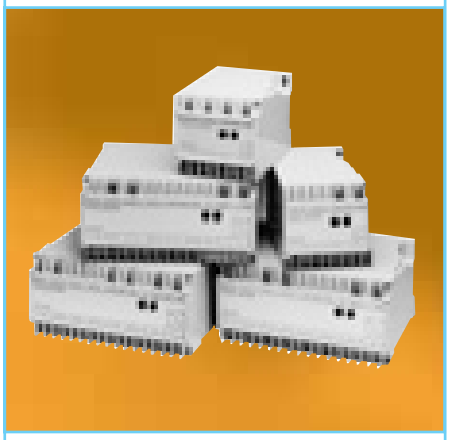
Cost savings remote metering
Reduction of signal levels for ease of metering
Isolated output for safety
Protection against high voltage and overload

## Applications

Switchgear
Distribution systems
Generator sets
Control panels
Energy management
Building management
Utility power monitoring
Process control
Motor control

## Approvals

UL file no. E140758
CSA file no. LR52592
BV file no. 3896H-07425-AO PRSO BV

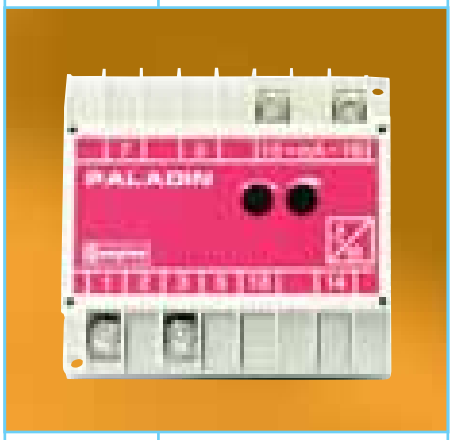


## Specifications

| | |
|---|---|
| Performance: | designed to comply with BS6253 part 1, EN60688, IEC688, AS1384 and ANSI. C37. |
| Temperature range: | storage -20°C to +70°C<br>operating 0°C to +60°C<br>calibrated at 23°C |
| Temperature coefficient: | 0.03%/ per °C |
| Humidity range: | Up to 95% RH |
| Zero adjustment: | ±2% minimum (except TAA & TVA) |
| Span adjustment: | ±10% minimum |
| Accuracy class: | 0.5 unless otherwise specified |
| Accuracy range: | 0 to 125% (except self powered) |
| Stability: | +0.25% per annum (reducing with time) |
| Test voltage: | 2kV ms to ANSI, C37 |
| Response time: | <400 ms from 0 to 99% of rated output, 250ms to 90% |
| DC outputs (typical): | 0/1mA into 0-10kΩ<br>0/5mA into 0-2kΩ<br>0/10mA into 0-1kΩ<br>0/20mA into 0-500Ω (600Ω available on selected models)<br>4/20mA into 0-500Ω (600Ω available on selected models)<br>0/5V 1k ohm minimum load<br>0/10V 1K ohm minimum load - bipolar for some models |
| Current output protection: | Fully protected against open and short circuited output |
| Voltage output protection: | Fully protected against open circuit output |
| Maximum output: | 20V DC when open circuit |
| Output ripple: | <0.5% of full rated output |
| Overoad capacity: | 2 x rated current continuous<br>1.25 x rated voltage continuous<br>20 x rated current for 1 second<br>1.5 x rated voltage for 10 seconds |
| Input impedance:<br>(DC I/P) | DC 1000 ohms/volt as standard<br>10k ohms/volt available on request |
| Input burden: | AC <2 VA |
| Auxiliary burden: | <2 VA AC <3.5 W DC<br>auxiliary voltage variation: ±20% AC, ±15% DC, maximum 14% ripple |
| Safety: | To IEC1010 with terminal cover, basic insulation category |
| Minimum test voltage: | 2kV rms for 1 minute |
| Flammability: | flame retardant |
| Isolation: | input/output/supply/case (except TRR, TRP, TRT and TRV with no input/output isolation) |
| Interference: | electrical stress surge withstand to IEC 688, part of IEC 801 and ANSI C37 90a |
| Immunity: | impulse test 5kV transient to IEC688, and IEC801 |
| Enclosure: | IP50 to BS5490, IEC529 when the terminal cover is fitted. The case is UL94V0 and the terminal cover is UL94V2 |
| Fixing: | EN50022 |
| Approvals: | EMC and LVD<br>UL recognised file no. E140758<br>CSA recognised file no. LR52592<br>BV file no. 3896H-07425-AO PRSO BV |

## AC Current Average Sensing - Self Powered

*Measures current to an accuracy of 0.5%. Average sensing and calibrated to indicate the RMS value of a sinewave with less than 1% distortion. Internal power is derived from the input signal. Input and output are isolated.*




### Specifications

| | |
|---|---|
| Inputs: | 1, 5 or 10 A AC 50 or 60Hz |
| Output: | 0/1mA, 0/5mA, 0/10mA and 0/20mA |
| Auxiliary power: | self powered |

### Product Code – Single Phase Current Transducer - 1 DC Output

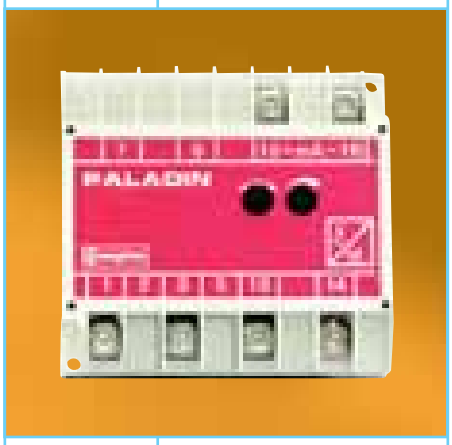
| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | self | 0/1mA | 253-TAA*-LSFA-C6 | 1 |

### Product Code – 3 Phase Current Transducer - 3 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | self | 0/1mA | 256-TAA-LSFA-C6 | 47 |

## AC Current Average Sensing - Auxiliary Powered

*Single or three phase models offering current measurement down to zero input Model TAL provides a current output with a live zero (4-20mA). Average sensing and calibrated to indicate the RMS value of a sinewave with up to 1% distortion. Input, output and auxiliary are isolated.*




### Specifications

| | |
|---|---|
| Inputs: | 1, 5 or 10 A AC 50 or 60Hz |
| Output: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415, 440 and 480 V<br>DC 12, 24, 48, 110,120 or 135V nomina |

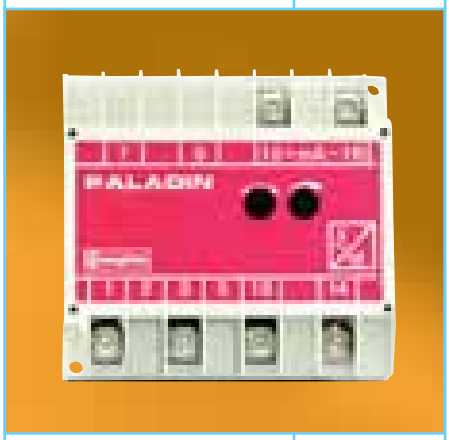
### Product Code – Single Phase Current Transducer - 1 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 4/20mA | 253-TAL*-LSHG-C6-DG | 6 |

### Product Code – 3 Phase Current Transducers - 3 DC Outputs

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 0/1mA | 256-TAS*-LSFA-C6-DG | 2 |
| 5 A 60Hz | 120V | 4/20mA | 256-TAL*-LSHG-C6-DG | 2 |

With multiple analogue outputs, do not common the -ve terminals.




## True RMS Current

*True RMS measurement of the input current, measuring non standard and distorted waveforms. Calibrated for sinewaves with up to 30% of 3rd harmonic distortion. Isolation is provided between input, output and auxiliary.*

### Specifications

| | |
|---|---|
| Inputs: | 1.5 or 10A AC, 50 or 60Hz<br>Contact factory for other potential inputs |
| Output: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415, 440 and 480V<br>DC 12, 24, 48, 110, 120, or 135V |

### Product Code – Single Phase Current Transducer

Auxiliary powered - 1 DC output.

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5A 60HZ | 120V | 0/1mA | 253-TAR*-LSFA-C6-DG | 6 |

### Product Code – 3 Phase Current Transducers

Auxiliary powered - 3 DC outputs.

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60HZ | 120V | 0/1mA | 256-TAR*-LSFA-C6-DG | 2 |

With multiple analogue outputs, do not common the -ve terminals.

## Integrating Demand

*RMS calibration, conveniently averages fluctuating input signals into a steady signal. The AC input model can provide a maximum demand monitor with 8, 15 or 30 minute integration periods. The DC input model can accept output from other transducers, e.g. watt for indicating integrated power, or RTD for average temperature.*

### Specifications

| | |
|---|---|
| Inputs: | 1 or 5A AC, 50 or 60Hz<br>0/1mA, 0/20mA, DC<br>0/5mA, 0/10mA, 0/20mA, 0/1 V, 0/10 V DC |
| Auxiliary power: | 63.5, 110, 120, 220, 240, 280, 415, 440, 480V AC |

### Product Code – Single Phase AC Integrating Demand Current Transducer

Auxiliary powered - 1 DC output.

| Input AC | Time constant | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 8 minutes | 0/1mA | 253-TAP*-LSFA-C6-DG | 8 |
| 5 A 60Hz | 15 minutes | 0/1mA | 253-TAN*-LSFA-C6-DG | 8 |
| 5 A 60Hz | 30 minutes | 0/1mA | 253-TAM*-LSFA-C6-DG | 8 |

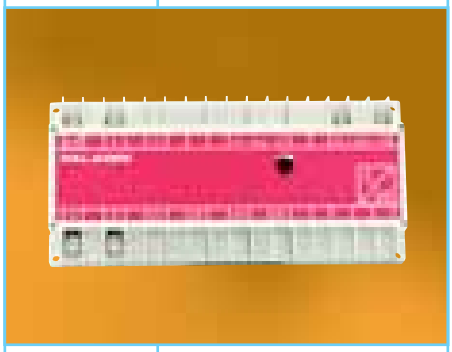
### Product Code – DC Integrating Demand Transducer

Auxiliary powered - 1 DC output.

| Input AC | Time constant | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 1mA | 8 minutes | 0/1mA | 253-TDP*-FAFA-DG | 4 |
| 1mA | 15 minutes | 0/1mA | 253-TDN*-FAFA-DG | 4 |
| 1mA | 30 minutes | 0/1mA | 253-TDM*-FAFA-DG | 4 |

## AC Current Bi-Directional

*Demonstrates the magnitude and direction of an AC input current.*



### Specifications

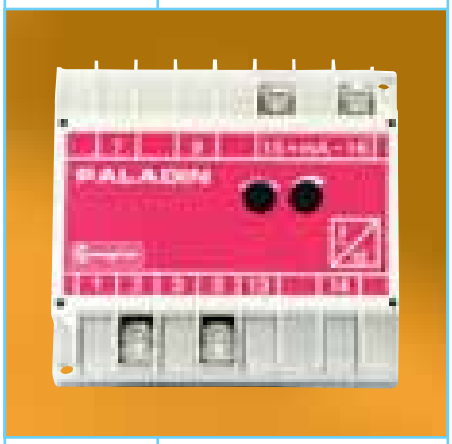
| | |
|---|---|
| Inputs: | voltage: 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415 and 480V AC, 50 or 60Hz<br>current: 1 or 5A, 50 or 60Hz |
| Outputs: | ±1mA/5mA/10mA/20mA |
| Auxiliary power: | self powered |

### Product Code – Single or 3 Phase System, Self Powered, 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A, 60Hz | self | +/-1mA | 256-TAB*<br>-LSM1-C6-PQ-T3 | 3 |

## AC Voltage Average Sensing - Self Powered

*Standard version for use in all voltage measuring applications. Average sensing for normal sinewave voltages, RMS calibrated for sinewave with up to 1% of 3rd harmonic distortion. Permits measurement down to 20% of full input. The input signal provides operational power, thus avoiding the need for a separate supply. The input is isolated from the output.*

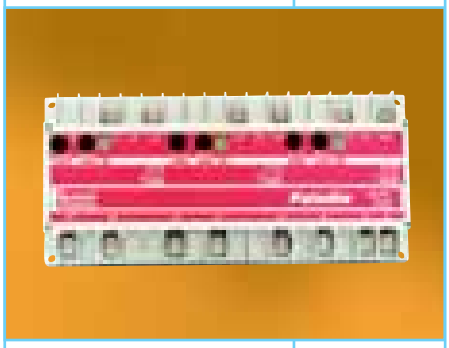


### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415, 440 and 480V AC 50 or 60Hz |
| Range: | 20 to 125% |
| Auxiliary power: | self powered |
| Outputs: | 0/1mA, 0/5mA, 0/10mA and 0/20mA |

### Product Code – Single Phase, Self Powered, 1 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V 60Hz | self | 0/1mA | 253-TVA*-PQFA-C6 | 10 |



## AC Voltage Average Sensing - Auxiliary Powered

*Auxiliary power allows measuring voltages down to zero. Designed for average sensing and calibrated to indicate the RMS value of a sinewave with up to 1% distortion. Model TVL provides a voltage input with a live zero (4-20mA). All models have input and output isolation.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415, 440 and 480V AC, 50 or 60Hz |
| Output: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 100, 110, 120, 220, 240, 250, 380, 400, 415, 480V DC 12, 24, 48, 110, 120 or 135V |

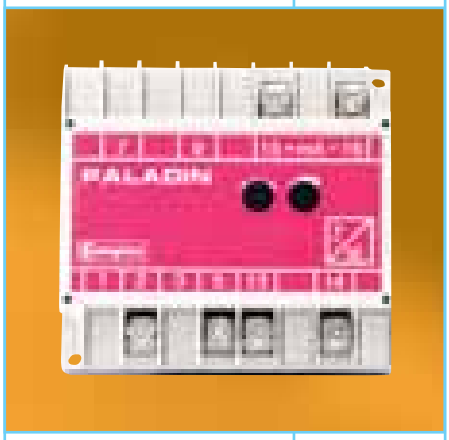
### Product Code – Single Phase - Live Zero - AC Voltage Transducer, Auxiliary Powered - 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V | 120V | 4/20mA | 253-TVL*-PQHG-C6-DG | 15 |

### Product Code – 3 Phase - Live Zero - AC Voltage Transducer, Auxiliary Powered - 3 DC Outputs

| Input AC | System | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V | 3 Phase 3 wire | 4/20mA | 256-TVL*-PQHG-C6-DG | 11 |
| 120V | 3 Phase 4 wire | 0/1mA | 256-TVS*-PQFA-C6-DG | 11 |

With multiple analogue outputs, do not common the -ve terminals.




## AC Voltage Suppressed Zero - Expanded Scale

*Designed for 'expanded scale' measurements at critical voltage levels, indicating small changes within a large voltage span. Average sensing and RMS calibrated, isolation is provided between input and output.*

### Specifications

| | |
|---|---|
| Inputs: | Between ±10% and ±30% of nominal 63.5, 100, 110, 120, 139, 208, 220, 240, 250, 277, 380, 400, 415, 440 and 480V AC 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA DC |

### Product Code – Single Phase - Suppressed Zero - AC Voltage Transducer, Self Powered - 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 108 - 132V | self | 0/1mA | 253-TVZ*-A9FA-C6 | 15 |

## True RMS AC Voltage


*Single or 3 phase true RMS voltage measurement down to zero. Calibration is maintained for sinewaves having up to 30% of 3rd harmonic distortion. Isolation is provided between input and output.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 240, 250, 380, 400, 415, 440, 480V AC, 50 or 60Hz |
| DC outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 100, 110, 120, 220, 250, 380, 400, 415, 480V. DC 12, 24, 48, 110, 120, 135V |

### Product Code – Single Phase. Voltage Transducer, Auxiliary Powered - 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 253-TVR*-PQFA-C6-DG | 15 |

### Product Code – 3 Phase. Voltage Transducers

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 256-TVR*-PQFA-C6-DG | 11 |

With multiple analogue outputs, do not common -ve terminals.

## Frequency Transducer


*A simple reliable transducer for measuring AC power frequencies that provides a DC output which is directly proportional to the change of input within a specified span. Isolation is provided between input and output. Ideally suited for process control monitoring, data acquisition, mains and genset applications.*

### Specifications

| | |
|---|---|
| Frequency: | 45-55Hz, 55-65Hz, 45-65Hz, 360-440Hz |
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V 50 or 60Hz. Refer to factory for other inputs |
| Outputs: | 0/1mA, 4/20mA, 0/5mA, 0/10mA, 0/20mA |
| Auxiliary powered: | self powered |
| Accuracy: | 0.1% of mid frequency |

### Product Codes – Single Frequency Transducer, Self Powered - 1 DC Output

| Input AC | Frequency | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V | 45/55Hz | 0/1mA | 253-THZ*-PQFA-AG | 10 |
| 120V | 55/65Hz | 0/1mA | 253-THZ*-PQFA-AN | 10 |
| 120V | 45/65Hz | 0/1mA | 253-THZ*-PQFA-AJ | 10 |
| 120V | 360/440Hz | 0/1mA | 253-THZ*-PQFA-BI | 10 |


## Tap Position Transmitter

*For accurate remote indication of tap position selection on a high voltage transformer. The variable tap position voltage is monitored, a DC output produced which is proportional to the tap position.*

### Specifications

| | |
|---|---|
| Input span: | 1-20k<br>5-50 taps at 400Ω each<br>10-50 taps at 30Ω each |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 110, 120, 220, 240, 380, 415V<br>63.5, 139, 208, 277, 440, 480V<br>DC 12, 24, 48, 120, 135V |

### Product Codes – Tap Position Transmitter, Auxiliary Powered

| Taps | Ohm | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 10-50 | 30 | 0/1mA | 253-TRT*-TIFA-DG | 12 |
| 5-50 | 400 | 0/1mA | 253-TRT*-T5FA-DG | 12 |

## Slide Wire Transmitter

*Accurate measurement and transmission of the resistance ratio of a 3 wire potentiometer. A stabilised voltage is applied to the potentiometer and the voltage measured from zero to the end of the wiper. This parameter is amplified and the DC output produced is proportional to the resistance value.*

### Specifications

| | |
|---|---|
| Input span: | minimum 1kΩ max 50kΩ specific R1, R2, R3 values<br>Example for 1k Potentiometer: R1 = 1k, R2 = 0, R3 = 1k<br>Example for 5k Potentiometer using only 4k;<br>R1 = 5k, R2 = 1k, R3 = 4k (Remember R1 = R2 + R3) |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA or 4-20mA,<br>0/1, 0/5, 0/10V DC |
| Auxiliary power: | AC 110, 120, 220, 240, 380, 415V, 63.5, 139, 208, 277, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

**Note:**

Not all applications provide for the slider to mechanically travel the full distance along the resistor track. Normally the first resistor step is inside the transducer and its value should be stated when ordering, as well as the total track resistance. End of track or connecting lead resistance, if significant, should also be considered. For satisfactory operation, the change in resistance should be greater than 20% of the total resistance.

### Product Code – Side Wire Transmitter (3 wire), Auxiliary Powered

| Input (specify) | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| R1, R2, R3 | 120V | 0/1mA | 253-TRP*-TRFA-DG | 12 |

## Linear Integrator Pulsed Output Transducer

*Typical applications result in pulses proportional to kilowatt-hours, ampere hours, litre-hours etc., depending on the transducer or transmitter used. Accepts inputs such as process signals derived from transducers or transmitters and integrates them with respect to time to produce a pulsed output via volt free relay contacts. Converts DC input into a pulsed kilowatt hour and ampere hour measurement output.*

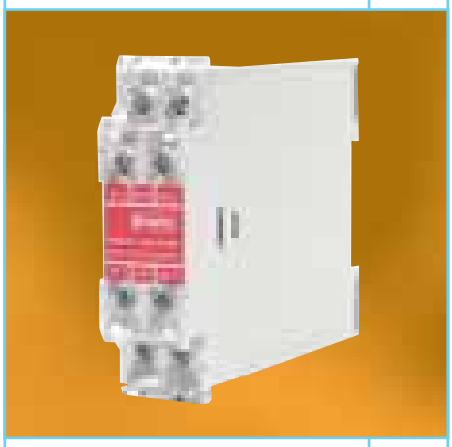
### Specifications

| | |
|---|---|
| Inputs: | 0/1mA, 4/20mA, 0/5mA, 0/10mA, 0/20mA, 0/1V DC, 0/10V DC |
| Output: | Volt free relay contacts |
| Pulse rate: | Minimum 100/hour maximum 10,000/hour, specify. |
| Auxiliary power: | 63.5, 110, 120, 139, 208, 220, 240, 277, 380, 415, 440, 480V AC |

### Product Code – Linear Integrator

| Input | Pulses per hour | AC Aux. power | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 0/1mA | specify | 120V | 253-TIK*-FAPO-DG | 13 |

## Signal Isolator



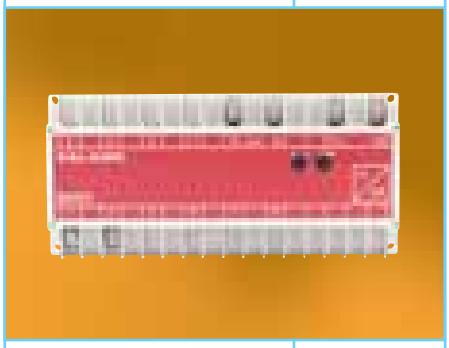
*The signal isolator is designed for use in signal transmission and processing applications to prevent noise and interference caused by ground loops between signal source and the measuring device. The isolator provides galvanic high voltage isolation between the source and measuring device.*

### Specifications

| | |
|---|---|
| Input/output ratio: | 1 to 1 |
| Max input/output: | 20mA DC |
| Accuracy: | 0.2% at 250 ohms |
| Isolation: | 660V AC, 930V DC continuous |
| Test voltage: | 1.5 kV at 50 Hz for 1 minute |
| Load range: | 0-500 ohms @ 20mA DC |
| Output voltage: | I out x R Load limited to 15V |
| Input voltage: | Typically I x (load + 200Ω) limited to 18V |
| UL file number: | E149713N |
| CSA file number: | LR52592 |

### Product Codes – Single Frequency Transducer, Self Powered - 1 DC Output

| Input DC | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|
| 20mA | 0/20mA | 250-ISA*-HF | 5 |



## DC/DC & Temperature

*DC input versions accept signals over a wide range, providing galvanic isolation between the input and output signals. Output is directly proportional to the input. Thermocouple models also incorporate cold junction compensation for all base metal thermocouples, and thermocouple break protection. Suitable for data acquisition and data control monitoring.*

### Specifications

| | |
|---|---|
| Inputs: | DC voltage: any value between 10mV to 600V<br>DC current: any value between 100µA to 10A |
| Thermocouple models: | range of temperature transmitters suitable for use with a variety of thermocouples. |
| Inputs: | most popular types are:<br>J-Fe/Const 0-700°C<br>K-NiCr/NiA 0-1200°C<br>T-Cu/Cn0-200°C |
| Auxiliary power: | AC 63.5, 110, 120, 220, 240, 380, 415, 440 and 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Codes – DC/DC & Temperature Transducer

| Input | O/P DC | AC Aux. power | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| DC current | 0/1mA | 120V | 256-TTA*-**FA-DG | 18 |
| DC millivolts | 0/1mA | 120V | 256-TTM*-**FA-DG | 18 |
| DC voltage | 0/1mA | 120V | 256-TTV*-**FA-DG | 18 |
| **Thermocouple** | | | | |
| Type K | 0/1mA | 120V | 256-TTN*-KTFA-DG | 18 |
| Type T | 0/1mA | 120V | 256-TTC*-TTFA-DG | 18 |
| Type J | 0/1mA | 120V | 256-TTF*-JTFA-DG | 18 |


## Resistance Transmitter

*A simple and convenient way of measuring and transmitting temperature values in the form of a load independent DC signal. Transmitters detect varying resistance due to temperature change at the RTD (Resistance Temperature Detector). Designed for platinum (Vt.100), copper (Cu 10) or nickel (Ni100) RTDs.*

### Specifications

| | |
|---|---|
| Input: | 100Ω Platinum - (Pt100), 10Ω copper, 100Ω nickel |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA, |
| Auxiliary: | AC 110, 120, 220, 240, 380, 415V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Codes – Resistance Transmitter

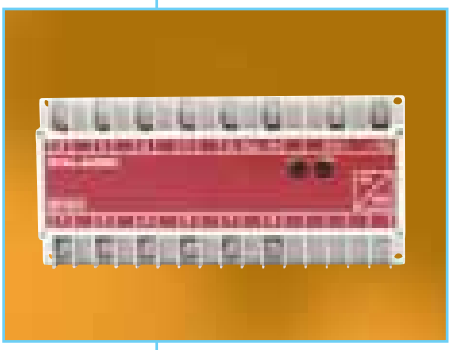
| Input | O/P DC | AC Aux. power | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 10 ohms copper RTD | 0/1mA | 120V | 253-TRR*-R1FA-DG | 17 |
| 100 ohms VT RTD | 0/1mA | 120V | 253-TRR*-R2FA-DG | 17 |

### Ordering Information

Input span can be specified in temperature or resistance. The resistance value between lowest and highest measured temperature must be within the stated limits.

| | |
|---|---|
| Platinum: | 20Ω minimum span, 200Ω maximum span |
| Copper: | 2Ω minimum span, 20Ω maximum span |
| Nickel: | 20Ω minimum span, 200Ω maximum span |

## Power Transducers



*A wide range of transducers to measure power in single or 3 phase, balanced or unbalanced, 3 or 4 wire systems. Transducers utilise the well established 'time division multiplication' method of measuring instantaneous power over a wide range of input waveforms. In the self powered version the system voltage provides both power supply and an input to the voltage modulation circuit of an oscillator. Square wave pulses from a multi-vibrator circuit with a mark-space ratio varied by the measured voltage, and amplitude varied by the measured current, are fed to an integrator and an output amplifier circuit, producing a DC milliamp signal directly proportional to the power input. All inputs are isolated by transformers. For large voltage variations use the auxiliary powered versions. Self powered units permit voltage variations up to +20% of the nominal input. Measures both import and exported power.*

### Specifications

| | |
|---|---|
| Input voltage: | 63.5, 110, 120, 150, 208, 220, 240, 277, 380, 415, 480V |
| Current: | 1, 5, 10A |
| Frequency: | 50, 60 or 400 Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | self powered |
| AC: | 63.5, 110, 120, 150, 208, 220, 240, 277, 380, 415, 480V |
| DC: | 12, 24, 48, 120, 135V |

### Product Codes – Watt Transducer

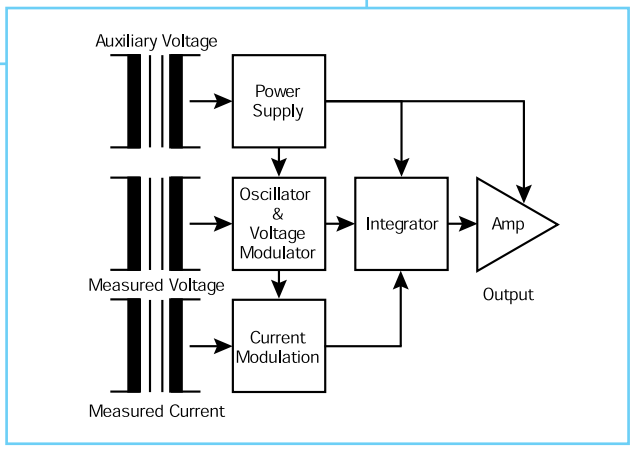
| | Catalogue no. | Connection diag. |
|---|---|---|
| Single phase | 256-TWK | 14 |
| 3 phase 3 wire balanced load | 256-TWL | 19 |
| 3 phase 4 wire balanced load | 256-TWH | 24 |
| 3 phase 3 wire unbalanced load | 256-TWM | 20 |
| 3 phase 4 wire unbalanced load | 256-TWN | 35 |
| 3 phase 3 wire balanced load (2 voltage connections) | 256-TWS | 38 |

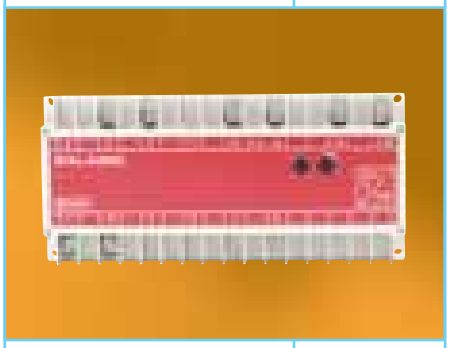
### Product Codes – VAr Transducer

| | | |
|---|---|---|
| Single phase | 256-TXK | 14 |
| 3 phase 3 wire balanced load | 256-TXG | 34 |
| 3 phase 4 wire balanced load | 256-TXH | 42 |
| 3 phase 3 wire unbalanced load | 256-TXM | 20 |
| 3 phase 4 wire unbalanced load | 256-TXN | 40 |

### Product Codes – VA Transducer

| | | |
|---|---|---|
| Single phase | 256-TYK | 14 |
| 3 phase 3 wire balanced load | 256-TYG | 41 |
| 3 phase 4 wire balanced load | 256-TYH | 42 |
| 3 phase 3 wire unbalanced load | 256-TYM | 20 |
| 3 phase 4 wire unbalanced load | 256-TYN | 35 |





## Power Factor and Phase Angle

*A range of power factor and phase angle transducers with linearised output.*

### Product Codes – Power Factor Transducer (for Digital Meters & Systems)

3 Phase 3 or 4 Wire Balanced Load.

| Power factor | Catalogue no. | Connection diag. |
|---|---|---|
| Single phase 0.5/1/0.5 | 256-TDSU | 43 |
| Single phase 0/1/0 | 256-TDCU | 43 |
| Single phase 1/0/1/0/1 | 256-TDAU | 43 |
| 3 phase 3 or 4 wire balance load 0.5/1/0.5 | 256-TDTU | 45 |
| 3 phase 3 wire balance load 0/1/0 | 256-TDEU | 46 |
| 3 phase 3 or 4 wire balance load 1/0/1/0/1 | 256-TDBU | 46 |

**Note:** These products are only suitable for 50 Hz or 60 Hz operation.

### Product Codes – Phase Angle Transducers Single Phase

3 Phase 3 or 4 Wire Balanced Load, 2 or 4 Quadrant

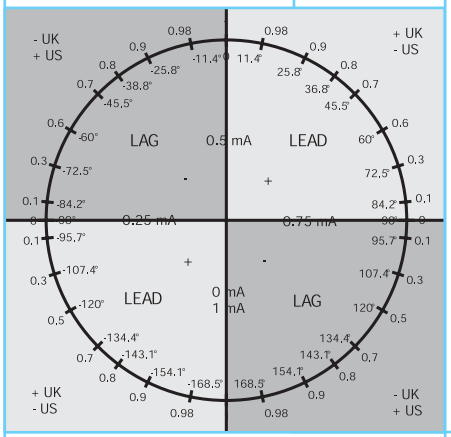
| Phase angle | Catalogue no. | Connection diag. |
|---|---|---|
| Single phase<br>60/0/60 75/0/36 0.5/1.0/0.5 or 0.2/1/0.8 | 256-TPSU | 14 |
| Single phase -180°/0/180° | 256-TPAU | 14 |
| 3 phase 3 or 4 wire balanced load<br>0.5/1/0.5 or 0.2/1/0.8 | 256-TPTU | 42 |
| 3 phase 3 or 4 wire balanced load -180°/0/180° | 256-TPBU | 19 |

### Product Codes – Phase Angle Transducers Single Phase

3 Phase 3 or 4 Wire Balanced Load
Accuracy +/- 3% of span, i.e. 0.03 counts on 0.5/1/1/0.5 model.

| Power factor | Catalogue no. | Connection diag. |
|---|---|---|
| Single phase - 0.5/1/0.5 | 256-TFSU | 14 |
| Single phase - 0/1/0 | 256-TFCU | 14 |
| Single phase - 1/0/1/0/1 | 256-TFAU | 14 |
| 3 phase 3 or 4 wire balanced load 0.5/1/0.5 | 256-TFTU | 42 |
| 3 phase 3 wire balanced load 0/1/0 | 256-TFEU | 19 |
| 3 phase 3 wire or 4 wire balanced load 1/0/1/0/1 | 256-TFBU | 19 |

**Note:** These products are only suitable for 50 Hz or 60 Hz operation.




### Product Code – Phase Relationship Transducer

| Phase relationship | Catalogue no. | Connection diag. |
|---|---|---|
| Measures the phase relationship between two systems (voltage inputs) | 256-TPDU | 36 |

### Conversion to P.F.

The transducer output, if displayed on an analogue meter, produces an inconvenient non-linear scale. Computer users may need a linearising program.

Other transducers with a linearised output are available from Crompton Instruments if required.

# Paladin Advantage Transducers Class 0.2

*An extensive range of higher specification transducers offering Class 0.2 measurement of up to eight electrical parameters. The flexible design provides for up to 3 analogue outputs in one housing, and fibre optic cable output in the digital version of the RS232 for trouble free operation in electrically noisy environments. The range offers resistance to EMC protection against high voltage and overload, and resistance to vibration in harsh electrical environments.*

### High Accuracy
Class 0.2 accuracy for analogue output. Typically accuracy is 0.15% with RS232 output.

### Interference Elimination
Running output through fibre optic cable RS232 output eliminates ground loop and radio frequency interference problems. The cable can be run near AC power cables without risk of data corruption.

### High Speed Precision Measurement
Each cycle of the mains waveform is sampled 32 times in the power transducers.

### Unique Flexibility
A wide combination of parameters can be measured. Multiple outputs from a single housing, can be scaled to individual customer requirements, including dual slope.

### True Power Factor
Advanced design provides true power factor (W/VA) output.

### Operating Condition Indication
Green LED status indication shows actual operating condition.

### Frequency Range Control
Out-of-range filter on the frequency transducer helps eliminate invalid signals and the need for additional protection circuits.

### Approvals

| | |
|---|---|
| Designed to comply with | |
| Function: | EN60688, IEC688:1992, EMC and LVD |
| Vibration/shock: | IEC 68 |
| Safety: | EN61010, IEC 1010-1 (installation category III, Pollution degree 2, 300V rms) |
| Enclosure: | IEC529 (IP50) |
| Fixing: | 35mm DIN rail to EN50022 or via optional fixing feet |
| National specification: | indicated by 7th in the part number |

### Features
Extensive range
High accuracy 0.2%
True RMS or average sensing measurement
Multiple outputs in one housing
Exceptional waveform handling on distorted waveforms
Zero and span adjustments
DIN rail mounting
Single and 3 phase systems
Vibration and shock resistant
Flame retardant cases
Screw clamp terminals

### Benefits
Cost saving remote metering
Reduction of signal levels for ease of metering
Isolated output for safety
Protection against high voltage and overload

### Applications
Switchgear
Distribution systems
Generator sets
Control panels
Energy management
Building management
Utility power monitoring
Process control
Motor control

### Approvals
Vibration, shock and safety approvals

| Current / Spec | Current | Voltage | Frequency | Current, volts frequency | watts | VArs | VA | Power factor | Phase angle |
|---|---|---|---|---|---|---|---|---|---|
| | 252-XAA<br>252-XAR<br>252-XAS<br>252-XAL | 252-XVA, 252-XVR<br>252-XVS, 252-XVZ<br>252-XVL | 252-XH | 256-XAR, 256-XAS<br>256-XLK, 256-XVR<br>256-XVS, 256-XVW<br>256-XVX, 256-XVY<br>256-XVZ | 256-XW Series | 256-XX Series | 256-XY Series | 256-XF Series | 256-XP Series |
| Prefered inputs: | 1A, 5A | 110, 120, 208, 220<br>230, 240, 277, 380<br>400, 415, 480V | 57.7, 110, 120, 220<br>230, 240, 380, 400<br>415V | 1A, 5A<br>110, 120, 220, 230, 240, 277, 380, 400, 415, 480V | | | | | |
| Other inputs: | 0.2A<br>to 10A | 63.5, 69.3, 100<br>115, 127, 173<br>190, 200, 440V | 63.5, 100, 127<br>208, 277, 440, 480V | 0.2A to 10A<br>57.7, 63.5, 69.3, 100, 115, 127, 173, 190, 200, 440V | | | | | |
| Overload:<br><br>Maximum input: | 2 x In continuous<br>50 x in for 1 second | 1.5Vn continuous<br><br>2 x Vn for 1 second maximum terminal voltage 600V | 1.5Vn continuous<br><br>2 x Vn for 1 second maximum terminal voltage 600V | 3 x in continuous, 20 x in, 5 x 1 second with 5 minute intervals<br><br>1.2 x Vn continuous. maximum terminal voltage 600V<br>2 x Vn continuous for 10 seconds with 10 second intervals<br>maximum terminal voltage 600V | | | | | |
| Frequency: | 50 or 60Hz +/=10% | | 50 or 60Hz | 40 to 65Hz | | | | | |
| Ranges: | 45/55, 54/66Hz | | 45/55, 55/65, 45/65<br>47/63, 48/52<br>360/440Hz | 45/55, 55/65, 45-65Hz<br>47/53, 57/63Hz | | | | .5/1/.5<br>.2/1/.8<br>-1/0/1/0/-1 | 60/0/60°<br>30/0/70°<br>-180/0/180° |
| Burden at normal: | <0.2VA for 252-XAS XAA = 1 VA<br><1.5VA for 252-XVA<br><0.25VA for 252-XAR/XVR<br><4.0VA for 252-XVZ | | <1VA for 252-XHL/XHS<br><3VA for 252-XHA | less than 0.02VA voltage<br>less than 0.2VA current | | | | | |
| Accuracy: | Class 0.2 | | +/=0.05% of mid freq. | .02% of mid freq. 256/XLK<br>0.04% for 45/65Hz | Class 0.2 usage group III ≤1°<br>RS 232 accuracy typically 0.15% | | | | |
| Temperature: | operating -10 to 60°C<br>(normal range of use)<br>storage -55° to 85°C<br>calibrated at 23°C | | | operating -10° – 60°C (normal range of use)<br>ref range 0 – 50°C<br>storage -20 – 70°C<br>calibrated at 23°C | | | | | |
| Temp. coefficient: | +/-0.01%/°C | | +/-0.01% of mid freq/°C | +/-0.008%/°C | | | | | |
| Humidity: | | | Less than 95%RH | | | | | | |
| Ripple: | 0.4% P/P | | <0.5% rms | 0.4% P/P | | | | | |
| Response time: | Less than 200ms to 99% | | Less than 400ms to 95% | less than 200ms to 99% | | | | | |
| Zero & span: | +/-2% (255-XAA/XVA/XAS/XHA/XHS/XVS<br>(have no zero adjustment) | | | +/-2% typical adjustment | | | | | |
| Isolation: | 4kV rms I/P/O/P/AUX/CASE | | | | | | | | |
| Auxiliary supply: | Not required on model 252-XAA/XVA/XHA<br>DC auxiliary 12, 24, 48, 110 & 125V DC For all other models select from AC voltage input range*** | | | select from AC voltage input range above***<br>DC auxiliary 12, 24, 48, 110, 120, 135V*** | | | | | |
| Range: | +/-20% of nominal. Maximum DC terminal voltage 150V | | | +/-20% of nominal. Maximum DC terminal voltage 156V | | | | | |
| Burden: | less than 3VA | | | less than 6VA | | | | | |
| Preferred nominal outputs: | 0-1mA into load of 0 – 15kR<br>0-20mA into load of 0 – 750R<br>4-20mA into load of 0 – 750R<br>(not available on models 252-XVA/XAA/XHA) | | | single or bi-directional output 256-XF XW<br>0-1mA into load of 0 – 15kR, uni-directional only<br>0-20mA into load of 0 – 750R<br>4-20mA into load of 0 – 750R<br>4-12-20mA into load – 750R | | | | | |
| Other outputs: | 0-5mA into load of 0 – 3 kR<br>0-10mA into load of 0 –1.5 kR<br>0-10-20mA into load of 0 – 750 R 252-XVZ<br>0-0.5-1mA into load of 0 – 15 kR only<br>0-5V across 250R minimum XAR, XVR, XVZ<br>0-10V across 500R minimum XAR, XVR, XVZ<br>1-5V across 250R minimum XAR, XVR<br>2-10V across 250R minimum XAR, XVR | | | dual slope<br>0.1V across 50R minimum<br>0-5V across 250R minimum<br>0-10V across 500R minimum<br>1-5V across 250R minimum<br>2-10V across 500R minimum<br>0-5mA into load of 0 to 3kR<br>0-10mA into load of 0 to 1.5kR | | | | | |
| Over-range: | maximum output is less than 2 x nominal output | | | maximum output is less than 1.3 x nominal output | | | | | |
| Compliance: | 15V (current outputs) 20 mA (voltage outputs) | | | 15V (current outputs) 20mA (voltage outputs) | | | | | |
| Maximum: | less than 24V | | | less than 24V | | | | | |
| RS232 | use fibre optic adaptor 252-TCA class 0.5% accuracy | | | protocols see publication DWT1540/2 fibre optic-cable socket option | | | | | |

Stability one year. For dimensions, see page 33. For connection diagrams, see pages 34-41.

**Note:** ***For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.

## AC Current Average Sensing - Self Powered

*For use in all current measuring applications, calibrated to indicate the true RMS value of a sinewave with less than 1% of 3rd harmonic distortion. Self powered version allows measurements down to 20% of full input, no auxiliary power required, input and output isolated.*

### Specifications

| | |
|---|---|
| Inputs: | 1, 5 or 10 A AC, 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA |
| Auxiliary power: | self powered |

### Product Code – Single Phase, Current Transducer, Self Powered, 1 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | self | 0/1mA | 252-XAA*-LSFA-C6 | 1 |

## AC Current Average Sensing - Auxiliary Powered

*Auxiliary supply version allows measurement of input currents down to zero, providing a measuring range 0-100% or normal. Calibrated to indicate the true RMS value of a sinewave with up to 1% distortion. Live zero output available. Input, output and auxiliary are isolated.*

### Specifications

| | |
|---|---|
| Inputs: | 1, 5 or 10 A AC, 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440 and 480V |
| | DC 12, 24, 48, 110, 125V |

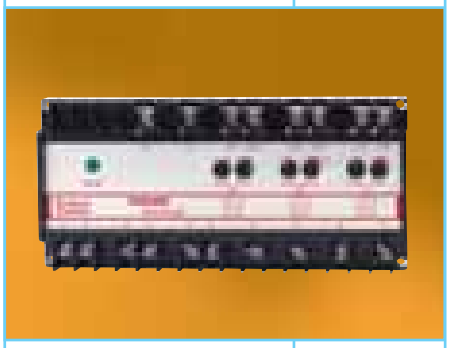
### Product Codes – Single Phase, Current Transducer, Auxiliary Powered, 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 0/1mA | 252-XAS*-LSFA-C6-PQ | 6 |
| 5 A 60Hz | 120V | 4/20mA | 252-XAL*-LSHG-C6-PQ | 6 |

### Product Codes – 3 Phase, Current Transducers, Auxiliary Powered, 3 DC Outputs

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 0/1mA | 256-XAS*-LSFA-C6-PQ | 2 |
| 5 A 60Hz | 120V | 4/20mA | 256-XAS*-LSHG-C6-PQ | 2 |

With multiple analogue outputs, do not common the -ve terminals.



## AC Current True RMS Sensing - Auxiliary Powered

*Used for measuring non standard and distorted waveforms. Measures true RMS value input current. Calibration is maintained for sinewaves having up to 50% of 3rd harmonic distortion. Spring triggered current waveforms from any firing angle will typically be accurate to 0.3%. Isolation is provided between input, output and auxiliary.*

### Specifications

| | |
|---|---|
| Inputs: | 1.5 or 10A AC refer to factory for other inputs |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120, or 135V |

### Product Codes – 3 Phase, Current Transducers, Auxiliary Powered, 3 DC Outputs

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 0/1mA | 252-XAR*-LSFA-C6-PQ | 6 |

### Product Code – 3 Phase, Current Transducer, Auxiliary Powered, 3 DC Outputs

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 5 A 60Hz | 120V | 0/1mA | 256-XAR*-LSFA-C6-PQ | 2 |

With multiple analogue outputs, do not common the -ve terminals.

## AC Voltage Average Sensing-Self Powered

*Standard version for use in all voltage measuring applications, allowing measurement down to 20% of full input. Average sensing for normal sinewave voltages and RMS calibrated for sinewave with up to 1% of 3rd harmonic distortion. No auxiliary required. Input and output isolated.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 115, 120, 139, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V AC 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA |
| Range: | 20 – 125% |
| Auxiliary power: | self powered |

### Product Code – Single Phase, Voltage Transducer, Self Powered, 1 DC Output

| Input AC | AC Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120 V 60Hz | self | 0/1mA | 252-XVA*-PQFA-C6 | 10 |

## AC Voltage Average Sensing - Auxiliary Powered

*Auxiliary power allows voltage measurement down to zero, providing a measurement range of 0-100% or nominal. Average sensing and calibrated to indicate the true RMS value of a sinewave with up to 1% distortion. Live zero output available. Input, output and aux., are isolated.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440 and 480V AC, 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120, or 135V |

### Product Codes – Single Phase, Voltage Transducer, Auxiliary Powered, 1 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 252-XVS*-PQFA-C6-PQ | 15 |
| 120V 60Hz | 120V | 4/20mA | 252-XVL*-PQHG-C6-PQ | 15 |

### Product Codes – 3 Phase, 3 Wire, Voltage Transducer, Auxiliary Powered, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V | 120V | 0/1mA | 256-XVW*-PQFA-C6-PQ | 11 |
| 120V | 120V | 4/20mA | 256-XVW*-PQHG-C6-PQ | 11 |

### Product Code – 3 Phase, 4 Wire, Voltage Transducer, Auxiliary Powered, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 256-XVS*-PQFA-C6-PQ | 16 |

With multiple analogue outputs, do not common the -ve terminals.

## AC Voltage True RMS-Auxiliary Powered

*Measures true RMS voltages of non standard and distorted waveforms. Calibration is correct for sinewaves having up to 50% of 3rd harmonic distortion, even hybrid triggered current waveforms at any firing angle will typically be accurate to 0.3%. Isolation is provided between input and output.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 115, 120, 150, 200, 208, 220, 230, 240, 380, 400, 415, 440, 480V AC, 50 or 60Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA. |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 125V |

### Product Codes – Single Phase, Voltage Transducer, Auxiliary Powered, 1 DC Output

| Input AC | Aux. power | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 252-XVR*-PQFA-C6-PQ | 15 |
| 120V 60Hz | 120V | 4/20mA | 252-XVR*-PQHG-C6-PQ | 15 |

### Product Codes – 3 Phase, 3 Wire, Voltage Transducer, Auxiliary Powered, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 256-XVY*-PQFA-C6-PQ | 11 |
| 120V 60Hz | 120V | 4/20mA | 256-XVY*-PQHG-C6-PQ | 11 |

### Product Codes – 3 Phase, 4 Wire, Voltage Transducer, Auxiliary Powered, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V 60Hz | 120V | 0/1mA | 256-XVR*-PQFA-C6-PQ | 16 |
| 120V 60Hz | 120V | 4/20mA | 256-XVR*-PQHG-C6-PQ | 16 |

With multiple analogue outputs, do not common the -ve terminals.

## AC Voltage with Suppressed Zero or Expanded Scale

*Single or three phase displaying small changes within a large voltage. The indicated bandwidth can be 10-30% on either side of nominal. The output is directly proportional to the input within a specified span, providing very high accuracy and stability.*

### Specifications

| | |
|---|---|
| Input range: | +/- 10% or +/- 30% of nominal 100, 120, 220, 240, 380V AC |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA |
| Auxiliary power: | self powered (252), aux. powered (256) |

### Product Code – Single Phase, Expanded Scale AC Voltage Transducer, Self Powered, 1 DC Output

| Input AC | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|
| 110/130V | 0/1mA | 252-XVZ*-A9FA-C6 | 15 |

### Product Code – 3 Phase, 3 Wire, Expanded Scale AC Voltage Transducer, Auxiliary Powered, RMS Sensing and Calibration, 3 DC Outputs

| | | | |
|---|---|---|---|
| 110/130V | 0/1mA | 256-XVX*-A9FA-C6-PQ | 16 |

### Product Code – 3 Phase, 4 Wire, Expanded Scale AC Voltage Transducer, Auxiliary Powered, 3 DC Outputs

| | | | |
|---|---|---|---|
| 110/130V | 0/1mA | 256-XVZ*-A9FA-C6-PQ | 16 |

With multiple analogue outputs, do not common the -ve terminals.

## Frequency

*A simple and reliable transducer for measuring supply frequencies of mains and gensets. The output is directly proportional to the input frequency, providing very high accuracy and stability. Isolation provided between input and output.*

### Specifications

| | |
|---|---|
| Inputs preferred: | 57.7, 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V |
| Frequency: | 45-55Hz, 55-65Hz, 45-65Hz |
| Auxiliary power: | self powered 252 x XHA, aux. powered 252-XL & XHS |
| Accuracy: | 0.05 of mid frequency |

### Product Codes – Single Frequency Transducer, 1 DC Output, Self Powered

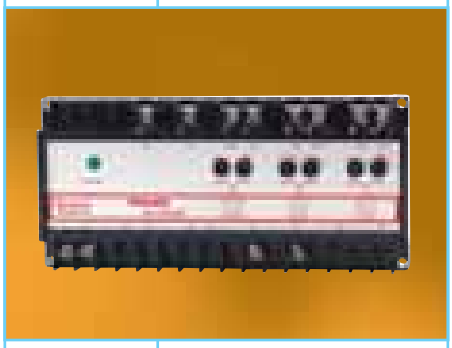
| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V | 45/55 | 0/1mA | 252-XHA*-PQ-FA-AG | 10 |
| 120V | 55/65 | 0/1mA | 252-XHA*-PQ-FA-AN | 10 |
| 120V | 45/65 | 0/1mA | 252-XHA*-PQ-FA-AJ | 10 |
| 120V | 360/440 | 0/1mA | 252-XHA*-PQ-FA-BI | 10 |

### Product Codes – Single Frequency Transducer, 1 DC Output, Auxiliary Powered

| | | | | |
|---|---|---|---|---|
| 120V | 45/55 | 4/20mA | 252-XHL*-PQ-HG-AG-PQ | 15 |
| 120V | 55/65 | 4/20mA | 252-XHL*-PQ-HG-AN-PQ | 15 |
| 120V | 45/65 | 4/20mA | 252-XHL*-PQ-HG-AJ-PQ | 15 |
| 120V | 360/440 | 4/20mA | 252-XHL*-PQ-HG-BI-PQ | 15 |
| 120V | 45/55 | 0/1mA | 252-XHS*-PQ-FA-AG-PQ | 15 |
| 120V | 55/65 | 0/1mA | 252-XHS*-PQ-FA-AN-PQ | 15 |
| 120V | 45/65 | 0/1mA | 252-XHS*-PQ-FA-AJ-PQ | 15 |
| 120V | 360/440 | 0/1mA | 252-XHS*-PQ-FA-BI-PQ | 15 |

## 3 in 1 Voltage, Current and Frequency

*3 in 1 voltage, current and frequency true RMS measurement transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered. Available with auxiliary power or self powered models.*



### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 – 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

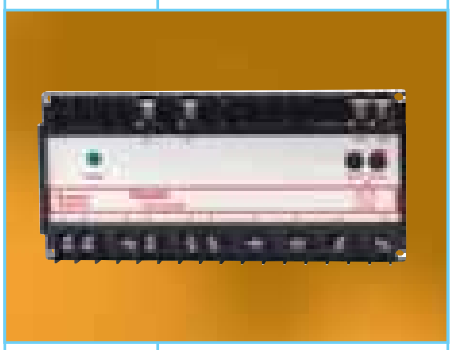
### Product Code – Auxiliary Powered, 3 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 55/65 | 0/1mA | 256-XLK*-PQLS-AN-FA-DG | 9 |

With multiple analogue outputs, do not common the -ve terminals.

## Watt Transducers

*True RMS measurement watt transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*



### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440 and 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XWK*-QQFA-C3** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XWW*-QQFA-C3** | 21 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XWM*-QQFA-C3** | 20 |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XWH*-QQFA-C3** | 24 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XWL*-QQFA-C3** | 41 |

## VAr Transducers

*True RMS measurement VAr transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120, 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XXK*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XXW*-QQFA-C3-** | 21 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 DC Output

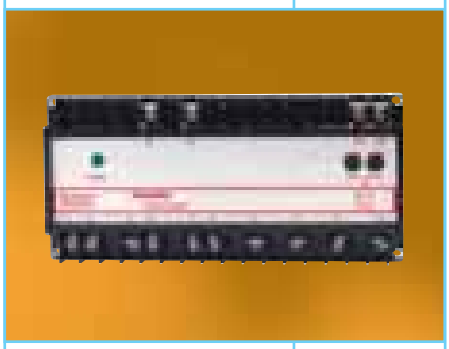
| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XXL*-QQFA-C3-** | 19 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XXM*-QQFA-C3-** | 20 |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XXH*-QQFA-C3-** | 24 |



## VA Transducer

*True RMS measurement VA transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Codes – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XYK*-QQFA-C3-** | 14 |
| 240V, 10A | 40-65Hz | 0/1mA | 256-XYK*-Q8FA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XYW*-QQFA-C3-** | 21 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XYL*-QQFA-C3-** | 19 |

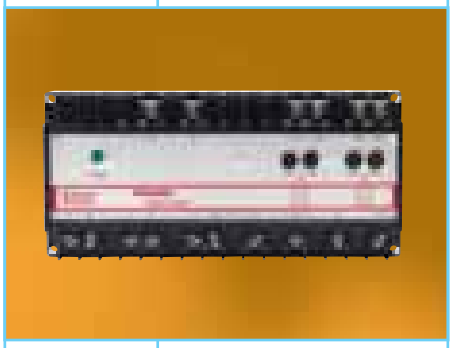
### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XYM*-QQFA-C3-** | 20 |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XYH*-QQFA-C3-** | 24 |

## Watt and VAr Transducers



*Watt and VAr true RMS measurement transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V AC<br>DC 12, 24, 48, 110, 120 or 135V DC |

### Product Code – Single Phase, 2 Wire 1 Element, 2 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XDK*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 2 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XDW*-QQFA-C3-** | 23 |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 2 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XDH*-QQFA-C3-** | 26 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 Element, 2 DC Outputs

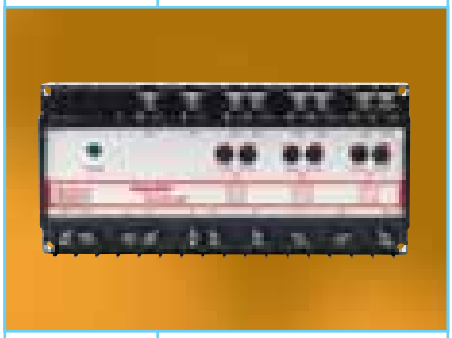
| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XDL*-QQFA-C3-** | 25 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 2 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XDM*-QQFA-C3-** | 22 |

With multiple analogue outputs, do not common the -ve terminals.

## Watt, VAr & VA



*Watt, VAr & VA true RMS measurement transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 3 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XEK*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XRM*-QQFA-C3-** | 31 |

### Product Code – 3 Phase, 3 Wire Balanced Load 1 Element, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XRL*-QQFA-C3-** | 27 |

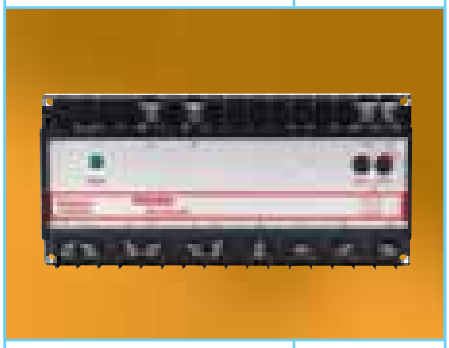
### Product Code – 3 Phase, 4 Wire Balanced Load 1 Element, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XRH*-QQFA-C3-** | 28 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XRW*-QQFA-C3-** | 32 |

With multiple analogue outputs, do not common the -ve terminals.



## Power Factor – 2 Quadrant

*Power Factor – 2 Quadrant true RMS measurement transducer provide exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFS*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFV*--QQFA-C3-** | 24 |

### Product Code – 3 phase, 3 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFW*--QQFA-C3-** | 19 |

### Product Code – 3 phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFU*-QQFA-C3-** | 20 |

### Product Code – 3 phase, 4 Wire Unbalanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFT*-QQFA-C3-** | 21 |

## Power Factor – 4 Quadrant

*Power Factor – 4 Quadrant true RMS measurement transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 – 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFA*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFD*-QQFA-C3-** | 24 |

### Product Code – 3 Phase, 3 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFG*-QQFA-C3-** | 19 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFC*-QQFA-C3-** | 20 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XFB*-QQFA-C3-** | 21 |

## Phase Angle Transducer – 2 Quadrant

*True RMS measurement Phase Angle – 2 Quadrant transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 1 DC Output

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPS*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPT*-QQFA-C3-** | 21 |

### Product Code – 3 Phase, 4 Wire, Balanced Load, 3 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPV*-QQFA-C3-** | 24 |

### Product Code – 3 Phase, 3 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPW*-QQFA-C3-** | 19 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPU*-QQFA-C3-** | 20 |

## Phase Angle Transducer – 4 Quadrant

*True RMS measurement Phase Angle – 4 Quadrant transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 – 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – Single Phase, 2 Wire 1 Element, 2 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XPA*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XPB*-QQFA-C3-** | 21 |

### Product Code – 3 Phase, 4 Wire, Balanced Load, 1 DC Outputs

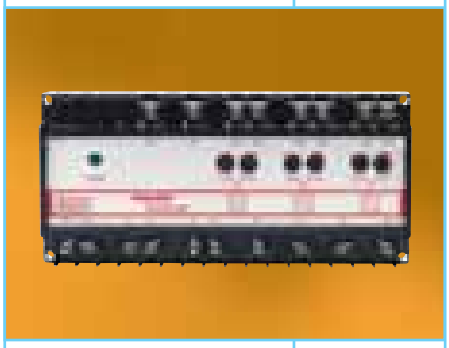
| | | | | |
|---|---|---|---|---|
| 120V L-L, 5A | 40-65Hz | 0/1mA | 256-XPD*-QQFA-C3-** | 24 |

### Product Code – 3 Phase, 3 Wire, Balanced Load, 1 Element, 1 DC Output

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XPG*-QQFA-C3-** | 19 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V L-N, 5A | 40-65Hz | 0/1mA | 256-XPC*-QQFA-C3-** | 20 |



## Watt, VAr and Power Factor – 2 Quadrant

*Watt, VAr and Power Factor – 2 Quadrant true RMS measurement transducer provides exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V AC<br>DC 12, 24, 48, 110, 120 or 135V DC |

### Product Code – Single Phase, 2 Wire 1 Element, 3 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XGK*-QQFA-C3-** | 14 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XSW*-QQFA-C3-** | 32 |

### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XSM*-QQFA-C3-** | 31 |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XSH*-QQFA-C3-** | 28 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 Element, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XSL*-QQFA-C3-** | 27 |

•With multiple analogue outputs, do not common the -ve terminals.

## Watt, VAr and Power Factor – 4 Quadrant

*Watt, VAr and Power Factor – 4 Quadrant true RMS measurement transducer providing exceptional waveform handling on distorted waveforms. Available as either auxiliary or self powered.*

### Specifications

| | |
|---|---|
| Inputs: | 63.5, 100, 110, 120, 220, 230, 240, 380, 400, 415, 440, 480V AC |
| Current: | 1 or 5A AC |
| Frequency: | 40 to 65Hz |
| Outputs: | 0/1mA, 0/5mA, 0/10mA, 0/20mA, 4/20mA |
| Auxiliary power: | AC 63.5, 100, 110, 115, 120, 200, 208, 220, 240, 277, 380, 400, 415, 440, 480V<br>DC 12, 24, 48, 110, 120 or 135V |

### Product Code – 3 Phase, 4 Wire Balanced Load, 1 Element, 3 DC Outputs

| Input AC | Frequency Hz | O/P DC | Catalogue no. | Connection diag. |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XJH*-QQFA-C3-** | 28 |

### Product Code – 3 Phase, 3 Wire Balanced Load, 1 Element, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XJL*-QQFA-C3-** | 27 |

### Product Code – 3 Phase, 4 Wire Unbalanced Load, 3 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XJW*-QQFA-C3-** | 32 |

•With multiple analogue outputs, do not common the -ve terminals.

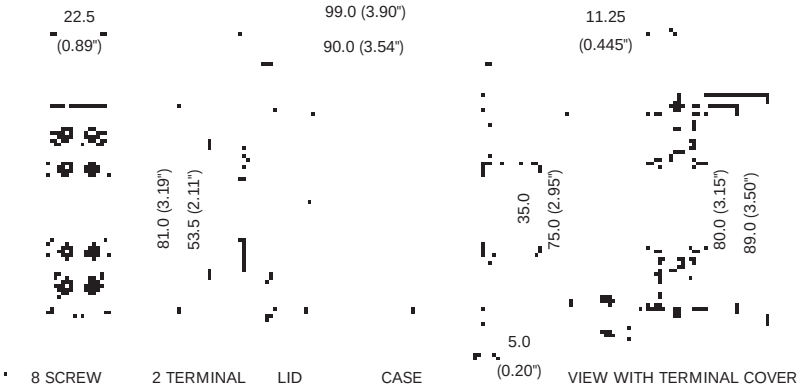
### Product Code – 3 Phase, 3 Wire Unbalanced Load, 2 Elements, 3 DC Outputs

| | | | | |
|---|---|---|---|---|
| 120V, 5A | 40-65Hz | 0/1mA | 256-XJM*-QQFA-C3-** | 31 |

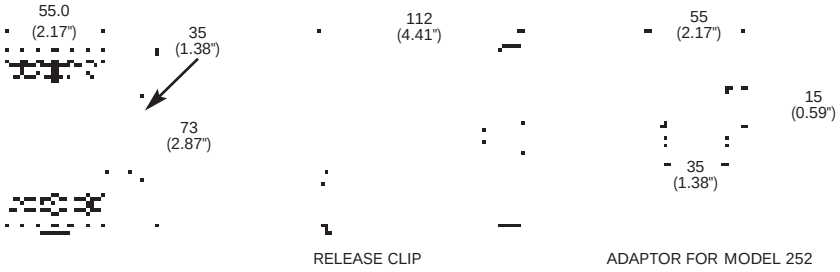
# Paladin Transducers 250 Series

## Dimensions

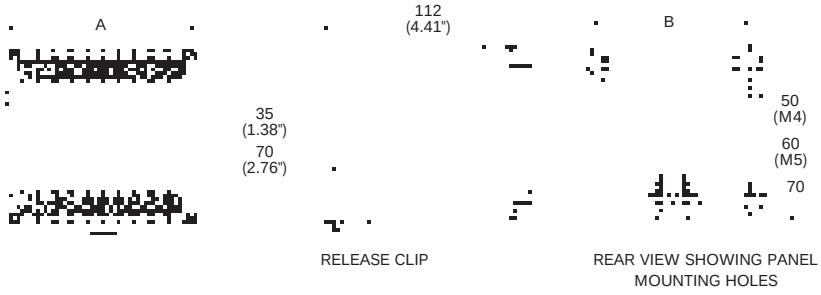
### Model 250




### Model 252




### Model 253, 256




| Model | A mm | A inches | B mm | B inches |
|---|---|---|---|---|
| 250 | 22.5 | 0.88 | - | - |
| 252 | 55 | 2.17 | - | - |
| 253 | 75 | 2.96 | 60 | 2.36 |
| 256 | 150 | 5.90 | 135 | 5.31 |

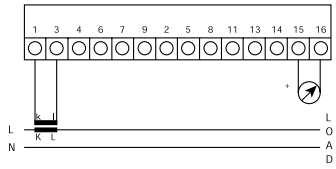
### Mounting Details

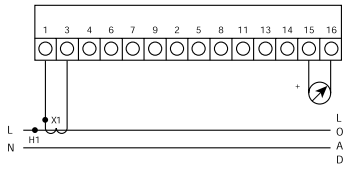
Position 1 - DIN top hat rail mounting (DIN ENS0022-35)
Position 2 - Screw mounting to suit M4 fixings

# Connection Diagrams

## Type 252-XAA, Type 253-TAA

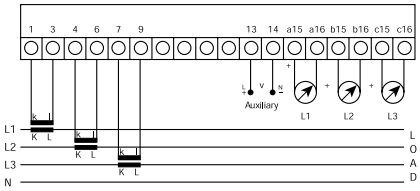
Single Phase Current, Self Powered – Diagram 1

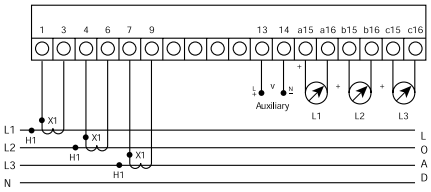



## Type 256-XAS/XAR, Type 256-TAS, TAL, TAR

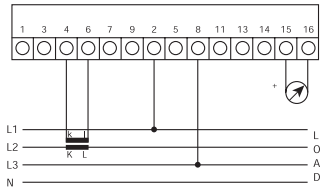
3 Ø Current, 3 Outputs – Diagram 2

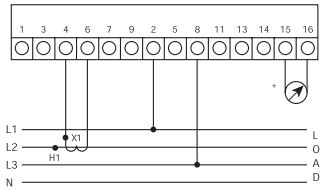



## Type 256-TAB

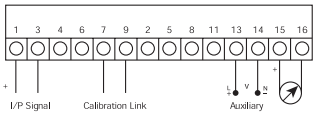
Bi-directional 3 Ø 3 Wire Current – Diagram 3




## Type 253-TDP/TDN/TDM

Integrating DC Current – Diagram 4

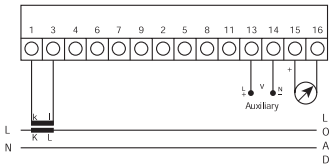


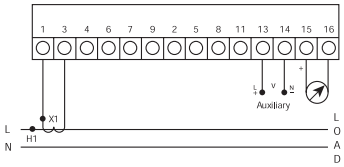

## Type 253-ISA

Single Isolator – Diagram 5


## Type 252-XAS/XAR/XAL, Type 253-TAL/TAR

Single Phase Current – Diagram 6



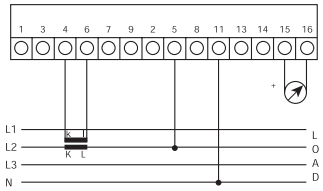



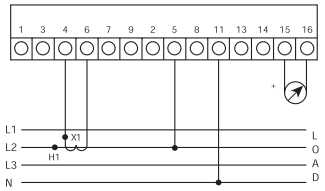

### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

## Type 256-TAB

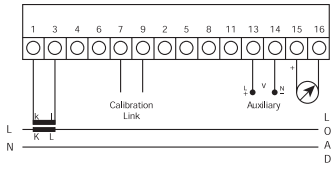
Bi-directional Single Phase and 3 Ø 4 Wire Current – Diagram 7

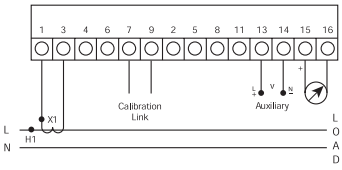



## Type 253-TAP/TAN/TAM

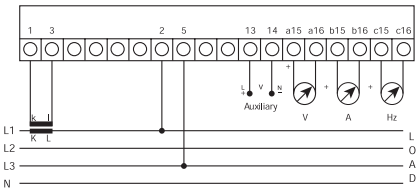
Integrating AC Current – Diagram 8

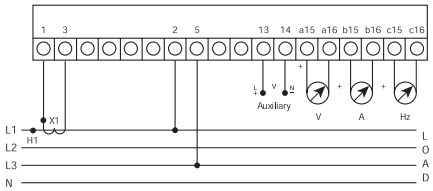



## Type 256-XLK

Voltage, Current and Frequency, 3 Outputs – Diagram 9



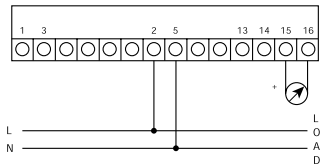




## Type 252-XVA & Type 253-TVA

Single Phase Voltage Self Powereda

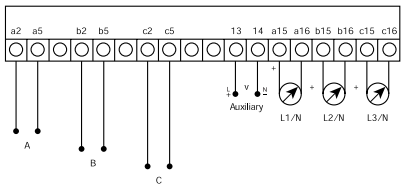
## Type 253-XHA, 253-THZ

Frequency – Diagram 10



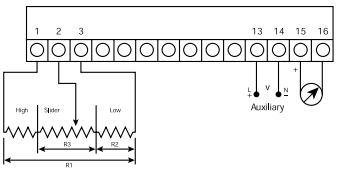

## Type 256-TVL, TVR, TVS, TVW
## Type 256-XVU, XVW, XVY, XVX

3 x 1Ø Voltages 3 Outputs – Diagram 11



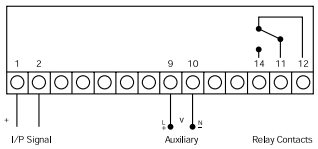

## Type 253-TIK

Tap Position and Slideware Transmitter – Diagram 12




## Type 253-TRP/TRT

Linear Integrator – Diagram 13

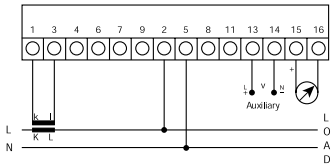


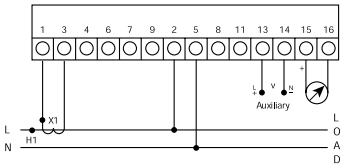

### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

## Type 256-XWK/XXK/XYK/XDK/XEK/XGK/XFS/XFA/XPS/XPA
## Type 256-TWK/TXK/TYK/TPS/TPA/TFA/TFS/TFC

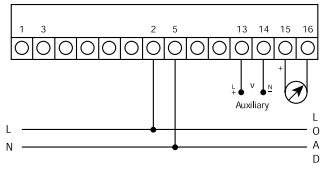
Single Phase, watts or VArs or VA or Phase Angle or Power Factor, Watt and VAr: Watt, VAr and VA: Watt, VAr and Power Factor.
One Output – Diagram 14



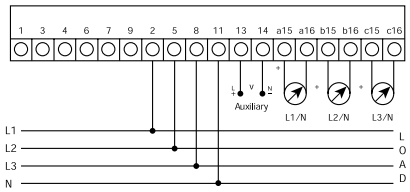

## Type 252-XVS, XVZ, XVR, XVL, XHL, XHS
## Type 253-TVL, TVR, TVZ

Single Phase Voltage – Diagram 15



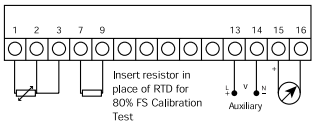

## Type 256-XVS/XVR/XVZ/XVL

3 Ø 4W Voltage, 3 Outputs – Diagram 16



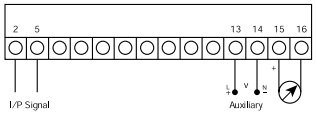

## Type 253-TRR

Temperature Transmitter – Diagram 17



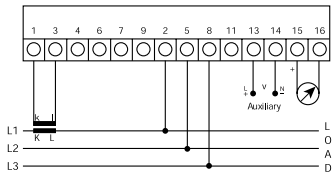

## Type 256-TTA/M/V/F/C/N

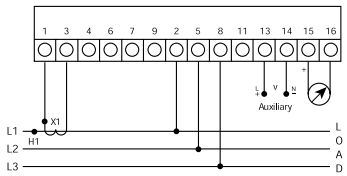
DC/DC Transducer and Temperature
Diagram 18




## Type 256-XWL/XXL/XYL/XFW/XPW/XPG/XFG
## Type 256-TWL/TPB/TFB/TFE

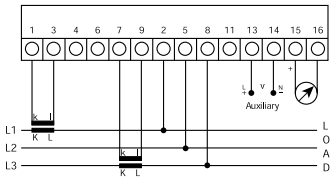
3 Ø 3W Balanced Load, watts or VArs or VA or Phase Angle or Power Factor.
One Output – Diagram 19

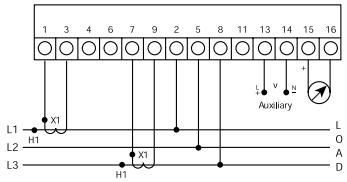



## Type 256-XWM/XXM/XYM/XZM/XFU/XFC/XPU/XPC
## Type 256-TWM/TXM/TYM

3 Ø 3W Unbalanced Load, watts or VArs or VA or Phase Angle or Power Factor.
One Output – Diagram 20



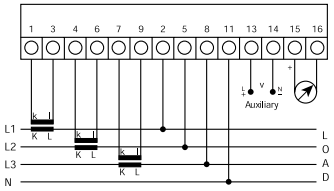



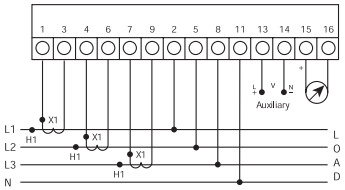

### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).
5. Model 256-XDK has 2 outputs (a) and (b).
6. Models 256-XEK and 256-XGK have 3 outputs (a), (b) and (c).

## Type 256-XWW/XXW/XYW/XZW/XFT/XFB/XPT/XPB

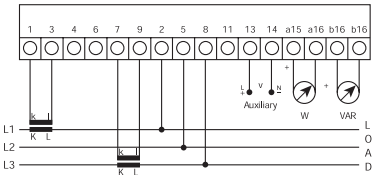
3 Ø 4W Unbalanced Load, 3 Elements,
Watts or VArs or VA or Phase Angle or Power Factor.
One Output – Diagram 21

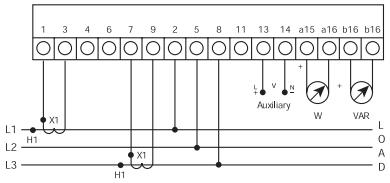



## Type 256-XDM

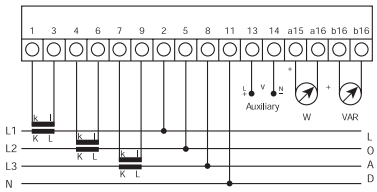
3 Ø 3W Unbalanced Load, Watt and VAr, 2 Outputs – Diagram 22

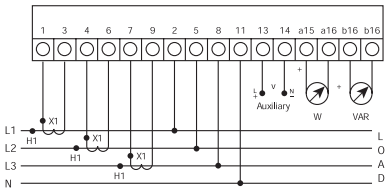



## Type 256-XDW

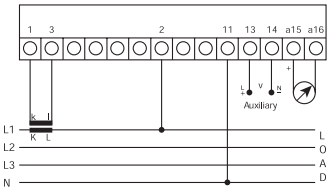
3 Ø 4W Unbalanced Load, 3 Elements, Watt and VAr, 2 Outputs – Diagram 23

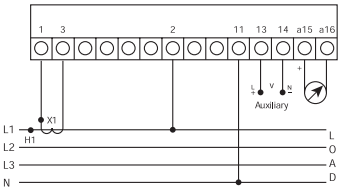



## Type 256-XWH/XXH/XYH/XFV/XFD/XPV/XPD
## Type 256-TWH/TXH/TYH

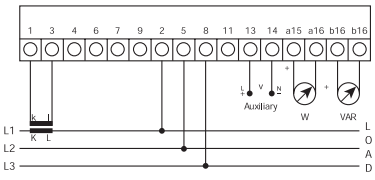
3 Ø 4W Balanced Load, WattS or VArs or VA or Phase Angle or Power Factor
1 Output – Diagram 24

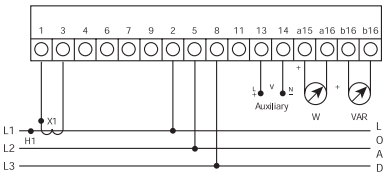



## Type 256-XDL

3 Ø 3W Balanced Load, Watt and VAr, 2 Outputs – Diagram 25



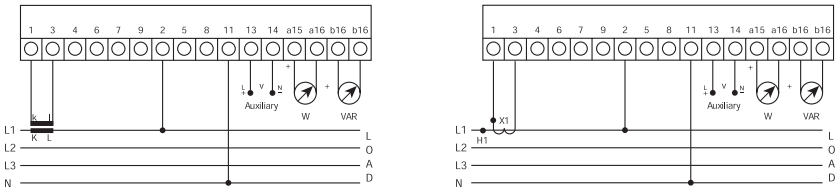




## Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

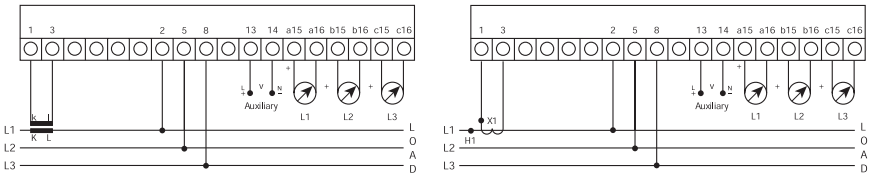
## Type 256-XDH

3 Ø 4W Balanced Load, Watt and VAr, 2 Outputs – Diagram 26



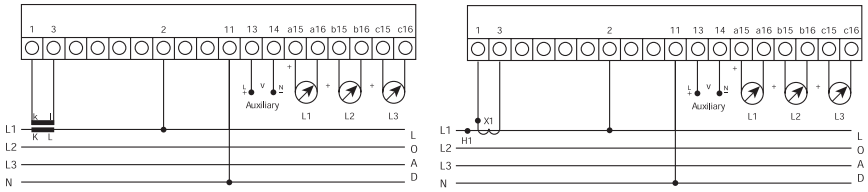

## Type 256-XRL/XSL/XJL

3 Ø 3W Balanced Load, Watt, VAr and VA:
Watt, VAr and Power Factor, 3 Outputs – Diagram 27



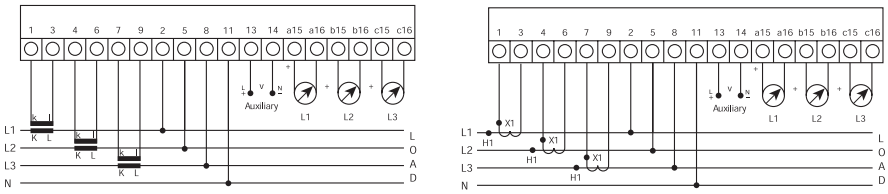

## Type 256-XRH/XSH/XJH

3 Ø 4W Balanced Load, Watt, VAr and VA:
Watt, VAr and Power Factor, 3 Outputs – Diagram 28



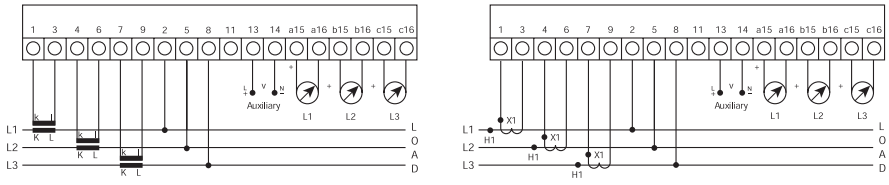

## Type 256-XWE/XXE/XYE/XFE/XFF/XPE/XPF

3 Ø 4W Unbalanced Load, Watts or VArs or VA or Phase Angle or Power Factor
3 Outputs – Diagram 29




## Type 256-XRM/XSM/XJM

3 Ø 3W Unbalanced Load, Watt, VAr and VA: Watt, VAr and Power Factor, 3 Outputs
Diagram 31

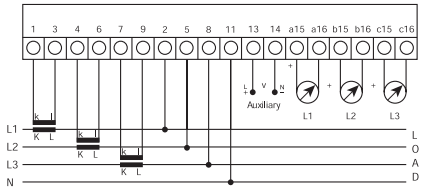


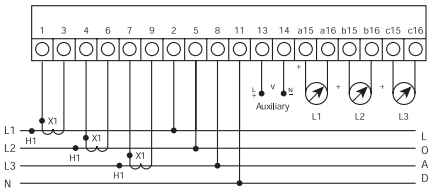

### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

## Type 256-XRW/XSW/XJW

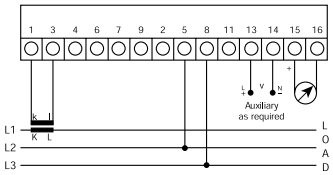
3 Ø 4W Unbalanced Load, 3 Elements, Watt, VAr and VA: Watt, VAr and Power Factor
3 Outputs – Diagram 32

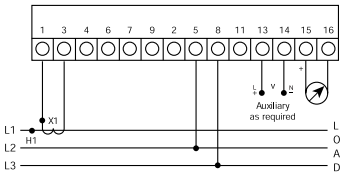



## Type 256-TWE/TXG/TPT

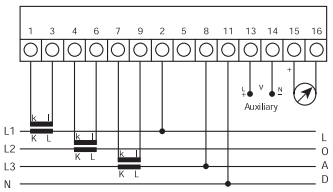
3 Phase 3 wire Balanced Load, Watts, VArs or Phase Angle – Diagram 34

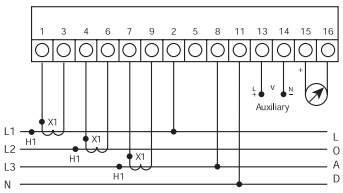



## Type 256-TWN/TXP/TYN

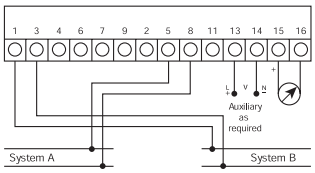
3 Ø 4W Unbalanced Load, Watts or VArs, or VA – Diagram 35



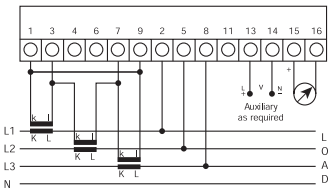

## Type 256-TPD

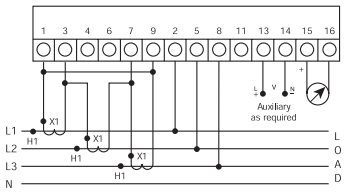
Phase Difference Transducer, 2 Voltage Inputs – Diagram 36




## Type 256-TXJ

3 Ø 4W Unbalanced Load, VArs, Delta Connected CT's – Diagram 37



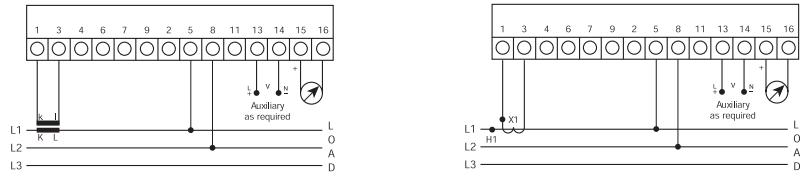




### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

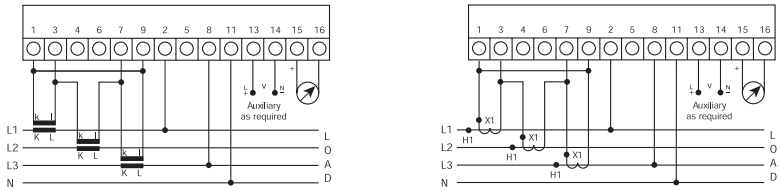
## Type 256-TWS

3 Ø 3W Balanced Load, Watts – Diagram 38



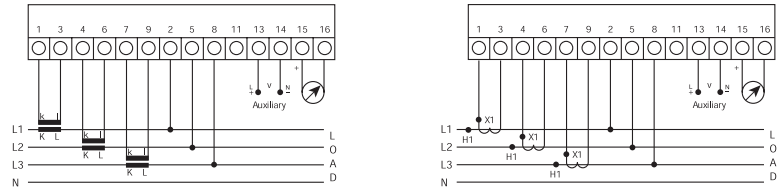

## Type 256-TWJ/TYJ

3 Ø 4W Unbalanced Load, Watts or VA Delta Connected CT's – Diagram 39




## Type 256-TXN

3 Ø 4W, Unbalanced Load, VArs – Diagram 40

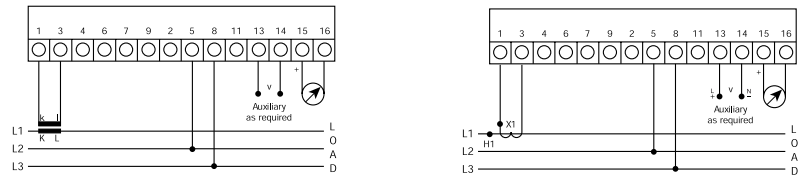



**25D-ODA**

Pin 2 = data, 4 and 5 = power for ODA, 6 and 20 = power for ODA, 7 = ground

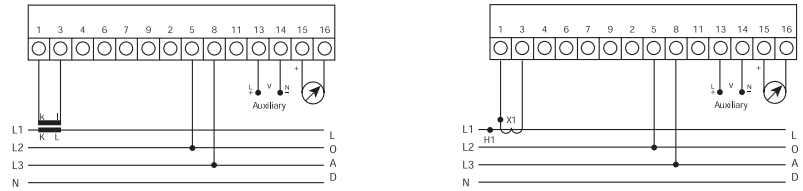
## Type 256-TYG, XWL

3 Ø 3W Balanced Load, VA, WATT – Diagram 41




## Type 256-TPT/TFT/TXH/TYH

3 Phase 3/4W, Balanced Load, Phase Angle or Power Factor – Diagram 42

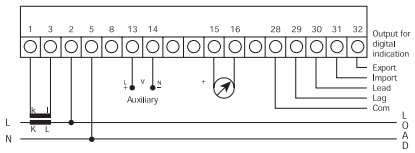


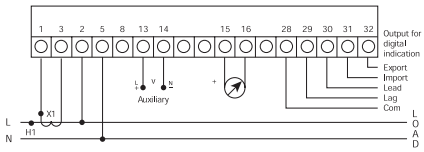

### Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

## Type 256-TDA/TDC/TDS

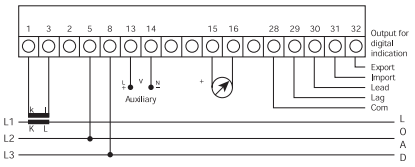
4 Quadrant, Single Phase Power Factor with an Output for a Digital Indicator – Diagram 43

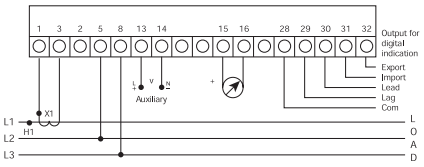



## Type 256-TDT

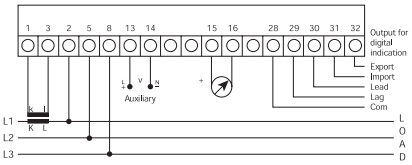
3 Phase 3/4W, Balanced Load, Power Factor, with an Output for a Digital Indicator Diagram 45

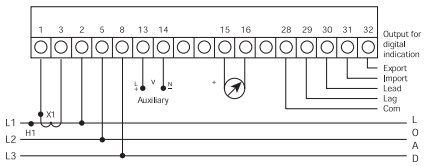



## Type 256-TDB/TDE

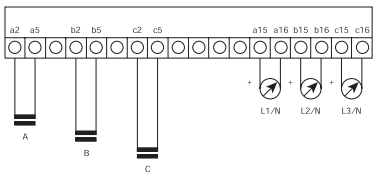
4 Quadrant, 3 Phase 3/4W, Wire Balanced Load, Power Factor with an Output for a Digital Indicator – Diagram 46

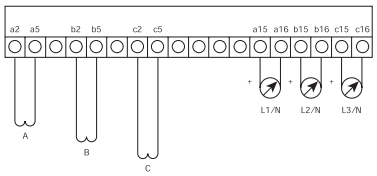



## Type 256-TAA

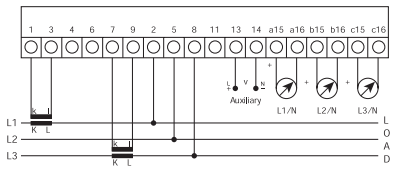
3 x 1Ø Current, Outputs – Diagram 47




## Type 256-XVW/XVY/XVX

3 Ø 3W Voltage, 3 Outputs – Diagram 48




## Notes on connection diagrams

1. When using more than one item via a current transformer, inputs must be in series.
2. Auxiliary supply applies only if ordered. For maximum performance an AC or DC auxiliary is recommended. Self powering is achieveable for a voltage variation of less than 20%.
3. When there is more than one output the outputs are in the sequence listed on the description, i.e. on a watt, VAr and VA Transducer, output (a) is watt, (b) is VAr and (c) is VA.
4. Where more than one output is provided there is no isolation between outputs. User may require a signal isolator (Module 250-ISA).

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